



# Integrated Natural Resources Management Plan

## Naval Radio Transmitter Facility Dixon



*January 2014*



# **Integrated Natural Resources Management Plan**

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Naval Radio Transmitter Facility Dixon

January 2014

**Prepared for:**

Naval Radio Transmitter Facility Dixon  
7200 Radio Station Road  
Dixon, California 95620

**Under Contract with:**

Naval Facilities Engineering Command Southwest  
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**Contract No. N62473-06-D-2402/0027**

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**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN  
Naval Radio Transmitter Facility Dixon, California**

**APPROVAL**

This Integrated Natural Resources Management Plan (INRMP) fulfills the requirements for the INRMP in accordance with the Sikes Act (as amended), and DoDI 4715.03, and OPNAVINST 5090.1C CH-1. This document was prepared and reviewed in coordination with U.S. Department of the Interior, Fish and Wildlife Service, and California Department of Fish and Wildlife Bay Delta Region in accordance with the 2013 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations.

**Approving Official—U.S. Navy, Commander, Navy Region Southwest**

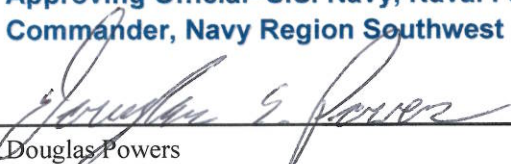

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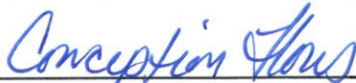

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**Concurring Agency - U.S. Fish and Wildlife Service**

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**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN**  
**Naval Radio Transmitter Facility Dixon, California**

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**Concurring Agency - California Department of Fish and Wildlife**

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## Executive Summary

An Integrated Natural Resources Management Plan (INRMP) is a long-term planning document to guide the installation commander in the management of natural resources to support the installation mission, while protecting and enhancing installation resources for multiple use, sustainable yield, and biological integrity. The Sikes Act (as amended [16 United States Code {U.S.C} 670a]) requires the U.S. Department of Defense (DoD) to prepare and implement an INRMP for each installation that contains significant natural resources. The U.S. Department of the Navy (Navy) guides implementation of the Sikes Act (as amended) through Chief of Naval Operations Instruction (OPNAVINST) 5090.1C CH-1 18 July 2011, Environmental Readiness Program Manual (hereinafter OPNAVINST 5090.1C CH-1). The Navy is required to ensure ecosystem management is the basis for all management of its lands (Sikes Act, as amended; Department of Defense Instruction [DoDI] 4715.03). The goal of this INRMP is to provide the guidelines, means, and mechanism for assuring long term sustainability and vitality of both the military mission and health of the installation's natural resources. This INRMP will help installation commanders effectively manage natural resources to ensure the sustainability of all ecosystems within the installation; ensure no net loss of the capability of installation lands to support the DoD mission; conserve and rehabilitate natural resources on military installations; sustain multipurpose use of the resources and public access to military installations; participate as appropriate, in regional ecosystem initiatives; and demonstrate conservation benefits for species listed under the Endangered Species Act.

Naval Radio Transmitter Facility (NRTF) Dixon (referred to as installation or facility) encompasses approximately 1,235 acres of mostly agricultural land and antenna field in Solano County, California. NRTF Dixon property supports the Naval Computer and Telecommunications Station (NCTS) San Diego as a tenant. NRTF Dixon is a special area under the responsibility of the Commander, Navy Region Southwest (CNRSW). NCTS San Diego's mission at NRTF Dixon is to provide military communications service within the Navy's Pacific Area of Operations. The installation is a combined service facility for high power transmission of low/high frequency electronic signals, via antennas for the U.S. Pacific Fleet's ship/shore and Defense Information System requirements. Principal users include both the U.S. Air Force and the Navy. NCTS San Diego reports operationally to Naval Computer and Telecommunications Area Master Station Pacific, under the command of Naval Network Warfare Command. The installation is a government-owned, contractor-operated and maintained site.

NRTF Dixon is in the Sacramento-San Joaquin Delta region of the Central Valley of California. The property is part of a low-lying, flat plain. The region is dominated by agriculture and suburban/urban development, and natural processes are now controlled and fragmented through a matrix of agriculture, canals, levees, drainage, and stream channelization. The property at NRTF Dixon is a combination of agricultural fields, maintained grasslands, and natural plant communities. NRTF Dixon straddles the edge of both the geographic and political boundaries of the 'Legal Delta' (identified in Map 3-2) as defined by the 1959 Delta Protection Act (as presented in Lund et al. 2007). The 1959 Delta Protection Act defined an area where the State Water Project and Central Valley Project management activities would be coordinated to keep the Delta water fresh enough for agriculture and human use.

Core ecosystem attributes and values at NRTF Dixon include:

- Federal land ownership in a matrix of private land. The military use of the land as an antenna field is compatible with the matrix and maintains many ecosystem values and services.
- Soils with conductivity properties (derived from salt content) conducive to the military mission.

- Vernal pools and wetlands with potential for enhancement and restoration that is compatible with mission responsibilities. Wetlands may support endemic or rare species, and could be enhanced to support Pacific flyway species on the U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern (BCC) list.
- Agricultural and wildland habitats in a matrix dominated by agriculture. These occur within a regional system of wetland, grassland, and agricultural parcels designated as preserves by various jurisdictions.
- Benefit to recognized Species at Risk. The property's open habitat condition benefits the burrowing owl (*Athene cunicularia*). For Swainson's hawks (*Buteo swainsoni*), the pocket gopher prey base benefits from the alfalfa production/harvest cycle, and from nearby trees and riparian woodlands for nesting (within a 10-mile radius).
- Located completely in a 100-year floodplain that has an aquatic connection to the San Francisco Bay Delta.

The INRMP is structured to meet the goal stated in Chapter 1 and the objectives in Chapters 3 and 4. For each INRMP topic, specific key issues are identified, current management is described and its effectiveness is assessed. Out of the identified issues and management assessment, objectives and specific management strategies are presented. From the management strategies, natural resources management projects to be implemented are identified, and appended to this document as a list of projects (Appendix A: Implementation Summary Table). Strategies are presented as a framework, and not at the level of detail of a work plan or proposal.

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# INRMP Cross-Walk to the U.S. Department of Defense Template

Office of the Under Secretary of Defense (Acquisition, Technology and Logistics) Memorandum on the Integrated Natural Resources Management Plan Template, 14 August 2006.

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# Naval Radio Transmitter Facility Dixon

## Integrated Natural Resources Management Plan

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## 1.0 Introduction and Overview

### 1.1 Purpose and Scope

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Naval Radio Transmitter Facility (NRTF)<sup>1</sup> Dixon property (referred to as installation or facility) supports the Naval Computer and Telecommunications Station (NCTS) San Diego as a tenant. NRTF Dixon is a special area and is under the responsibility of the Commander, Navy Region Southwest (CNRSW) (CNRSW Instruction 11000.1, 25 July 2013). CNRSW adopts this Integrated Natural Resources Management Plan (INRMP or Plan) for NRTF Dixon as a framework for managing natural resources on land it owns or controls. The purpose of the INRMP is to help CNRSW manage natural resources effectively to ensure that installation lands remain available and in good condition to support the military mission. Naval Facilities Engineering Command (NAVFAC) Southwest Natural Resources Specialists are an arm of CNRSW and will perform the duties required to implement and maintain this INRMP.

This INRMP is a requirement of the Sikes Act<sup>2</sup> (as amended, 2012). It is implemented by way of the Department of Defense Instruction (DoDI) 4715.03 18 March 2011, for military lands of the U.S. Department of Defense (DoD). The Sikes Act (as amended) states that the INRMP is the primary means by which natural resources compliance and stewardship priorities are set, and funding requirements are determined (U.S. Congress 2000). The U.S. Department of the Navy (Navy) guides implementation of the Sikes Act (as amended) through Chief of Naval Operations (CNO) Instruction (OPNAVINST) 5090.1C CH-1 18 July 2011, Environmental Readiness Program Manual (hereinafter, OPNAVINST 5090.1C CH-1).

This INRMP considers a long-term planning horizon with annual reviews and updates to be made as necessary. A commitment to implement priority projects, as funding permits, is provided with the signatures in the front of this Plan.

Projects are proposed, which cover a range of topics identified by the Sikes Act (as amended), stipulating that this INRMP provide for:

- Conservation and rehabilitation of natural resources;
- Sustainable, multipurpose use of resources;
- Public access that is necessary and appropriate for the use described above, subject to safety and military security requirements;
- Specific natural resource management goals and objectives, and time-frames for acting on them;
- Fish and wildlife management, land management, and forest management;
- Fish and wildlife habitat enhancement or modifications;
- Wetlands protection, enhancement, and restoration where necessary for support of fish, wildlife, or plants;
- Integration of and consistency among various activities conducted under the Plan;

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<sup>1</sup> Note that acronyms and abbreviations are presented in Appendix B: Acronyms and Abbreviations.

<sup>2</sup> Note that all laws and regulations relevant to this INRMP are presented in Appendix C: Applicable Laws and Regulations.

- Sustainable use by the public of natural resources to the extent that use is not inconsistent with needs of the fish and wildlife resources;
- Enforcement of natural resource laws and regulations;
- No net loss in the capability of the military installation lands to support the military mission of the installation; and
- Such other activities as the Secretary of the Navy determines appropriate.

The DoD is required to ensure that ecosystem management is the basis for all management of DoD lands and waters (Office of the Under Secretary of Defense [OUSD] Memorandum of 08 August 1994, Implementation of Ecosystem Management in the Department of Defense, and DoDI 4715.03). Based on an ecosystem approach, this INRMP takes a large geographic view to ensure achievement of the overriding goal of protecting the properties and functions of natural ecosystems. Since ecosystem boundaries are rarely synonymous with property ownership, installations such as NRTF Dixon are encouraged to form cooperative partnerships with nearby communities, as appropriate, and take part in public awareness initiatives in an effort to manage ecosystems successfully. DoDI 4715.03 provides principles and guidelines for implementing ecosystem management on DoD lands. This is discussed further in Section 1.9: Management Approaches and Chapters 3 and 4 of this INRMP.

Consistent with all of the above, this INRMP provides goals and objectives for the use and conservation of natural resources at NRTF Dixon that integrate regional ecosystem, military, social (community), and economic concerns. It establishes planning and management strategies; identifies natural resource constraints and opportunities; supports the resolution of land use conflicts; provides baseline descriptions of natural resources necessary for the development of conservation strategies and environmental assessment; serves as the principal information source for the preparation of future environmental documents for proposed NRTF Dixon actions; and provides guidance for annual natural resources management reviews, internal compliance audits, and annual budget submittals.

Designed to facilitate both stewardship and compliance with natural resources laws in the context of military mission requirements, this INRMP integrates natural resources components of existing NRTF Dixon plans, environmental documents, and the requirements of all applicable DoD, Navy, and installation regulations and guidelines.

## 1.2 Authority

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The Sikes Act (as amended) directs the DoD to take the appropriate management actions necessary to protect and enhance the land and water resources on all installations under its control. The DoD Directive 4700.4 Natural Resources Management Program and DoDI 4715.03 are implemented herein to establish fundamental land management policies and procedures for all military lands to preserve the military mission, and at the same time protect the natural resources. In Chapter 24 of OPNAVINST 5090.1C CH-1, program responsibilities and standards are set for complying with resource protection laws, regulations and Executive Orders (EOs) to conserve and manage natural resources on Navy installations in the United States and its territories and possessions. Finally, the CNO INRMP Guidance for Navy Installations, How to Prepare, Implement, and Revise INRMPs (April 2006) supplies guidelines on the process and procedure for developing an INRMP. Additional policy, regulation, and legislation regarding land management are contained in the remaining references, cited in this chapter.

Federal and state legal requirements that are primary drivers for natural resources management are listed in Appendix C: Applicable Laws and Regulations (U.S. Codes [USC], Public Laws, EOs, and Code of Federal Regulations).

Organization of this INRMP contains all the elements of the DoD Template for INRMPs (OUSD Acquisition, Technology and Logistics Memorandum, 14 August 2006 [DoD 2006]). Since both DoD and Navy guidance (DoDI 4715.03, CNO Guidance of April 2006, and OPNAVINST 5090.1C CH-1) are more comprehensive than that identified in the DoD Template, the outline has been re-worked so that additional material is added in the document to ensure compliance with all guidelines (Navy 2006, 2011b). A cross-walk between the DoD Template and this INRMP's content is provided in the front of this INRMP, after the Table of Contents.

## 1.3 Location and Real Estate Summary

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### Location

NRTF Dixon is located in the Sacramento Valley, a major agricultural region within the Central Valley of California (Map 1-1). The facility is approximately 65 miles northwest of Stockton (population 291,707)<sup>3</sup> and 65 miles northeast of San Francisco (population 805,235). Also in close proximity to Sacramento (population 466,488), about 25 miles separates the installation from the State capitol.

The property is located 7 miles southeast of the city of Dixon, California (population 18,351), and Interstate 80. It is east of Highway 113 at the intersection of Robben Road and Radio Station Road.

In addition to identifying the extent of Navy property, the NRTF Dixon Boundary illustrated in maps throughout this document also serves to denote the area to which this INRMP, including its objectives and strategies, applies.

### Real Estate Summary (INRMP Boundary)

NRTF Dixon encompasses approximately 1,235 acres owned by the Navy and located entirely within Solano County, California. Military mission-related land uses at the installation require buildings and equipment that facilitate operation and maintenance of the communications equipment (Map 1-2).

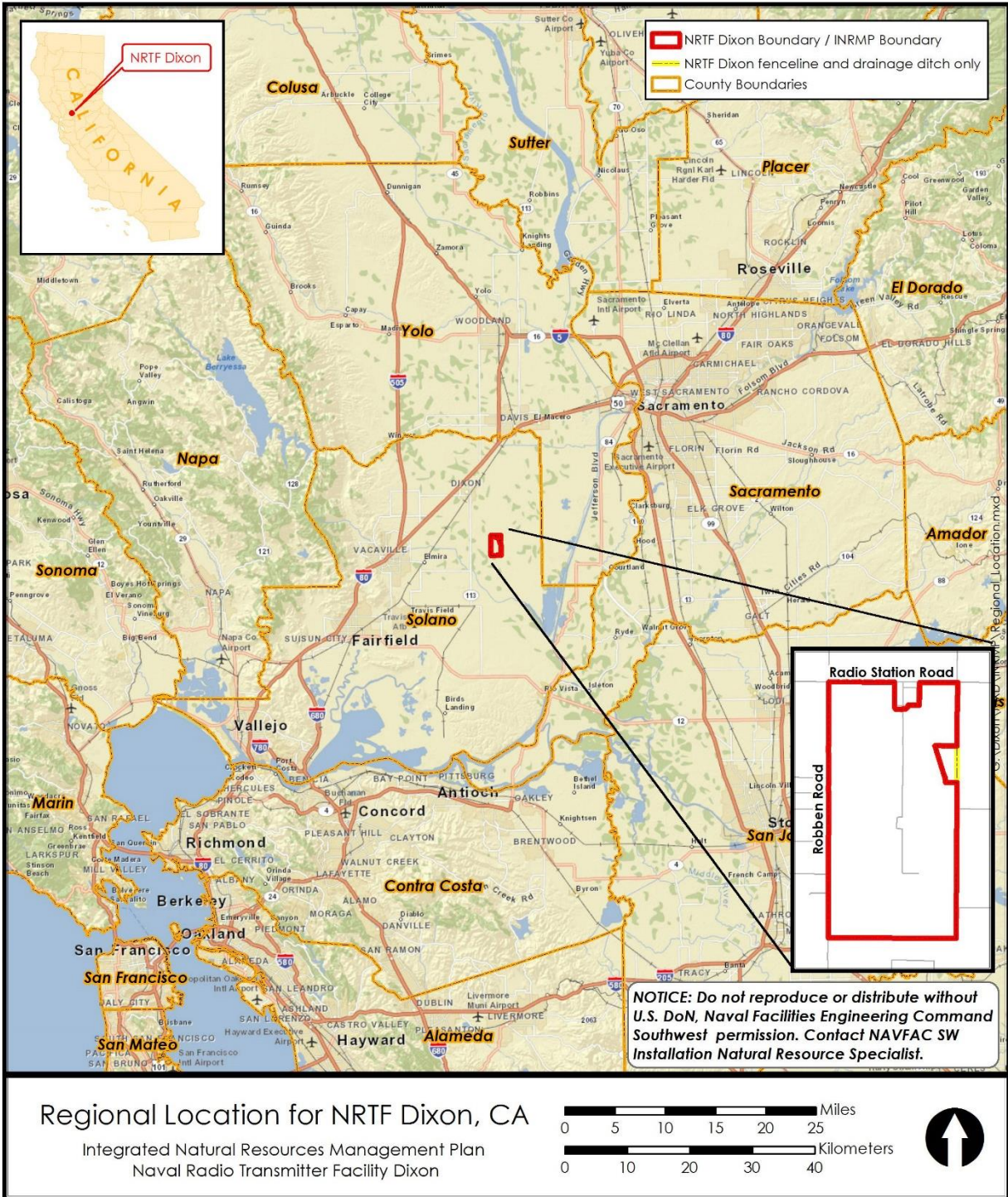
### Developed Areas and Equipment for the Military Mission

There is a small, developed compound in the middle of NRTF Dixon. It houses a 24,000 square-foot transmitter building and a facilities maintenance shop from which installation operations and maintenance at NRTF Dixon are conducted. Fencing exists around the entire perimeter of this area. Additional support facilities are located at the northern end of the property. Combined, developed areas on NRTF Dixon encompass approximately 14.4 acres.

High frequency transmitters, antennas, and associated ancillary equipment, and two low-frequency transmitters and antennas are located throughout the installation. Additional details on the installation's facilities are included in Chapter 2.

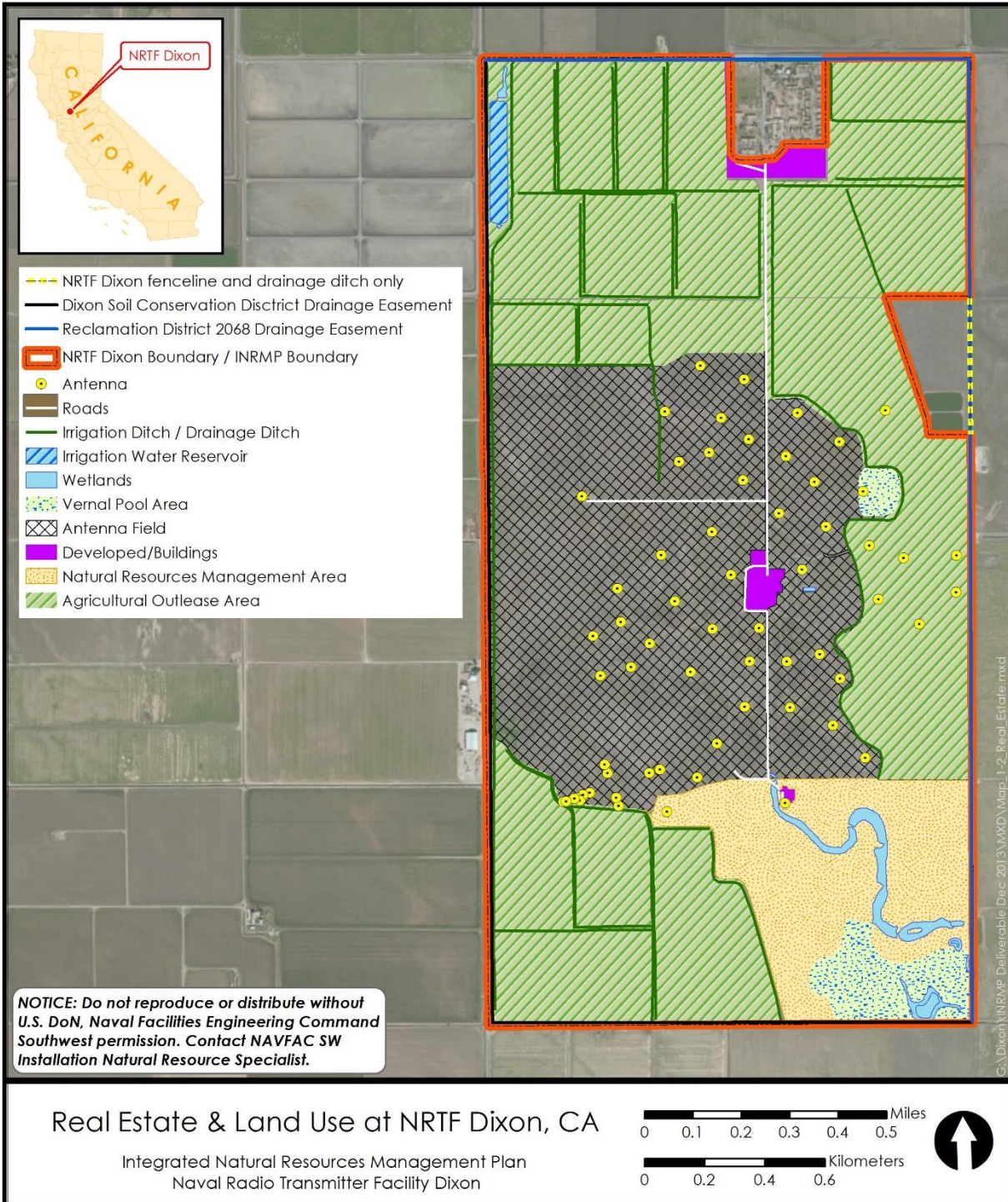
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<sup>3</sup> All population numbers given here are drawn from the U.S. Census Bureau ([www.census.gov](http://www.census.gov)) and based on the 2010 census.



Map 1-1. Regional map for Naval Radio Transmitter Facility Dixon, California.<sup>4</sup>

<sup>4</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.



<sup>5</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

A 24-acre Housing Area, adjacent to the northern portion of NRTF Dixon, was transferred from Navy ownership to the Dixon Housing Authority in February 2013 and is no longer part of the installation. When owned by the Navy, the Housing Area was used to house married personnel (until 1979 when NRTF Dixon became a government-owned, contractor-operated facility), and subsequently as a migrant farm worker camp, managed under lease from the Navy by the Dixon Housing Authority. The Navy also transferred two oxidation ponds and an adjacent field to the Housing Authority, located along the eastern edge of the installation. The Navy has granted the Authority several easements to facilitate access to the ponds and maintenance of a sewer line, water line, and powerlines used by the Housing Area and located on Navy property (Section 2.4.1: Real Estate Outgrants and Easements); the Housing Area has a separate water supply. The perimeter fence and drainage ditch to the east of the transferred oxidation ponds remain under the responsibility of the Navy.

### ***Antenna Field***

The majority of NRTF Dixon's communication antennas are located in a 417-acre antenna field in the central portion of the installation. The agricultural lessee currently maintains a portion of the agricultural outlease area for the antennas as well, bringing the total area to 500 acres. Ground cover is primarily non-native/native grassland and mowing occurs around the antennas as a fire abatement measure. Additional details on the antennas and antenna field are included in Chapters 2 and 3.

### ***Agricultural Outlease Area***

There is one agricultural outlease parcel, which comprises the entire 585 acres of agricultural land at NRTF Dixon (including those areas maintained by the lessee for the antennas). The irrigation district is Solano Irrigation District. A holding pond for irrigation is on-site and a canal intersects the property. Irrigation ditches that deliver and drain water for the parcel run along the perimeter of the installation and in between individual fields. Agriculture at NRTF Dixon provides some of the safety and security functions described below (Section 1.5.3: Mission Sustainability and the INRMP "No Net Loss" Requirement) and is compatible with operation of the military mission of the facility. It also defrays some operational costs. Additional details on agriculture and its role on the installation are provided in Chapters 2 and 4.

### ***Natural Resources Management Area***

A 154-acre Natural Resources Management Area (NRMA) in the southeastern corner of the installation complements the military mission at NRTF Dixon. It was set aside because of large vernal pools, seasonal wetlands, man-made ponds, and freshwater marsh. It encompasses remnant native habitats and continues to be managed for the benefit of wildlife and native plant communities. It was used in the past as a recreation area for barbecues and picnics when military personnel were still residing on the facility. Two antennas are located in the NRMA. Additional details on the NRMA are provided in Chapter 3.

More detailed information regarding NRTF Dixon land use, operations, and facilities is provided in Chapter 2.

## **1.4 NRTF Dixon and Tenant's Military Mission**

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NRTF Dixon is a government-owned, contractor-operated and maintained site. According to CNRSW Instruction 11000.1, dated 25 July 2013, NRTF Dixon property is considered a "special area" and is under the direct responsibility of CNRSW located in San Diego, California. Special areas are sites that are removed from the main activity. The mission of CNRSW is "to enhance our nation's combat readiness through efficient and effective management of our shore installations while preserving the critical resources necessary to secure the future of our forces."

NCTS San Diego is a tenant on NRTF Dixon. NCTS “is the regional C41 connectivity Subject Matter Expert; managing, maintaining, and operating the Information Technology Infrastructure and all Navy strategic communications in support of our shore and afloat war fighting customers.” NCTS San Diego reports operationally to Naval Computer and Telecommunications Area Master Station Pacific, under the command of Navy Network Warfare Command.

At NRTF Dixon, the NCTS San Diego’s mission is to provide military communications service within the Navy’s Pacific Area of Operations. The installation is a combined service facility for high power transmission of low/high frequency electronic signals via antennas for the U.S. Pacific Fleet ship/shore and Defense Information System requirements. Principal users include the U.S. Air Force and the Navy. There is currently no military training, or storage and use of any munitions, at NRTF Dixon. Additional details on how NRTF Dixon achieves its military mission are provided in Chapter 2.

## **1.5 Achieving INRMP Success**

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### **1.5.1 INRMP Implementation**

Secretary of the Navy Instruction 6240.6E assigns responsibility for establishing, implementing, and maintaining the natural resources programs under the jurisdiction of Secretary of the Navy to the Commander, Navy Installations Command (CNIC). On most installations, the Commanding Officer (CO) ensures that military operations and natural resources conservation measures are integrated and consistent with stewardship and legal requirements through the development of the INRMP.

### **1.5.2 Funding Implementation**

For the purposes of this INRMP, the terms compliance and stewardship have specific meanings as criteria for implementing project actions. Overall project or activity rankings are aligned with Naval Operations N45 Environmental Readiness Levels to ensure that the installation's highest priorities are promoted in future budget cycles. Environmental Readiness Level 4 (the highest priority) is assigned to projects or activities based on compliance with legal requirements, such as the Endangered Species Act, Clean Water Act, or Migratory Bird Treaty Act. Alternatively, a project or activity may be considered good land stewardship but is not considered a legal obligation, and this investment may yield only undefined future benefits. High priority compliance projects to comply with legal obligations are generally funded within annual budget constraints; however, future federal budgets could decrease available funding for both compliance and lower ranked stewardship projects. Annual funding for all conservation projects are ranked on a regional basis and each project must compete for available funds among multiple Navy installations. It is the Navy's policy to promote long-term mission and environmental sustainability measures, including good stewardship practices, and all valid compliance and stewardship requirements are submitted for consideration during budget programming cycles.

The various project ranking scenarios are described in Chapter 5.

#### **1.5.2.1 Anti-Deficiency Act**

NAVFAC Southwest on behalf of CNRSW intends to implement actions in this INRMP within the framework of regulatory compliance, national Navy mission obligations, anti-terrorism and force protection limitations, and funding constraints. The execution of any of the INRMP projects will be dependent on the availability of appropriate funding sources. Any requirement for the obligation of funds

for projects or actions in the INRMP shall be subject to the availability of funds appropriated by Congress. None of the proposed projects or actions shall be interpreted to require obligations or payment of funds in violation of any applicable federal law, including the Anti-Deficiency Act, 31 USC § 1341.

### **1.5.3 Mission Sustainability and the INRMP “No Net Loss” Requirement**

In keeping with the principal use of military installations to ensure the preparedness of the U.S. Armed Forces, the Sikes Act (as amended) mandates that in managing natural resources the INRMP shall provide for no net loss of the capability of the installation’s lands to support the military mission.

NRTF Dixon is the sole high frequency transmitter station on the west coast of the U.S. The link between land use, environmental compliance, and the mission of supporting communications for the Pacific Area of Operations needs to be described. This INRMP attempts to anticipate and protect against all encroachment on resources available for fulfilling the military mission, particularly those environmental resources that are key to sustaining the military mission. Military uses are described in Chapter 2; natural resources and associated management strategies are presented in Chapter 3.

The U.S. Congress endowed the Navy with public lands as an investment in national security. The common denominator between national security and public land stewardship is the concept of sustainability. Sustainability is a relative condition of the ecosystem and the military mission that can be measured. The sustainability and no net loss of the resources that support NRTF Dixon are considered further in Chapter 4.

For the purpose of this INRMP, an impact to mission accomplishment and sustainability has occurred when any of the above are constrained or when one of the following conditions occurs:

- Access to land and supporting infrastructure is constrained. In particular, availability of sufficient space to operate communications facilities; capability to support sufficient instrumentation to ensure safe and secure communications functions; availability of effective infrastructure to support safe and secure communications equipment and information transmittal; and capability to successfully coordinate and deconflict environmental compliance and safety and security requirements.
- Security and safety of life, property, or information for current and future use is impaired. The main concerns of the mission are safety and security. The ability to keep the installation clean of hazardous material aids in assuring the safety of the site, not just for current military purposes, but potentially for alternate future uses. Maintenance of safety and security measures requires facilities, space, and access to radio frequency airspace and land; security clear zones, including cooperation from neighboring landowners; ability to secure water supply in emergencies; control of encroachment from outside the perimeter fence line; and compliance with anti-terrorism force protection standards for construction, which include landscaping described in DoDI 2000.16, DoD Antiterrorism Standards 02 October 2006.
- Soil and water resources or supply are impaired such that environmental compliance has become a problem and damage has occurred. Soil surface stabilization is needed to sustain antenna conductivity, minimize erosion, and maximize opportunities for soils to self-stabilize after disturbance.
- Ecological integrity is harmed. Compliance under the Sikes Act (as amended) for mission sustainability (no net loss) is also defined in this INRMP to include the ecological integrity of NRTF Dixon lands still dominated by natural resources. Ecological integrity will carry these lands into the long-term future with all the elements that allow self-recovery to remain intact.



- Cultural resources compliance is impaired. Long-term strategies include cultural resources surveys of areas that are not targeted for immediate use. Such investigations aid in long-term planning and contribute to the archaeological context developed to evaluate resources.

*Under Section 110 of the National Historic Preservation Act, federal land managers are directed to inventory cultural resources on lands under their control even when no activity or undertaking is planned.*

Many mission concerns are compatible with the natural resources conservation, such as the need to establish safety and security buffers between Navy assets and other land uses. Military activity at NRTF Dixon is relatively benign as compared to other installations on a day-to-day basis. The large requirement for uninhabited open space has allowed for sustainability, and precluded many potential conflicts between operational requirements and sensitive natural resources.

## 1.5.4 Relationship to Other Operational Plans

As required by DoD policy, this INRMP integrates the principal objectives and guidelines from several key NRTF Dixon plans (which are interrelated with natural resources planning) and establishes a unified approach to natural resources management. Coherency with these plans is a function of this INRMP and is detailed in Chapters 3 and 4. The plans include the following:

### Facilities Maintenance Plan

The Facilities Maintenance Plan describes the Facility Maintenance Management System. This system is used to perform minor maintenance and repair, inspection, and emergency and service work to maintain installation facilities and equipment as part of the Operations and Maintenance contract. The plan contains provisions for maintenance of the antennas, including vegetation control requirements and methods for each type of antenna as well as other areas of the installation (Navy 2008).

### Integrated Cultural Resources Management

The primary goal and objective of the cultural resources management program of NRTF Dixon is to implement this INRMP in a manner consistent with the conservation of significant cultural resources at the installation. The current Historical and Archaeological Resources Protection Plan (1996) for the installation was prepared to guide the identification and management of significant historic resources and Native American traditional cultural properties at NRTF Dixon. Though at the time it was prepared no such sites had been identified at the installation, it provides protocols for inadvertent discovery of cultural resources and subsequent treatment of artifacts or human remains (Navy 1996). Recent identification of four cultural and archaeological sites on the installation (Shaver 2011) has led to a concern that any activities requiring soil disturbance or digging may impact other cultural resources not yet identified at NRTF Dixon. Additional surveys to locate potential cultural sites outside of the agricultural outlease area are ongoing. It is possible that a cultural resources management plan for NRTF Dixon will be developed based on current and future results of cultural resources surveys; it would contain updated procedures for management of these resources (compliance strategies and standard operating procedures) in accordance with federal statutes, regulations, executive orders, and instructions.

### Integrated Pest Management Plan

Before 2010, responsibility for oversight of the pest management program at NRTF Dixon was with Naval Air Station Lemoore and NAVFAC Southwest. At that time, pest management requirements and guidelines were contained within both Naval Air Station Lemoore's Integrated Pest Management Plan (NAVFAC Southwest 2010a) and NRTF Dixon's Partner Pest Management Plan (NAVFAC Southwest 2009). The former describes in detail administrative roles and responsibilities that can be generally applied to NRTF Dixon. The latter discusses only those elements of pest management unique to NRTF Dixon.

A new Integrated Pest Management Plan is to be developed for NRTF Dixon. The new Integrated Pest Management Plan will be a comprehensive long-range document that captures all the pest management and pesticide-related activities conducted on NRTF Dixon. The goal of the pest management program is and will continue to be to aggressively control, by mechanical means or pesticide application, all noxious and undesirable weeds, rodents, insects, and other pests on NRTF Dixon's grounds and agricultural outlease parcels. It provides the tools and products to include pesticide management in NRTF Dixon's overall Environmental Management System (EMS) program and to support reduced reliance on chemical means of pest control, per DoDI 4150.07 (DoD Pest Management Program 29 May 2008) and OPNAVINST 6250.4C (Navy Pest Management Programs 11 April 2012).

### **Soil and Water Conservation Plan for Agricultural Outleases**

The Soil and Water Conservation Plan for Agricultural Outleases provides strategies, standards, required actions, and restrictions, according to which agricultural outlease holders should manage their leased parcels to conserve soil resources and consumption of water resources. It also defines and describes reimbursable projects. The plan is included as an exhibit with each agricultural outlease agreement. As necessary, it provides specific guidance per individual parcel to reflect any unique constraints (Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements).

### **Installation Restoration Program Site Management**

NRTF Dixon has an active Installation Restoration Program aimed at identifying and reducing to prescribed safe levels any potential risks caused by the Navy's past operations on the facility. Multiple studies and reports, focused on individual Installation Restoration sites on the installation, cover the status, management, response strategy, and action items related to environmental restoration activities and closure for each individual site. The reports and their related activities satisfy the corrective action obligations of the Navy under the Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act, and the National Oil and Hazardous Substances Pollution Contingency Plan (Title 40 of the Code of Federal Regulations, Part 300). The Navy works closely with the Central Valley Regional Water Quality Control Board (hereinafter, Central Valley Water Board) and the California Department of Toxic Substances Control as part of its Installation Restoration Program.

### **Hazardous Material Contingency Plan**

NRTF Dixon does not meet the threshold requirements to develop a Facility Response Plan. The Operations and Maintenance contractor for NCTS San Diego at NRTF Dixon maintains a current Hazardous Material Spill Contingency Plan (Navy 2011a). The plan identifies storage locations of oil and hazardous materials (including pesticides) and response procedures and a contact list in the event of a spill. As there have been no recent oil or hazardous material spills at NRTF Dixon there has not been a need to implement the plan. Any activities that may introduce hazardous materials onto the installation must be approved by NAVFAC Southwest (Section 4.5.4: Hazardous Material Spill Prevention and Response).

## **1.6 INRMP Vision, Goals and Objectives**

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The NRTF Dixon natural resources management program is managed by NAVFAC Southwest and supports the Navy's mission through responsible stewardship of the installation's natural resources. NRTF Dixon seeks to use integrated natural resources management and principles of ecosystem management to ensure ecosystem viability and biodiversity, in support of the military mission.

This INRMP is an update of the 2002 NRTF Dixon INRMP. The original NRTF Dixon INRMP was published in 1987 (Navy 1987). The 2002 INRMP revision was concluded in May of that year and was published along with an Environmental Assessment (Navy 2002). The 2002 INRMP Environmental Assessment remains in force for this INRMP update as no significant changes to the NRTF Dixon property or natural resources management program have occurred to require a revision of the Environmental Assessment.

The INRMP's purpose is to chart the management and use of natural resources, establish conservation priorities, and provide a basis for formulating budgets. Where appropriate, specific methods for reaching stated goals are outlined within the document. These may change as evolving resources and priorities dictate and are not meant to be a prescriptive or exhaustive list.

This document is intended to be a living document and will be updated annually as needed to keep the material, goals, and objectives relevant to current conditions. The INRMP and any proposed revisions will be reviewed every year, during the annual INRMP metrics review meeting. Signatures will be requested each year from the two primary stakeholders (U.S. Fish and Wildlife Service [USFWS] and California Department of Fish and Wildlife [CDFW]), providing the regulatory agencies an opportunity to concur.

CNRSW maintains an Environmental Policy Statement (Navy 2013)<sup>6</sup> to actively promote mission readiness through environmental stewardship across the region's activities. To achieve this, CNRSW commits to:

1. Being an environmentally responsible neighbor where we operate to ensure public health and safety and protection of the environment;
2. Preserve significant aspects of the natural and cultural environment;
3. Use sustainable resources to modernize facilities and the shore-side infrastructure;
4. Conserve natural resources by reducing, reusing, and recycling materials; and purchase products made from recycled materials;
5. Develop and improve operations and technologies that minimize waste; prevent air and water pollution; minimize health and safety risks; and dispose of waste safely and responsibly;
6. Ensure the responsible use of energy and water, including conservation and improve efficiency;
7. Share appropriate pollution prevention technologies, knowledge and methods;
8. Participate in efforts to improve environmental protection and understanding in our communities;
9. Adhere with applicable environmental federal, state, and local regulations, and DoD and Navy policies; and
10. Ensure this policy is communicated to all military and civilian personnel, and contractors to encourage continual improvement within the Region.

## Vision and Goals

The vision for the INRMP is that the Navy achieves its current and evolving mission requirements while conserving its natural resources. This INRMP's goal is to:

*Provide the guidelines, means, and mechanism for assuring long-term sustainability and vitality of both the military mission and health of NRTF Dixon's natural resources.*

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<sup>6</sup> Available online at: <http://www.cnrc.navy.mil/regions/cnrsw.html>

This INRMP aims to improve the condition of an ecosystem that contains land and water dedicated to the support of national security. In doing so, it intends to achieve long-term certainty and permanence for the Navy mission. This includes seeking maximum landscape and natural ecosystem health, productivity, biodiversity, recovery of habitats and species at risk. It also leads the Navy in institutionalizing a Navy Conservation Ethic.

To achieve this vision and goal, work should contribute to the following standards of success:

- Navy mission accomplishment that is unimpeded;
- A net gain in agricultural productivity, natural biodiversity, and sensitive species recovery;
- Natural resources that are resilient and self-recoverable with minimal human intervention;
- Navy projects that are not delayed, and contribute no net loss to conservation goals;
- Interagency partnerships that result in mutual benefits and improved cost-effectiveness of the work undertaken; and
- A growing internal (NRTF Dixon) and external (public) conservation ethic as measured by natural resources program partnerships, with public access that is necessary and appropriate for the use of the installation, subject to safety and security requirements.

## Definition of Planning Terms

INRMPs have specific objectives and tasks shaped by DoD guidelines and directives, laws and regulations, public needs, public values, ecological theory and practice, and management experience. A goal statement is necessary for setting the course towards a successful plan. The planning terms used in this document cover a gradient of specificity and durability, ranging from a very broad, enduring goal, to resource or topic-specific objectives, which in turn encompass specific strategies or tasks (Table 1-1). For each topic area in Chapters 3 and 4, they are presented in a step-down approach.

*Table 1-1. Definitions of planning terms used in this document.*

Hierarchy	Definition
Goal	Broad statement of intent, direction, and purpose. An enduring, visionary description of where you want to go, an end outcome. A goal is not necessarily completely attainable. It does, however, describe a desired outcome related to the mission, rather than an activity or a process.
Objective	Specific statement that describes a desired future condition or successful outcome. Can be quantitative. Should be followed by a "standard," which is an observable indicator by which successful attainment of a condition stated in the objective is measured. "How do we know we are making progress or have attained the desired condition or successful outcome?" Should be good for at least five years.
Strategy	Explicit description of ways and means chosen to achieve objectives or standards. "What are we going to do about it?"
Task	Specific step, practice, or method to get the job done, usually organized sequentially with timelines and duty assignments. These go out of date quickly and should be updated annually.

## 1.7 Key Issues

The Navy recognizes that healthy and viable natural resources help support the military mission at NRTF Dixon by providing a safe environment for the operation and maintenance of the site. Weapons are not tested at the site and there is no on-the-ground training; the NRTF Dixon mission poses few constraints to natural resources management. Site activities are generally passive in nature, except when new antenna arrays are constructed or existing ones improved. The following general natural resources issues have been identified, which are connected to sustaining the military mission at NRTF Dixon.

## Antenna Facilities

Weed control is necessary. There are established populations of invasive non-native plants. Mowing takes place under antennas as a weed treatment and for fire control. Mowing may affect migratory birds and may have long-term impacts to habitat. Mowing may also contribute to invasive plant spread. Ground squirrels (*Spermophilus beecheyi*) burrow along the roads and underneath the fuel pads, which undermines the pads and creates a safety hazard. Burrowing owls (*Athene cunicularia*) use ground squirrel burrows, and so contribute to the hazard. In addition, burrowing owls have been observed burrowing near water tanks and along antenna cables. Smallwood and Morrison (2008) note that the burrowing owl population at NRTF Dixon exhibits the highest density of nesting pairs they have seen reported in the scientific literature. It may also be the largest remaining population of this species in Solano and Yolo Counties (Smallwood and Morrison 2008).

## Natural Resources Management Area

The large vernal pool in the NRMA contains vernal pool indicator species and may provide habitat for federally listed species. Surveys are needed to identify any listed species that may be present; if so, appropriate management strategies developed in consultation with the USFWS are needed to avoid designation of Critical Habitat on the installation. With climate change, there may be a possibility of sea water intrusion into waters connected to the Sacramento-San Joaquin Delta slough system, to which NRTF Dixon is connected.

## Agriculture

Cows from an adjacent parcel to the east of NRTF Dixon occasionally break through the perimeter fence. Cows pose a hazard when on installation roads, particularly during emergency operations. The Agricultural Outlease Program at NRTF Dixon is vulnerable to the availability of pollinators. A recent worldwide crisis in declining pollinator availability was recognized as the most dominant pollinator—the European honey bee (*Apis mellifera*)—experienced widespread die-offs. Though European honey bee numbers have since stabilized, the crisis serves as an indicator of modern agriculture’s vulnerability to reliance on a single insect pollinator. Land use practices to conserve native pollinators might reduce this vulnerability.

# 1.8 Roles, Responsibilities and Stakeholders

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## 1.8.1 Navy Roles and Responsibilities

The following is a list of roles and responsibilities of the Navy chain of command in supporting the installation and development, revision, and implementation of this INRMP. Policy leadership and liaison with non-Navy partners is provided by CNRSW N40 and NAVFAC Southwest.

### Chief of Naval Operations

CNO serves as the principal leader and overall Navy program manager for the development, revision, and implementation of this INRMP. CNO regularly updates policy and issues specific implementing guidance based on new or changing laws and regulations for the development, revision, and implementation of the INRMP and associated National Environmental Policy Act (NEPA) documentation. CNO addresses and coordinates resolution of natural resources issues affecting the Navy mission. Additionally, CNO approves all INRMP projects prior to submittal to regulatory agencies for signature.

## **Commander, Navy Installations Command**

CNIC reviews the entire INRMP. Their role is to ensure all lands under the control of the Navy are evaluated for significant natural resources. CNIC ensures that those installations with significant natural resources prepare, maintain, and implement a Natural Resources Management program. This includes development, implementation, review and necessary updates and revisions of INRMPs. CNIC maintains and upgrades, as necessary, a web-based Navy Conservation website, which includes Environmental Program Requirements (EPR)-web. EPR-web is the web based program in which all installations submit their natural resources projects for approval during the Program Objective Memorandum (POM) cycle.<sup>7</sup> POM is the Navy's annual process to budget funding four years in advance.

## **Commander, Navy Region Southwest**

Regional Commanders ensure that installations comply with DoD, Navy and CNO policy on INRMPs and their associated NEPA documentation. They ensure that installations under their purview review their INRMPs for operations and effect. They ensure the programming and budgeting of resources necessary to maintain and implement INRMPs, which involves the evaluation and validation of EPR-web based project proposals and the funding of installation natural resources management staff. Navy Region Southwest (NRSW) maintains close liaison with the INRMP signatory partners (USFWS and CDFW) and other INRMP stakeholders. CNRSW endorses INRMPs prior to finalization, and promotes and coordinates their implementation through CNIC.

As a special area, NRTF Dixon is under the direct responsibility of CNRSW. CNRSW or their designee is considered the CO for NRTF Dixon.

## **Naval Facilities Engineering Command Southwest**

NAVFAC Southwest is responsible for the planning, engineering/design, construction, real estate (including the acquisition and disposal of), and environmental services in a six state area on the West Coast. The command also provides public works services such as transportation, maintenance, utilities/energy delivery, facilities management and base operations support to Navy and Marine Corps installations within its geographic area of responsibility, as well as support to other federal agencies. NAVFAC Southwest assists in implementing Navy policy to ensure stewardship of Navy lands and resources and compliance with natural resources laws and regulations. It also provides technical expertise to evaluate and validate funding requests for natural resources projects. NAVFAC Southwest provides contracting authority, technical oversight, planning documents, and contracts (including Cooperative Agreements) for installations within its jurisdiction.

NRTF Dixon is a government-owned, contractor-operated site. As such, Navy personnel are not employed on-site for the purposes of natural resources management. NAVFAC Southwest Desert Integrated Product Team coordinates NAVFAC centralized natural resources funding and technical assistance. NAVFAC Southwest coordinates with all regulatory agencies regarding NRTF Dixon. Site approval from NAVFAC Southwest is required for all facilities and activities, including, but not limited to, development, reconstruction, repairs, utilities, leases, and easements.

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<sup>7</sup> A POM is a recommendation from the Services and Defense Agencies to the Secretary of Defense concerning how they plan to allocate resources for program(s). The POM covers the 5-year Future Year Defense Program and presents the Services and Defense Agencies proposal on how they will balance their allocation of available resources. It is submitted each August and includes an analysis of missions, objectives, alternative methods to accomplish objectives, and allocation of resources. More information on POM is available at: <http://www.acqnotes.com/Acquisitions/Program%20Objective%20Memorandum%20%28POM%29.html>.

## 1.8.2 Internal Stakeholders

The following is a list of internal stakeholders that support the development, revision, and implementation of this INRMP. Approving Officials review and approve the INRMP.

### Commanding Officer

CNRSW or their designee is the CO for NRTF Dixon. The CO is responsible for managing and operating NRTF Dixon. Operational health and safety is a primary concern, so the CO must ensure that the natural resources management program supports the military mission and that it does not pose risks to personnel. Navy policy for safety is to manage for a zero mishap rate.

The CO ensures the preparation, completion, and implementation of INRMPs and associated NEPA documentation. Their role is to:

- Act as stewards of natural resources under their jurisdiction and integrate natural resources requirements into the day-to-day decision-making process; ensure natural resources management and INRMPs comply with all natural resources related federal regulations, directives, instructions and policies;
- Ensure implementation of the INRMP through annual evaluations of the natural resources metrics;
- Involve appropriate tenant, operational, training, or research and development commands in the INRMP review process to ensure no net loss of military mission;
- Designate a Natural Resources Manager/Coordinator responsible for the management efforts related to the preparation, revision, implementation, and funding for INRMPs (Appendix E: Natural Resources Manager Appointment Letter), as well as coordination with subordinate commands, installations, and other federal and state agencies;
- Involve appropriate Navy Judge Advocate General or Office of the General Counsel legal counsel to provide advice and counsel with respect to legal matters related to natural resources management and INRMPs; and
- Endorse INRMPs via the CO's signature.

### Environmental Management at NRTF Dixon

NAVFAC Southwest, as delegated by command directive, is responsible for the preparation and implementation of this INRMP. Acting through the Natural Resources Manager, NAVFAC Southwest is responsible for management of natural resources as part of the overall NRTF Dixon environmental program. Areas of responsibility include NEPA, air and water resources, solid and hazardous waste, cultural resources, and natural resources including agriculture, pest management, and wildlife management. The NAVFAC Southwest staff provides technical support. NAVFAC Southwest works closely with the on-site NCTS San Diego employee to implement the natural resources program. Health and safety issues and compliance are the highest and most overriding priorities. This INRMP is the direct vehicle for accomplishment of many of the responsibilities of the designated CO.

### Approving Officials

- CNRSW's designee as Installation CO
- NRSW Natural Resources Program
- NAVFAC Southwest Natural Resources Program

## Other Internal Stakeholders

- NCTS San Diego (tenant)
- CNRSW (N40)
- NRSW Public Affairs Office
- NRSW Office of Counsel
- NAVFAC Southwest Office of Counsel
- NAVFAC Southwest Integrated Product Team

## 1.8.3 External Stakeholders

External Sikes Act stakeholders review and sign the INRMP. Other external stakeholders have the opportunity to review the INRMP.

### 1.8.3.1 External Sikes Act Stakeholders (Concurring Officials)

The Sikes Act (as amended) requires the Secretary of the Navy to prepare INRMPs in cooperation with the USFWS and state wildlife agency, which in California is the CDFW. An INRMP represents the parties' attempt to reach mutual agreement concerning the conservation, protection, and management of fish and wildlife resources. Mutual agreement should be the goal with respect to the entire INRMP. No element of the Sikes Act (as amended) is intended to either enlarge or diminish the existing responsibility and authority of the wildlife agencies concerning natural resources management on military lands. A Memorandum of Understanding, signed in July 2013, established a cooperative tripartite agreement between the DoD, the U.S. Department of the Interior, USFWS, and the state fish and wildlife agencies as represented by the International Association of Fish and Wildlife Agencies recognizing the partnerships necessary to prepare, review, and implement INRMPs on military installations. The tripartite agreement is presented in Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements.

This INRMP has been prepared in accordance with the Sikes Act (as amended) and in cooperation with USFWS and CDFW. Implementation of this INRMP and any changes in planned activities will be undertaken with the cooperation and agreement of USFWS and CDFW. This INRMP is a living document and will be updated to reflect improved management practices, changes in proposed actions within NRTF Dixon, and agency comments or concerns about ongoing or proposed activities. DoD policy requires installations to review INRMPs annually in cooperation with two primary parties to the INRMP (USFWS and the state fish and wildlife agency). Annual reviews facilitate adaptive management by providing an opportunity for the parties to review the goals and objectives of the INRMP, as well as establish a realistic schedule for undertaking proposed actions. As this INRMP is considered a long term document with no set expiration date, the annual review process allows an opportunity for updating the plan, when necessary.

### 1.8.3.2 Other External Stakeholders

- City of Dixon, California
- Solano County, California



## 1.9 Management Approaches

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### 1.9.1 Ecosystem Management

In an effort to manage from a broader perspective than merely funding classifications, the DoD and the Navy have adopted a policy of ecosystem management for INRMPs (DoDI 4715.03 and OPNAVINST 5090.1C CH-1).

DoDI 4715.03 describes ecosystem management as “a goal-driven approach to managing natural and cultural resources that supports present and future mission requirements; preserves ecosystem integrity; is at a scale compatible with natural processes; is cognizant of nature’s time-frames; recognizes social and economic viability within functioning ecosystems; is adaptable to complex and changing requirements; and is realized through effective partnerships among private, local, state, tribal, and federal interests. Ecosystem-based management is a process that considers the environment as a complex system functioning as a whole, not as a collection of parts, and recognizes that people and their social and economic needs are a part of the whole.”

This approach integrates ecological, economic and social factors taking a long-term view of human activities, including military uses, and biological resources as part of the same environment (OPNAVINST 5090.1C CH-1). Managing for military readiness and sustainability, and ecosystem management are both approaches that attempt to integrate long-term goals with short-term project lists.

DoDI 4715.03 specifies five elements of ecosystem-based management, which are supported by OPNAVINST 5090.1C CH-1:

1. *Multiple species management*—Avoid single-species management and implement an ecosystem-based multiple species management approach, insofar as that is consistent with the requirements of the Environmental Site Assessment.
2. *Adaptive management*—Use an adaptive management approach to manage natural resources, such as climate change.
3. *Partnerships*—Evaluate and engage in the formation of local or regional partnerships that benefit the goals and objectives of the INRMP.
4. *Information*—Use the best available scientific information in decision-making and adaptive management techniques in natural resources management.
5. *Ecosystem services*—Foster long-term sustainability of ecosystem services. Ecosystem services are benefits obtained from the ecosystem that maintain the conditions for life on Earth, such as food and water; flood and disease control; spiritual, recreational, and cultural benefits; and nutrient cycling, among others.

Besides a component of ecosystem management, adaptive management is also a separate requirement for INRMPs under DoDI 4715.03, when it states “whenever practicable to manage and monitor resources over sufficiently long time periods to allow for adaptive management and assessment of changing ecosystem dynamics (i.e. incorporate a monitoring component to management plans).” Adaptive management accommodates the reality that ecosystems are complex and continually changing by employing flexible management practices that can be modified as the environment changes. Based on observations, data, or increased scientific knowledge, adjustments may be made to the goals and management activities altered to meet the current situation. This flexibility in management practices is permissible if executed within the constraints of the INRMP.

This INRMP and the goals and strategies it establishes are consistent with the ecosystem-based management approach in DoDI 4715.03 and OPNAVINST 5090.1C CH-1.

## 1.9.2 Environmental Management System

DoD policy states that “DoD Components shall adopt an EMS and work to integrate in all core business areas.” The goal is to “establish robust systems that sustain compliance, avoid risk and pollution, inform the public, and promote interoperability among the DoD components, other nations’ militaries, and with industry.” The remainder of this policy is found in the memorandum from the OUSD (Acquisition, Technology and Logistics) dated 05 April 2002.

The Navy’s EMS integrates environmental considerations into day-to-day activities across all levels and functions of Navy enterprise with regard to best practices for the use of renewable and non-renewable resources and how pollution and wastes are prevented and processed. It is a formal management framework required under Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (05 October 2009), that provides a systematic way to review and improve operations, create awareness, and improve environmental performance (CNO policy 06 December 2001). Systematic environmental management as an integral part of day-to-day decision making and long-term planning processes is an important step in supporting mission readiness and effective use of resources. The most significant resource for every organization is their senior leadership’s commitment and visibility in EMS implementation and sustainability. A robust EMS is essential to sustaining compliance, reducing pollution, and minimizing risk to mission. The Navy EMS conforms to the International Organization for Standardization 14001:2004 EMS standard. A working EMS “should be a tool to help organizations not only stay in compliance with legislated and voluntary environmental requirements, but also continuously improve their overall environmental performance.”<sup>8</sup>

Executive Order 13514 requires that each federal agency conduct a self-audit of pollution prevention practices using an accepted EMS framework. Components of the approach include advancing the national policy that, whenever feasible and cost-effective, pollution should be prevented or reduced at the source. Funding for regulatory compliance programs shall emphasize pollution prevention as a means to address environmental compliance. Each agency must reduce its use of toxic chemicals and hazardous substances; reduce the toxic release inventory and off-site transfers of toxic chemicals for treatment and disposal; develop a plan to phase out the procurement of Class I ozone-depleting substances for all non-excepted uses; and promote the sustainable management of federal facility lands through the implementation of cost-effective, environmentally sound landscaping practices, and programs to reduce adverse impacts to the natural environment.

## 1.10 INRMP Review and Revision Process

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Section 101(b)(2) of the Sikes Act (as amended) [16 USC 670a(b)(2)] specifically directs that the INRMPs be reviewed “as to operation and effect” by the primary parties “on a regular basis, but not less often than every five years,” emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the Sikes Act (as amended) and contribute to the conservation and rehabilitation of natural resources on military installations. The OUSD guidance (01 November 2004) states that joint review should be reflected in a memorandum or letters.

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<sup>8</sup> <https://www.denix.osd.mil/denix/Public/Library/EMS/emswat.html>.

DoD policy requires installations to review INRMPs annually in cooperation with the two primary parties to the INRMP (USFWS and CDFW). Annual reviews facilitate adaptive management by providing an opportunity for the parties to review the goals and objectives of the plan, as well as establish a realistic schedule for undertaking proposed actions (Section 5.3: INRMP Review and Metrics).

Recent guidance on INRMP implementation interpreted that the five-year review would not necessarily constitute a revision; that this would occur only if deemed necessary. The Annual Review process is broadly guided by the Real Estate Manual (DoD Directive 4715.DD-R 1996) and by OPNAVINST 5090.1C CH-1, Environmental and Natural Resources Program Manual. Policy memoranda in 2002, supplemented in 2004 and 2005, clarified procedures for INRMP reviews and revisions.

- Deputy Undersecretary of Defense for Installations and the Environment Policy Memorandum 10 October 2002, which replaced a 1998 policy memorandum.
- Assistant Deputy Undersecretary of Defense for Environment, Safety and Occupational Health Policy Memorandum (01 November 2004).
- Assistant Deputy Undersecretary of Defense for Environment, Safety and Occupational Health Policy Memorandum (17 May 2005).

The INRMP Implementation Guidance (10 October 2002 Memorandum) improved coordination external to DoD (USFWS, state agencies, and the public) and internal to DoD (military operators and trainers, cultural resources managers, pest managers). It also added new tracking procedures, called metrics, to ensure proper INRMP coordination occurred and that projects were implemented. These natural resources metrics have been updated, and are available on the Navy Conservation website (refer to Section 5.3.1: INRMP Metrics). The 2002 guidance also required that each installation provide a notice of intent to prepare or revise the INRMP. Each military installation now must request that USFWS and the state fish and wildlife agency participate in both the development and review of the INRMPs. Current coordination guidelines are that the USFWS field office is the appropriate entry point for military installations, and the USFWS Regional Sikes Act Coordinator is the liaison to facilitate INRMP review.

The Supplemental DoD INRMP Guidance (01 November 2004 Memorandum) further defined the scope of the annual and five-year review, public comment on INRMP reviews, and Endangered Species Act consultation. A formal review must be performed by the parties at least every five years. Less formal annual reviews facilitate adaptive management, during which INRMP goals, objectives, and must fund projects are reviewed, and a realistic schedule established to undertake proposed actions. The resulting written documentation of the review should be jointly executed or in some other way reflect the parties' mutual agreement and summarize the rationale for the conclusions the parties have reached.

As an INRMP is a public document that requires the mutual agreement of the installation, USFWS, and state fish and wildlife agencies (Navy 2006), it is crucial that a common understanding be reached regarding which projects contained in a draft INRMP are most likely to be funded under existing policy.

The Supplemental DoD INRMP Guidance (17 May 2005 Memorandum) stated that all INRMPs must address resource management on all of the lands for which the subject installation has real property accountability, including lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission. Per this memo, installation commanders may require tenants, lessees, permittees, and other parties that request permission to occupy or use installation property to accept responsibility, as a condition of their occupancy or use, for performing appropriate natural resource management actions. This does not, however, obviate the need to address natural resource management on any such lands in the INRMP.

DoD policy states that there is no legal obligation to invite the public either to review or to comment upon the parties' mutually agreed upon decision to continue implementation of an existing INRMP without revision (Navy 2006).

If the parties determine that revisions to an INRMP are necessary, public comment shall be invited in conjunction with any required NEPA analysis. In general, limited revisions that are not expected to result in biophysical consequences different from those in the existing INRMP and NEPA document do not require an updated NEPA document or public comment period. More substantial revisions to an INRMP would require new or supplemental NEPA analysis and 30-day review period (barring extraordinary circumstances) to allow the public to comment on both documents (Navy 2006).

## 1.11 Integrating Other Plans

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This INRMP is fully integrated with the installation planning processes of NRTF Dixon, including NEPA documentation. As part of DoD's policy to promote collaborative partnerships and integration of INRMP activities with external stakeholders, including consistency with state and regional natural resource plans, the following have been identified as relevant to natural resource management at NRTF Dixon.

In addition, the updated natural resources baseline condition described in this INRMP provides the foundation for the ecosystem-based approach to management and conservation of natural resources at NRTF Dixon. This information is shared with other agencies and public interests participating in regional land use and environmental resources management initiatives in accordance with command directives.

### State Comprehensive Wildlife Plan

The California Wildlife Action Plan (Bunn et al. 2007)<sup>9</sup> is a comprehensive state wildlife conservation strategy. It addresses the area of NRTF Dixon in its subregion emphasis on the Central Valley and Bay Delta Region. For this Region, these stressors for wildlife were identified:

- Growth and development (urban, residential, and agricultural);
- Water management conflicts and reduced water for wildlife;
- Water pollution;
- Invasive species;
- Climate change.

The Wildlife Action Plan focuses on conservation of remnant wetlands, and riparian habitats. It identified a number of management focus species for the region, including Swainson's hawk (*Buteo swainsoni*), giant garter snake (*Thamnophis gigas*), and California tiger salamander (*Ambystoma californiense*). The Sacramento/Davis/Stockton region of the Central Valley is one of two areas in California (with the Modoc Plateau) where Swainson's hawks breed.

Wildlife Action Plan recommendations relevant to NRTF Dixon include: integration and development of regional habitat conservation and restoration plans; multi-species wildlife management and habitat improvement, including monitoring, research and restoration for ecosystems and Species at Risk; reducing effects of invasive species; restoring habitat connectivity along major rivers in the Central Valley and other water dependent habitats factoring in the likely effects of climate change; providing buffers for areas to be impacted by climate change, such as sea level rise and catastrophic flood events;

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<sup>9</sup> The California Wildlife Action Plan can be accessed online at <http://www.dfg.ca.gov/wildlife/wap/report.html>.

and restoring surface and groundwater sources, stream channels, and natural storage places for sediment and water to benefit wetland and transitional habitats and assist in flood management.

### **Bay Delta Conservation Plan**

The heart of the Bay Delta Conservation Plan is a long-term conservation strategy and actions for a healthy Delta. Goals include conservation and management of terrestrial and aquatic species, restoration of ecological functions and ecosystem services, and improving current water supplies and reliability of those supplies delivered through the State Water Project and the Central Valley Project. It will be grounded in the best available science and provide for an adaptive management and monitoring program to guide decision-making during implementation. The plan is being prepared by a group of local water agencies, environmental and conservation organizations, state and federal agencies, and other interest groups ([www.baydeltaconservationplan.com](http://www.baydeltaconservationplan.com)).

### **Central Valley Joint Venture**

As one of 18 national Joint Ventures, the Central Valley Joint Venture (2006) brings together conservation organizations, public entities, private landowners and other partners interested in the conservation of bird habitat within California's Central Valley. The 2006 Implementation Plan is a five-year strategy addressing the habitat and water needs of various bird groups using the best available science and identifying the critical role of agriculture in bird conservation. NRTF Dixon, with an elevation below 300 feet mean sea level, is located in a Primary Focus Area for conservation in this plan. Moreover, goals for seasonal wetland conservation, restoration, and enhancement in the Yolo Basin, which includes NRTF Dixon, are ranked highest because of the percent of unprotected wetlands.

### **Central Valley Flood Protection Plan**

NRTF Dixon is located within a 100-year flood zone. Protection of the installation from large-scale floods is aided in part by the state-managed levee system along rivers and canals in the Delta, particularly the Yolo Bypass. Some of these levees are at risk, due to age and insufficient maintenance, according to the Central Valley Flood Protection Plan (California Department of Water Resources 2012). The purpose of the Central Valley Flood Management Planning Program is to develop a sustainable, integrated flood management plan for areas protected by facilities of the State-Federal flood protection system in the Central Valley. The flood protection plan operationalizes this purpose through a comprehensive new framework to guide California's management of flood risk along the Sacramento River and San Joaquin River systems.

### **California Water Plan Update**

The Sacramento-San Joaquin River Delta Integrated Water Management regional report (California Department of Water Resources 2009)<sup>10</sup> identifies regional water management challenges, some of which could affect NRTF Dixon natural resources and operational capability:

- Changing aquatic habitats with reduced abundance and diversity of aquatic organisms (particularly fish) and increased dominance of non-native species;
- Stability of the Delta's aging levee system;
- Flooding that causes overtopping and erosion of levees;
- Projected sea level rise; and
- Large-scale export of Delta water to other areas of California.

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<sup>10</sup> Available online at <http://waterplan.water.ca.gov/cwpu2009/index.cfm#volume3>.

The report details innovative projects, initiatives, and partnerships to address these challenges. The larger California Water Update Plan 2009 also provides resources that land and water managers throughout California can use to achieve improved water management, covering topics such as climate change, environmental water use, floods, water quality, legislation, and sustainability.

### **Central Valley Water Board Long-Term Irrigated Lands Regulatory Program**

This program proposed to address the quality of both surface water and groundwater that may be impacted by agricultural activities in the Central Valley. The Central Valley Water Board has identified key elements to be included in the program:

- Expand the current Irrigated Lands Regulatory Program to include discharges to groundwater, in particular to protect from nitrate contaminants to drinking water.
- Establish requirements so that known high threats have more regulatory requirements, low threats have fewer requirements.
- Tailor requirements to the setting and issues relevant to specific geographic areas or commodities.
- Increase grower and Coalition (or third party) accountability by identifying specific expectations that must be met to avoid individual regulation by the Central Valley Water Board.
- Require growers to conduct evaluations of their management practices to ensure they are protecting groundwater and surface water; individual management plans may be necessary in those areas with nitrate contaminants.
- Require third parties to develop regional water quality management plans for areas where irrigated agriculture is contributing to water quality problems.
- Conduct monitoring to fill data gaps, determine the effectiveness of management practices, and track water quality trends.
- Focus on areas where irrigated agriculture is contributing to a water quality problem that is impacting the beneficial uses of water.

NRTF Dixon is located within the Sacramento Valley Water Quality Coalition that has formed to address and implement the requirements of this new program.

### **Solano County General Plan**

The Solano County General Plan (Solano County 2008) guides development and conservation within the unincorporated county through 2030 and is the primary document used by the County to regulate land use under California Law. It regulates density standards for development of Agriculture or Natural Resource lands to discourage large scale residential or mixed use development outside of municipal areas. The plan strives to encourage sustainable use of natural resources, enhance agricultural business and preserve agricultural lands and resources within the county. It establishes long-term policies and provides a guide for day-to-day decision-making. In particular, NRTF Dixon may find opportunity to contribute to the goals presented in Chapter 4: Resources, which focus on natural resource management and conservation, including an emphasis on water resources and watersheds.

### **Solano County Water Agency Integrated Regional Water Management Plan**

The Integrated Regional Water Management Plan of the Solano County Water Agency (of which Solano Irrigation District and Maine Prairie Water District are a part) outlines region-wide policies and projects to meet the ten strategic issues of the Solano County Water Agency:

- Match supply to demand through the long term.

- Manage the County's groundwater resources.
- Encourage water of the appropriate quality for the intended use.
- Improve runoff water quality.
- Manage flood control services.
- Participate in multi-county flood control.
- Manage environmental resources.
- Leverage state and federal funding opportunities.
- Address safety and security issues.
- Prepare for climate change.

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

## 2.0 Military and Other Uses of Land and Natural Resources

*This Chapter describes the operations, facilities, services and other land uses at Naval Radio Transmitter Facility Dixon which support the installation's military mission and ongoing activities. It includes a focus on both past and current use of land and natural resources. Together with Chapter 3, which describes the natural resources, a picture of the current condition, use, and capabilities of the installation is provided.*

### 2.1 Historic Overview

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#### 2.1.1 Native American Use of Natural Resources

##### Prehistory

Human occupation of the Central Valley is thought to date back to at least 10,000 years before present; however, understanding the prehistoric occupation of the Central Valley is a challenging undertaking. The extensive modification of the natural landscape for cultivation, combined with ongoing alluvial deposition, has limited our understanding of cultural history and chronology to the late Holocene (or the last 2,500–3,500 years) (Rosenthal et al. 2007, cited in Hale 2009).

The Middle Archaic (5550 to 550 B.C.) saw the stabilization of major landforms, and the establishment of local subsistence and settlement strategies that continue and intensify later in time. Valley sites tend to include a greater number of formalized tools and extensive plant and animal remains, leading many to suggest that a relatively sedentary, logistical-based subsistence system was in place early in the Middle Archaic.

The Upper Archaic (550 B.C. to A.D. 1100) is essentially a continuation of economic processes occurring during the Middle Archaic. The foothill-valley distinction continues to persist in the Upper Archaic, based on the greater number of milling stones relative to mortars and less ornamental items in foothill sites.

The Emergent Period (post A.D. 1100) is the best-known of all periods because archaeological sites are more numerous and assemblages are larger. Emergent Period assemblages are noticeably different from preceding periods because they are generally more diverse, are typified by greater technological specialization, and burials tend to have a greater number and diversity of burial furnishings.

Overall, the prehistoric record from the Delta region of the Central Valley exhibits a trend of subsistence intensification that likely began with the early use of acorns and other high-cost/high-yield resources. These exploitation patterns most likely emerged as a way to deal with seasonal variance in food availability and environmental changes that had noticeable effects on the productivity of local wetland and terrestrial resources (Hale 2009).

## Native American Resources

The primary Native American group known to have used the Central Valley prior to European arrival was the Wintun, who occupied the valley from San Francisco Bay north to the McCloud River and the south fork of the Trinity River. When Europeans first entered central California, the area west of the Sacramento River and north of Suisun Bay was occupied by the Patwin, a subgroup of the Wintun, who resided primarily along the Sacramento River (EDAW 2006; U.S. Department of the Navy [Navy] 1996). The term Patwin does not denote a politically unified entity, rather it describes different groups of people who share similar cultural traits and close linguistic affinities. Patwin territory occupied an area 90 miles north-south and 40 miles east-west from Princeton in the southern Sacramento Valley southward to the San Pablo and Suisun Bays. Most of the population resided in large villages along rivers. The nearest Native American settlement in the vicinity of Naval Radio Transmitter Facility (NRTF) Dixon is the village of Ululato, which is located on Ularis Creek, approximately 12 miles northwest of the facility (Johnson 1978).

Subsistence was based on hunting, fishing, and gathering of vegetable foods. The Patwin took a variety of animals, including deer, pronghorn, elk, rabbits, and various species of fish and birds. Deer, ducks, geese, quail, and mud hen were caught in various nets. Fish species included chub, salmon, sturgeon, hardhead, and trout. Other animals, including most raptors and carnivores, were hunted for their feathers or pelts, which were used for ceremonial or utilitarian purposes (EDAW 2006).

The Patwin also collected salt from salt grass by burning the grass and collecting the residue, which appeared as a blackish “cake.” Tobacco was collected from along river banks, and various plant species were collected from the Central Valley plain for their seeds. Acorns were harvested from the valley oak. Freshwater mussels were collected from along the banks of major drainages, along with blackberries and wild grapes. The Patwin also seasonally collected tule roots and brodiaea bulbs (EDAW 2006). The subsistence cycle was dependent upon the specific locations utilized by individual villages.

The Patwin traded a variety of items with the Central Wintun, Pomo, Wappo, Northwestern and Southern Maidu, including foodstuffs, woodpecker-scalp belts, feathers, abalone shell and magnesite beads, and cordage (Johnson 1978). Material culture relied on a variety of lithic (projectile points, mortars, pestles) and perishable objects (bows, harpoons, basketry, nets, tule balsa boats) for utilitarian, recreational, and ceremonial uses (Johnson 1978).

This aboriginal way of life was disrupted during the Hispanic Era and was subjected to intense Euro-American pressures from the late 1840s through the American Period (Johnson 1978). Mission Sonoma (San Francisco Solano), established in 1823, had the greatest impact on the aboriginal Patwin population (Johnson 1978; Hart 1978). The Patwin were transformed from hunter-gatherers into agricultural laborers who lived at the missions and worked with former neighboring groups and for individual Euro-Americans. Later, with the secularization of the missions by Mexico in 1834, most of the aboriginal population gradually moved from the missions to ranchos to work as manual laborers.

### 2.1.2 Pre-Navy Land Use

Europeans first reached the Sacramento Valley area via the 1772 Pedro Fages expedition, which reached the Carquinez Strait. The strait connects Suisun Bay to San Pablo Bay. The de Anza expedition also reached the strait in 1776, but Europeans did not cross the strait until 1810, when Gabriel Moraga led a raid against the Suisun tribe on the strait’s north shore (EDAW 2006).

In 1835, General Mariano Guadalupe Vallejo was commissioned by the Mexican government to colonize the Fairfield/Suisun area to protect interior Mexican interests from the Russians at Fort Ross. The lower

part of the Sacramento Valley and Delta areas were settled rapidly as the Mexican government granted large tracts of land and access to the region's natural resources (EDAW 2006). Five land grants were established within Solano County in the Mexican Era: Rancho Suisun (1837), Rancho Tolenas (1840), Ranch Los Putos (1840s), Rancho Rio de los Putos (1842), and Rancho Los Ulpinos (1844). Also in 1844, General Mariano Vallejo established the settlement of Eureka in a portion of his unconfirmed Rancho Suscol. This settlement was later renamed Vallejo in his honor. Benicia and Cordelia were also within Rancho Suscol (Marschner 2000; EDAW 2006).

The hide and tallow trade was the primary economy of California during the Rancho Period. Herds of cattle were raised and slaughtered for their hides. Hides were worth one dollar each, and came to be known as a California dollar. The hides were shipped to New England for use by the shoe and boot industry. Tallow, derived from cattle fat, was used to make candles and soap (EDAW 2006).

After the Gold Rush subsided in California, former gold seekers and pioneers began to settle Solano County in the late 1840s and into the 1850s. The settlers raised livestock and planted fruit orchards, vineyards, wheat, barley, and oats (EDAW 2006).

The Mexican regime lasted until 14 June 1846, when the California Republic was established. The American flag was raised on 07 July 1846. The area that became Solano County continued as part of the Sonoma territory for three years under the American government. The boundaries of Solano County were set on 18 February 1850 by the first elected legislature of the territory of California, making Solano County one of the original 27 counties.

Twelve townships were established in Solano County between 1850 and 1871. The largest towns were adjacent to San Pablo and Suisun Bays, but the majority of towns were situated at the ends of sloughs or channels that primarily ran through the eastern portion of the county (EDAW 2006).

In 1852, Elijah Silvey founded Silveyville half way between Suisun City and Sacramento. Silvey hoped to attract gold prospectors passing through the area. The town, originally consisting of a saloon, hotel, and corral, prospered and added a blacksmith and a store. Various grains, including oats, barley, wheat, and alfalfa, were grown on the lands surrounding Silveyville. However, Silveyville was abandoned in 1868, when the California Pacific Railroad missed the town. Thomas Dickson, for whom the city of Dixon is named, donated a 10-acre plot of land for a train station. The residents moved to Dixon for access to the newly constructed railroad, moving entire homes and even a church from Silveyville to Dixon with the use of log rollers. The new railroad station was originally supposed to be called Dickson's Station, but the name was misspelled, and the town became known as Dixon (Keegan 1989; EDAW 2006). Grain crops dominated agricultural production in Dixon until the early 20th century, when large-scale irrigation developed and farmers began growing alfalfa and raising cattle. By 1914, Dixon was known as the Dairy City. Today, Dixon continues to be called Dairy City, although few dairies remain. The few remaining dairies, however, produce as much milk today as during Dixon's peak dairy-producing years in the 1930s (Goerke-Shrode 2000; EDAW 2006).

### **2.1.3 Historic Navy Land Use**

In 1890, the site later to become NRTF Dixon was owned by four people: Eppinger, Coleman, Timothy Paige, and Henry Peters. The site was not developed, and the Navy purchased it in 1941, during World War II, for use as a radio transmitting station. Construction began in July 1946 and operations were phased in between 1947 and 1950 for a fleet communications facility for the Naval Communications Station, Stockton. NRTF Dixon provided services and equipment to regional commands, including Naval Air Station Moffett Field, Naval Air Station Alameda, and Patrol Wings United States Pacific Fleet. From

1963 to 1966, NRTF Dixon was expanded to extend antennas on the transmitter building and add 12 more antennas and assorted transmission lines, transmitters, and electronic equipment. In 1979, the Navy contracted operation of NRTF Dixon to a private corporation, and the installation was converted to a contractor-operated-facility (Navy 1996; Naval Facilities Engineering Command [NAVFAC] Southwest 2011b). The Navy retains ownership to the land, while the contractors are responsible for the operation and maintenance of all communications equipment, structures, support facilities, buildings, and grounds necessary to fulfill the military mission (Navy 1987, cited in Navy 2002).

The Housing Area was outleased to the Dixon Housing Authority at the time of the installation's conversion and a new main gate was built west of the Housing Area (Navy 1996). In February 2013, the Housing Area was transferred to the Dixon Housing Authority along with two oxidation ponds and an adjacent field. The area is now entirely owned and managed by the Authority; it continues to provide housing for seasonal migrant farm workers and their families.

## 2.2 Navy Operations and Activities

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Naval Computer and Telecommunications Station (NCTS) San Diego is a tenant and the sole operational user of NRTF Dixon. As such, NRTF Dixon is a combined service facility for high power transmission of low/high frequency electronic signals via antennas for the U.S. Pacific Fleet's ship/shore and Defense Information System requirements. Principal current users of the installation include both the U.S. Air Force and Navy. The primary land use is an antenna field for the transmission of military information. The NRTF Dixon transmitting site has a variety of very tall towers, shorter towers, and curtain arrays. There is currently no military training, or storage and use of any munitions, at NRTF Dixon.

Primary activities of the installation are to maintain communications and supporting equipment. The majority of activities are generally passive in nature—except when new antenna arrays are constructed or existing ones improved—and pose few constraints to natural resources management.

NCTS San Diego, located on Naval Air Station North Island, is the operational commander for the antennas at NRTF Dixon. NRTF Dixon is a special area<sup>1</sup> under the direct responsibility of the Commander, Navy Region Southwest or their designee.

## 2.3 Facilities and Infrastructure

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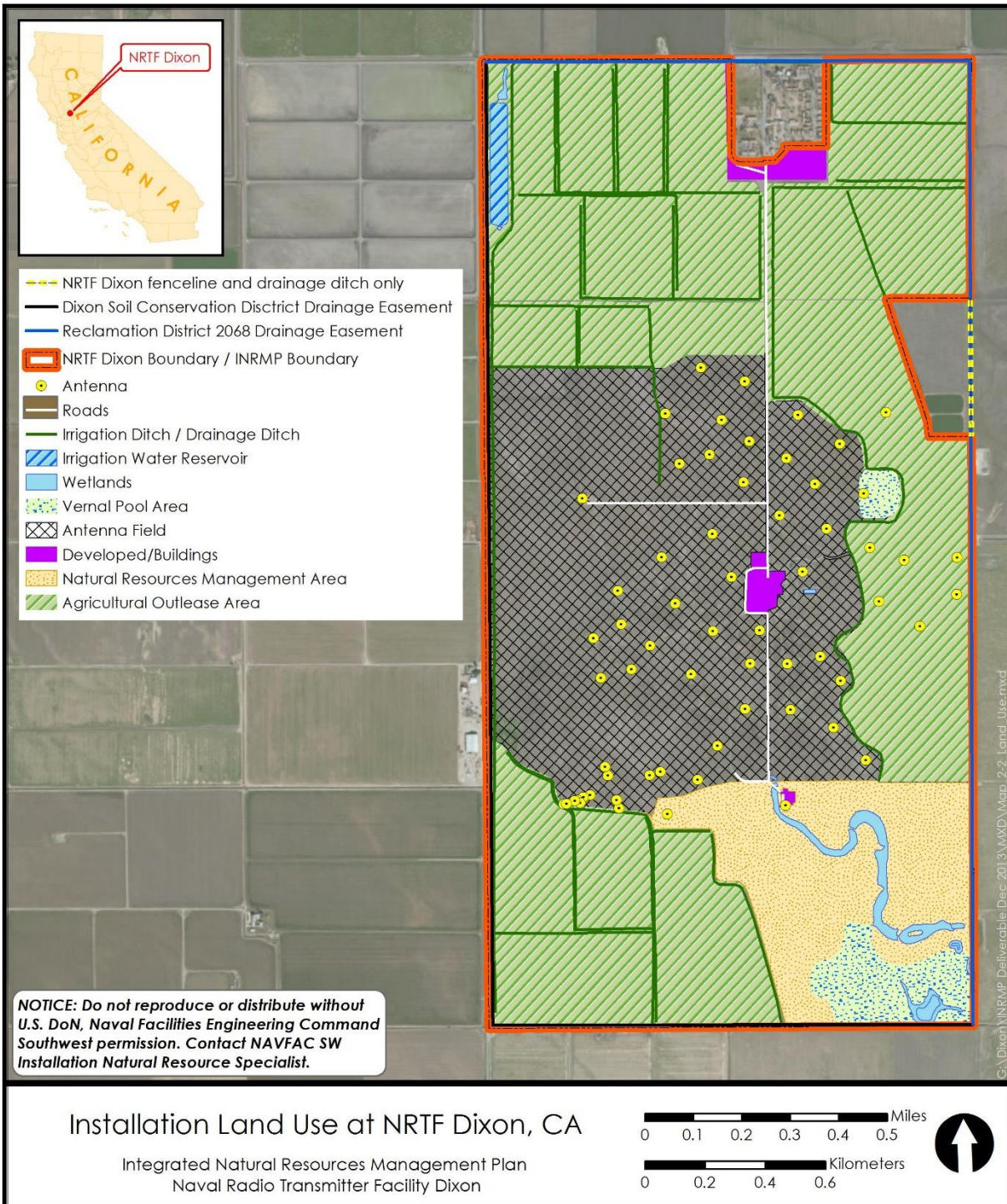
### 2.3.1 Facilities

Situated on approximately 1,235 acres, the primary facilities of NRTF Dixon are a 24,000-square-foot transmitter building and associated antenna fields (Map 2-1). Support facilities include two 2,000-kilowatt diesel-powered generators, a power switch-gear building, and a facilities maintenance shop located in the center of the property. A 2,400-square-foot storage building, deep wells and a pump house, and water storage tanks are located near the northern end of the property. Pacific Gas & Electric maintains a 12.7-kilovolt substation on the installation to support NRTF Dixon power needs.

There is a perimeter fence surrounding the installation for security purposes. Interior fencing is provided around the developed compound in the center of the installation and other sensitive infrastructure and equipment.

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<sup>1</sup> Special Areas are sites that are remote from the main activity (Commander, Navy Region Southwest Instruction 11000.1, dated 25 July 2013).



Map 2-1. Land use on Naval Radio Transmitter Facility Dixon, California.<sup>2</sup>

<sup>2</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

Map 2-2 provides an aerial image of NRTF Dixon.

### **Antenna Array**

There are high-frequency transmitters, antennas, and associated ancillary equipment, as well as two low-frequency transmitters and two 600-foot low-frequency antennas at NRTF Dixon. Antenna ground screens are buried 4–8 inches or 12 inches underground and radiate out from the base of each antenna approximately 1,400 feet. They are electrically part of the antenna and consist of copper wires that create a reflective surface for the antenna to operate. Antenna anchors (guy wires) also radiate out from the antennas approximately 500 to 600 feet, and some as far as 1,000 feet, depending on antenna size (Map 2-1 and Map 2-3). Most antennas are located in a 417-acre antenna field on the installation, the ground cover of which is primarily grassland. The agricultural lessee currently maintains a portion of the agricultural outlease area for the antennas, bringing the total area to 500 acres.

Visual inspections of the antenna ground screens are conducted on a regular basis. Mowing also takes place under the antennas as a fire abatement measure.

Because there is a radio frequency hazard at NRTF Dixon, a Radio Frequency Survey is conducted every four years. Some radiation hazards do exist (Section 4.1.3.1: Communication Towers and Power Lines).

## **2.3.2 Services and Utilities**

The services and utilities at NRTF Dixon include, but are not limited to, fire protection, water provision and use, wastewater treatment and disposal, stormwater collection, electricity, and solid waste.

### **Fire Protection**

Mowing around the antennas and along roads is conducted as a fire abatement measure. In case of fire, the Dixon Fire Department would respond to a 911 call from NRTF Dixon personnel.

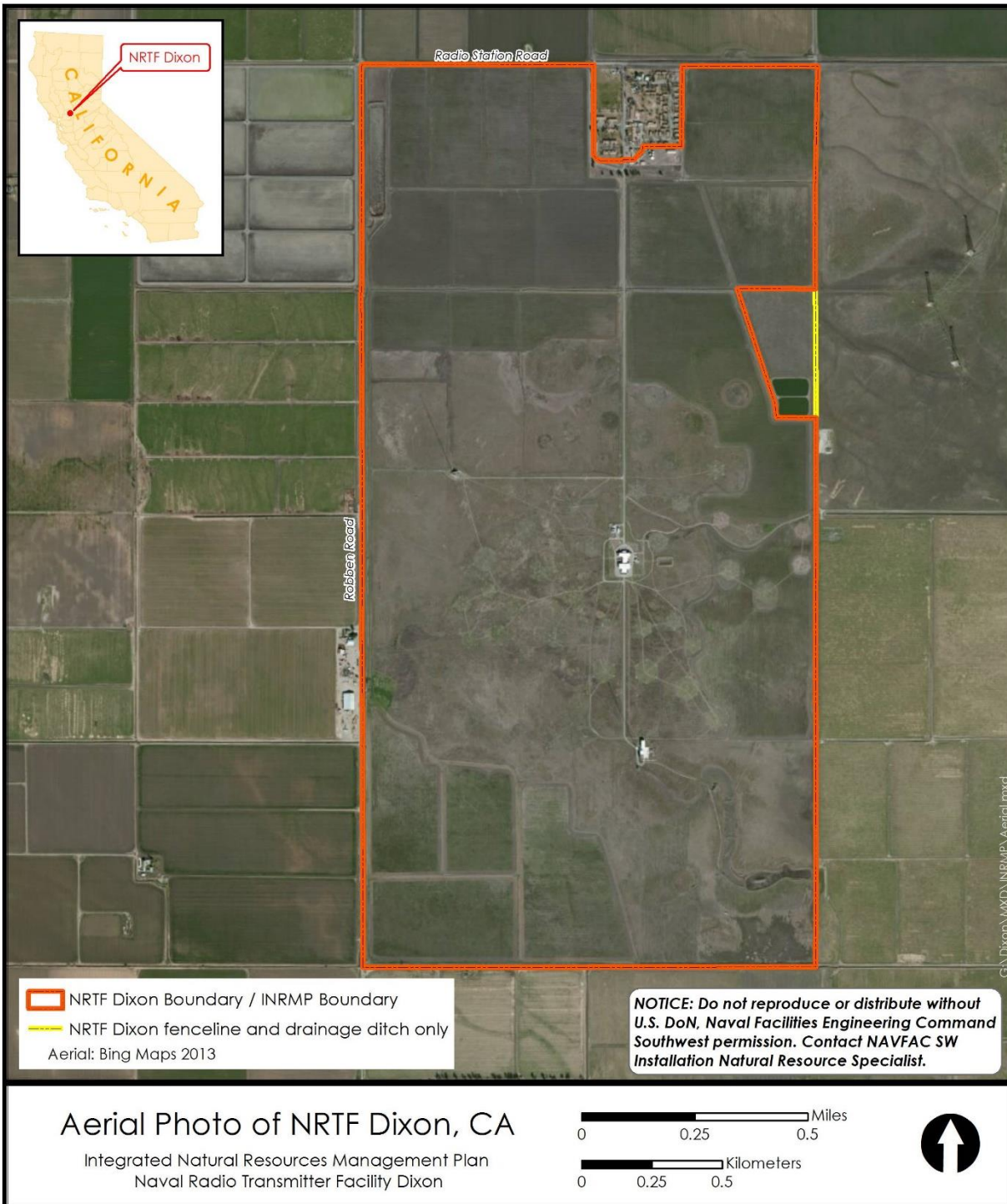
### **Water Supply and Use—Domestic and Agricultural**

NRTF Dixon has two wells, located south of the adjacent Dixon Housing Authority Housing Area, providing domestic water to the transmitter site. The transmitter site uses approximately three million gallons of water per year, which is chlorinated and stored in tanks on the facility before distribution. The distribution system is permitted with Solano County under the “State Small Water Systems” regulations. Water mains within NRTF Dixon are largely within the developed areas and parallel to existing roadways.<sup>3</sup>

Agricultural lands along the southeast side of the property have generally received surface water from the Delta for irrigation, while lands to the northwest of the property generally rely on groundwater for irrigation (Navy 2002). Some irrigation water for land on the installation is taken from the Dixon main drain, which runs along the west side of the facility (Navy 2002).

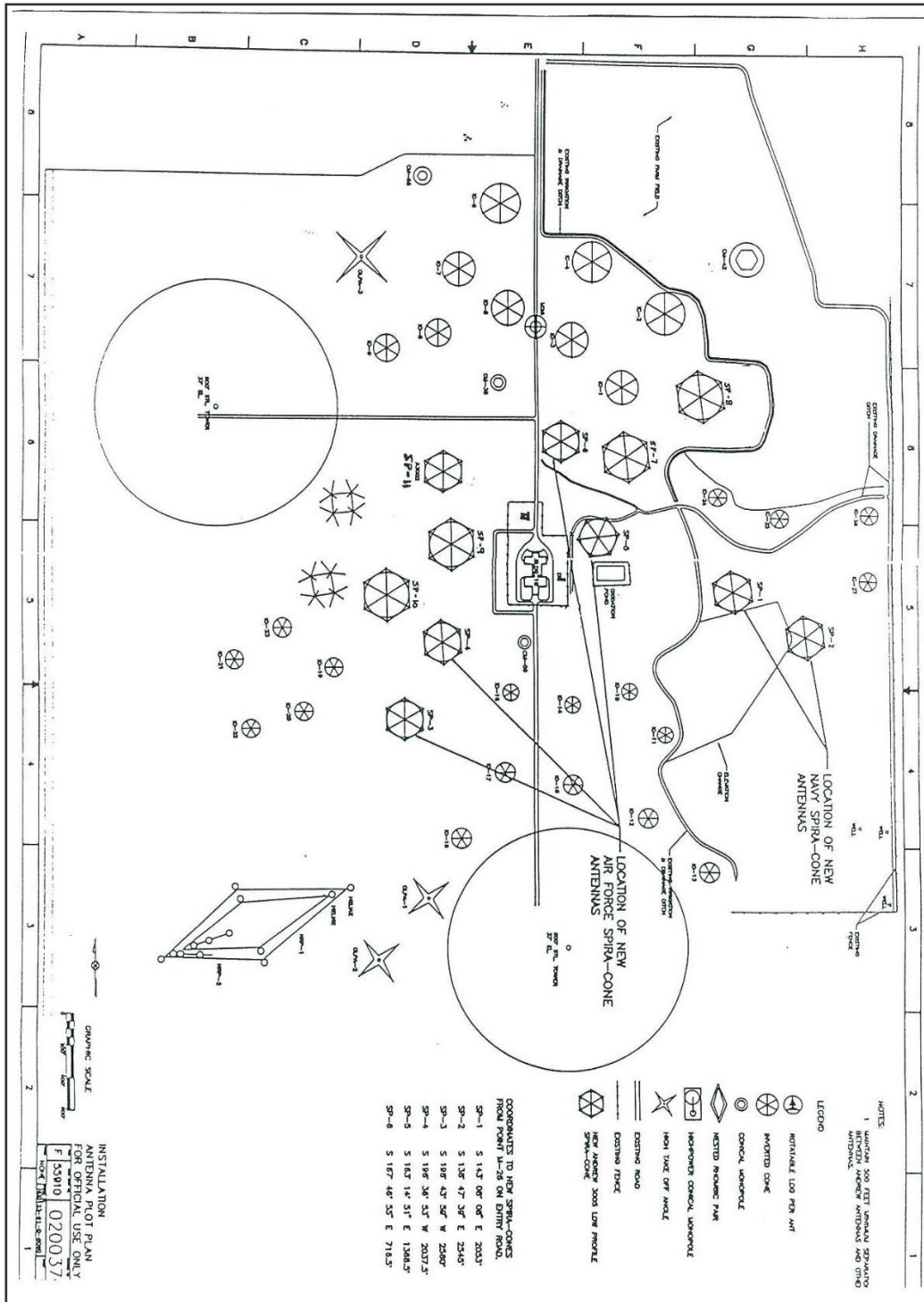
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<sup>3</sup> The Housing Area that was transferred to the Dixon Housing Authority in February 2013 has two separate 380-foot deep wells and distribution system for domestic water needs. The wells are located near the facility's north end (NAVFAC Southwest 2011c).



Map 2-2. Aerial image of Naval Radio Transmitter Facility Dixon, California.<sup>4</sup>

<sup>4</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.



Map 2-3. Location of antennas, antenna groundmats, and anchors at Naval Radio Transmitter Facility Dixon, California.<sup>5</sup>

<sup>5</sup> The map of the antenna ground mats at NRTF Dixon is provided and maintained by the Navy. The map is distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of this map to define the limits or jurisdiction of any federal, state, or local government. The map is intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the map.



NRTF Dixon is located within the Solano Irrigation District. The Solano Irrigation District (located in Dixon, California) transfers irrigation water to the Maine Prairie Water District (south of Dixon, California), which then provides it to approximately 580 acres of the NRTF Dixon agricultural parcel. The water is first used to fill a reservoir in the northwest corner of the installation and is subsequently distributed to the agricultural fields, via the Dixon main drain, which connects to ditches that extend into the agricultural outlease area (Navy 1987, as cited in Navy 2002). The perimeter ditches generally parallel existing roadways, while the internal ditches follow the edges of agricultural outlease parcels. The Dixon main drain is also used for agricultural waste water from fields to the north; therefore, a portion of the irrigation water provided to NRTF Dixon is runoff from those agricultural fields.

The perimeter drainage ditches are currently under easement to, and maintained by, the Dixon Soil Conservation District and Reclamation District 2068<sup>6</sup> (not including general weed control activities). Agricultural lessees are responsible for maintaining the ditches within the agricultural outlease area.

Purchase of irrigation water from the Solano Irrigation District is separate from any agreement that the agricultural lessee has with NRTF Dixon.

In addition, there is a well near the reservoir that is used to supplement the irrigation water supply (Navy 2002). In general, the agricultural wells are pumped at relatively higher rates throughout the growing season than the domestic water wells that would be pumped intermittently all year around (NAVFAC Southwest 2011c.).

## **Wastewater Treatment and Disposal**

Wastewater from Building 10 goes to a 3,500-gallon septic tank. A permit is in place with the Central Valley Region of the California Regional Water Quality Control Board (Central Valley Water Board) (General Order No. 97-10-DWQ-R5018, with a separate Monitoring and Reporting Program Order No. 5-01-822 in lieu of the monitoring requirements in the General Order).<sup>7</sup>

## **Stormwater Collection**

There is no formal stormwater collection system at NRTF Dixon; stormwater drains into the facility's perimeter ditches. The Dixon Soil Conservation District maintains the ditches on the western and southern perimeters, which drain the southern portion of the facility. Reclamation District 2068 maintains the ditches on the northern and eastern perimeters, which drain the northern portion of the facility. Water collects in the basement of Building 10 during wet weather conditions; this is likely due to the fact that the entire installation is located in the 100-year flood zone as defined by the Federal Emergency Management Agency (Section 3.3.4: Water Resources, Water Quality and Floodplains). When this occurs, the water is pumped into a ditch behind the building.

When required, NRTF Dixon complies with National Pollutant Discharge Elimination System permit requirements by obtaining construction and industrial stormwater permits and individual point-source municipal and industrial discharge permits, as needed.

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<sup>6</sup> Reclamation District # 2068 is commonly referred to as the Yolo district. Reclamation districts are legal sub-divisions of the Central Valley Flood Protection Board, and are responsible for maintaining flood control improvements (Central Valley Flood Protection Board 2010). The Yolo district provides direct protection to about 13,000 acres of highly developed agricultural lands together with related homes, roads, and buildings through the maintenance of the west levee of Yolo Bypass and east levee of Cache Slough (Central Valley Flood Protection Board 2010).

<sup>7</sup> Wastewater from the adjacent Housing Area is pumped to two oxidation ponds northeast of the installation's central developed area. Both the Housing Area and oxidation ponds were transferred from Navy ownership to the Dixon Housing Authority in February 2013. An easement on installation property leading from the Housing Area to the ponds provides the Housing Authority access to them.

The Navy currently pays to have excess water in the installation's irrigation ditches pumped by the Solano Irrigation District two to four times per year to remove it.

The Central Valley Water Board and the California Environmental Protection Agency have developed a Long-Term Irrigated Lands Regulatory Program (California Environmental Protection Agency and Central Valley Water Board 2011, 2012). It applies to all irrigated lands and managed wetlands in the Central Valley and includes new requirements for water quality management and monitoring to regulate waste that leaves irrigated land and reaches groundwater or surface water. The definition of waste discharges under this program is sufficiently broad. As part of this program, growers are also responsible for becoming part of a Coalition, if not already, or obtaining other proper regulatory coverage, conducting farm evaluations, making any necessary changes, and providing such information to the Coalition to report to the Central Valley Water Board. NRTF Dixon is located within the Sacramento Valley Water Quality Coalition.<sup>8</sup>

## Electricity

No natural gas is used on the facility. Pacific Gas & Electric provides electrical power to the facility by way of a 12.7-kilovolt commercial substation. Electrical facilities include four Navy-owned substations near Building 10. There are two additional emergency generators, each rated at 2,000-kilowatt, which run on diesel fuel (Navy 1998).

In general, the electrical supply system is within the developed areas of NRTF Dixon.

## Solid Waste

The Operations and Maintenance Contractor at NRTF Dixon, on behalf of the Navy, has a contract with Vacaville Sanitary Service. Approximately 20,000 pounds of solid waste per year is collected from the facility. The waste is disposed of at the local municipal landfill.

### 2.3.3 Storage Tanks and Fuel

There were previously five underground storage tanks (UST) at NRTF Dixon. The five UST sites are known as USTs A and B (near buildings 5, 51, and 21), UST C (near building 28), and USTs D and E (near building 52). All have been removed and are considered closed with no further action required (Table 2-1).

Solano County Department of Environmental Management has regulatory oversight of the UST program for Solano County as authorized by the Central Valley Water Board. The Navy cooperates with Solano County to comply with all regulations regarding removal, testing and sampling regarding USTs.

Currently, there are two 6,000-gallon above ground diesel storage tanks 500 feet from the transmitter building, and two 100-gallon diesel tanks within the generator building to supply the emergency generators (Navy 2002).

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<sup>8</sup> More information available online at: [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/irrigated\\_lands/](http://www.swrcb.ca.gov/rwqcb5/water_issues/irrigated_lands/).

Table 2-1. Underground storage tanks at Naval Radio Transmitter Facility Dixon, California.

Name	Key Problem	Status	Projected Clean-Up/ Closure Date	Central Valley Water Board Case #	CDTSC Case #
USTs A & B, BLDGs #5, 51, and 21	USTs A and B (both single wall steel gasoline tanks) were located near the entrance of NRTF Dixon, California, immediately south of Buildings 5 and 51. Both were installed in the 1960s and documented to be last used in 1997; both had contained gasoline. Both tanks were removed on 08 September 1989, including associated piping. Tanks were in good condition with no holes or evidence of soil contamination. Central Valley Water Board determined that these sites are closed and that there is no threat to water quality. No further action required.	Closed	2/25/1997 - date A closed 10/13/1998 - date B closed	480202 (A) and 480203 (B)	N/A
UST C, BLDG #28	UST C was a 5,000-gallon diesel tank (single wall steel tank) located near the center of NRTF Dixon, California, just west of Building 28. It was removed on 08 September 1989, and three holes were noted in the tank, along with evidence of soil contamination. On 30 April 1990, 4–5 feet of soil was removed from the bottom of the former UST and the excavation was backfilled with clean fill. The contaminated soil removed was disposed of off-site. On 19 December 1995, this site was considered closed by the Central Valley Water Board with no further action required. The Central Valley Water Board recommended closure of this site as a low risk groundwater case, with possible continual groundwater monitoring.	Closed	1/8/1996	480109	N/A
USTs D & E, BLDG #52	Two 12,500-gallon single wall USTs (both used to store diesel associated with electrical generator) were located just south of the generator building at NRTF Dixon, California. During their removal on 28 April 1995, obvious soil contamination was noted that appeared to be associated with leaking pipes. Contaminated soil surrounding the tanks was excavated and disposed of off-site on both 25 August 1995 and 18 March 1996. The excavation was backfilled and asphalted over. Trace level (at or slightly above the analytical reporting limits) of oil and grease (quantified as motor oil) and diesel have been detected in samples from the wells surrounding the former UST area. However, none of the more volatile and mobile compounds were detected in the groundwater samples analyzed. The Central Valley Water Board and Solano County agreed that no further action was required.	Closed	5/5/2011 - date D closed 1/8/1996 - date E closed	480201	N/A

CDTSC = California Department of Toxic Substance Control

Sources:

Smith Technology Corporation 1996; Central Valley Water Board 13 October 1998; Solano County Department of Environmental Management 04 September 1998; E. Casados, pers. com. 2012.

## 2.3.4 Transportation and Circulation

Transportation systems on NRTF Dixon consist primarily of paved roadways in and between the developed areas. Unpaved roadways exist in the antenna field, around the edges of the property, and around the edges of the agricultural parcels. Access to NRTF Dixon is through the main gate from Radio Station Road on the northern edge of the property (located west of the migrant worker Housing Area).

The primary installation roadway runs north-south through much of the length of the facility with a short paved road running due west from the main road, just north of the transmitter facility. Near the south end of the facility, a dirt road runs east to access a former landfill (Landfill Area A), which is currently planted with crops, abutting the eastern fence. Graded roads in the undeveloped areas provide access to agricultural parcel; these roads can accommodate small equipment but not heavy machinery.

## 2.4 Other Land Uses

### 2.4.1 Real Estate Outgrants and Easements

The Navy currently maintains multiple leases and easements at NRTF Dixon including those associated with the adjacent Housing Area, agricultural parcel, and perimeter drainage ditches (Table 2-2). Management responsibility for leases and easements generally fall to the lessee or easement grantee, unless otherwise specified. NRTF Dixon is a special area; therefore, no other adjunct properties are associated with it.

*Table 2-2. Outgrants and easements at Naval Radio Transmitter Facility Dixon, California.*

<b>Outgrant or Easement</b>	<b>Beneficiary</b>	<b>Location and Area</b>	<b>Type of Agreement</b>
Agricultural Outlease	Varies. Lease is competitively renewed every five years.	585 acres throughout the installation (Map 2-1).	Lease
Perimeter Drainage Ditches	Dixon Soil Conservation District	Western and southern perimeter ditches: 2.65 miles (Map 2-1).	Easement
Perimeter Drainage Ditches	Reclamation District 2068 (Yolano Reclamation District)	Northern and eastern perimeter ditches: 2.65 miles (Map 2-1).	Easement
Roadway Access	Dixon Housing Authority	Leading from the installation main gate to the oxidation ponds that were transferred to the Dixon Housing Authority in February 2013. Composed of two adjacent easements: Parcel 4 easement is 20 feet wide along a paved road (1.31 acres) that begins at the main gate; Parcel 5 easement is 10 feet wide along a dirt road (0.29 acres) that begins where Parcel 4 ends and leads to the oxidation ponds (Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements).	Easement
Sewer Line	Dixon Housing Authority	A 12-foot wide easement (Parcel 3) for access to a sewer line that leads from the Housing Area to the oxidation ponds (0.5 acres) (Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements).	Easement
Water Line	Dixon Housing Authority	173.37 square feet located on Navy property just outside the southern boundary of the Housing Area for access to a water line (Parcel 8; Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements).	Easement
Power Lines	Dixon Housing Authority	Two 10-foot wide easements on Navy property along the southern boundary of the Housing Area for access to electrical lines (Parcels 6 and 7, totaling 0.11 acres; Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements).	Easement

The perimeter drainage ditches are currently under easement to two different organizations. The Dixon Soil Conservation Service maintains an easement for the western and southern perimeter ditches to drain the southern portion of the facility. Reclamation District 2068 maintains an easement for the northern and eastern perimeter ditches to drain the northern portion of the facility. Both organizations are responsible for maintenance of the ditches (not including general weed control activities) (Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements).

In February 2013, the Housing Area at NRTF Dixon that had originally been leased by the Navy to the Dixon Housing Authority was transferred to that organization, along with two oxidation ponds and a field adjacent to them (a total of 46.75 acres transferred). The Navy had been leasing the Housing Area to the Authority since 1982 to house seasonal migrant farm workers and their families. Six easements located on Navy property were granted to the Dixon Housing Authority to allow access to the oxidations ponds (two roadway access easements); a sewer line (one easement) that leads from the Housing Area to the ponds; and power lines (two easements) and a water line (one easement) along the southern boundary of the Housing Area (Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements). The perimeter fence and drainage ditch to the east of the transferred oxidation ponds remains the responsibility of the Navy. The Housing Area had originally been for married NRTF Dixon personnel prior to 1979, at which point NRTF Dixon became a government-owned, contractor-operated facility.

In addition, the Navy maintains a 20-foot wide electrical easement (totaling 0.52 acres) in the transferred Housing Area to allow them access to electrical lines that continue to provide service to the installation (Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements).

### **Agricultural Outlease Area**

Approximately 585 acres at NRTF Dixon are outleased for agriculture, making it a dominant land use at the installation (roughly 50 percent of total installation acreage) (Map 2-4). Such land use is historic to the property and consistent with the region.<sup>9</sup> The State of California has classified the agricultural land on the northern portion of the installation as Prime Farmland, and the southern portion as Unique Farmland (California Department of Conservation 2008).<sup>10</sup> Agriculture at NRTF Dixon provides the following functions:

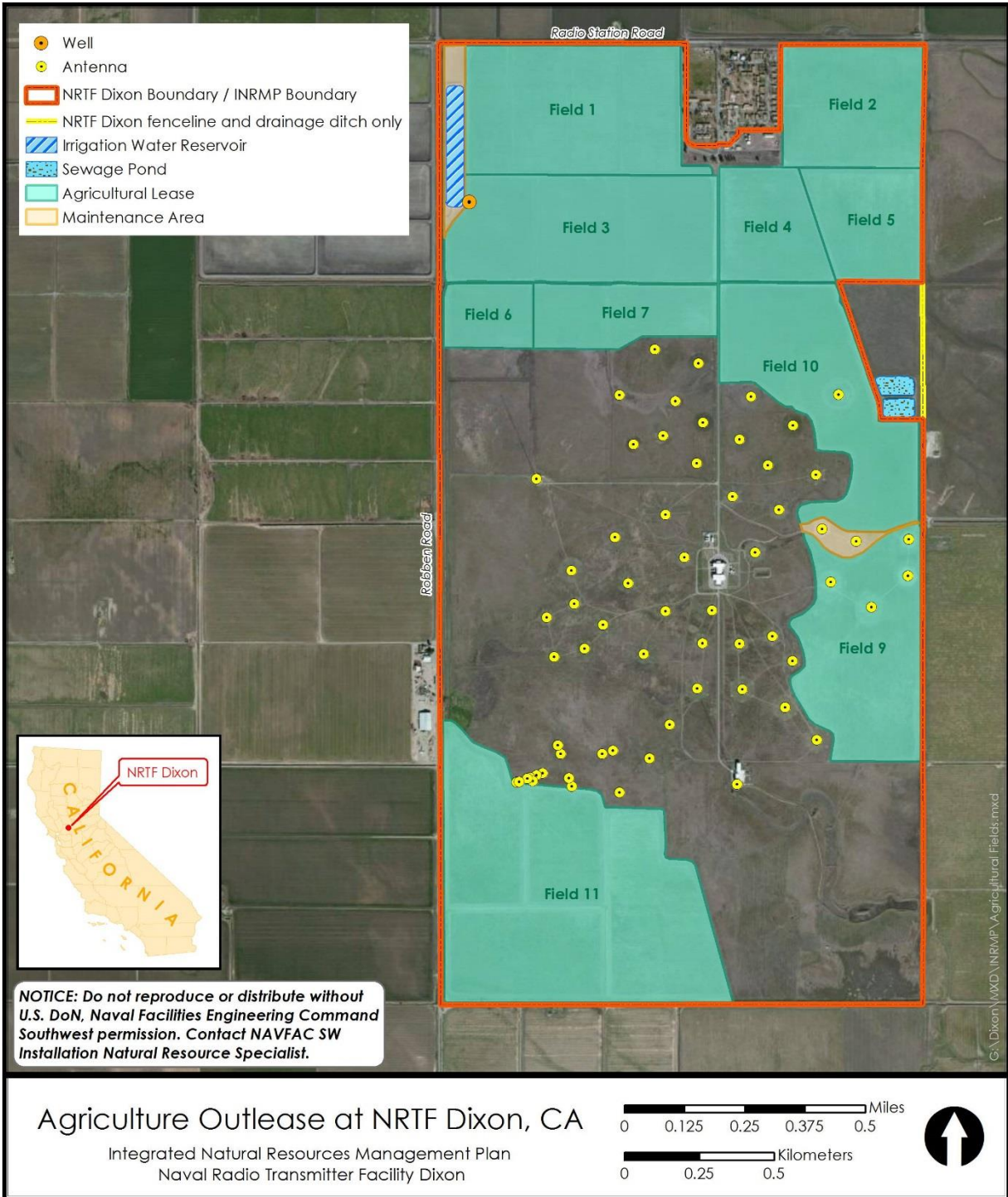
- Supports the military mission through compatible land management;
- Provides revenue from the leases to fund agriculture related projects first, then natural resources management programs at NRTF Dixon and other facilities;
- Allows for maintenance and stewardship of lands at no cost to taxpayers, including weed abatement, groundskeeping, and fire-break construction. As part of the outlease program, farmers are required to perform land maintenance and stewardship projects to preserve and enhance natural resources; and
- Provides employment and generates revenue, which benefits local communities.

The entire 585 acres (Parcel 4A01) at NRTF Dixon is generally leased to one lessee for a duration of five years, after which it is competitively renewed. The agricultural lease was most recently awarded in October 2012. Agriculture lease restrictions are currently in place for certain areas where the lessee maintains fields for the antenna array, and due to cultural resources issues, such that 368 acres are farmed and the remaining area is maintained according to the Soil and Water Conservation Plan, per the outlease agreement. Maintenance in the areas with restrictions primarily involves regular mowing.

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<sup>9</sup> NRTF Dixon is located in the Maine Prairie subarea identified in the Solano County General Plan (Solano County 2008, Ch. 3 - Agriculture). In this area, minimum lot sizes are 80 acres and crops grown include alfalfa, corn and wheat, which are primarily sold to dairies throughout the region. Almost the entirety of the unincorporated Solano County land immediately surrounding NRTF Dixon is under Williamson Act contracts to preserve the agricultural use of state-designated Important Farmland areas. A property immediately to the east of the southern portion of the facility is used as a cow pasture.

<sup>10</sup> Prime farmland is land best suited for producing food, feed, forage, fiber, and oilseed crops and also is available for these uses. Prime farmland has the soil quality, growing season, and moisture supply needed to produce sustained high yield of crops, when treated and managed (including water management) according to current farming methods. Unique farmland does not meet the criteria for prime farmland or farmland of statewide importance, but is used for producing specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality or high yield of a specific crop, when treated and managed according to modern farming methods. Examples of such crops are citrus, olives, avocados, rice, grapes, and cut flowers.



Map 2-4. Agricultural outlease area at Naval Radio Transmitter Facility Dixon, California.<sup>11</sup>

<sup>11</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

These lands have produced corn, sugar beets, alfalfa, safflower, winter wheat, tomatoes, and barley. Recently, crops planted at NRTF Dixon have principally been alfalfa and hay with no restrictions in the agricultural outlease agreement on the type of crop that lessees can plant (nor any crop rotation requirements). Part of the agricultural area of the facility has been grazed in the past, but this practice has been discontinued. The current agricultural outlease agreement specifies that livestock grazing is not allowed.

## 2.4.2 Natural Resources Management Area

Approximately 160 acres in the southeastern corner of the facility are managed for the benefit of natural resources and termed a Natural Resources Management Area (NRMA) (Map 2-1). This area was set aside because of the large vernal pool, seasonal wetlands, man-made ponds, and freshwater marsh on the property. It provides habitat for wildlife and was used in the past as a recreational area for barbecues and picnics, when military personnel were still residing on the facility. A former firing range also existed at this location (Section 2.4.4: Installation Restoration Sites).

The NRMA is not internally fenced off from the rest of the installation. The installation perimeter fencing separates it from adjacent properties to the east and south. Two antennas are located in the NRMA. One of the 600-foot tower antennas is in a small paved area at the end of the installation's main paved road, and another antenna identified as *High Take Off Angle* is in the northwestern corner of the NRMA (Map 2-1 and Map 2-3). The 600-foot antenna has a 1,400-foot radial ground mat and anchor wires that extend into the NRMA. The *High Take Off Angle* antenna does not have a ground mat associated with it (D. Svaldi, pers. com. 2013). Mowing around these antennas is not required.

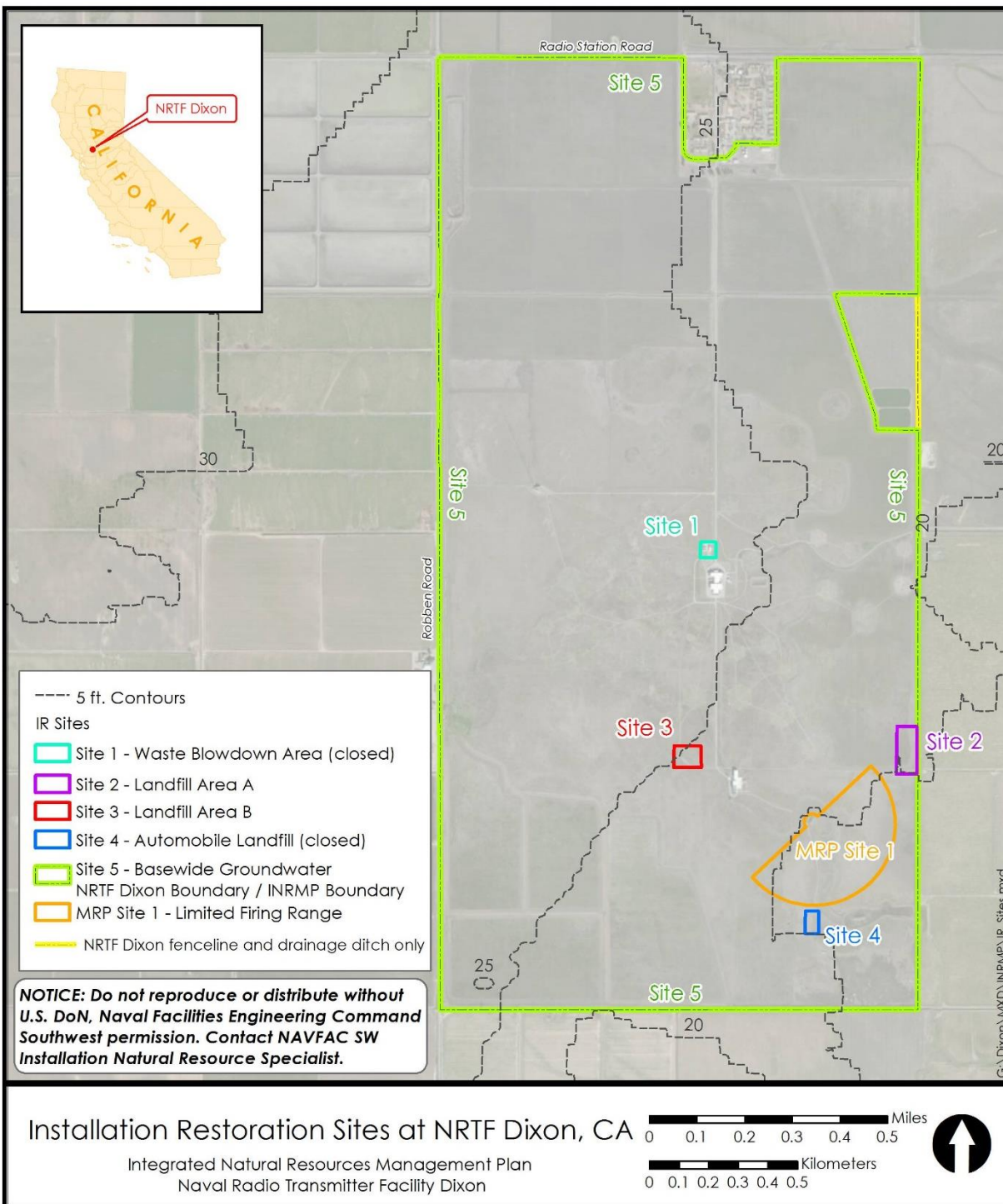
## 2.4.3 Landscaping and Grounds

Some landscaping is in place immediately surrounding the buildings in the centrally located developed area on the installation, including shrubs and a lawn. There is no maintained landscaping in the small developed area just south of the Dixon Housing Authority Housing Area; however, it does contain some trees.

Grounds maintenance on the installation is focused on mowing around the antennas and along the paved road as a fire abatement measure (Section 3.3.5: Wildland Fire Management).

## 2.4.4 Installation Restoration Sites

NRTF Dixon contains five Installation Restoration Program sites and one Munitions Response Program site. Two of the sites are closed and the remaining four are open. The Installation Restoration Program sites are known as Site 1, Waste Blowdown Area, which is mostly asphalt with some grassy areas and was closed in October 2011; Site 2, Landfill Area A, which is covered with an agricultural field; Site 3, Landfill Area B, which is covered with grasslands; Site 4, the Automobile Landfill, which is covered with grasslands within the NRMA and was closed in April 2012; and Site 5, Basewide Groundwater. The Munitions Response Program site is known as Munitions Response Program Site 1, Limited Firing Range. All open sites are subject to continued monitoring (Map 2-5; Appendix F: Installation Restoration Sites). The sites are regulated by the Central Valley Water Board and the California Department of Toxic Substance Control.



Map 2-5. Installation Restoration Sites at Naval Radio Transmitter Facility Dixon, California.<sup>12</sup>

<sup>12</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.



## 2.4.5 Cultural and Historic Resources

Current archaeological and cultural surveys are ongoing at NRTF Dixon. The last survey, conducted in 2011, identified four archaeological sites and 17 prehistoric isolates within the agricultural outlease area (Shaver 2011). Surveys conducted in the vicinity of NRTF Dixon (1979 and 1994) prior to recent surveys, including the 1996 preparation of the Historical and Archaeological Resources Protection Plan, had not identified any archaeological or cultural sites on the installation (Navy 1996, 2002). No prehistoric cultural resources were identified on, or within one mile, of the facility. No National Register-eligible properties or culturally important properties were identified at NRTF Dixon. Only two previous investigations occurred in a 1-mile radius and these were also negative. These results led to the determination that NRTF Dixon had a low potential for archaeological discoveries. The lack of cultural material is consistent with expectations for the local area, given that the region was likely marshland during prehistoric times and has since been drained for agricultural use.

In 2011, the Navy conducted an archaeological survey on 587 acres comprised of 378 acres of irrigated farmland and 209 acres designated as maintenance areas for the Agricultural Outlease Renewal Project (Shaver 2011). As a result of this survey, one historical archaeological site (CA-SOL-473H), two prehistoric archaeological sites (CA-SOL-474, -476), one multi-component archaeological site (CA-SOL-475), and 17 prehistoric isolates were identified. Currently, these four archaeological sites have not been evaluated for the National Register of Historic Places. There are approximately 500 acres in the central area of NRTF Dixon that have not been surveyed for cultural resources.

No buildings or structures eligible for listing on the National Register of Historic Places have been identified at NRTF Dixon. The structures on the facility were built between 1947 and 1966 and, therefore, are not related to any World War II historic contexts. However, at this time the buildings and structures at NRTF Dixon have not been formally evaluated for National Register of Historic Places eligibility.

## 2.4.6 Public Access and Outdoor Recreation

There is no public access to NRTF Dixon given the sensitive nature of the installation mission and concerns for public safety and health related to the mission. Official visits to the site should be coordinated through NCTS San Diego. There are no outdoor recreational activities at NRTF Dixon.

Access to the adjacent Housing Area is restricted to its residents. There is a fence that separates the Housing Area from the installation to discourage trespassing.

## 2.5 Regional Land Use

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Land surrounding NRTF Dixon is zoned by Solano County for intensive agriculture (Solano County 2008). The area south of the City of Dixon surrounding NRTF Dixon is almost exclusively irrigated farmland with the occasional widely separated residence. There are several free-standing residences on farm property adjacent to NRTF Dixon. Land east and west of the facility is primarily used for crops and grazing. The property on the other side of Radio Station Road, opposite of the facility entrance, is privately owned farmland (Navy 2000b).

The nearest population center is the city of Dixon, which is approximately seven miles northwest of NRTF Dixon. According to the 2000 Environmental Condition of Property Report, there are no industrial land uses on adjacent properties (Navy 2000b). However, there is a city-owned wastewater treatment facility adjacent to the west side of NRTF Dixon. This wastewater treatment facility consists of a series of oxidation ponds covering over 100 acres (Navy 2002).

Jepson Prairie, a native grassland and wetland preserve, is located five miles south of NRTF Dixon. It may be beneficial for NRTF Dixon to collaborate on restoration efforts with the preserve.

Map 2-6 shows regional land use in the vicinity of NRTF Dixon.

## **2.6 Future Land Use Patterns and Plans**

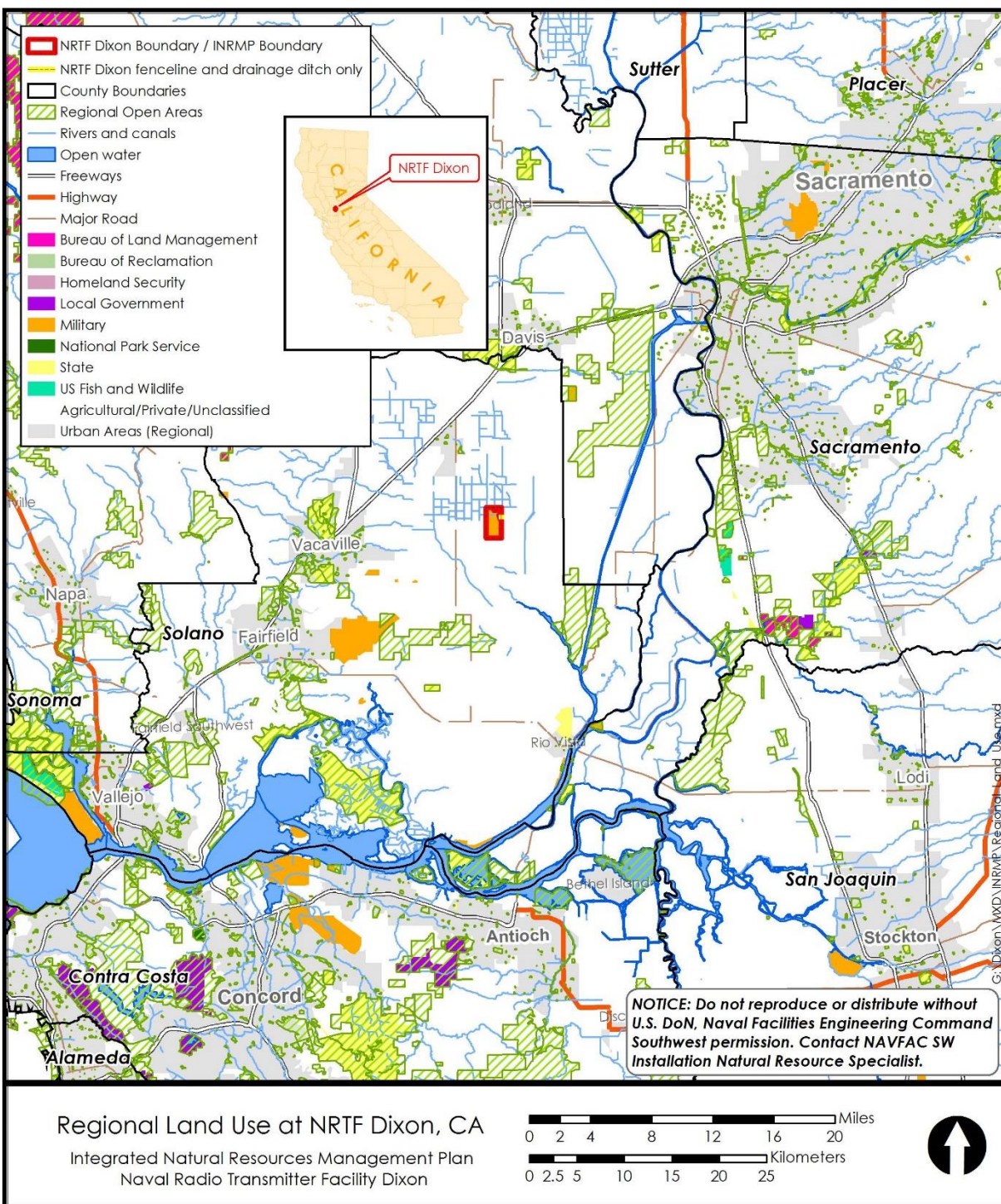
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NRTF Dixon is currently expanding its high frequency communication system. This will include increased use of existing high frequency antennas, possibly by users in addition to the Navy and Air Force. There are currently no plans to expand the antenna field, as the expansion in use can be accommodated using existing antennas. Even though all antennas are not necessarily used to their full capacity, none are scheduled to be removed. The goal is to maintain full mission capability at NRTF Dixon in response to future needs. Replacement of older antennas may occur as needed.

The primary characteristics of NRTF Dixon's environment that support this continued mission (and use expansion) include a low corrosive environment and soil conductivity that supports use of the antenna ground screens (soil salts, clay, and moisture). It was for these reasons that the NRTF Dixon site was chosen in the 1940s.

To maintain the current use and mission of NRTF Dixon, the following future projects have been identified.

- Repair roads for Navy use.
- In concert with road repair, relocate burrowing owls and ground squirrels burrowing in areas with sensitive infrastructure and equipment.
- Repair or remove the bridge in southwest corner of the property.
- Repair the fence line along the southern border.



Map 2-6. Regional land use in the vicinity of Naval Radio Transmitter Facility Dixon, California.<sup>13</sup>

<sup>13</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

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## 3.0 Natural Resources Current Condition and Management

*This Chapter describes the natural resources of Naval Radio Transmitter Facility Dixon, including what is known about their status and condition, as well as strategies for current and future management. The strategies are presented in an ecosystem context. The Department of Defense directs that Integrated Natural Resources Management Plans will foster long-term sustainability of ecosystem services, which are the benefits provided to humans from ecosystems. By identifying the physical, chemical, and biological roots of these benefits, there is a better chance of conserving them.*

### 3.1 Ecoregional Setting and Managing with an Ecosystem Approach

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The Great Central Valley of California<sup>1</sup> contains three geographic subregions: the Sacramento Valley, the San Joaquin Valley, and the region of the confluence of the Sacramento River and San Joaquin River at the Sacramento-San Joaquin Delta (hereinafter, the Delta; Map 3-1). Together these geographic subregions are approximately 450 miles long and average 50 miles wide. Naval Radio Transmitter Facility (NRTF) Dixon straddles the boundary between the Sacramento Valley and Delta regions.

NRTF Dixon lies within the Yolo-American Basin ecological subregion of the Great Central Valley ecoregion (U.S. Forest Service [USFS] 1995) (Map 3-2). This nearly level ecological subregion is underlain geologically by alluvium. Prior to extensive channelization and the construction of levees, fluvial erosion and deposition were the main geomorphic process that characterized the Yolo-American Basin (USFS 1995). The Yolo-American Basin was once covered by extensive needlegrass grasslands, wetlands, and riparian woodlands (USFS 1995). Whereas prior to European settlement fire and floods were the major forms of ecological disturbance, today the region is dominated by agriculture and suburban/urban development, and these natural processes are now controlled and fragmented through a matrix of agriculture, canals, levees, drainage, and stream channelization. Local agriculture primarily produces alfalfa, tomatoes, and walnuts (California Department of Food and Agriculture 2010a). Land use overlays include municipalities, water districts, and a network of agricultural and wildland preserves.

NRTF Dixon straddles the northwestern extent of the border of the Delta region, a prominent geographic feature that has defined much of the region's historical, political, and ecological context. In the Delta, fresh water from the San Joaquin and Sacramento Rivers mix with salt water from San Francisco Bay. Encompassing 1,600 square miles of waterways, the San Francisco Bay and Sacramento-San Joaquin Delta together form the West Coast's largest estuary and the second-largest estuary in the nation (Bunn et al. 2007). The Delta was formed as a freshwater marsh, underlain by thick peat layers that formed from decaying tules. Natural channels were shifting, creating a complex and dynamic ecosystem where there was no clear distinction between aquatic and terrestrial components (Moyle et al. 2010).

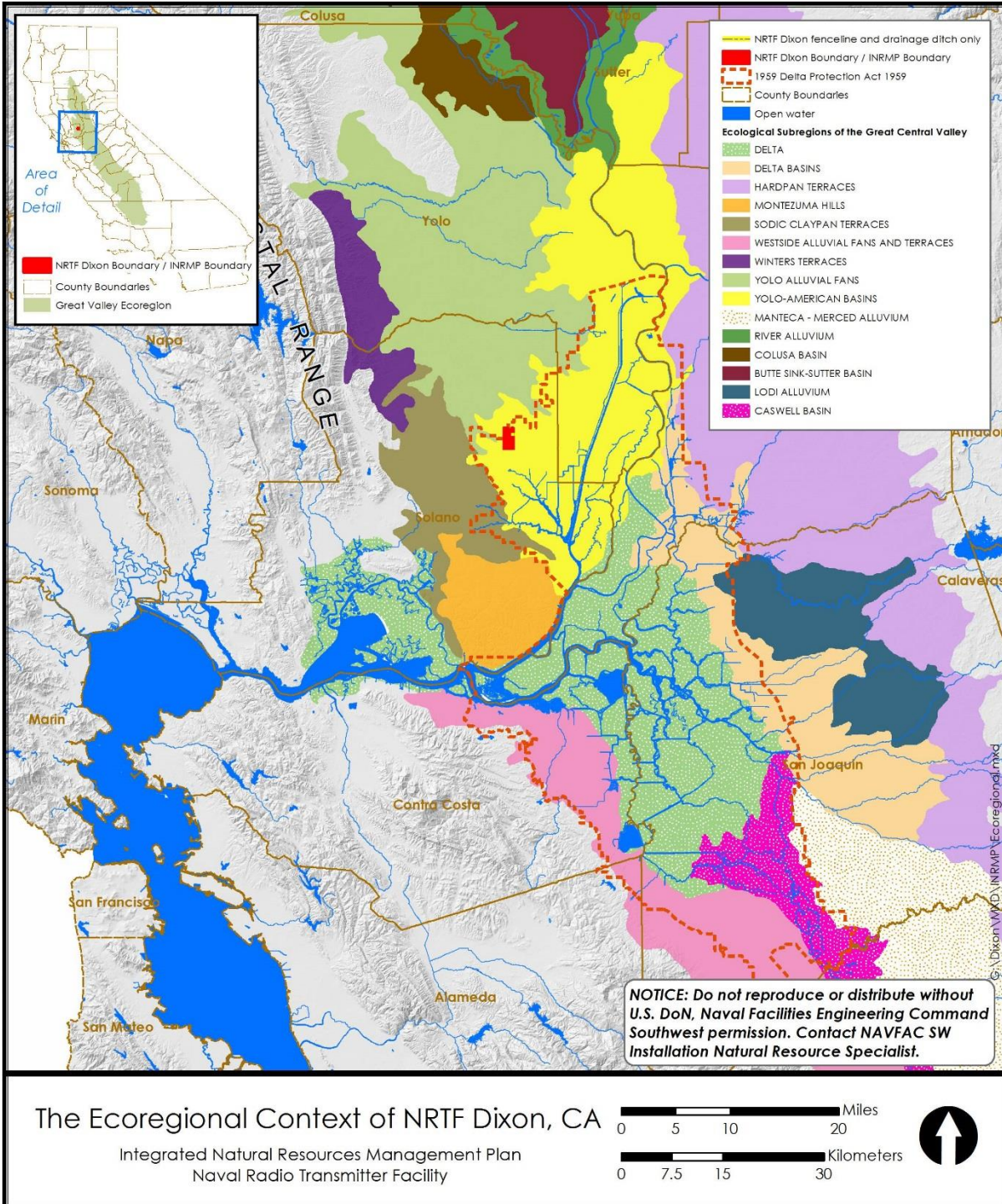
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<sup>1</sup> The Great Central Valley contains three distinct overarching watersheds, or hydrologic regions. Two of these hydrologic regions (the Sacramento River and San Joaquin River) capture riverwater from the northern and central Coast Range and Sierra Nevada mountains (45% of California's land area) and feed the Delta (Map 3-1). The southern and drier portion of the San Joaquin Valley, known as the Tulare Lake hydrologic region, is isolated from the ocean.



Map 3-1. The Great Central Valley of California and Naval Radio Transmitter Facility Dixon, California.<sup>2</sup>

<sup>2</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.



Map 3-2. Ecological subregions, the Sacramento-San Joaquin Delta, and Naval Radio Transmitter Facility Dixon, California.<sup>3</sup>

<sup>3</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

As the Delta is now the hub of much of California's water supply, it is arguably the state's most important water resource (Bunn et al. 2007). Large pumping stations feed Delta water into both the federal Central Valley Project to farmland in the southern Central Valley and to the State Water Project to metropolitan areas in southern California. These two projects constitute the largest agriculture and municipal water-supply system in the United States (Moyle et al. 2010). Other water is extracted for use in the Delta itself (National Academy of Sciences 2010). Over the last 100 years, channelization and the construction of canals and levees to serve these ends have severely altered both natural geomorphic and ecological processes of the Delta. This has resulted in regional land subsidence, separation of aquatic and terrestrial communities, and extirpation of large-ranging mammals (e.g. beaver, tule elk, and grizzly bear), as well as aquatic species (Moyle et al. 2010).

*NRTF Dixon straddles the edge of the political boundaries of the 'Legal Delta' (identified in Map 3-2), as defined by the 1959 Delta Protection Act (as presented in Lund et al. 2007). The 1959 Delta Protection Act defined an area where the State Water Project and Central Valley Project management activities would be coordinated to keep the Delta water fresh enough for agriculture and human use (Lund et al. 2007).*

Most former wetland and marsh areas of the Delta have been drained for agriculture and are protected by an aging collection of levees (Moyle et al. 2010). The Delta, as it exists today, supports an assemblage of primarily exotic species. Current natural resources management in the Delta is highly focused on the conservation of delta smelt (*Hypomesus transpacificus*), winter-run and fall-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley steelhead (*Oncorhynchus mykiss*), and green sturgeon (*Acipenser medirostris*) (Moyle et al. 2010).

### 3.1.1 Core Ecosystem Values and Services

The Sikes Act (as amended) states that the Integrated Natural Resources Management Plan (INRMP) goals “shall be to maintain or develop an ecosystem-based conservation program.” Ecosystem-based management is “a goal-driven approach to managing natural and cultural resources that supports present and future mission requirements; preserves ecosystem integrity; is at a scale compatible with natural processes; is cognizant of nature’s time-frames; recognizes social and economic viability within functioning ecosystems; is adaptable to complex and changing requirements; and is realized through effective partnerships among private, local, state, tribal, and federal interests” (U.S. Department of Defense Instruction [DoDI] 4715.03). Important goals of this approach include multiple species management to ensure that biologically or geographically significant or sensitive resources are monitored and managed for their protection and long-term sustainability (DoDI 4715.03).

*Department of Defense installations “shall follow an ecosystem-based management approach to natural resources-related practices and decisions, using scientifically sound conservation procedures, techniques, and data” (DoDI 4715.03).*

Certain core ecosystem attributes contribute to the conservation value of NRTF Dixon:

- Federal land ownership in a matrix of private land, the use of which (military mission) is compatible with and maintains many ecosystem values and services.
- Located completely in a 100-year floodplain that has an aquatic connection to the San Francisco Bay and Sacramento-San Joaquin Delta.
- Soils with conductivity properties (derived from salt content) conducive to the military mission.
- Vernal pools and wetlands with high potential for enhancement and restoration that is compatible with mission responsibilities. Wetlands may support endemic or rare species, and could be enhanced



to support Pacific flyway species on the U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern (BCC) list.

- Agricultural and wildland habitats in a matrix dominated by agriculture. These occur within a regional system of wetland, grassland, and agricultural parcels designated as preserves by various jurisdictions.
- Benefit to recognized Species at Risk. The property's open habitat condition benefits the burrowing owl (*Athene cunicularia*), which may be the largest population in the region and has a high density of nesting pairs (Smallwood and Morrison 2008). For Swainson's hawks (*Buteo swainsoni*), the pocket gopher prey base benefits from the alfalfa production/harvest cycle, and from nearby trees and riparian woodlands for nesting (within a 10-mile radius).
- Emerging cultural resource understanding.

### Specific Issues for Managing with an Ecosystem-Based Approach

- Weed invasion threatens the health of native flora and fauna communities, and is a concern along roadsides. Grounds maintenance practices, such as mowing, can either facilitate or deter the establishment of invasives.
- Climate change threatens the condition and biodiversity of the vernal pool, grassland, roadside, and wetland vegetation communities throughout this ecoregion. Its effects are likely exacerbated by the historic land use practices that drained or filled wetlands, and converted native bunchgrass grasslands to non-native annual grasses. In addition, the California Wildlife Action Plan (Bunn et al. 2007) identifies the loss, degradation, and fragmentation of habitats, both terrestrial and aquatic, as a major wildlife stressor in the region. Flood control structures, such as dikes, levees, and hardened embankments (riprap), have altered floodplain habitats like riparian forests and wetlands. The remaining habitat fragments are central to the survival of the species that persist on them. Examples include vernal pool species, Swainson's hawks, and burrowing owls.
- Surveys are needed to identify Species at Risk, as well as to identify baseline conditions that can be tracked to reflect the status of ecosystem integrity, which is a goal of ecosystem management and is used as a measure of military mission sustainability (Section 1.9.1: Ecosystem Management and Section 4.1.1: No Net Loss to the Military Mission).

*Future projected sea level rise would affect the Sacramento-San Joaquin Delta, the hub of California's water supply system (California Department of Water Resources 2006). Higher water levels could threaten Delta island levees and could intrude onto NRTF Dixon.*

### Current Management

Current management of natural resources at NRTF Dixon is project- or species-based, and generally programmed within annual to three-year budget cycles. This includes, but is not limited to, the following activities:

1. Vernal pool surveys and mapping;
2. Baseline species surveys and vegetation mapping;
3. Weed control;
4. Internal fence installation around the Natural Resources Management Area (NRMA);
5. Mowing around the antennas and along paved roads for fire abatement purposes;
6. Groundwater studies as part of Installation Restoration Program (IRP) investigations.

## Assessment of Current Management

The NRTF Dixon natural resources program has already adopted many elements of an ecosystem approach. It continues to conserve and protect plant and wildlife habitat quality through the use of avoidance measures, signage, fencing, and education.

The challenge for managers is to determine which ecosystem-based indicators characterize the system, and yet are simple enough to be effectively monitored at low cost since it is not affordable to measure everything. The most efficient and informative monitoring approach is one that occurs at a small scale but consistently over time. Use of remotely-sensed imagery, both historic and current, is one inexpensive means of establishing baseline conditions and change over time. Methods that can be integrated with in-the-field verification and regional programs provide the most power for interpretation of cause-and-effect. Tailoring a monitoring program for adaptive management requires a conceptual model of how the ecosystem and land use interplay, based on scientific literature (refer to Section 1.9.1: Ecosystem Management).

Selection criteria for an ecosystem-based indicator species vary depending on the objective, but typically those selected are: (1) species representing important habitat types and are believed to be functionally equivalent to many other species with similar habitat/ecological needs (at NRTF Dixon, this would include agricultural fields as habitats, wetlands including vernal pools, grasslands, or roadsides as habitats) and (2) flagship or umbrella species that range widely (i.e. a migratory bird or fish), under the assumption that their broad habitat and area needs will also provide for all other species in those habitats (Ruckelshaus and Hays 1998). Habitat management to benefit wildlife is especially important in the agriculturally dominated landscape of the region.

## Management Strategy

**Objective:** *Maintain and enhance the natural health of the NRTF Dixon ecosystem through conservation of soil health, water quality, and regional habitat connections while ensuring the full achievement of present and future military mission requirements. Conserve and enhance populations of plants and wildlife through habitat conservation.*

- I. Protect basic components of the ecosystem's sustainability and resilience to disturbance, such as intact soil and hydrological process, habitat size, and connections, to the extent practicable.
- II. Develop an integrated habitat management plan for multiple species. Integrate agricultural tailwater, stormwater, roadside management, invasive species control, and ecological indicators to restore vernal pool, wetland, grassland, and habitat for Species at Risk.
  - A. As practicable, set objectives for habitat restoration and processes that link them. Control invasive species through habitat management that prevents their establishment, including intact hydrology.
  - B. Ensure that habitats are able to sustain viable populations of special status species present.
  - C. Protect and enhance landscape-level habitat values by implementing practices that protect larger habitat patches, maintain connectivity and dispersal corridors, and

*Biodiversity conservation on DoD lands and waters should be followed whenever practicable to: (1) maintain or restore remaining native ecosystem types across their natural range of variation; (2) maintain or reestablish viable populations of native species on an installation, when practical; (3) maintain ecological processes, such as disturbance regimes, hydrological processes, and nutrient cycles, to the extent practicable; and (4) manage and monitor resources over sufficiently long time periods to allow for adaptive management and assessment of changing ecosystem dynamics (i.e. incorporate a monitoring component to management plans) (DoDI 4715.03).*

- establish buffer zones as compatible with mission requirements. Avoid habitat fragmentation and road proliferation, as practicable.
- D. Ensure habitats have all essential elements to maintain productivity and soil stability. Habitats and ecosites should sustain a level of biodiversity appropriate for the area and be conducive to appropriate uses. Habitat or ecosite indicators include vegetation composition, structure, distribution, and productivity.
  - E. Implement best practices to minimize resource use and impacts to habitats, species, and ecological functions.
  - F. As feasible, adopt a set of Management Focus Species for NRTF Dixon that can provide insight into habitat conditions, structure, and function to ensure management decisions are achieving the desired outcome. These should include: those natural resources considered to be significant or Species at Risk, as defined in DoDI 4715.03;<sup>4</sup> sentinel species that may be regional indicators of climate change; beneficial pollinators; endemic species associated with vernal pools; and specific avian species, particularly USFWS BCC.
  - G. Maintain databases for all management focus species regarding taxonomic and legal status, rangewide and NRTF Dixon distribution, and inventory techniques and time-frames for monitoring and assessment. Use the California Natural Diversity Database (CNDDDB) as a tool to provide managers with important information of sensitive species locations and habitat.
- III. Address threats to native habitats that are common across the region, such as invasive species and climate change, in cooperation with partners, as practicable. Become a partner with others to conduct vulnerability assessments for habitats and species in relation to climate change.
- IV. Develop coordinated approaches toward ecosystem health through partnerships.

**Objective:** *Implement a robust and scientifically defensible monitoring program to track species population and habitat health trends, evaluate success of enhancement work, detect long-term trends and changes in ecosystem dynamics, and contribute to reporting on ecosystem integrity and impacts to the military mission, adaptive management, and regional data sharing where appropriate.*

- I. Seek peer-reviewed and maintain best available scientific and field-tested information for use in land management decisions in order to report on the health of NRTF Dixon lands.
  - A. Continue to conduct baseline surveys, particularly for protected and sensitive species.
  - B. Provide for an institutional database that may be used to orient future resource managers.
- II. As feasible, adopt a cost-effective, simplified, long-term monitoring program to support natural resources adaptive management, which can also contribute to reports on compliance, risk, vulnerabilities, and an assessment of the condition and trends of the land, as well as changing ecosystem dynamics (DoDI 4715.03).
  - A. Identify ecosystem monitoring needs and develop a range of defensible monitoring protocols and activities directly related to addressing metrics objectives, and providing insight into ecological integrity of the installation's natural resources base as a measure of military mission sustainability (Section 1.9.1: Ecosystem Management and Section 4.1.1: No Net Loss to the Military Mission).

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<sup>4</sup> Species at Risk "includes species on lists maintained by USFWS, National Oceanic and Atmospheric Administration Fisheries Service, and state agencies as threatened or endangered or candidates for such lists. Species at Risk also includes species whose designation as threatened or endangered may require conservation efforts significantly impacting a military mission" (DoDI 4715.03).

- B. Develop and use benchmarks to evaluate success of enhanced areas and recovery of restored areas. Include a monitoring component in future habitat enhancement and invasive species control activities that standardizes methods across habitats.
  - C. Measure success of natural resources management actions by how well they are meeting the purpose and objectives of the INRMP. This can be either qualitative or quantitative (Navy 2006). Adapt monitoring and management actions based on results.
  - D. Participate in or ensure consistency with regional ecosystem initiatives and monitoring protocols, including U.S. Department of Defense (DoD) partnerships, in order to derive additional interpretive power from Navy data sets. Partner with other regional land management organizations to standardize data collection and share results across the population range of species.
- III. Identify research projects that the natural resources management program would welcome from outside researchers, through Cooperative Agreements and other partnerships, as practicable (use Appendix G: Research Requirements for this purpose).

## 3.2 Climate and Climate Change

The climate of the region is characterized by a typical Mediterranean regime of dry, hot summers and cool, moist winters. Air temperature movement is moderated by the influence of San Francisco Bay. Oceanic influence on climate is slight near NRTF Dixon, which can receive some marine air through the Carquinez Straits (USFS 1995). The rainfall regime is typical of the central and northern regions of the Great Central Valley with rainfall occurring mostly from November through April. Light snowfall in winter is rare, but not unknown (Western Regional Climate Center 2013).

The normal precipitation at NRTF Dixon is approximately 17.1 inches annually (Figure 3-1), most of which falls from October through April (Figure 3-2). Summer temperatures range from 54 degrees Fahrenheit (°F) to 92°F; winter temperatures range from 36°F to 59°F (Figure 3-3). Prevailing winds at NRTF Dixon are from the south-southwest, except in December and January, when winds are from the north-northwest (Western Regional Climate Center 2013). Winds average 6 miles per hour. Average monthly wind speed values for the nearby airport in Vacaville are presented in Table 3-1.

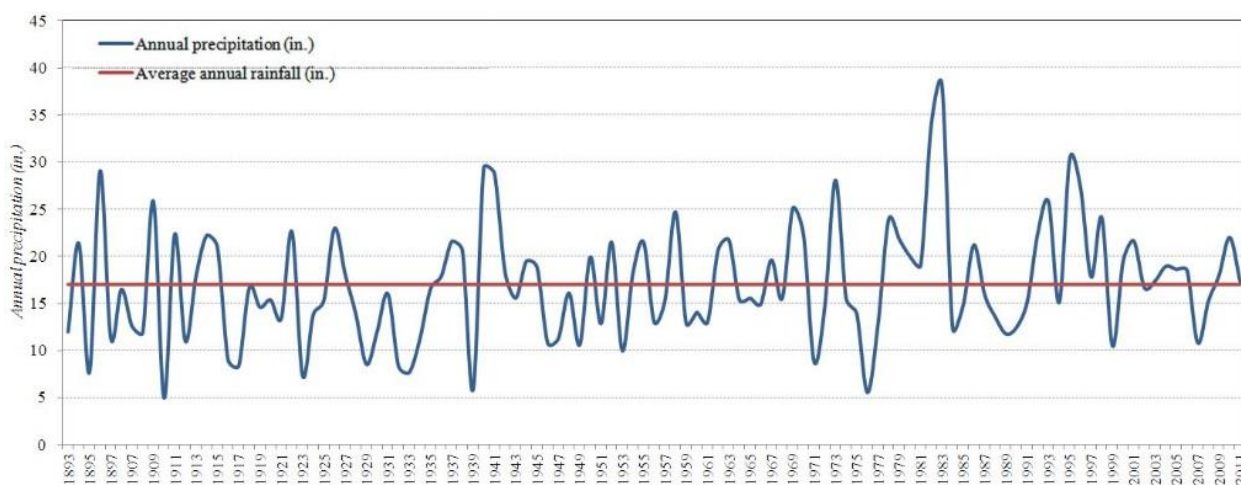


Figure 3-1. Annual rainfall in the vicinity of Naval Radio Transmitter Facility Dixon, California from 1893 to July 2012 (Data source: Western Regional Climate Data Center, Davis, California weather station).

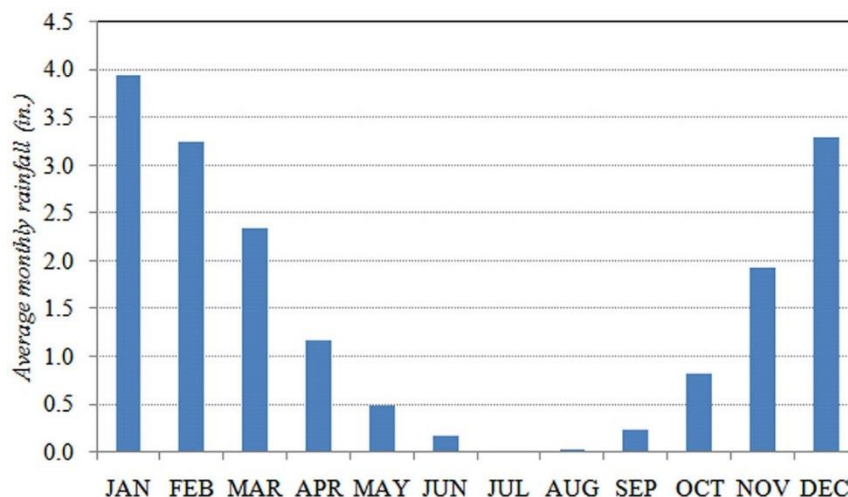


Figure 3-2. Average monthly rainfall in the vicinity of Naval Radio Transmitter Facility Dixon, California from 1893 to July 2012 (Data source: Western Regional Climate Data Center, Davis, California weather station).

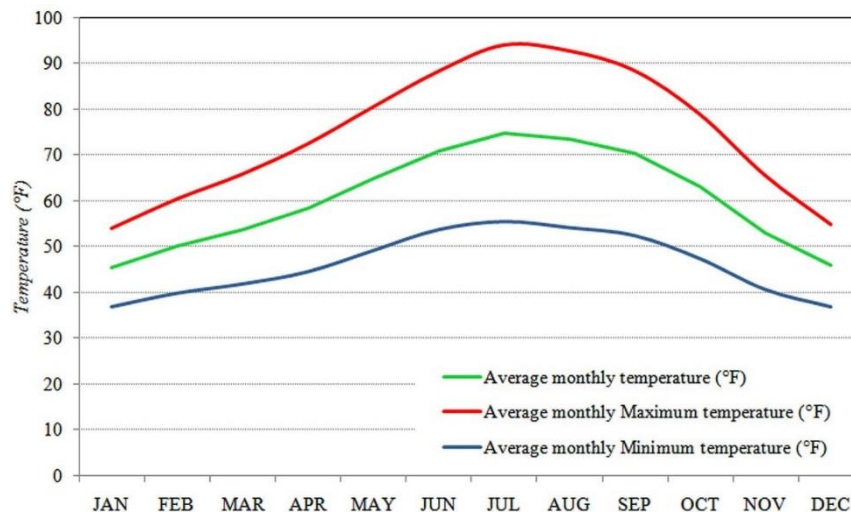


Figure 3-3. Average monthly temperature regime in the vicinity of Naval Radio Transmitter Facility Dixon, California (Data source: Western Regional Climate Data Center, Davis, California weather station).

Table 3-1. Monthly and annual wind speed in miles per hour for Vacaville Airport, California (Western Regional Climate Center 2013).

Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1998-2012	4.4	5.5	6.3	7.1	7.	7.5	7.3	6.7	5.9	5.5	4.4	4.9	6.0

Commonly occurring during the rainy season, heavy ground fog, or so-called ‘tule fog,’ is a common winter climatic phenomenon of the Sacramento Valley. This dense fog is the product of the both winter atmospheric conditions and geography (National Oceanic and Atmospheric Administration 2010). By the late fall, cool season storms bring rain to the valley floor, thereby adding low-level atmospheric moisture. High pressure building aloft behind these storms limits vertical air movement from the valley air basin.

As the ground cools during long winter nights, it cools the adjacent air and forms fog as temperatures reach dew points (National Oceanic and Atmospheric Administration 2010). The total number of average fog days per year in Sacramento (the closest recording station) is 34, with a majority of these fog days occurring between November and February (Western Regional Climate Center 2013).

Climate change and sea level rise have the potential to impact NRTF Dixon facilities, infrastructure, and natural resources. Climate change is likely to be seen at NRTF Dixon in the wetlands first, as more intense winter flooding and greater erosion and sedimentation of stream channels (Field et al. 1999; Hayhoe et al. 2004). Hotter, drier summers could alter the ability of vernal pools to support endemic species, or may allow more invasion by upland plants. Ephemeral pools are considered a potential indicator community for monitoring climate change due to their sensitivity to water temperature and seasonality and duration of flooding (Graham 2003). In general, species and habitats affected first will likely be those at the margins of their distribution and population stability. Such changes will likely increase crop demand for water as well as through increased evapotranspiration rates (California Department of Water Resources [CDWR] 2006) (Section 4.1.4: Adapting to Effects of Climate Change and Regional Growth and Conservation Initiatives).

### **3.3 Physical Conditions and Managing the Physical and Chemical Environment**

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Physical conditions of the installation are presented here, including geology and seismicity, soils, water resources, and fire. Management of soils, water resources, and wildland fire are discussed.

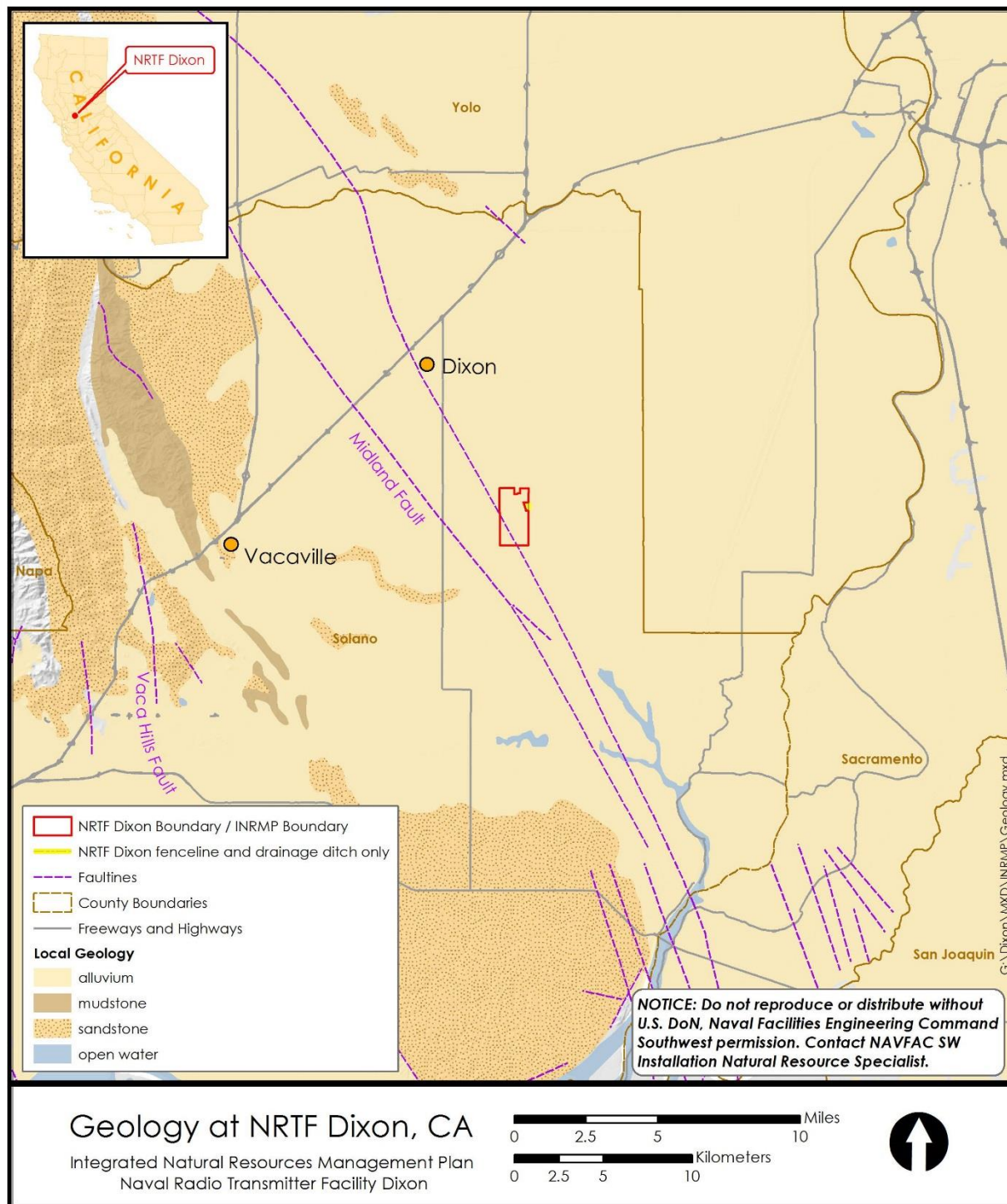
#### **3.3.1 Topography**

NRTF Dixon lies within the Sacramento Valley physiographic province, in the transitional zone between the Putah Plain and the Yolo Basin. The Yolo Basin represents the floodplain of the Sacramento River, and floodplain deposits extend into the southeast-trending shallow drainage depressions on the northeast quarter of the property.

The elevation of NRTF Dixon ranges between approximately 20 and 30 feet above mean sea level (National Geographic Society 2009). The land surface is nearly flat, sloping at a rate of about 3 feet per mile to the southeast, toward the Sacramento River.

#### **3.3.2 Geology and Seismicity**

The property is underlain by recent alluvium (Map 3-3) with exposures of older alluvium in the northeast and southeast corners of the property (Wagner et al. 1981). The alluvium, which could date to the late Tertiary Period (more than 1.8 million years ago), is about 2,000 feet thick beneath the site and is underlain by marine sediments deposited in the early Tertiary Period (Wagner et al. 1981; CDWR 2004). In the southern Sacramento Valley, marine sediments were deposited during the Eocene Epoch, more than 40 million years ago. The east branch of the Midland Fault, part of a northwest-trending fault zone that cuts the older Tertiary marine deposits but not the younger Quaternary alluvium above them, crosses the southern half of the facility (Jennings 1994; Wagner et al. 1981).



Map 3-3. Geology and fault lines at Naval Radio Transmitter Facility Dixon, California.<sup>5</sup>

<sup>5</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

Mineral resources in the vicinity of NRTF Dixon include natural gas deposits. The Sacramento Basin is the most productive of the gas producing basins in California and yielded about 80 percent of the gas production in the state in 1964. Previously harvested reserves in the Sacramento Basin total 9 trillion cubic feet, while an additional 534 billion cubic feet of natural gas and 323 thousand barrels of natural gas liquids in the Sacramento Basin Province are estimated but undiscovered (U.S. Geological Service [USGS] 2006).

The Sacramento Valley contains few active faults, and is one of the most seismically quiescent regions of the state. The nearest Quaternary fault (showing evidence of displacement within the past 1.8 million years) is the Vaca Fault, which parallels the western margin of the valley, about 10 miles west of NRTF Dixon (Map 3-3). The age of the fault is not precisely known, and movement last occurred prior to between 700,000 and 200 years ago (Jennings 1994). The nearest Holocene fault (active between 10,000 and 200 years ago) is the Concord-Green Valley Fault, which is another 10 miles west of the Vaca Fault (not shown on Map 3-3).

The Concord-Green Valley Fault, running due north from of the City of Benicia, probably represents the easternmost of the active faults belonging to the San Andreas Fault system. The Association of Bay Area Governments estimates that ground shaking intensity in the NRTF Dixon area from a magnitude 6.7 earthquake on the Concord-Green Valley Fault would be moderate (VI) to strong (VII) on the modified Mercalli Scale of earthquake intensity<sup>6</sup> (Association of Bay Area Governments 2003). The general plan for Solano County identifies NRTF Dixon to lie within a zone of high liquefaction potential and high shrink swell potential (Solano County 2008). The USGS (2008) has estimated that there is about a 10 percent probability that an earthquake large enough to cause peak ground acceleration between 0.20–0.25 percent the acceleration of gravity will hit NRTF Dixon in the next 50 years (Map 3-4).

### 3.3.3 Soil Resources and Condition

There are four soil types represented on NRTF Dixon, presented in Map 3-5. These soils are poorly drained, with slow internal drainage, medium to fine texture, and deep profiles. The first natural resources management plan for the facility (Navy 1987) reports that the land was extensively leveled to improve drainage.

Soil units include Capay silty clay loam, Capay clay, Clear Lake clay, and Antioch-San Ysidro complex (Appendix H: Soil Descriptions). Antioch-San Ysidro complex consists of about 50 percent Antioch and about 35 percent San Ysidro soils. The Antioch-San Ysidro complex seems to correspond generally to the Older Alluvium geologic unit (Wagner et al. 1981). Capay Clay, Capay silty clay loam, and Clear Lake soils are considered prime farmland by the California Department of Conservation (2008). The main limitation of the soils for agriculture is slow permeability, which can result in erosion or excessive tail water when irrigation is applied too quickly. A shallow hard clay (claypan), found at a depth of about 20 inches in the Antioch and San Ysidro soils, prevents water from percolating and can cause the soil to become waterlogged. The main limitation of the soils for roads and construction sites is the high clay content, shrink-swell potential, and corrosivity for steel pipes and tanks.

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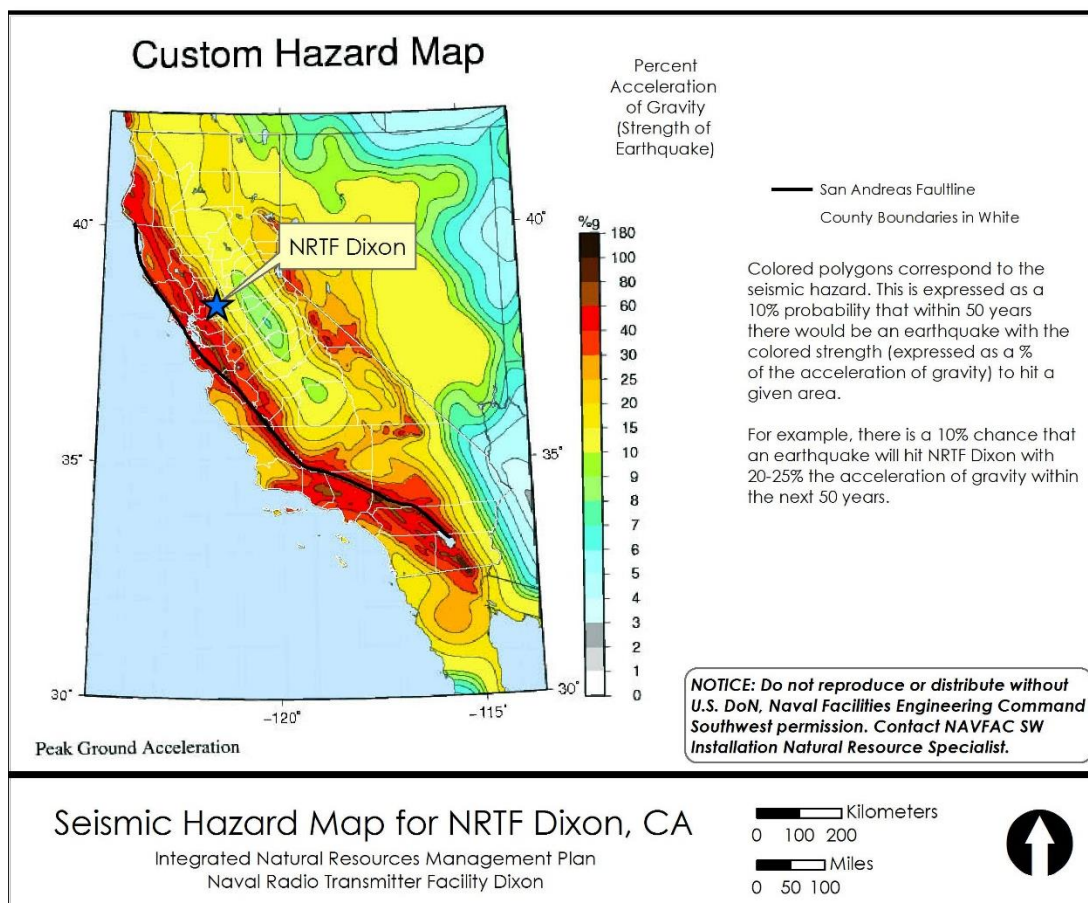
<sup>6</sup> Moderate or VI: Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle).

Strong or VII: Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.

Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.

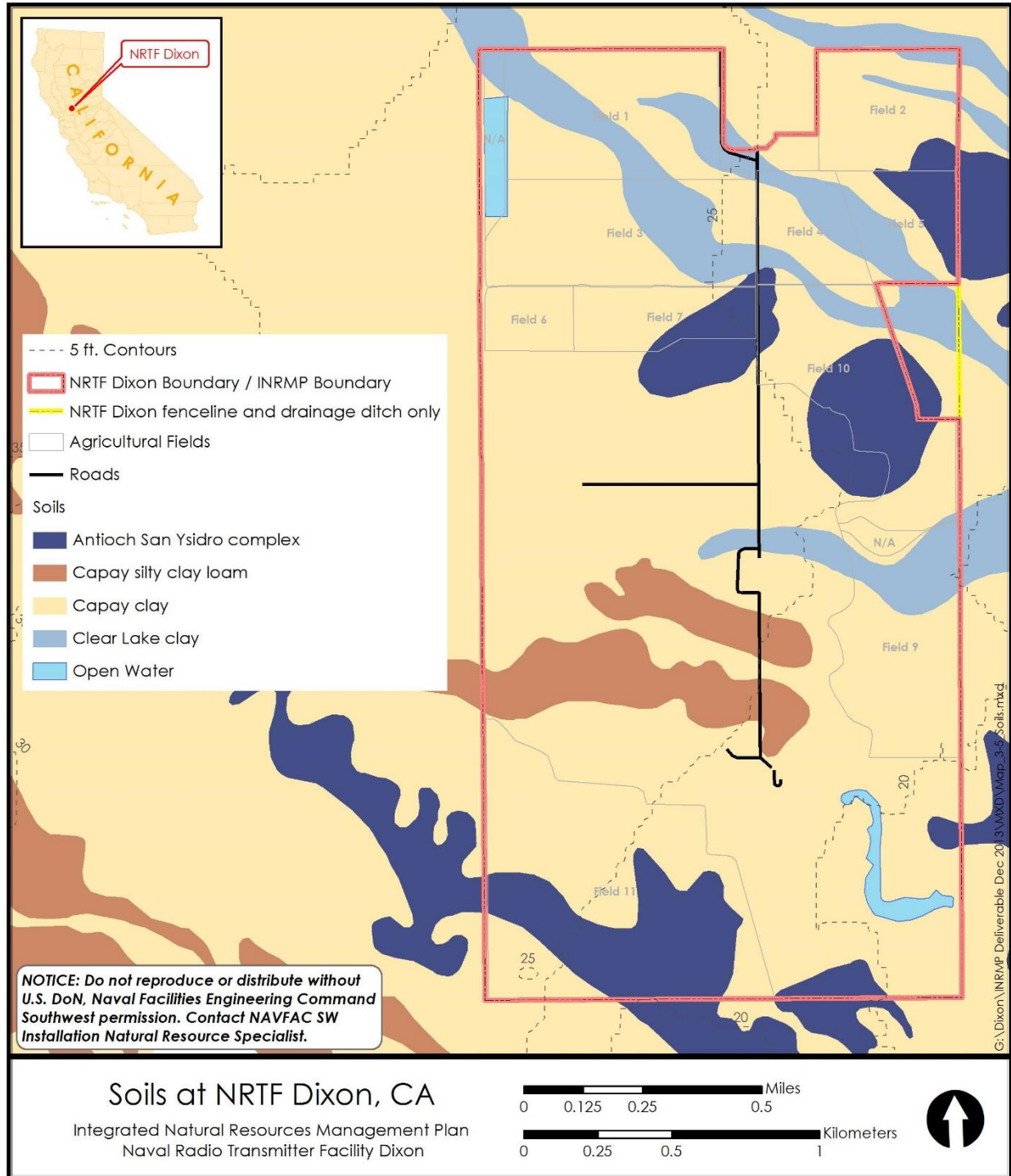
Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally (Association of Bay Area Governments 2003).





Map 3-4. Seismic hazard at Naval Radio Transmitter Facility Dixon, California (U.S. Geological Survey 2008).<sup>7</sup>

<sup>7</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.



Map 3-5. Soils at Naval Radio Transmitter Facility Dixon, California.<sup>8</sup>

<sup>8</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

Although soil erosion normally represents only a slight problem due to the relatively level terrain, NRTF Dixon has previously identified irrigation ditch bank erosion as a problem (Navy 2002).

### Specific Issues for Soil Resources and Condition

- The Capay and Clear Lake soils at NRTF Dixon have fine texture and slow permeability that can result in standing water, which could damage crops and exacerbate flooding.
- Soils in specific areas on the installation may be contaminated with hazardous materials from previous uses, including closed landfill areas and munitions area.

### Current Management

Federal agencies must manage lands to control and prevent soil erosion and conserve natural resources by conducting surveys and implementing soil conservation measures. The Sikes Act (as amended), Soil Conservation sections of the U.S. Code ([USC]; 16 USC §§ 590a-590q3), Farmland Protection Policy Act, the Clean Water Act (CWA), DoDI 4715.03, and Chief of Naval Operations Instruction (OPNAVINST) 5090.1C CH-1 require Best Management Practices (BMPs) for soils and water resources on federal lands. The Conservation Districts of U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) are responsible for helping practitioners, including NRTF Dixon, implement soil conservation and management programs.<sup>9</sup> Previous efforts with NRCS include technical support of the agricultural production program, revegetation recommendations, irrigation water delivery system design, and stormwater drainage evaluations. Implementation of programs and projects called for within INRMPs is a means of fulfilling this requirement, including studies or projects for erosion control. The primary purpose of soil conservation and management at NRTF Dixon is to protect soil resources for their agricultural and ecological values. Lessees currently comply with soil management guidelines provided in the Soil and Water Conservation Plan of the agricultural outlease agreement. However, the Soil and Water Conservation Plan has few soil requirements and BMPs.

*The guidance for INRMPs requires the reporting of soils inventory at least to the association level. Soil mapping is a function of the federal government under the NRCS, but characterization of soils also occurs through vegetation classification and mapping protocols, wildlife habitat values mapping, and in engineering studies associated with construction projects.*

Soil quality is also managed by the IRP for those areas contaminated with hazardous materials from previous uses.

### Assessment of Current Management

Soils at NRTF Dixon were mapped to sufficient scales for natural resources management purposes by the Soil Conservation Service in 1977 (to association level), updated periodically on the NRCS website (to series level) (Soil Conservation Service 1977; NRCS 2013; Map 3-5; Appendix H: Soil Descriptions).

Currently, land at NRTF Dixon is almost completely flat with no serious concern of waterborne soil erosion. However, ensuring that soil erosion and conservation measures or BMPs are provided for, NRTF Dixon could help to conserve and prevent soil loss. Specifications from local agencies and guidance provided by the NRCS could be referenced.

Likewise, soil conservation and improvement practices should be an integral focus of habitat enhancement activities, including restoration post-clean up of IRP sites.

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<sup>9</sup> The NRCS is the primary federal agency with which NRTF Dixon cooperates on erosion control projects, soil surveys, plant materials studies, and rehabilitation efforts on disturbed lands.

## Management Strategy

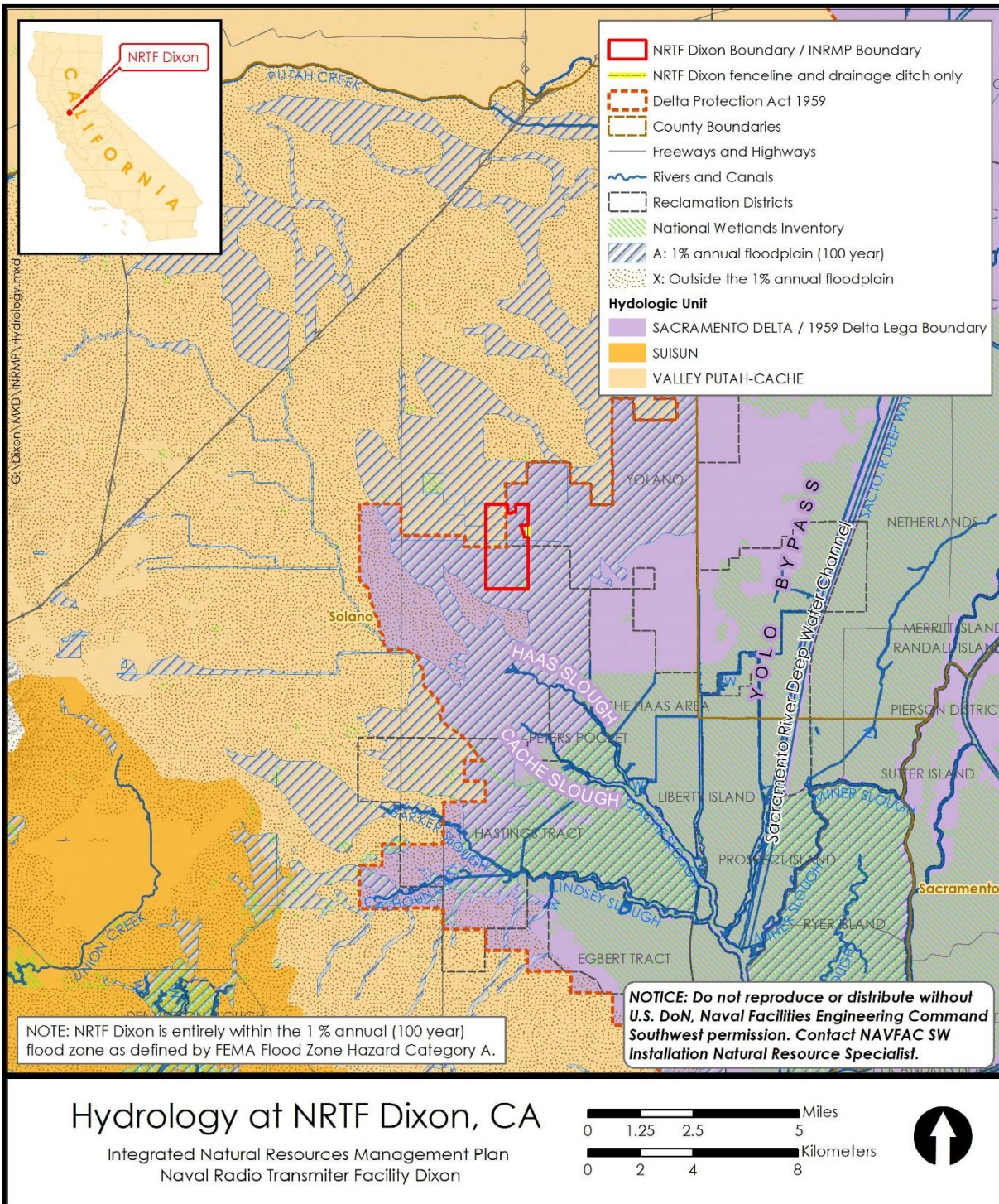
**Objective:** *Conserve soil productivity, nutrient functioning, water quality, and wildlife habitat through effective implementation of BMPs to prevent and control soil erosion related to construction or other uses of natural resources, while maintaining the military mission and sustainable agricultural practices.*

- I. Maintain soil quality in agricultural areas. Lessees should continue managing soils according to the Soil and Water Conservation Plan of the agricultural outlease agreement.
- II. Soil conservation shall be considered in all site feasibility studies and project planning, design and construction (including restoration and habitat enhancement).
  - A. Seek opportunities to maintain a working relationship with and draw on the expertise of the NRCS to conserve soils and soil quality at NRTF Dixon.
  - B. Ensure incorporation of BMPs in the preliminary design and construction of facilities, as well as maintenance activities, involving ground disturbance.
    1. Use the specific guidance for selecting BMPs as presented in the California Storm Water Best Management Practices Handbook (California Stormwater Quality Association 2009), including project planning and design guides, Storm Water Pollution Prevention Plans, Water Pollution Control Programs preparation manuals, Construction Site BMPs Manual (California Department of Transportation 2003), and wind erosion/dust control measures.
    2. Continue to minimize disturbance by locating staging areas in disturbed areas only. Staging areas should be prohibited within sensitive habitat areas. Staging areas should be delineated on the grading plans and reviewed by the resources agencies and project biological monitors, prior to start of construction.
  - C. Keep a record of the most effective BMPs for use in NEPA planning and project implementation.
  - D. Incorporate responsibilities for BMPs and sensitive resources protection in all real estate agreements (leases and easements) when they come up for renewal, especially in the Soil and Water Conservation Plan of the Agricultural Outlease Agreement.
  - E. Maintain soil quality in the NRMA and grassland area through beneficial vegetation and habitat management practices.
- III. Stabilize disturbed sites using native plants or protective materials.
- IV. Investigate the possibility of using soil-disturbing activities to facilitate habitat enhancement and rehabilitation, particularly in light of potential cultural resources on-site that have not yet been surveyed.

### 3.3.4 Water Resources, Water Quality and Floodplains

Local hydrology and water systems in the vicinity of NRTF Dixon are depicted in Map 3-6. NRTF Dixon straddles both the Sacramento Delta and Valley Putah-Cache hydrologic units, and the legal boundary of the Sacramento-San Joaquin Delta (Lund et al. 2007) as defined by the 1959 Delta Protection Act (which follows the Sacramento Delta hydrologic basin boundary, shown in Map 3-6's view extent).

*FEMA regulates floodplains. Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk. They are depicted on a community's Flood Insurance Rate Map or Flood Hazardous Boundary Map. Each zone reflects the severity or type of flooding in the area (FEMA 2010).*



Map 3-6. Hydrology at Naval Radio Transmitter Facility Dixon, California.<sup>10</sup>

<sup>10</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

The northeast section of the property lies within the Reclamation District 2068 (also known as the Yolo Reclamation District),<sup>11</sup> and the southern portion within the Dixon Soil Conservation District. The property lies entirely within the Federal Emergency Management Agency (FEMA) 100-year flood zone (Map 3-6). Jurisdictional and non-jurisdictional waters at NRTF Dixon are discussed elsewhere (Section 3.4.3: Wetlands and Jurisdictional Waters).

### **3.3.4.1 Groundwater and Water Quality**

The Tehama formation contains the main aquifers that underlie the western portion of the Sacramento Valley, including NRTF Dixon (Naval Facilities Engineering Command [NAVFAC] Southwest 2011c). The regional groundwater gradient dips toward the east. Based on historical groundwater elevation data, the predominant direction of groundwater flow was interpreted to be east-southeast. The groundwater flow patterns appear to vary slightly from year to year.

Groundwater was measured by the USGS in 1912 at levels that the CDWR now considers the baseline for pre-development levels (CDWR 2004). Due to development and drought, water levels reached their lowest in the 1950s, and groundwater reportedly occurred at a depth of about 40 to 80 feet below the ground surface in the area of the property in 1965 (CDWR 2010). After the drought of 1980s, groundwater elevations, as measured by wells in the immediate vicinity of NRTF Dixon, have consistently hovered at mean sea level (CDWR 2010). According to recent investigations by the Navy, the current depth to the shallow water-bearing zone beneath NRTF Dixon is approximately 8 to 16 feet below ground surface. The varying depths of the shallow groundwater underlying the facility indicate that it occurs in discontinuous zones. The materials that make up the shallow water-bearing zone include clayey fine sands and fine sands (NAVFAC Southwest 2011c).

Groundwater is used to supply potable water for the Navy and other personnel at NRTF Dixon as well as supplement surface water sources of irrigation. Directions of groundwater flow likely are not influenced by local pumping from the agricultural and domestic wells (NAVFAC Southwest 2011c).

Groundwater within the Solano subbasin is considered to be of generally good quality, and usable for both domestic and agricultural purposes (CDWR 2004). Summaries of the most recent water quality assessments for the SOL-12 Well, south of Radio Station Road and East of Robben road, are available through the Groundwater Ambient Monitoring and Assessment Program (State Water Resources Control Board 2010).

### **3.3.4.2 Surface Water, Floodplains, and Water Quality**

Permanent water bodies at NRTF Dixon include a flashboard dam adjacent to Robben Road, near the intersection with Radio Station Road that creates a small reservoir to hold imported irrigation water; and a dam that forms a reservoir along a natural drainage swale near the southeastern corner of the installation.<sup>12</sup> Irrigation ditches around the perimeter of the property frequently have water in them.

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<sup>11</sup> Reclamation District # 2068 is commonly referred to as the Yolo district. Reclamation districts are legal sub-divisions of the Central Valley Flood Protection Board, and are responsible for maintaining flood control improvements (Central Valley Flood Protection Board 2010). The Yolo district provides direct protection to about 13,000 acres of highly developed agricultural lands together with related homes, roads, and buildings through the maintenance of the west levee of Yolo Bypass and east levee of Cache Slough (Central Valley Flood Protection Board 2010).

<sup>12</sup> Two small sewage treatment oxidation ponds along the eastern perimeter of the installation had been leased to the Dixon Housing Authority for water treatment of the Housing Area. These ponds were transferred to the Authority along with the Housing Area in February 2013 and are no longer considered to be on Navy property.

Intermittent streams cross NRTF Dixon lands and drain in the direction of Cache Slough, which joins the Sacramento River Deep Water Channel south of Liberty Island in the Delta (Navy 2002). The principal named surface water feature in the area is Haas Slough, which extends from Cache Slough to within a little more than a mile south of the property (Map 3-6). Sloughs provide drainage during low tides and low stream flows and allow delta waters to move upland during higher flows and higher tides. Sloughs, extended by canals, provide a source of irrigation water to land tracts on the delta margin and are also used for discharging agricultural drainage return flows. It is unclear, however, whether water flows in NRTF Dixon's installation irrigation ditches are currently connected to the Delta via the slough that is present in the installation's southeastern corner. During the winter, this slough (within the NRMA) becomes inundated. In the past, this area was filled with water regularly by NRTF Dixon staff and would attract a number of birds.

Currently, Delta water is used both as drinking water and for irrigation; water quality is therefore, critical. Delta water quality is also an issue for maintaining environmental benefits of the Delta, such as habitat for migrating fish.<sup>13</sup>

Water quality of surface waters at NRTF Dixon is unknown. The Central Valley Regional Water Quality Control Board (hereinafter, Central Valley Water Board) and the California Environmental Protection Agency have developed a Long-Term Irrigated Lands Regulatory Program (ILRP) (California Environmental Protection Agency and Central Valley Water Board 2011, 2012). The framework applies to all irrigated lands and managed wetlands in the Central Valley and includes new requirements for water quality management and monitoring in order to regulate waste that leaves irrigated land and reaches groundwater or surface water. As part of this program, growers are also responsible for becoming part of a Coalition, if not already, or obtaining other proper regulatory coverage, conducting farm evaluations, making any necessary changes, and providing such information to the Coalition to report to the Board. Since the Navy is responsible for activities on the property, any potential notices of violations would be issued to the Navy.

### **Specific Issues for Water Resources, Water Quality and Floodplains**

- Potential for contamination from either on-site or off-site sources of installation groundwater (deep and perched aquifers). The installation is down gradient from a landfill that could contribute to contamination of installation groundwater.
- Discharge of NRTF Dixon agricultural runoff into surface waters (non-jurisdictional) and groundwater are proposed to be regulated by the ILRP Framework, which includes new requirements for water quality management and monitoring in order to regulate waste that leaves irrigated land.
- Adequate planning is needed for flood management prior to construction or other projects, as the entire NRTF Dixon facility falls within the 100-year flood zone. Impacts or changes to the floodplain could increase the risk of impacts from future floods.

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<sup>13</sup> In the 1920s, surface water flows diverted to agriculture and urban use from the Sacramento and San Joaquin rivers and other delta tributaries resulted in decreased outflows to the delta and saline water intrusion into the delta. Records show that in the 1930s, before Shasta Dam was built, water with 1,000 parts per million of chloride occasionally extended into delta waterways nearby to NRTF Dixon. After Shasta dam was built, summertime releases for irrigation reduced saline intrusion, maintaining lower salinities in the delta.

## Current Management

Maintaining high quality standards for all water bodies located on NRTF Dixon is a priority, reinforced by several federal and state water quality regulations. NRTF Dixon does not have an integrated water quality management program independent from this INRMP. However, the primary goals and objectives of resources management on NRTF Dixon are to protect the quality of water bodies and resources by identifying and managing aquatic habitats, reducing pollutant loading from agricultural practices and any construction activities, and promoting conservation measures.

*The primary federal laws governing water resources at NRTF Dixon are the CWA and the Safe Drinking Water Act, 42 USC § 300f et seq. Soil Conservation sections of the USC (16 USC §§ 590a-590q3), the Watershed Protection and Flood Prevention Act, Public Law 92-419 (16 USC §§ 1001 – 1011, 33 USC 701), and the watershed approach included in DoDI 4715.03 are also important.*

Currently, agricultural lessees at NRTF Dixon do not recycle water that drains from their fields. There are no tailwater return lines or sumps to achieve this. The CDWR has disallowed the discharge of any agricultural water into jurisdictional waters. The installation complies with this currently, but such discharges would need to be reevaluated upon receiving results from the facility's proposed jurisdictional delineation update.

Regular monitoring is also performed by the IRP for water quality (along with any necessary rendition actions) at all relevant IRP sites on NRTF Dixon.

*The primary state agencies charged with regulating water resources are the Health and Welfare Agency, the California Environmental Protection Agency, and the Resources Agency. Within the Health and Welfare Agency, the Department of Health Services, Division of Drinking Water and Environmental Management, regulates public drinking water supplies and implements provisions of the federal Safe Drinking Water Act.*

There is no active management of the risks or benefits provided by floodplains at NRTF Dixon. Risks are minimal considering that there is no ongoing construction on the installation and that any antennas installed are primarily to replace ones that are removed. Any individual activities within the floodplain are considered during environmental project review. The conductivity of the soil on the installation (due to its clay base, salts, and soil moisture) benefits functionality of the ground mats buried under each of the antennas.

## Assessment of Current Management

NRTF Dixon has been successful at remaining in compliance with water use and quality permits (wastewater permit under General Order No. 97-10-DWQ-R5018 and Monitoring and Reporting Program Order No. 5-01-822). Water quality monitoring of surface and groundwater resources (including at IRP sites) has allowed NRTF Dixon to address water quality issues as they arise.

In light of the Central Valley Water Board's ILRP Framework, NRTF Dixon agricultural lessees may need to update their management and monitoring of waste discharges to remain in compliance, if they have not done so already. The Framework expands regulation to any waste discharge into groundwater as well as surface water, broadens the definition of waste to include non-runoff discharges (such as aerial drift or overspray of pesticides, among others), and proposes additional monitoring and management requirements for growers in the Central Valley. Application of this Framework to the region may also affect the quality of irrigation water that NRTF Dixon receives, since it is primarily runoff from agricultural fields to the north of the installation. General water quality monitoring should continue, with participation of agricultural lessees to assess groundwater quality and to develop necessary actions to safeguard it.

*The U.S. Geological Survey is the principal federal agency with which NRTF Dixon cooperates on the management of watersheds and water resources on the installation.*



As part of a watershed management approach, the installation should seek to preserve soil and water productivity and functions; manage erosion and water quality using BMPs;<sup>14</sup> and assess the impacts of any altered water flows, degraded wetland vegetation, nonpoint source pollution and water supply. There is also a need for the installation to incorporate floodzone management into facility-wide planning. Clay-base soils at NRTF Dixon can absorb a large quantity of water, but can also become waterlogged quickly, thus releasing that water. The facility is currently protected from major floods by the levee system along the Sacramento River and in the San Joaquin Delta. To avoid relying on flood control responsibility and actions that are outside of the Navy's control, it would be prudent to plan for floods in NRTF Dixon's future. Flood management at NRTF Dixon can be integrated into wetland enhancement and other approaches that focus on habitat management as a strategy to absorb flood impacts.

## Management Strategy

**Objective:** *Protect and enhance water sources and associated adjacent habitats, supporting natural resource management goals, and facilitating the military mission.*

- I. Provide protection to high-value habitats and water resources, particularly those used by sensitive or indicator species.
- II. Coordinate with the Yolo Reclamation District and the Dixon Soil Conservation District for management of the facility's perimeter drainage ditches, particularly if they are deemed jurisdictional. *Efficient and sustainable water use is required by Executive Order 13514 on Federal Leadership in Environmental, Energy and Economic Performance (05 October 2009).*
- III. Maintain sufficient and efficient water flow in irrigation ditches by keeping them free of obstructions.
- IV. Use water efficiently, and improve the sustainable use of water in the agriculture program and the interface between the built and natural environment, and as part of an Environmental Management System.
  - A. Monitor groundwater pumping with meters to determine use and if management may be needed.
- V. Ensure availability of adequate water to meet natural resources management objectives, including habitat enhancement and the recovery and/or re-establishment of native habitats and management focus species.
  - A. Maintain or promote the physical and biological conditions necessary for optimizing water resource use in achieving surface characteristics and the desired natural plant community, and other necessary conditions for supporting management focus and special status species and biodiversity.

**Objective:** *Maintain the quality of waters in compliance with state and/or federal water quality standards, including for wildlife.*

- I. Monitor groundwater quality—including chemical, physical, and biological constituents—on the installation so that water quality standards identified in the Central Valley Water Board Basin Plan for the Sacramento River and San Joaquin River Basins are not exceeded. Monitor water quality using regionally consistent methods.
  - A. Comply with water quality permit requirements, including when required by project size or if a project may affect wetlands or watercourses.

<sup>14</sup> Generally, these BMPs (including those for agriculture, construction, and project planning) should be consistent with those approved by the State of California under the Nonpoint Source Pollution Control Plan. The Basin Plan for Sacramento and San Joaquin River Basins (Central Valley Water Board 2011a) provides some BMP recommendations and ideas, including for groundwater resources.

- B. Continue to monitor groundwater quality in areas that have been impacted by hazardous materials contamination and which have been addressed or are currently being addressed by the IRP.
  - C. If any contaminants are detected that may adversely impact wildlife or human health, develop a long-term monitoring and management program to address them through the IRP, as necessary.
  - D. Ensure the agricultural lessee complies with new requirements included in the Recommended ILRP Framework, developed by the Central Valley Water Board.
- II. Ensure quality of groundwater that may be contributing to wetlands, vernal pools, and other aquatic habitats on the installation to avoid adverse impacts to vegetation and wildlife.
  - III. Minimize contributions from both point and nonpoint sources of pollution resulting from NRTF Dixon land management actions.

**Objective:** *Avoid direct or indirect effects on floodplains and restore and preserve the natural and beneficial values served by floodplains.*

- I. Provide adequate planning for flood management and reduce flood risk, since the entire facility is within the 100-year flood zone.
  - A. Limit construction on the facility to avoid increasing potential for impacts from floods.
  - B. During periods of potential flooding, prevent water logging of the soil from irrigation so that soils may better absorb the naturally occurring flows.
  - C. Wetlands naturally serve as water storage habitats and can absorb flooding when it does occur. Restoring them and creating other suitable habitats (e.g. by using berms) can enhance their flood protection potential.
- II. When construction is necessary, evaluate through the NEPA and site approval process the potential effects of actions in floodplains. This includes any development in a floodway and floodplain that may obstruct, divert, or retard flood flows, or which may affect flood elevations and flood protection. Avoidance and minimization measures and/or offsetting impacts should be incorporated.
- III. Preserve and restore the natural and beneficial values provided by floodplains such as ecosystem protection, public safety and flood-damage reduction, as well as the hydrologic integrity of aquatic habitats and the vegetation that thrives there.
  - A. Identify any special or unique flora and fauna associated with floodplains in order to identify the natural and beneficial functions provided by floodplains.
  - B. Incorporate consideration of floodplains into habitat enhancement and restoration activities, such as using flora associated with floodplains in enhancement activities.

*OPNAVINST 5090.1C CH-1 states the Navy will avoid direct or indirect development of floodplains, and restore and preserve the natural and beneficial values served by floodplains. Potential effects of actions in floodplains must be evaluated and early opportunity for public review of proposals in floodplains must be provided. This includes any development that may obstruct, divert, or retard flood flows, or which may affect flood elevations and flood protection. Executive Order 11988 (24 May 1977, 42 Federal Register 26951) was also developed to avoid adverse impacts associated with the occupancy and modification of floodplains.*

*The California Floodplain Management Report (CDWR 2002) provides a comprehensive list of recommendations for improving floodplain management (Bunn et al. 2007).*

### 3.3.5 Wildland Fire Management

Federal wildland fire policy mandates that all federal lands with burnable vegetation have a wildland fire management plan (WFMP) and resources to safely mitigate losses (U.S. Department of Agriculture and U.S. Department of the Interior 2009). A WFMP is a strategic document that guides the full range of fire management related decisions, including evaluating the potential for allowing fire to play its natural ecological role. It addresses all aspects of wildland fire management consistent with federal fire policy. The DoD adopted federal wildland fire management policy through DoDI 6055.6-M (DoD 2006a). DoDI 6055.6-M provides policy and criteria for the allocation, assignment, operations, and administration of the DoD Fire and Emergency Services and Emergency Medical Service programs.

#### Specific Issues for Wildland Fire Management

- A WFMP for NRTF Dixon does not currently exist.
- Fires at NRTF Dixon would be detrimental to the sensitive communications equipment and antennas, thus threatening operational capability of the installation and the military mission.
- It is unknown to what degree the current mowing regime (to prevent fire spread by clearing vegetation around antennas and other sensitive infrastructure) may be contributing to spread of invasive plant species on the installation.

#### Current Management

A large percentage of land at NRTF Dixon is in irrigated agricultural production or is maintained by mowing. Mowing is primarily to create fire breaks around the antennas and along the paved road. When there is no agricultural lessee to maintain the outlease area under production, the Operations and Maintenance (O&M) contractor coordinates with a contractor or a local farmer to cut and till strategic areas to function as fire breaks to maintain additional safety boundaries. These management practices tend to minimize risk of fire spreading.

Prescribed burning, as a method to control invasive species, is not feasible due to the sensitive infrastructure and equipment on the installation and the increased labor required to prepare for, and clean-up after, a burn. Unlike other military installations that have intensive ground training components, few activities on NRTF Dixon generate fire hazards.

#### Assessment of Current Management

While wildfires are not a major concern at NRTF Dixon, a WFMP is important to develop for the installation, primarily to map the location of sensitive resources and facilities as well as access points and routes in the case of a fire. Overall, the primary concern is for NRTF Dixon staff and public safety. Second, minimizing damage to facilities and sensitive communications equipment help avoid costly losses.

Ongoing fire management activities, such as mowing vegetation around the antennas and along roads, could be standardized in a WFMP, along with the mapping described above. There may also be opportunities to time mowing in a way so that it does not favor spread of invasive species, while keeping with the current vegetation height restriction for the fire break areas (6 inches).

#### Management Strategy

**Objective:** *Protect the human, infrastructure, natural, and cultural resources of NRTF Dixon from the impacts of wildfire and fire management interventions. Maintain a low risk of wildfire at NRTF Dixon.*

- I. Develop a WFMP for NRTF Dixon in coordination with the nearest federal or local fire department, in compliance with DoDI 6055.6-M.
  - A. Use development of the WFMP to standardize current fire prevention practices ongoing at NRTF Dixon.
  - B. Analyze areas where the use of fire retardant would, or should, be avoided.
- II. Coordinate with outside agencies and landowners to control fires with the potential to impact NRTF Dixon and continue to support the local firefighting ability to respond to fires.
  - A. As needed, provide, maintain, or upgrade fire management cooperative agreements, memoranda of understanding, and reciprocal agreements to provide maximum protection to resources and infrastructure values.
  - B. Emphasize staging of fire suppression and post-suppression rehabilitation resources so that wildfires, if they do occur, may be responded to in a non-crisis atmosphere with proper planning.
  - C. Provide fire suppression support commensurate with resource and adjacent property at risk.
- III. Prevent ignitions that cause wildfires, primarily through education to prevent human-caused fires.
- IV. As necessary, develop and implement post-fire rehabilitation guidelines appropriate to NRTF Dixon and its plant communities.

## 3.4 Vegetation Communities and Habitats

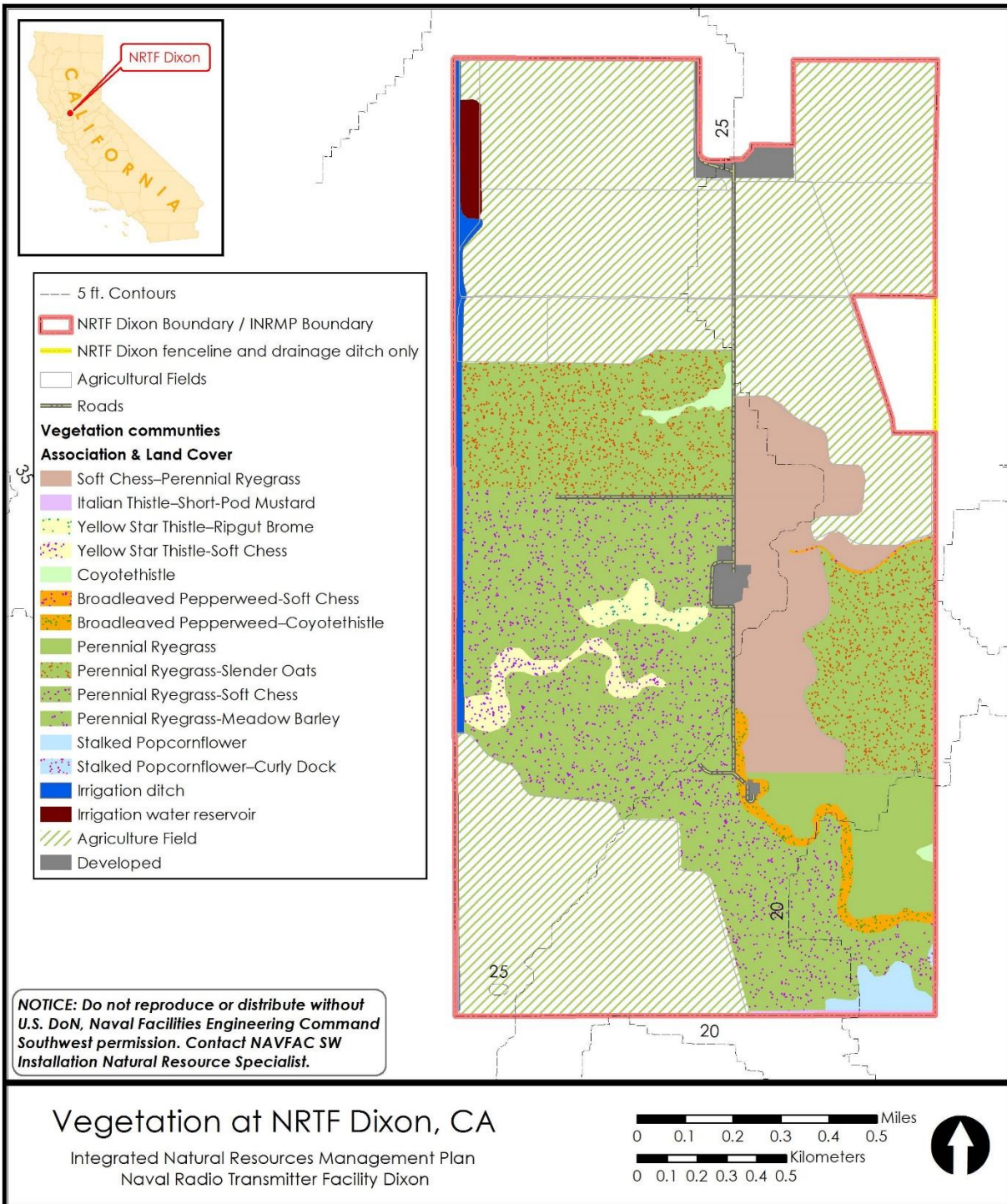
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NRTF Dixon is in the California Dry Steppe Province ecoregion as described by USFS (1995). The property is part of a low-lying, flat plain that is geologically related to both the Suisun Marsh and the Sacramento River flood zones. It likely was previously dominated by perennial bunch grasses, interspersed with vernal pools and by marsh and riparian corridors at one time. Over the last 200 years, the Central Valley has been significantly altered by farming flood control, water development, and drainage. Mediterranean annual grasses have largely displaced native grasses. Much of the land has been converted to agriculture.

The property at NRTF Dixon is a combination of agricultural fields, maintained grasslands, and natural plant communities. Vegetation communities and land cover types that provide wildlife habitat and surveyed vegetation communities are discussed here.

### 3.4.1 Vegetation Communities

Vegetation mapping at NRTF Dixon was updated in 2012 by Tierra Data Inc. (TDI) (Map 3-7). Vegetation class types were defined using the standard system developed in *A Manual of California Vegetation* (Sawyer et al. 2009) after performing Vegetation Rapid Assessment (California Native Plant Society [CNPS]) protocol surveys within each different plant community. The vegetation mapping complies with California standards required for vegetation classification. Some of the alliance-association communities identified are not yet explicitly described in the 2nd Edition of *A Manual of California Vegetation* (Sawyer et al. 2009). However, in all cases similar vegetation types have been defined and were used as references for the habitat descriptions of the plant communities at NRTF Dixon (TDI 2012; Appendix I: Applicable Reports).



Map 3-7. Vegetation communities at Naval Radio Transmitter Facility Dixon, California.<sup>15</sup>

<sup>15</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

The largest acreage vegetation types on the property are associations within the Perennial Ryegrass (*Lolium perenne*) Semi-Natural Stand covering approximately 40 percent of the installation (Table 3-2). In these areas, perennial ryegrass is either the dominant species present or nearly co-dominant with other grass species, creating various plant associations. In most cases, the grass species in the communities were quite dense. The grass is mowed near developed areas of the property, along roads and around antenna structures.

Although most of the property is influenced by agricultural activities or general maintenance practices, in addition to exotic species presence, several distinct species assemblages encompassed here are quite unique (Table 3-2). A few vernal pools occur on the property, and are nearly devoid of exotics. These ephemeral wetlands create valuable habitat for various animal species, while inundated (Section 3.7: Threatened and Endangered Species and Critical Habitat). Beyond that, the abundance of specialized plant life, displayed annually in these areas as the pools dry, is also exceptional.

In addition, 122 plant taxa have been identified at NRTF Dixon. Seventy are native, 47 are non-native, and five are undetermined.<sup>16</sup> Although the majority of plant species are native, common non-natives make up the majority of ground cover, as is typical throughout the Central Valley. Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon lists all plants that have been documented on NRTF Dixon (Holton Associates 1987; Navy 1987, 2000c, 2002; TDI 2012).

*Table 3-2. Vegetation communities of Naval Radio Transmitter Facility Dixon, California.*

<b>Vegetation Communities</b>	<b>Acres</b>	<b>% of Total</b>
Soft Chess ( <i>Bromus hordeaceus</i> ) Semi-Natural Stands	95.6	7.7
Soft Chess-Perennial Ryegrass ( <i>Lolium perenne</i> ) Association	95.6	7.7
Yellow Star Thistle ( <i>Centaurea solstitialis</i> ) Semi-Natural Stands	22.0	1.8
Yellow Star Thistle-Rippgut Brome ( <i>Bromus diandrus</i> ) Association	8.8	<1
Yellow Star Thistle-Soft Chess Association	13.2	1.1
Italian Thistle ( <i>Carduus pycnocephalus</i> ) Semi-Natural Stands	2.7	<1
Italian Thistle-Shortpod Mustard ( <i>Hirschfeldia incana</i> ) Association	2.7	<1
Stalked Popcornflower ( <i>Plagiobothrys stipitatus</i> ) Alliance	8.9	<1
Stalked Popcornflower Association	8.5	<1
Stalked Popcornflower-Curly dock ( <i>Rumex crispus</i> ) Association	0.4	<1
Coyotethistle ( <i>Eryngium vaseyi</i> ) Alliance	4.0	<1
Broadleaved Pepperweed ( <i>Lepidium latifolium</i> ) Semi-Natural Stands	14.1	1.1
Broadleaved Pepperweed-Soft Chess Association	1.2	<1
Broadleaved Pepperweed-Coyotethistle Association	12.9	1.0
Perennial Ryegrass ( <i>Lolium perenne</i> ) Semi-Natural Stands	492.8	39.7
Perennial Ryegrass Association	44.8	3.6
Perennial Ryegrass-Slender Oat ( <i>Avena barbata</i> ) Association	168.1	13.5
Perennial Ryegrass-Soft Chess Association	78.2	6.3
Perennial Ryegrass-Meadow Barley ( <i>Hordeum brachyantherum</i> ) Association	201.7	16.3
Other Land Cover Types	600.6	48.4
Agriculture Field <sup>1</sup>	558	45.0
Irrigation water reservoir	6.8	<1
Irrigation ditch	19.1	1.5
Developed	16.7	1.3

Source: TDI 2012, with modifications to account for the recent transfer of the Housing Area, along with the sewage ponds and an adjacent field.

1. Acreage for agricultural fields here differs from that provided in the agricultural outlease agreement since a portion of the agricultural outlease area is maintained by the lessee for the antennas. This maintained area was surveyed during recent vegetation mapping efforts and was found to contain the Perennial Ryegrass-Slender Oat Association and the Soft Chess-Perennial Ryegrass Association.

<sup>16</sup> Individual could only be identified to the level of genus, of which some species are native and others non-native to California.

## Annual Brome Grasslands

### Vegetation Communities

Soft Chess (*Bromus hordeaceus*)-Perennial Ryegrass (*Lolium perenne*) Association

Nearly 100 acres of the property at NRTF Dixon fall into the vegetation community alliance soft chess (*Bromus hordeaceus*) (40% cover) with perennial ryegrass (35% cover) as the association (Photo 3-1). Soft chess is a non-native annual grass, which typically occurs in open fields and often in disturbed areas. It is considered a desirable and nutritious feed for cattle by ranchers. The California Invasive Plant Council (Cal-IPC) (2006) identifies it as 'Limited' in terms of invasiveness.<sup>17</sup> On the property, this vegetation community is primarily composed of non-native species and is also maintained for fire control given most of this area contains antenna structures. Mowing and string trimming affect the height structure of this plant community, and thus its value for wildlife. The maintenance activities also alter the fire regime, which influences plant composition within this association over time, depending on timing and height of the management regime.



Photo 3-1. Soft Chess-Perennial Ryegrass Association at Naval Radio Transmitter Facility Dixon, California.

## Yellow Star Thistle and Italian Thistle Fields

### Vegetation Communities

Yellow Star Thistle (*Centaurea solstitialis*)-Ripgut Brome (*Bromus diandrus*) Association

Yellow Star Thistle (*Centaurea solstitialis*)-Soft Chess (*Bromus hordeaceus*) Association

Italian Thistle (*Carduus pycnocephalus*)-Shortpod Mustard (*Hirschfeldia incana*) Association

In both yellow star thistle (*Centaurea solstitialis*) associations, the co-dominance is between yellow star thistle and a non-native annual grass species (yellow star thistle-ripgut brome [*Bromus diandrus*] and yellow star thistle-soft chess). Together they comprise approximately 22 acres of NRTF Dixon (Photo 3-2) (TDI 2012). Yellow star thistle is an invasive non-native annual that occurs within disturbed grasslands and woodlands as well as roadsides and pastures. It is classified at the 'High' level of invasive ability<sup>18</sup> (Cal-IPC 2006) and can create dense monoculture stands and develop seed banks that are viable for approximately three years. It is considered the most serious range weed in the western United States. In the absence of management, it is possible that yellow star thistle will out-compete the non-native grasses.

<sup>17</sup> This level of classification is given to species that are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic (Cal-IPC 2006).

<sup>18</sup> This level of classification is given to species that have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically (Cal-IPC 2006).

The yellow star thistle association with ripgut brome, located southwest of the transmitter building, suggests that the 8.8 acres it covers may receive more water than the other yellow star thistle association, possibly from runoff. The association with soft chess is present in a somewhat meandering pattern, which may be the result of previous disturbance during grading activities.



*Photo 3-2. Yellow Star Thistle-Soft Chess Association at Naval Radio Transmitter Facility Dixon, California.*

The Italian thistle (*Carduus pycnocephalus*) field consists of the Italian thistle-shortpod mustard (*Hirschfeldia incana*) vegetation community. It is limited on the property, being present on less than three acres on an elevated bank on the southern boundary of the property (Photo 3-3) (TDI 2012). The bank serves as a barrier between adjacent agricultural lands, acting as an impoundment and creating an area to the north that is ephemerally inundated; it is almost entirely covered with non-native plant species.



*Photo 3-3. Italian Thistle-Short-Pod Mustard Association at Naval Radio Transmitter Facility Dixon, California.*

Both Italian thistle and shortpod mustard are considered to have weedy tendencies. Italian thistle is an invasive, non-native, annual herbaceous species that occurs within roadsides, pastures, and disturbed areas. Shortpod mustard has a 'Moderate' status according to Cal-IPC (2006).<sup>19</sup> While this plant community is adjacent to what is likely considered the most pristine portion of the property, the characteristics of soils and the ephemeral inundation of this area seemingly exclude the locally abundant non-native species.

<sup>19</sup> The description of "Moderate" weeds states that these species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread (Cal-IPC 2006).



## Perennial Ryegrass Field

### Vegetation Communities

Perennial Ryegrass ( <i>Lolium perenne</i> ) Association
Perennial Ryegrass ( <i>Lolium perenne</i> )-Slender Oat ( <i>Avena barbata</i> ) Association
Perennial Ryegrass ( <i>Lolium perenne</i> )-Soft Chess ( <i>Bromus hordeaceus</i> ) Association
Perennial Ryegrass ( <i>Lolium perenne</i> )-Meadow Barley ( <i>Hordeum brachyantherum</i> ) Association

Perennial ryegrass is a non-native species that occurs within dry to moist disturbed sites and abandoned fields. It can be an annual or perennial based on environmental conditions (Baldwin et al. 2012). This vegetation type is widespread and the adaptable perennial ryegrass grows on several different soil substrates. The stands burn readily and resprout (Sawyer et al. 2009).

In addition to the perennial ryegrass association, it appears in various associations with meadow barley (*Hordeum brachyantherum*), slender oat (*Avena barbata*), and soft chess (from greatest to least extent). Together they comprise 493 acres of the NRTF Dixon property, approximately 40 percent of the total vegetation coverage, extending from the antenna field into the NRMA (Photo 3-4). In most cases these communities are quite dense and consist of numerous exotic annual species at varying levels of abundance. Likely the result of previous disturbance from historical agricultural activities. However, native species are frequently found in intermittent areas throughout these exotic dominated stands (TDI 2012).



Photo 3-4. Perennial Ryegrass Semi-Natural Stands at Naval Radio Transmitter Facility Dixon, California.

## Native Plant Fields: Stalked Popcornflower and Coyotethistle

### Vegetation Communities

Stalked Popcornflower ( <i>Plagiobothrys stipitatus</i> ) Association
Stalked Popcornflower ( <i>Plagiobothrys stipitatus</i> )-Curly Dock ( <i>Rumex crispus</i> ) Association
Coyotethistle ( <i>Eryngium vaseyi</i> ) Alliance

The popcornflower field consists of two plant communities, stalked popcornflower (*Plagiobothrys stipitatus*) and stalked popcornflower-curly dock (*Rumex crispus*), on approximately nine acres in the NRMA at NRTF Dixon. The former is within the large vernal pool area adjacent to a manmade bank on the southern boundary of the property. The latter is in an ephemerally inundated area in the NRMA, on the eastern boundary of the property. It is likely that it has been historically disturbed from nearby agricultural activities. These two plant communities are almost entirely composed of native plants (Photo 3-5) (TDI 2012), some not observed elsewhere on the property. They offer opportunities for plants of specialized life forms to occur at NRTF Dixon.



Photo 3-5. Stalked Popcornflower Association at Naval Radio Transmitter Facility Dixon, California.

The estimated four acres of coyotethistle (*Eryngium vaseyi*) alliance (Photo 3-6), as shown in Map 3-7, are in two separate areas. The southeastern patch in the NRMA likely receives runoff from adjacent off-property agricultural activities, whereas the other patch centrally located in the antenna field is probably supported by road runoff. This plant community contains several native plant species typical of local seasonal wetlands.



Photo 3-6. Coyotethistle Alliance at Naval Radio Transmitter Facility Dixon, California.

## Broadleaved Pepperweed

### Vegetation Communities

Broadleaved Pepperweed (*Lepidium latifolium*)-Soft Chess (*Bromus hordeaceus*) Association

Broadleaved Pepperweed (*Lepidium latifolium*)-Coyotethistle (*Eryngium vaseyi*) Association

Broadleaved pepperweed (*Lepidium latifolium*) is a perennial non-native found in several land cover types including fields, grasslands, saline meadows, and disturbed areas. It has a 'High' rating of invasiveness (Cal-IPC 2006). At NRTF Dixon, two broadleaved pepperweed patches cover approximately 14 acres and consist of two associations. The broadleaved pepperweed-soft chess community is located along a narrow, meandering cement drainage on the eastern side of the property; broadleaved pepperweed

grows densely here and the community is dominated primarily by exotic species. Surrounding habitat and maintenance activities likely restrict the extent of this community. The broadleaved pepperweed-coyotethistle community is found along a wide drainage meandering through the NRMA that contains a variety of natives. This drainage is a manmade depression that is seasonally inundated, giving rise to ephemeral pooling areas. Broadleaved pepperweed is less dense here. In both places, the noxious species appears to be limited in its distribution to areas that contain more abundant water (Photo 3-7) (TDI 2012).



Photo 3-7. Broadleaved Pepperweed Semi-Natural Stands at Naval Radio Transmitter Facility Dixon, California.

## 3.4.2 Land Cover/Use and Habitat

### Antenna Field

#### Vegetation Communities Present

Soft Chess ( <i>Bromus hordeaceus</i> )-Perennial Ryegrass ( <i>Lolium perenne</i> ) Association
Yellow Star Thistle ( <i>Centaurea solstitialis</i> )-Ripgut Brome ( <i>Bromus diandrus</i> ) Association
Yellow Star Thistle ( <i>Centaurea solstitialis</i> )-Soft Chess ( <i>Bromus hordeaceus</i> ) Association
Coyotethistle ( <i>Eryngium vaseyi</i> ) Alliance
Broadleaved Pepperweed ( <i>Lepidium latifolium</i> )-Soft Chess ( <i>Bromus hordeaceus</i> ) Association
Broadleaved Pepperweed ( <i>Lepidium latifolium</i> )-Coyotethistle ( <i>Eryngium vaseyi</i> ) Association
Perennial Ryegrass ( <i>Lolium perenne</i> )-Slender Oat ( <i>Avena barbata</i> ) Association
Perennial Ryegrass ( <i>Lolium perenne</i> )-Soft Chess ( <i>Bromus hordeaceus</i> ) Association
Perennial Ryegrass ( <i>Lolium perenne</i> )-Meadow Barley ( <i>Hordeum brachyantherum</i> ) Association

The central area of NRTF Dixon that is maintained for the antennas comprises approximately 500 acres.<sup>20</sup> Parts of this area have supported agricultural fields and grazing in the past, but both have been discontinued. The perennial ryegrass and soft chess grasslands here are now mowed regularly only immediately around the antennas to reduce the potential for fire and also for weed control. Yellow star thistle communities appear in two patches in the western portion of the antenna field. Broadleaved pepperweed appears in a meandering drainage on the eastern side of the antenna field and appears limited to that location, which contains an abundance of water. An ephemeral wetland, adjacent to the paved road on the northern portion of the antenna field, contains native coyotethistle, and does not currently appear as managed.

<sup>20</sup> This acreage includes the 417-acre area officially designated as the antenna field and portions of the agricultural outlease area maintained by the lessee for the antennas (Section 1.3: Location and Real Estate Summary).

In a general mammal survey (TDI 2012), it was noted the relatively shorter vegetation within, compared to outside the antenna arrays, attracts ground squirrels (*Spermophilus beecheyi*) and burrowing owls, both species that tend to select more exposed environments or nesting sites (TDI 2012). The antenna arrays and their supporting guywires also provide burrowing owls convenient and abundant perch sites, so males can often be seen perched on this equipment while guarding nest burrows (Smallwood and Morrison 2008). In addition to the burrowing owl, bird species inhabiting the antenna fields and vernal pool lands include American goldfinch (*Spinus tristis*), Brewer's blackbird (*Euphagus cyanocephalus*), killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), whitecrowned sparrow (*Zonotrichia leucophrys*), red-winged blackbird (*Agelaius phoeniceus*), European starling (*Sturnus vulgaris*), and western meadowlark (*Sturnella neglecta*) (TDI 2012).

Mammals trapped in the annual grasslands at NRTF Dixon included California vole (*Microtus californicus*), deer mouse (*Peromyscus maniculatus*), house mouse (*Mus musculus*), and western harvest mouse (*Reithrodontomys megalotis*). Black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus auduboni*), and coyote (*Canis latrans*) were also observed.

## Natural Resources Management Area

### Vegetation Communities Present

Italian Thistle (*Carduus pycnocephalus*)-Short-Pod Mustard (*Hirschfeldia incana*) Association

Coyotethistle (*Eryngium vaseyi*) Alliance

Broadleaved Pepperweed (*Lepidium latifolium*)-Coyotethistle (*Eryngium vaseyi*) Association

Perennial Ryegrass (*Lolium perenne*) Association

Perennial Ryegrass (*Lolium perenne*)-Soft Chess (*Bromus hordeaceus*) Association

Perennial Ryegrass (*Lolium perenne*)-Meadow Barley (*Hordeum brachyantherum*) Association

Stalked Popcornflower (*Plagiobothrys stipitatus*) Association

Stalked Popcornflower (*Plagiobothrys stipitatus*)-Curly Dock (*Rumex crispus*) Association

The flora composition is to some extent natural for a few of the vegetation communities on the property. The majority of these vegetation communities are located within the 154-acre NRMA; which is presumably why they remain in such good condition. The NRMA includes the large vernal pool habitat on the southeastern edge of the property. It is likely that this site experienced some loss of historic species, due to the intense agriculture now abundant throughout most of the Sacramento Valley. The seasonally inundated areas here (as well as the coyotethistle community in the antenna field) contribute greatly to the natural diversity of the property, are unlike any other vegetation on the site, and are likely considered of importance on a local and possibly regional scale in terms of natural resources habitat. They also currently restrict the Italian thistle community located on a bank in the southeastern corner of the property (TDI 2012).

## Landscaped Areas

Species that could be expected to use the small number of landscaped areas of NRTF Dixon (primarily adjacent to the centrally located developed area) include American robin (*Turdus migratorius*), rock pigeon (*Columbia livia*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). In addition to their use of wetland habitats, California slender salamander (*Batrachoseps attenuatus*) and southern alligator lizard (*Elgaria multicarinata*) were observed in the south-central maintained area taking cover under debris.

## Agriculture Fields

Agricultural outlease areas at NRTF Dixon comprise approximately 585 acres (almost 50 percent) of the installation (Photo 3-8). Approximately 368 acres of this is currently farmed (Section 2.4.1: Real Estate Outgrants and Easements). In the past, these lands have produced corn, sugar beets, alfalfa, safflower, winter wheat, tomatoes, and barley. Recently, crops planted at NRTF Dixon have principally been alfalfa and hay.

The assemblage of species found in agricultural areas is quite similar to those in the grasslands. Additional birds observed in the agricultural fields include barn swallow (*Hirundo rustica*), black phoebe (*Sayornis nigricans*), ring-billed gull (*Larus delawarensis*), and a variety of sparrows including golden-crowned sparrow (*Zonotrichia atricapilla*), Lincoln's sparrow (*Melospiza lincolnii*), savannah sparrow (*Passerculus sandwichensis*), song sparrow (*Melospiza melodia*), and white-crowned sparrow. Marshbirds such as cattle egret (*Bubulcus ibis*), great blue heron (*Ardea herodias*), and great egret (*Ardea alba*) observed in the agriculture fields may have been foraging in the alfalfa or near small ponded areas in the fields during irrigation. Several studies have found that alfalfa attracts more birds than do most field crops (Smallwood and Geng 1993; Smallwood 1995; Smallwood et al. 1996).



Photo 3-8. Agricultural field at Naval Radio Transmitter Facility Dixon, California.

More than half of the bird species observed in the agriculture fields were located in the southwestern portion of the facility near the walnut trees bordering an irrigation ditch just inside the installation's perimeter fence. This small patch of windbreak can provide some cover and roosting for a variety of wildlife species, including raptors that use the trees for nesting and hummingbirds, warblers, and finches that are attracted to flowering trees' nectar. In general, bird populations benefit from the greater structural complexity provided by windbreaks on agricultural landscapes (Craighead and Craighead 1959; O'Connor and Shrubbs 1986). Similarly, canals running between the agricultural fields can provide habitat for species preferring riparian and shrub cover (TDI 2012).

Almost all raptor species documented during the 2009 to 2010 surveys at NRTF Dixon (TDI 2012) were observed foraging in, flying over, or roosting nearby the agricultural areas. This is most likely the case as their prey species find suitable habitat in alfalfa fields. Pocket gophers, for example, are an important food item to burrowing owls, Swainson's hawks, and multiple other special-status species. There are also eucalyptus trees adjacent to the Housing Area, where a pair of Swainson's hawk was observed nesting during the 2009-2010 surveys (TDI 2012).

### Specific Issues for Vegetation Communities and Habitats

- Populations of invasive species, such as yellow star thistle and broadleaved pepperweed, have become dominant in some portions of the grassland area at NRTF Dixon.
- It is unknown to what extent other NRTF Dixon management activities, such as mowing maintenance around the antennas and the IRP, may impact the condition of native habitats on the installation or how their activities could overlap with those for the natural resources management program.

- Management activities in the grasslands at NRTF Dixon could be better coordinated for a more holistic approach, including identification of goals and priorities for that area.
- Habitat enhancement actions for the benefit of native ecosystems and species are conducted infrequently.

## Current Management

The native grassland and wetland plant communities (especially the vernal pools in the NRMA) at NRTF Dixon are important for providing native wildlife habitat in a predominantly agricultural landscape. However, there is no current habitat management plan for vegetation communities and habitats on the installation. In the antenna field there has been some focus on management of the burrowing owl population. The majority of actions influencing native habitats are conducted by maintenance contractors and the IRP. All of these actions are to ensure operational capability of the installation and safety for human and wildlife health.

## Assessment of Current Management

There is opportunity to develop and implement a vegetation and habitat management program for NRTF Dixon that incorporates a focus on native habitats and species assemblages. A Native Grassland Management and Restoration Plan that establishes priorities and activities to improve the native condition of the grassland areas could be a part of this program. It is important to conduct habitat enhancement activities (where appropriate) to encourage native habitats that provide a combination of beneficial functions, including: support for wildlife (e.g. by encouraging native perennial grasses and supporting pollinators), control of invasive plants, and continued support for the burrowing owl population.

Defining other relevant habitat enhancement goals (for both uplands and wetlands) is important to help direct actions and follow up on monitoring and assessment. A phased approach for implementing identified priorities would allow flexibility and contribute to adaptive management. Combining restoration projects as feasible and designing monitoring activities and a database to record enhancement actions and results provide opportunities to implement a strategic multi-species, ecosystem approach while also increasing general cost effectiveness. Continued baseline inventories and vegetation mapping can provide additional insight into habitat health or enhancement. In particular, indicator species that can provide insight into habitat health, structure and function should be identified for monitoring. Such a program should incorporate a long-term view of human activities, military uses, and natural resources as part of the same environment.

Partnerships with other agencies and organizations can support the above goals, including development of a restoration plant list, based on that from Jepson Prairie, a preserve located five miles south of NRTF Dixon, which contains similar habitats.

## Management Strategy

**Objective:** *Conserve and enhance the ecological integrity and native diversity of each vegetation community and habitat to promote beneficial functions and to support diverse wildlife.*

- I. Promote and enhance native ecosystems when such action is practicable and does not conflict with the military mission. Emphasize vegetation communities that support indicator and management focus species.
  - A. Develop vegetation management and monitoring actions for NRTF Dixon focusing on priority habitats such as grasslands, wetland areas, and vernal pool areas. Incorporate actions that provide for beneficial uses for wildlife, such as pollinators. Prioritize actions based on recognized conservation value or known risks. Consider using a phased approach for combinations of restoration activities.

- B. Develop a restoration plant list that differentiates recommended species per area or beneficial use.
- C. Use vegetation maps to plan recovery strategies for disturbed areas. Combine restoration activities, where possible.
- D. In both the grassland area and wetland areas habitat enhancement and restoration activities should take into consideration the extent and location of necessary ground disturbance required to:
  - 1. Avoid disturbing ground mats under the antennas;
  - 2. Coordinate with the appropriate NAVFAC Southwest cultural resources staff before implementing such measures. There is the possibility that cultural resources may be present on the installation (outside of the agricultural outlease area) that have not been identified or surveyed.
  - 3. Avoid possible impacts to potential jurisdictional waters in light of updated delineation results and to the installation's aquatic habitats and water resources that may be connected to downstream federally threatened delta smelt habitat.
- II. Continue to refine and update the NRTF Dixon vegetation map as required using vegetation classification and mapping protocols that meet national Federal Geographic Data Committee and DoD standards. Develop habitat value maps for species of management interest for NRTF Dixon.
- III. Research development of a Native Grassland Management and Restoration Plan that incorporates vegetation community management, restoration, invasive species control, burrowing owl management, and monitoring.
- IV. If feasible, investigate the possibility for and logistics that would be required to develop a limited grazing program in the grassland areas at NRTF Dixon as a method to control invasive species and to aid in restoration.
- V. Promote collaboration and partnerships with outside researchers and organizations to benefit the vegetation community and habitat management program at NRTF Dixon, when practicable.

**Objective:** *Reduce threats to native vegetation and sensitive species while maintaining no net loss to the military mission.*

- I. Control invasive species, especially in areas within and adjacent to sensitive species' habitat and in areas where they pose threats to equipment and facilities.
- II. Ensure that construction and maintenance activities follow set guidelines that outline the procedures to be followed in sensitive resource areas.
- III. Install fencing where needed around sensitive resources to protect them from impact. Ensure that fencing used does not prevent wildlife from accessing essential habitats and resources or hinder necessary management activities such as invasive species control.

### 3.4.3 Wetlands and Jurisdictional Waters

Wetlands are of critical importance to the protection and maintenance of living resources, since they provide essential breeding, spawning, nesting, and wintering grounds for numerous wildlife species. Wetlands also enhance the quality of surface waters by impeding erosive forces of moving and trapping waterborne sediment and associated pollutants, providing a gradual release of stored flood waters and groundwater, and providing a natural means of flood control and storm damage protection through the absorption and storage of water during high-runoff events.

Wetlands at NRTF Dixon have not been delineated according to U.S. Army Corps of Engineers (USACE) standards but they have been mapped and classified according to USFWS criteria (Cowardin et al. 1979) by Geonex, Inc. and converted by Eagan, McCallister, and Associates, Inc., in conjunction with the USFWS National Wetland Inventory Program in 1994 (Navy 2000a, cited in Navy 2002). Classified wetlands on NRTF Dixon fall into two systems, Palustrine and Riverine. Two classes of Palustrine were mapped: Emergent and Unconsolidated Bottom. One subsystem and class of Riverine were mapped, Intermittent and Streambed, respectively (the Palustrine system does contain subsystems). These classes were further described with water regime and special modifiers that address flooding duration and types of man-made or altered wetlands (Table 3-3) (Navy 2002). Based on these criteria, seven classifications of Palustrine and one classification of Riverine wetlands exist on NRTF Dixon. Mapped wetlands on the facility total approximately 26 acres of which some subset likely fall under the jurisdiction of the USACE (Map 3-8). Use of the terms “likely jurisdictional” and “likely non-jurisdictional” throughout this INRMP are preliminary in nature and were not determined by USACE.

*The USACE has regulatory responsibility for implementing Section 404 of the Federal Water Pollution Control Act, also known as the CWA (33 USC § 1344), including the wetland permitting process. NRTF Dixon is within the jurisdiction of the Sacramento District, which would be involved in determining the presence of protected (jurisdictional) wetlands and in handling any permits related to dredge or fill activities within these wetlands.*

*Table 3-3. Wetlands documented at Naval Radio Transmitter Facility Dixon, California and classified based on Cowardin et al. (1979).*

USFWS Classification <sup>1</sup>	Wetland # <sup>2</sup>	Description and Locations	Land Use Area(s)	Likely Jurisdictional? <sup>3</sup>	Acres
PEM1A	2, 4, 12, 15	Wetland adjacent to irrigation reservoir (NW corner); Parts of vernal pools (SE corner);	Agricultural and NRMA, respectively	Yes	1.92
PEM1AH	10	Lower portion of man-made ponds	NRMA	No	1.45
PEM1C	14	Seasonal marsh on eastern property boundary	NRMA	Yes	0.28
PEM1CH	6, 7	NW portion of man-made ponds	NRMA	Yes	0.09
PEM1CH	8, 9, 11	Lower portion of man-made ponds	NRMA	No	6.40
PEM1CX	n/a	Ditch flowing East/West near Building 10	Antenna Field	Yes	0.50
PEM1CX	n/a	Ditch flowing North/South near Building 10	Antenna Field	No	0.50
PEM1AX	5	Excavated wetland, east of Building 10	Antenna Field	No	0.14
PEM2C	13, 16	Parts of vernal pools	NRMA	Yes	0.94
PUBKHX	3	Irrigation reservoir	Agricultural	No	5.90
R4SBFX	1	Perimeter irrigation ditches	Agricultural	No	8.69

Source: Navy 2002

NRMA - Natural Resources Management Area

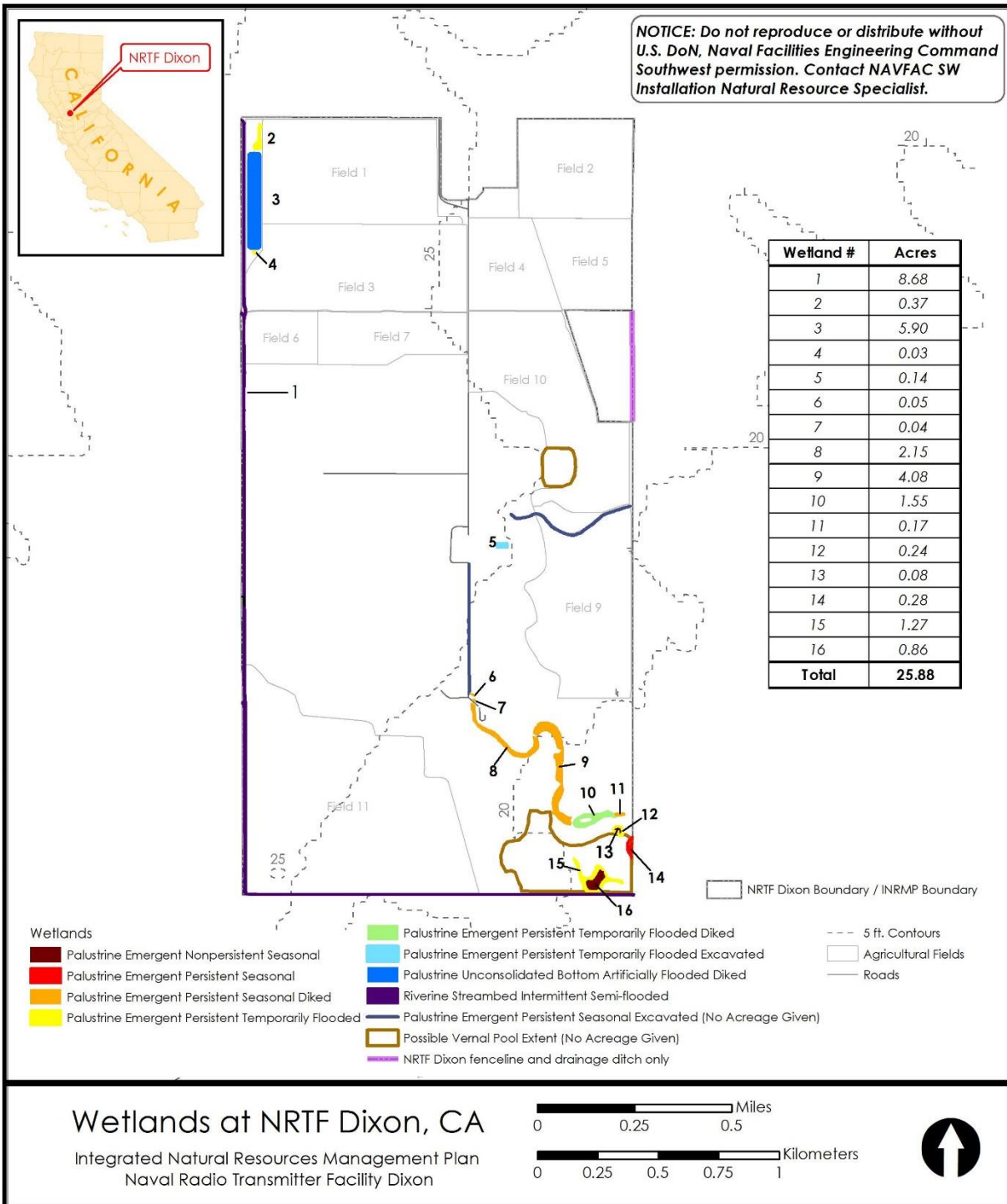
<sup>1</sup> Classified according to Cowardin et al. (1979)

- PEM1A Palustrine Emergent Persistent Temporarily Flooded
- PEM1AH Palustrine Emergent Persistent Temporarily Flooded Diked
- PEM1CH Palustrine Emergent Persistent Seasonal Diked
- PEM2C Palustrine Emergent Nonpersistent Seasonal
- PEM1C Palustrine Emergent Persistent Seasonal
- PEM1CX Palustrine Emergent Persistent Seasonal Excavated
- PEM1AX Palustrine Emergent Persistent Temporarily Flooded Excavated
- PUBKHX Palustrine Unconsolidated Bottom Artificially Flooded Diked
- R4SBFX Riverine Intermittent Streambed Semi-flooded

<sup>2</sup> Two sewage treatment oxidation ponds along the eastern perimeter of the installation were transferred to the Dixon Housing Authority in February 2013 along with the Housing Area. These ponds were part of the original wetlands classification report cited in the NRTF Dixon 2002 INRMP; at that time, they were classified as PUBKHX. They do not appear in this table or Map 3-8 because they are no longer considered to be a part of Navy property.

<sup>3</sup> Jurisdictional determination is preliminary in nature and was not determined by U.S. Army Corps of Engineers. Moreover, jurisdictional suggestions may differ from those shown here due to recent court cases that define acceptable justifications for jurisdictional status of isolated bodies of water, such as vernal pools.





Map 3-8. Mapped wetlands at Naval Radio Transmitter Facility Dixon, California.<sup>21</sup>

<sup>21</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

In addition to the large vernal pool area, other seasonal wetlands, freshwater marsh, and man-made water features exist at NRTF Dixon (Map 3-8):

- In the NRMA, the meandering wetland and series of ponds that crosses from the northwest to the southeast (wetlands #6-11) is lined with the non-native broadleaved pepperweed, along with an association of native coyotethistle. These series of ponds can be flooded via an irrigation ditch and were classified as Palustrine Emergent Persistent (Navy 2000a). The Navy no longer consistently maintains water flow to these ponds and wetland characteristics have diminished since described by Holton Associates in 1987 and mapped by Geonex in 1994 (wetlands #8-11) (Navy 2002). Most of these wetlands are not likely jurisdictional as the hydrology is not sufficient to maintain wetland vegetation or develop wetland soils.
- Within the vernal pool extent area (discussed in more detail below), native stalked popcornflower dominates (wetlands #15 and #16) along with non-native curly dock (wetland #14). The former was classified as Palustrine Emergent Persistent Temporarily Flooded and the latter as Palustrine Emergent Persistent Seasonal, which is bisected by the eastern property boundary of the NRMA. Approximately 0.28 acres of this seasonal marsh are within the property boundaries. These wetlands are identified as likely jurisdictional.
- An irrigation reservoir in the northwestern corner (wetland #3) of the property was classified as Palustrine Unconsolidated Artificially Flood Diked (Navy 2000a). This wetland is likely non-jurisdictional. There are some likely jurisdictional wetlands adjacent to the irrigation reservoir that were classified as Palustrine Emergent Persistent Temporarily Flooded (Navy 2000a) (wetlands #2 and #4).
- An excavated wetland (#5) classified as Palustrine Emergent Persistent Temporarily Flooded Excavated is located 300 feet east of the main transmitter building and is likely non-jurisdictional.
- Portions of the large irrigation ditch, bounding NRTF Dixon on the west and south in the southwestern portion of the property, were classified as Riverine Streambed Intermittent Semiflooded (wetland #1). These are likely non-jurisdictional.
- There are two ditches classified as Palustrine Emergent Persistent Seasonal Excavated located near Building 10. The ditch that runs west to east across a portion of the antenna field grassland is likely jurisdictional and is dominated by broadleaved pepperweed and soft chess. The ditch running north to south is likely non-jurisdictional. The remainder of the ditches on NRTF Dixon are not wetlands, and most likely would not fall under jurisdiction of USACE.

The wetlands at NRTF Dixon harbor amphibian species such as Pacific treefrogs (*Pseudacris regilla*), which were heard or observed in almost all wetland areas at NRTF Dixon, bullfrogs (*Lithobates catesbeianus*) (bullfrogs are a predator of fairy shrimp), California slender salamanders and western spadefoot toads (*Spea hammondi*). Many bird species were also observed near wetland areas in the NRMA, along canals, by the irrigation reservoir and the sewage ponds at NRTF Dixon. For the most part, these were marshbirds, shorebirds, seabirds, and waterfowl species, as well as some terrestrial and raptor species.

### 3.4.3.1 Vernal Pools

Vernal pools are ephemeral wetlands that form in areas of California with Mediterranean climates. The vernal pools at NRTF Dixon are part of the Solano-Colusa Vernal Pool Region, which covers the majority of Solano County ranging northward from the low lying plains adjacent to the Suisun Marsh and the Sacramento-San Joaquin Delta.

The pools in this region are relative large, up to several acres in size, and may occur singly or in small aggregations. Inundation periods and moisture periods are of longer duration on these claypan pools than on

similar hardpan pools (California Department of Fish and Game [CDFG] 1998). The region is best known for its excellent examples of Northern Claypan pools, such as at Jepson Prairie, between Highway 113 and Travis Airforce Base (CDFG 1998). This is the only known region to contain the federally threatened Delta green ground beetle (*Elaphrus viridis*) and Solano grass (*Tuctoria mucronata*) (also called Crampton's tuctoria or prickly spiralgrass), distinguishing it biologically from any other region (CDFG 1998). Many other rare endemic species depend on vernal pools in this region, including vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), conservancy fairy shrimp (*Branchinecta conservatio*), western spadefoot toad, and California tiger salamander, as well as a large number of migratory birds (Alexander 1976; Silveira 1998; Helm 1998; Barbour et al. 2007). Due to its alkaline soils and basin rim topography, the Solano-Colusa Vernal Pool Region shares many species with San Joaquin Valley Vernal Pool Region to the south (CDFG 1998). Witham et al. (1998) characterized the pools in the region of NRTF Dixon as basin rim claypan types with natrixeralf soil taxa (dry moisture regime with subsoil of sodium rich clays).<sup>22</sup> In Solano County in general, agricultural practices, water diversion and impounding for waterfowl enhancement, development, and road-building have impacted vernal pools so that there are few remaining viable vernal pool sites in the region (CDFG 1998).

The large vernal pool located in the southeast corner of the facility was estimated by Holton Associates (1987) to be approximately 3.4 acres in size (Photo 3-9), which appears to correspond with wetlands mapping (Navy 2000a). Based on aerial photograph interpretation, this vernal pool was mapped as a much larger area of approximately 29.8 acres in size (Navy 2002). This aerial photo mapping effort also indicated another possible vernal pool of approximately 4.9 acres in size approximately 1,200 feet northeast of the transmitter building in the antenna field (Navy 2002). Holton Associates (1987) identified two smaller vernal pools, which measured approximately 50 feet in diameter, adjacent to each other and west of the large pool in a cultivated area. Between the NRMA and the facility's main building, several low spots exist that contain "marginal" vernal pool characteristics, according to Holton Associates (1987). None of these pools have been mapped as wetlands or vernal pools in recent efforts (Navy 2002).



Photo 3-9. Vernal pool area within the Natural Resources Management Area at Naval Radio Transmitter Facility Dixon, California.

<sup>22</sup> "Natrixeralfs are soils with a subsoil accumulation of sodium rich clay and a xeric soil moisture regime. The pH of the sodium-rich clay subsoil is commonly greater than 9, and the clay and organic fractions are dispersed. As a result of this de-flocculated subsoil layer, the permeability of these soils is generally so low that water ponds in micro-relief depressions and passes through only very slowly. Natrixeralfs are mapped where vernal pools occur on basin rim landforms" (Witham et al. 1998).

## Specific Issues for Wetlands and Jurisdictional Waters

- The wetland inventory for NRTF Dixon was last updated in 1994. It may not accurately reflect the current conditions or presence of some wetlands on the installation.
- No formal jurisdictional delineation for wetlands or waters has occurred at NRTF Dixon. The previous wetland inventory only suggested the likelihood that a water feature would be jurisdictional (Table 3-3).
- No focused surveys have been conducted to determine the presence of rare and federally listed species in the wetland habitats on the installation (Section 3.7: Threatened and Endangered Species and Critical Habitat).

## Current Management

Management of NRTF Dixon wetlands (including vernal pools) and jurisdictional waters is to maintain installation compliance with relevant federal legislation and permit requirements. Most wetlands on the installation are located within the NRMA that has been set aside; no maintenance or other installation operational activities occur within its boundaries (there is no internal fence that separates it from other installation lands). However, the NRTF Dixon wetland inventory was last updated in 1994 and there is no current jurisdictional delineation of waters and wetlands for the facility that reflects recent changes in regulatory guidance (e.g. USACE/U.S.

*It is Navy policy to avoid adverse impacts on existing aquatic resources and to offset those adverse impacts that are unavoidable, including initiating actions to enhance their natural value (Navy 1989; Executive Order 11990). The goal is no net loss of the structure and function of wetlands (Executive Order 11990).*

Environmental Protection Agency December 2, 2008a, 2008b, 2008c). There may be additional vernal pools and wetlands present on the installation that were not mapped in 1994, including in the grassland areas. Moreover, no wetland management program or list of prioritized actions has been implemented on the installation. In the past, the wetland swale in the south would be intentionally filled with water by installation personnel and would support many bird species and individuals.

## Assessment of Current Management

There is a need for NRTF Dixon to update its wetland inventory mapping and to conduct a wetland delineation to ensure avoidance and minimization of impacts to these waters and habitats to ensure compliance with guidance in OPNAVINST 5090.1C CH-1, Executive Order (EO) 11990, and Section 404 of the CWA, which regulate wetlands and jurisdictional waters of the U.S. This effort would allow incorporation of recent regulatory guidance and contribute to evaluation of installation and habitat management activities that may potentially affect jurisdictional waters and wetlands (e.g. pesticide applications).

Regulatory permits may be required for sediment removal and vegetation disturbing activities in wetland areas under USACE regulations. If federally protected wildlife are demonstrated to use the wetland and vernal pool habitat at NRTF Dixon, USFWS consultation could also be required. Approved vegetation management strategies for the wetland and vernal pool areas would help avoid any regulatory actions and delays of work. Such a plan could, at the very least, take the shape of a list of prioritized management actions that can be updated based on implementation and monitoring results. Plan development should be based on the historical reference condition and use a watershed approach to achieve the most beneficial restoration site selection possible.

In general, it is not known to what degree the lack of active management for vernal pools on the installation has influenced their current condition. Restoration focus for vernal pools should include localized water retention via land contouring and encouraging establishment of native vernal pool plant

species. Enhancement activities can be adjusted based on monitoring results and the potential discovery of any sensitive or protected species using those habitats.

Collaboration with Jepson Prairie staff and other local wetland and vernal pool experts may prove useful in identifying the historical reference condition as well as providing lessons from their own restoration programs. A restoration plant list for NRTF Dixon should be developed, based on that used by Jepson Prairie, especially for the wetland and vernal pool habitats. The list should identify those plants that support some beneficial use (e.g. wildlife, pollinators, etc.).

NRTF Dixon wetland and jurisdictional water management objectives and strategies support the goals of the North American Waterfowl Management Plan, the North American Waterbird Conservation Plan, the Partners in Flight Conservation Plans, and the international obligations contained in the migratory bird treaties and conventions such as the Migratory Bird Treaty Act (MBTA).

## Management Strategy

**Objective:** *Determine the presence or absence of waters of the U.S. and wetlands and map them.*

- I. Inventory and map wetland habitats and USACE jurisdictional waters of the U.S. on NRTF Dixon. Include wetlands that may not have been identified in the previous inventory and determine whether surface waterway connections to the San Joaquin Delta are sufficient to deem them jurisdictional.
- II. Coordinate with the easement holders for the facility's perimeter drainage ditches regarding their management, if the ditches are deemed jurisdictional in a future planned delineation.

**Objective:** *Protect and enhance the natural and beneficial values of wetlands (their function and diversity), including in support of wildlife diversity and sensitive species.*

- I. Manage wetlands and riparian areas on NRTF Dixon in compliance with federal laws and natural resource-related components of the CWA, and EOs 11990 and 11988. USACE permits are required under Section 404 of the CWA for the discharge of dredge or fill material into waters of the U.S., including wetlands.
  - A. Collect and provide information on floodplain and wetland locations during planning of construction and maintenance activities to minimize potential impacts and preserve the natural and beneficial values of floodplains and wetlands. Implement BMPs as necessary.
  - B. Support the mitigation policy of avoidance, minimization, and compensation for wetland losses.
- II. Protect water quality and soil productivity through effective nonpoint source pollution control program, soil erosion control as needed, and maintaining adequate vegetation cover.
  - A. Minimize the potential for direct or indirect contamination from pesticide applications.
  - B. Prevent agricultural wastewater from reaching the vernal pools within the NRMA via ditches and a manmade swale in the NRMA.
  - C. Minimize the potential for contamination from infrastructure by following proper stormwater management practices (Section 4.1.3.2: Construction and Facility, Grounds, and Roadside Maintenance).
- III. Develop conceptual habitat enhancement goals and success criteria in a management plan for wetland and vernal pool areas on NRTF Dixon. Consider using a historical reference condition and employ a watershed management approach, identifying opportunities for mitigation of possible future wetland impacts. Include criteria for prioritizing management actions.

- A. Identify those sites that need proactive restoration, versus those that pose little problem if left to recover naturally.
  - B. Consistent with the Endangered Species Act (ESA), EO 13186 on Migratory Birds, and the California Wildlife Action Plan, protect and enhance wetland and vernal pool habitats (both natural and man-made), and restore degraded wetland areas.
  - C. Support the natural hydrologic functions of wetlands on NRTF Dixon, as practicable.
  - D. Monitor invasive species and control as practicable when populations are small.
  - E. Support native plant species establishment in and around degraded or restored wetlands. For vernal pools, consider using vegetation from nearby vernal pools or local seed sources.
  - F. Incorporate a monitoring component for wetland and vernal pool restoration activities, using proven monitoring protocols and benchmarks to evaluate success.
  - G. Protect and conserve the quality of wetland and vernal pool habitat on NRTF Dixon to support and provide habitat for special status and federally listed species.
- IV. In support of the North American Wetlands Conservation Act, Public Law 101-233 (16 USC §§ 4401-4414), seek partnerships among public agencies and other interests to achieve the wetland and habitat enhancement goals above, including support for migratory birds.

## 3.5 Fish and Wildlife Management

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Wildlife species found at NRTF Dixon consist of both residents and migrants, most of which are common to the Sacramento Valley with birds making up most of the vertebrate species. Species lists for reptiles, amphibians, birds, and mammals are based on wildlife surveys conducted on the facility from 1998 to 2000 (Navy 2000b), and 2009–2010 (TDI 2012), as well as incidental observations (Holton Associates 1987; Navy 2000c; Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon). No previous baseline survey has been conducted for invertebrates at NRTF Dixon. The management of fish and wildlife is discussed in the following sections.

### 3.5.1 Aquatic and Terrestrial Invertebrates

There are no records on invertebrate species from surveys at NRTF Dixon. During the 2009–2010 reptile and amphibian surveys, non-native red swamp crayfish (*Procambarus clarkii*) were observed incidentally in the ditch along Robben Road and in low abundance in the storage pond on the west side of the property (TDI 2012). Crayfish can provide a valuable resource to many larger animals such as wading birds that occasionally forage there. They may also provide a food resource to large frogs. However, crayfish pose a significant threat to native amphibians that attempt to reproduce there; crayfish continuously attack all stages of amphibian larvae and eggs (Axelsson et al. 1997). Additionally, endemic shrimp, beetles, and other taxa may be associated with the vernal pools.

#### Specific Issues

- There have been no baseline or focused surveys for invertebrates at NRTF Dixon to date.
- It is possible that the vernal pool habitat in the NRMA at NRTF Dixon may be suitable for the federally threatened delta green ground beetle and federally listed fairy shrimp species.
- Crayfish and bullfrogs may be harvested from the irrigation ditches at NRTF Dixon for local consumption.
- It is possible that non-native bullfrogs present prey on important invertebrates, including fairy shrimp that may exist on the installation.

## Current Management

Current management of invertebrate species on NRTF Dixon is accomplished primarily through the protection of their habitat.

## Assessment of Current Management

Despite their importance to ecosystems as pollinators and essential constituents of the food chain, among other functions, invertebrates have been a group that has remained relatively unstudied at NRTF Dixon. Future surveys for invertebrates, including federally listed species, could be used as a metric for the health of the vernal pool and wetland habitats in the NRMA and potentially provide valuable information for adaptive management. Better knowledge of invertebrate presence and habitat use can help direct habitat enhancement activities that favor them.

Although not a significant concern presently, it would be helpful to investigate to what degree non-native invasive crustaceans (e.g. crayfish) impact native amphibians in their primary habitats on the installation. It may be important to develop a control program for them. It would be important to investigate the extent of crayfish and bullfrog harvesting for consumption and if it may pose any human health risks, including potential threats from water quality of those ditches (Section 3.5.4: Reptiles and Amphibians).

## Management Strategy

**Objective:** *Identify and protect the abundance and diversity of aquatic and terrestrial invertebrate functional groups at NRTF Dixon.*

- I. Continue efforts to gather knowledge on invertebrate species at NRTF Dixon. Conduct assessments in representative habitats and locales to determine the health and trend of invertebrate populations in the context of ecosystem health and management.
  - A. Conduct a baseline invertebrate survey. Include all data in a Geographical Information Systems (GIS) database.
  - B. Conduct investigations in conjunction with botanical surveys.
  - C. Surveys should be conducted during years when plant species are in good condition and should be conducted over multiple years to avoid problems with some species exhibiting an extended superdiapause pupal stage.
  - D. Use invertebrate surveys of the wetland and vernal pool habitats in the NRMA as an indicator of ecosystem health.
- II. Identify management focus species and monitor regularly as part of relevant habitat enhancement monitoring activities.
- III. Evaluate the impact that non-native bullfrogs may have on native invertebrates, including fairy shrimp, at the installation. Develop management actions if needed, with a goal to control bullfrog populations in areas with sensitive wildlife.
- IV. Conserve habitat with abundant and diverse invertebrate species to the extent practical. Focus management on high quality habitat with abundant native species to help prevent invasion by non-native annuals to the extent practicable.
- V. In habitat enhancement and restoration, use native plant species that favor native invertebrate species, pollinator species in particular.

## 3.5.2 Pollinators

Pollinator communities at NRTF Dixon have not been surveyed. Changes in numbers and diversity of insects and other invertebrates on NRTF Dixon could influence bird and bat species use of the facility for foraging and potentially influence migrations. Pollinators have become the focus of special international attention, due to their key role in the world supply of food, fiber, and ecosystem biodiversity. Pollinators include a range of species from various animal groups including invertebrates (i.e. bees, butterflies, moths, beetles, flies), birds (i.e. hummingbirds), and mammals (i.e. bats).

*DoD is a member of the Pollinator Partnership and the North American Pollinator Protection Campaign (see <http://www.dodpollinatorworkshop.com/> and [www.pollinator.org](http://www.pollinator.org)). The DoD has also established a commitment to fund projects in support of pollinators.*

### Specific Issues

- No surveys for pollinator species presence and abundance have been conducted at NRTF Dixon to date. Pollinators are important for agriculture and the cultivation of pollination-dependent crops at NRTF Dixon and in the region.
- Improper use of pesticides during landscape and facility maintenance can negatively impact plants and habitats that support pollinators.
- Invasive species (flora and fauna) threaten quality of habitats and plants supporting beneficial pollinators.
- Various long term and regional threats to pollinator populations exist, such as habitat loss/change, erosion, and climate change.
- Plants in ecosystems of management interest at NRTF Dixon, including rare plants that may be found as a result of future surveys, may be dependent on local pollinators.

### Current Management

Currently, there is no special management focus for pollinators at NRTF Dixon. No baseline surveys have specifically focused on identifying pollinator species and the beneficial roles they play at the installation, not only for its natural resources and habitats, but also for its agricultural outlease area. Management for pollinator species is accomplished primarily through the protection and management of associated habitats.

### Assessment of Current Management

There are opportunities to support pollinators via vegetation and habitat management in the grasslands, vernal pool and wetland areas at NRTF Dixon. Restoration and coordination with post-construction and facility maintenance activities represent opportunities to benefit pollinator species. To ensure success of management actions, a baseline inventory of pollinators present at NRTF Dixon, as well as the plants and assemblages that support them, is important. The role that pollinators play in sustaining sensitive species and rare plants at NRTF Dixon is also worthy of further investigation, and may provide opportunities to coordinate and streamline research on both. Development of new educational material on pollinators and distributing information on DoD's new Pollinator Partnership will assist managers in protecting pollinator species and help to educate NRTF Dixon users on their importance.

### Management Strategy

**Objective:** *Maintain and enhance pollinator populations and their habitats when not in conflict with health and safety, or the military mission.*



- I. Inventory and monitor pollinator populations. Establish the baseline conditions of pollinators and the plants and animals dependent on them at NRTF Dixon.
- II. Manage for beneficial pollinators in collaboration with DoD and other agency partners.
- III. Identify and develop pollinator-friendly landscapes, where feasible. Employ avoidance and minimization measures to protect them from unnecessary disturbances.
- IV. Develop BMPs to ensure that pollinator species are not adversely impacted by NRTF Dixon activities.
  - A. Revegetate with native species contained on the recommended plant list to be developed for NRTF Dixon that benefit pollinators in a variety of habitats (Section 3.4: Vegetation Communities and Habitats).
  - B. Control the spread of invasive species.
  - C. Develop and implement a management program that supports bee relocation as opposed to bee eradication in the case of any conflicts.
- V. As feasible, develop and distribute educational materials on pollinators, including a pollinator protection guide for managers specific for NRTF Dixon.
- VI. Review existing literature on pollinators.

### 3.5.3 Fishes

Although no game fish are known to exist on the facility, they were stocked in the southeastern artificial ponds in the past (Holton Associates 1987). Mosquitofish (*Gambusia affinis*) are commonly observed in the irrigation ditches, and common carp (*Cyprinus carpio*) likely exist in the reservoir. Mosquitofish were most likely stocked for vector control. A fathead minnow (*Pimephales promelas*) was found during 2010 surveys (TDI 2012). The fathead minnow is a bait fish that was probably introduced to California in the Colorado River fishery in the 1950s, then raised in central California by the California Department of Fish and Wildlife (CDFW) and others (Moyle 2002). A common carp was also located during the 2010 surveys (TDI 2012).

#### Specific Issues

- Mosquitofish observed in the irrigation ditches may pose a significant threat to native amphibians that attempt to reproduce in the waterways. The fish attack their eggs and newly hatched larvae.
- While not known to occur at NRTF Dixon, Critical Habitat for the federally threatened delta smelt was designated by the USFWS in 1994 on approximately 75 percent of the installation. The boundaries of Critical Habitat follow the boundary of the Delta Protection Act of 1959. Recent meetings of the USFWS and NAVFAC Southwest have determined that no Primary Constituent Elements (PCEs) necessary for the delta smelt are present on NRTF Dixon (Map 3-10; Section 3.7.8: Delta Smelt).

#### Current Management

There are no fish indigenous to the area that have been observed at NRTF Dixon. Although the reservoirs have been stocked in the past on at least two occasions, no game fish appear to remain from these efforts (Holton Associates 1987). Because there is no recreational access to NRTF Dixon for security reasons, no additional fish will be stocked. Fish species at NRTF Dixon are not actively managed.

#### Assessment of Current Management

Mosquitofish may pose a threat to native amphibians attempting to reproduce in the irrigation waterways. Recent research and reviews suggest that mosquitofish are not as effective as once thought in controlling

mosquito populations or in reducing mosquito-borne diseases. Their aggressiveness has adversely affected populations of other small fish species and possibly even benefited mosquitoes by decreasing competitive and predation pressure from zooplankton and predatory invertebrates (USGS 2013).

It would be prudent to determine if mosquitofish at NRTF Dixon need to be managed to avoid adverse impacts to native amphibians. Surveys on the installation have documented only four amphibian species as present, one of which is the non-native, invasive bullfrog. None were observed in or near the irrigation waterways.

## Management Strategy

**Objective:** *Determine the existing populations of non-native fish at NRTF Dixon. Manage NRTF Dixon fishes and habitat to ensure no threat to other species and ensure no risk to fish habitats downstream.*

- I. Determine the presence of non-native fish at NRTF Dixon.
- II. Determine the need to manage the mosquitofish population in the irrigation waterways on the installation to reduce their potential predatory impact on native amphibians.
  - A. Investigate and employ other methods of mosquito control and prevention in consultation with the Solano County Mosquito Abatement District.
- III. If a connection between installation aquatic resources and the Delta is observed, ensure that management activities at the installation pose no threat to downstream fish habitats (particularly for the federally threatened delta smelt) (Section 3.7: Threatened and Endangered Species and Critical Habitat).

## 3.5.4 Reptiles and Amphibians

Surveys conducted in 2009 and 2010 detected three amphibian species and two reptile species using wandering transects (day and night) and pitfall traps (TDI 2012). Over the course of previous and recent surveys, a total of four species of amphibian and five species of reptile have been observed at NRTF Dixon (Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon).

Pacific treefrog, western spadefoot toad, California slender salamander, and bullfrog are the only amphibian species that have been documented on the facility (Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon) (Holton Associates 1987; Navy 2000c; TDI 2012). Pacific treefrogs were found within all environments, and were most abundant in seasonal wetlands in the NRMA and the eastern ponds, especially during the winter surveys. California slender salamanders were observed in the agricultural fields and along the western property edge. Bullfrogs have been observed in the drainage canal along the southern border of the NRMA in the past. Reptiles documented during the surveys include the southern alligator lizard, which were found on the dike around the farm storage pond, and a western fence lizard (*Sceloporus occidentalis*). Incidental sightings identified the presence of the pacific gopher snake (*Pituophis catenifer catenifer*) and an unidentified garter snake (*Thamnophis* sp.). They were found along borders of agricultural fields and the northwest reservoir. A federally and state threatened giant garter snake (*Thamnophis gigas*) was reported by an employee of NRTF Dixon's O&M contractor. However, the sighting was unconfirmed by an expert. Possible prey for the giant garter snake could include fish from the watercourse on the western side of the facility. Yellow-bellied racers (*Coluber constrictor mormon*) were detected in the NRMA and in the north antenna field.

## Specific Issues

- It is unknown to what degree non-native invasive amphibians and crustaceans may be impacting native amphibians at NRTF Dixon.
- It is possible that crayfish and bullfrogs may be harvested for consumption by locals from the irrigation ditches at NRTF Dixon.

## Current Management

Reptiles and amphibians are conserved at NRTF Dixon primarily through the protection of their habitat. Protection of wetland, mesic and other favorable habitat sites is especially important.

## Assessment of Current Management

Management for reptiles and amphibians at NRTF Dixon could be improved through better knowledge of their presence across the installation and their habitat preferences. Indicator reptile and amphibian species can also be monitored as a means to assess overall habitat health and quality, particularly for wetland and other mesic habitats at NRTF Dixon, which provide benefits to many other local flora and fauna. There is opportunity for NRTF Dixon to participate in the DoD Partnership for Amphibian and Reptile Conservation (DoD Partners for Amphibian and Reptile Conservation).

Although not a significant concern presently, it would be helpful to investigate to what degree non-native invasive amphibians (e.g. bullfrogs) have an impact on native amphibians and crustaceans in their primary habitats on the installation.

It would be important to investigate the extent of crayfish and bullfrog harvesting from irrigation ditches for consumption and if it may pose any human health risks, including potential threats from water quality of those ditches.

## Management Strategy

**Objective:** *Inventory and determine the health and trend of amphibian and reptile populations, emphasizing those that may indicate ecological trends or may become federally listed, and control exotic species that threaten these populations.*

- I. Identify management focus species and conduct surveys to determine existing populations.
  - A. Monitor regularly as part of relevant habitat enhancement monitoring activities.
  - B. Conduct an assessment to determine presence of any suitable habitat for the California tiger salamander and the giant garter snake, both federally and state threatened.
- II. Evaluate the impact that non-native amphibians and crustaceans may have on sensitive species, including fairy shrimp that may exist at the installation.
- III. Conserve reptile and amphibian habitat, particularly in the NRMA, to the extent practical.
  - A. Focus management on high quality habitat with abundant native species to help prevent invasion by non-native annuals to the extent practicable.
- IV. Investigate the extent to which crayfish and bullfrogs are harvested from irrigation ditches for local consumption. Develop appropriate regulations and management actions if necessary.
- V. Participate in DoD Partners for Amphibian and Reptile Conservation.

### 3.5.5 Birds

This section addresses the presence and management of migratory birds that, under the federal directive of the Migratory Bird Treaty Act (MBTA) and EO 13186, include federally listed and non-listed species.

NRTF Dixon provides nesting, roosting, and foraging habitat for around 100 species of birds (Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon) (Holton Associates 1987; Navy 2000c; TDI 2012). Of these, 26 have some special status assigned by an international treaty and governmental agencies (ESA, California Endangered Species Act, USFWS, CDFW, Convention of International Trade in Endangered Species of Wild Fauna and Flora [CITES]). Bird surveys in the last decade have confirmed sightings of 57 species of landbirds, 15 shorebirds, seven marshbirds, eight seabirds, and 16 waterfowl at the facility. The latest bird surveys were conducted from 2009 to 2010 (TDI 2012). In the following sections the nomenclature used for bird species is consistent with the American Ornithological Union, except that bird names are not capitalized (to be consistent with naming conventions for other species groups in this INRMP).

#### Resident Birds

Resident bird species at NRTF Dixon are defined as such dependent upon the amount of time the species spends on facility lands. They are typically present year round and breed at NRTF Dixon. In total, 54 species are probably residents (year-round residents with confirmed, possible, or unknown breeding; Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon). Those documented include burrowing owl, Swainson's hawk (Section 3.8: Other Special Status Wildlife Species), great horned owl (*Bubo virginianus*), mourning dove, loggerhead shrike (*Lanius ludovicianus*), cliff swallow (*Petrochelidon pyrrhonota*), and barn swallow.

#### Migratory Birds

Migratory bird species using NRTF Dixon habitats as a stop-over during their annual migrations may be doing so in combination with other suitable habitats in the region. Surrounding agricultural lands and wetlands of nearby vernal pool complexes, Suisun Marsh, Delta waterways, and the Yolo Bypass and other waterways of the Sacramento River system provide an abundance of resources for migratory birds. For migrating birds, water and a resting place are of essential importance. Areas of the facility that are essential for migrant resting and foraging are the vernal pools, alfalfa and other crops (due to irrigation and presence of prey), nearby trees, and farm holding ponds. At NRTF Dixon, many of the documented bird species were observed at the northwest irrigation reservoir. Birds that use the wetlands, such as the irrigation reservoir and canals, include waterfowl, marshbirds, shorebirds, and songbirds, such as mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), great blue heron, great egret, black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), bufflehead (*Bucephala albeola*), Canada goose (*Branta canadensis*), common goldeneye (*Bucephala clangula*), common yellowthroat (*Geothlypis trichas*), and red-winged blackbird. Grassland birds inhabiting the antenna fields and NRMA include American goldfinch, Brewer's blackbird, burrowing owl, killdeer, mourning dove, white-crowned sparrow, and western meadowlark. The assemblage of species found in agricultural areas is quite similar to those in the grasslands. In particular, raptors were often observed foraging in, flying over, and roosting nearby to the agricultural areas. Species that could be expected to use landscaped areas of NRTF Dixon include American robin, rock pigeon, house finch, and house sparrow.

#### Specific Issues

- There is a need to continue documenting and refining knowledge of avian use on the installation, particularly during the breeding season and in relation to habitat type and use.

- There is a high density of breeding pairs of burrowing owls at NRTF Dixon, which may constitute the largest population in the area (Smallwood and Morrison 2008).
- Antennas and their guy wires may present a potential hazard to birds on the installation.

## Current Management

All bird species at NRTF Dixon, with the exception of rock doves, European starlings, and house sparrows, are protected by federal law under the MBTA and EO 13186 (Appendix C: Applicable Laws and Regulations; Appendix K: Reporting on Migratory Bird Management).

Current management for avian species at NRTF Dixon is achieved primarily through management of their habitat. A bird monitoring program also coincides with updates to the INRMP (usually every five years). The results of this monitoring are used to update and refine the installation's species list. The burrowing owl population at NRTF Dixon has also been monitored in the past.

Installation management actions are not known to have threatened bird populations. In lieu of a USFWS depredation permit, avoidance and minimization measures are employed for all relevant activities in order to comply with the MBTA. Potential strike hazards presented by the antennas and guy wires on the installation have not been assessed. Any bird strikes would be assessed by monitoring requirements under the Migratory Bird Rule exemption for military readiness activities.

## Assessment of Current Management

With no federally-listed avian species currently known to be present on the installation, management of avian populations at NRTF Dixon is driven by the MBTA and by protection of key habitats (grasslands and wetlands). Military land managers must comply with the Memorandum of Understanding (MOU) between the USFWS and DoD required by EO 13186 for integrating the MBTA into management efforts. Guidance set forth by the Secretary of the Defense offers several tools for how to implement management activities for migratory birds. Among the guidance is the development and maintenance of an installation bird checklist, which NRTF Dixon should continue to refine and improve through more regular bird surveys in all habitats during all times of the year. Priority for monitoring should be placed on BCC, as identified by the USFWS and other comprehensive bird conservation plans, such as long-billed curlew, loggerhead shrike, whimbrel, and Swainson's hawk (USFWS 2008a; Partners in Flight [PIF] Central and Southern California Coast and Valleys) (Section 3.8: Other Special Status Wildlife Species). At NRTF Dixon, management focus and indicator species should also be chosen that can be monitored to provide insight into habitat health and condition, as practicable.

*The Migratory Bird Rule authorizes the military to "take" migratory birds during military readiness exercises under the MBTA without a permit, but if the military determines that the activity will significantly affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize and/or mitigate the effects (Appendix C: Applicable Laws and Regulations; Appendix K: Reporting on Migratory Bird Management).*

Focusing routine maintenance of habitat areas (e.g. mowing) outside of the breeding season will reduce MBTA-related impacts and concerns. If activities are necessary during the breeding season, NRTF Dixon's avoidance and minimization measures should apply to active nests, eggs, or chicks. This is particularly important for grassland species, such as burrowing owls, many of which nest on the ground in high grass. Passively relocating burrowing owls, and other species as needed, may also help to reduce potential threats to them via installation management activities (Section 3.8: Other Special Status Wildlife Species). In conjunction with a breeding bird survey, an assessment of current and proposed installation management activities and their potential impacts on birds during the breeding season should also be conducted.

Any bird strikes resulting from a collision with the antennas and guy wires at NRTF Dixon would be considered under the military readiness exemption of the Migratory Bird Rule since the antennas facilitate communications of the Navy's Pacific Fleet, and thus, are considered essential to the military mission.<sup>23</sup> However, it is important that such strikes are monitored to demonstrate no significant impact to resident and migratory bird populations; this should include investigation into the frequency of strikes and if particular species are being impacted. This information should be gathered and presented in an Avian Protection Plan.

Additionally, improved baseline information (including nesting, habitat use, etc.) and habitat value maps would improve the installation's ability to analyze impacts, when the need arises. Habitat value maps could be translated into BMPs and avoidance/minimization measures under NEPA and project review processes, as well as contribute to the Under Secretary of Defense's intent (Memo 3 April 2007) for implementing EO 13186 and promoting conservation of migratory birds. Collection of baseline information also facilitates reporting on any significant population effects to migratory birds (50 Code of Federal Regulation Part 21 - Military Readiness Exemption) and helps to support major bird conservation initiatives, where DoD is a partner (EO 13186 and DoD-USFWS MOU).

In addition to complying with the above regulations, NRTF Dixon should continue to track the listing status of migratory and resident birds found either at the installation or in the vicinity and seek partnerships to participate in long-term monitoring and management.

## Management Strategy

**Objective:** *Minimize impacts to migratory bird populations from installation activities, as practicable. Protect and restore key habitats, where feasible, for migratory and resident birds at NRTF Dixon, concentrating on grassland and wetland areas.*

- I. Protect migratory bird populations by avoiding and minimizing impacts to birds using conservation principles, standards, and practices, as compatible with mission requirements (EO 13186).
  - A. Comply with the military readiness MBTA-Migratory Bird Rule by developing and implementing conservation measures for the effects of military readiness activities on migratory birds if there may be a significant adverse impact on a migratory bird population.
    1. Prepare an Avian Protection Plan. Its primary function would be to monitor bird strikes against the antennas and their guy wires to assess if there is a significant impact to resident and migratory bird populations and to facilitate any reporting that may be required per 50 Code of Federal Regulation Part 21 Migratory Bird Rule. It should also include monitoring and assessment strategies for other activities identified as potentially impacting resident and migratory birds, such as pesticide applications and mowing treatments. Develop management measures as needed.
  - B. Comply with the MBTA for non-readiness activities. Conduct an assessment of non-readiness activities that could impact resident or migratory birds on the installation and apply avoidance and minimization measures for those activities if they pose any threat. As feasible, avoid activities in areas with known nesting birds during the breeding season to avoid take.

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<sup>23</sup> Activities to maintain the antennas, such as mowing around them for fire abatement or any repairs of them, would not be considered under the military readiness exemption if such activities were to take or impact migratory birds. Military readiness activity, as defined in Public Law 107-314, § 315(f), 116 Stat. 2458 (December 2, 2002) [Public Law § 319 (c)(1)], "includes all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. It does not include (a) routine operation of installation operating support functions, such as: administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; morale, welfare, and recreation activities; shops; and mess halls, (b) operation of industrial activities, or (c) construction or demolition of facilities listed above."

- C. Implement installation-level BMPs for migratory bird protection, based on the resources and data available. These BMPs should ensure the protection and conservation of species protected under the MBTA during tree removal and maintenance activities and during construction, demolition, renovation, and maintenance activities at NRTF Dixon through coordination with the appropriate office/department.
  - D. Identify and protect key nesting areas, migration routes, important prey base areas, and concentration for birds of prey by employing avoidance and minimization measures during NEPA compliance and the site approval process. Consider nesting areas and sensitive wildlife concentration areas.
- II. Implement habitat-based strategies for conservation of migratory birds (EO 13186). Identify and map high-value habitats for management focus birds at NRTF Dixon. Improvements should consider the importance of wetlands for birds, controlling invasive species, and promoting habitat structural diversity.
  - III. Consider installing raptor nesting platforms to encourage raptor use of the installation.
  - IV. Develop and enhance conservation partnerships to further the work of bird conservation (EO 13186; DoD-USFWS MOU; Under Secretary of Defense Memo (2007), Sikes Act [as amended]).
    - A. Use cooperative assistance from wildlife agencies, organizations, and volunteers to help collect needed data.

**Objective:** *Continue to monitor avian use of NRTF Dixon to improve the inventory and inform on population trends and distributions, as well as to facilitate and guide natural resources management decisions.*

- I. Conduct inventory and monitoring regularly for the adaptive management of birds, focusing on BCC and other indicator species. Consider establishing survey walking transects in appropriate habitat to promote consistency across surveys and monitoring.
  - A. Conduct an installation-wide avian survey every five years. Continue to maintain and update the installation bird checklist, by season, of birds occurring on NRTF Dixon or in the vicinity.
  - B. Report to the national military database DoD Bird Conservation Database (<http://www.dodpif.org/projects/>) the results of bird surveys, research and monitoring, and species accounts.
  - C. Conduct a focused breeding bird survey to better assess the distribution and abundance of species breeding at NRTF Dixon.
  - D. Conduct surveys of burrowing owl populations on NRTF Dixon and implement species-specific management strategies as practicable (Section 3.8: Other Special Status Wildlife Species).
- II. Monitor effectiveness of bird management practices and adjust management strategies as appropriate. Identify management focus species which could be affected by installation activities.

### 3.5.6 Mammals

Twenty-three species of mammals have been documented at NRTF Dixon including ten rodents and seven species of bat (Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon) (Holton Associates 1987; Navy 2000c; TDI 2012). Commonly occurring mammal species include deer mouse, California ground squirrel (*Citellus beecheyi*), desert cottontail, black-tailed jackrabbit, and Mexican free-tailed bat (*Tadarida brasiliensis*). Small mammal trapping from 2009 to 2010 captured four species of rodents, with deer mouse being the most common (TDI 2012). Deer mice were captured in all habitats on the facility, as were house mice. California voles were captured in the

antenna field grasslands. Western harvest mice were captured only in the antenna field and the NRMA. Density and species richness of small mammals was greatest in the antenna fields. Black-tailed jackrabbits were the most commonly observed species and were found in all habitats, but most commonly in the antenna fields. Feral dogs and cats have also been observed on NRTF Dixon in the past.

### Specific Issues

- The minimal data on mammals present on the facility is a data gap for natural resources management decision-making processes.

### Current Management

Management of mammals consists primarily of maintaining current population levels by protection of potential habitat and conducting surveys to determine species distribution and abundance during INRMP updates.

### Assessment of Current Management

In addition to regular baseline mammal inventories during INRMP updates, regular monitoring of management focus and indicator species is useful to identify trends and habitat use. Species of interest include either native species or introduced species that are influencing habitat and other species groups at NRTF Dixon. Indicator species should be chosen that provide the best insight into health of habitats of interest (e.g. their structure and function).

### Management Strategy

**Objective:** *Improve knowledge of mammals throughout the installation to facilitate and guide natural resource management decisions and habitat management for them.*

- I. Identify management focus species and determine where on NRTF Dixon they are most likely to occur, based on observations and existence of suitable habitat.
  - A. Monitor regularly as part of relevant habitat enhancement monitoring activities and include in a GIS geodatabase.
- II. Continue to conduct regular mammal surveys at NRTF Dixon, including identifying habitat use and preference to manage for those species through habitat management activities.

## 3.5.7 Bats

Bats at NRTF Dixon were surveyed using sonar detection units during the fall, winter, and spring of 2009-2010 (TDI 2012). Seven species of bat were identified; the greatest number of recordings (288 out of 303) and species (all seven) were noted in the spring survey. The Mexican free-tailed bat was the most dominant bat species at the facility with 278 records out of the total 303 records. Of interest is the presence of the little brown bat (*Myotis lucifugus*), which has previously not been known to occur in the Central Valley. Its closest known habitat includes the mountain ranges to the east and west of the facility. The only special status species recorded at NRTF Dixon is the pallid bat (*Antrozous pallidus*), a California Special Species of Concern; it was recorded in two distinct locations on the facility during the spring survey (Appendix I: Applicable Reports; Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon).

### Specific Issues

- Of interest is the presence of the little brown bat and pallid bat at NRTF Dixon.



## Current Management

Bat populations at NRTF Dixon are not actively managed, other than through management of habitats and plant communities.

## Assessment of Current Management

Threats to bats are generally from intrusion of roost sites and degradation of water resources. Bats currently use NRTF Dixon primarily for foraging, given the ample water resources present supporting invertebrates that the bats feed on; availability of roosting sites is likely not a limiting factor. As a result, protection of key foraging sites, water resources, and food supply are important for management of healthy bat populations at NRTF Dixon.

In future mammal or bat inventories and focused surveys on pollinators, it would be helpful to assess frequency of bat resource use, and location, on the installation. In addition, investigation into the presence of the little brown bat at the facility in cooperation with regional partners may shed some light on possible habitat changes, both at NRTF Dixon and in the region, that are encouraging presence in an area where it has not been observed before.

## Management Strategy

**Objective:** *Maintain and enhance bat populations and their habitat when not in conflict with health and safety, or the military mission.*

- I. Identify management focus species and determine where on NRTF Dixon they are most likely to occur, based on observations and existence of suitable habitat. Monitor regularly as part of relevant habitat enhancement monitoring activities and include in a GIS geodatabase.
- II. Continue to conduct regular bat surveys at NRTF Dixon, including identifying habitat use and preference to manage for those species through habitat management activities. Include a focus on the presence, habitat and resource use of the little brown bat and pallid bat at NRTF Dixon.
- III. Conserve and enhance bat habitat and bat-friendly conditions.
  - A. If feasible, during new developments and retrofits, advocate for facility lighting that has less negative impact on bat habitat, such as night-sky compliant lights and those focused downward as opposed to broadcast lighting.
  - B. Maintain open water areas to ensure availability to bats.
- IV. If bat habitat is present at NRTF Dixon, any tree removal or building demolition activities should be conducted under supervision of a qualified biologist, during seasonal periods of bat activity.

## 3.6 Special Status Plants

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Special status plants that are confirmed or may potentially inhabit NRTF Dixon are presented in Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon. This list is based on upon CNDDDB records of the listed and rare plants in the vicinity of the facility.

The 2002 NRTF Dixon INRMP identified two special status plant species as present at the installation that are likely misidentifications:

- Federally and state endangered Burke's goldfields (*Lasthenia burkei*), also CNPS Rare Plant Rank of 1B.1.<sup>24</sup> The species was not observed during 2009-2010 surveys (TDI 2012).<sup>25</sup> It is more likely this species was misidentified in previous surveys. Records of Burke's goldfields are localized to southern Lake, southern Mendocino, and northern Sonoma Counties in California.
- Pincushion navarretia (*Navarretia myersii*) with CNPS Rare Plant Rank 1B.1. The species was not observed during 2009–2010 surveys (TDI 2012). It is more likely this species was misidentified in previous surveys. Records of pincushion navarretia are localized to foothill vernal pools in Sacramento, Amador, and Merced Counties.

*The CNPS is a non-profit organization dedicated to the understanding and appreciation of California's native plants and how to conserve them and their natural habitats and is dedicated to the preservation of California native plants. The CNPS has a website dedicated to sensitive and rare plants with a rating system that has been adopted by CDFW.*

Neither plant is listed as present at Jepson Prairie, a preserve within the same Solano-Colusa Vernal Pool Region as NRTF Dixon, and with vernal pool habitat similar to that found on NRTF Dixon. Jepson Prairie is located five to six miles south of the installation. These species are acknowledged in Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon, but not discussed further in this INRMP.

As a result, no special status plant species are confirmed as present at NRTF Dixon; however, some could potentially occur (Section 3.7: Threatened and Endangered Species and Critical Habitat; Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon).

### Specific Issues

- The absence of rare plant surveys at NRTF Dixon may contribute to the lack of rare plant identification on the installation.
- CNDDDB records indicate the presence of some CNPS-ranked rare plants in the vicinity of NRTF Dixon (Map 3-9; Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon).

### Current Management

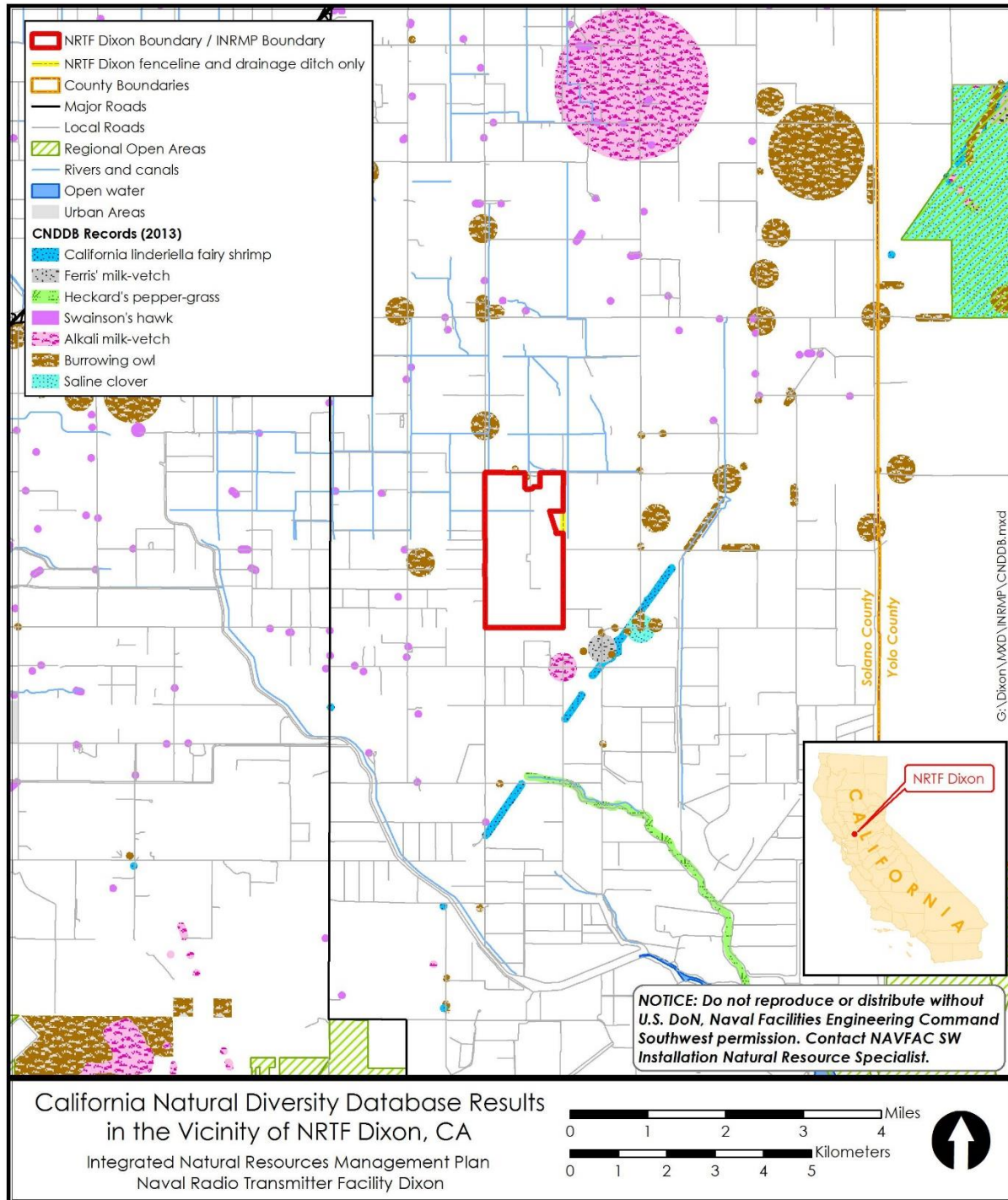
Current management of special status plant species on NRTF Dixon is accomplished primarily through the protection and management of their habitats.

### Assessment of Current Management

It would be prudent to conduct rare plant searches at NRTF Dixon to identify the presence of any special status plants that may exist on the installation. Focused surveys have not been conducted in the past. If special status plants are present, habitat management activities should incorporate a program for their management, as needed. In the case of any federally listed species present, NRTF Dixon would need to consult with the USFWS to develop a management program.

<sup>24</sup> CNPS Rare Plant Rank 1B = Plants Rare, Threatened, or Endangered in California and Elsewhere. CNPS Threat Rank 0.1 = Seriously threatened in California (over 80% of occurrences threatened/ high degree and immediacy of threat) (CNPS 2013).

<sup>25</sup> A rare plant survey was not conducted during these surveys.



Map 3-9. California Natural Diversity Database records for species potentially occurring on Naval Radio Transmitter Facility Dixon, California.<sup>26</sup>

<sup>26</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

## Management Strategy

**Objective:** *Evaluate, protect, and enhance special status plant populations, should they be documented on the installation, while ensuring compatible land use and flexibility to fulfill mission requirements.*

- I. Conduct rare plant searches at high potential areas, within the grassland and NRMA, prioritizing searches based on habitat suitability, threats and vulnerabilities, and potential for endemics.
  - A. Identify any special or unique flora and fauna associated with floodplains in order to identify the natural and beneficial functions provided by floodplains.
  - B. If any federally or state listed plants are identified as a result of these searches, develop management plans and actions for them in consultation with the USFWS and the CDFW, as appropriate.
- II. Identify threats and vulnerabilities for known locations of special status and management focus plants, or plant assemblages.
  - A. Develop avoidance and minimization recommendations, as appropriate.
  - B. Incorporate measures that work well into construction and maintenance practices, and project implementation processes, as appropriate.
  - C. Conduct standardized sensitive plant species monitoring according to refined, tested, and repeatable methods tailored for each sensitive species.
- III. Conduct research surveys, as needed, prior to any military construction project(s), including as part of NEPA or other environmental review process.

## 3.7 Threatened and Endangered Species and Critical Habitat

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No federally listed species are confirmed present at NRTF Dixon. Three federally listed plant species and seven animal species presented below are those with potential to occur, based on habitat present at the installation, and records of species presence and designations of Critical Habitat at locations in the vicinity of the installation (Table 3-4; Map 3-10). Nine of the ten species have Critical Habitat designated in the region of NRTF Dixon. The only species without Critical Habitat is the giant garter snake. In the recent past an employee of the installation's O&M contractor reported the presence of the giant garter snake at NRTF Dixon. However, that sighting was unconfirmed by an expert.

Currently, there is designated Critical Habitat for the delta smelt on three-quarters of the installation (Map 3-10). The delta smelt Critical Habitat boundary coincides with the boundary of the Delta Protection Act of 1959, in the upper watershed of the San Joaquin Delta, in which NRTF Dixon is located. The delta smelt is not known to occur at NRTF Dixon and recent meetings of the USFWS and NAVFAC Southwest determined that no PCEs necessary for the delta smelt are present on NRTF Dixon (Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns).

Table 3-4. Federally listed species with potential to occur at Naval Radio Transmitter Facility Dixon, California and classified based on Cowardin et al. (1979).

Common Name	Scientific Name	Federal/State/CNPS Status	Presence at NRTF Dixon	Critical Habitat (CH) Designated? (Map 3-10)
Colusa grass	<i>Neostapfia colusana</i>	FT/SE/1B.1	Not documented.	Yes. CH designated approximately 10 miles northeast of NRTF Dixon at Yolo County Grasslands Regional Park. Also positively identified at Jepson Prairie Preserve, approximately 5 miles southwest of NRTF Dixon, although CH is not designated there.
Solano grass (Crampton's tuctoria)	<i>Tuctoria mucronata</i>	FE/SE/1B.1	Not documented.	Yes. CH designated approximately 10 miles northeast of NRTF Dixon at Yolo County Grasslands Regional Park.
Contra Costa goldfields	<i>Lasthenia conjugens</i>	FE/ - /1B.1	Not documented.	Yes. CH designated on lands surrounding Travis Air Force Base, approximately 10–12 miles southwest of NRTF Dixon.
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE/ - / -	Not documented.	Yes. CH designated on lands just south of Travis Air Force Base, approximately 12 miles southwest of NRTF Dixon.
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT/ - / -	Not documented.	Yes. Multiple subunits throughout California and Oregon. The closest to NRTF Dixon are located 10 miles northeast (Yolo County Grasslands Regional Park) and 5 miles southwest of the installation.
vernal pool tadpole shrimp	<i>Lepidurus packardi</i>	FE/ - / -	Not documented.	Yes. Multiple subunits throughout California, some of which coincide with vernal pool fairy shrimp Critical Habitat. The closest to NRTF Dixon are to the southwest, including the same area 5 miles southwest of the installation as described for the vernal pool fairy shrimp.
delta green ground beetle	<i>Elaphrus viridis</i>	FT/ - / -	Not documented.	Yes. Two vernal pools in Solano County, south of the City of Dixon. Located approximately 5 miles south and slightly west of NRTF Dixon.
delta smelt	<i>Hypomesus transpacificus</i>	FT/SE/ -	Not documented.	Yes. CH coincides with the boundary of the Delta Protection Act of 1959 in the upper watershed of the San Joaquin Delta in which three-quarters of NRTF Dixon is located.
giant garter snake	<i>Thamnophis gigas</i>	FT/ST/ -	Reported sighting, but presence unconfirmed by an expert.	None.
California tiger salamander (Central Population)	<i>Ambystoma californiense</i>	FT/ST/ -	Not documented.	Yes. CH designated on 5,699 acres at Jepson Prairie Preserve, located approximately 6 miles southwest of NRTF Dixon, among other areas throughout the Central Valley. This unit represents the northwestern portion of the species' distribution.

Codes: FE = Federally Endangered, FT = Federally Threatened, SE = State Endangered, ST = State Threatened

CNPS Rare Plant Rank 1B = Plants Rare, Threatened or Endangered in California and Elsewhere

CNPS Threat Rank 0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

Sources:

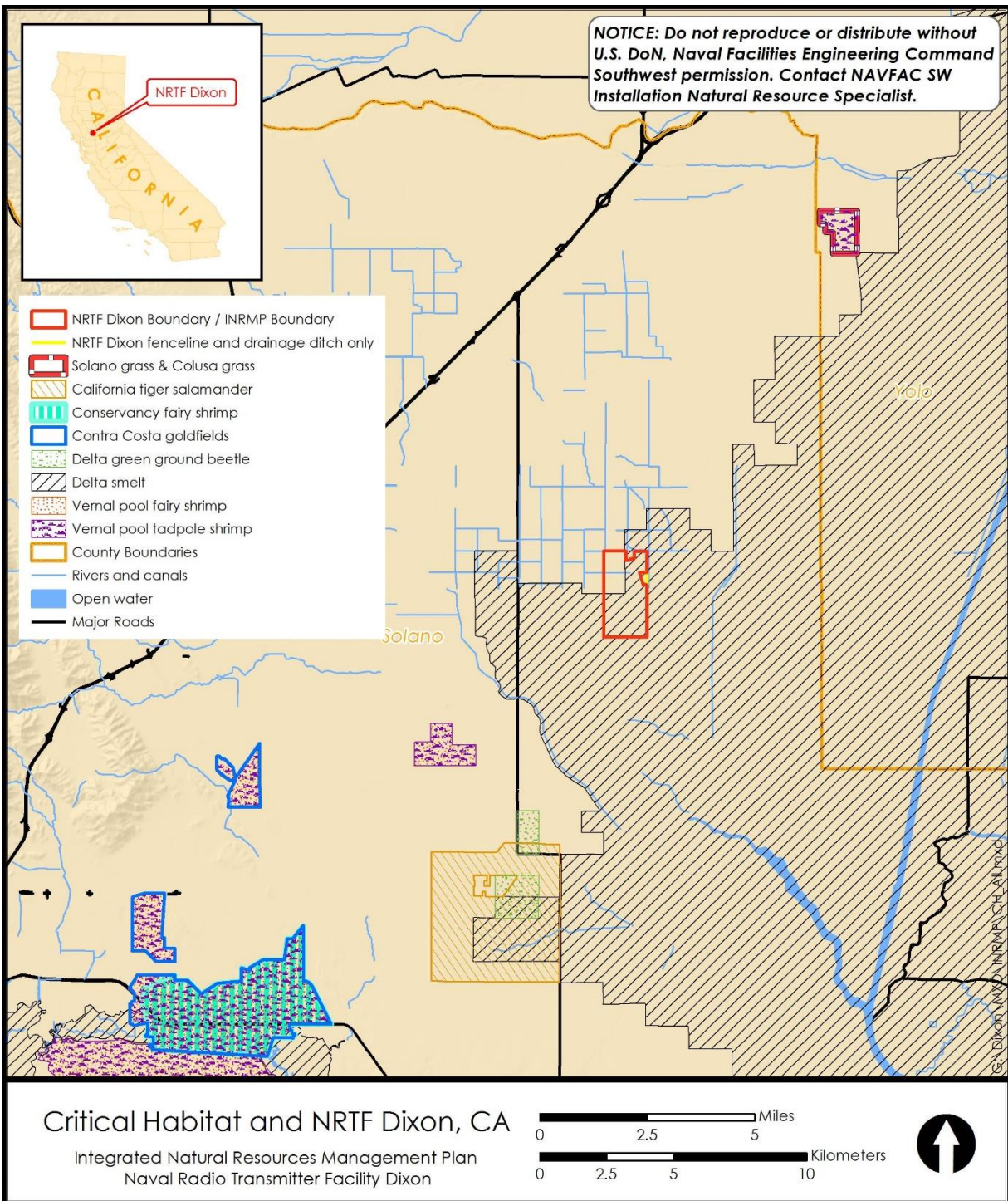
CDFW 2013a, CDFW 2013b, CNPS 2013

Colusa grass, Solano grass, Contra Costa goldfields, Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp Critical Habitat: USFWS 11 August 2005.

Delta Green Ground Beetle Critical Habitat: USFWS 08 August 1980.

Delta Smelt Critical Habitat: USFWS 19 December 1994.

California Tiger Salamander Critical Habitat: USFWS 23 August 2005.



Map 3-10. Critical Habitat on, and in the vicinity of, Naval Radio Transmitter Facility Dixon, California.<sup>27</sup>

<sup>27</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

### 3.7.1 Colusa Grass (Federally Threatened, State Endangered)

Colusa grass (*Neostapfia colusana*) is an annual herb that blooms from May to August and is endemic to California vernal pool habitat. It was listed as federally threatened in 1997 and state endangered in 1979. This species also has a CNPS Rare Plant Rank of 1B.1.



**Colusa Grass**  
(*Neostapfia colusana*)  
Copyright: Aaron E. Sims, 2012.

Currently, there are 43 presumed extant occurrences in Yolo, Solano, Merced, and Stanislaus Counties (Hogle 2002 and CNDDDB 2008, both cited in USFWS 2008b). The vast majority of these occurrences are in Stanislaus County (15 occurrences) and Merced County (22 occurrences). Population sizes can vary greatly from year to year. It has a broad ecological range occurring on the rim of alkaline basins in the Sacramento and San Joaquin Valleys, on acidic soils of alluvial fans and stream terraces along the eastern margin of the San Joaquin Valley and into the adjacent foothills, as well as in Northern Claypan and Northern Hardpan vernal pool types. It has been found growing in pools ranging from 0.02 to 617.5 acres. Long-term inundation of approximately three months is required for seed germination, and it appears that deeper pools and stock ponds are most likely to provide the long inundation period required (USFWS 2008b; USFWS 11 August 2005).

Threats to the species include agriculture, development, overgrazing, flood control, non-native plants, and habitat fragmentation and loss (CNPS 2013).

Colusa grass has not been documented on NRTF Dixon. However, it has the potential to occur given its presence and designation of Critical Habitat at nearby locations (Table 3-4; Map 3-10). PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.

### 3.7.2 Solano Grass (Federally and State Endangered)

Solano grass, also known as Crampton's tuctoria, is a small annual herb (1–8 inches tall) that blooms from April to August. It is endemic to vernal pools and is found only in the Solano-Colusa Vernal Pool Region (USFWS 2009b). It was listed as federally endangered in 1978 and state endangered in 1979. This species also has a CNPS Rare Plant Rank of 1B.1.



**Solano Grass**  
(*Tuctoria mucronata*)  
Copyright: Carol W. Witham, 2004.

Solano grass is found in two naturally occurring scattered vernal pool complex areas in Solano and Yolo Counties in the Sacramento Valley, with an elevation varying between near 15 feet (5 meters) to near 35 feet (11 meters) (USFWS 2009b). It is known from only three occurrences: one at Olcott Lake at Jepson Prairie Preserve, one nearby on private land, and one south of Davis at Yolo County Grasslands Regional Park, which is adjacent to DoD-owned land.<sup>28</sup> Only four plants were found at Jepson Prairie in 1993, and none in 1994–1996, 1998, 2000, and later; the site was presumed extirpated in 2005 (CNPS 2013).

<sup>28</sup> Yolo County Grasslands Regional Park was deeded to Yolo County in 1972 from the DoD. It was originally part of McClellan Air Force Base's Davis Global Communications site used for air force radio communication operations for the pacific region of the U.S. Yolo County is currently evaluating transference of a remaining 315-acre portion of the property still owned by the DoD (Yolo County website 2013).

Solano grass is a semi-aquatic annual grass unique among grasses in exhibiting single-cell C4 photosynthesis, which occurs in only 0.003 percent of known species of C4 flowering plants (Boykin et al. 2008, cited in USFWS 2009b).<sup>29</sup> The species germinates under water and produces a whorl of submerged leaves, considered juvenile leaves, and are replaced by foliage that allows the plants to persist in the terrestrial environment, when the pools dry (Keeley 1991). It produces stems and leaves covered with small droplets of a sticky, acrid secretion (a characteristic of the genus *Tuctoria* and the genus *Neostapfia*). It is wind-pollinated, which may be limiting for small populations. Local seed dispersal is by water; long-distance dispersal is unlikely, but may be aided occasionally by waterfowl. The seeds can remain dormant for an undetermined length of time (at least three to four years), and germinate underwater after they have been immersed for prolonged periods (USFWS 2009b).

The specific vernal pool characteristics that determine the suitability for Solano grass germination and growth are unknown; however, the vernal pool complexes that provide suitable habitat for this species include similar physiographic and edaphic settings—claypan soils of saline-alkali flood basin rims basins soils. It also appears that the species seems to favor somewhat larger and deeper vernal pools as compared to other vernal pool plants (USFWS 11 August 2005). Threats to the species include non-native plants (CNPS 2013).

Solano grass has not been documented on NRTF Dixon. However, it has the potential to occur, given its presence and designation of Critical Habitat at nearby locations (Table 3-4; Map 3-10). PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.

### 3.7.3 Contra Costa Goldfields (Federally Endangered)

Contra Costa goldfields (*Lasthenia conjugens*) is an annual herb that grows 4–12 inches (10–30 centimeters) tall, blooms from March to June, and is found in mesic habitats including vernal pools, swales, moist flats, and depressions within a grassland matrix with a typical elevational range of 6–200 feet (2–61 meters) (CNDDDB 2007, cited in USFWS 2008c). It was listed as federally endangered in 1997. This species also has a CNPS Rare Plant Rank of 1B.1.



Contra Costa Goldfields  
(*Lasthenia conjugens*)  
Copyright: Zoya Akulova, 2009.

Occurrences of the species are found in five centers of concentration in the northern and central Coast Range and western part of the Central Valley in Solano and Contra Costa Counties. By far, the greatest concentration of this species is in the area east of Fairfield in Solano County. Several historical collections were from populations growing in the saline-alkaline transition zone between vernal pools and tidal marshes on the eastern margin of the San Francisco Bay (CNDDDB 2002, cited in USFWS 11 August 2005).

Although some of the habitat characteristics of the species are known, specific pool characteristics that determine suitability for Contra Costa goldfields germination, growth, reproduction, and dispersal are not well understood. This species is normally observed in only a few pools within the vernal pool complexes in which it is found (USFWS 11 August 2005). The two most commonly reported associates of this species are Italian ryegrass (*Lolium multiflorum*) and popcornflower. Other rare plants that co-occur with Contra Costa goldfields include alkali milk-vetch (*Astragalus tener* var. *tener*), few-flowered navarretia (*Navarretia leucocephala* ssp. *pauciflora*), and Greene's legenere (*Legenere limosa*) (CNDDDB 2007, cited in USFWS 2008c).

<sup>29</sup> Plants with C4 photosynthesis utilize a more complex biochemical process than most plants (with C3 photosynthesis) in converting carbon dioxide to energy, which increases photosynthetic efficiency at low carbon dioxide concentrations (Boykin et al. 2008 as cited in USFWS 2009b).



Many historical occurrences of this species have been extirpated by development and agriculture. Contra Costa goldfields is currently threatened by development, habitat alteration, hydrological alterations, overgrazing, and non-native plants (CNPS 2013). The status of the species is uncertain, due in part to the difficulty of relocating sites, and also because this species may reappear on a site after several years, even if absent during a given survey. Of the 32 reported occurrences in the CNDDDB, 20 occurrences are presumed extant (USFWS 2008c).

Contra Costa goldfields has not been documented on NRTF Dixon. However, it has the potential to occur, given its presence and designation of Critical Habitat at nearby locations (Table 3-4; Map 3-10). The vernal pools at NRTF Dixon are dominated by popcornflower associations, one of the most commonly reported associates of this species. Moreover, CNDDDB records indicate the presence of alkali milk-vetch, a rare species known to co-occur with Contra Costa goldfields, just south of NRTF Dixon. PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.

### 3.7.4 Conservancy Fairy Shrimp (Federally Endangered)

Conservancy fairy shrimp are tiny freshwater crustaceans with delicate elongate bodies, large stalked compound eyes and 11 pairs of phyllopods (swimming legs that also function as gills) (USFWS 2012a). It is endemic to vernal pools in California and was listed as federally endangered in 1994.

The Conservancy fairy shrimp is restricted to the Central Valley except for one population along the Central Coast in Ventura County. The majority of sites inhabited by this species are relatively large and turbid vernal pools (from 1–2 acres [0.4–0.8 hectares] to 88 acres [35 hectares]), often referred to as playa pools (Helm 1998; Eriksen and Belk 1999, cited in USFWS 2012a; Vollmar 2002, cited in USFWS 2012a; USFWS 11 August 2005). At Jepson Prairie, CNDDDB has 13 locality records for this species, referred to as the Jepson Prairie population. Populations exist at Yolo Bypass Wildlife Area in Yolo County and Mariner Ranch in Placer County, among others. Currently the USFWS is aware of ten populations of Conservancy fairy shrimp (USFWS 2012a).



Conservancy Fairy Shrimp  
(*Branchinecta conservatio*)  
Copyright: Doug Wirtz, 2009.

Threats to this species include urban development, agricultural conversion, and reduced water supply for habitat.

Conservancy fairy shrimp have not been documented on NRTF Dixon. However, the species has the potential to occur, given its presence and designation of Critical Habitat at nearby locations (Table 3-4; Map 3-10). PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.

### 3.7.5 Vernal Pool Fairy Shrimp (Federally Threatened)

The vernal pool fairy shrimp is a small freshwater crustacean 0.12 to 0.15 inches long, endemic to California and the Agate Desert of southern Oregon. It was listed as federally threatened in December 1994.

The species has a relatively short life-span, allowing it to hatch, mature to adulthood, and reproduce within the short time period when vernal pools contain water. When the temporary pools dry, fairy shrimp offspring in the form of desiccation-resistant embryos (also called cysts) persist in the substrate until winter

rains return, and appropriate temperatures induce some of the cysts to hatch. The species' range often spreads via the flooding and movement of wildlife within and through vernal pool complexes, allowing fairy shrimp to disperse between individual pools. As a result, vernal pool fairy shrimp are best characterized as pertaining to specific vernal pool complexes, rather than individual pools.

Threats to this species include vernal pool habitat loss and degradation from urban development, agricultural conversion, and altered hydrology. Predation of vernal pool crustaceans by non-native bullfrogs also increases the threat of predation beyond that found naturally.

Mosquitofish pose a threat if they are able to move into vernal pools from nearby canals or other permanent water sources via flows from swales, drainages, and flooding. Introduction of pesticides and other contaminants into vernal pool waters may also threaten occurrences of the vernal pool fairy shrimp.

Approximately 5,261 hectares of vernal pool habitats, including mitigation banks, have been set aside for the vernal pool fairy shrimp, specifically as terms and conditions of section 7 consultations. In the region of NRTF Dixon, vernal pool fairy shrimp are protected on several preserves in the Jepson Prairie area, and at Travis Air Force Base in Solano County (USFWS 2005, 2007a), including Critical Habitat designations (Table 3-4; Map 3-10). The status of the vernal pool fairy shrimp at NRTF Dixon to date is unknown. PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.

### 3.7.6 Vernal Pool Tadpole Shrimp (Federally Endangered)

The vernal pool tadpole shrimp was listed as federally endangered in December 1994 and is found only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands in California. They maintain a patchy distribution across the Central Valley of California from Shasta County south to northwestern Tulare County, with isolated occurrences in Alameda and Contra Costa Counties.

The species can be identified by the large, shield-like carapace that covers the front half of its body. Its size, when mature, ranges from 0.6 to 3.3 inches in length. Vernal pool tadpole shrimp have much longer lifespans than many other vernal pool crustaceans and they continue growing throughout their lives, periodically molting their shells. It feeds on fairy shrimp species and on detritus. Threats to this species are the same as the vernal pool fairy shrimp previously described (USFWS 2005, 2007b).

In the vicinity of NRTF Dixon, 40 occurrences of vernal pool tadpole shrimp have been documented on the Jepson Prairie, Travis Air Force Base, private land, and near Montezuma in Solano County. Current distribution is highly reduced compared to historic distribution due to habitat loss and degradation. The status of the vernal pool tadpole shrimp at NRTF Dixon to date is unknown. Critical Habitat has been designated for this species in the area of NRTF Dixon (Table 3-4; Map 3-10). PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.



Vernal Pool Fairy Shrimp  
(*Branchinecta lynchi*)  
Copyright: Abigail Fateman,  
2012.



Vernal Pool Tadpole Shrimp  
(*Lepidurus packardii*)  
Copyright: Bill Stagnaro, 2010.

### 3.7.7 Delta Green Ground Beetle (Federally Threatened)

The delta green ground beetle was thought extinct, but rediscovered in 1974 at Jepson Prairie in Solano County. At the time of its federal listing of threatened in August 1980, it was known to occur on the edges of only two vernal pools in Solano County, south of the city of Dixon; these areas are included in its Critical Habitat designation (also finalized in 1980) (Table 3-4; Map 3-10). It is threatened by agricultural practices and other habitat modifications; almost half of the beetle's known occurrences remain on unprotected, private lands. It is believed to have had a more extensive historical range.



Delta Green Ground Beetle  
(*Elaphrus viridis*)  
Copyright: Adam G. Clause, 2012.

The delta green ground beetle is a 0.25-inch long member of the ground beetle family (Carabidae) with brilliant metallic green and bronze coloring. It is typically found along the margins of vernal pools and in bare areas along trails and roadsides, where individuals often hide in cracks in mud and under low-growing vegetation. This species is primarily associated with Pescadero clay (the clay base to vernal pools and lakes), the Solano-Pescadero complex, Solano loam, and Pescadero clay loam. It is believed that beetle larvae crawl into soil cracks, when vernal pools dry up, to survive the hot summer and fall as diapausing pupae. The beetle is also known to frequent upland habitat—they have been found hundreds of meters from the nearest shoreline—but only during the wet season.

Surveys for the beetle (as part of its Recovery Plan, USFWS 2005) are ongoing within and outside of the Jepson Prairie area, where it was rediscovered in 1974. However, the beetle can be difficult to locate, even by trained professionals; in some cases, its presence should be assumed on proximity to known occurrences and the suitability of the habitat to support the beetle. The presence of springtails (Collembola)—the most important prey source for the beetle—is a required habitat trait (USFWS 2009a). Recent surveys found the beetle only at those pools strongly associated with Pescadero clay soil and those pools without extensive buildup of invasive plants (Arnold and Kavanaugh 2007, cited in USFWS 2009a). The USFWS Recovery Plan for the species (2005) calls for protection of all known beetle occurrences and protection of 95 percent of suitable beetle habitat in the nearby Jepson Prairie area.

As of 2007, there were seven extant populations in the area, including Jepson Prairie Preserve, Wilcox Ranch, Calhoun Cut Ecological Reserve, Barker Slough Management Unit, the Michael Remy vernal pool preserve, the Burke Ranch, and Campbell Ranch (USFWS 2005, 2009a). To date, its status on NRTF Dixon is unknown. PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.

### 3.7.8 Delta Smelt (Federally Threatened, State Endangered)

The delta smelt was listed as federally threatened on 05 March 1993 and upgraded from state threatened to state endangered on 20 January 2010. Populations are believed to have declined significantly recently (1991-2001), with record lows from 2002 to 2008. Population numbers are now estimated at the lowest levels ever measured (USFWS 2010a).

Reclassification of their listing was not recommended at the time of the USFWS 2004 five-year review, as there was no indication at the time that the decreasing trend observed in 2002 was outside of the range of expected variability. In response to a recent petition to reclassify the delta smelt from a threatened to an endangered species, the USFWS stated that



Delta Smelt  
(*Hypomesus transpacificus*)  
Copyright: B. Moose Peterson,  
USFWS, 2005.

they believed the reclassification was warranted, but precluded by other higher priority listing actions. They suggested that they would develop a proposed rule for the reclassification as their priorities allow (USFWS 07 April 2010). Critical Habitat for delta smelt was designated in December 1994 (Table 3-4; Map 3-10).

Delta smelt are slender-bodied fish, usually 2 to 3 inches long (though up to 4.7 inches long has been observed). They are nearly translucent with a steely blue sheen to their sides. They are endemic to the Sacramento Delta, where they are distributed from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties. The delta smelt is pelagic (lives in the open water column away from the bottom) and tolerant of a wide salinity range. They have been collected from estuarine waters up to 14 parts per thousand salinity (USFWS 19 December 1994).

Threats include:

- Reduced Delta water flow, during late spring through fall and early winter, which moves the delta smelt's low-salinity zone upstream to smaller areas, where there is increased competition for their prey. Causes of reduced flow include smaller upstream releases from dams, increased water exports from state and federal facilities, and upstream water diversions for flooding rice fields.
- Increased water clarity during the summer and fall, indicating a decrease in turbidity, which is needed for delta smelt to capture prey and avoid predators. Increased water clarity in delta smelt rearing habitat is due to decreased sediment transport by upstream dams and the spread of the invasive Brazilian waterweed (*Egeria densa*) that traps suspended sediments.
- Competition from introduced species, including the overbite clam (*Corbula amurensis*), which also feeds on delta smelt prey species.
- Possible predation by non-native fish including striped bass (*Morone saxatilis*), largemouth bass (*Micropterus salmoides*), and in particular, inland silversides (*Menidia beryllina*).

The delta smelt have not been observed at NRTF Dixon, to date. It is unknown to what degree water resource management practices at NRTF Dixon may affect delta smelt populations within the Delta and its designated Critical Habitat (Table 3-4). Spawning of the delta smelt has been known to occur in Cache Slough, approximately seven miles south of NRTF Dixon. Haas Slough, which is approximately more than one mile south of NRTF Dixon, connects to Cache Slough (Map 3-6). PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns. Recent meetings of the USFWS and NAVFAC Southwest have determined that no PCEs necessary for the delta smelt are present on NRTF Dixon.

### 3.7.9 Giant Garter Snake (Federally and State Threatened)

The giant garter snake has been listed as state threatened since 1971, and its range has changed little since its federally threatened listing in 1993.

The giant garter snake is endemic to valley floor wetlands in Sacramento and San Joaquin Valleys. It prefers freshwater marshes and low gradient streams, though it has adapted to drainage canals and irrigation ditches. Water habitats are used during the species' active season, while emergent herbaceous wetland vegetation is used for foraging. Often, giant garter snakes will bask on grassy banks and in openings in waterside vegetation, though they are also known to take refuge in higher elevation upland habitat, especially to escape flooding. They feed on small fishes, tadpoles, and frogs. In agricultural areas, they are most known to inhabit fields cultivated



Giant Garter Snake  
(*Thamnophis gigas*)  
Copyright: Dave Feliz.

with rice. Primary threats to the giant garter snake include habitat loss and degradation. In most of its range, these habitat changes have occurred due to expanding urban development.

Recently, a new population of giant garter snakes was discovered at Yolo Bypass in 2005. Records indicate that in the area of NRTF Dixon, the giant garter snake has included small population clusters on isolated patches of limited quality habitat at Willow Slough (north of Dixon and west of Sacramento) in the late 1980s, at Yolo Wildlife Area (north of Dixon and west of Davis) in 2005, and at Liberty Farms (almost immediately southeast of the NRTF Dixon) in 1987. However, recent surveys conducted by USGS in 2004 and 2005 found no giant garter snakes near Liberty Farms. Some studies concluded that the snake may no longer occur in Solano County (Wylie and Martin 2004, cited in USFWS 2006; USFWS 2012c). The USFWS considers populations in the Yolo Basin to be threatened with extirpation. Distribution maps of this species overlap the NRTF Dixon area (Stebbins 2003).

Presence of the giant garter snake on NRTF Dixon was reported as an incidental sighting by an employee of the O&M contractor in 2009–2010. Its presence at the facility was not confirmed by an expert and the species has not been reported there since (Table 3-4). Critical Habitat has not been designated for this species.

### 3.7.10 California Tiger Salamander (Federally and State Threatened)

The Central population of California tiger salamander<sup>30</sup> (*Ambystoma californiense*) was listed as federally threatened in 2004 and listed as state threatened in 2010. It is a large, stocky, terrestrial salamander with a broad, rounded snout. Adult males are about 8 inches long, females a little less than 7 inches. Coloration consists of white or pale yellow spots or bars on a black background on the back and sides. The belly varies from almost uniform white or pale yellow to a variegated pattern of white or pale yellow and black. The salamander's small eyes protrude from the head.



California Tiger Salamander  
(*Ambystoma californiense*)  
Copyright: John Cleckler,  
USFWS, 2009.

The California tiger salamander is estimated to have disappeared from more than 50 percent of its historic range (California Herps 2013). Their current range in California consists mostly of the Central Valley and Sierra Nevada foothills from Yolo to Kern Counties with small populations around Santa Barbara and Sonoma (USFWS 2013). The species spends most of its life on land, living in estivation in underground burrows made by squirrels and other animals. Its habitat requirements include grasslands and low foothills with ephemeral pools or ponds for breeding. Adults feed primarily on insects; larvae eat algae, mosquito larvae, tadpoles, and insects. In November, the salamanders emerge from their burrows, traveling as much as a mile to a pond to breed. They return to their burrows in late spring. In a given year, populations in a single pond can decline to less than 20 breeding adults, making them prone to local extinction. For population stability, they require large contiguous areas of vernal pools containing multiple breeding ponds (USFWS 2013).

The California tiger salamander's natural predators include birds, such as herons and egrets. Bullfrogs, crayfish, mosquito fish, green sunfish, and other introduced species prey on adult or larval salamanders. Introduced subspecies of the tiger salamander also pose a threat: they may out-compete the California tiger salamanders or interbreed to create hybrids less adapted to California climate (USFWS 2013). Human-induced threats include loss or fragmentation of suitable habitat through urbanization, agriculture

<sup>30</sup> Three distinct populations are recognized by the USFWS. They include the Sonoma County population, Santa Barbara County population, and the Central California population. Of the three, Critical Habitat for the Central California population is designated near NRTF Dixon. The Central California population was listed as federally threatened on 04 August 2004 and its Critical Habitat designated on 23 August 2005. The Sonoma County and Santa Barbara County populations of this species are listed as federally endangered.

and associated activities. Ground squirrel control programs may reduce the number of burrows where salamanders live. Moreover, poisons used on ground squirrels disproportionately affect salamanders, due to their smaller size and permeable skins. Indirect impacts from pesticides in mosquito abatement may also affect California tiger salamanders through reduction of prey. Like California toads, vehicle traffic poses a threat to salamanders, during their breeding migration.

No California tiger salamanders have been observed at NRTF Dixon. However, the installation is located within the species' range (according to the CDFW species range maps) and could contain suitable habitat, particularly in the grassland areas. The wetland and vernal pool areas within the NRMA may provide suitable breeding habitat. Critical Habitat has been designated for this species at Jepson Prairie, approximately 6 miles southwest of the installation (Table 3-4); this unit contains four extant occurrences of the species in one aggregation (USFWS 23 August 2005). PCEs identified by the USFWS for the species' Critical Habitat are discussed in Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns.

### **Protection of Threatened and Endangered Species and Critical Habitat**

The ESA was revised via the National Defense Authorization Act of 2004 (Public Law 108-136) to recognize INRMP conservation measures and species benefit that could obviate the need for Critical Habitat designation on Navy lands. All Navy installations with federally listed threatened or endangered species, proposed federally listed threatened or endangered species, candidate species,<sup>31</sup> or unoccupied habitat for a listed species where Critical Habitat may be designated, must structure the INRMP to avoid the designation of Critical Habitat.<sup>32</sup> The INRMP may obviate the need for Critical Habitat if it specifically addresses both the benefit provided to the listed species and the provisions made for the long-term conservation of the species. The species benefit must be clearly identifiable in the document and referenced as a specific topic in the INRMP table of contents. Currently, there is Critical Habitat designated for delta smelt on NRTF Dixon; it was designated in 1994.

The USFWS uses a three-point criteria test to determine if an INRMP provides a benefit to the species. An installation is strongly encouraged to use these USFWS criteria, listed below, when structuring its INRMP to avoid the need for Critical Habitat designation.

1. The plan<sup>33</sup> provides a conservation benefit to the species and demonstrates the provisions made for long-term conservation of the species. The cumulative benefits of the management activities identified in this INRMP, for the length of the INRMP, must maintain or provide for an increase in a species' population, or the enhancement or restoration of its habitat within the area covered by the plan (i.e. those areas deemed essential to the conservation of the species). A conservation benefit may result from reducing fragmentation of habitat, maintaining or increasing populations, ensuring against catastrophic events, enhancing and restoring habitats, buffering protected areas, or testing and implementing new conservation strategies.

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<sup>31</sup> Federal Candidate species are plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. The USFWS encourages cooperative conservation efforts for these species because they are, by definition, a species that may warrant future protection under the ESA (USFWS 2011).

<sup>32</sup> Critical Habitat is defined in Section 3(5)(A) of the ESA as "(i) the specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection...upon a determination...that such areas are essential for the survival of the species." The designation of Critical Habitat for a listed species is one of several protection measures aimed at aiding recovery of the species and its removal from federal listing. The Navy requires Chief of Naval Operations-level review of changes to or proposals for Critical Habitat per Secretary of the Navy memo 25 November 2002.

<sup>33</sup> For NRTF Dixon, "the plan" refers to the INRMP itself.

2. The plan provides certainty that the management plan will be implemented. Persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all the necessary authorizations or approvals. An implementation schedule, including completion dates, for the conservation effort is provided in the plan.
3. The plan provides certainty that the conservation effort will be effective. The following criteria will be considered when determining the effectiveness of the conservation effort. The plan includes (a) biological goals (broad guiding principles for the program) and objectives (measurable targets for achieving the goals); (b) quantifiable, scientifically valid parameters that will demonstrate achievement of objectives and standards for these parameters by which progress will be measured are identified; (c) provisions for monitoring and, where appropriate, adaptive management; (d) provisions for reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided; and (e) a duration sufficient to implement the plan and achieve the benefits of its goals and objectives.

### **Specific Issues for Threatened and Endangered Species and Critical Habitat**

- Minimal or no surveys have been conducted to determine the presence or absence of some potentially occurring federally listed species at NRTF Dixon.
- While the delta smelt has not been documented at NRTF Dixon to date, Critical Habitat was designated on three-quarters of the installation property in December 1994. The delta smelt Critical Habitat boundary coincides with the boundary of the Delta Protection Act of 1959 in the upper watershed of the San Joaquin Delta in which NRTF Dixon is located. While there are no PCEs for delta smelt present (Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns), the installation's hydrologic connection to Delta waters downstream where delta smelt may be found is still undetermined.

### **Assessment of Current Management**

As a part of the natural resources program, the goals and objectives of NRTF Dixon's federally endangered and threatened species management are to protect, conserve, and enhance those populations in accordance with all applicable federal and Navy regulations. This is critical to the mission because biodiversity conservation contributes to overall ecosystem integrity and sustainability, which in turn supports the military mission by maintaining natural landscapes for realistic military operations.

Programs to protect endangered, threatened, and sensitive species and their associated habitats are budgeted and supported by NRTF Dixon and Commander, Navy Region Southwest. Management of federally listed threatened and endangered species will continue to be accomplished by managing land uses in close coordination with the USFWS and with other appropriate land managers. Any action that may potentially affect (positively or negatively) the continued existence of a federally endangered or threatened species must undergo consultation with the USFWS (Section 4.7: Natural Resources Consultation Planning). Management programs are coordinated with the USFWS as appropriate and required. Informal consultation is undertaken on a case-by-case basis by NAVFAC Southwest.

At this time, no federally threatened or endangered species have been documented at NRTF Dixon. Future surveys to be conducted on the installation may identify federally listed species leading to development of specific management plans in consultation with the USFWS. In the meantime, current management of potentially suitable habitat for federally threatened and endangered species populations at NRTF Dixon is addressed in the INRMP, including consideration for the delta smelt Critical Habitat designated on 75 percent of installation property. Habitat enhancement monitoring proposed in other sections of the INRMP

contributes opportunities to detect any previously undocumented federally listed species at NRTF Dixon. Such surveys and monitoring are necessary to identify existing (including periodically or indirectly utilized) habitat for those species, and to assist in the determination as Critical Habitat.

Should any federally listed species be identified at NRTF Dixon, appropriate conservation efforts, management strategies, and plans should be developed in consultation with the USFWS and implemented through approval and funding from the NRTF Dixon command and follow recognized monitoring methodologies. Annual INRMP metric updates provide a formal means to utilize adaptive management and review progress made for protecting and conserving any federally threatened and endangered species that may exist at NRTF Dixon.

## Management Strategy

**Objective:** *Conduct surveys for presence of federally listed species, species proposed for listing, and federal candidate species for listing.*

- I. Conduct surveys (using established methodology) of listed species to determine presence or absence of species during breeding and non-breeding season.
  - A. Develop a standard format and a database to collect and maintain records of observations.
  - B. Develop an accurate and complete GIS database of all federally listed species, species of special management concern, and related features at NRTF Dixon.
- II. Continue to survey for federally threatened and endangered species and candidate species potentially occurring at NRTF Dixon as part of regular species surveys, including newly listed species.
- III. Track the listing status of species being proposed for listing under the federal ESA.

**Objective:** *Protect and conserve federally listed species, species proposed for listing, federal candidate species for listing, and their habitats that occur at NRTF Dixon in accordance with ESA.*

- I. If any federally listed species are confirmed present NRTF Dixon, appropriate management plans and monitoring activities shall be developed for them in consultation with the USFWS, and incorporated into the natural resources management program and the INRMP.
- II. Implement habitat management approaches described in this INRMP, which benefit native and federally listed species.
  - A. As they are developed and as needed, integrate species-specific management actions/plans into general habitat management plans for NRTF Dixon.
  - B. Protect habitats potentially home to listed species from disturbance, in particular wetlands and vernal pools in the NRMA. Determine appropriate BMPs for pesticide applications necessary in these areas.
  - C. Monitor implementation of activities and adjust as needed based on results.
- III. Given the designation of Critical Habitat, yet absence of the delta smelt and lack of its PCEs, on NRTF Dixon, continue to seek USFWS input in implementing projects and/or habitat enhancement activities that may affect aquatic habitats at NRTF Dixon or downstream Delta waters.
  - A. Investigate the potential connection of NRTF Dixon water resources, aquatic and wetland habitats with downstream San Joaquin Delta waters that may be inhabited by the delta smelt. The smelt is known to spawn in Cache Slough, 7 miles south of NRTF Dixon. Haas Slough, a little more than 1 mile south of the installation, connects to Cache Slough.



- IV. Seek opportunities to develop partnerships with institutions, organizations, and other researchers to develop and improve knowledge and management of federally listed species present at NRTF Dixon and to contribute to regional initiatives for those species.

## 3.8 Other Special Status Wildlife Species

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There are 28 special status species that occur at NRTF Dixon, including those with designations under CITES, USFWS BCC, as well as state listed species and state species of special concern (SSC).

Species discussed in detail in the following subsections (Section 3.8.1: Reptiles and Amphibians through Section 3.8.3: Mammals) and presented in Table 3-5 include only those species documented on the installation that: (a) have a federal designation—for NRTF Dixon, this is only USFWS BCC, since there are currently no federally listed species documented; (b) are state listed threatened or endangered; or (c) are identified as California SSC for species groups other than birds.<sup>34</sup> A number of species documented at NRTF Dixon have more than one special status designation.

Species with only a CITES designation or birds designated only as California SSC are not treated in detail here;<sup>34</sup> however, they are listed below as part of the definitions for the various special status designations. All special status species are presented in Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon.

### Species of Special Concern

A variety of SSC lists, created for use by other agencies and organizations (e.g. CITES, Bureau of Land Management, USFS, National Audubon Society, USFWS, and CDFW), serve as watch lists for species that are worthy of a conservation effort and that may potentially deserve formal listing. The lists used in this INRMP include:

- CITES designation applied to roughly 5,000 animal and 29,000 plant species to protect their continued survival from the impacts of international trade, whether traded as live specimens, food (including dried herbs), or integrated into products (e.g. clothing, jewelry). CITES is an international agreement to which countries adhere voluntarily. Though it is legally binding and signatory countries are required to implement the Convention, it does not take the place of national laws. Eighteen CITES-listed species have been documented at NRTF Dixon. Those species with a CITES designation only include: American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), ferruginous hawk (*Buteo regalis*), great horned owl, merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*), cattle egret, Canada goose, green-winged teal (*Anas crecca*), northern pintail (*Anas acuta*), and northern shoveler (*Anas clypeata*). NRTF Dixon species with other special status designations (discussed below) in addition to CITES include: burrowing owl, northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), Swainson's hawk, and white-tailed kite (*Elanus leucurus*).

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<sup>34</sup> The USFWS no longer maintains Species of Special Concern lists for any species groups other than birds. As a result, to determine which avian species are presented in Table 3-5 and addressed in detail in this section, the USFWS BCC list is used in lieu of the CDFW SSC list for birds. For all other species groups, the CDFW SSC list is used.

Table 3-5. Other special status wildlife present at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	Intl/Federal/ State Status	Presence at NRTF Dixon	NRTF Dixon Management?
Western spadefoot toad	<i>Spea hammondi</i>	-/ISSC	Heard calling within the NRMA during 2009-2010 surveys, but not observed.	Encompassed in this INRMP's ecosystem management approach.
Burrowing owl	<i>Athene cunicularia</i>	CITES/BCC/ SSC	Resides in burrows in the grasslands in the antenna field and NRMA.	Encompassed in this INRMP's ecosystem management approach. Population monitoring and reports.
Long-billed curlew (non-breeding season)	<i>Numenius americanus</i>	-BCC/-	Grasslands in the antenna field and NRMA. Documented in both the 2002 INRMP and 2009-2010 surveys.	Encompassed in this INRMP's ecosystem management approach.
Loggerhead shrike	<i>Lanius ludovicianus</i>	-BCC/SSC	Observed throughout the installation in 2009-2010 surveys. Document as present in 2002 INRMP.	Encompassed in this INRMP's ecosystem management approach.
Swainson's hawk	<i>Buteo swainsoni</i>	CITES/-ST	Forages over agricultural fields, preying on small mammals. Nesting pair observed in eucalyptus tree near the main gate in 2009-2010 surveys.	Encompassed in this INRMP's ecosystem management approach.
Whimbrel (non-breeding season)	<i>Numenius phaeopus</i>	-BCC/-	Incidental sighting on the installation by S. Smallwood in 2006, 2007.	Encompassed in this INRMP's ecosystem management approach.
Yellow-billed magpie	<i>Pica nuttalli</i>	-BCC/-	Documented as present in the 2002 INRMP.	Encompassed in this INRMP's ecosystem management approach.
Pallid bat	<i>Antrozous pallidus</i>	-/ISSC	Recorded as present in 2009-2010 surveys along the western perimeter of the installation.	Encompassed in this INRMP's ecosystem management approach.

Codes:

International: CITES = species is included on a list maintained by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2012).

Federal: BCC = USFWS Birds of Conservation Concern.

State: SSC = California Species of Special Concern; ST = State Threatened; CFP = California Fully Protected.

Sources: CDFW 2013a; USFWS 2008a; CITES 2012; Navy 2002; TDI 2012; S. Smallwood pers. com.; Smallwood and Morrison 2008.

- USFWS BCC designation applied to migratory and non-migratory birds that without additional conservation actions “are likely to become candidates for listing under the ESA of 1973” (Fish and Wildlife Conservation Act amended 1988; USFWS 2008a). BCC species are considered all nongame birds; gamebirds without hunting seasons; subsistence-hunted nongame birds in Alaska; and ESA candidates, proposed endangered or threatened, and recently delisted species. The USFWS maintains BCC lists for various Bird Conservation Regions (BCRs) throughout the United States; NRTF Dixon falls within BCR 32 Coastal California. There are five BCC birds documented at NRTF Dixon: burrowing owl, long-billed curlew (*Numenius americanus*), loggerhead shrike, whimbrel (*Numenius phaeopus*), and yellow-billed magpie (*Pica nuttalli*) (Table 3-5; Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon).<sup>35</sup>
- California SSC designation applied by the CDFW to species that are not listed under the ESA or California Endangered Species Act, but which, nonetheless are (1) declining at a rate that could result in listing, or (2) historically occurred in low numbers and known threats to their persistence currently exist (CDFG 2011). There are ten SSC species documented at NRTF Dixon, two of which are also BCC (Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon): western spadefoot toad, northern harrier, short-eared owl, burrowing owl, loggerhead shrike,

<sup>35</sup> The USFWS BCC list was last published in 2008. It has been noted that there are differences between this USFWS published list and birds identified as BCC in other lists maintained by the CDFW and an interactive map on the DoD-PIF website (though the DoD-PIF website also maintains a link to the 2008 USFWS BCC list). This INRMP relies on the 2008 USFWS published BCC list as the source of BCC designations. The bird species identified as BCCs for NRTF Dixon will be updated at the time that the USFWS publishes an updated BCC list.

yellow-breasted chat (*Icteria virens*), American white pelican (*Pelecanus erythrorhynchos*), black tern (*Chlidonias niger*), song sparrow (*Melospiza melodia*; Modesto population), and pallid bat.

- State Fully Protected designation given by the CDFW to species that may not be taken or possessed at any time and no licenses or permits may be issued for their take, except for collecting these species for necessary scientific research, and relocation of the bird species for the protection of livestock (CDFG 2011). There is only one State Fully Protected species documented at NRTF Dixon: white-tailed kite.

## State Listed Species

Species within California designated by the CDFW as either endangered or threatened have specific, state-driven legal protection as described in the California Endangered Species Act (as amended in 1984). There is only one state threatened species documented at NRTF Dixon: Swainson's hawk (Table 3-5; Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon; CDFW 2013a).

Although protection of non-federally listed species is not mandatory on federal installations, management of these species contributes to the overall maintenance of their natural populations and reduces the likelihood that these species will be given additional legislative protection in the future. In particular, the USFWS points out that its BCC list, according to BCRs, will be most useful to federal land-managing agencies and their partners in their efforts to abide by the bird conservation principles embodied in the MBTA and EO 13186 (USFWS 2008a).

## 3.8.1 Reptiles and Amphibians

### Western Spadefoot Toad (SSC)

The western spadefoot toad is California SSC. It is a relatively smooth-skinned species of spadefoot toad with pale gold eyes that have vertical pupils and is generally found near wetland habitats. They have a wedge-shaped black spade on each hind foot and adults are between 1.5 and 3 inches (3.8 and 7.5 centimeters). The species ranges throughout the Central Valley of California, its populations being localized, but widespread. It is considered nearly endemic to central and southwestern California, where it has been extirpated from many sites (Jennings and Hayes 1994). They prefer short-grass plains and sandy or gravelly soils (such as alkali flats, washes, and alluvial fans). The species is almost completely terrestrial, entering the water only to breed (Jennings and Hayes 1994). Western spadefoots are primarily nocturnal, during which time they prey on a variety of insects. With the ability to migrate up to several hundred meters between nonbreeding and breeding, western spadefoots are most active during rains of winter-spring breeding. Adults tend to show high fidelity to specific breeding sites, which include temporary rain pools and slow-moving streams. They can also be active during summer storms or evenings with high soil moisture levels. For the rest of the year, they remain belowground, especially during dry and cold weather (they have sometimes been observed to occupy small mammal burrows) (Jennings and Hays 1994). Threats are primarily urbanization and agricultural development. Some populations may also be threatened by habitat fragmentation or exotic species (such as mosquitofish stocked for mosquito abatement, bullfrogs, and crayfish) (Jennings and Hayes 1994; Clausen and Hammerson 2002).



Western Spadefoot Toad  
(*Spea hammondi*)  
Copyright: Gary Nafis  
caherps.com.

During the most recent surveys at NRTF Dixon, one or two calls of the western spadefoot toad were heard among hundreds of Pacific treefrogs in the NRMA; however, no spadefoots were seen (TDI 2012).

## 3.8.2 Birds

### Burrowing Owl (CITES, BCC, SSC)

The western burrowing owl is a BCC and SSC. It is often characterized as the only diurnal owl in North America, though its diurnal activities are mostly limited to males guarding nest burrows. Most burrowing owl activity occurs during transition periods between day and night and at night. They feed on small mammals, small birds, amphibians, lizards, invertebrates, and carrion.



Burrowing Owl  
(*Athene cunicularia*)  
Copyright: Smallwood and  
Morrison 2008.

There is a high density of burrowing owl nesting pairs at NRTF Dixon; the population appears to be relatively stable and the largest remaining in Solano and Yolo Counties (Smallwood and Morrison 2008). At the facility, they are found throughout the antenna field, nesting in ground squirrel burrows, within the inverted concrete culverts (half-rounds) that cover the transmitting cables, and within 15 artificial burrows constructed for the owls in 2000 (seven doubles and one single in eight constructed mounds). However, there has been a decline in nesting pairs using the artificial burrow mounds (Smallwood and Morrison 2008). The mounds have deteriorated substantially due to ground squirrel burrowing and weed establishment. Plastic placed on the mounds to control weeds has not been effective.

Half-rounds, on the other hand, appear to be the most important nesting structure for the species at NRTF Dixon (Smallwood and Morrison 2008). They provide convenient nest sites and rise above ground just high enough for burrowing owls to perch upon in order to detect approaching predators. Burrowing animals are attracted to the fill soil that buries the cables (that provide power to the antenna arrays) as opposed to the undisturbed clay and clay loams underlying the installation, which are difficult to burrow in. Gaps between the cable covers often serve as entryways to nest sites underneath. Burrowing owls have nested within these cable covers at NRTF Dixon for many years without any conflict to the operation of the facility (Smallwood and Morrison 2008).

Other structures at NRTF Dixon that may benefit burrowing owls include paved road surfaces and concrete-lined ditches, which are often undermined by ground squirrels and the resulting cavities used by burrowing owls as nest sites. On a couple of occasions, they have also been observed nesting in a hollowed-out utility pole used as a perimeter marker of an antenna array. Nests created in such places are considered damaging to infrastructure and in need of repair. Burrowing owls also find additional perch opportunities along the cyclone fence surrounding the main building complex, road signs, and on signs marking buried cable (Smallwood and Morrison 2008).

Throughout the installation, the antenna arrays appear to be more strongly selected by the burrowing owls, though some additional nests are occasionally found in areas set apart from the arrays (Smallwood and Morrison 2008).

It is possible that a population decrease from 2006 to 2007 (43 nest burrows to 24 nest burrows) was due to natural inter-annual variation in burrowing owl abundance on the installation. However, the decrease may also be due to the decline in performance of the artificial burrows at NRTF Dixon (Smallwood and Morrison 2008). In a May 2010 survey, 31 nesting pairs of burrowing owls were counted, suggesting a slight rebound of nesting pairs. None of the artificial burrows or their overlying soil mounds were occupied by burrowing owls in that survey.

Vulnerabilities of this species derive primarily from their use of burrows, including aerial and ground predators (coyotes, hawks, other owls), land conversions, ground disturbing activities, and potential decline of California ground squirrels, their principal burrow providers.<sup>36</sup> They are also vulnerable to pesticides (Rosenberg et al. 2009) and auto collisions. Burrowing owls can lose habitat to tree propagation and cessation of grassland management as well, which results in tall, dense stands of vegetation. Once tall herbaceous plants cover soil mounds atop artificial burrow systems or crowd other burrows, they are no longer attractive to burrowing owls. In the vicinity of NRTF Dixon, experts have observed that burrowing owl populations are declining largely due to residential and commercial development (Johnson 1997; S. Smallwood, pers. comm. 2011).

### Long-Billed Curlew (BCC)

The long-billed curlew is listed as a BCC by the USFWS for the species' non-breeding season in BCR 32, in which NRTF Dixon is located. This species is North America's largest shorebird; it breeds on dry prairies and plains in the western United States and migrates to spend its winters in California and points farther south. During migration and the non-breeding season, this species spends its time on various natural and artificial wetland habitats including evaporation and sewage ponds and grassland habitats in California's Central Valley, as well as flooded agricultural fields and associated water features such as drainage ditches, sloughs, farm ponds, and reservoirs. Its bill is best adapted for capturing invertebrates living in burrows in mud and pastures. The population of long-billed curlews in North America was significantly reduced at the end of the 19th century by hunting. In their non-breeding range in California, their wintering habitat in wetlands has declined by 90 percent. Major threats continue to be impacts from development and projected climate change. Pesticide spraying may also harm curlews indirectly by reducing food supplies, particularly grasshoppers (Dugger and Dugger 2002; Cornell Lab of Ornithology 2013a). This species was observed at NRTF Dixon in May 2010 during the most recent surveys, at which time it was likely migrating back to its breeding grounds (TDI 2012).



Long-Billed Curlew  
(*Numenius americanus*)  
Copyright: Mike Baird, 2008.

### Loggerhead Shrike (BCC, SSC)

The loggerhead shrike is a declining species throughout its range in North America, including California Central Valley, and is listed a BCC (USFWS, BCR 32) and a SSC (CDFW). It is the only member of the shrike family endemic to North America. It has a large hooked bill, with grey head and back, white underparts, and black along the tail, wings and mask around the eye.



Loggerhead Shrike  
(*Lanius ludovicianus*)  
Copyright: Dick Daniels, 2013.

The loggerhead shrike breeds mainly in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground. It is present year round throughout most of the California range, which includes NRTF Dixon. They require tall shrubs or trees (they can also use fences or powerlines) for hunting perches, territorial advertisement, and pair maintenance; open areas of short grasses, forbs or bare ground for hunting, and large shrubs or trees for nests (usually 1–2 meters above the ground). The birds also use sharp, thorny, or multistemmed plants and barbed-wire fences for prey manipulation or storage (Shuford and Gardali 2008).

<sup>36</sup> Once ground squirrels are extirpated from a particular area, the burrows they used dry out and collapse, leaving few if any burrow opportunities for burrowing owls. Artificial burrows are a poor substitute as they require long-term management commitments that may be difficult to keep. Feral dogs and ground squirrels often dig out parts of the artificial burrow system, resulting in loss of burrows unless the damage is repaired. Moreover, artificial burrows often involve fill soil, which attracts fossorial animals like ground squirrels and which tends to aggregate tall-growing herbaceous plants making the artificial burrow systems unattractive to the owls (Smallwood and Morrison 2008).

The species has been reduced in number and extirpated in localized areas in California, primarily by habitat loss on breeding and wintering grounds as well as along migratory routes, resulting from agricultural conversion and urbanization. Exotic grasses and forbs introduced by livestock grazing also pose a threat to the shrike (Shuford and Gardali 2008). Management and research needs identified for this species include increasing suitable habitat throughout the species' range, investigating impacts of exotic grass invasion (and resulting altered fire regimes), examining the effects of habitat fragmentation, and studying the effects of pesticides, among others (Shuford and Gardali 2008).

At NRTF Dixon, this species was seen throughout the installation including in the southwest corner near walnut trees, in willow trees by a southern tower antenna, and in the northwest corner on a fence by the irrigation reservoir. It is likely a breeding resident (TDI 2012).

### Swainson's Hawk (CITES, State Threatened)

The Swainson's hawk was listed state threatened in 1983, which was approved in part due to the results of a statewide survey (Bloom 1980) for the CDFW. The survey estimated that 350 nesting pairs remained in the state, representing a 90 percent population reduction of historic Swainson's hawk numbers, once the most common nesting buteo hawk in California (Sharp 1902). The Swainson's Hawk Technical Advisory Committee was established in 1989 to address management, research, and land use issues affecting the species.

Swainson's hawk is a medium-sized hawk with relatively long, pointed wings which curve up somewhat while the bird is in flight. Adapted to the open grasslands, Swainson's hawk has become dependent on agriculture as native grasslands and riparian areas are converted to agricultural lands, including alfalfa and other hay crops, and certain grain and row croplands (Bunn et al. 2007). They prey primarily on mice, ground squirrels, rabbits, birds, and reptiles during the breeding season, and insects like grasshoppers, locust, and beetles during the non-breeding season. The CDFW considers irrigated alfalfa, tomatoes, beets, dry farming and other low-growing crops as foraging habitat for the species. Their swoop method style of hunting requires perches (such as trees or tall structures) that allow them swoop down to pick up the prey item. They are known for hunting in groups called kettles and will often follow farmers tilling their acreage searching for displaced prey from the farmer's activities. The species also has the second longest migration of all raptor species: it breeds in the western United States and Canada, and winters in South America as far south as Argentina. Swainson's hawks that breed in California, however, winter primarily in Mexico (Woodbridge 1998). Swainson's hawks typically return to their breeding grounds in late February, making nests of sticks and lined with greenery, usually placed low in a tree, bush, or shrub often adjacent to a riparian area or an agricultural field.

A 1993 five-year status review of Swainson's hawk indicated that habitat loss, due to residential and commercial development, is the most significant threat to the remaining population. In addition, the type of crops that are currently grown in the Central Valley (including rice, cotton, orchards, and vineyards) are generally incompatible with the needs of foraging Swainson's hawks (CDFG 1993). Their incompatibility is primarily due to the intensity of their cultivation, lack of available prey, and density of the vegetation. Pesticide use has also adversely affected them (Woodbridge 1998). Swainson's hawks in California now breed primarily in the Sacramento/Davis/Stockton region of the Central Valley and the Modoc Plateau of northeastern California in a population that is fragmented and irregularly distributed across this range (Bunn et al. 2007; Estep 1989).



Swainson's Hawk  
(*Buteo swainsoni*)  
Copyright: USFWS.

At NRTF Dixon, a nesting pair was observed in a eucalyptus tree near the facility's gate during the 2009–2010 surveys (TDI 2012). In general, Swainson's hawks prefer tall trees for their nesting. This species hunts over the open grasslands and agricultural fields at the property, often foraging in or near alfalfa fields where they prey on small mammals. This species is strongly tied to mammal cycles in the alfalfa fields in this region.

### Whimbrel (BCC)

The whimbrel is listed as a BCC by the USFWS for the species' non-breeding, wintering season in BCR 32, in which NRTF Dixon is located. This species has an appearance similar to the long-billed curlew, however it is slightly shorter, with a shorter bill, has distinct stripes on top of its head, lacks cinnamon under the wings, and is more barred and less buffy. It is one of those most wide-ranging shorebirds in the world with long migration routes from its boreal, subarctic and low arctic breeding areas. In California, it overwinters in tidal flats and shorelines, occasionally visiting inland habitats. During that time, it primarily eats marine invertebrates, especially small crabs, but also insects and berries. Its numbers declined sharply during the 19th century due to hunting for sport and food, and no definitive information is available on current population trends. The greatest current threats to the species include loss of coastal wetland habitat and environmental contamination (Skeel and Mallory 1996; Cornell Lab of Ornithology 2013a). The whimbrel was documented as present on NRTF Dixon through incidental sightings in 2006 and 2007 by an expert conducting surveys on the installation at the time (S. Smallwood, pers. comm.), but was not observed during the most recent surveys (TDI 2012). It was likely either on its way to or returning from its breeding grounds.



Whimbrel  
(*Numenius phaeopus*)  
Copyright: Andreas Trepte,  
2011.

### Yellow-Billed Magpie (BCC)

The yellow-billed magpie is listed as a BCC by the USFWS. It is a large black-and-white songbird with a long dark tail and bright yellow around the eyes and beak. The species is endemic to central and southern California, particularly savannah habitat, such as in valley floors containing large trees scattered among broad expanses of open ground. The yellow-billed magpie is omnivorous, eating a variety of plant and animal foods, though insects make up the most of its diet. Accessible water must be present all year where it resides. It nests in trees, creating dome bowl-shaped nests made primarily of sticks and mud. Populations of this species are currently stable, though recommendations for monitoring are in place due to the species' limited range (Koenig and Reynolds 2009; Cornell Lab of Ornithology 2013b). The yellow-billed magpie was documented as present on NRTF Dixon in the installation's 2002 INRMP (Navy 2002), but was not observed during the most recent surveys (TDI 2012).



Yellow-Billed Magpie  
(*Pica nuttalli*)  
Copyright: Walter Siegmund,  
2006.

## 3.8.3 Mammals

### Pallid Bat (SSC)

The pallid bat is a California SSC. It is distinguished from other bats by its light colored fur (Pierson and Rainey 1998). It is found throughout California and most of the southwestern United States and northern Mexico in a wide range of habitats from low desert to coniferous forest (Bat Conservation International

2010). It is a year-round resident that hibernates and rouses occasionally to drink and forage through the winter. Day roosts may include rocks, mines, caves, hollow trees, buildings, and bridges. Night roosts include bridges, caves, and mines; they are one of the species most predictably associated with bridges.

Pallid bats are colonial with a typical colony containing 30 to 70 individuals. They are not known to migrate and are presumed to spend the winter hibernating close to their summer roosts (Pierson and Rainey 1998). The pallid bat's food include large moths and ground arthropods (scorpions, centipedes, millipedes, grasshoppers, long-horned beetles, Jerusalem crickets). Pallid bats may actually land to take prey (Bradley et al. 2006). They have also been reported as visitors to fruits and flowers, presumably to feed on insects, but as such they appear to serve as pollinators for some desert plants (Pierson and Rainey 1998).



**Pallid Bat**  
*(Antrozous pallidus)*  
Copyright: M. Siders, Bureau,  
of Land Management.

At NRTF Dixon, the pallid bat was recorded during the most recent surveys by anabat locations stationed along the western perimeter of the installation, one near the irrigation reservoir and the other further south along the perimeter drainage ditch (TDI 2012).

### **Specific Issues for Other Special Status Wildlife Species**

- Minimal or no surveys have been conducted to determine the presence or absence of some potentially occurring special status species.
- The current data gap on special status species having potential to occur at NRTF Dixon may result in land use management decisions that could negatively affect these species.

### **Current Management**

DoDI 4715.03 states that the DoD shall, to the best of its ability, implement conservation and management efforts to further the conservation of state-listed species when such action is practicable and does not conflict with legal authority, military mission, or operational capabilities. The DoD recognizes the value of maintaining diverse ecosystems, thus NRTF Dixon intends to manage for species warranting stewardship.

### **Assessment of Current Management**

The habitat-based and species-specific management measures proposed in this INRMP, in conjunction with site approval and project review processes, provide a sufficient level of natural resources management to protect and conserve species warranting Navy stewardship at NRTF Dixon.

However, habitat management and species specific measures should be developed for management focus species, particularly special status bird species known to breed on the installation, such as burrowing owl (Smallwood and Morrison 2008) and Swainson's hawk.

Management measures should be updated continually to incorporate new special status species as they are discovered on the installation in future surveys. Such updates should be reflected in the INRMP to ensure adequate protection for these species.

Monitoring of special status species on the installation should occur on a regular basis in conjunction with baseline inventories and other ongoing monitoring associated with habitat enhancement activities. Special status species identified at the federal and state level and by other organizations can serve as good



indicator species for habitats at NRTF Dixon. Monitoring them can also create a foundation for future natural resources management partnerships and data sharing.

## Management Strategy

**Objective:** *Conduct species level surveys that target the presence of special status species in the habitats where they may occur.*

- I. Fund and conduct surveys for special status species, using established methodology and qualified biologists certified to conduct special status species surveys.
- II. Incorporate data into natural resources management and GIS databases.

**Objective:** *Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings, to establish a foundation for potential future partnerships, and as a way to monitor habitat health.*

- I. Based on results of surveys, species warranting Navy consideration and the habitats that support them should be protected to the extent practicable.
  - A. Use species information and their habitat requirements to guide the development of project-specific BMPs.
  - B. Maintain contact with regional specialists and regulatory agencies regarding the listing status of unique species known or thought to occur on NRTF Dixon.
  - C. Stay updated on agency decisions, published material, and meetings that change the listing status of species.
  - D. Ensure environmental review adequately considers effects to special status species so that avoidance and minimization measures can be properly implemented.
- II. Continue to resolve baseline biological data gaps.
  - A. Support ongoing and new research on distribution and ecology of species warranting Navy stewardship. Seek opportunities to partner with academic institutions and other outside researchers to facilitate resource data collection.
  - B. Continue to inventory, monitor and map existing species warranting Navy stewardship.
- III. Develop species-specific management measures for special status species known to breed on the installation, particularly the burrowing owl and Swainson's hawk.
  - A. Develop management strategies and priorities for the burrowing owl at NRTF Dixon as part of an overall habitat management plan for the installation.
  - B. Comply with the MBTA and protect burrowing owls and Swainson's hawks from disturbance from routine maintenance and construction (Section 3.5.5: Birds). Incorporate avoidance and minimization measures from the CDFW staff report for the burrowing owl (CDFG 2012), including use of exclusion zones, where necessary.<sup>37</sup>
  - C. In concert with improving burrowing owl habitat at NRTF Dixon, remove the artificial burrows and burrow mounds that have deteriorated and are no longer used. Encourage their use of the installation away from areas critical to the military mission and from infrastructure, buildings, and antennas to preserve their integrity and functionality.

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<sup>37</sup> Available online at: <http://www.dfg.ca.gov/wildlife/nongame/docs/BUOWStaffReport.pdf>

- D. Provide adequate protection to burrowing owls from pest predators that are known to dig up burrows.
  - E. Ensure that environmental review for any change in agricultural practice adequately considers impacts to Swainson's hawk and other sensitive species so that avoidance and minimization measures can be properly implemented.
  - F. Install raptor nesting platforms in appropriate areas, compatible with the military mission, to complement existing trees as suitable nesting habitat for Swainson's hawk and other birds of prey.
- IV. Seek opportunities to develop partnerships with institutions, organizations, and other researchers to develop and improve knowledge and management of special status species at NRTF Dixon and to contribute to regional initiatives for those species.

### 3.9 Invasive Species Management

Invasive plant and animal species are an important stressor on wildlife in this region, just as they are in other regions throughout the state (CALFED 2000; Cal-IPC 2006; CDFG 2005; Goals Project 1999; Hickey et al. 2003; Jurek 1994; Lewis et al. 1993; Riparian Habitat Joint Venture 2004). Climate change has the potential to interact with invasive species through multiple mechanisms and exacerbate impacts on native ecosystems (National Invasive Species Council 2008; Environmental Protection Agency 2008).

Twenty-six taxa of invasive or noxious weeds have been identified at NRTF Dixon (Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon). None of the recorded plant species are on the federal noxious weed list. The California Department of Food and Agriculture list includes ten species observed at the facility, one of which is on its List A: yellowspine thistle (*Cirsium ochrocentrum*). Twenty-one species found at NRTF Dixon are on the Cal-IPC list; four species rated "High" include red brome (*Bromus madritensis* ssp. *rubens*), yellow star thistle, broadleaved pepperweed, and Eurasian milfoil (*Myriophyllum spicatum*).

*EO 13112 defines invasive species as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." It requires federal agencies to prevent the introduction of invasive non-native species and provide for their control (OPNAVINST 5090.1C CH-1). The Federal Plant Protection Act of 2000 (Title IV of P.L. 106-224) prohibits introducing any animal, plant or material considered harmful to this country's agriculture. This Act consolidated and modernized all major statutes pertaining to plant protection and quarantine (Federal Noxious Weed Act; National Invasive Species Act; Plant Quarantine Act).*

#### Specific Issues

- Invasive species such as yellow star thistle, Italian thistle, and broadleaved pepperweed are dominant vegetation associations at NRTF Dixon in patches in both the antenna field and the NRMA. These and other invasive species found on NRTF Dixon degrade native habitat for special status and other species at the installation. Yellow star thistle in the grassland antenna field is an immediate problem.
- Invasive species monitoring and subsequent control at NRTF Dixon has rarely been conducted outside of the agricultural outlease areas.
- Invasive non-native plants can be a serious threat to natural plant habitat by changing the structure of the plant community. It is important that infestations are addressed while still at manageable levels to prevent costly eradication efforts and encroachment into uninvaded areas.
- Invasive species management strategies need to comply with the to-be-developed Integrated Pest Management Plan (IPMP) for NRTF Dixon (Section 4.5.2: Integrated Pest Management).

## Current Management

NRTF Dixon does not currently have an Invasive Species Management Plan (ISMP) or a program in place to remove invasive non-native plants from areas outside of the agricultural outlease area. There are limited invasive control activities performed by the grounds maintenance contractor and the agricultural lessee.

The grounds maintenance contractor does perform mowing treatments directly around the antennas and along the main road. This is to prevent fuel build-up around the antennas in order to prevent fires. The mowing is not intended to control invasive species. No pesticides are used by the grounds maintenance contractor outside of developed areas on the installation. Simple spot-spray of Round-Up Pro is used for weed control around the fence line and antennas in improved grounds. Mowing is conducted strategically and as needed around other sensitive infrastructure on the installation.

Agricultural lessees are required to control invasive species on their parcels and in irrigation ditches as per the Soil and Water Conservation Plan of the agricultural outlease agreement for NRTF Dixon. Agricultural outlease pest management plans are reviewed by the NRTF Dixon Integrated Pest Management Coordinator, located at NAVFAC Southwest in San Diego. The NAVFAC Southwest Performance Assessment Representative conducts occasional compliance checks.<sup>38</sup>

Pesticide use in natural resources management programs must comply with applicable requirements of OPNAVINST 6250.4C and Chapter 17 of OPNAVINST 5090.1C CH-1. Other than ensuring that a pesticide is registered with the Environmental Protection Agency and California Department of Pesticide Regulation, and so long as its application is in compliance with state and federal laws, approval of a pesticide for use on NRTF Dixon makes no specific considerations for where it will be applied.

## Assessment of Current Management

Invasive species control measures for NRTF Dixon need to be developed and implemented to conform to EO 13112. They should comply with the to-be-developed NRTF Dixon IPMP, which will include guidelines for the systematic method of identifying, prioritizing, and eradicating invasive species. Strategic planning consistent with other government agencies' plans is also necessary to address complex invasive species issues on a local and regional scale.

An ISMP could be developed to address long term goals to manage yellow star thistle and broadleaved pepperweed. The ISMP should include strategic goals that focus on prevention, early detection and rapid response, control and management, restoration, and organizational collaboration. Strategies should include a catalog, map, and other documentation of weed control efforts, to better track success of weed management activities and contribute to adaptive management. Such measures will help to avoid costly eradication of large populations. The plan should be revised regularly to update priority lists based on regional invasive species lists updates, and to detail current research on species and the most effective control practices.

Furthermore, current habitat management activities at NRTF Dixon should be evaluated in light of their potential contribution to spread of invasive species on the installation, including timing of mowing and agricultural lessee invasive control measures, among others.

A Native Grassland Management and Restoration Plan for the installation would integrate the above with other habitat enhancement and species specific management goals for the grassland area. Habitat

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<sup>38</sup> In the case of NRTF Dixon, the Integrated Pest Management Coordinator and the Performance Assessment Representative are both at NAVFAC Southwest in San Diego, California. The NAVFAC Southwest Pest Management Consultant is the Integrated Pest Management Coordinator for NRTF Dixon.

enhancement and restoration, while actively improving native vegetation communities, can help to more effectively control invasive species than repeated spraying and removal year after year.

Opportunities to collaborate with other agencies and institutions to collect data on invasive species populations in the area, and methods and responsibilities for their control, could take the shape of partnerships with University of California Davis and Jepson Prairie Preserve. Both are in the vicinity of NRTF Dixon and could provide insight into, and support for, effective invasive control approaches on the installation. Additional funds for invasive species control and native ecosystem management may also be available through such partnerships. The California Wildlife Conservation Board ([www.wcb.ca.gov](http://www.wcb.ca.gov)), for example, funds restoration partnership work related to native ecosystems in California.

The control and eradication of non-native plant species, especially invasives, is of primary importance to natural resources management at NRTF Dixon and it is an important step toward conservation of native Sacramento-San Joaquin Delta ecosystems.

## Management Strategy

**Objective:** *Control the spread and introduction of invasive plants with priority on those with the greatest potential for sensitive species or habitat degradation, and restore to native habitat when feasible. Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. Apply adaptive management principles.*

- I. Develop and implement an IPMP that includes prevention measures. Review and update the plan as necessary (see also Section 4.5.2: Integrated Pest Management).
- II. As feasible, develop and implement an ISMP based on current needs, information and priorities to comply with EO 13112. The ISMP should comply with the installation's IPMP and provide long-term goals for invasive species management (Section 4.5.2: Integrated Pest Management). Conduct the following measures as needed, and integrate into the ISMP when it is developed.
  - A. Create a comprehensive map of invasive plant species at NRTF Dixon. Such a tool can help to prioritize weed control (and subsequent restoration) activities on the installation and identify those areas where partnerships with other organizations or entities could address introduction of invasive plants from adjacent areas.
  - B. Use both incidental observations, as well as regular monitoring practices, to identify current and detect new pest plant introductions. Record data into a GIS database.
  - C. Identify vectors and locations of introduction as needed, such as roads, adjacent properties, and equipment used by contractors.
  - D. Ensure that non-native plant control efforts do not in themselves pose a threat to sensitive habitat and species. Restrict the use of pesticides in areas with known sensitive species or habitats. This includes the vernal pool and wetland habitats in the NRMA and portions of the grassland area inhabited by burrowing owls.
  - E. Prioritize treatment areas, based on the known aggressiveness of the invasive species, extent of infestation, and threat risk to native plants and animals. Aggressively controlling new satellite populations, while addressing the outer perimeters of established populations, is a cost-effective approach (e.g. broadleaved pepperweed).
  - F. Document areas of removal to ensure re-growth does not occur. Monitoring should use accepted standardized methods.

- III. Develop invasive control measures for NRTF Dixon that are effective and do not threaten existing or potential sensitive species on the installation nor damage sensitive infrastructure important to the military mission.
  - A. Determine the most effective procedures to control weeds in the various habitats at NRTF Dixon, especially in areas where weeds degrade the habitat of special status and sensitive species.
  - B. Investigate the possibility, and logistics that would be required, to develop a limited grazing program in the grassland areas at NRTF Dixon as a method to control invasive species and aid in restoration.
  - C. Follow invasive species control with habitat enhancement and restoration activities, where appropriate and feasible. Avoid disturbing the ground mats under the antennas.
- IV. Coordinate invasive plant control efforts with the O&M contractor to ensure that mowing activities do not contribute to invasive plant spread. Make the GIS database of invasive species on the installation available to the O&M contractor to facilitate coordination.
- V. Promote cooperative interagency efforts and other partnerships to collect data on invasive species populations in the area and methods and responsibilities for their control.

## 3.10 Pest and Predator Control

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### Specific Issues

- Ground squirrels pose a threat to the integrity of sensitive infrastructure on the installation, particularly wherever soils are sandy and soft, making burrowing easy (e.g. near antennas, their ground mats, underground antenna cables, underneath fuel pads, and along paved roads). The ground squirrels have overrun the artificial burrowing mounds originally constructed for burrowing owls (installed in 2002). Their proximity to the road encourages more ground squirrels to burrow into the soft soils at road edges, undermining road stability. Since burrowing owls depend on ground squirrel burrows for their burrows, they tend to follow ground squirrels as their habitat increases or shifts at NRTF Dixon.
- Feral dogs and cats have been observed on NRTF Dixon in the past. Feral dogs, cats, and coyotes pose a threat to native ground dwelling species including burrowing owls. They may also pose a hazard to humans, when found roaming on the installation near occupied buildings.
- Cows from adjacent grazing areas occasionally break through the installation's eastern perimeter fence. Their trespass represents significant potential harm to vernal pool and wetland habitats and their dependent species, in the NRMA. They also pose a risk to facility management, when found on roads and near sensitive infrastructure.

### Current Management

Before 2010, the IPMP for Naval Air Station Lemoore and the Partner Pest Management Plan for NRTF Dixon guided pest management at NRTF Dixon. NAVFAC Southwest has planned to create a new IPMP for NRTF Dixon (Section 3.9: Invasive Species Management and Section 4.5.2: Integrated Pest Management). The facility's O&M contractor controls rodents to reduce human contact and to reduce the risk of disease. Solano County Animal Control and/or CDFW are responsible for removing sick or dead animals, and should be contacted if any are determined present at NRTF Dixon.

Within the agricultural outlease area, the lessee is responsible for pest management, including the control of all undesirable weeds, rodents, insects, and other pests. This includes the lessee paying costs of

mosquito pesticide applications to the Solano County Mosquito Abatement District. The lessee is responsible for complying with all federal, state, and local environmental standards for obtaining required permits, and for coordinating with the Integrated Pest Management Coordinator for NRTF Dixon, currently at NAVFAC Southwest, including submitting pest management plans for their parcels for Integrated Pest Management Coordinator review and approval. Agricultural lessees are currently permitted to install bait stations on their parcels to control ground squirrels preying on their crops. However, they have rarely been used as ground squirrels are not often observed in the agriculture fields. They are concentrated in the annual grassland area and antenna field.

Feral dogs and cats can be a potential health and safety hazard for installation personnel, as well as endangered, threatened and sensitive species. Currently, NRTF Dixon implements guidelines of the Chief of Naval Operations (CNO) Policy Letter Preventing Feral Cat and Dog Populations on Navy Property (CNO 10 January 2002) to eliminate adverse effects to native wildlife, as well as prevent injury or disease to Navy personnel. This policy ensures the humane capture and removal of free roaming cats and dogs, while prohibiting the use of Trap/Neuter/Release methods. In addition, Wildlife Services of the U.S. Department of Agriculture performs coyote round-ups at NRTF Dixon, as needed.

### Assessment of Current Management

NRTF Dixon continues to comply with DoD policy by achieving, maintaining, and monitoring compliance with all applicable EOs and federal, state, and local statutory and regulatory requirements as presented in Naval Air Station Lemoore's IPMP (NAVFAC Southwest 2010a) and NRTF Dixon's Partner Pest Management Plan (NAVFAC Southwest 2009), which have regulated the program up until 2010. The new IPMP for NRTF Dixon, once it is developed and implemented, will continue to guide the installation's achievement and compliance with all applicable regulations.

*The USFWS defines pests as: those organisms (vertebrates, invertebrates, plants, and microorganisms and their vectors, etc.), which are detrimental to fish, wildlife, human health, fish, and wildlife habitat or to established management goals.*

Removal and relocation of burrowing owl mounds to noncritical areas of the installation would encourage both ground squirrel and burrowing owl relocation away from sensitive areas, and also provide an opportunity to conduct infrastructure repairs (e.g. the main paved road) without harm to these animals. Such actions could be combined with a burrowing owl habitat study and incorporated into a native grassland management and restoration plan.

Installing raptor nesting platforms on the installation would also encourage naturally occurring biological control of ground squirrels. Raptors, in combination with other controls, can help maintain pressure on the ground squirrel population at NRTF Dixon to keep it in check.

### Management Strategy

**Objective:** *Identify and monitor pest species on NRTF Dixon. Develop and prioritize control efforts to enhance the natural environment and safeguard operational capability through safe pest relocation and removal. Avoid negative impacts to native wildlife and habitats.*

- I. Control the size and location of the ground squirrel population at NRTF Dixon, using a strategy of relocation and encouraging naturally occurring biological control.
  - A. Remove artificial burrows and burrowing mounds installed near infrastructure that are degraded and over-run with ground squirrels.
  - B. Combine ground squirrel and burrowing owl relocation with needed infrastructure repairs.

- C. Install raptor nesting platforms on the installation to encourage raptor use and biological control of the ground squirrel population.
- II. Provide adequate protection to sensitive resources from the effects of pest control activities.
  - A. Take precautions to prevent drift of pesticides to non-target areas. Special attention must be used when conducting pest management near endangered and threatened species and their habitats.
  - B. Ensure that pest control activities do not have an adverse effect on natural resources by ensuring that grounds maintenance contractors comply with the new IPMP and adhere to guidelines proposed in this INRMP (particularly in relation to sensitive habitats and species).
- III. Comply with the MBTA with regard to controlling avian pests.
- IV. Conduct internal compliance assessments of the pesticide and pest management program, including the agricultural outlease area.
- V. Protect the wetlands and vernal pools from cows breaking the eastern fence and entering onto NRTF Dixon from an adjacent property.
- VI. If a livestock grazing program were to be implemented on NRTF Dixon and when necessary, a cooperative relationship would be maintained with the U.S. Department of Agriculture Wildlife Services for coyote control. Also maintain a cooperative relationship with the Solano County Mosquito Abatement District for control of mosquito larvae in irrigation ditches
- VII. Comply with CNO Policy Letter Preventing Feral Cat and Dog Populations on Navy Property (CNO 10 January 2002), and ensure that they are not allowed in natural areas on the installation.

## 3.11 Data Integration, Access, and Reporting

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### Specific Issues

- Currently there is no formalized and integrated natural resources data management system for NRTF Dixon.
- For future natural resource surveys and assessments there is a need to manage and integrate data, develop data access protocols, and establish data sharing relationships with regional partners.

### Current Management

NRTF Dixon GIS data and other natural resources information is developed and maintained on a project-by-project basis. Various GIS data sets are housed by NAVFAC Southwest through the GeoReadiness Center and government contractors; however, there is no single repository for all natural resources data for the installation. No known staff member has been identified as responsible for managing NRTF Dixon data.

Natural resources data for NRTF Dixon is disclosed to outside researchers and institutions on a case-by-case basis, given the high security status of the installation. Information received by NRTF Dixon and provided to others is primarily in the form of assembled reports describing studies and assessments that have occurred at the installation. Total volume of these reports available for distribution is low, given the few natural resources studies and projects at NRTF Dixon.

### Assessment of Current Management

The intent of developing a formalized and integrated database for NRTF Dixon is to organize data for use by NAVFAC Southwest natural resources staff. This is particularly important for those species that are, or may be considered, for listing under provisions of the ESA; proposed focused surveys may lead to the

discovery of special status species previously unknown to the installation. A method to house and track such data (both GIS and other), and integrate it with existing data, would provide NAVFAC Southwest a tool useful for management decisions and impact assessment early in the planning process. It would also help streamline decision-making across departments and prevent delays caused by the need for unforeseen natural resource management actions.

It is equally important to provide this information in a usable format to other land managers; management of species can best be accomplished when all forms of potential impacts are considered for a species throughout its entire range. Ecosystem-wide resource management requires mutual cooperation of regional land managers, regulators, and scientific groups and facilitates regional planning efforts towards common goals. If researchers or scientific organizations wish to access to natural resources data for NRTF Dixon, they are encouraged to contact and request data from the NAVFAC Southwest.

### **Management Strategy**

**Objective:** *Ensure the technically sound, practical and appropriate use of library and computer technology to integrate, analyze, and communicate natural resource information, monitoring and research in support of management decisions and effective allocation of resources.*

- I. Ensure GIS data and products that pertain to NRTF Dixon natural resources are available to staff via a dedicated CITRIX share drive folder. Data and products of general interest, such as listed species habitat areas, should be made available via GeoReadiness Explorer.
  - A. Develop a plan that delineates the types of information to be included, accessible format, frequency for updating, and accessibility limits.
  - B. Ensure that all surveys and reports that contain spatial data are submitted with an accurate and complete GIS geodatabase that meets DoD and Navy standards.
- II. Participate in data sharing, technology transfer, and communication as applicable (DoDI 4715.03).
- III. Seek standardization of the approach to communicate research and monitoring results.
- IV. Continue to develop and maintain data management capabilities for NRTF Dixon.
  - A. Continue to update the GIS database by setting standards for periodic update, thereby keeping GIS data current.
  - B. Provide appropriate data to the CNDDDB.





# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

### 4.0 Sustainability and Compatible Use at NRTF Dixon

*Chapter 4 considers how to sustain the military mission, and use of natural resources to support the mission, through best practices, regulatory compliance, public outreach, and linking to long-term programs and partners both internal and external to Naval Radio Transmitter Facility Dixon. Department of Defense policy requires that this plan defines impact to the military mission, describes the relationship between this plan and operational plans, and describes how to integrate the military mission with sustainable land use.*

#### 4.1 Sustainability of the Military Mission and the Natural Environment

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##### 4.1.1 No Net Loss to the Military Mission

###### Background

The Sikes Act (as amended) stipulates that this Integrated Natural Resources Management Plan (INRMP) provide for “no net loss in the capability of the military installation lands to support the military mission.” The purpose of this section is to address Department of Defense (DoD) and Department of the Navy [Navy] guidance that directs this INRMP to describe the natural resources that make the mission achievable, and how mission requirements are met while meeting natural resource compliance responsibilities. A successfully implemented INRMP will meet two basic purposes for the installation:

1. It will ensure the sustainability of all natural resources.
2. It will ensure no net loss of the land’s capability to support the mission.

Healthy, sustainable ecosystems support realistic military mission needs by providing open space and buffers, stable and productive soils, clear air, clean water, and a range of natural conditions that are available for the indefinite future. DoD policy states that “All DoD natural resources conservation program activities shall work to guarantee DoD continued access to its land, air, and water resources... to sustain the long-term ecological integrity of the resource base and the ecosystem services it provides, in accordance with Sections 670a-670o of Title 16 U.S. Code (USC) (the Sikes Act [as amended]).”

Finally, Navy guidance for INRMPs states that “Appropriate management objectives to protect mission capabilities of installation lands (from which annual projects are developed) should be clearly articulated and should be high in INRMP funding priorities” (Navy 2006).

The following sections describe:

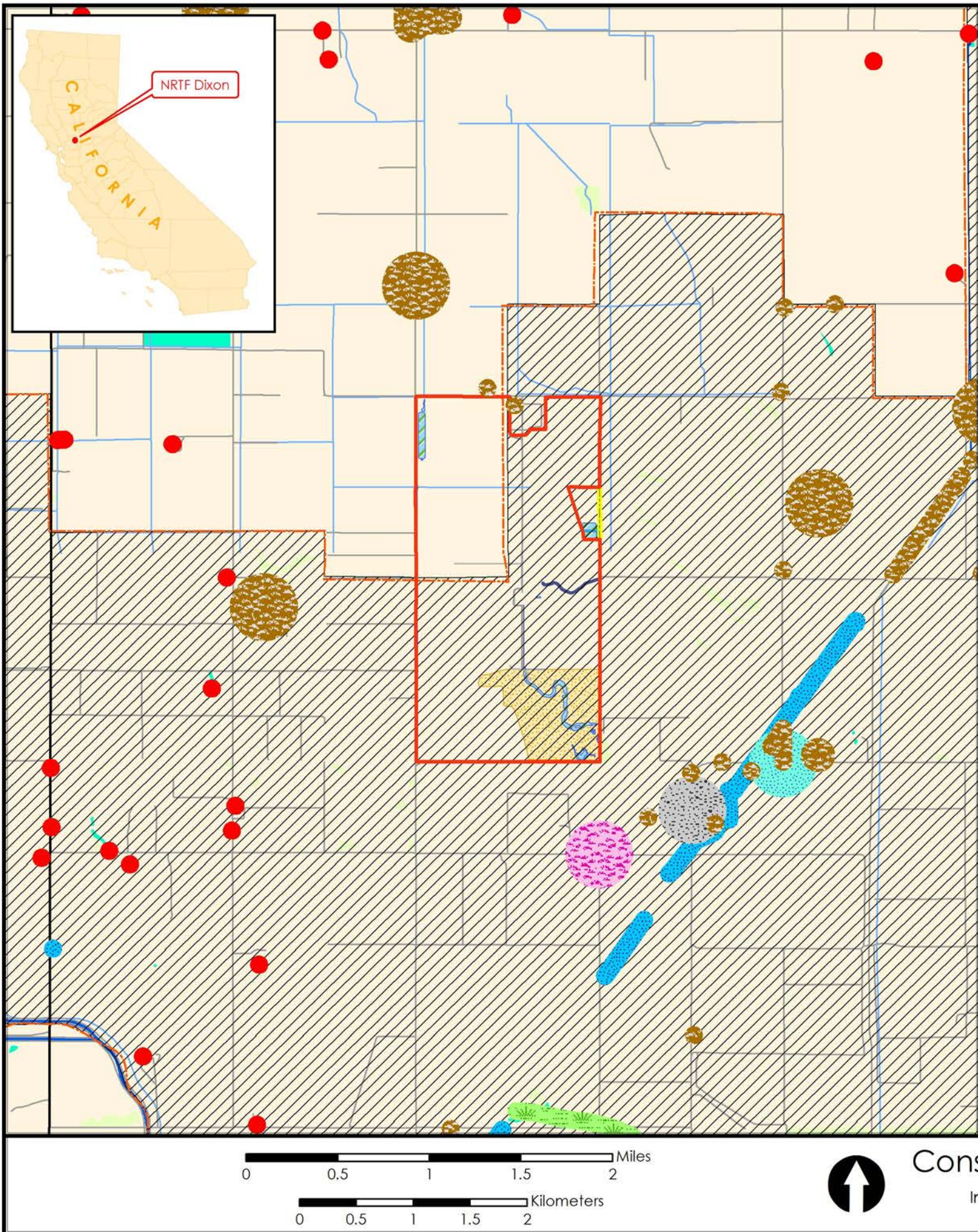
- The characteristics of the site, location, and natural resources of Naval Radio Transmitter Facility (NRTF) Dixon that are key to supporting the Navy mission, and how natural resource constraints and conflicts are managed to protect the mission.
- Resource-specific best practices, consistent with the Navy's Environmental Management System (Chief of Naval Operations Instruction [OPNAVINST] 5090.1C CH-1), for maintaining healthy, natural resource conditions, the use of renewable and non-renewable resources, and how pollution and wastes are prevented and processed.
- Preparing for climate change and regional planning initiatives, that may affect future land use or cause a mission encroachment concern.

## 4.1.2 Integrated Military Mission and Sustainable Land Use Decisions

Key to the military mission at NRTF Dixon is the region's low corrosive environment and conductivity of the soil (its salts, clay, and soil moisture) that facilitate function of the antenna array. The relative isolation of the installation within an agricultural landscape is also important, ensuring a maximum buffer for the health, safety, and security of the public and installation personnel. Open space beneath the antennas and the ability to maintain a fire safe condition are also important. Planning for sustainability should protect these characteristics.

Map 4-1 shows locations of sensitive resources and regulatory limitations on land use as required in the DoD INRMP Template (Memo Deputy Assistant Secretary of the Navy 14 August 2006) as the "Constraints Map." The map is intended to show all areas where restrictions on the military mission occur due to natural resources related issues, including listed species, soil erosion, invasive species, wetlands and jurisdictional waters, etc. Table 4-1 accompanies this map by describing sensitive resources based on regulatory concerns, and potential to sustain the military mission. Its purpose is to facilitate planning by anticipating possible natural resource conflicts and compatibilities, and to ensure sustainability of the military mission and natural resources. Land and natural resources managers can use it to anticipate regulatory requirements and plan conservation measures associated with projects, while also identifying potential for restoration and enhancement of ecosystem services (see DoD policy guidelines in DoD Instruction [DoDI] 4715.03). Information in this table could also contribute to development of NRTF Dixon-specific ecosystem integrity indicators or benchmarks that would provide insight into achievement of natural resource aspects of military mission sustainability (DoDI 4715.03).

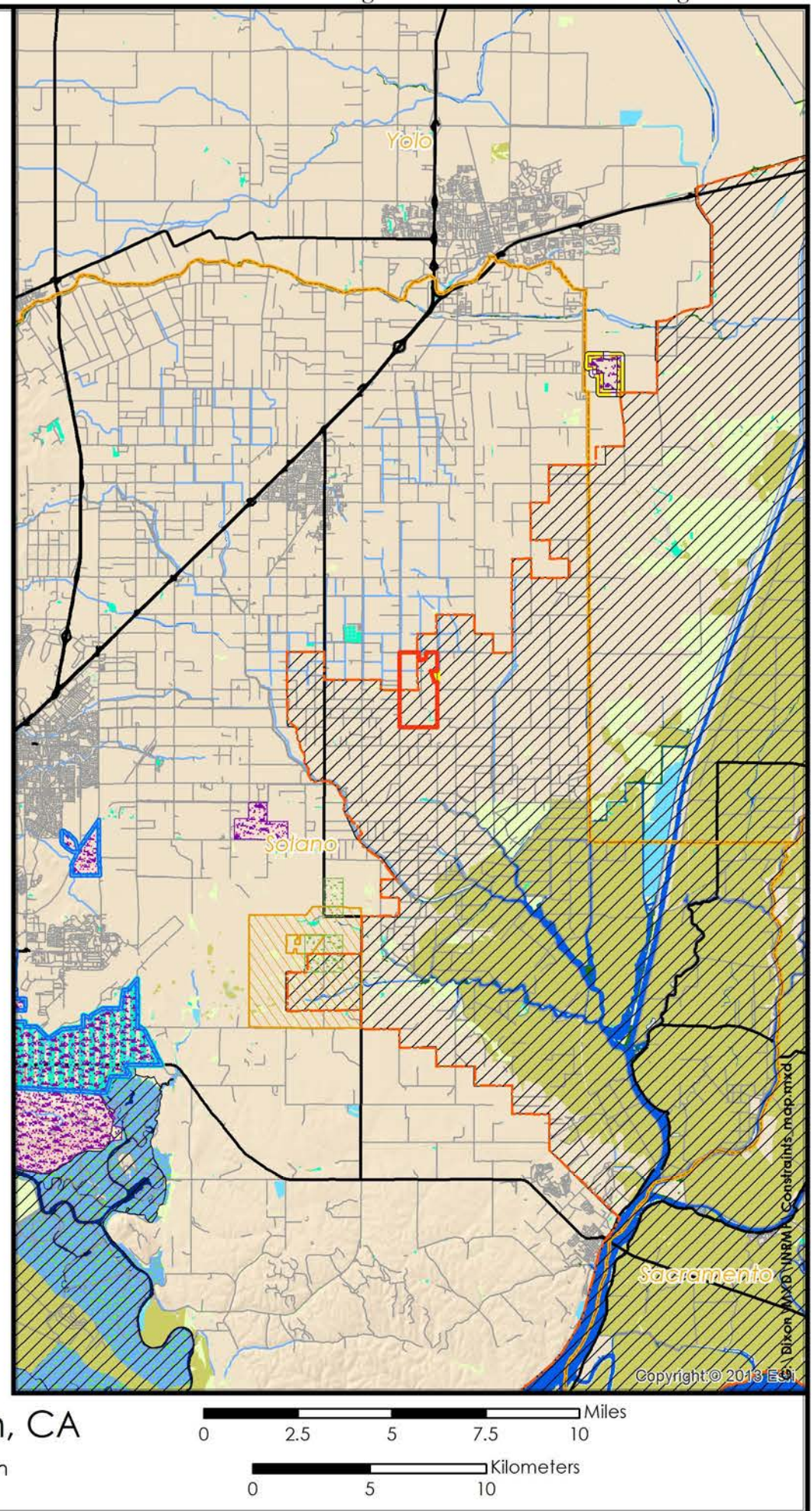
Finally, Map 4-2 shows the area surrounding NRTF Dixon in order to consider opportunities for managing encroachment on the installation and identifying strategic regional partnerships. This map is required in the DoD INRMP Template (Memo Deputy Assistant Secretary of the Navy 14 August 2006) as the "Opportunities Map." It is intended to show areas where there are little to no restrictions on the military mission.



- Legend**
- NRTF Dixon Boundary / INRMP Boundary
  - NRTF Dixon fenceline and drainage ditch only
  - Delta Protection Act 1959
  - California tiger salamander
  - Colusa grass & Solano grass
  - Conservancy fairy shrimp
  - Contra Costa goldfields
  - Delta green ground beetle
  - Delta smelt
  - Vernal pool fairy shrimp
  - Vernal pool tadpole shrimp
  - county
  - Major Roads
  - Local Roads
  - Rivers and Canals
- National Wetlands Inventory Types**
- Estuarine and Marine Deepwater
  - Estuarine and Marine Wetland
  - Freshwater Emergent Wetland
  - Freshwater Forested/Shrub Wetland
  - Freshwater Pond
  - Lake
  - Other
  - Riverine
- California CNDDDB Records (2013)**
- California linderiella fairy shrimp
  - Ferris' milk-vetch
  - Heckard's pepper-grass
  - Swainson's hawk
  - Alkali milk-vetch
  - Burrowing owl
  - Saline clover
  - Wetland Areas
  - Wetlands Channel
  - Natural Resources Management Area

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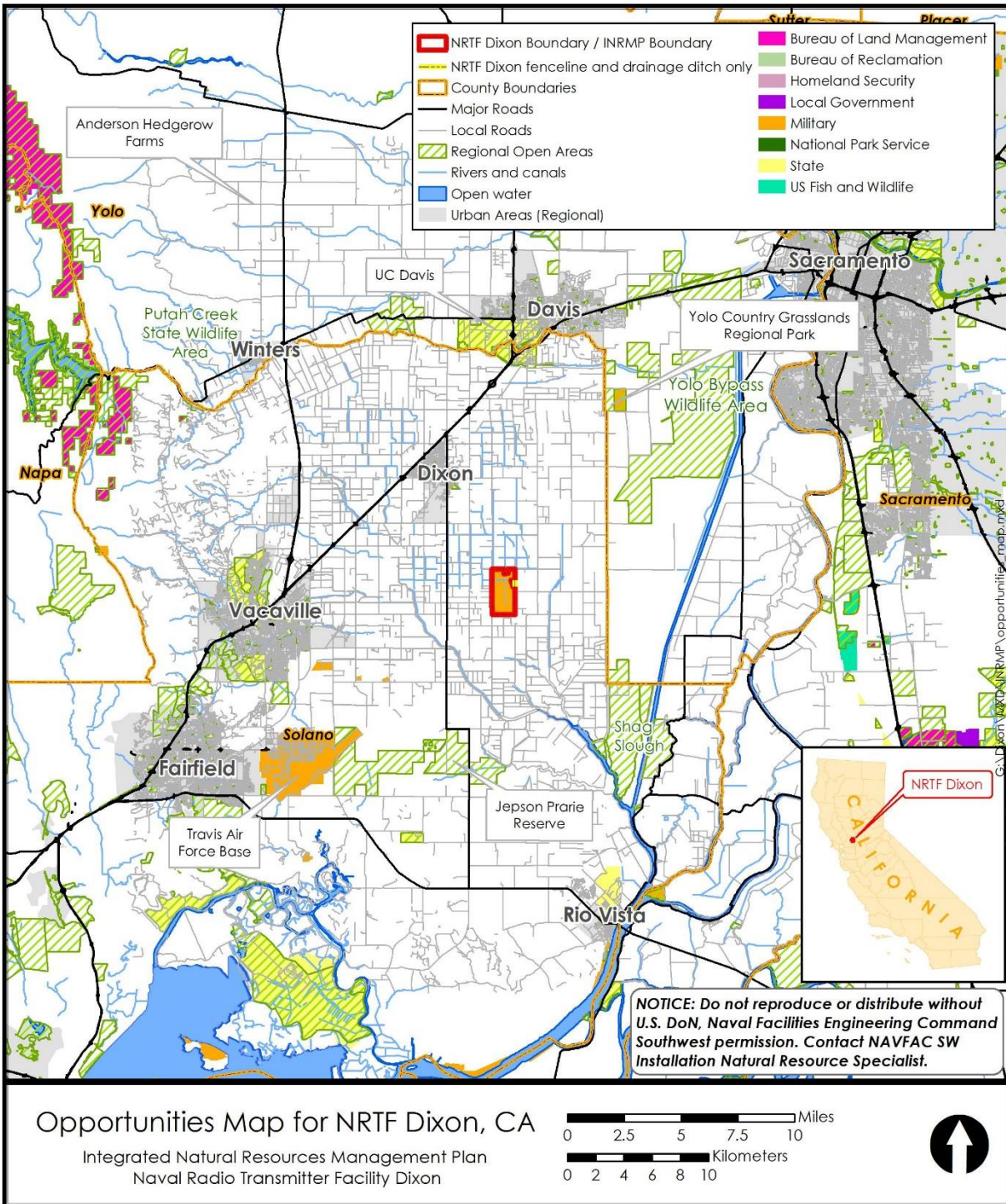
**Constraints Map for NRTF Dixon, CA**  
 Integrated Natural Resources Management Plan  
 Naval Radio Transmitter Facility Dixon

Map 4-1. Constraints map for NRTF Dixon.

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Table 4-1. Summary of Constraints - potential regulatory concerns and habitat enhancement potential to support the sustainment of the military mission at Naval Radio Transmitter Facility Dixon, California.

Habitat	Resources of Concern	Habitat Value	Potential Regulatory Concerns	Ecosystem Service Enhancement Potential Contributing to Sustainability (DoDI 4715.03)	Desired Ecosystem Condition to Inform Creation of Benchmarks and Indicators
Vernal Pools	Wetlands. Species at Risk	High	Likely jurisdictional wetlands, special status species	Wetland restoration for wildlife, migratory birds and wetland ecological function. Sensitive species surveys.	Special status species are present and reproducing. Habitat provides life cycle and movement needs at the scale needed by these species.
Other jurisdictional wetlands	Wetlands. Species at Risk	High	Jurisdictional wetlands, special status species	Wetland restoration as above. Flood abatement due to 100-year floodplain. Management of wetland flora and fauna.	Enhanced connectivity with other wetlands for flood abatement and facility protection, movement of Species at Risk, water quality filtration effectiveness.
Non jurisdictional wetlands, including irrigation reservoir, and excavated pond near developed area	Wetlands. Species at Risk	Medium	Special status species, water quality, water rights	Wetland and adjacent upland restoration for Species at Risk.	Enhanced function for flood abatement, water quality, native habitat.
Antenna field	Burrowing owl, long-billed curlew, other Species at Risk	Medium	Special status species, avian nesting. Impacts to migratory birds.	Reduced invasive species, and reduced maintenance need through native grassland restoration, burrowing owl habitat assessment and relocation to avoid undermining of infrastructure, and enhancement of owl habitat elsewhere on property. Enhanced soil water storage through replacement of annual grasses with deep-rooted perennial grasses - helps manage floodplain flows.	No wildlife mortality due to infrastructure. Vegetation is weed free, composed of short-statured natives that capture rain and hold water in soil, thereby reducing flood potential that might affect infrastructure. Abundant pollinators. Low maintenance requirement for mowing.
Uncultivated roadsides and ditch embankments	Burrowing owl	Medium	Special status species	Invasive species control along roadsides through targeted management measures. Burrowing owl burrow surveys and relocation as needed. Enhanced function for filtering stormwater runoff.	Reduced use of pesticides due to native species enhancement. Weed free. Road surface and other infrastructure not undermined due to wildlife activity. Clean stormwater delivered to wetlands and ground water table. Abundant use by beneficial pollinators. Reduced need for routine maintenance.
Agricultural lands	None	Low	Offers little wildlife habitat, so surveys are not likely to be required	Integrated pest management. Agricultural practices that promote soil productivity, water quality and reduced chemical inputs.	Weed free. Low use of pesticides with no residual into ground water or wetlands, no mortality of beneficial fauna. Efficient water use, no water quality or erosion concerns. Abundant pollinators for crop productivity.
Transmitter facility (developed area)	None	Low	Offers little wildlife habitat, so surveys are not likely to be required	Implementation of Low Impact Development practices to help with water-logged soils and flooding. Native species landscaping.	Compliance with Executive Orders on leadership in sustainable practice for energy, water, greenhouse gas management. Habitat value enhanced through inclusion of native and pollinator plants.
Property Perimeter	None	Low to High	Wetlands at some locations	Enhanced native species, beneficial pollinator support.	Secure perimeter with low-stature native vegetation that is weed free.



Map 4-2. Opportunities map for Naval Radio Transmitter Facility Dixon, California.<sup>2</sup>

<sup>2</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

## Specific Issues

- The concept of sustainability in the military and under the Sikes Act (as amended) requires this INRMP to document no net loss to the military mission. With respect to natural resource concerns, benchmarks providing insight into ecological integrity could be developed to help a manager report on mission sustainability (DoDI 4715.03). They should incorporate some way to evaluate long-term threats on the health of NRTF Dixon habitats such as water resource quality and availability, soil erosion, invasive species, and climate change. Information provided in Table 4-1 could contribute to this effort.
- Such benchmarks or a unified set of mission sustainability indicators would help inform facility management. They should also facilitate integration of professional disciplines by drawing on the best available science from various fields (such as wildlife, water, soils, agriculture, energy, restoration ecology, economics, development, or business).

## Current Management

Since most of NRTF Dixon's natural resources function as a safety and security buffer zone for the sensitive communications equipment and associated maintenance activities, sustainable land use and a healthy ecosystem are relatively compatible compared to installations that support more ground troop or off-road training. Most day-to-day activities at NRTF Dixon have little potential to impact natural resources. Existing antenna sites are re-used when older antennas are decommissioned, and existing instrumentation and infrastructure satisfy current installation needs so that environmental costs associated with establishing new areas is avoided. In addition, a need to expand the antenna field in the near future is not anticipated.

Naval Facilities Engineering Command (NAVFAC) Southwest is at the beginning stages of using benchmarks specific to NRTF Dixon to measure installation natural resources and mission sustainability. This includes monitoring and evaluating whether the military mission has adequate access to natural resources to facilitate the installation's low and high frequency communications mission. They are also useful in evaluating impacts at longer time scales than one project at a time, at both current and future footprint and tempo of operations.

The Sikes Act (as amended) requires each installation with significant natural resources to report annually on the status of its INRMP implementation. As part of the annual INRMP review, Commanding Officers (COs) must answer the following questions (Assistant Secretary of the Navy [Installations and Environment] 22 August 2006):

- Does the natural resources team consult with facility managers when making changes to the INRMP in order to keep it current?
- To what level do natural resources compliance requirements support the installation's ability to sustain its mission?
- Has there been a net loss of lands available for mission activities?
- Does the INRMP process effectively consider current mission requirements?

## Assessment of Current Management

As the use of NRTF Dixon-specific sustainability benchmarks becomes more established, they should help inform the CO's ability to respond positively to the above metrics questions. The DoD's policy is that installations shall use Natural Resources Conservation metrics to assess INRMP implementation, measure conservation efforts, ensure no net loss of military testing and training lands across the various installations, understand the conservation program's installation mission support, and indicate the success of partnerships with the USFWS, state fish and wildlife agencies (DoDI 4715.03).

Examples of mission-natural resource metrics are:

- No delay in military work due to natural resource compliance;
- Sufficient water resources into the future;
- Access to soils that facilitate function of buried antenna ground mats, including their low corrosivity and high conductivity;
- Land disturbance is either confined in footprint or managed in a way that the land can generally self-recover from disturbance without permanent degradation of its potential to support vegetation and wildlife.
- Adequate land and air space unencumbered by competing uses, including safety, security, noise, and frequency spectrum buffers.

Areas suitable for encroachment partnering agreements should be identified during the development and revision of INRMPs and mapped as a Geographic Information System (GIS) theme and reported up the chain to program needed funding. It is important to work with installation planners to identify natural areas adjacent to an installation, that if set aside through these agreements, can protect current and future mission requirements. Commander, Navy Installations Command N46 is the resource sponsor for encroachment partnering projects (INRMP Guidance for Navy Installations 18 April 2006).

Encroachment issues with indirect relationship to natural resources that have been identified by the Navy are:

- Adjacent land uses that lead to trespass of livestock or other perimeter encroachment concerns.
- Cultural resources compliance.
- Ground squirrels and burrowing owls that burrow near or under installation infrastructure.

## Management Strategy

**Objective:** *Achieve no net loss of military value by aligning current and future land use (location, extent, timing, and intensity) with protection of environmental values into the future.*

- I. Ensure compliance with statutes and regulations to protect sensitive natural resources, to maintain environmental quality and to exercise responsible stewardship of public lands.
- II. Address long-term threats to the stability of the natural environment. These include climate change and invasion by non-native flora and fauna.
  - A. Develop sustainability and performance benchmarks and identify best practices for the management of habitats, species, and ecological functions on NRTF Dixon. Incorporate a focus on contributing to ecosystem integrity and sustainability.
  - B. Implement a coordinated monitoring program using land health and focal species indicators that can be implemented cost-effectively over time, and facilitates reporting on natural resources condition in relation to other Sacramento-San Joaquin Valley areas and annual INRMP program metrics questions (see Section 3.1: Ecoregional Setting and Managing with an Ecosystem Approach).
- III. Maintain healthy habitats by restoring and rehabilitating degraded habitats, using principles of ecosystem management and sustainability to balance short-term projects with long-term goals.
  - A. Continue to use the Constraints and Opportunities maps to provide an enhanced spatial scale to analyze military mission needs, compatibility with natural resources, and conservation of high-value, scarce habitats and species.
- IV. Continue to use National Environmental Policy Act (NEPA) documentation, including cumulative effects analysis, to guide specific projects, document choices, and long-term conservation of natural resources.



- V. Develop, maintain, and enhance coordination and cooperation with neighboring communities, agencies, and organizations to ensure compatibility of installation natural resources uses with the Navy's mission.
- VI. Ensure Navy leadership has visibility with respect to the total cost of mission sustainment, day-to-day operations, infrastructure and development or redevelopment. This should incorporate climate change scenarios and the projected value of impacts to habitat and natural resources associated with the land use decisions.
- VII. Ensure the CO's preparedness to answer as part of the INRMP metrics review, the questions identified above, in Current Management.

### **4.1.3 Infrastructure and Grounds**

The following subsections address the sustainability of natural resources that specifically support infrastructure, and best practices that support this purpose.

#### **4.1.3.1 Communication Towers and Power Lines**

##### **Specific Issues**

- The antennas and their guy wires may pose a potential risk to migratory and other birds. The number of collisions between birds and the antennas and wires at the installation is unknown, nor what species may be most susceptible.

##### **Current Management**

The antennas at NRTF Dixon are maintained by the Operations and Maintenance (O&M) contractor. The Facilities Maintenance Plan (Navy 2008) details inspections and maintenance activities to be conducted.

Radio signals, such as those emitted by the antennas at NRTF Dixon, can result in thermal heating and radio frequency shocks and burns. Hazards to persons from electromagnetic radiation are measured by Permissible Exposure Limits. In addition, an electromagnetic radiation hazard occurs when civilian or military transmitting equipment generates an electromagnetic field sufficient to result in sparks with sufficient magnitude to ignite flammable materials.

The Navy updates the survey of Radar and Transmitter equipment every four years to assess any electromagnetic radiation hazards. The latest survey was conducted in early 2011. It determined that electromagnetic radiation levels extending beyond the base boundary are within Federal Communications Commission guidelines for public safety (D. Svaldi, pers. com. 2011). The 2011 survey report also noted the need for fencing around specific antennas; fences were recently installed around those antennas (D. Svaldi, pers. com. 2013). Visitors and staff working on the facility are regularly notified of safety protocols, and warning signs are posted on access roads leading to antennas, on the perimeter fences around the antennas, and on the antennas themselves.

##### **Assessment of Current Management**

Regular updates of the electromagnetic emissions surveys at NRTF Dixon protect public and personnel health and safety. However, additional measures are warranted to also ensure protection of natural resources.

Demarcation of the boundary of the buried ground mats is conducted on a per project basis by the O&M contractor at NRTF Dixon (Map 2-3). Location of the underground mats may influence strategies

proposed and used to control weeds and restore native species assemblages in the grasslands area (Section 3.4: Vegetation Communities and Habitats), as well as influence fence placement. Coordination between the O&M contractor and the NAVFAC Southwest natural resource manager occurs for projects likely to affect the ground mats to avoid damaging them. Currently, the antennas ground mat map exists in hard copy form only. To be most useful, it should be converted into a GIS file so it can be combined with layers of natural resources to show the extent of their overlap.

In addition, collisions between birds and the antennas (and their guy wires) are possible. However, no data are currently available as to whether this is occurring to determine if the structures pose a threat to migratory birds, what feature poses the threat, and which species are the most susceptible. NAVFAC Southwest plans to gather such data through development and implementation of an Avian Protection Plan (Section 3.5.5: Birds).

## Management Strategy

**Objective:** *Safeguard military readiness by maintaining grounds for antennas and other communications towers while avoiding and minimizing impacts to native wildlife and plants.*

- I. For any new antennas, communications towers, and powerlines, ensure that siting criteria are reviewed by NAVFAC Southwest's natural resources manager (Section 4.6: NEPA Compliance).
- II. An Avian Protection Plan should be written to quantify impacts to birds, and determine the cause of impact (Section 3.5.5: Birds).
- III. Any proposed towers should also comply with USFWS guidelines for reducing fatal bird strikes on communication towers (USFWS 2012b)<sup>3</sup> to the greatest extent practicable:
  - A. When feasible, reduce numbers of new towers needed by using existing structures such as buildings and co-locating multiple antennas on a single structure.
  - B. If new towers must be built, construct them to be below 199 feet tall to avoid the requirement for aviation safety lighting. Construct unguyed towers with platforms that will accommodate possible future co-locations and build them away from areas of high migratory bird traffic, wetlands and other known bird areas.
  - C. Where towers over 199 feet are needed, use the minimum amount and intensity of lighting allowed under Federal Communications Commission regulations.
  - D. Use white or red strobe lights whenever lights are required for aviation safety.
  - E. When possible, minimize the tower footprint on newly constructed towers.
  - F. Dismantle inactive towers as soon as possible, when feasible.
  - G. Use visual daytime markers in areas of high diurnal raptor or waterfowl movements.
  - H. Security lighting for on-ground facilities should be minimized, point downwards or be down-shielded.
  - I. Allow access to tower sites for monitoring purposes.
- IV. Use the map of NRTF Dixon antennas and their ground mats/guy wires as a tool to enhance coordination between the O&M contractor and NAVFAC Southwest natural resources manager regarding habitat enhancement activities in and around the antenna field.
  - A. To be most useful, the map should be converted into a GIS file so it can be combined with layers of natural resources to show the extent of their overlap.

<sup>3</sup> Available online at: [www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html](http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html)

### 4.1.3.2 Construction and Facility, Grounds, and Roadside Maintenance

#### Specific Issues

- Facilities planning interfaces with natural resources planning at the building exterior and in site selection. Coordinating among the roles and responsibilities of those executing the Environmental Management System for NRTF Dixon, those responsible for pollution prevention, and natural/cultural resources management can help to achieve mutually interdependent program goals.
- Routine maintenance may be hampered by the need to comply with requirements to protect sensitive habitat and species (e.g. federally listed species, burrowing owls, migratory birds, etc.) unless there is advanced early coordination. Avoidance and minimization measures should be employed to comply with the Migratory Bird Treaty Act (MBTA). There may be a need to relocate burrowing owls away from sensitive infrastructure, such as antennas and the paved road.
- It is unclear to what degree the current vegetation mowing regime (as a fire abatement measure for antennas and other sensitive infrastructure) may be contributing to the spread of invasive plants (Section 3.9: Invasive Species Management) or if alternative methods of grounds maintenance that benefit habitat and reduce the need to mow, would benefit the natural resources program.
- Low Impact Development (LID) strategies that divert runoff and flow path from sensitive and heavily used areas could be important, particularly considering that the entire installation is located in the 100-year flood zone, that the basement of at least one building occasionally floods during wet weather, and that water quality is important for wetland species. LID stormwater practice is currently required in many stormwater permits, and should be considered where feasible. LID is a site design strategy with a goal of maintaining or replicating the pre-development or pre-disturbance hydrological regime through the use of designs to create a functionally equivalent hydrological landscape.<sup>4</sup>
- Night lighting may have environmental effects (i.e. broadcast versus downward focused lighting). Security lighting around buildings is for safety, such as lighting in uninhabited areas and in high asset locations.
- A bridge in the southwest corner of the property is in need of repair or removal, which may require NEPA analysis and consultation with the U.S. Army Corps of Engineers (USACE) regarding impacts to the potentially jurisdictional irrigation ditch under the bridge.

#### Current Management

In the Navy, the first requirement of facilities is mission support. At the same time, Navy policy promotes sustainable development per NAVFAC Instruction 11010.45, including in all parts of the planning phase up to and including completion of project documentation. Leadership in Energy and Environmental Design is a tool that the Navy uses to measure their achievement (NAVFAC Instruction 11010.45).

The following general requirements assist NAVFAC Southwest personnel in managing NRTF Dixon construction and facility maintenance activities relative to natural resources:

- During the planning process, the effects of locating new facilities or concentrated military operations in or adjacent to biological resources known to contain sensitive species must be evaluated through NEPA.
- Site approval from NAVFAC Southwest is required for all facilities and activities. Activities include, but are not limited to, development, reconstruction, repairs, utilities, leases, and easements.

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<sup>4</sup> In LID, hydrological functions of storage, infiltration, and groundwater recharge, as well as the volume and frequency of discharges are maintained through the use of integrated and distributed micro-scale stormwater retention and detention areas, reduction of impervious surfaces, and lengthening of flow paths and runoff time (Coffman 2000). This contrasts with conventional approaches that typically convey and manage runoff in large facilities located at the base of drainage areas.

- NAVFAC Southwest must approve any actions that could introduce hazardous materials or waste to an uncontaminated area (Section 4.5.4: Hazardous Material Spill Prevention and Response).

The O&M contractor uses the Facilities Maintenance Management System to perform minor maintenance and repair, inspection, and emergency and service work to maintain installation facilities and equipment. This includes grounds maintenance such as mowing around the antennas and in other areas. The Facilities Maintenance Plan (Navy 2008) describes this system and includes specific preventive maintenance requirements including those for the improved and semi-improved grounds and antennas.<sup>5</sup> Emergency work is scheduled immediately to prevent loss or damage to installation property, while regular service work is scheduled as time permits. In particular, security and emergency lighting for safety (primarily at night) is maintained.

Typically, vegetation shall not exceed a height of six inches within the antenna ground screens or guy wire patterns; this is a fire abatement measure. Additional vegetation control requirements are set in accordance with the type of antenna that is being serviced, as indicated in the Facilities Maintenance Plan. Such control may be accomplished by use of chemical (herbicides) and mechanical (mowing and weed eating) methods; mowing is more common. During times of inclement weather and when ground conditions are such that equipment cannot safely get out to the fields, vegetation control is suspended until conditions permit.

The limited landscaping within the developed area, including a lawn and hedges, are maintained by regular mowing/trimming, watering, and re-seeding/fertilizing. In this area the concrete ditch, cable covers, and water spigots are also kept free of vegetation. Weed control (using physical methods such as mowing, weed-eating, or chemical methods) is conducted anywhere from 5 to 15 feet around various structures including substations, water and fuel storage tanks, automatic gates, manhole covers, fire hydrants, and deepwell water pumps. When mowed, vegetation is cut to a maximum height of 6 inches.

All access roads and all paved areas within the boundaries of NRTF Dixon are also inspected and maintained on a regular basis by the O&M contractor. Roadsides along the paved road are mowed as a fire abatement measure. All unpaved roads are maintained with mowing and grading when needed. This provides clear paths to perform antenna maintenance and repair functions.

## Assessment of Current Management

Actions for sustainability planning and management at NRTF Dixon should draw on Navy guidance (NAVFAC Instruction 11010.45) and tier off of those currently mandated in Executive Order (EO) 13423 (2007). Expert opinions, experience from practitioners and other stakeholders could also be sought out as needed. Participation of Navy natural resources personnel should be early in construction and maintenance planning stages to ensure that adequate funding, resources, and commitment are available to comply with federal, state, and Navy regulations, apart from necessary regulatory consultation and permitting.

*EO 13423 tasks federal agencies with defining principles for implementing sustainable development in construction.*

Where installation management actions might have an impact on federally listed species, or their habitat, consultation with the USFWS (informally or formally) should take place. Critical Habitat for the delta smelt has been designated on NRTF Dixon (Section 3.7.8: Delta Smelt; Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns). It is possible that other federally listed species may be documented on the installation in future surveys (Section 3.7: Threatened and Endangered Species and

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<sup>5</sup> NRTF Dixon's only improved area is the inner Building 10 compound area. Semi-improved areas include the antenna field, roads, and the north area around the water storage tanks and storage building, not including the agricultural outlease area.

Critical Habitat; Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns). Facility maintenance and project proposals should be reevaluated in light of new discoveries.

To comply with the MBTA, maintenance activities should be conducted outside of the breeding season in those areas where there are breeding birds (Section 3.5.5: Birds; Section 3.8: Other Special Status Wildlife Species; Appendix K: Reporting on Migratory Bird Management). Otherwise, NAVFAC Southwest should require clearance surveys at least seven days prior to the activity and employ additional avoidance and minimization measures as needed. Currently, there are no stipulations in facility maintenance plans, or in lease agreements, regarding the need to focus maintenance and construction outside of the breeding season.

Consultation with the USACE should occur if an activity may impact a jurisdictional water or wetland (Section 3.4.3: Wetlands and Jurisdictional Waters).

Vegetation control outside of the developed area has effectively controlled weeds in target areas (e.g. around specific structures) and reduced fuel hazard to protect sensitive equipment and protect the main evacuation route. However, there is need to investigate the overlap of such grounds maintenance activities with sensitive resources and habitats, and whether alternatives might provide opportunities for better practice. In addition, while mowing along the edges of roads is performed as a fire abatement measure, it is possible that it may contribute to degradation of those areas and spread of invasive species.

## Management Strategy

**Objective:** *Conduct construction and facility maintenance in a way that allows for protection of sensitive environmental resources while ensuring full accomplishment of the military mission. Enable innovation in planning, design, project management and implementation to sustain Navy institutional missions and natural resource assets.*

- I. Comply with Navy and DoD policy to design, use, and promote construction practices that minimize adverse effects on natural habitat (EO 13148 and Presidential Memorandum 26 April 1994).
  - A. Promote sustainable land use through avoiding the use of undeveloped land, open space, water and soil conservation areas, existing natural ecosystems, endangered species habitats, and floodplains (NAVFAC Instruction 11010.45).<sup>6</sup>

*NAVFAC Instruction 11010.45 guides the Navy's efforts to protect natural resources in facility planning.*
  - B. Use construction siting, materials, and methods that promote biotic communities to the fullest extent possible.
  - C. Ensure existing facilities and land management practices are applied in a way that does not conflict with achieving or maintaining wetland functions (or quality of water resources). Promote the use of LID practices to protect water quality at NRTF Dixon as Best Management Practices (BMPs) that will help to address runoff and nonpoint source pollution problem areas.<sup>7</sup> Also prevent pollution by reducing fertilizer and pesticide use and recycling green waste.

<sup>6</sup> NAVFAC Instruction 11010.45 emphasizes: efficient water use; reducing stormwater runoff; minimizing paved areas; maximizing native vegetation; aligning structures to passively reduce energy consumption; minimizing building footprints and retaining open space; improving energy efficiency; reducing greenhouse gases and reducing energy use; reducing or eliminating the use of pesticides, herbicides, and synthetic fertilizers; promoting the use of compost and recycled rain or gray water; reducing consumption of petroleum fueled transportation and operations; preventing waste and encouraging recycling (EO 13101); and avoiding broadcast lighting in outdoor areas.

<sup>7</sup> The goal of Navy policy is "no net increase" in the amount of stormwater volume and sediment or nutrient loading that escapes into the ecosystems surrounding Navy facilities and installations. Beginning in 2011, Navy and DoD policies (16 November 2007 and 19 January 2010, respectively) mandated implementation of LID strategies for stormwater management for federal facility construction as regulated and guided by the Energy Independence and Security Act Section 438 (Title 42 USC 17094) and the updated United Facilities Criteria 3-210-10, LID (15

- D.** When possible, incorporate regionally appropriate native species for landscaping. Implement water-efficient practices and irrigate only when necessary. Use integrated pest management practices.
- II.** Strengthen participation of natural resources personnel in the site and project review process (NAVFAC P-73 Manual) (Section 4.6: NEPA Compliance) and improve their integration into sustainability planning through Regional Shore Infrastructure Planning, master planning and NEPA processes. Facilitate early, advance project review.
- A.** Consider training in sustainable design criteria in the Navy for engineers, construction and design specialists, water quality specialists, and biologists. This could be web-based training.
- B.** Develop a guidesheet of natural resource protection protocols (avoidance and minimization measures) for routine repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected.
- C.** NRTF Dixon contractors conducting maintenance activities, who come across a nest or other natural resource they believe is in danger of being impacted, shall contact NAVFAC Southwest for guidance on next steps.
- III.** Consider environmental impacts and natural resource conservation in all site feasibility studies and project planning, design, and construction. Ensure incorporation of BMPs in the preliminary engineering, design, and construction of facilities involving ground disturbance as well as regular maintenance activities, where applicable (OPNAVINST 5090.1C CH-1). Appropriate conservation work and associated funding shall be included in project proposals and construction contracts and specifications.
- A.** Obtain and review any nonpoint source pollution plans addressing soil erosion prevention and pesticide and fertilizer use.<sup>8</sup> Develop or use proven BMPs to control soil erosion, prevent nonpoint source pollution from construction sites and to protect sensitive resources.<sup>9</sup> Map permitted wastewater or stormwater management issues (NAVFAC P-73 Real Estate Manual). *Stormwater and nonpoint source pollution management is guided by Section 319 of the Clean Water Act.*
- B.** Vehicular traffic associated with construction and operational support activities, including parking, will remain on established roads (paved and graded) to the maximum extent practicable.
- C.** Clean construction and facility maintenance equipment (e.g. mowers) in designated areas (e.g. staging areas), in accordance with BMPs, prior to entering and departing the project corridor to minimize the spread and establishment of non-native invasive plant species.
- D.** Construction and maintenance sites should include revegetation or the distribution of organic and geologic materials (i.e. rocks) over the disturbed area to reduce erosion while allowing the area to naturally vegetate.
- E.** Use native seeds or plants, which are compatible with the enhancement of protected species, to revegetate staging areas and other disturbed areas.

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November 2010). The California National Pollutant Discharge Elimination System General Permit for Construction Stormwater [Order No. 2009-0009-DWQ] also includes requirements for post-construction BMPs [aka LID], which are mandatory. LID resources and ideas are included in the EPA's Technical Guidance document for the Energy Independent and Security Act Section 438; Appendix B of the UFC 3-210-10; and the California Stormwater Quality Association website ([www.casqa.org](http://www.casqa.org)).

<sup>8</sup> OPNAVINST 5090.1C CH-1 includes agricultural run-off in the definition of nonpoint source pollution (Chapter 24).

<sup>9</sup> Guidelines of Section 319 of the Clean Water Act assign the States responsibility to implement nonpoint source pollution BMPs. Federal consistency provisions also authorize States to review Federal activities with State nonpoint source programs (OPNAVINST 5090.1C CH-1). OPNAVINST 5090.1C CH-1 requires "that state-approved erosion prevention/control measures are included as requirements in the specifications for all ground disturbing construction projects."

- F. Impacts to areas containing sensitive or management focus species need to be identified in appropriate NEPA documentation. Appropriate restoration and/or mitigation should be provided for these impacts through consultation with NAVFAC Southwest and/or other agencies as needed.
  - G. Monitor and enforce compliance with BMPs.
  - H. Funding should be provided throughout building phases and post-construction to remove weeds.
  - I. For construction or site activities, the MBTA requires that federal agencies coordinate with USFWS to obtain permits prior to the activity if it would likely result in the take of a migratory bird. If construction or clearing activities are scheduled during nesting season (February 15 through August 31), NAVFAC Southwest should be consulted to conduct surveys to identify active nests.
- IV. Where feasible, avoid installing broadcast lighting in outdoor areas, particularly on building exteriors. Encourage use of downward-focused lighting using fixtures that are “night-sky compliant” to avoid unnecessary disturbance to nocturnal wildlife. Areas where safety is primary concern may be excepted (Section 3.5.7: Bats).
- V. For construction activities, a U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System permit for stormwater discharges is required for sites where one or more acres of land will be cleared, graded, excavated, or stockpiled.<sup>10</sup> In California, these general permits are administered by the California State Water Resources Control Board.
- VI. Secure all appropriate permits before work commences.

**Objective:** *Employ grounds maintenance activities that avoid unnecessary impacts to sensitive species and habitats, and integrate with INRMP habitat conservation and enhancement objectives.*

- I. Maintain grounds to comply with federal requirements (e.g. MBTA).
- II. Continue to maintain strategic fuel breaks throughout NRTF Dixon (e.g. along evacuation routes, around antennas, burnable infrastructure, and occupied buildings) in an effort to slow and stop fire spread should a wildfire ignite.
  - A. Coordinate mowing for managing hazardous fuel condition with invasive species control to ensure that the mowing regime does not inadvertently contribute to invasive plant spread, and remains compatible with fire protection and security needs.
- III. Develop a MBTA protocol and best practices for routine maintenance activities such as mowing and herbicide application, etc. As feasible, combine with efforts to passively relocate burrowing owls away from sensitive installation areas, including the antenna field.
  - A. As practicable, schedule routine maintenance activities outside of the breeding season in areas known to be occupied by breeding birds, including firebreak maintenance around the antennas and their guy wires.
  - B. If conducting such activities during breeding season, conduct clearance surveys at least seven days prior to the activity and implement additional avoidance and minimization measures as needed.

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<sup>10</sup> When calculating the area of disturbance, all phases of the project shall be added together. A project cannot be phased to avoid permit compliance or application for a permit.

**Objective:** *Maintain paved and graded roads for access to facility equipment in a way that does not unnecessarily impact sensitive resources and habitats.*

- I. Improve the soundness of (paved and graded) road siting and maintenance practices to avoid and minimize environmental impacts, by maintaining access and operation of roads to their original design standard or better. Ensure proper drainage to accommodate flood flows, since the installation occurs in a floodplain. Avoid development in a floodway that may obstruct, divert, or retard flood flows, or which may affect flood elevations and flood protection.
- II. Employ targeted management measures for roadsides. Roads and roadsides tend to be corridors for invasion of non-native plants, given the frequent maintenance and mowing that can favor disturbance and invasive species. They also process water differently from the natural environment.
  - A. Avoid mowing that cuts vegetation to a height of less than four inches to prevent providing a competitive advantage to invasive species nearby or that are already established in roadsides.
  - B. Avoid removing all vegetation along roadsides as it disturbs the soil surface.
  - C. Develop and implement BMPs to improve roadside condition, while still complying with fire abatement needs (e.g. vegetation height restriction of six inches).
- III. If feasible, conduct repairs for the paved road in concert with ground squirrel and burrowing owl relocation efforts.

### 4.1.3.3 Fencelines and Buffer Zones

#### Specific Issues

- Cattle from adjacent grazing areas occasionally break through the installation's eastern perimeter fence. Their trespass represents: (a) significant potential harm to vernal pool and wetland habitats and their dependent species, in the Natural Resources Management Area; and (b) a threat to sensitive installation equipment and personnel safety, especially at night when cattle sometimes are on the roadway (Section 3.10: Pest and Predator Control). Further, when cattle come onto the property, they feed in the agricultural outlease area of the installation, which could result in the lessee petitioning the Navy for damages.

#### Current Management

The O&M contractor inspects fencing around sensitive infrastructure and electrical equipment, as well as the perimeter fence, on a regular basis. Mowing for weed control and fire abatement occurs around internally fenced infrastructure and equipment.

#### Assessment of Current Management

Internal fencing provides an extra measure of security for sensitive equipment and infrastructure on the installation (including protection for personnel safety). Maintaining buffer zones around these fenced areas also prevents establishment of natural resources that may conflict with use and maintenance of those areas.

#### Management Strategy

**Objective:** *Using integrated fencing and buffer zones, provide security and safety for operations, personnel, and the public, while avoiding and minimizing environmental impacts.*

- I. Integrate security fencing, required clear zones, safety requirements, and encroachment control into designated, multi-purpose buffer zones.
  - A. Maintain perimeter and internal security fencing to protect public and personnel safety.



- B. Protect installation natural resources, agricultural outlease areas, infrastructure and personnel safety from damage resulting from trespass of cows through the eastern perimeter fence, as practicable.
  - C. Install an interior fence around the Natural Resources Management Area to protect the vernal pool area and other sensitive resources.
- II. Ensure maintenance methods promote native habitats and species, as appropriate.

#### **4.1.4 Adapting to Effects of Climate Change and Regional Growth and Conservation Initiatives**

##### **Background**

The evidence for climate change is extensive and has generated consensus in the scientific community (Government Accountability Office 2007; Gitay et al. 2002; Oreskes 2004). Addressing climate change poses a new challenge for natural resources managers who will need to understand the anticipated changes in ecosystem structure and function, in addition to understanding ecosystems as they function now and as they have in the past (Government Accountability Office 2007).

DoDI 4715.03 includes a requirement to address climate change on all installations. It states that “All DoD Components shall, in a regionally consistent manner, and to the extent practicable and using the best science available, utilize existing tools to assess the potential impacts of climate change to natural resources on DoD installations, identify significant natural resources that are likely to remain on DoD lands or that may in the future occur on DoD lands and, when not in conflict with mission objectives, take steps to implement adaptive management to ensure the long-term sustainability of those resources.”

##### **Specific Issues**

Consideration should be given to regional partnerships in planning for and adapting to climate change, in the context of NRTF Dixon and its vulnerability to flooding, extended drought, subsidence, and designation of Critical Habitat for delta smelt under the Endangered Species Act (ESA). Some regional climate change predictions imply that facilities at NRTF Dixon may be at risk of flooding in the 50- to 100-year time-frame. It is important that planning take place for infrastructure protection in a floodplain under the range of regional climate scenarios that could take place, and that infrastructure sites remain properly drained and vegetated to hold water as effectively as possible.

As part of both the Sacramento River and Delta floodplains, and in an area affected by regional land subsidence, climate change effects are likely to be seen at NRTF Dixon in wetlands first. More intense winter flooding and greater sedimentation of stream channels are expected. Hotter, drier summers could alter the ability of vernal pools to support endemic species, or may allow more invasion by upland plants. Ephemeral pools are considered a potential indicator community for monitoring climate change due to their sensitivity to water temperature, seasonality, and duration of flooding. Research indicates that climate change will likely have long-term and adverse impacts on natural resources, including terrestrial and aquatic habitats. Native plants and animals, including special status species, may not be able to adapt or relocate quickly enough to survive.

The California Wildlife Action Plan (Bunn et al. 2007) identifies climate change as one of four primary stressors affecting wildlife, along with growth and development, water management conflicts, and invasive species, and makes recommendations to include climate change science in restoration work.

A range of scenarios is possible using accepted models for climate change at NRTF Dixon. Local data sets need to be developed and integrated through regional collaboration and consensus to establish relevance of the models at the local scale.

## Current Management

NRTF Dixon is still defining possible impacts from climate change and how to monitor and respond them.

In terms of regional growth, all land surrounding NRTF Dixon is zoned as agriculture (Solano County 2008), which protects the installation from any encroachment issues resulting from increasing population centers and/or development nearby. In addition, some lands in the vicinity (though not adjacent) have been converted into natural resource preserves or are under conservation easements. Designation of such lands surrounding the installation for agricultural (or livestock) production and/ or protection for natural resources should continue to be encouraged.

## Assessment of Current Management

Assessing the impacts of climate change is best approached by identifying an environmental baseline for the future that considers the differences in landscape form and function, caused by climate change and other stressors on the landscape. Conducting a climate change vulnerability assessment may guide essential monitoring requirements, as well as develop appropriate adaptive management strategies. However, the abundance and distribution of species and habitats on Navy properties may be too small in scale to address comprehensive climate change vulnerabilities. Therefore, regional partnerships may be the most appropriate means to conduct such assessments and in developing and implementing adaptation strategies. In general, natural resources managers should identify natural resources management strategies that provide conservation benefits to the ecosystem, regardless of whether climate changes occur.

## Management Strategy

**Objective:** *Adapt and mitigate the adverse impacts of climate change through annual goal setting based on science-based scenarios, targets, collaborative planning with Land Conservation Cooperatives or other regional efforts, and adaptive management.*

- I. Develop a natural resources program framework for adapting to climate change, including a Vulnerability Assessment for vernal pools, analysis of flood potential via the Delta, and recommendations for restoration work to ensure sustainability of military operations, infrastructure, and healthy habitats with expected climate change. Work with regional partners for maximum effectiveness.
  - A. Collaborate with the California Landscape Conservation Cooperative for the purposes of participating in regionally coordinated conservation measures.
  - B. Ensure that conservation priorities and expenditures reflect the resources most vulnerable to climate change, such as wetlands, vernal pools, and species on the margins of their distribution patterns.
- II. Address the anticipated increase in extreme weather events through preventative technologies. Support water resources planning.
- III. Address the anticipated shifts in species ranges and population abundances through adaptive management.
  - A. Determine if plant community composition and productivity are as expected.
  - B. Identify species and communities that are resilient or vulnerable to climate change impacts by conducting climate change vulnerability assessments.

- C.** Identify data and research needs for ensuring an effective response to the consequences of climate change.
  - D.** Provide for the management of threatened, endangered, and other Species at Risk such that changes in distribution and abundance may be understood in the context of climate change.
  - E.** Lessen the impacts of higher air temperatures and drought by improving the overall resiliency of the ecosystem to resist or recover from disturbance. This can be done by ensuring an abundance of moderately-deep and deep-rooted perennials, stable soils, and intact watersheds for vernal pools.
- IV.** Identify restoration projects to adapt habitat elements for specific species which may be impacted by climate change.
- V.** Improve coordination and collaboration that responds to the consequences and costs of climate change.
  - A.** Identify and implement regional conservation designs that provide stepping stones for species to move to sites with suitable climates.
  - B.** Participate in climate change review for Navy Encroachment Action planning.
  - C.** Investigate and consider regional collaboration with other federal agencies and installations in developing vulnerability assessment and climate change adaptation strategies. In particular, the Bay-Delta region of California, in which NRTF Dixon is located, is a particular focus for predicting climate change impacts and developing resiliencies and responses to anticipated changes. Collaboration on climate change responses and species vulnerability assessments could be achieved through partnerships with Bay-Delta region organizations, for example, those participating in development of the Bay-Delta Conservation Plan.
  - D.** Incorporate DoD guidance resulting from the EO on Preparing the United States for the Impacts of Climate Change (01 November 2013),<sup>11</sup> which focuses on adjusting policies to improve resilience of ecosystems to climate change and reduce contributions to it.
- VI.** Ensure that installation personnel have access to climate change education and outreach. Examples of resources include:
  - A.** Monitor climate change predictions for the Delta from University of California Davis, the Bay-Delta Adaptation Program, and the San Francisco Bay Estuarine Institute.
  - B.** The Strategic Environmental Research and Development program website contains links to DoD sponsored research on natural resources conservation and climate change:  
[www.serdp.org/Program-Areas/Resources-Conservation-and-Climate-Change](http://www.serdp.org/Program-Areas/Resources-Conservation-and-Climate-Change).
  - C.** A number of online training resources can be used to develop a basic understanding of climate science and adaptation planning, including:
    1. DoD Video Responding to Climate Change:  
<http://www.dodworkshops.org/files/ClimateChange/CC-Animation.html>.
    2. U.S. Forest Service short course “Adapting to Climate Change”:  
[www.fs.fed.us/ccrc/hjar/index\\_st.html](http://www.fs.fed.us/ccrc/hjar/index_st.html).
- VII.** Continue to work with Solano County and other regional partners to ensure that lands surrounding the installation contain uses compatible to the military mission at NRTF Dixon, including agricultural (or livestock) production and/or preserves and conservation easements for natural resources.

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<sup>11</sup> Available online at: <http://www.whitehouse.gov/the-press-office/2013/11/01/executive-order-preparing-united-states-impacts-climate-change>.

## 4.2 Management of Other Uses and Real Estate Outgrants

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### Background

The Sikes Act (as amended) and Title 10 of the USC, section 2667 (e)(4) provide for the leasing of non-excess DoD lands to an agency, organization, or person. Management of Navy real estate leases is guided by Real Estate Operations and Natural Resources Management Procedural Manual NAVFAC P-73 Volume II. Because the determining factors regarding resource usage are compatibility with the military mission, safety issues associated with the military mission, protection of cultural sites, and sensitive environmental habitats and managed species, all leases and outgrants are subject to comply with all relevant installation plans and this INRMP.

In addition, DoDI 4715.03 indicates that the Heads of the Office of Secretary of Defense and DoD Components with natural resources management responsibilities shall ensure compliance and coordination by tenant activities, lessees, contractors, and operators on lands for which the DoD Component has a direct real estate interest and for which the management has been outsourced by privatization initiatives or Enhanced Use Lease Agreements. This is also supported by OPNAVINST 5090.1C CH-1.

All Navy hosts and tenants are required to develop agreements, or include in existing agreements, roles and responsibilities with respect to environmental compliance. Such agreements shall include pollution prevention, environmental compliance evaluations, environmental planning documentation, contact with regulatory agencies, payment of fines/fees, permit signatures/duties, hazardous waste management, emergency planning and community right-to-know implementation, training, corrective and/or response actions, etc. (OPNAVINST 5090.1C CH-1 Chapter 1, pg. 1-5).

### Specific Issues

- Outlease holders for the perimeter drainage ditches are responsible for ditch maintenance and repair (not including general weed control activities).
- Agricultural lease restrictions are in place for certain areas due to the presence of cultural resource issues.

### Current Management

Real estate outgrants at NRTF Dixon consist of properties leased for continual use by lessees, such as the agricultural outlease area, utility corridors, and other easements. Easements and utility corridors are established to allow passage onto NRTF Dixon primarily for maintenance purposes. All lessees and outgrant holders are responsible for natural resources management on their respective properties. The O&M contractor is responsible for maintenance in most easements and utility corridors. NAVFAC Southwest is responsible for managing all real estate leases and outgrants at NRTF Dixon, including ensuring compliance with applicable regulations and Navy guidance. NAVFAC Southwest is also responsible for natural resource management on the installation.

### Assessment of Current Management

Real estate outgrants, including utility corridors and other easements, at NRTF Dixon should comply with natural resources management requirements that the installation has agreed to or reasonably proposed, as provided in this INRMP and any other plans developed for NRTF Dixon that regulate actions with potential impact to sensitive resources and habitats (i.e. Section 4.5.2: Integrated Pest Management; Section 4.5.1: Integrated Cultural Resources Management Planning, etc.). Exceptions to this compliance could be made on a case-by-case basis, provided there is a sufficient alternative for environmental oversight to ensure protection of resources and avoidance of violations.

Responsible parties and roles, and a review schedule for outgrants and easements, should be maintained to ensure adequate and appropriate environmental oversight. Such a system is already implemented for the agricultural outlease area (Section 4.2.1: Agricultural Outlease Management). Finally, keeping any protocols, procedures, and other records on hand regarding natural resource treatment and outgrant and easement use would ensure consistency.

## Management Strategy

**Objective:** *Ensure that all activities of lessees are in accordance with federal environmental regulations, EOs, and guidance outlined in the INRMP.*

- I. Oversee, inspect, and monitor outgrants for compliance with environmental protection laws and DoD and Navy guidance (e.g. this INRMP).
  - A. The NAVFAC Southwest natural resources manager for NRTF Dixon is responsible for ensuring compliance with environmental requirements of outgrants and leases, and that such requirements meet the standards of any NRTF Dixon regulatory responsibilities.
  - B. Implement policies to include specific environmental compliance actions and adoption of BMPs in all outgrants. Enforce compliance with lease conservation measures and other BMPs, consistent with laws and this INRMP.
  - C. Work with NAVFAC Southwest Real Estate to ensure periodic inspections of all outgrants and to implement effective actions to address violations.
- II. As feasible, designate utility corridors and areas suitable for future infrastructure, such as antennas, in advance. Maximize the use of existing communication sites and corridors, and prevent the proliferation of scattered single user corridors.
- III. Evaluate real estate leases through the NEPA process (Section 4.6: NEPA Compliance).

## 4.2.1 Agricultural Outlease Management

### Background

The Sikes Act (as amended) and OPNAVINST 5090.1C CH-1 require the Navy to identify areas that may be suitable and available for agricultural outleasing or commercial forestry. More specifically, Title 10 of the USC, section 2667 (e)(4) provides for the use of DoD lands under a lease to an agency, organization, or person for the purpose of agricultural outleasing or the production of and sale of forest products that have commercial value. It is the policy of the DoD and Navy, under the Sikes Act (as amended), to promote agricultural outleases (along with other land uses) to the maximum extent compatible with the military mission and ecological constraints.

Many military installations include agricultural and/or grazing lands that must be retained for buffer or safety zones, security of the installation, mobilization needs, or future mission requirements. Where feasible, these lands may be put under production to optimize natural resources and to minimize funds expended in maintaining them. DoDI 4715.03 states that such “programs exist to provide ecosystem-level management that supports and enhances the land’s ability to support each installation’s respective military mission while simultaneously obtaining ecologically sustainable results that satisfy all federally mandated requirements for natural resources.”

In addition, OPNAVINST 5090.1C CH-1 states that “Navy installations shall identify and minimize the adverse effects of their actions on prime and unique farmlands in accordance with the Farm Land Protection Policy (7 USC 4201 et seq.). Congress enacted the Farmland Protection Policy Act as a subtitle of the 1981 Farm Bill. The purpose of the law is to “...minimize the extent to which Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses...” (Public Law [PL] 97-98, Sec. 1539-1549; 7 USC 4201, et seq.).” The Farmland Protection Policy Act also stipulates that federal programs be compatible with state, local, and private efforts to protect farmland. For the purposes of the law, federal programs include construction projects, and the management of federal lands. The U.S. Department of Agriculture’s Natural Resources Conservation Service is charged with oversight of the Farmland Protection Policy Act.

Agricultural lands leased pursuant to PL 97-321 permit the Secretary of the Navy to retain the lease rental receipts to cover the expenses of leasing and to finance multiple land use management programs (i.e. natural resources projects) (Section 5.4.4.1: Department of Defense Funding Sources).

Finally, NAVFAC must document, with an economic analysis, why land that is suitable for grazing or agricultural purposes is not leased (as long as it meets criteria for compatibility with the military mission and ecological constraints). If the CO chooses not to implement recommendations to outlease land for agriculture or grazing purposes, the Engineering Field Commands will document the reasons they believe an affirmative decision was not made, and retain in a permanent file with an economic analysis. Reviews should be conducted periodically (at least every five years) because changes in an installation's mission requirements may impact outleasing potential (Real Estate Operations and Natural Resources Management Procedural Manual NAVFAC P-73 Volume II).

### **Specific Issues**

- The bridge in the southwest corner of the installation is in need of repair or removal to ensure continued access with farm equipment to the southwest agriculture field, where the lessee is responsible for mowing or controlling weeds under the outlease agreement.
- Discharge of agricultural runoff into surface waters is regulated by the Central Valley Region of the California Regional Water Quality Control Board (hereinafter Central Valley Water Board) as part of the Long-term Irrigated Lands Regulatory Program (California Environmental Protection Agency and Central Valley Water Board 2011, 2012). Potential discharge of NRTF Dixon agricultural water into surface water could be an issue if the lessee is not part of a coalition to monitor and report such discharge.
- Agricultural lease restrictions are in place for certain areas due to cultural resource issues.

### **Current Management**

The major nonmilitary land use at NRTF Dixon is agricultural production through the facility’s outlease program. The program is managed by NAVFAC Southwest in San Diego, California. Responsibilities of NAVFAC Southwest pertaining to agricultural practices include establishing policy for managing natural resources under each lease, for ensuring compatibility of land use with the military mission at NRTF Dixon, and for ensuring the use of good conservation practices. In addition, NAVFAC Southwest is responsible for awarding leases, for preparing soil and water conservation plans, and for conducting periodic inspections to ensure compliance with the provisions of each lease. NAVFAC Southwest is also responsible for environmental oversight at NRTF Dixon. The Contract Technical Advisor from Navy Computer and Telecommunications Station San Diego present at NRTF Dixon acts as an on-station liaison in the event of any emergencies in the agricultural outlease area.

The entire 585 acres of agricultural land (Parcel 4A01) is generally leased to one lessee for a duration of five years. After five years, the lease is competitively renewed.

Under the outlease agreement for Parcel 4A01, the lessee is required to comply with conservation and maintenance measures stipulated in the soil and water conservation plan included in the outlease agreement. Conservation and maintenance provisions include the following:

- Irrigation water management;
- Ditch and drainage system maintenance;
- Pest management and mosquito abatement;
- Road maintenance;
- Erosion, dust, fire, and weed control;
- Fence maintenance;
- Debris removal; and
- Other management practices necessary to ensure the sustainability of agriculture on NRTF Dixon.

The lessee can perform reimbursable conservation and maintenance related work as identified, approved, and directed in advance by the Navy. The lessee is also responsible for maintaining agreements with the Solano Irrigation District to provide water to isolated agricultural fields at NRTF Dixon. In general, the lessee supports future land management to continue agricultural production.

There are currently no crop rotation requirements or crop restrictions for agricultural outlease lands on the installation. There is currently no tailwater return line or sump at the end of the agricultural fields. The California Department of Water Resources has disallowed the discharge of any agricultural water into jurisdictional waters. As a result, the Navy currently pays to have excess water in the irrigation ditches pumped by the Solano Irrigation District two to four times a year to remove it.

### **Assessment of Current Management**

In addition to providing sustainable agriculture, many of the above provisions, such as debris removal and pest management, help NRTF Dixon meet its natural resources management goals. Agricultural outlease lands are managed to be compatible with the military mission of NRTF Dixon.

The agricultural outlease was most recently awarded in October 2012. In general, there may be a need for natural resources managers to ensure that weed control and other necessary management actions are taken in the agricultural outlease area in times when there is no agricultural lessee.

Additional goals of the program outlined below have been developed to maintain a sustainable agricultural program, to sustain military readiness, and to conserve the integrity of natural resources on the installation.

### **Management Strategy**

**Objective:** *Maintain sustainable agricultural practices to the maximum extent possible in accordance with the military mission and ecological and cultural resource constraints.*

- I. Manage current and future agricultural outlease agreements to reduce negative ecological impacts and conflicts with the military mission associated with farming activities.
  - A. Conduct agricultural outlease inspections at least once per year to ensure compliance with the soil and water conservation plan of the lease agreement.
- II. Safeguard water quality and maintain soil fertility and productivity in the agricultural outlease area.

- A. Update the agricultural outlease at NRTF Dixon to comply with new requirements included in the Long-Term Irrigated Lands Regulatory Program (California Environmental Protection Agency and Central Valley Water Board 2011, 2012).
      - B. Encourage opportunities to collaborate with Natural Resources Conservation Service regarding agricultural soil fertility and productivity at NRTF Dixon.
      - C. Update an irrigation evaluation as part of the agricultural outlease agreement. Prevent agricultural irrigation waters from reaching the vernal pools and other wetland areas.
- III. Ensure control of pest species in compliance with NRTF Dixon's new Integrated Pest Management Plan (IPMP), pesticide application requirements and reporting.
  - A. Within the agricultural areas, the lessee is responsible for pest management, including the control of all undesirable weeds, rodents, insects, and other pests (including in irrigation ditches and windbreaks).
  - B. Continue to require the agriculture lessee to submit a pest management plan to the Integrated Pest Management Coordinator (IPMC) and the NAVFAC Southwest Performance Assessment Representative (PAR) for their review and approval.<sup>12</sup>
  - C. Encourage the lessee to reduce the use of pesticides (per DoDI 4715.03) and establish agricultural practices that support ecological integrity of the site.
- IV. Ensure that agricultural lessees are aware of buried antenna groundmat locations to prevent accidental tilling or other damage to them. Clearly marking the buried groundmat areas in the field should aid in this.
- V. Consult with appropriate NAVFAC Southwest cultural resources personnel regarding any potential temporary restrictions on the use of the agricultural outlease area, or portions of it, in order to protect cultural resources existing there.
- VI. Consider agricultural land retirement where and when necessary and feasible, in particular to protect military mission capability, natural and cultural resources, and/or in response to infrastructural capacity for agricultural activity.
- VII. Ensure that environmental review for any change in agricultural practice adequately considers effects to Swainson's hawk and other sensitive species so that avoidance and minimization measures can be properly implemented.

## 4.2.2 Livestock Grazing

### Specific Issues

- While managed livestock grazing could be a valuable management tool to maintain and restore healthy habitats, it has the potential to harm sensitive infrastructure and equipment at NRTF Dixon, including the buried antenna groundmats.

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<sup>12</sup> In the case of NRTF Dixon, the IPMC and the PAR are both at NAVFAC Southwest in San Diego, California. The NAVFAC Southwest Pest Management Consultant is the IPMC for NRTF Dixon.



## Current Management

Livestock grazing had been allowed in the past at NRTF Dixon (sheep grazing in the grassland area and the northern agricultural fields over 30 years ago). It was found to be detrimental to the military mission of the facility due to potential damage and maintenance of the antenna array. It is currently prohibited; the agricultural outlease agreement specifically states that grazing is not allowed.

## Assessment of Current Management

Exclusion of livestock grazing at NRTF Dixon allows installation managers to ensure no harm to sensitive infrastructure and equipment, particularly the antennas and their buried ground mats. However, grazing has been proven in nearby cases to support and complement natural resources management activities, such as invasive species control and habitat restoration (e.g. Barry 1998). Nearby Jepson Prairie Preserve, for example, has employed sheep grazing successfully to restore its native grassland and wetland plant communities.

If a limited grazing program could be developed to ensure no harm to sensitive installation equipment and infrastructure (e.g. in specific areas away from antennas and ground mats using temporary exclusion fencing) and piloted on a small scale, it could benefit natural resources management.

## Management Strategy

**Objective:** *Investigate opportunities to employ a livestock grazing lease as a tool for natural resources management at NRTF Dixon, ensuring protection of sensitive infrastructure and equipment in accordance with the military mission.*

- I. In collaboration with the O&M contractor, investigate the possibility for and logistics that would be required to develop a limited grazing program at NRTF Dixon as a method to control invasive species and aid in restoration. Consider implementing such a program, if feasible.
  - A. Development and implementation of such a program will avoid impacts to antenna ground mats or other sensitive equipment and should not excessively burden current NRTF Dixon staff responsible for antenna operation and maintenance.
  - B. Winter grazing should likely be avoided, to prevent impacts to antenna ground mats. The mats are more susceptible to damage when soils are waterlogged and easily disturbed by grazing animals.

## 4.3 Public Access and Outdoor Recreation

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### Background

The Sikes Act (as amended) requires each military service to provide outdoor recreation and interpretive opportunities to the public, where and when it is compatible with military safety and security needs. DoDI 4715.03 states, “the principal purpose of DoD lands and waters is to support mission-related activities. Those lands and waters shall be made available to the public for educational or recreational use of natural and cultural resources when such access is compatible with military mission activities, ecosystem sustainability, and other considerations such as security, safety, and fiscal soundness. Opportunities for such access shall be equitably and impartially allocated” and that INRMPS shall describe areas and conditions appropriate for public access. OPNAVINST 5090.1C CH-1 states, “military lands will be available to the public and DoD employees for enjoyment and use of natural resources, except when a specific determination has been made that a military mission prevents such access for safety or security reasons, or that the natural resources will not support such usage.”

## Current Management

NRTF Dixon is closed to the public for safety and security reasons related to the sensitive nature of the installation mission. As a result, there are no outdoor recreation activities or facilities there. Access to the agricultural outlease area is provided to the agricultural lessee.

Visits to the site are coordinated through Navy Computer and Telecommunications Station San Diego for official purposes only. This includes giving federal or state conservation officials access to natural resources at NRTF Dixon to “conduct official business pursuant to applicable requirements of laws and regulations (e.g. section 1531 of the Sikes Act [as amended]) and an installation’s operational, security, and safety policies and procedures” (DoDI 4715.03). Those provided access to the installation are briefed on safety and security measures, particularly related to the antennas and other sensitive equipment there.

## Management Strategy

**Objective:** *Continue to restrict recreational facilities and opportunities in order to promote public and personnel safety in light of sensitive equipment and natural resources, unless deemed compatible and managed without compromise to the military mission.*

- I. To comply with DoDI 4715.03, continue to grant access to NRTF Dixon for qualified individuals as warranted, including federal or state conservation officials related to DoD-controlled natural resources and applicable requirements of laws and regulations (see Section 4.8: Natural Resources Law Enforcement).
- II. Continue to provide access to agricultural lessees in order to maintain the agricultural outlease program.
- III. Take steps to discourage and minimize the impacts of unauthorized access. Use appropriate signage in key access areas (DoDI 4715.03).

## 4.4 Environmental Education and Public Outreach

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### Background

DoD policy encourages outreach and environmental education for the public and for DoD personnel when it comes to natural resources management on Navy installations. DoDI 4715.03 states that the “DoD shall engage in public awareness and outreach programs to educate DoD personnel and the public regarding the resources on military lands and DoD efforts to conserve those resources” and further emphasizes that a “conservation ethic [should be] integrated throughout DoD through education, training, and awareness programs.” The instruction also advises that natural resources conservation policies be integrated into education, training, construction, and instruction programs and that opportunities for “efficiencies in providing natural resources conservation training through increased interagency and DoD Component cooperation” should be identified.

### Specific Issues

There is a need to ensure that NRTF Dixon decision-makers, contractors and lessees are aware of and comply with natural resources management protocols and requirements for the installation with regard to facility management and maintenance.

### Current Management

There is currently no environmental education targeting public audiences since there is no public access and the primary mission-related installation activities are antenna and facility maintenance. However,

NRTF Dixon does participate in more passive avenues of environmental education by providing access and opportunities for research to independent investigators and academic institutions (sometimes through Cooperative Agreements that address the installation's natural resource knowledge gaps). Their access to the installation must comply with current NRTF Dixon public access protocols.

The primary means of educating DoD personnel and decision-makers (including contractors and lessees) regarding natural resources management at NRTF Dixon is through this INRMP.

Day-to-day decisions for installation maintenance are made by the O&M contractor, in addition to lessees, other contractors, and the Installation Restoration Program (IRP). There is no natural resources manager stationed at NRTF Dixon. As a result, it would be useful to ensure that, beyond the INRMP, contractors, lessees, and other relevant departments have sufficient knowledge of installation natural resources and applicable requirements in order to conduct facility and other grounds maintenance to the best of their ability and in a way that does not unnecessarily impact or sacrifice benefits to those resources (e.g. mowing outside of the breeding season, activities that may require a depredation permit, no pesticide spraying zones for consideration of special status species, some Installation Restoration (IR) site restoration practices, etc.). This could take the shape of regular review of facility and lease management activities and frequent communication between NAVFAC Southwest natural resources managers, contractors, lessees, and other relevant departments. Overall, it will enhance coordination and improve solutions to facility management-related natural resource issues as well as compliance with applicable natural resource laws and regulations.

## Assessment of Current Management

Absence of active public outreach and environmental education at NRTF Dixon is consistent with the installation's non-intensive use and mission for antenna maintenance, while ensuring public and personnel safety and security. At the same time, facilitating cooperative agreements and providing access to academic institutions and researchers, to study the installation's natural resources contributes to improved knowledge of the natural resources on Navy property and in the region.

## Management Strategy

**Objective:** *Promote an awareness of overlapping maintenance activities and natural resources management needs and sensitive resources among day-to-day facility operators, including contractors and lessees.*

- I. Ensure that NRTF Dixon contractors and lessees have adequate natural resources management information and training relevant to their job or role on the installation to ensure compliance with natural resources conservation policies (Section 5.2: Staffing and Personnel Training).
  - A. Incorporate natural resources conservation policies into relevant installation education, training, construction, and instruction programs (DoDI 4715.03).

**Objective:** *Contribute to improved knowledge of natural resources on the installation and understanding of the regional environment through opportunities for study by academic institutions and researchers, subject to compliance with current public access protocols for the installation.*

- I. Seek opportunities to invite local educational institutions to participate in natural resource programs and projects at NRTF Dixon.
  - A. Develop and maintain a list of installation-based research projects that NRTF Dixon natural resources managers would consider welcoming from local researchers and institutions to address

data gaps or other resource knowledge needs. Use this list as a way to develop mutually beneficial projects should there be interest from outside (Appendix G: Research Requirements).

## 4.5 Integrating Other Internal Plans and Programs

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It is DoD policy that this INRMP should be “fully coordinated with appropriate installation offices responsible for preparing, maintaining, and implementing other programs and plans that may affect land use or be affected by land use decisions” (DoDI 4715.03). INRMPs are to be prepared in coordination with installation range plans, training plans, Integrated Cultural Resource Management Plans, IPMPs, IR plans that address contaminants covered by the Comprehensive Environmental Response, Compensation and Liability Act, Resource Conservation and Recovery Act (RCRA), and related provisions, and other appropriate plans and offices (OPNAVINST 5090.1C CH-1). However, this INRMP is not intended to function as a comprehensive compilation of details on all related topics, but to briefly summarize the key interrelationships with these plans, and reference where detailed information can be found.

### 4.5.1 Integrated Cultural Resources Management Planning

Cultural resources are protected primarily through the National Historic Preservation Act of 1966, PL 89-665, as amended (16 USC §§ 470–470x-6) and its implementing regulations (36 Code of Federal Regulations [CFR] 800), the Archaeological and Historic Preservation Act of 1974 (Moss-Bennett Act), PL 86-532 (16 USC §§ 469–469c), and the Archaeological Resources Protection Act of 1979, PL 96-95 (16 USC §§ 470aa–470mm). Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their actions on properties listed in or eligible for listing in the National Register of Historic Places. Criteria for inclusion in the National Register of Historic Places are provided in 36 CFR 60.4 (Appendix C: Applicable Laws and Regulations).

When intersecting with natural resources, the primary objective of the cultural resources management program of NRTF Dixon is to implement this INRMP in a manner consistent with the conservation of significant cultural resources at the installation.

The current Historical and Archaeological Resources Protection Plan (Navy 1996) for the installation was prepared to guide the identification and management of significant historic resources and Native American traditional cultural properties at NRTF Dixon. Though no such sites had been identified at the installation at the time it was prepared, it provides protocols for inadvertent discovery of cultural resources and subsequent treatment of artifacts or human remains (Navy 1996). Recent identification of four cultural and archaeological sites on the installation has led to a concern that any activities requiring soil disturbance or digging may impact other cultural resources not yet identified at NRTF Dixon. Additional surveys to locate potential cultural sites outside of the agricultural outlease area are to take place starting in 2013.

NAVFAC Southwest cultural resources personnel manage and implement the cultural resources program at NRTF Dixon. Certain agricultural outlease areas have recently been curtailed due to the discovery of cultural resources.

### Coordination Approach

Prior to initiating any new land disturbance activities at NRTF Dixon, project proponents, facility managers, or other contractors should consult with NAVFAC Southwest cultural resources personnel. This includes activities ranging from construction and facility maintenance to habitat enhancement and restoration.

Briefings for any personnel working in sensitive habitat areas or cultural resources areas should help keep them apprised of any prohibited activities or restrictions for specific areas of the installation.

## 4.5.2 Integrated Pest Management

Before 2010, responsibility for oversight of the pest management program at NRTF Dixon was with the Environmental Management Division at Naval Air Station Lemoore and NAVFAC Southwest. At that time, pest management requirements were contained within both Naval Air Station Lemoore's IPMP (NAVFAC Southwest 2010a), which describes in detail administrative roles and responsibilities that can be generally applied to NRTF Dixon, and NRTF Dixon's Partner Pest Management Plan (NAVFAC Southwest 2009), which discusses only those elements of pest management unique to NRTF Dixon.

Pest management at NRTF Dixon is either achieved through mowing or application of appropriate approved pesticides. The O&M contractor at NRTF Dixon is responsible for maintaining the grounds, including pest management outside of the agricultural outlease area to provide public health protection, help maintain facilities, protect environmental resources, improve personnel quality of life, and ensure NRTF Dixon accomplishes its mission.

The agricultural lessee is responsible for pest management within the agricultural outlease area, including the control of all undesirable weeds, rodents, insects, and other pests. This includes the lessee paying the costs of mosquito pesticide applications to the Solano County Mosquito Abatement District. Compliance checks for invasive species management is performed about once per year by the IPMC for NRTF Dixon, who sits at NAVFAC Southwest in San Diego, California. Agricultural lessees are also required to report on pesticide use on their parcels as part of an annual pest management plan reviewed by the IPMC. The Plan includes target pests, non-chemical and chemical control methods, and a list of pesticides to be used. Lack of a current pest management plan for any agricultural outlease is considered non-compliant.

Both the O&M contractor and the agricultural lessee are responsible for complying with all federal, state, and local environmental standards, for obtaining required permits, and for coordinating with the IPMC and the Pest Management PAR at NAVFAC Southwest.<sup>13</sup> Other than ensuring that a pesticide is registered with the EPA and determining if it has a State Department regulation, and so long as its application is in compliance with state and federal laws, approval of a pesticide for use on NRTF Dixon makes no specific considerations for where it will be applied.

A new IPMP is to be developed for NRTF Dixon (Section 3.9: Invasive Species Management). OPNAVINST 6250.4C and 5090.1C CH-1, Chapter 17 require all Navy activities that conduct pest management operations to have an IPMP. The new IPMP will be a comprehensive long-range document that captures all the pest management and pesticide-related activities conducted on NRTF Dixon. It will contain guidelines for systematic methods for identifying and prioritizing management actions for pests and eradication of invasive plant species (Section 3.9: Invasive Species Management). These plans add value by developing compliance systems and streamlining operations involving the use of pesticides including applications, storage, and the archiving records all of which are tightly regulated by Federal Insecticide, Fungicide, and Rodenticide Act, state and local laws, DoD, and Navy regulations.<sup>14</sup> As a planning document, NRTF Dixon's IPMP will be a vital component of effective integrated pest management.

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<sup>13</sup> In the case of NRTF Dixon, the IPMC and the PAR are both at NAVFAC Southwest in San Diego, California. The NAVFAC Southwest Pest Management Consultant is the IPMC for NRTF Dixon.

<sup>14</sup> The State of California can also enforce pesticide use as regulated by other state enforced federal laws such as the Clean Water Act, RCRA, ESA, and Clear Air Act.

## Coordination Approach

Integrated pest management at NRTF Dixon should contribute to the DoD's annual goals or measures of merit per DoDI 4150.07 (DoD 2008a) and OPNAVINST 6250.4C (Navy 2012).

Reinforcing integrated pest management environmental objectives as a means to support INRMP goals should include: reducing reliance on chemical means of pest control and supporting lessees toward such a goal (DoDI 4150.07); reducing pesticide pollution to prevent adverse impacts on air, water, and land resources; ensuring all pesticide applicators are appropriately certified and trained; promoting the use of effective technologies and methods to control pests; complying with appropriate record keeping and reporting requirements to ensure compliance with relevant laws and regulations; requiring agricultural lessees to conduct and report on pest management activities on their parcels per the Agricultural Outlease Agreement; enabling the IPMC to maintain effective oversight of the program and coordination with local agencies; reviewing lessee and contractor pest management plans and applications for the use of new pesticides; and updating the IPMP at intervals defined in DoDI 4150.07 and OPNAVINST 6250.4C.

Due to the environmentally sensitive areas located on NRTF Dixon, in addition to a list of pesticides, pest management procedures to be used for the following programs should be submitted to the IPMC for review and approval: noxious weed control; predator management; aerial application of pesticides; control of migratory bird pest species. Chemical and non-chemical control of pests and invasive plants during the breeding season in areas with known migratory birds should also be reviewed by the IPMC and NAVFAC Southwest Pest Management PAR to facilitate compliance with the MBTA.

*Per DoD 4150.07, the DoD's measures of merit include: (a) 100 percent of DoD installations will have current pest management plans; (b) Maintain the 55 percent pesticide use reduction achieved from 1993 to 2003 (in pounds of active ingredient); (c) 100 percent of all DoD installation pesticide applicators will be appropriately certified.*

During times when there is no agricultural lessee at NRTF Dixon, NAVFAC Southwest should evaluate the need to conduct pest management actions in the agricultural outlease areas.

### 4.5.3 Installation Restoration Program

NRTF Dixon has an active IRP aimed at identifying and reducing to prescribed safe levels any potential risks caused by the Navy's past operations on the facility. Funding from the IRP is designated for removal actions, interim remedial actions, and remedial actions of known hazardous waste sites. Currently, the IRP is conducting ongoing groundwater studies and consulting with relevant regulatory agencies to work toward closure of open IR sites.

The IRP has been successful in closing Underground Storage Tank IR sites (Section 2.3.3: Storage Tanks and Fuel), two IR sites (Section 2.4.4: Installation Restoration Sites) and responding to regulatory agency requirements for site clean-up and closure. There are opportunities to increase coordination with NRTF Dixon natural resources managers to ensure the most benefit to native species and habitats during IR site management, restoration, and rehabilitation.

*The DoD established the IRP to provide guidance and funding for investigating and remediating hazardous waste sites caused by historical disposal activities at military installations. The fundamental goal of the IRP is to protect human health, safety, and the environment. The IRP investigates and, if necessary, remediates former disposal and test areas, some of which were used before the disposal of chemicals was regulated or even fully understood.*

## Coordination Approach

The installation recognizes that adverse impacts to natural resources addressed in this INRMP may result from the release of hazardous substances, pollutants, and contaminants into the environment. The Navy IRP is responsible for identifying Comprehensive Environmental Response, Compensation and Liability Act releases, RCRA releases, and releases under related provisions; considering risks and assessing impacts to human health and the environment, including impacts to endangered species, migratory birds, and biotic communities; and developing and selecting response actions when a release may result in an unacceptable risk to human health and the environment.

When appropriate, NAVFAC Southwest natural resources management staff, on behalf of NRTF Dixon, will help the IRP Remedial Project Manager identify potential impacts to natural resources caused by the release of these contaminants.

Regional or installation natural resources staff will also participate, as appropriate, in the IRP decision-making process by communicating natural resource issues on the installation to the Remedial Project Manager, attending Restoration Advisory Board meetings, reviewing and commenting on IRP documents (e.g. Remedial Investigation, Ecological Risk Assessment), and ensuring that response actions, to the maximum extent practicable, are undertaken in a manner that minimizes impacts to natural resources on the installation.

When appropriate, the regional or installation natural resources staff will make recommendations to the IRP Remedial Project Manager regarding cleanup strategies and site restoration. During initial monitoring protocols, the natural resources manager may suggest sampling and testing be accomplished so as to not impact sensitive or critical areas. Also during site restoration, the natural resources manager has the opportunity to recommend site restoration practices that are outlined within the INRMP. Examples include landfill caps restored to grasslands, excavation areas restored to wetland/pond areas, and treated water located to enhance a pond area.

### 4.5.4 Hazardous Material Spill Prevention and Response

NRTF Dixon does not meet the threshold requirements to develop a Facility Response Plan. As a result, the O&M contractor for NRTF Dixon maintains a current Hazardous Material Spill Contingency Plan (Navy 2011a). The plan identifies storage locations of oil and hazardous materials (including pesticides), response procedures, and contact list in the event of a spill. There have been no recent oil or hazardous material spills at NRTF Dixon, so there has not been a need to implement the plan. Any activities that may introduce hazardous materials onto the installation must be approved by NAVFAC Southwest.

#### Coordination Approach

NAVFAC Southwest and the O&M contractor should evaluate the proximity of regulated and sensitive resources relative to oil and hazardous material storage areas. Ensuring that the O&M contractor has an up-to-date map of NRTF Dixon sensitive resources as a complement to the Hazardous Material Spill Contingency Plan can help managers determine the need to preventatively address natural resources concerns and to protect them in the event of a spill (e.g. proximity and impact from burrowing owls and ground squirrels near fuel pads, and any jurisdictional waters of the U.S.).

*As regulated by 40 CFR Part 300, OPNAVINST 5090.1C CH-1 (Chapter 12) states that "any Navy facility that stores petroleum or hazardous substances and does not meet federal requirements for preparing Facility Response Plan [having to do with amount of oil and hazardous substances stored at the facility] shall maintain an Oil and Hazardous Substance Spill Contingency Plan" and that it should be tailored to the specific size and operations at the facility. The primary goal of such a plan is to protect public health and safety, as well as jurisdictional waters of the U.S. or other regulated resources from potential spill impacts.*

## 4.6 NEPA Compliance

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### Background

NEPA requires federal agencies to assess, in detail, the potential environmental impacts of their actions that could significantly affect the quality of the environment. NEPA is intended to help decision makers make informed decisions that are based on an understanding of environmental consequences, as well as involve the public in the process. Though NEPA requires consideration of more than the natural environment, NEPA provides planners with a process to identify and assess natural resources impacts requiring mitigation and avoidance.

NEPA requires an analysis of whether a major federal action will result in a “significant” environmental impact. The process requires the analysis of all reasonable alternatives to the proposed action, but does not require the selection of the least damaging alternative. Individual and cumulative impacts must be considered. The NEPA process must be documented using one of the following:

1. Record of Categorical Exclusion: Categorical Exclusions are actions that the Navy and EPA have agreed do not have a significant effect on the human environment and therefore do not require preparation of an Environmental Assessment (EA) or Environmental Impact Statement (EIS) (Appendix C: Applicable Laws and Regulations).
2. An EA is the analysis to be completed when the government is uncertain as to whether an action will significantly affect the environment or whether an action is controversial; the result of an EA is either a Finding of No Significant Impact or a requirement to complete an EIS. In practice, an EA is prepared when a Finding of No Significant Impact is a near certainty.
3. An EIS is a full disclosure document that presents a full and complete discussion of significant impacts. An EIS informs the public and decision makers of reasonable alternatives to the proposed action.

An important component of NEPA is the requirement for public participation in the decision-making process. Federal agencies are to encourage and facilitate public involvement through a scoping and environmental review process. The requirements for public involvement differ between an EA and an EIS in that for EIS-level assessments, the process must meet formal requirements specified in the regulations that implement NEPA.

### Current Management

INRMPs are to discuss the present process used by installation planners for review of projects, particularly any ground disturbing projects, from site selection to completion, and how the natural resources professionals currently participate, and should participate in the future, in the review process to ensure that natural resources issues are identified and properly addressed (NAVFAC P-73 Manual).

INRMPs function as a significant source of baseline natural resources information and conservation initiatives used to develop NEPA documents for military readiness activities (Navy Guidance for INRMPs April 2006).

For the most part, activities and projects at NRTF Dixon are approved as Categorical Exclusions, and have not required preparation of EAs or EISs. The level of NEPA analysis applied to each action is determined on a project-by-project basis. For such analysis, project proponents and NEPA planners responsible for NRTF Dixon ensure compliance with NEPA requirements and OPNAVINST 5090.1C CH-1 guidance. The OPNAVINST 5090.1C CH-1 outlines the NEPA process for the Navy.



## 4.7 Natural Resources Consultation Planning

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### Background

Because an INRMP is a long-term planning document that directs the management and conservation of natural resources on a day-to-day basis, it may provide the foundation of information necessary for ESA consultations, migratory bird permits/resource information, and any federal consistency determinations. INRMPs also provide pertinent information for various planning level documentation, some information applicable to master plans, Clean Water Act (CWA) permits, and Clean Air Act Permits. Comprehensive Environmental Response, Compensation and Liability Act and RCRA related information might also be derived and shared with installation planners and environmental engineers (Navy INRMP Guidance for Naval Installations April 2006).

DoDI 4715.03 requires INRMPs to include procedures “to comply with federally-listed threatened and endangered species management and recovery efforts on DoD lands and waters...and shall emphasize military mission requirements and interagency cooperation during consultation, species recovery planning, and management activities.”

Section 7(a)(2) of the ESA requires federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of a listed species or destroy or adversely modify their designated Critical Habitat. This is done through consultation with, and assistance from, the Secretary of Interior (through the USFWS) to emphasize identification and resolution of potential species conflicts in the early stages of project planning. A Biological Opinion is the product of this interagency consultation pursuant to Section 7(a)(2) of the ESA and is covered in the implementing regulations published in 50 CFR Part 402.

Informal consultation is an optional process between the USFWS and the action agency to determine whether a formal consultation is needed. It provides an opportunity to discuss ways to modify the action to reduce or remove adverse effects to the species or Critical Habitat. Based on the best scientific and commercial data available, the agency determines the effects on listed species and Critical Habitat. It concludes when a determination of no effect is made, when the USFWS concurs with a not likely to adversely affect determination, or when the agency initiates formal consultation.

Formal consultation is needed when the action agency determines, through informal consultation or a biological assessment, that the action will affect the listed species or Critical Habitat. It begins with the federal agency's written request for consultation under Section 7 (a)(2) of the ESA, and concludes with the USFWS issuing a Biological Opinion under Section 7 (b)(3) of the ESA. No consultation is needed when the proposed action falls under an existing Biological Opinion or if there is no listed species or designated Critical Habitat within the proposed action area.

In addition, waters of the U.S., including wetlands, are protected under the CWA and EO 11990. The USACE regulates impacts to wetlands and other waters under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. Projects that may involve any impacts, including excavating dredged or fill material, to waters of the U.S. and wetlands must be reviewed and authorized by the USACE and reviewed by the EPA.

### Current Management

Although Critical Habitat for the delta smelt has been designated on NRTF Dixon, the primary constituent elements for the species' Critical Habitat are not present (Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns) and the species has not been observed on the

installation. Current activities on NRTF Dixon do not affect the species' primary constituent elements that may be present in waters downstream from the installation. However, if any actions were to affect them, consultation with the USFWS would be required in advance of those actions.

Currently, there are no other known listed species or those that are proposed for listing on NRTF Dixon. No other Critical Habitat has been designated on the installation.

A current jurisdictional and wetland delineation enables facility and natural resources managers to determine if consultation with the USACE is needed for CWA Section 404 permits depending on a proposed project. Consultation with the USFWS may also be necessary if activities or projects are adversely affecting migratory bird populations protected under the MBTA.

## Considerations for Consultation and Planning

NRTF Dixon's consultation strategy should be designed as programmatically and comprehensively as possible in order to avoid military mission delay or impairment. The INRMP should be used as an initial screen for review of projects proposed on the installation from both Navy and outside interests.

To streamline the consultation process, there should be clear communication of regulatory requirements. This includes collaborating with project proponents to plan conservation measures to avoid or minimize effects on natural resources first, and only then consider options to "rectify, reduce, eliminate, or compensate for the impact" of unavoidable effects (Council on Environmental Quality 1978).<sup>15</sup> In the case of NRTF Dixon, the need to compensate for impacts of proposed projects should be avoided through effective application of the following standard conservation measures, among others as needed:

- *Avoidance and Minimization First.* Proposed actions are required to include impact avoidance and minimization measures as a first step in the planning process, prior to any regulatory authorizations being given. Possible measures include: worker environmental protection briefings, signs, markers, protective fencing, biological monitoring, erosion and sedimentation prevention, noise baffling, and temporary impact restoration. These should be included as part of the environmental protection plan for all standard operating procedures during planning.
- *Survey Buffers.* When making presence/absence determinations relative to a project, buffer areas where indirect effects may affect species must be considered as well. If a habitat is used by a species for some important part of their life cycle, it is considered occupied regardless of the presence of the species at any one time. Corridors for animal movement, such as drainages and roads, are important considerations.
- *Use of a Qualified Biological Monitor.* A biological monitor or qualified biologist should be retained, in coordination with the natural resources biologists, to educate workers, oversee and implement impact avoidance and minimization, document impacts, and guide revegetation efforts for all proposed actions that require active avoidance or actually will affect threatened or endangered species, wetlands, or require active revegetation.
- *Breeding Season Avoidance.* On NRTF Dixon, all but three birds are covered under the MBTA (rock doves, European starlings, and house sparrows). Planners must review proposed actions with regard to conduct of actions during the active breeding season (can be January–September) and project caused loss of traditionally used nesting/roosting sites. Habitat clearing activities should be timed to

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<sup>15</sup> In the context of NEPA, "mitigation" includes a range of potential measures to be considered in the following order: (a) Avoiding the impact altogether by not taking a certain action or parts of an action, (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment, (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and (e) Compensating for the impact by replacing or providing substitute resources or environments (as defined by the Council on Environmental Quality, 40 CFR 1508.20).

avoid the breeding season to maximum extent practicable to avoid damage to active bird nests. All contracts and work orders prepared for NRTF Dixon must include provisions in the Environmental Protection section which prohibit harming, damage, or destruction of active bird nests while requiring “work arounds.” Navy Contracts Specialists can provide such language.

- *Other Seasonal Avoidance Measures for Facilities Projects.* During the active growing and breeding season, species and habitats are more sensitive to harm, harassment, or damage. Any seasonal restrictions must be in accordance with mission requirements and compatibility.
- *Restoration Plans to be Completed in Advance.* All actions that require active habitat restoration or enhancement must have an appropriate plan developed prior to implementation. Such plans must discuss the site conditions, methods to be implemented, monitoring and maintenance (usually three-five years), success criteria, remedial actions if expected success is not being achieved, and reporting requirements.
- *Section 404 Compliance.* Determine if CWA Section 404 compliance is necessary for any projects on NRTF Dixon property. As applicable, provide clear direction on how to exercise any appropriate nationwide permit so that project work would be facilitated. BMPs should be described; if the project stays within the guidelines, a simple letter would need to be sent to the USACE with notification of the project, and no additional public notification would be necessary.
- *Phasing of Work.* Often, careful planning can show that impacts to the differing resources can be phased or avoided. To assist project planners, a schedule of sensitivity periods will help.
- *Tracking Conservation Measures.* Identify conservation measure requirements and restrictions associated with environmental agreements, NEPA projects, and other permits. Track progress to ensure compliance with these agreements.

Improving the success of conservation measures and enhancement projects should be based on regulatory, functional, and ecosystem criteria by using: performance work statements (do what and by what standard, by whom and with what money); project lists (one-time projects); and standardized scopes of work for recurring work.

## 4.8 Natural Resources Law Enforcement

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### Current Management & Assessment of Current Management

There is currently no law enforcement program in place on NRTF Dixon. NRTF Dixon also currently has no hunting or fishing programs. The U.S. Department of Agriculture Wildlife Services occasionally rounds up coyotes to remove them from the installation. Currently, NAVFAC Southwest staff responds to issues regarding the MBTA. NAVFAC Southwest also ensures and oversees compliance of lessees and contractors with applicable laws and regulations.

The potential existence of federally listed species in several areas of the installation, however, could warrant personnel trained in both the ESA and natural resources law enforcement. NAVFAC Southwest can maintain or establish relationships with other Federal agencies to provide trained natural resource law enforcement personnel support.

### Management Strategy

**Objective:** *Provide for enforcement of natural resources laws and regulations by professionally trained personnel, taking proper safety and security measures into account.*

- I. Commanders shall permit federal and state conservation officials access to enforce natural resources laws after taking proper safety and security measures (Section 4.3: Public Access and Outdoor Recreation), per DoDI 4715.03.
- II. Maintain relationships with other agencies or organizations that can provide natural resources law enforcement support by trained personnel as needed.

## 4.9 Beneficial Partnerships and Collaborative Planning

### Background

Supporting military installations' conservation efforts is a concerted effort by the DoD, the four Military Services, the DoD Legacy Management Program, the DoD Readiness and Environmental Protection Initiative Program, the DoD Partners in Flight Program, the National Military Fish and Wildlife Association, and the International Association of Fish and Wildlife Agencies. The DoD has signed numerous memoranda of agreement among agencies and non-governmental organizations for collaborative conservation and management initiatives. These are listed in Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements.

Cooperative management of NRTF Dixon wildlife is required under the federal Sikes Act (as amended) and the Fish and Wildlife Coordination Act.<sup>16</sup> The USFWS and California Department of Fish and Wildlife (CDFW) have a statutory obligation to review and coordinate on INRMPs (Section 1.8.3.1: External Sikes Act Stakeholders). Recognizing this core, three-way partnership in preparing, reviewing, and implementing INRMPs among the DoD, U.S. Department of the Interior, USFWS, and state fish and wildlife agencies, a Tripartite Agreement was updated in July 2013 (Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements). The CDFW and other state fish and wildlife agencies were represented by the International Association of Fish and Wildlife Agencies. The desire is for “synchronization of INRMPs with existing fish and wildlife service and state natural resources management plans” and “mutually agreed-upon fish and wildlife service conservation objectives to satisfy the goals of the Sikes Act.”

The Sikes Act (as amended) provides a mechanism whereby the DoD, U.S. Department of the Interior, and host states cooperate to plan, maintain, and manage fish and wildlife on military installations. Sikes Act (as amended) provisions and cooperative agreements for outdoor recreation, such as for hunting and fishing, are implemented nationally by a Memorandum of Understanding between the DoD and U.S. Department of the Interior. The Sikes Act (as amended) no longer requires a Cooperative Agreements with the USFWS or CDFW as a separate document; however, the DoD 17 May 2005 guidance states that joint review should be reflected in a memo or letters.

The DoD and Navy policy calls for installations to expand involvement in regional ecosystem planning, management, and restoration initiatives. Establishing cooperative planning efforts with surrounding land agencies and individuals will benefit NRTF Dixon natural resources and those of the entire region. Cooperative planning can also reduce the costs of actions that require management across boundaries such as biological monitoring.

The Navy also sees partnerships as a means to manage encroachment pressure on the Navy mission. The definition of encroachment is defined in OPNAVINST 11010.40: “Any Navy or non-Navy action planned or executed in the vicinity of a Naval activity or operational area which inhibits, curtails, or possesses the

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<sup>16</sup> Like NEPA, the Fish and Wildlife Coordination Act is essentially procedural as no specific outcome is mandated.

potential to impede the performance of the mission of the Naval activity.” The instruction also defines encroachment to be any lack of action by the Navy to coordinate with local jurisdictions, monitor the development plans of adjacent communities, or adequately manage facilities and real property.

## Current Management

Currently, NAVFAC Southwest consults with the USFWS and the CDFW on management of special status species and habitat on the installation, primarily including the resident burrowing owl populations and the designation of delta smelt Critical Habitat on three-quarters of NRTF Dixon property.

NRTF Dixon’s regulatory partners include:

- USFWS Ecological Services
- U.S. Department of Agriculture Wildlife Services
- USACE
- CDFW

## Assessment of Current Management

There are opportunities for NRTF Dixon to take advantage of existing DoD memoranda of understanding with conservation and natural resource management partners listed above, or other regional partners as needed. If additional special status species are discovered on the installation, this would be another reason to collaborate in the interest of effective conservation. Local and regional partnerships can support this INRMP’s management strategies for habitat enhancement in both the Natural Resources Management Area (focusing on wetlands and vernal pools), and in the native grassland area (focusing on invasive species control).

NRTF Dixon encroachment issues that could warrant partnerships as part of a management approach include eradicating invasive plant species, preventing trespass of animals from adjacent lands, managing facilities and grounds in light of delta smelt Critical Habitat on the installation, managing the ground squirrel and burrowing owl populations, maintaining sufficient space and soil properties for antenna function, employing land use practices to conserve native pollinators, and addressing projected climate change impacts on the installation (see also Section 1.7: Key Issues).

## Management Strategy

**Objective:** *Invest effort in cooperative resources planning partnerships to create regional conservation, ecosystem-based solutions of mutual benefit while also protecting the military mission.*

- I. Participate in conservation and encroachment planning.
- II. Participate in regional conservation and ecosystem planning efforts, in collaboration with other governmental agencies and non-governmental organizations.
  - A. Ensure NRTF Dixon involvement through proper internal coordination with other DoD stakeholders, evaluation of agreements that may encumber land or resources now or in the future, and evaluation of the potential benefits to NRTF Dixon natural resources.
  - B. Become a non-binding partner in regional conservation planning efforts, such as Landscape Conservation Cooperatives.
- III. Meet with USFWS and CDFW at least annually to fulfill Sikes Act (as amended) provisions and related inter-agency cooperative agreements.

- A.** Ensure compatibility with INRMP goals, objectives, and policies, as well as internal consistency in future inter-agency agreements and plans.
  - B.** Involve state and federal resources agencies in the implementation of INRMP objectives and policies when practicable.
  - C.** Promote information sharing and scientifically-based, coordinated data collection and management planning, as resources permit.
  - D.** Support California Wildlife Action Plan (Bunn et al. 2007) goals and objectives to:
    - 1. Reduce the major natural resource stressors identified for the Central Valley and Bay-Delta region. At NRTF Dixon, this could include: promoting sustainable and efficient land use to stem growth and development (urban, residential, and agricultural); using water efficiently to help avoid water management conflicts and reduced water for wildlife; preventing water pollution (especially nonpoint source pollution); eradicating invasive species; and addressing contributions to and impacts from climate change.
    - 2. Protect wetland and vernal pool habitats, and habitat for the burrowing owl; strive to restore them where they are degraded.
    - 3. Eradicate or control existing occurrences of invasive species and prevent new introductions.
  - E.** Support USFWS regional goals such as habitat conservation planning.
  - F.** Discuss and finalize annual INRMP metrics for the installation.
- IV.** Continue the use of Cooperative Agreements to provide for the maintenance and improvement of natural resources according to this INRMP, or to benefit natural resources research.



# Naval Radio Transmitter Facility Dixon

## Integrated Natural Resources Management Plan

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### 5.0 Implementation Strategy

*To successfully attain this Integrated Natural Resources Management Plan's Goals and Objectives, the measures in Chapters 3 and 4 need to be prioritized, assigned, and prepared for funding. This Chapter lays out an implementation strategy that is a key component of the Navy's adaptive management approach, and is consistent with the budgeting hierarchy of Department of Defense and Navy directives.*

#### 5.1 General Considerations

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A successfully implemented Integrated Natural Resources Management Plan (INRMP) will:

- Ensure the sustainability of all ecosystems encompassed by Naval Radio Transmitter Facility (NRTF) Dixon; and
- Ensure no net loss of the capability of NRTF Dixon lands to support the U.S. Department of Defense (DoD) mission.

*The Sikes Act (as amended) and DoD guidance require that INRMPs ensure that no net loss of available land and operational carrying capacity for military support occurs while pursuing environmental protection needs (DoD Instruction 4715.DD-R 1996).*

Formal adoption of an INRMP by a Regional Commander, or their designee as Installation Commanding Officer (CO), constitutes a commitment to seek funding and execute, subject to the availability of funding, all Navy Environmental Readiness Level (ERL) 4 projects and activities in accordance with specific time-frames identified in the INRMP. For a description of ERL 4 projects and activities and budget programming hierarchy for this INRMP (both DoD and U.S. Department of the Navy [Navy]); see Section 5.4.1: Funding Classifications.

Successful implementation of this INRMP will depend upon not only the guidelines set up and projects described, but how well these are translated into performance work statements (who will do what and with what money), project lists and scopes of work, and a workload plan. It must fit into the formal Environmental Management System established for NRTF Dixon for integrating environmental considerations into day-to-day activities across all levels and functions of the Navy enterprise (Section 1.9.2: Environmental Management System). NRTF Dixon's natural resources, and its staff and environmental ethic, set the stage to help lead resources management in partnership with other agencies. To accomplish this, Naval Facilities Engineering Command (NAVFAC) Southwest, on behalf of NRTF Dixon, will need to take advantage of funding opportunities outside normal program boundaries, consistent with authority to receive and use any such funds.

The responsibility for development, revision, and implementation of INRMPs is shared at every level among many different command elements. Roles of various parties identified in implementing this INRMP are described in Section 1.8: Roles, Responsibilities and Stakeholders. These entities ensure the programming of resources necessary to establish and support an integrated natural resources program consistent with legislative requirements, DoD policy, and stewardship. As the Navy shore infrastructure continues to change through reorganization and regionalization, many natural resources functions that

formerly were the responsibility of installation commanders have passed to Regional Commanders and area coordinators.

## 5.2 Staffing and Personnel Training

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The Sikes Act (as amended) specifically requires that there be “sufficient numbers of professionally trained natural resources management and natural resources enforcement personnel to be available and assigned responsibility” to implement an INRMP. Staff should also be provided opportunities and support to receive both comprehensive training specific to their job and supplemental training and professional development in a timely manner, as needed, to ensure proper and efficient management of natural resources (Department of Defense Instruction [DoDI] 4715.03; OPNAVINST 5090.1C CH-1).

As NAVFAC Southwest is responsible for natural resources management at NRTF Dixon, they maintain professionally trained personnel with various specialized skills for managing NRTF Dixon resources. NAVFAC Southwest identifies personnel requirements to accomplish INRMP goals and objectives, allocates existing budgetary and personnel resources, and identifies staffing needs based on any additional current and future projects. Personnel within NAVFAC Southwest assigned to natural resources management are the core staff responsible for implementing the INRMP. Through oversight and monitoring, these personnel ensure that a consistent conservation program is carried out by using strategies outlined in this Plan to support the Navy mission and achieve INRMP goals and objectives.

Cooperative projects among different Navy organizations are monitored by the originating or controlling office, as specified prior to project implementation.

NAVFAC Southwest also coordinates with the Operations and Maintenance contractor at NRTF Dixon for natural resources management when needed.

Current opportunities for training and professional development provided to NAVFAC Southwest natural resources staff have been sufficient to adequately implement the NRTF Dixon INRMP and manage natural resources on the installation. However, with expanding natural resources management needs (including anticipated surveys, delineations, and updating Geographic Information Systems [GIS] records), there is a need for additional training; future surveys may identify sensitive species that will need to be managed for.

Training may be obtained from a variety of sources, including universities, regulatory agencies, professional societies, and other Navy or military organizations. These training opportunities may be offered in the forms of structured courses or conferences, workshops, and symposia. The following is a topic list for training opportunities, certifications, workshops, conferences, and other professional development that natural resources staff responsible for NRTF Dixon should consider participating in, as needed.

- Integrated Pesticide/Pest Management training;
- Wetland management training;
- Endangered species management training;
- Raptor management and/or banding permit;
- GIS and Global Positioning System training to enable collaborative work between Natural Resources Management staff, GIS staff, and contractors for Natural Resources Management purposes such as data management and generation;
- Climate change training;
- National Marine Fish and Wildlife Association annual workshop;



- North American Wildlife and Natural Resources Conference;
- Partners in Flight national, regional, and state meetings (generally in conjunction with other listed meetings);
- U.S. Fish and Wildlife Service (USFWS) National Conservation Training Center webinars and online training;
- Naval Civil Engineering Corps Officers School (CECOS) Natural Resources Compliance training;
- CECOS Advanced Environmental Law;
- CECOS Environmental Negotiation Workshop; and
- CECOS Environmental GIS/Geostatistics course.

NAVFAC Southwest should also represent NRTF Dixon at the following annual workshops or professional conferences as appropriate and funding allows: National Military Fish and Wildlife Association annual workshop; North American Wildlife and Natural Resources Conference; Partners in Flight national, regional, and state meetings.

### 5.3 INRMP Review and Metrics

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The INRMP review and revision process is described in Section 1.10: INRMP Review and Revision Process.

NAVFAC Southwest, on behalf of NRTF Dixon, ensures compliance with DoD Directive 4715.DD-R 1996, which requires installations to improve and refine natural resources management by adaptively adjusting success criteria and priorities based on past accomplishments, new risks and threats, new biological information, and changes in policy. NAVFAC Southwest complies with all recent DoD INRMP guidance and the Sikes Act (as amended) for both five-year and annual reviews of the NRTF Dixon INRMP (Section 1.10: INRMP Review and Revision Process).

Upon request from Chief of Naval Operations/Commander, Navy Installations Command and Commander, Navy Region Southwest, NAVFAC Southwest coordinates natural resources requirements with other federal, state, or local agencies, including the acquisition of INRMP mutual agreement between the Navy, USFWS, and California Department of Fish and Wildlife (CDFW). NAVFAC Southwest provides a notice of intent to prepare or revise the INRMP to the USFWS Field Office and the CDFW, and ensures that the USFWS Regional Sikes Act Coordinator is notified. Annual reviews are conducted in compliance with the Sikes Act (as amended) in coordination with the USFWS and the CDFW and any other INRMP stakeholders at the discretion of the Natural Resources Program Manager. The annual reviews are intended to verify the following:

- Current information on all conservation metrics is available.
- All *must fund* projects and activities have been budgeted for and implementation is on schedule.
- All required trained natural resources positions are filled or are in the process of being filled.
- Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.
- All required coordination has occurred.
- All significant changes in the installation's mission requirements or its natural resources have been identified.
- The INRMP objectives remain valid.

NAVFAC Southwest also tracks INRMP implementation and disseminates related information to others as appropriate. They maintain natural resources program information needed to satisfy reporting requirements, legislative information requests, and to support project requests. This information is collected in the NAVFAC Natural Resources Data Call Station and applicable GIS programs.

### 5.3.1 INRMP Metrics

As a guide for addressing annual INRMP review, the Navy Natural Resources Metrics are used to assess INRMP implementation, measure conservation efforts, ensure no net loss of military testing and training lands, and understand the conservation program's installation mission support and indicate the success of partnerships. They are used to gather and report essential information required by Congress, Executive Orders (EOs), existing United States laws, and the DoD on an annual basis. There are seven Focus Areas that comprise the Natural Resources Metrics to be evaluated during the annual review of the Natural Resources Program/INRMP.

1. Ecosystem Integrity
2. Listed Species and Critical Habitat
3. Fish and Wildlife Management and Public Use
4. Partnership Effectiveness
5. Team Adequacy
6. INRMP Project Implementation
7. INRMP Impact on the Installation Mission

A full copy of the most recent Natural Resources Metrics questions are presented in Appendix M: Natural Resources Conservation Metrics and are available on the Navy Conservation Website (Figure 5-1).

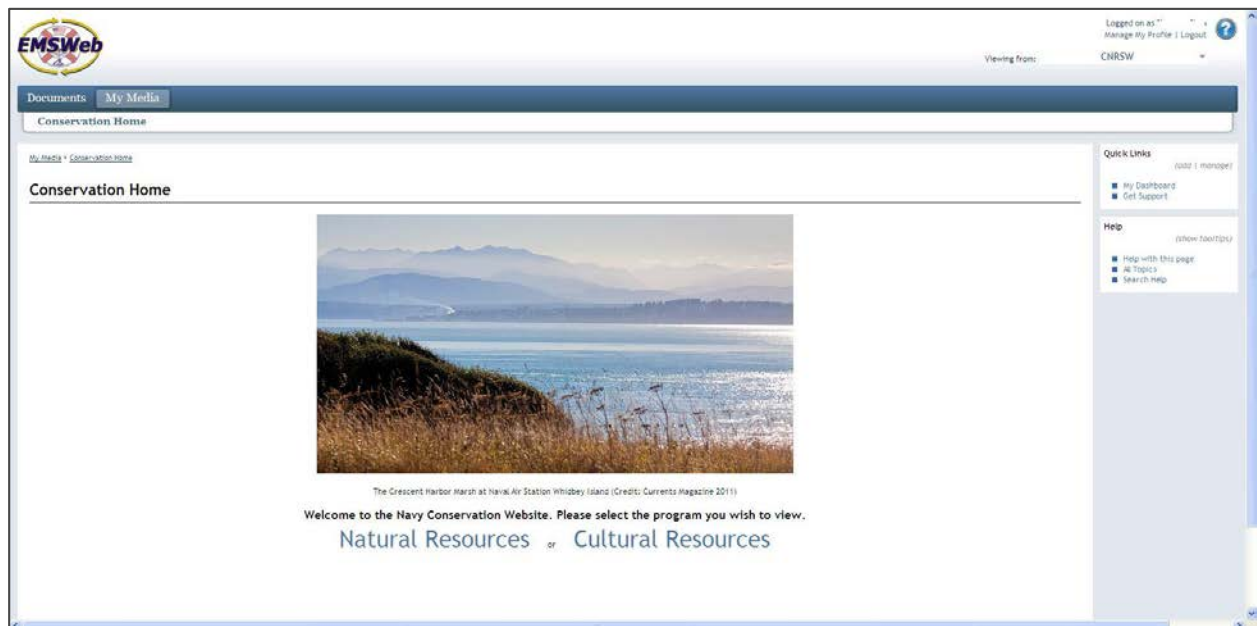


Figure 5-1. Navy Conservation Website, where the metrics builder can be found.

## 5.4 INRMP Project Programming and Budgeting

Installation COs or Officers-in-Charge endorse, via signature, their INRMPs. Their responsibility is to act as stewards of natural resources under their jurisdiction and integrate natural resources requirements into the day-to-day decision-making process. To accomplish this, they involve appropriate tenant, operational, training, or research and development commands in the INRMP review process to ensure no net loss of the military mission. At their discretion they may bring in Navy Judge Advocate General or Office of the General Counsel Legal Counsel to provide advice and counsel with respect to legal matters related to natural resources management and INRMPs (OPNAVINST 5090.1C CH-1).

Formal adoption of an INRMP by a CO or Officer-in-Charge constitutes a commitment to seek funding and execute, subject to the availability of funding, all *must fund*<sup>1</sup> projects and activities, in accordance with specific time-frames identified in the INRMP. The INRMP is considered implemented if the installation:

1. Actively requests, receives, and uses funds for all ERL 4 projects and activities;
2. Ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the tasks required by the INRMP;
3. Coordinates annually with all cooperating offices; and
4. Documents specific INRMP action accomplishments undertaken each year.

*Must fund projects are defined and assessed based on four Navy ERLs to enable capability-based programming and budgeting of environmental funding. Such projects support all actions specifically required by law, regulation or Executive Order just in time (Section 5.4.1: Funding Classifications and Section 5.5: INRMP Implementation Summary).*

Under the Sikes Act (as amended), any natural resources management activity that is specifically addressed in the INRMP must be implemented (subject to availability of funds). Failure to implement the INRMP is a violation of the Act and may be a source of litigation. Since the Sikes Act (as amended) requires implementation of the INRMP, there is a clear fiscal connection between INRMP preparation, revision, implementation, and funding. Funding to implement natural resources management will largely come from program sources (through Commander, Navy Region Southwest). Accordingly, it is vital that budget personnel understand and participate in the INRMP process.

### 5.4.1 Funding Classifications

For the purposes of this INRMP, the terms stewardship and compliance have specific meaning as criteria for implementing project lists. Project rankings are assigned based on whether an activity is mandatory to comply with a legal requirement, such as under the Endangered Species Act (ESA), Clean Water Act, or Migratory Bird Treaty Act. Alternatively, a project may be considered good land stewardship but is not considered an obligation for NRTF Dixon to be found in compliance with environmental laws. Projects considered necessary to comply with the law are generally funded within budget constraints, whereas stewardship projects are ranked lower for funding consideration when projects are competed among multiple installations. Current policy is, however, that they will eventually be funded.

<sup>1</sup> Specifically, must fund projects and actions are those required to: (a) Meet with legislative directives, EOs, and any legal requirement supported by laws and regulations found, but not limited to federally listed species surveys, baseline wetland delineations, mapping of federally listed species, and mapping of Critical Habitat; (b) Meet the USFWS special management criteria for federally listed species management and avoidance of Critical Habitat designation of military bases; (c) Integrally support mission readiness, training requirements, and land sustainability, such as prevention of resource loss or degradation and baseline data collection and long-term trend monitoring efforts; and (d) Provide for qualified natural resources personnel.

The funding strategies described here are implemented when projects are defined and prioritized, as for this INRMP in Appendix A: Implementation Summary Table. The budgeting plan for the INRMP is based on programming and budgeting priorities for conservation programs described in OPNAVINST 5090.1C CH-1. Funds will be requested for tasks within this INRMP based on this plan.

### **Environmental Readiness Program Assessment Database**

Environmental Portal and the Environmental Program Requirements Web (EPR-Web) is an optimized online database used to define all programming for the Navy's environmental requirements. EPR-Web records data on project expenditures and provides immediate, web-based access to requirements entered by the multiple Navy environmental programs, including Environmental Compliance, Pollution Prevention, Conservation, Radiological Controls, and Range Sustainment, as related to environmental costs on military ranges. It is the Navy's policy to fully fund compliance with all applicable federal, state, and local laws; EOs; and associated implementing rules, regulations, DoDIs and Directives, and applicable international and overseas requirements (OPNAVINST 5090.1C CH-1).

All natural resources requirements are entered into EPR-Web and they are available for review/approval by the chain of command by the dates specified in the Guidance letter that is provided annually by Chief of Naval Operations (N45). This database is the source document for determining all programming and budgeting requirements of the Environmental Quality Program. EPR-Web is also the tool for providing the four ERL capabilities used in producing programming and budgeting requirements for the various processes within the budget planning system.

The budget programming hierarchy for this INRMP is based on both DoD and Navy funding level classifications. The four programming and budgeting priority levels detailed in DoDI 4715.03 (18 March 2011) Natural Resources Conservation Program, implement policy, assign responsibilities, and prescribe procedures for the integrated management of natural and cultural resources on property under DoD control. Budget priorities are also described in OPNAVINST 5090.1C CH-1, Environmental and Natural Resources Program Manual.

### **Department of Defense Funding Classifications**

The previous DoD classification used Class 0, I, II, and III projects. The guidance has been updated and Enclosure 4 of DoDI 4715.03 defines the four classes of conservation programs. Navy policy requires funding of all DoD Recurring Natural Resources Conservation Management Requirements and Non-Recurring Current Compliance projects.

### **Recurring Natural Resources Conservation Management Requirements**

*Formerly DoD Class 0.* These activities are needed to cover the administrative, personnel, and other costs associated with managing the DoD Natural Resources Conservation Program that are necessary to meet applicable compliance requirements in federal and state laws, regulations, EOs, and DoD policies, or in direct support of the military mission. DoD components shall give priority to recurring natural resources conservation management requirements associated with the operation of facilities, installations, and deployed weapons systems. These activities include day-to-day costs of sustaining an effective natural resources management program, as well as annual requirements, including manpower, training, supplies, permits, fees, testing and monitoring, sampling and analysis, reporting and record keeping, maintenance of natural resources conservation equipment, and compliance self-assessments.

### **Non-Recurring Current Compliance**

*Formerly DoD Class I.* These projects and activities are needed to support: an installation currently out of compliance; signed compliance agreements or consent order; meeting requirements with applicable federal or state laws, regulations, standards, EOs, or policies; immediate and essential maintenance of operational integrity or military mission sustainment; and projects or activities that will be out of compliance if not implemented in the current program year.

### **Non-Recurring Maintenance Requirements**

*Formerly DoD Class II.* These projects and activities are needed to meet an established deadline beyond the current program year and maintain compliance. Examples include: compliance with future deadlines; conservation, GIS mapping, and data management to comply with federal, state, and local regulations, EOs, and DoD policy; efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives; wetlands enhancement to minimize wetlands loss and enhance existing degraded wetlands; and conservation recommendations in Biological Opinions.

### **Non-Recurring Enhancement Actions Beyond Compliance**

*Formerly DoD Class III.* These projects and activities enhance conservation resources or the integrity of the installation mission or are needed to address overall environmental goals and objectives, but are not specifically required by law, regulation, or EO, and are not of an immediate nature. Examples include: community outreach activities; educational and public awareness projects; restoration or enhancement of natural resources when no specific compliance requirement dictates a course or timing of action; and management and execution of volunteer and partnership programs.

## **Navy Environmental Readiness Levels for Assigning Budget Priorities**

Four Navy ERLs have been established to enable capability-based programming and budgeting of environmental funding (recurring and non-recurring projects), and to facilitate capability versus cost trade-off decisions. The projects recommended in this INRMP have been prioritized based on compliance and stewardship criteria provided in the hierarchy below. ERL 4 is considered the absolute minimum level of environmental readiness capability required to maintain compliance with applicable legal requirements. The definitions of ERL 4 through ERL 1 follow, as provided in OPNAVINST 5090.1C CH-1:

1. Environmental Readiness Level 4
  - Supports all actions specifically required by law, regulation, or EO (DoD Non-Recurring Current Compliance and Non-Recurring Maintenance Requirements projects) just in time.
  - Supports all DoD Recurring Natural Resources Conservation Management Requirements as they relate to a specific statute, such as hazardous waste disposal, permits, fees, monitoring, sampling and analysis, reporting, and record keeping.
  - Supports recurring administrative, personnel and other costs associated with managing environmental programs that are necessary to meet applicable compliance requirements (DoD Recurring Natural Resources Conservation Management Requirements).
  - Supports minimum feasible Navy executive agent responsibilities, participation in Office of the Secretary of Defense (OSD) sponsored inter-department and inter-agency efforts, and OSD mandated regional coordination efforts.
2. Environmental Readiness Level 3
  - Supports all capabilities provided by ERL 4.

- Supports existing level of Navy executive agent responsibilities, participation in OSD sponsored inter-department and inter-agency efforts, and OSD mandated regional coordination efforts.
  - Supports proactive involvement in the legislative and regulatory process to identify and mitigate requirements that will impose excessive costs or restrictions on operations and training.
  - Supports proactive initiatives critical to the protection of Navy operational readiness.
3. Environmental Readiness Level 2
- Supports all capabilities provided under ERL 3.
  - Supports enhanced proactive initiatives critical to the protection of Navy operational readiness.
  - Supports all Navy and DoD policy requirements.
  - Supports investments in pollution reduction, compliance enhancement, energy conservation, and cost reduction.
4. Environmental Readiness Level 1
- Supports all capabilities provided under ERL 2.
  - Supports proactive actions required to ensure compliance with pending/strongly anticipated laws and regulations in a timely manner and/or to prevent adverse impact to Navy mission.
  - Supports investments that demonstrate Navy environmental leadership and proactive environmental stewardship.

## 5.4.2 Implementation Schedule

This INRMP will become effective upon the acceptance and signatory release described in Section 1.8: Roles, Responsibilities and Stakeholders. Current projects, activities, and plans have been incorporated into the INRMP, as the plan serves as a formal structuring and integration of the existing natural resources management program.

Future work identified herein will be implemented as funding becomes available. Priorities identified in this INRMP will generally determine the order of implementation. NAVFAC Southwest will determine what projects and activities are appropriate to initiate, given funding, at any particular time. The INRMP is meant to be flexible, dynamic, and adaptable to the immediate concerns and needs of natural resources management and the Navy mission. Programming for INRMP implementation generally occurs in one- to three-year budget cycles through the Program Objectives Memorandum system; this is how the DoD allocates resources and links INRMP objectives to budgets and execution. See Appendix A: Implementation Summary Table for the INRMP Implementation Summary Table (Table A-1).

## 5.4.3 Federal Anti-Deficiency Act

NAVFAC Southwest, on behalf of NRTF Dixon, intends to implement actions in this INRMP within the framework of regulatory compliance, national Navy mission obligations, anti-terrorism and force protection limitations, and funding constraints. The execution of any of the INRMP projects will be dependent on the availability of appropriate funding sources. Any requirement for the obligation of funds for projects or actions in the INRMP shall be subject to the availability of funds appropriated by Congress, and none of the proposed projects or actions shall be interpreted to require obligations or payment of funds in violation of any applicable federal law, including the Anti-Deficiency Act (31 U.S. Code 1341 *et seq.*).

## 5.4.4 Funding Sources

In order to implement the various research, surveys, and programs necessary to fulfill NAVFAC Southwest's mission for natural resources management at NRTF Dixon, funding must be identified and acquired. There are several avenues of funding available to NAVFAC Southwest for this purpose, beyond the typical Naval operational budget, that allow the inclusion of additional projects to assist NAVFAC Southwest in their mission-related and stewardship endeavors. NAVFAC Southwest must continually assess the priority and level of budgetary needs to fulfill Navy and regulatory requirements and to sustain overall program goals. These funding sources are discussed below in general terms, as this process is dynamic and is dependent on the INRMP's continuously developing program.

These programs will be implemented using Navy personnel and program resources as much as possible; however, it is likely that contractors will accomplish many projects. NAVFAC Southwest will identify projects that would be accomplished using contract vehicles, with existing contracts being used where possible and appropriate.

For large projects that involve different Navy organizations, representatives of these organizations would coordinate budgeting and scheduling to ensure that the project can be accomplished in the planned time-frame. Large-budget projects may not be completely funded in a fiscal year, requiring incremental funding over the term of the project.

In some cases, smaller, lower-priority projects may be conducted using unspent funds from other tasks or year-end fallout funding. Some projects may be accomplished with little or no funding required, such as those requiring only a change of policy or coordination and effort from partners. These tasks can be implemented virtually as soon as planning is performed.

In concert with the above, NAVFAC Southwest can ensure adequate funding for NRTF Dixon natural resources management initiatives by providing documentation to secure appropriate levels of in-house funding; maintaining prioritized lists of management efforts to facilitate programs required for compliance and legal mandates and to support the military mission; developing long-range plans and documentation to secure off-site funding; continuing to request funding from other agencies for programs of mutual benefit; and continuing to support scientific and academic efforts to initiate or supplement natural resources management programs.

### 5.4.4.1 Department of Defense Funding Sources

#### Operations and Maintenance Funds

Funding sources for the natural resources program are derived from General and Administrative, Operations and Maintenance Navy (O&MN), and input into the Navy Environmental Program Requirement (EPR) system for funding. This primary budgetary source is the basis for maintaining the personnel and core programs inherent to the natural resources program. These appropriated funds are the primary source of resources to support must-fund, just-in-time environmental compliance (i.e. Navy ERL 4 projects). O&MN funds are generally not available for Navy ERL 3-1 projects. It is the responsibility of NAVFAC Southwest to manage the natural resources program budget and funding for NRTF Dixon. Once O&MN funds are appropriated for core personnel and the program, funding can be justified for other project requirements.

#### Fish and Wildlife Fees

Fish and Wildlife Fees are collected via sales of licenses to hunt or fish. They are authorized by the Sikes Act (as amended) and may be used only for fish and wildlife management on the installation where they

are collected. NRTF Dixon generates no Fish and Wildlife Fees, and none are anticipated since a hunting and/or fishing program is incompatible with the security of the installation.

### Revenues from Agricultural/Grazing Outleasing

Revenues from rents on agricultural and grazing outleases on Navy lands are a source of funding for natural resources management programs. While NRTF Dixon has no forests, the sale of forest products from other Navy lands also contributes to such funding. Funds accumulated through the outleasing of agricultural and grazing lands on many installations are directed back into the natural resources program, and are reallocated throughout the Navy by NAVFAC Headquarters. NRTF Dixon maintains one agricultural outlease covering approximately 585 acres, which is renewed every five to ten years. The agricultural outlease program at NRTF Dixon is managed by NAVFAC Southwest in San Diego, California (refer to Section 2.4.1: Real Estate Outgrants and Easements and Section 4.2.1: Agricultural Outlease Management). Most agricultural outlease improvement projects at NRTF Dixon are funded by the centrally managed fund. A limited number of NAVFAC Southwest staff are also funded by the central agricultural fund to support the agricultural outlease program at NRTF Dixon. Presently, there are no grazing outleases on NRTF Dixon.

Revenues from the agricultural and grazing outlease program are available for (OPNAVINST 5090.1C CH-1):

- Administrative expenses of agricultural leases. The Navy shall give priority to funding natural resources professionals directly responsible for the administration of agricultural programs;
- Initiation, improvement, and perpetuation of agricultural leases; and
- Implementation of related INRMP stewardship projects. Navy installations with land management programs will obtain the services of a natural resources professional for guidance of land management programs such as grounds maintenance, landscaping, wetland protection and enhancement, erosion control, nonpoint source pollution prevention, and agricultural outleasing.

### Recycling Funds

Installations with a Qualified Recycling Program may use proceeds for some types of natural resource projects. NRTF Dixon does not currently have a recycling program.

### DoD Legacy Funds

The Legacy Resource Management Program (LRMP) was enacted in 1990 to provide financial assistance to military natural and cultural resources management. The program assists with protection and enhancement of natural resources while supporting military readiness. Legacy projects may involve regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, and/or monitoring, and predicting migratory patterns of birds and other animals.<sup>2</sup> The LRMP has three main components: stewardship, leadership, and partnership. Stewardship projects assist the military in sustaining its natural resources. Leadership initiatives provide programs that serve to guide and often become *flagship* programs for other military, scientific, and public organizations. Partnerships provide for cooperative efforts in planning, management, and research.

The LRMP emphasizes five areas:

- Ecosystem approaches to natural resources management to maintain biological diversity and the sustainable use of land and water resources for the military mission and other uses.

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<sup>2</sup> Information on this program can be found at [www.dodlegacy.org](http://www.dodlegacy.org).



- Interdisciplinary approaches that incorporate the often overlapping goals of natural and cultural resources management. Legacy strives to take advantage of this by sharing management methodologies and techniques across natural and cultural resource initiatives.
- Promoting natural and cultural resources by public and military education and involvement.
- Application of resource management initiatives regionally. The LRMP supports regional efforts between the military and other governmental and non-governmental organizations.
- Development of innovative new technologies to provide more efficient and effective natural resources management.

### **Strategic Environmental Research and Development Program and Environmental Security Technology Certification Program**

The Strategic Environmental Research and Development Program and Environmental Security Technology Security Program are the DoD's environmental science and technology program, planned and executed in partnership with the U.S. Department of Energy and Environmental Protection Agency with participation by numerous other federal and non-federal organizations. The Strategic Environmental Research and Development Program invests across a broad spectrum of basic and applied research, as well as advanced development to improve DoD's environmental performance, reduce costs, and enhance and sustain mission capabilities. The Strategic Environmental Research and Development Program and Environmental Security Technology Certification Program promote partnerships and collaboration among academia, industry, the military services, and other federal agencies. They are independent programs managed from a joint office to coordinate efforts from basic and applied research to field demonstration and validation.

### **Special Initiatives**

The DoD or Navy may establish special initiatives to fund natural resource projects. Funding is generally available only for a limited number of projects. There are currently two such DoD initiatives:

- Streamside Forests. Lifelines to Clean Water is a DoD streamside restoration small grants program. Funds are available to military installations working in partnership with a local school and/or civic organization to purchase locally native plant material for small streamside restoration projects. Funds are distributed as reimbursements. Up to \$5,000 may be awarded per project. This is an ongoing program (no deadline), so proposals can be submitted at any time. Applications and additional information are available on the DENIX website.
- Sustaining Our Forests, Preserving Our Future. Funding to ensure that the integrity of DoD forested lands remains intact.

#### **5.4.4.2 External Assistance**

Personnel limits have resulted in the need for outside assistance with some natural resources programs on NRTF Dixon. The growth of environmental compliance requirements has increased the need for external assistance.

Many external assistance projects will be determined by funding availability. As feasible, NRTF Dixon should provide funding and support for research, other studies, and specific management programs to further installation natural resources management through Contractor Support, Cooperative Agreements (CAs), Memoranda of Understanding, and other partnership vehicles appropriate for the installation.

## Memoranda of Understanding

Memoranda of Understanding that the DoD has signed on to provide valuable opportunities for collaboration that can benefit both sustainability of the military mission and natural resources management at NRTF Dixon. Examples of such opportunities are included in Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements.

## Contractor Support

Contractors give NRTF Dixon access to a wide variety of specialties and fields. In accordance with Circular No. A-76, the federal government is mandated to use commercial sources to supply the products and services the government needs. At NRTF Dixon, contractors are involved in operating the installation itself (it is a government-owned, contractor-operated facility), projects such as National Environment Policy Act documentation, vegetation surveys, species surveys, invasive species management, grounds maintenance, management plans, and similar activities.

## Cooperative Agreements

Navy guidance on INRMPs states: “Installations are encouraged to work with other organizations, agencies, and individuals both on and off the installation throughout the planning process. Building partnerships with the right organization(s) is essential for ecosystem management.” CAs<sup>3</sup> are one means to accomplish this kind of partnership. Indeed, the Sikes Act (as amended) states that the Secretary of the Navy can enter into CAs with states, local governments, nongovernmental organizations, individuals, and with other agencies (inter-agency agreements) to provide for: (1) the maintenance and improvement of natural resources on, or to benefit natural and historic research on, DoD installations; and (2) the maintenance and improvement of natural resources located off of a DoD installation if the purpose of the CA or interagency agreement is to relieve or eliminate current or anticipated challenges that could restrict, impede, or otherwise interfere with, whether directly or indirectly, current or anticipated military activities.

In order to use a CA, substantial involvement is expected between the Navy and state, local government, or other recipient when carrying out the activity contemplated in the agreement. CAs provide a mutually beneficial means of acquiring, analyzing, and interpreting natural resources data, which can then be used to inform natural resources management decisions. CAs are funded by the Navy and produce information that can be used to help resource managers achieve project-specific compliance with environmental laws.

## Cooperative Ecosystem Studies Units

The Cooperative Ecosystem Studies Units program is a working collaboration among federal agencies, universities, state agencies, non-governmental organizations, and other non-federal institutional partners. The Cooperative Ecosystem Studies Units National Network provides multidisciplinary research, technical assistance, and education to resource and environmental managers. Although the overall program is overseen by the U.S. Department of the Interior, one of the participating agencies is DoD.

## University Assistance

Universities are an excellent source of research assistance. NRTF Dixon has not yet partnered with any universities to help with specialized needs (e.g. natural resources research). There are opportunities for future partnerships with local universities such as the University of California, Davis.

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<sup>3</sup> CAs are legal relationships between the Navy and States, local governments, institutions of higher education, hospitals, non-profit organizations or individuals. The principal purpose of the relationship is to transfer a thing of value to the State, local government, or other recipient to carry out a public purpose of support or stimulation authorized by a law of the United States instead of acquiring (by purchase, lease, or barter) property or services for the direct benefit or use of the U.S. Government. Authorization for CAs is arranged through NAVFAC.

## 5.4.5 Research Funding Requirements

Environmental program funding within the Navy is primarily based upon federally mandated requirements. Consequently, program managers are encouraged to seek outside funding for projects consistent with the INRMP, such as research, that will benefit natural resources on installations, but that are not directly related to federal mandates.

New funding sources should be sought from federal, state, local, and nonprofit organizations with an interest in achieving the goals and objectives of this INRMP in partnership with NRTF Dixon. Any such funding would need to be consistent with authorization to receive and use such funds. These will often require cost-sharing. This funding opportunity should be sought for projects that are not *must-fund* items, tied directly to immediate regulatory compliance. Examples are watershed management, habitat enhancement, or wetland restoration. Partnerships with outside researchers can be guided by projects identified in Appendix G: Research Requirements.

## 5.5 INRMP Implementation Summary

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The approach and actions that support INRMP implementation are identified in this section. Following these are Table 5-1, Table 5-2, Table 5-3, and Table A-1 that summarize various aspects of the implementation of this INRMP.

The purpose of Table A-1 (INRMP Implementation Summary Table) is to summarize all projects or activities that NAVFAC Southwest intends to implement over the duration of the INRMP time-frame. It is organized according to INRMP management topic. Management strategies presented in Chapter 3 Natural Resources Condition and Management, Chapter 4 Sustainability and Compatible Use at NRTF Dixon, and Chapter 5 Implementation Strategy identify the means by which NAVFAC Southwest on behalf of NRTF Dixon intends to achieve desired future conditions. Management actions, such as EPR projects, are specific projects or activities that provide NAVFAC Southwest a mechanism to strive towards achieving those desired future conditions. Individual EPR projects may address multiple management strategies encompassing various INRMP management topics. This Implementation Table parallels the structure of the INRMP as presented in Chapters 3 and 4. In order to reduce redundancy, all INRMP management strategies presented in these sections are incorporated by reference in the INRMP Section column of the table. Management strategies that pertain to special status species have their own sections rather than including special status species management strategies in the broader sections that pertain to wildlife populations.

Table 5-1 identifies the various EPR project codes and descriptions that are referenced in the EPR Number column of Table A-1; these include the EPR number or placeholder for future EPR projects if appropriate. Table 5-2 identifies the applicable funding sources for each project; for more information on funding sources refer to Section 5.4.4: Funding Sources. Table 5-3 identifies the applicable INRMP legal drivers, or compliance requirements, for all of the various INRMP management projects or activities. All projects listed in Table A-1 support compliance with OPNAVINST 5090.1C CH-1 and DoDI 4715.03.

Effective implementation of the NRTF Dixon INRMP relies on organizational capacity, communication, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of installation lands by the Navy, as required by the Sikes Act (as amended). Investigating and utilizing all appropriate avenues and partnerships to achieve the goals and objectives of this INRMP will contribute to the best possible management and most efficient use of funds.

Implementing a balanced, multiple-use natural resources program can be accomplished through:

- Professional management (NAVFAC P-73 Volume II) with ongoing training and professional development opportunities;
- Prioritizing and allocating funding to support compliance requirements with emphasis on INRMP actions and projects in the order of ERL 4 (must fund), ERL 3, ERL 2, and ERL 1 (OPNAVINST 5090.1C CH-1, DoDI 4715.03, Section 5.4.1: Funding Classifications). Budget priorities for threatened and endangered species management, especially compliance with Biological Opinions, should receive the highest possible budgeting priority, and support the need to avoid Critical Habitat designations under Section 4(b)(2) of the ESA, or Section 4(a)3 of the ESA (exemption from Critical Habitat designations for national security reasons);
- Identifying new funding sources from federal, state, local, and nonprofit organizations with an interest in achieving the goals and objectives of this INRMP in partnership with NAVFAC Southwest to further NRTF Dixon natural resources management goals and compliance (for non-ERL 4 must fund items). Partnerships can strengthen natural resources management actions locally and regionally, particularly when supporting mutual goals of this INRMP and the California Wildlife Action Plan or other regional plans;
- Seeking recognition for natural resource work conducted at NRTF Dixon to showcase management accomplishments; and
- Continuing to ensure effective communication, adaptive oversight and policy leadership through the Navy Natural Resources Strategic Plan.

*Table 5-1. Integrated Natural Resources Management Plan environmental program requirements, project codes and descriptions.*

<b>EPR Project Code</b>	<b>Description</b>
0088614100	CH SW NCTS Dixon INRMP and Associated Surveys
00886NR091	3 SAR SW Burrowing Owl Burrow Survey and Mapping Project
00886NR107	EO 11990 SW NCTS Dixon - Vernal Pool Survey, Mapping and Wetland Delineation
00886NR108	Sikes SW NCTS Dixon - Natural Resource Management Area Fence Maintenance
00886NR110	Sikes SW NCTS Dixon - Development and Implementation of a Wildlife Habitat Enhancement Plan
00886NR112	EO 13112 SW NCTS Dixon - Invasive Weed Management
00886NR114	Sikes SW NCTS Dixon Flora and Fauna Surveys
00886NR200	MBTA SW NCTS Dixon Avian Protection Plan Development and Implementation
00886NR201	Sikes SW NCTS Dixon Wildland Fire Protection Plan
00886IPMPS	Integrated Pest Management Plan NCTS Dixon

*Table 5-2. Integrated Natural Resources Management Plan project funding sources.*

<b>Funding Sources</b>	<b>Description</b>
NAVFAC Southwest In-House	NAVFAC Southwest Office responsible for NRTF Dixon natural resources management and INRMP implementation funding
Other Navy In-House	Other NAVFAC Southwest Department or Division funding
O&MN	Operations and Maintenance Navy funding
Ag. Funds	Agricultural/Grazing Outleasing funding
DoD Legacy	DoD Legacy funding
Partnership	Research institution, non-governmental organization, volunteer funding, or other partnership funding
Project Proponent	Project proponent funding

*Table 5-3. Integrated Natural Resources Management Plan implementation table management project or activity legal drivers.*

<b>Acronyms</b>	<b>Description</b>
BEPA	Bald and Golden Eagle Protection Act
CA ILRP	California Central Valley Regional Water Quality Control Board Long-term Irrigated Lands Regulatory Program
CAA	Clean Air Act
CESA	California Endangered Species Act
CWA	Clean Water Act
DoD Partnership	Partnership for Amphibian and Reptile Conservation, Partners in Flight, Pollinator Partnership, etc.
DoDI 4715.03	DoD Natural Resources Conservation Program
DoDI 6055.06	DoD Fire and Emergency Services Program
DQA	Data Quality Act
EO 11514	Protection and Enhancement of Environmental Quality
EO 11988	Floodplain Management
EO 11990	Protection of Wetlands
EO 11991	Protection and Enhancement of Environmental Quality
EO 12342	Environmental Safeguard for Animal Damage Control on Federal Lands
EO 13112	Invasive Species
EO 13186	Migratory Birds
EO 13423	Strengthening Federal Environmental, Energy, and Transportation Management
EO 13514	Federal Leadership in Environmental, Energy, and Economic Performance
ESA	Endangered Species Act
FNWA	Federal Noxious Weed Act
LRPPA	Legacy Resource Protection Program Act
MBTA	Migratory Bird Treaty Act
Migratory Bird Rule	50 CFR Part 21 Migratory Bird Permits: Take of Migratory Birds by the Armed Forces, 28 February 2007
NAVFAC P-73, Vol. II	NAVFAC, P-73. (May 1987) Real Estate Procedural Manual and Natural Resources Management Procedural Manual
Navy Guidance for INRMPs	CNO (N45) Integrated Natural Resources Management Program Guidance. 10 April 2006
NEPA	National Environmental Policy Act
OPNAVINST 5090.1C CH-1	Environmental Protection and Natural Resources Manual (as amended)
OPPA	Oil Pollution Prevention Act
PPA	Plant Protection Act
Presidential Memorandum of April 1994	Presidential Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds, 26 April 1994
QDR	2010 Quadrennial Defense Review
RCRA-HSWA	Resource Conservation and Recovery Act - Hazardous and Solid Waste Amendments
SCA	Soil Conservation Act, 16 U.S. Code §§ 590a et seq.
Sikes Act (as amended)	Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960, as amended
WAP	California Wildlife Action Plan
WPFPA	Watershed Protection and Flood Prevention Act

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

### Appendix A: Implementation Summary Table

The purpose of Table A-1: Integrated Natural Resources Management Plan (INRMP) Implementation Summary is to summarize all projects or activities that Naval Facilities Engineering Command (NAVFAC) Southwest intends to implement over the duration of the INRMP time-frame. It includes reference to supporting management strategies in Chapters 3 and 4, the Environmental Program Requirement (EPR) funding code, project description, associated legal or compliance drivers, anticipated implementation time-frames, relevant Natural Resource Focus Areas, and potential funding sources and cost estimates for implementing all natural resources projects identified in this INRMP. All projects listed in Table A-1: INRMP Implementation Summary Table support compliance with Chief of Naval Operations Instruction (OPNAVINST) 5090.1C CH-1 and DoD Instruction (DoDI) 4715.03.

The Sikes Act (as amended) requires implementation of this INRMP; however, INRMP implementation is also subject to the provisions of the Federal Anti-Deficiency Act. Some INRMP projects are accomplished with installation staff; others involve contracting work to specialists. The implementation schedule identified in Table A-1 is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements.

**Table A-1. Integrated Natural Resources Management Plan Implementation Summary, including assignment of priorities based on legal driver behind each project.**

INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule		Natural Resource Focus Areas	Cost Estimate
<b>Chapter 3 Natural Resources Current Condition and Management</b>									
<b>Section 3.1: Ecoregional Setting and Managing with an Ecosystem Approach</b>									
	O&MN	00886NR110	Develop and implement a comprehensive, integrated habitat management plan that includes target conditions and best practices.	4	Sikes Act (as amended), ESA, EO 13186, EO 13112, EO 11990, DoDI 4715.03.	Ongoing	2019	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	
	O&MN	00886NR110	Implement a coordinated monitoring program using land health and focal species indicators.	3	Sikes Act (as amended), ESA, MBTA, EO 13186, EO 13112, EO 11990, DoDI 4715.03, OPNAVINST 5090.1C CH-1.	Ongoing	2020	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness 5. Team Adequacy 6. INRMP Project Implementation	
<b>Section 3.3: Physical Conditions and Managing the Physical and Chemical Environment</b>									
<b>Section 3.3.5: Wildland Fire Management</b>									
	O&MN, NAVFAC Southwest In-House	00886NR201	Develop and implement a Wildland Fire Management Plan for NRTF Dixon. In it, include a fire management approach for NRTF Dixon that standardizes current fire prevention and control strategies. Update as necessary.	4	ESA, DoDI 6055.6, DoDI 4715.03	5 years	2018	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness	
<b>Section 3.4: Vegetation Communities and Habitats</b>									
	O&MN	00886NR110	When feasible, enhance vegetation communities and habitats to improve their native condition and support beneficial uses. Incorporate habitat enhancement monitoring, including monitoring of indicator or management focus species. Prioritize activities for wetland and vernal pool areas. Develop a restoration plant list to guide habitat enhancement activities.	4	Sikes Act (as amended), MBTA, EO 13186, EO 11990, DoDI 4715.03	Ongoing	2020	1. Ecosystem Integrity 3. Fish and Wildlife Management and Public Use	
<b>Section 3.4.3: Wetlands and Jurisdictional Waters</b>									
	O&MN, NAVFAC Southwest In-House, Project Proponent	00886NR107	Inventory and map wetland habitats and U.S. Army Corps of Engineers jurisdictional waters of the U.S. Determine whether surface waterway connections to the San Joaquin Delta are sufficient to deem them jurisdictional.	4	CWA, NEPA, OPNAVINST 5090.1C CH-1, EO 11990, DoDI 4715.03	Ongoing	2016	1. Ecosystem Integrity	
<b>Section 3.5: Fish and Wildlife Management</b>									
<b>Section 3.5.1: Aquatic and Terrestrial Invertebrates</b>									
	O&MN	00886NR114	Conduct a baseline invertebrate survey and program for surveys as part of installation-wide flora and fauna surveys.	4	Sikes Act (as amended), DoDI 4715.03	5 years	2016	1. Ecosystem Integrity	
<b>Section 3.5.2: Pollinators</b>									
	O&MN, Partnership, DoD Legacy	0088614100	Conduct a baseline survey to determine presence, distribution and abundance of important pollinator species and the plants dependent upon them.	4	Sikes Act (as amended), DoD partnership	5 years	2016	1. Ecosystem Integrity	

INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule		Natural Resource Focus Areas	Cost Estimate
	O&MN, NAVFAC Southwest In-House, Other Navy In-House, Partnership, DoD Legacy	00886NR110	Identify and establish pollinator-friendly landscapes where feasible, particularly as a part of habitat enhancement activities and in coordination with facility maintenance and/or construction activities. Avoid and minimize impacts to pollinators.	4	Sikes Act (as amended), DoD partnership	Ongoing	2019 - 2020	1. Ecosystem Integrity	
<b>Section 3.5.4: Reptiles and Amphibians</b>									
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR114, 0088614100	Identify management focus reptiles and amphibians and conduct surveys to determine existing populations. Monitor to determine management needs. Investigate impact of non-native invasive amphibians and crustaceans on native amphibians. If necessary, develop a control program for these invasive species.	4	Sikes Act (as amended), EO 13112	Ongoing	2016	1. Ecosystem Integrity	
<b>Section 3.5.5: Birds</b>									
	O&MN, NAVFAC Southwest In-House, Other Navy In-House, Partnership	00886NR114, 0088614100	Conduct a focused breeding bird survey to better assess the distribution and abundance of species breeding on NRTF Dixon.	4	Sikes Act (as amended), MBTA, Migratory Bird Rule, EO 13186	Ongoing	2016	1. Ecosystem Integrity	
	O&MN, NAVFAC Southwest In-House	00886NR200	Develop and implement an Avian Protection Plan to monitor and document frequency and species of bird strikes against antennas and guy wires. Incorporate additional monitoring and assessment strategies into the plan for those activities identified as potentially impacting resident and migratory birds.	4	MBTA, Sikes Act (as amended), DoDI 4715.03, EO 13186, Migratory Bird Rule	Ongoing	2017	1. Ecosystem Integrity	
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR114, 0088614100	Conduct migratory and resident bird surveys. When feasible, conduct habitat enhancement management activities to conserve bird populations and develop and maintain information on status and trend of populations and habitat.	4	Sikes Act (as amended), MBTA, BEPA, EO 13186	Ongoing	2016	1. Ecosystem Integrity	
<b>Section 3.5.6: Mammals</b>									
	O&MN	00886NR114, 0088614100	Conduct mammal surveys as part of installation-wide flora and fauna surveys every five years.	4	Sikes Act (as amended), DoDI 4715.03	5 years	2016	1. Ecosystem Integrity	
<b>Section 3.5.7: Bats</b>									
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR114, 0088614100	Inventory and monitor bat populations on NRTF Dixon as part of base-wide flora and fauna surveys and pollinator-focused surveys. In concert, further investigate the presence of the little brown bat and pallid bat at NRTF Dixon and their reliance on installation resources.	4	Sikes Act (as amended), DoDI 4715.03	Ongoing	2016	1. Ecosystem Integrity 4. Partnership Effectiveness	
<b>Section 3.6: Special Status Plants</b>									
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR107, 0088614100, 00886NR114	Conduct rare plant searches at high potential areas within the grassland and natural resources management area. If present, monitor all plants populations that are federally listed or candidates for listing that may be found on the installation and develop appropriate management actions as needed.	4	Sikes Act (as amended), ESA, DoDI 4715.03	5 years/ Ongoing	2016	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	

INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule	Natural Resource Focus Areas	Cost Estimate
<b>Section 3.7: Threatened and Endangered Species and Critical Habitat</b>								
	O&MN	00886NR107, 0088614100, 00886NR114	Every three years, conduct focused surveys for federally threatened and endangered species and species that are candidates for listing that potentially occur at NRTF Dixon, particularly in the vernal pool and wetland areas.	4	ESA, Sikes Act (as amended), DoDI 4715.03	3 years 2016	2. Listed Species and Critical Habitat	
	O&MN	00886NR107, 0088614100	Conduct monitoring for any federally listed species or species that are candidates for listing that are present on NRTF Dixon.	4	ESA, Sikes Act (as amended), DoDI 4715.03	Ongoing 2016	2. Listed Species and Critical Habitat	
<b>Section 3.8: Other Special Status Wildlife Species</b>								
	O&MN, NAVFAC Southwest In-House	0088614100 00886NR107	Conduct surveys for special status species. Monitor and map special status species on a regular basis as part of baseline surveys.	4	ESA, Sikes Act (as amended), DoDI 4715.03	Ongoing 2016	1. Ecosystem Integrity	
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR091	Conduct surveys for burrowing owls and map results. Consider removing artificial burrows and burrow mounds. Consider developing different habitat management techniques for the burrowing owl to encourage use away from sensitive infrastructure at NRTF Dixon.	4	Sikes Act (as amended) - no net loss provision, EO 13186, DoDI 4715.03	Ongoing 2016	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 7. INRMP Impact on the Installation Mission	
	O&MN	00886NR110	Install raptor nesting platforms in appropriate areas compatible with the military mission to complement existing trees as suitable nesting habitat for Swainson's hawk and other birds of prey.	4	Sikes Act (as amended), DoDI 4715.03	Ongoing 2019	1. Ecosystem Integrity 4. Partnership Effectiveness	
<b>Section 3.9: Invasive Species Management</b>								
	O&MN	00886IPMPS	Develop and implement an Integrated Pest Management Plan for NRTF Dixon that includes prevention measures. Review Plan and update as necessary.	4	Sikes Act (as amended), OPNAVINST 5090.1C CH-1, DoDI 4150.07, OPNAVINST 6250.4C, EO 13112, PPA, FNWA	Ongoing 2016	1. Ecosystem Integrity	
	O&MN, NAVFAC Southwest In-House	00886NR112	Conduct invasive plant species management and control activities that are effective and do not threaten existing or potential sensitive species. Update control measures as needs and conditions change.	4	Sikes Act (as amended), EO 13112, FNWA, DoDI 4715.03	Ongoing 2016	1. Ecosystem Integrity	
<b>Section 3.11: Data Integration, Access, and Reporting</b>								
	O&MN, NAVFAC Southwest In-House	N/A	Develop an integrated database for NRTF Dixon natural resource management information and data, including Geographic Information System (GIS).	3	Sikes Act (as amended), DoDI 4715.03, DQA	Ongoing 2025	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 4. Partnership Effectiveness 5. Team Adequacy 6. INRMP Project Implementation 7. INRMP Impact on the Installation Mission	
	O&MN, NAVFAC Southwest In-House	N/A	Convert the map of antennas and their ground mats/ guy wires into a GIS file so that it can be combined with the natural resource layers to show the extent of their overlap.	3	Sikes Act (as amended)	One Time 2017	1. Ecosystem Integrity	



INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule	Natural Resource Focus Areas	Cost Estimate
<b>Chapter 4 Sustainability and Compatible Use at NRTF Dixon</b>								
<b>Section 4.1.3: Infrastructure and Grounds</b>								
<b>Section 4.1.3.2: Construction and Facility, Grounds, and Roadside Maintenance</b>								
	NAVFAC Southwest In-House	N/A	When necessary, conduct clearance surveys for nesting birds and burrowing owls seven days before mowing activities.	4	Sikes Act (as amended), MBTA	Ongoing 2014	1. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	
<b>Section 4.1.3.3: Fencelines and Buffer Zones</b>								
	O&MN, NAVFAC Southwest In-House	00886NR108	Maintain/ install fencing around the NRMA. Ensure that fencing used does not prevent wildlife from accessing the area or that it does not hinder necessary management activities such as invasive species control.	4	Sikes Act (as amended), DoDI 4715.03	5 years 2019	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	
<b>Section 4.1.4: Adapting to Effects of Climate Change and Regional Growth and Conservation Initiatives</b>								
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR110	Develop a natural resources program framework for adapting to climate change, to include a Vulnerability Assessment for vernal pools and analysis of flood potential via the Delta, and recommendations for restoration work to ensure sustainability of military operations and healthy habitats.	4	DoDI 4715.03, ODR	Ongoing 2015	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 4. Partnership Effectiveness	
<b>Section 4.3: Public Access and Outdoor Recreation</b>								
	O&MN, NAVFAC Southwest In-House	00886NR108	Install and maintain appropriate signs in key areas to minimize unauthorized access and protect sensitive areas.	3	Sikes Act (as amended)	Ongoing 2019	1. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	

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# Naval Radio Transmitter Facility Dixon

## Integrated Natural Resources Management Plan

### Appendix B: Acronyms and Abbreviations

Acronym/Abbreviation	Definition
°F	degree(s) Fahrenheit
ANS	Aquatic Nuisance Species
BO	Biological Opinion
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BMP	Best Management Practice
Cal-IPC	California Invasive Plant Council
CA	Cooperative Agreement
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDWR	California Department of Water Resources
CECOS	Civil Engineering Corps Officers School
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CITES	Convention of International Trade in Endangered Species
CNDDB	California Natural Diversity Database
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operations
CNPS	California Native Plant Society
CNRSW	Commander, Navy Region Southwest
CO	Commanding Officer
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA	Clean Water Act
DoD	U.S. Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EMS	Environmental Management System
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPR	Environmental Program Requirement
EPR-Web	Environmental Program Requirements Web
ERL	Environmental Readiness Level
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
GIS	Geographical Information Systems
ILRP	Irrigated Lands Regulatory Program
INRMP	Integrated Natural Resources Management Plan
IPMC	Integrated Pest Management Coordinator

IPMP	Integrated Pest Management Plan
IR	Installation Restoration
IRP	Installation Restoration Program
ISMP	Invasive Species Management Plan
LID	Low Impact Development
LRMP	Legacy Resource Management Program
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NAA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Department of the Navy
NCTS	Naval Computer and Telecommunications Station
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NISC	National Invasive Species Council
NISMP	National Invasive Species Monitoring Plan
NPDES	National Pollutant Discharge Elimination System
NR	Natural Resources
NRCS	Natural Resources Conservation Service
NRMA	Natural Resources Management Area
NRTF	Naval Radio Transmitter Facility
O&M	Operations and Maintenance
O&MN	Operations and Maintenance Navy
OPNAVINST	Naval Operations Instruction
OSD	Office of the Secretary of Defense
OUSD	Office of the Under Secretary of Defense
PAR	Performance Assessment Representative
PCEs	Primary Constituent Elements
PIF	Partners in Flight
PL	Public Law
POM	Program Objective Memorandum
RCRA	Resource Conservation and Recovery Act
SSC	Species of Special Concern
SWRCB	State Water Resources Control Board
TDI	Tierra Data Inc.
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
UST	Underground Storage Tanks
WFMP	Wildland Fire Management Plan



# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

## Appendix C: Applicable Laws and Regulations

### C.1 Planning Jurisdictions

#### C.1.1 U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) is a cooperative partner in the endangered species program at Naval Radio Transmitter Facility (NRTF) Dixon and is a signatory participant in approving the Integrated Natural Resources Management Plan (INRMP) in accordance with the Sikes Act (as amended). The USFWS has an informal agreement with NRTF Dixon to provide technical assistance on federally endangered, threatened, and species of special concern and wetlands-related management issues, as necessary.

#### C.1.2 California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) is responsible for management of most fish and wildlife within the state, including those on federal lands. The CDFW is a required signatory participant for this INRMP, and the primary state agency responsible for managing fish and wildlife in California. NRTF Dixon's interaction with CDFW involves nuisance wildlife and management for state listed species.

### C.2 Laws, Regulations, Instructions, and Directives

Descriptions of the most relevant federal, state, and local laws and regulations as well as Executive Orders (EOs), U.S. Department of Defense (DoD) Instructions (DoDIs), and Department of the Navy (Navy) Instructions and manuals are included in this Appendix to provide an overview of the most influential laws, regulations, EOs, instructions, and manuals that can pertain to all types of projects occurring on NRTF Dixon. Natural resources consultation requirements, including any current or planned consultations, consistency with Endangered Species Act (ESA) Recovery Plans, and Regional Water Quality Control Board Basin Plans are discussed in this Appendix. The laws, regulations, instructions, and directives included in this Appendix are identified below in Table C-1.

The remainder of this Appendix is structured to focus on federal laws first and state laws second. Furthermore, the section on Federal Laws is further segregated into subsections that focus on cultural resources and specific natural resource topics including the environment in general, air resources, water resources, soil resources, terrestrial and aquatic habitats, wildlife populations, and species of concern. These natural resource topics correspond to the natural resource management sections contained within Chapter 3 of the INRMP.

Table C-1. Laws, regulations, instructions, and directives.

<b>Section</b>	<b>Topic</b>
<b>C.3</b>	<b>Federal Laws</b>
<b>C.3.1</b>	<b>Federal Natural Resource Laws</b>
<b>C.3.1.1</b>	<b>Environmental Laws</b>
	Community Environmental Response Facilitation Act
	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986
	Conservation Programs on Military Reservations
	Conservation and Rehabilitation Program on Military and Public Lands
	Energy Independence and Security Act 2007
	Federal Insecticide, Fungicide, and Rodenticide Act
	National Environmental Policy Act (NEPA) of 1969
	Noise Control Act
	Oil Pollution Prevention Act of 1990
	Resource Conservation and Recovery Act of 1976 as amended by the Hazardous and Solid Waste Amendments of 1984
	Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960, as amended
	Sikes Act as Amended by Public Law 108-136, the National Defense Authorization Act of 2004
	Youth Conservation Corps Act
<b>C.3.1.2</b>	<b>Air Resource Laws</b>
	Clean Air Act, as amended
<b>C.3.1.3</b>	<b>Water Resource Laws</b>
	Clean Water Act (Federal Water Pollution Control Act) of 1972 as amended
	Clean Water Act: Section 401 Water Quality Certification
	Clean Water Act: Section 404 Permits for Dredged or Fill Material and the Rivers and Harbors Act of 1899
	Federal Water Pollution Control Act Amendments
	Safe Drinking Water Act
<b>C.3.1.4</b>	<b>Soil Resource Laws</b>
	Soil Conservation Act, 16 U.S.C. 3B
<b>C.3.1.5</b>	<b>Terrestrial and Aquatic Habitat Laws</b>
	Emergency Wetlands Resources Act of 1986
	Federal Flood Disaster Prevention Act
	Land and Water Conservation Act of 1965
	Legacy Resources Protection Program Act
	North American Wetlands Conservation Act
	Watershed Protection and Flood Prevention Act
<b>C.3.1.6</b>	<b>Wildlife Population Laws</b>
	Animal Damage Control Act
	Fish and Wildlife Conservation Act of 1980
	Fish and Wildlife Coordination Act of 1934
	Magnuson Stevens Fishery Conservation and Management Act, as amended
	Migratory Bird Treaty Act of 1918, as amended
	Migratory Bird Treaty Act as amended by the National Defense Authorization Act of 2003
<b>C.3.1.7</b>	<b>Species of Concern Laws</b>
	Bald and Golden Eagle Protection Act
	Endangered Species Act of 1973, as amended
	Plant Protection Act of 2000
	Federal Noxious Weed Act of 1974
	Noxious Plant Control Act
<b>C.3.2</b>	<b>Agricultural Production Laws</b>
	Central Valley Project Improvement Act
	Outleasing for Grazing and Agriculture on Military Lands Act
	Farmland Protection Policy Act
<b>C.3.3</b>	<b>Federal Cultural Resource Laws</b>
	American Antiquities Act of 1906
	American Indian Religious Freedom Act of 1978
	Archaeological and Historic Preservation Act (Moss-Bennett Act) of 1974
	Archaeological Resources Protection Act of 1979
	Historic Sites Act of 1935
	National Historic Preservation Act of 1966
	Native American Graves Protection and Repatriation Act of 1990

<b>Section</b>	<b>Topic</b>
<b>C.3.4</b>	<b>Other Federal Laws</b>
	Americans with Disabilities Act of 1990
	Anti-Deficiency Act
	Data Quality Act
	Defense Appropriation Act
	Disabled Sportsman Access Act
	Emergency Planning and Community Right-to-Know Act
	Federal Facilities Compliance Act
	Military Construction and Authorization Act
	Military Construction Authorization Act - Leases; Non-excess property
	Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping
	National Trails System Act
	Outdoor Recreation-Federal/State Program Act
<b>C.4</b>	<b>Executive Orders</b>
<b>C.4.1</b>	<b>Executive Orders Relevant to Natural Resources</b>
<b>C.4.1.1</b>	<b>Environmental Executive Orders</b>
	Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423)
	Federal Leadership in Environmental, Energy, and Economic Performance (EO 13514)
<b>C.4.1.2</b>	<b>Terrestrial and Aquatic Executive Orders</b>
	Floodplain Management (EO 11988)
	Off-Road Vehicles on Public Lands (EO 11989)
	Protection of Wetlands (EO 11990)
<b>C.4.1.3</b>	<b>Wildlife Population Executive Orders</b>
	Migratory Birds (EO 13186)
<b>C.4.1.4</b>	<b>Species of Concern Executive Orders</b>
	Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342)
	Invasive Species (EO 13112)
<b>C.4.1.5</b>	<b>Cultural Resources Executive Orders</b>
	Indian Sacred Sites (EO 13007)
	Protection and Enhancement of the Cultural Environment (EO 11593)
<b>C.5</b>	<b>Federal Regulations, Directives, and Instructions</b>
<b>C.5.1</b>	<b>Federal Regulations</b>
	10 Code of Federal Regulations (CFR) 436. Federal Energy Management and Planning Programs
	18 CFR 1312. Archaeological Resource Protection Act Regulations
	29 CFR 1910. Occupational Safety and Health Standards
	29 CFR 1910.1200. Hazard Communication Standard
	29 CFR 1910.120. Hazardous Waste and Emergency Response
	32 CFR 172. DoD Regulations for the Disposition of Proceeds from Sales of Surplus Property
	32 CFR 188. Environmental Effects in the U.S. of Department of Defense (DoD) Actions
	32 CFR 190. Natural Resources Management Program
	32 CFR 229. Protection of Archaeological Resources: Uniform Regulations
	32 CFR 650. Environmental Effects Abroad of Major Federal Actions - Environmental Protection and Enhancement: Subpart H, Historic Preservation
	32 CFR 775. U.S. Navy Procedures for Implementing the National Environmental Policy Act (NEPA)
	33 CFR 156. U.S. Coast Guard (USCG) Regulations for Universal Waste Management Standards
	33 CFR 320-330. Regulatory Programs of the Corps of Engineers
	33 CFR 330. Dredge and Fill Nationwide Permit Program
	36 CFR 60. National Register of Historic Places
	36 CFR 63. Determination of Eligibility for Inclusion in the National Register of Historic Places
	36 CFR 65. National Historic Landmarks Program
	36 CFR 67. Historic Preservation Certificates
	36 CFR 68. The Secretary of Interior's Standards for Historic Preservation Projects
	36 CFR 78. Waiver of Federal Agency Responsibility under Section 110 of the National Historic Preservation Act
	36 CFR 79. Curation of Federally Owned and Administered Archaeological Collections
	36 CFR 800. National Historic Preservation Act Regulations for the Protection of Historic Properties
	40 CFR 6. EPA Regulations on Implementation of NEPA Procedures
	40 CFR 7. Archaeological Resources Protection Act of 1979: Uniform Regulations
	40 CFR 50. U.S. Environmental Protection Agency (EPA) Regulations on National Primary and Secondary Ambient Air Quality Standards
	40 CFR 51-52. EPA Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans
	40 CFR 53. EPA Regulations for Ambient Air Monitoring Reference and Equivalent Methods

Section	Topic
	40 CFR 56. EPA Regulations on Regional Consistency under the Clean Air Act
	40 CFR 58. EPA Ambient Air Quality Surveillance Regulations
	40 CFR 60. EPA Regulations on New Source Performance Standards
	40 CFR 61. National Emissions Standards for Hazardous Air Pollutants
	40 CFR 62. EPA Regulations on State Plans for Designated Facilities and Pollutants
	40 CFR 65. EPA Regulations on Delayed Compliance Orders under the Clean Air Act
	40 CFR 66. EPA Regulations for Assessment and Collection of Noncompliance Penalties
	40 CFR 68. Chemical Accident Prevention Provisions
	40 CFR 69. EPA Special Exemptions from Requirements of the Clean Air Act
	40 CFR 70. State Operating Permit Programs
	40 CFR 80. Regulation of Fuels and Fuel Additives
	40 CFR 81. EPA Regulations Designating Areas for Air Quality Planning
	40 CFR 82. EPA Stratospheric Ozone Protection Regulations
	40 CFR 86. Control of Air Pollution from New and In-Use Motor Vehicle Engines: Certification and Test Procedures
	40 CFR 87. EPA Regulations on Control of Air Pollution and Aircraft and Aircraft Engines
	40 CFR 104. EPA Regulations on Public Hearings on Effluent Standards for Toxic Pollutants
	40 CFR 109. EPA Regulations on Criteria for State, Local, and Regional Oil Removal Contingency Plans
	40 CFR 110. EPA Regulations on Discharge of Oil
	40 CFR 112. EPA Regulations on Oil Pollution Prevention
	40 CFR 113. EPA Regulations on Liability for Small Onshore Oil Storage Facilities
	40 CFR 116-117. EPA Regulations on Hazardous Substances
	40 CFR 122. EPA National Pollutant Discharge Elimination System Permit Regulations
	40 CFR 125. EPA Regulations on Criteria and Standards for the National Pollutant Discharge Elimination System
	40 CFR 129. EPA Toxic Pollutant Effluent Standard
	40 CFR 130. EPA Requirements for Water Quality Planning and Management
	40 CFR 131. EPA Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California
	40 CFR 141-143. EPA National Drinking Water Regulations
	40 CFR 148. EPA Regulations on Hazardous Waste Disposal Restrictions for Class I Wells
	40 CFR 150-186. EPA Regulations for Pesticide Programs
	40 CFR 162. EPA Regulations on Insecticide, Fungicide, and Rodenticide Use
	40 CFR 230. Guidelines for Specification of Disposal Sites for Dredged or Fill Material
	40 CFR 231. EPA Regulations on Disposal Site Determination under the Clean Water Act
	40 CFR 240-241. EPA Guidelines for Thermal Processing of Solid Wastes and for the Land Disposal of Solid Wastes
	40 CFR 243. EPA Guidelines for Solid Waste Storage and Collection
	40 CFR 244. EPA Guidelines for Solid Waste Management of Beverage Containers
	40 CFR 245. EPA Guidelines for Resource Recovery Facilities
	40 CFR 246. EPA Guidelines for Source Separation for Materials Recovery
	40 CFR 247. EPA Guidelines for Procurement of Products that Contain Recycled Materials
	40 CFR 248. EPA Guidelines for Federal Procurement of Building Insulation Products Containing Recovered Materials
	40 CFR 249. EPA Guidelines for Federal Procurement of Cement and Concrete Containing Fly Ash
	40 CFR 250. EPA Guidelines for Federal Procurement of Paper and Paper Products Containing Recovered Materials
	40 CFR 252. EPA Guidelines for Federal Procurement of Lubricating Oils Containing Re-refined Oil
	40 CFR 253. EPA Guidelines for Federal Procurement of Retread Tires
	40 CFR 255. EPA Guidelines for Identification of Regions and Agencies for Solid Waste Management
	40 CFR 257. EPA Regulations on Criteria for Classification of Solid Waste Disposal Facilities and Practices
	40 CFR 259. EPA Medical Waste Regulations
	40 CFR 260-270. EPA Regulations Implementing the Resource Conservation and Recovery Act
	40 CFR 262. EPA Regulations for Hazardous Waste Generators
	40 CFR 264. EPA Regulations for Owners and Operators of Permitted Hazardous Waste Facilities
	40 CFR 268. EPA Regulations on Land Disposal Restrictions
	40 CFR 273. EPA Regulations for Universal Waste Management Standards
	40 CFR 279. Used Oil Management Standards
	40 CFR 280. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
	40 CFR 300. National Oil and Hazardous Substance Pollution
	40 CFR 300.600. National Oil and Hazardous Substances Pollution Contingency Plan, Designation of Federal Trustees
	40 CFR 300.615. Responsibilities of Trustees
	40 CFR 302. EPA Designation, Reportable Quantities, and Notification Requirements for Hazardous Substances under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
	40 CFR 355. EPA Regulations for Emergency Planning and Notification under the CERCLA



<b>Section</b>	<b>Topic</b>
	40 CFR 370. EPA Hazardous Chemical Reporting and Community Right-to-Know Requirements
	40 CFR 372. EPA Toxic Chemical Release Reporting Regulations
	40 CFR 373. EPA Regulations for Real Property Transactions under the CERCLA
	40 CFR 403. General Pretreatment Regulations for Existing and New Sources of Pollution
	40 CFR 413. EPA Effluent Guidelines and Standards for Electroplating
	40 CFR 414. EPA Effluent Guidelines and Standards for Organic Chemicals
	40 CFR 415. EPA Guidelines and Standards for Inorganic Chemicals
	40 CFR 417. EPA Effluent Guidelines and Standards for Soaps and Detergents
	40 CFR 433. EPA Effluent Guidelines and Standards for Metal Finishing
	40 CFR 504. State Sludge Management Programs Regulations
	40 CFR 760-761. EPA Regulations for Controlling Polychlorinated Biphenyls
	40 CFR 1500-1508. Council On Environmental Quality Regulations on Implementing NEPA Procedures
	41 CFR 41-47. Disposal Regulations
	43 CFR 3. Preservation of American Antiquities
	43 CFR 7. Archaeological Resources Protection Act of 1979; Uniform Regulations
	43 CFR 10. Native American Graves Protection and Repatriation Act Regulations
	43 CFR 11. U.S. Department of the Interior Regulations on Natural Resource Damage Assessments
	49 CFR 100-199. Department of Transportation Hazardous Materials Regulations
	49 CFR 126. Pesticide Transportation
	49 CFR 194. Oil Pollution Prevention Regulations for Onshore Pipelines
	50 CFR 10. General Provision and Statutes Administered by the USFWS
	50 CFR 10.13 List of Migratory Birds
	50 CFR 17.11 and 17.12. USFWS List of Endangered and Threatened Wildlife
	50 CFR 402. Interagency Cooperation - ESA of 1973 as amended
<b>C.5.2</b>	<b>Federal Register Documentation</b>
	74 FR 59443. Federal List of Endangered and Threatened Wildlife
<b>C.5.3</b>	<b>Department of the Interior Fish and Wildlife Service Memoranda</b>
	USFWS Memorandum to Regional Directors, Regions 1-8, Delegation of INRMP Concurrence Authority (12 June 2009)
<b>C.5.4</b>	<b>Department of Defense Instructions, Directives, and Memorandums</b>
	DoDI 4150.07. (29 May 2008) DoD Pest Management Program
	DoDI 4700.4. (24 January 1989) Natural Resources Management Program
	DoDI 4715.03. (18 March 2011) Natural Resources Conservation Program
	DoDI 4715.4. (18 June 1996) Pollution Prevention
	DoDI 4715.9. (03 May 1996) Environmental Planning and Analysis
	DoDI 4715.16. (18 September 2008) Cultural Resources Management
	DoDI 6055.6. (10 October 2000) DoD Fire and Emergency Services Program
	DoDI 5000.13. (13 December 1976) Natural Resources: The Secretary of Defense Natural Resources Conservation Award
	DoD Directive (DoDD) 4001.1.(04 September 1986) Installation Management
	DoDD 4140.1. (04 January 1993) Material Management Policy
	DoDD 4150.7. (22 April 1996) DoD Pest Management Programs
	DoDD 4165.57. (08 November 1977) Air Installation Compatible Use Zones
	DoDD 4165.60. (27 July 1989) Hazardous Material Pollution
	DoDD 4165.60. (04 October 1976) Solid Waste Management - Collection, Disposal, Resource Recovery, and Recycling Program
	DoDD 4165.61. (09 August 1993) Intergovernmental Coordination of DoD Federal Development Programs and Activities
	DoDD 4700.1. Natural Resources Conservation and Management
	DoDD 4700.2. (15 July 1988) Secretary of Defense Award for Natural Resources and Environmental Management
	DoDD 4700.4. (24 January 1989) Natural Resources Management Program
	DoDD 4705.1. (09 July 1992) Management of Land-based Water Resources in Support of Joint Contingency Operations
	DoDD 4710.1 (21 June 1984) Archaeological and Historic Resources Management
	DoDD 4715.DD-R (April 1996) Draft Integrated Natural Resources Management in DoD
	DoDD 4715.1. (24 February 1996) Environmental Security
	DoDD 4715.2. (03 May 1996) DoD Regional Environmental Coordination
	DoDD 4715.4. (18 June 1996) Pollution Prevention
	DoDD 4715.5. (22 April 1996) Management of Environmental Compliance at Overseas Installations
	DoDD 4715.6. (24 April 1996) Environmental Compliance
	DoDD 4715.7. (22 April 96) Environmental Restoration Program
	DoDD 4715.8. (02 February 1998) Environmental Education Training and Career Development
	DoDD 4715.9. (03 May 1996) Environmental Planning and Analysis
	DoDD 4715.10. (24 April 1996) Environmental Education Training and Career Development
	DoDD 4715.11. (24 April 2007) Environmental and Explosive Safety Management on Operational Ranges within the United States

<b>Section</b>	<b>Topic</b>
	DoDD 4715.12. (19 August 1999) Environmental and Explosive Safety Management on DoD Active and Inactive Ranges Outside the United States
	DoDD 5030.41. (01 June 1977) Oil and Hazardous Substances Pollution Prevention and Contingency Program
	DoDD 6050.1. (30 July 1979) Environmental Effects in the US of DoD Actions
	DoDD 6050.2. (19 April 1979) Use of Off-Road Vehicles on DoD Lands
	DoDD 6050.5. (29 October 1990) DoD Hazard Communication Program
	DoDD 6050.7. (31 March 1979) Environmental Effects Abroad of Major DoD Actions
	DoDD 6050.8. (27 February 1986) Storage and Disposal of Non-DoD Owned Hazardous or Toxic Materials on DoD Installations
	DoDD 6050.10 (20 September 1991) DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installations
	DoDD 6050.15 (14 June 1985) Prevention of Oil Pollution from Ships Owned or Operated by DoD
	DoDD 6050.16. (20 September 1991) DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installations
	DoDD 7000.14-R (18 March 1993) DoD Financial Management Regulations
	Deputy Under Secretary of Defense (Installations and Environment) Memorandum. Implementation of Sikes Act Improvement Act: Updated Guidance with Attachment. 10 October 2002.
	Assistant Deputy Undersecretary of Defense for Environment, Safety and Occupational Health Policy Memorandum. Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning INRMP Reviews. 01 November 2004.
	Office of the Under Secretary of Defense Memorandum. Implementation of Ecosystem Management in the Department of Defense. 08 August 1994
	Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands. 17 May 2005
	Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Integrated Natural Resource Management Plan Template. 14 August 2006
	Memorandum of Understanding Among The U.S. Department of Defense and USFWS and The International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resources Management Program on Military Installations. 29 July 2013
	Memorandum of Understanding to Promote the Conservation of Migratory Birds between the USFWS and the DoD in Accordance with EO 13186. Prepared by the Under Secretary of Defense for Acquisition, Technology, and Logistics in April 2007
<b>C.5.5</b>	<b>Department of the Navy Manuals, Instructions, and Guidance</b>
	Commander, Navy Region Southwest Instruction 11000.1, Assignment of Special Areas, 25 July 2013.
	Secretary of the Navy Instruction (SECNAVINST) 4000.35. (17 August 1992) (NOTAL) Department of the Navy Cultural Resources Program
	SECNAVINST 5090.8 (18 December 2000) (Deputy Assistant Secretary of the Navy (Installations & Environment)) Policy for Environmental Protection, Natural Resources, and Cultural Resources Program
	SECNAVINST 6240.6E. (18 December 2000) Implementation of DoD Directives under DoDI 4700.4
	SECNAVINST 6401-1A. (16 August 1994) Veterinary Health Services
	Naval Operations Instruction (OPNAVINST) 5090.1C CH-1 dtd 18 July 2011 Environmental Readiness Program Manual
	OPNAVINST 5090.1C CH-24 (6I) dtd 18 July 2011 Bird/Animal Aircraft Strike Hazard Program
	OPNAVINST 5750.13. (10 November 1975) Historical Properties of the Navy
	OPNAVINST 6250.4C. (11 April 2012) Pest Management Programs
	OPNAVINST 8000.16. Environmental Security Management
	OPNAVINST 8026.2A (15 June 2000) Navy Munitions Disposition Policy
	OPNAVINST 11000.17. (17 September 1999) National Preservation Act Consultations Related to Base Realignment and Closure Actions
	OPNAVINST 11010.20F. (07 June 1996) Facilities Projects Manual
	NAVFAC P-73. (May 87) Real Estate Procedural Manual, Volumes I and II; and Natural Resources Management Procedural Manual, Chapter 2 - Integrated Natural Resources Management Plans
	NAVFACINST 6250.3H. Applied Biology Program Services and Training
	NAVFACINST 11010.45. (30 June 2002) Comprehensive Regional Planning Instruction (Land Use Module/Regional Shore Infrastructure Plan Links)
	NAVFACINST 11012.111A. Land Use Conservation Planning
	NAVFACINST MO-100.4. Guidance on Special Interest Areas
	Office of the Assistant Secretary (Installations and Environment) Memorandum for Commander Navy Installations Command (N45), Director Environmental Readiness Division (N45), Director Facilities and Services Division (CMC-LFL). Department of the Navy Natural Resources Program Metrics. 22 August 2006
	Chief of Naval Operations (N45) Integrated Natural Resources Management Program Guidance. 10 April 2006 (5090 N456K/6U838101)

Section	Topic
	Chief of Naval Operations (N45) Policy Letter Preventing Feral Cat and Dog Populations on Navy Property 10 January 2002 (5090 Ser N456M/1U595820)
	Chief of Naval Operations (N45) Navy Environmental Management System Policy 06 December 2001 (5090 Ser N451G/1U595831)
<b>C.6</b>	<b>California State Laws</b>
<b>C.6.1</b>	<b>Water Resource Laws</b>
	California Water Code
	Porter-Cologne Water Quality Control Act
<b>C.6.2</b>	<b>Species of Concern Laws</b>
	California Endangered Species Act
<b>C.7</b>	<b>State Regulations</b>
	California Central Valley Regional Water Quality Control Board Long-term Irrigated Lands Regulatory Program
<b>C.8</b>	<b>Local Government</b>

## C.3 Federal Laws

### C.3.1 Federal Natural Resource Laws

#### C.3.1.1 Environmental Laws

##### Community Environmental Response Facilitation Act

The Community Environmental Response Facilitation Act (42 U.S. Code [USC] § 9601 note, 9620) amends Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 120 (h) to allow expedition of reuse and redevelopment of federal facilities being closed. It was expanded to include federal agency requirements pertaining to the disposal of real property.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, PL 96-510 (26 USC §§ 9601-9675) as amended by the Superfund Amendments and Reauthorization Act of 1986, PL 99-499 (100 Stat. 1613)

The CERCLA of 1980 (43 USC §§ 9601 et seq.), commonly known as Superfund, was enacted by Congress on 11 December 1980 (U.S. Environmental Protection Agency [EPA] 2010d). This Act establishes programs for the cleanup of hazardous waste disposal and spill sites to ensure protection of human health and the environment. The Act designates the President as trustee for federally protected or managed natural resources. This law also created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, \$1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites (EPA 2010d). The CERCLA:

- Established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- Provided for liability of persons responsible for releases of hazardous waste at these sites; and
- Established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response; and

- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List.

The CERCLA also enabled the revision of the National Contingency Plan (NCP). The CERCLA provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The CERCLA also established the National Priorities List (EPA 2010d).

The CERCLA was amended by the Superfund Amendments and Reauthorization Act on 17 October 1986 (EPA 2010d).

### **Conservation Programs on Military Reservations**

The Conservation Programs on Military Reservations (PL 90-465; 16 USC §§ 670 et seq.) amends Public Law (PL) 86-797 to include outdoor recreation programs on military lands.

### **Conservation and Rehabilitation Program on Military and Public Lands**

The Conservation and Rehabilitation Program on Military and Public Lands (PL 93-452; 16 USC §§ 670 et seq.) amends PL 86-797 by providing for fish and wildlife habitat improvements, range rehabilitation, and control of off-road vehicles on federal lands.

### **Energy Independence and Security Act 2007**

The Energy Independence and Security Act (EISA) of 2007 established energy management goals and requirements while also amending portions of the National Energy Conservation Policy Act. Signed on 19 December 2007, the EISA aims to: move the United States toward greater energy independence and security; increase the production of clean renewable fuels; protect consumers; increase the efficiency of products, buildings, and vehicles; promote research on and deploy greenhouse gas capture and storage options; improve the energy performance of the federal government; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy.

The EISA reinforces the energy reduction goals for federal agencies put forth in EO 13423, as well as introduces more aggressive requirements. The three key provisions enacted are the Corporate Average Fuel Economy Standards, the Renewable Fuel Standard, and the appliance/lighting efficiency standards. The EISA mandates the implementation of Low Impact Development for construction projects greater than 5,000 square feet.

### **Federal Insecticide, Fungicide, and Rodenticide Act, PL 92-516, as amended (7 USC §§ 136-136y)**

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the use and application of pesticides in natural resources management programs. When the FIFRA was first passed in 1947, it established procedures for registering pesticides with the U.S. Department of Agriculture and established labeling provisions (EPA 2010a). The law was still primarily concerned with the efficacy of pesticides and did not regulate pesticide use.

The FIFRA was essentially rewritten in 1972 when it was amended by the Federal Environmental Pesticide Control Act (EPA 2010a). The law has been amended numerous times since 1972, including some significant amendments in the form of the Food Quality Protection Act of 1996. In its current form,

FIFRA mandates that EPA regulate the use and sale of pesticides to protect human health and preserve the environment (EPA 2010a).

Since the Federal Environmental Pesticide Control Act amendments, EPA is specifically authorized to: (1) strengthen the registration process by shifting the burden of proof to the chemical manufacturer, (2) enforce compliance against banned and unregistered products, and (3) promulgate the regulatory framework missing from the original law (EPA 2010a).

FIFRA provides EPA with the authority to oversee the sale and use of pesticides. However, because FIFRA does not fully preempt state/tribal or local law, each state/tribe and local government may also regulate pesticide use (EPA 2010a).

### **National Environmental Policy Act of 1969, PL 91-190 (42 USC 4321-4370d)**

The National Environmental Policy Act (NEPA) (PL 91-190; 42 USC §§ 4321 et seq.) was signed on 01 January 1970, and became the basic national policy for protection of the environment. Its passage was driven by the broadly felt sentiment that federal agencies should lead the nation in environmental protection. It established a systematic, interdisciplinary framework for agencies to prevent environmental damage, and contains action-forcing procedures to ensure that environmental factors are taken into account on major decisions, and to document those decisions. There are four stated purposes of NEPA (42 USC § 4321):

- Declare a national policy which will encourage productive and enjoyable harmony between people and the environment.
- Promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate health and welfare.
- Enrich the understanding of the ecological system and natural resources important to the nation.
- Establish a Council on Environmental Quality (CEQ).

Activities directly undertaken by, financed by, or requiring approval of federal agencies are subject to NEPA environmental review processes, with certain specified exceptions. The NEPA is implemented by CEQ regulations (40 Code of Federal Regulations [CFR] § 1500-1508). The most important function of agency compliance with NEPA procedure is to fully disclose and consider environmental information in decision making and to inform the public of potential impacts and alternatives. However, if adverse environmental effects of a proposed action are identified and disclosed to the public, the agency may decide that other factors outweigh environmental impacts and continue with the action.

NEPA has three decisional mechanisms. A proposed federal agency action is first reviewed to see if it can qualify for a categorical exclusion (usually small, routine projects with no potential significant environmental effect; categories are identified in agency NEPA policies) or other exemption to the process. If not, then an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is prepared. If an EA is prepared and it concludes that adverse environmental impacts will be insignificant, then the agency can file a Finding of No Significant Impact, followed by implementing its preferred alternative. If the proposed project has the potential to “significantly affect the quality of the human environment,” then the EIS process must be followed. Briefly, these steps are: Notice of Intent, scoping process, Draft EIS, Agency/Public Review and Comment, Final EIS, Record of Decision, and Agency Action.

Project mitigation is usually used as a means to address adverse environmental impacts through the federal NEPA process. However, NEPA establishes no mitigation requirement for adverse environmental impacts. “A

solution to an environmental problem” is a simple definition of a mitigation measure (Bass and Herson 1993). To be adequate and effective, mitigation measures should fit in one of five categories defined by the CEQ as:

1. Avoiding the impact by not taking a certain action or parts of an action.
2. Minimizing the impact by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time, by preservation and maintenance during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

An EIS must identify all relevant, reasonable mitigation measures that could lessen impacts to the human environment. However, a federal agency does not have to adopt mitigation measures included in an EIS unless agency-specific NEPA procedures require adoption of mitigation measures or the agency commits to implementing mitigation measures in the Record of Decision.

For Navy projects DoD has issued policies and procedures, including a supplement providing policy and assigning responsibilities adopted by Navy (32 CFR § 775). These Navy procedures meet the NEPA requirement that every federal agency adopt procedures to supplement CEQ regulations. Following the Navy directive, specific policy for compliance with procedural requirements was issued under OPNAVINST 5090.1C CH-1. This document tasks each Naval installation with ensuring that Navy actions are in accordance with NEPA.

NEPA compliance for INRMPs is specifically addressed by the Chief of Naval Operations (CNO) guidance (CNO Letter 5090 Ser N456F/8U589129 of 30 November 1998). The guidance is intended to be consistent with a Secretary of the Navy memorandum (12 August 1998), which stated:

“All projects essential to fulfill the selected alternative (mix of management objectives) must be implemented within a time-frame indicated in the INRMP. Any deviation or change from achieving the selected alternative may require supplementation to the EA or EIS and an opportunity for public comment. An installation may add or modify projects for achieving the selected alternative without additional review under NEPA if the projects are consistent with the existing NEPA analysis.”

The CNO letter provided the following guidelines:

- The EA for an INRMP should be a separate document, but a case-by-case decision may be made.
- The INRMP and NEPA process should occur concurrently, and an integrated schedule was suggested in which the EA is expected to be 75% complete when the INRMP is ready for public comment, and 90% complete when letters of concurrence are requested from stakeholders.
- A Finding of No Significant Impact is required before an INRMP may be signed.

Table C-2 lists the actions that under normal conditions are categorically excluded from further documentation requirements under NEPA.

*Table C-2. List of categorical exclusions from further documentation requirements under the National Environmental Policy Act per OPNAVINST 5090.1C CH-1.*

<b>Categorical Exclusion</b>
a. Routine personnel, fiscal, and administrative activities involving military and civilian personnel (i.e. recruiting, processing, paying, and records keeping).
b. Reductions in force, wherein impacts are limited to socioeconomic factors.
c. Routine movement of mobile assets, such as ships and aircraft, in home port reassignments (when no new support facilities are required) to perform as operational groups, and/or for repair and overhaul.
d. Relocation of personnel into existing federally owned or commercially leased space that does not involve a substantial change in the supporting infrastructure (an increase in vehicular traffic beyond the capacity of the supporting road network. To accommodate such an increase is an example of substantial change).
e. Studies, data, and information gathering that involve no physical change to the environment (i.e. topographic surveys, bird counts, wetland mapping, forest inventories, and timber cruising).
f. Routine repair and maintenance of facilities and equipment to maintain existing operations and activities, including maintenance of improved and semi-improved grounds such as landscaping, lawn care, and minor erosion control measures.
g. Alteration and additions of existing structures to conform to or provide conforming use specifically required by new or existing applicable legislation or regulations (i.e. hush houses for aircraft engines and scrubbers for air emissions).
h. Routine actions normally conducted to operate, protect, and maintain military-owned and/or controlled properties (i.e. maintaining law and order; physical plant protection by military police and security personnel; and localized pest management activities on improved and semi-improved lands conducted under applicable federal and state directives).
i. New construction that is consistent with existing land use and, when completed, the use or operation of which complies with existing regulatory requirements (i.e. a building on a parking lot with associated discharges/runoff that are within existing handling capacities; a bus stop along a roadway; and a foundation pad for portable buildings within a building complex).
j. Procurement activities that provide goods and support for routine operations.
k. Day-to-day personnel resource management and research activities under approved plans and inter-agency agreements and designed to improve and/or upgrade military ability to manage those resources.
l. Decisions to close facilities, decommission equipment, and/or temporarily discontinue use of facilities or equipment (where such equipment is not used to prevent/control environmental impacts). (Note: Does not apply to permanent closure of public roads or to base closures.)
m. Contracts for activities conducted at established laboratories and plants, to include contractor-operated laboratories and plants, within facilities where all airborne emissions, waterborne effluent, external radiation levels, outdoor noise, and solid and bulk waste disposal practices comply with existing applicable federal, state, and local laws and regulations.
n. Routine movement, handling and distribution of materials, including hazardous materials and wastes that when moved, handled, or distributed are under applicable regulations.
o. Demolition, disposal, or improvements involving buildings or structures neither on nor eligible for listing on the National Register of Historic Places and when under applicable regulations (i.e. removal of asbestos, polychlorinated biphenyls, and other hazardous materials).
p. Acquisition, installation, and operation of utility and communication systems, data processing cable and similar electronic equipment, which use existing rights of way, easements, distribution systems, and/or facilities.
q. Renewals and/or initial real estate ingrats and outgrants involving existing facilities and land wherein use does not change significantly. This includes, but is not limited to, existing or federally-owned or privately-owned housing, office, storage, warehouse, laboratory, and other special purpose space.
r. Grants of license, easement, or similar arrangements for the use of existing rights-of-way or incidental easements complementing the use of existing rights-of-way for use by vehicles (not to include significant increase in vehicle loading); electrical, telephone, and other transmission and communication lines; water, wastewater, stormwater, and irrigation pipelines, pumping stations, and facilities, and for similar utility and transportation uses.
s. Transfer of real property from the military to another military department or to another federal agency, and the granting of leases (including leases granted under the agricultural out leasing program where soil conservation plans are incorporated), permits and easements where there is no substantial change in land use or where subsequent land use would otherwise be categorically excluded.
t. Disposal of excess easement interests to the underlying fee owner.
u. Renewals and minor amendments of existing real estate grants for use of government-owned real property with no anticipated significant change in land use.
v. Pre-lease exploration activities for oil, gas or geothermal reserves (e.g. geophysical surveys).
w. Return of public domain lands to the Department of the Interior.
x. Land withdrawal continuances or extensions, that merely establish times, and where there is no significant change in land use.
y. Temporary closure of public access to military property to protect human or animal life.
z. Engineering effort undertaken to define the elements of a proposal or alternatives sufficiently to assess the environmental effects.
aa. Actions, which require the concurrence or approval of another federal agency, where the action is a categorical exclusion of the other federal agency.
bb. Maintenance dredging and debris disposal requiring no new depths, securing of applicable permits, and disposal at an approved disposal site.
cc. Installation of devices to protect human or animal life (i.e. raptor electrocution prevention devices, fencing to restrict wildlife movement onto airfields, and fencing and grating to prevent accidental entry to hazardous areas).
dd. Natural resources management actions undertaken or permitted under agreement with or subject to regulation by federal, state, or local organizations having management responsibility and authority over the natural resources in question, including hunting or fishing during hunting or fishing seasons established by state authorities under their state fish and game management laws. Concerning natural resources regulated by another federal agency, the responsible command may cooperate in any environmental analysis that may be required by the other agency's regulations.
ee. Approval of recreational activities that do not involve significant physical alteration of the environment or increase human disturbance in sensitive natural habitats and that do not occur in or next to areas inhabited by endangered or threatened species.
ff. Routine maintenance of timber stands, including issuance of down-wood firewood permits, hazardous tree removal, and sanitation salvage.
gg. Reintroduction of endemic or native species (other than endangered or threatened species) into their historical habitat when no substantial site preparation is involved.

## **Noise Control Act**

The Noise Control Act of 1972 (42 USC § 4901 et seq.) (as amended by the Quiet Communities Act) authorizes establishment of federal noise emission standards for products distributed in commerce and coordinates federal research efforts in noise control.

## **Oil Pollution Prevention Act of 1990, PL 101-380 (33 USC 2701 et seq.)**

The Oil Pollution Prevention Act established new requirements and extensively amended the Federal Water Pollution Control Act (33 USC §§ 2701 et seq.) to provide enhanced capabilities for oil spill response and natural resource damage assessment by the USFWS. The act provides that the National Contingency Plan include planning, rescue, and minimization of damage to fish and wildlife in responding to oil pollution. It requires USFWS consultation on developing a fish and wildlife response plan for the National Contingency Plan, input to Area Contingency Plans, review of Facility and Tank Vessel Contingency Plans, and conducting damage assessments associated with oil spills. One aspect of particular interest to the USFWS involves the identification of ecologically sensitive areas and the preparation of scientific monitoring and evaluation plans. Research conducted by the USFWS is to be directed and coordinated by the National Wetland Research Center (USFWS 2010b).

## **Resource Conservation and Recovery Act of 1976, PL 94-580 (42 USC §§ 6901-6992k) as amended by the Hazardous and Solid Waste Amendments of 1984, PL 98-616**

The Resource Conservation and Recovery Act (RCRA) (42 USC §§ 692 et seq.) gives the EPA the authority to control hazardous waste from the cradle-to-grave and establishes a comprehensive program, which manages solid and hazardous waste (EPA 2010c). This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. Subtitle C, Hazardous Waste Management, sets up a framework for managing hazardous waste from its initial generation to its final disposal. Waste pesticides and equipment/containers contaminated by pesticides are included under hazardous waste management requirements.

The RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances (EPA 2010c).

The federal Hazardous and Solid Waste Amendments are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program (EPA 2010c).

## **Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960, PL 86-797 as amended by Sikes Act Improvement Act of 1997, PL 93-452, and all subsequent amendments (16 USC §§ 670-670f)**

Under the Fish and Wildlife Conservation and Military Reservations Act of 1960, commonly known as the Sikes Act (PL 86-797) as amended by the Sikes Act Improvement Act of 1997 (PL 105-85, codified as 16 USC § 670 - 670f [1999]), and all subsequent amendments, the Secretary of Defense shall carry out a program for conserving and rehabilitating natural resources on military installations. To facilitate the program, the Secretary of each military department shall prepare and implement an INRMP for each



military installation in the U.S. under the jurisdiction of the Secretary. These plans must be consistent with the use of military installations to ensure the preparedness of the Armed Forces.

The secretaries of the military departments shall carry out the program to provide for the following:

- Conservation and rehabilitation of natural resources on military installations;
- Sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and non-consumptive uses, subject to safety requirements and military security; and
- Public access to military installations to use natural resources.

The Sikes Act (as amended) requires Navy facilities to manage their natural resources so as to provide multiple uses and public access, to the extent that the military mission is not jeopardized. The act provides a mechanism whereby DoD and U.S. Department of the Interior and the states cooperate to manage fish and wildlife on military installations.

Personnel charged with natural resources management are to be professionally trained in their fields of responsibility. Section 101 of the Sikes Act (as amended) authorizes planning programs for developing, maintaining, and coordinating natural resources programs on each military reservation. In compliance with 16 USC § 670a(b), to the extent appropriate and applicable, the INRMP provides for the following:

- Fish and wildlife management, land management, forest management, and fish and wildlife-oriented recreation;
- Fish and wildlife habitat enhancement or modifications;
- Wetlands protection and enhancement where necessary for support of fish, wildlife, and plants;
- Integration of and consistency among the various activities conducted under the Plan;
- Establishment of specific natural resources management goals and objectives and time-frames for proposed actions;
- Sustainable public use of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;
- Public access to NRTF Dixon that is necessary and appropriate for the use described above, subject to the requirements necessary to ensure public safety and military security;
- Enforcement of applicable natural resources laws and regulations;
- No net loss in the capability of NRTF Dixon to support the military mission; and
- Such other activities as the Secretary of the Navy determines appropriate.

### **Sikes Act as Amended by Public Law 108-136, The National Defense Authorization Act of 2004**

The National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2004 changed the ESA regarding INRMPs, which were justified on the basis of the need to promote military readiness while protecting listed species. Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Interior or the Secretary of Commerce, as appropriate, is precluded from designating Critical Habitat on any areas owned, controlled, or designated for use by DoD where an INRMP has been developed that, as determined by the Interior or Commerce Secretary, provides a benefit to the species for which Critical Habitat designation is proposed.

## **Youth Conservation Corps Act**

The Youth Conservation Corps Act of 1972, as amended (PL 93-408 as amended; 16 USC § 1701) expands and makes permanent a Youth Conservation Corps program and establishes objectives for youth employment and conservation work on public lands.

### **C.3.1.2 Air Resource Laws**

#### **Clean Air Act, as amended (42 USC §§ 7401 et seq.)**

The Clean Air Act as amended regulates air emissions from area, stationary, and mobile sources. This law authorizes the EPA to establish National Ambient Air Quality Standards to protect public health and the environment.

The legal authority for federal programs regarding air pollution control is based on the 1990 Clean Air Act Amendments. The 1990 Clean Air Act Amendments substantially increased the authority and responsibility of the federal government (EPA 2010b). New regulatory programs were authorized for control of acid deposition (acid rain) and for the issuance of stationary source operating permits. The National Emission Standards for Hazardous Air Pollutants were incorporated into a greatly expanded program for controlling toxic air pollutants. The provisions for attainment and maintenance of National Ambient Air Quality Standards were substantially modified and expanded. Other revisions included provisions regarding stratospheric ozone protection, increased enforcement authority, and expanded research programs (EPA 2010b). These are the latest in a series of amendments made to the Clean Air Act. This legislation modified and extended federal legal authority provided by the earlier Clean Air Acts of 1963 and 1970 (EPA 2010b).

### **C.3.1.3 Water Resource Laws**

#### **Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387)**

The objective of the Clean Water Act (CWA) (PL 92-500, as amended; 33 USC §§ 1251 et seq.) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (Section 101a). The CWA has three major approaches to water pollution control:

- Construction grants for reducing municipal discharges;
- National Pollutant Discharge Elimination System (NPDES) permits for control of point source (stormwater and waste water) discharges; and
- Water quality management planning for nonpoint source control from diffuse natural origins such as sediment.

In 1972, Congress adopted a “zero-discharge” goal and a focus on “preventable causes of pollution” to emphasize the source of contamination rather than controls at the outfall or water body itself. Water quality standards include a legal designation of the desired use for a given body of water and the water quality criteria appropriate for that use. The criteria are specific levels of water quality which are expected to make a water body suitable for its desired use. Effluent limitations are restrictions on quantities, rates, and concentrations in wastewater discharges measured at the discharger's outfall pipe (Goldfarb 1984).

Administration of the act is delegated to the State Water Resources Control Board (SWRCB) in California. The Regional Water Quality Control Board is responsible for setting water quality standards and criteria for water bodies in its regional plan and for issuing and enforcing NPDES permits.

**Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387): Section 401 Water Quality Certification, 1986, (33 USC 1341)**

Section 401 requires state certification of federal permits that result in actions that discharge into navigable waters. Under Section 401, states have authority to review federal permits that may result in a discharge to wetlands or water bodies under state jurisdiction.

**Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387): Section 404 Permits for Dredged or Fill Material, 1977 (33 USC 1344) and the Rivers and Harbors Act of 1899 (33 USC 401 et seq.)**

One of the laws most commonly affecting federal projects and properties is Section 404 of the federal CWA, passed in 1972 and jointly administered by the U.S. Army Corps of Engineers (USACE) and EPA. This section of the law regulates the discharge of dredged or fill material into the waters of the United States, which also includes jurisdictional wetlands. Discharges are any material that results in a change in the bottom elevation of a water body or wetland, including grading, road fills, stream crossings, building pads, and flood and erosion control on stream banks. Vernal pools are considered non-tidal waters that are isolated wetlands under Section 404.

The USACE is responsible for developing regulations for the Section 404 permit process and issuing permits, with the EPA maintaining power to veto the USACE's decisions.

Comments are provided to the USACE on specific projects by the USFWS because of requirements of the Fish and Wildlife Coordination Act. If the USACE supports these comments, then proposals for project mitigation can become conditions of the permit, even though USFWS do not have direct regulatory authority under the CWA. Their mitigation concerns may become measures added to permits to ensure marine habitat protection and restoration as a means to protect fish and wildlife populations.

There are 26 more or less generic nationwide permits that preauthorize certain minor discharges as long as they meet certain conditions (e.g. construction of outfall structures, backfill or bedding for utility lines, fill for bank stabilization, and minor road crossings). The nationwide permit system is currently being modified. If a discharge would cause the loss of or substantially modify one to 10 acres of water, including adjacent wetlands, then the nationwide permit may not apply. Work cannot begin until USACE notifies the Navy that the nationwide permit applies.

The individual permit process is much more complex and time-consuming. It requires consultation, an EA prepared by USACE, Public Interest Review and a 404(b)(1) Evaluation. If significant impacts are found, then an EIS must be prepared. These regulations apply to vernal pools. Customarily, the L.A. District Engineer requires an individual permit and an EA for fills in any vernal pool, regardless of the presence or absence of endangered species. The USACE is attempting to formalize requirements particular to vernal pools. A Memorandum of Agreement between USACE and EPA dated 07 February 1990 states that all potential impacts must first be shown to have been avoided, minimized and then compensated for. Compensation is considered a last resort only, which involves the creation of a habitat to replace a similar habitat unavoidably

eliminated at a project site. The concerned agencies must be completely convinced that the proposed compensation will completely mitigate the lost habitat. Any activity in a wetland will require at least an EA.

Penalties: A Class I or civil penalty may not exceed \$10,000 per violation, with the maximum amount of \$25,000. Class II civil penalty may not exceed \$10,000 per day as each violation continues, with the maximum amount not to exceed \$125,000.

### **Federal Water Pollution Control Act Amendments**

The Federal Water Pollution Control Act Amendments of 1972 (see CWA; PL 92-500; 33 USC §§ 1251 et seq.) sets up a federal permit and license system to carry out certain pollution discharge activities in navigable waters. Section 314 of this act established the Clean Lakes Program. The purpose of the Clean Lakes Program is to develop a national program to clean up publicly owned freshwater lakes. In order to receive a grant for in-lake restoration under this program, all point sources of pollution must be treated or have treatment planned under Section 201 and 402 of the CWA.

### **Safe Drinking Water Act**

The Safe Drinking Water Act (42 USC §§ 300[f] et seq.) prescribes treatment and distribution control strategies for abating contamination of drinking water and also requires the establishment of a permit program to regulate injection of liquids into underground strata.

The Safe Drinking Water Act provides for direct control of underground injection of fluids that may affect groundwater supplies. States may assume the predominant role in executing groundwater protection programs. The EPA has direct responsibility only if a state chooses not to participate in an underground injection control program.

#### **C.3.1.4 Soil Resource Laws**

##### **Soil Conservation Act (16 USC §§ 590a et seq.)**

The Soil Conservation Act (PL 74-46; 16 USC § 590A) provides for application of soil conservation practices on federal lands. The act requires federal agencies to control and prevent soil erosion and preserve natural resources in managing federal lands.

#### **C.3.1.5 Terrestrial and Aquatic Habitat Laws**

##### **Emergency Wetlands Resources Act of 1986, PL 99-645, as amended (16 USC 3901-3932)**

This act, PL 99-645 (100 Stat. 3582), approved 10 November 1986, authorized the purchase of wetlands from Land and Water Conservation Fund monies, removing a prior prohibition on such acquisitions (USFWS 2010c). It required the Secretary to establish a National Wetlands Priority Conservation Plan, required the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transferred to the Migratory Bird Conservation Fund amounts equal to the import duties on arms and ammunition (USFWS 2010b).

It extended the Wetlands Loan Act authorization through 1988 and forgave the previous advances under the act (USFWS 2010c). It also required the Secretary to report to Congress on wetlands loss, including an analysis of the role of federal programs and policies in inducing such losses. In addition, it directed the Secretary, through the Service, to continue the National Wetlands Inventory; to complete by 30

September 1998, mapping of the contiguous U.S.; to produce, as soon as practicable, maps of Alaska and other non-contiguous portions of the United States; and to produce, by 30 September 1990, and at ten-year intervals thereafter, reports to update and improve in the September 1982 “Status and Trends of Wetlands and Deepwater Habitat in the Conterminous United States, 1950s to 1970s” (USFWS 2010c).

### **Federal Flood Disaster Prevention Act (42 USC 4001)**

The Federal Flood Disaster Prevention Act (PL 93-234; 42 USC §§ 4001 et seq.) established the Federal Flood Insurance Program, which has provided some incentives for construction outside flood-prone areas. To a limited degree, this has reduced destruction of riparian vegetation by developments. President Carter issued two executive orders in a related effort: EO 11988 (Floodplain Protection), directed federal agencies to avoid construction in flood-hazard areas and to seek restoration and preservation of the natural and beneficial values of floodplains; EO 11990 (Protection of Wetlands) directed federal agencies to minimize the destruction, loss, or degradation of wetlands.

### **Land and Water Conservation Act of 1965 (16 USC 4601 et seq.)**

The Land and Water Conservation Act assists in preserving, developing, and assuring accessibility to outdoor recreation resources.

### **Legacy Resource Protection Program Act, PL 101-511**

The Legacy Resource Protection Program Act established a program for the stewardship of biological, geophysical, cultural, and historic resources on DoD lands.

### **North American Wetlands Conservation Act, PL 101-233 (16 USC 4401-4414)**

The North American Wetlands Conservation Act (103 Stat. 1968; 16 USC 4401-4412) - PL 101-233, enacted 13 December 1989, provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on Wetlands between Canada, U.S. and Mexico (USFWS 2010d).

The Act converts the Pittman-Robertson account into a trust fund, with the interest available without appropriation through the year 2006 to carry out the programs authorized by the act, along with an authorization for annual appropriation of \$15 million plus an amount equal to the fines and forfeitures collected under the Migratory Bird Treaty Act (MBTA) (USFWS 2010d).

Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment not to exceed 50 percent of the United States' share of the cost of wetlands conservation projects in Canada, Mexico, or the U.S. (or 100 percent of the cost of projects on federal lands). At least 50 percent, and no more than 70 percent, of the funds received are to go to Canada and Mexico each year (USFWS 2010d).

A North American Wetlands Conservation Council is created to recommend projects to be funded under the Act to the Migratory Bird Conservation Commission (USFWS 2010d). The council is to be composed of the Director of the Service, the Secretary of the National Fish and Wildlife Foundation, a state fish and game agency director from each flyway, and three representatives of different non-profit organizations participating in projects under the plan or the act. The Chairman of the Council and one other member serve ex officio on the Commission for consideration of the Council's recommendations (USFWS 2010d).

The Commission must justify in writing to the Council, and annually to Congress, any decisions not to accept Council recommendations (USFWS 2010d).

Public Law 101-593, approved 16 November 1990 (104 Stat. 2962), provided that the Director is the federal official responsible for compliance with NEPA, with respect to Council actions, and that recommendation(s) from the Council to the Commission constitute agency action requiring the preparation of an EA or EIS. The Chairman of the Council is also required to take steps to ensure public notice of Council meetings (USFWS 2010d).

Public Law 103-375, 19 October 1994 (108 Stat. 3494), reauthorized the law through fiscal year 1998; and increased the authorization for appropriations to \$20 million per year for 1995 and 1996, and \$30 million per year through 1998. The amendment also acknowledged the role of Mexico in plan preparation and project selection and implementation, and recognized that projects carried out in Mexico could include cash contributions from non-U.S. sources (USFWS 2010d).

Public Law 105-312, 30 October 1998 (112 Stat. 2958), provides for a reauthorization of the law and extends funding authority at the current level of \$30 million per year through fiscal year 2003. An amendment to the law requires the Secretary of the Interior to reappoint Ducks Unlimited to fill one of the non-governmental organization seats on the North American Wetlands Council for a three-year term. It further requires the Secretary to publish a policy on how rotations will be handled in the future (USFWS 2010d).

### **Watershed Protection and Flood Prevention Act, PL 92-419 (16 USC 1001-1011, 33 USC 701)**

The Watershed Protection and Flood Prevention Act (PL 83-566), 04 August 1954, as amended, authorized the Natural Resources Conservation Service (NRCS) to cooperate with states and local agencies to carry out works of improvement for soil conservation and for other purposes including flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land (NRCS 2010).

The NRCS implements the Watershed Protection and Flood Prevention Act through three programs:

- Watershed Operations
- Watershed Protection and Flood Prevention Operations
- Watershed Rehabilitation

**Watershed Operations.** Watershed Operations is a voluntary program that provides assistance to sponsoring local organizations of authorized watershed projects, planned and approved under the authority of the Watershed Protection and Flood Prevention Act of 1954 (PL 83-566), and eleven designated watersheds authorized by the Flood Control Act of 1944 (PL 78-534) (NRCS 2010). The NRCS provides technical and financial assistance to states, local governments and Tribes (project sponsors) to implement authorized watershed project plans for the purpose of watershed protection; flood mitigation; water quality improvements; soil erosion reduction; rural, municipal and industrial water supply; irrigation water management; sediment control; fish and wildlife enhancement; and wetlands and wetland function creation and restoration (NRCS 2010).

**Watershed Protection and Flood Prevention Operations.** The Flood Control Act of 22 December 1944 authorized the Secretary of Agriculture to install watershed improvement measures to reduce flood,

sedimentation, and erosion damages; further the conservation, development, utilization, and disposal of water; and the conservation and proper utilization of land (NRCS 2010).

**Watershed Rehabilitation.** Local communities, with NRCS assistance, have constructed over 11,000 dams in 47 states since 1948 (NRCS 2010).

### **C.3.1.6 Wildlife Population Laws**

#### **Animal Damage Control Act (7 USC 426 §§ et seq.)**

The Animal Damage Control Act provides broad authority for investigation, demonstrations and control of mammalian predators, rodents, and birds.

#### **Fish and Wildlife Conservation Act of 1980, PL 96-366 (16 USC §§ 2901-2912)**

The Fish and Wildlife Conservation Act of 1980 (PL 96-366; 16 USC §§ 2901 et seq.) provides for conservation, protection, restoration, and propagation of certain species, including migratory birds threatened with extinction.

#### **Fish and Wildlife Coordination Act of 1934, PL 85-624, as amended (16 USC §§ 661-666c)**

The Fish and Wildlife Coordination Act (PL 85-624; 16 USC §§ 661 et seq.) is a law which mandates that wildlife conservation receive equal consideration and be coordinated with other features of water resource development. The intent is to prevent loss or damage of wildlife and provide for development and improvement of wildlife in conjunction with water development projects. Federal agencies proposing to impound, divert, or control surface waters are required to consult with the USFWS and CDFW, to include and give full consideration to the recommendations of these agencies, and to provide justifiable means and measures for benefiting wildlife in project plans. The USACE must coordinate permit applications with USFWS and CDFW. Like NEPA, implementation of this act is essentially procedural in that no particular outcome is mandated. The act authorizes project modification, land acquisition, and other measures necessary to protect wildlife.

#### **Migratory Bird Treaty Act of 1918, 40 Stat. 755, as amended (16 USC §§ 703-712)**

The MBTA (16 USC § 703 et seq.) of 1918 is a federal statute that implements four treaties with the U.S. and Canada, Mexico, Japan, and Russia on the conservation and protection of migratory birds. It uses federal permits as a tool to assist in the conservation of migratory birds to authorize otherwise prohibited activities for scientific, educational, cultural, and other purposes.

The number of bird species covered by the MBTA is extensive and is listed at 50 CFR § 10.13. Further, the regulatory definition of “migratory bird” is broad and includes any mutation or hybrid of an identified species and includes any part, egg, or nest of such bird (50 CFR § 10.12). A federal court in Washington, D.C., had ruled in 2002 that the MBTA covers all migratory birds, even if they are non-native species. The Migratory Bird Treaty Reform Act of 2004 amended the MBTA to clarify that only species that are native to the U.S. are protected under that act. It clarified, in statute, that the protections and programs outlined in the MBTA of 1916 and the congressionally approved regulations attached to the Act in 1918 apply only to native birds, not the increasing and increasingly problematic alien or exotic bird populations. As required by the Migratory Bird Treaty Reform Act, the USFWS has published a List of Bird Species to Which the

MBTA Does Not Apply which includes “all non-native, human-introduced bird species...” This list may be found in Volume 70, Number 49, Pages 12710-12716 of the Federal Register dated on 15 March 2005.

The MBTA, which is enforced by the USFWS, makes it unlawful “by any means or in any manner, to pursue, hunt, take, capture [or] kill” any migratory bird, or attempt such actions, except as permitted by regulation. The applicable regulations prohibit the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, except under a valid permit or as permitted by the implementing regulations (50 CFR § 21.11).

The USFWS migratory bird depredation permits (Title 50 CFR § 21.43) are required before any person may take, possess, or transport migratory birds, except for yellow-headed blackbirds, red-winged blackbirds, rusty blackbirds, Brewer's blackbirds, cowbirds, all grackles, crows, and magpies found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. When horned larks, golden-crowned, white-crowned and other crowned sparrows, and house finches are, under extraordinary conditions, seriously injurious to agriculture or other interests, the Commissioner of Agriculture may, without a permit, kill or cause to be killed, under his/her general supervision, such of the above migratory birds as may be necessary to safeguard any agricultural or horticultural crop. No permit is necessary merely to scare or herd depredating migratory birds other than threatened or endangered species or bald or golden eagles.

The USFWS has sole authority for coordinating and supervising all federal migratory bird management activities, including enforcement of statutes regulating the taking of protected species (game and nongame) by individuals and federal agencies. The MBTA provides the USFWS the opportunity to comment on projects potentially affecting bird species, and their habitats, that are not protected under the ESA. Violations of the MBTA can result in criminal and civil penalty. Therefore, if a project has the potential to affect nesting birds or nesting substrate (e.g. trimming nest trees) a qualified biologist from the Natural Resources Office must be contacted to determine if there will be any violations.

There have been recent developments regarding implementation of the MBTA and DoD. Following a U.S. District Court decision, which granted an injunction on live fire military training on behalf of a private party, Congress enacted the 2003 NDAA, which authorized an interim period during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities. During this interim period, Congress also directed the Secretary of Interior to, not later than one year after enactment of the NDAA, promulgate a regulation to deal with the incidental take of migratory birds in conjunction with military readiness activities from the take prohibition of the MBTA. Under the 2003 NDAA, the House Armed Services Committee authorized a set of initiatives intended to “restore a balance between protecting the environment and military readiness.” One of these initiatives, regarding the MBTA, stated:

“The Migratory Bird Treaty Act allows federal agencies to obtain permits to remove migratory birds for economic or safety reasons, such as clearing geese from a golf course or runway. However, a federal court ruled in March 2002 that Navy activities at a training range near Guam violated the MBTA because the court felt that the law does not allow for permits for the accidental taking of birds during military readiness activities. As a result, the court temporarily shut down military training at the facility. In order to ensure that DoD can operate all of its facilities without further interruptions of this nature, the conferees provided the DoD with authority under which the MBTA would not apply to the incidental taking of a migratory bird by DoD during an authorized military readiness activity. In addition, the conferees directed the



Secretary of the Interior, with the concurrence of DoD, to exercise its authority within one year to initiate regulations that would exempt DoD from the MBTA for incidental takings of migratory birds during authorized military readiness activities.”

### **DoD Migratory Bird Rule and Guidance**

The new Migratory Bird Rule relates to military readiness activities and was established in accordance with Section 315 of the NDAA for FY 2003. The final rule, “Migratory Bird Permits: Take of Migratory Birds by the Armed Forces,” was published as 50 CFR Part 21 in the 28 February 2007 FR (pg. 8931-8950). It authorizes the military to “take” migratory birds under the MBTA without a permit, but if the military determines that the activity will “significantly” affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize/mitigate the effects.

This is different from the USFWS-DoD Memoranda of Understanding (MOU) (FR 30 August 2006), which addresses the conservation of migratory birds on military lands in relation to all activities except readiness. Key to implementing the MBTA Rule and guidance documents on the MOU between the USFWS and DoD are the wording of the authorization for take that requires an understanding of the definition of the following terms:

*Population*, as used in Section 21.15, is a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.

*Significant adverse effect on a population*, used in Section 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is “biologically viable” when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem are not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

In April 2007, guidance was issued by the Office of the Undersecretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186 (17 January 2001). This guidance covers all activities on Navy property including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups.

The Guidance emphasizes interdisciplinary collaboration within the framework of North American Bird Conservation Initiative Bird Conservation Regions, collaborative inventory and long-term monitoring. Many questions remain about how to implement the Migratory Bird Rule and the new Guidance on the USFWS-DoD MOU. For example, how the evaluation of significance needs to be addressed in decision documents is still being worked out. Since the impact assessment must be conducted on populations of migratory birds, there may be a need to collect better population baseline data. Conservation measures undertaken under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces

must report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

### ***DoD Migratory Bird MOU and Executive Order 13186***

For DoD activities other than military readiness, migratory bird concerns are addressed through an MOU (July 2006) developed in accordance with EO 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds,” signed 10 January 2001 (66 FR 3853). The USFWS-DoD MOU (FR 30 August 2006) that evolved out of the requirements of the EO addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the DoD will conserve migratory birds and does not authorize any take. In April 2007, further guidance was issued by the Office of the Undersecretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186. This guidance covers all activities at NRTF Dixon, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The guidance emphasizes interdisciplinary collaboration within the framework of North American Bird Conservation Initiative Bird Conservation Regions, collaborative inventory and long-term monitoring. The EO directs executive departments to take certain actions regarding the protection of migratory birds.

A Council for the Conservation of Migratory Birds was established to help agencies implement the EO. The EO requires NEPA evaluations to include effects on migratory birds and that advance notice or annual reports must be made to the USFWS concerning actions that result in the taking of migratory birds. The EO also requires agencies to control the establishment of exotic species that may endanger migratory birds and their habitat. Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within administration budgetary limits, and in harmony with agency missions:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance the habitat of migratory birds, as practicable;
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- Design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;
- Within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance, ensure that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as Partners in Flight, U.S. National Shorebird Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Plan, and other planning efforts, as well as guidance from other sources, including the Food and Agricultural Organization's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;

- Ensure that environmental analyses of federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;
- Provide notice to USFWS in advance of conducting an action that is intended to take migratory birds, or annually report to USFWS on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control;
- Minimize the intentional take of species of concern by: (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. With respect to intentional take, the MOU shall be consistent with the appropriate sections of 50 CFR parts 10, 21, and 22;
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;
- Within the scope of its statutorily-designated authorities, control the import, export, and establishment in the wild of live exotic animals and plants that may be harmful to migratory bird resources;
- Promote research and information exchange related to the conservation of migratory bird resources, including coordinated inventorying and monitoring and the collection and assessment of information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with USFWS, the U.S. Geological Survey-Biological Resources Division, and other appropriate repositories of such data (e.g. the Cornell Laboratory of Ornithology);
- Provide training and information to appropriate employees on methods and means of avoiding or minimizing the take of migratory birds and conserving and restoring migratory bird habitat;
- Promote migratory bird conservation in international activities and with other countries and international partners, in consultation with the State Department, as appropriate or relevant to the agency's authorities;
- Recognize and promote economic and recreational values of birds, as appropriate; and
- Develop partnerships with non-federal entities to further bird conservation.

### **Migratory Bird Treaty Act as amended by the National Defense Authorization Act of 2003**

The NDAA for FY 2003 exempted the DoD from the MBTA for the incidental take of migratory birds as a result of otherwise authorized military readiness activities until the Secretary of Interior prescribes regulations authorizing such take. The DoD shall give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities. As indicated in the proposed rule, migratory bird conservation will be incorporated into INRMPS, where applicable, to mitigate where needed and to protect migratory birds and their habitats.

### **C.3.1.7 Species of Concern Laws**

#### **Bald and Golden Eagle Protection Act**

The Bald and Golden Eagle Protection Act (Bald and Golden Eagles Act; PL 95-616; 16 USC §§ 668 et seq.) of 1979 provides for protection of the bald eagle and the golden eagle by prohibiting taking, possession, and commerce in the birds.

#### **Endangered Species Act of 1973, PL 93-205, (16 USC 1531-1534)**

Once a species becomes federally listed as endangered or threatened, regulations to protect the species from illegal “take” become applicable to any project carried out or funded by federal departments such as DoD that may affect an individual animal or its habitat. A “take” is defined as to: “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect” a listed species, or attempt to do so. The USFWS was charged by Congress with overseeing ESA implementation for all species except most marine species, which are under jurisdiction of the NMFS.

Section 7(a)(1) of the ESA states that all federal agencies shall utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of the ESA. “Conservation” is defined in the ESA as “to use...all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [ESA] are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regular taking.”

Under Section 7(a)(2) of the ESA, federal project proponents must consult with USFWS or the National Marine Fisheries Service (NMFS) if one or more listed species may be affected by an action. Consultation with USFWS or NMFS may range from informal discussions to formal consultation requiring a Biological Assessment (BA) by the project proponent (Figure C-1). For nonfederal project applicants, the USACE takes the lead in this consultation if the issue is within their jurisdiction. Other federal agencies may appropriately be named as the action agency that must conduct the consultation. With the issuance of a Biological Opinion (BO), “terms and conditions” are stated, which are measures to avoid or minimize the take of any listed species. A BO must include: (1) a summary of the information on which the opinion was based (the information is to be provided by the federal agency), (2) a detailed discussion of the effects of the action on listed species or Critical Habitat, and (3) the USFWS opinion on whether the action is likely to jeopardize the continued existence of a listed species or adversely modify Critical Habitat.

The BO may include an incidental take statement that specifies: (1) the amount of “take” that is allowed, (2) reasonable and prudent measures that the USFWS considers necessary or appropriate to minimize such a “take”, and (3) the terms and conditions that must be complied with to implement the reasonable and prudent measures. When an “incidental take statement” is issued with the BO, the federal project proponent may be excused from incidentally taking a listed species as part of the agency’s otherwise lawful activity as long as the specified taking conditions are met. Section 10 of the ESA also provides for a similar incidental take permit for private, state, and local government projects. To qualify, the project proponent must submit a habitat conservation plan and also seek to minimize and mitigate the impacts of the taking to the “maximum extent practicable.”

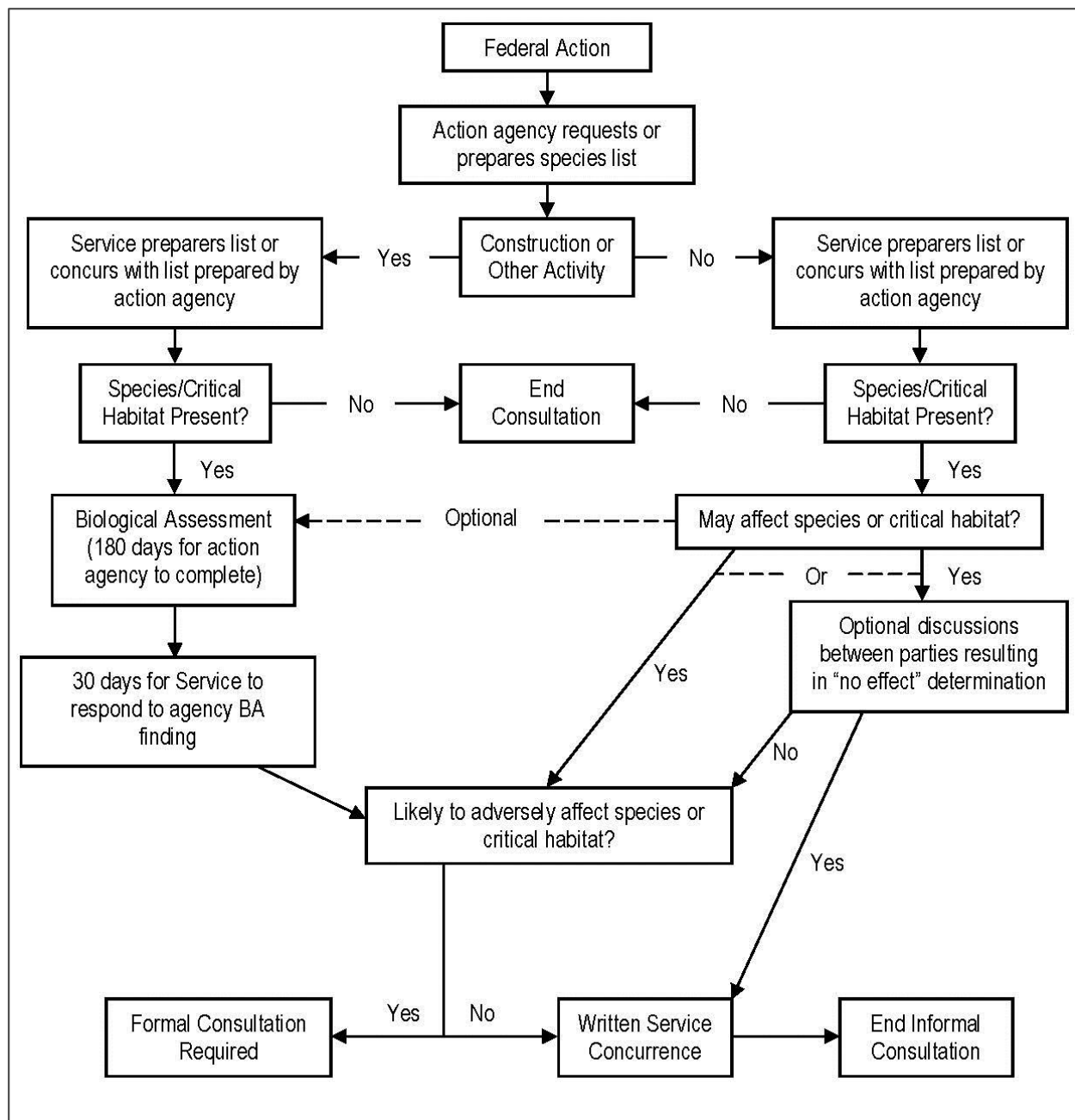


Figure C-1. Informal federal process for Endangered Species Act Consultation (USFWS and NMFS 1998).

Critical Habitat may be designated for a listed species, in which case such habitat may require special management consideration or protection. Section 318(a) of the NDAA for FY 2004 (PL 108-136) made changes to the ESA regarding INRMPs. These changes were justified on the basis of the need to promote military readiness while protecting listed species. Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Interior or the Secretary of Commerce, as appropriate, may be precluded from designating Critical Habitat on any areas owned, controlled, or designated for use by DoD where an INRMP has been implemented that, as determined by the Interior or Commerce Secretary, provides a benefit to the species for which Critical Habitat designation is proposed.

The Navy must take measures to ensure that no irreversible or irretrievable commitment of resources is authorized, funded or carried out by them that will likely jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify designated Critical Habitat, until the consultation process is complete. The Navy is to provide leadership in identifying and protecting habitat that is critical for any threatened or endangered species.

Navy installations are required to carry out the following:

1. Maintain liaison with local governmental agencies and organizations having an interest in endangered and threatened species protection.
2. Delineate boundaries of the habitat areas of endangered and threatened species on maps.
3. Initiate consultation with the USFWS or NMFS, per cooperative agreement procedures, when a proposed action or program has been identified that may affect listed species or their habitat.
4. Perform a BA for any action that may adversely affect the continued existence of endangered and threatened species or result in the destruction or adverse modification of habitat of such species (the BA should contain the final BO of the USFWS or NMFS following the consultation process).
5. Cooperate with the USFWS or NMFS during development and implementation of a recovery plan for listed species occurring on the installation.

This INRMP must undergo an internal Section 7 review by staff to determine if consultation is needed. In addition, the INRMP must clearly demonstrate a benefit to the species (Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns).

ESA Penalties: Civil penalty of up to \$25,000 per violation or criminal penalty of up to \$50,000 and/or one year in prison, knowing violation for a take or damage/destruction of Critical Habitat of an endangered animal.

### **Plant Protection Act of 2000, PL 106-224 (7 USC §§ 7701)**

The Plant Protection Act of 2000 (PL 106-224; 7 USC §§ 7701) consolidated related responsibilities that were previously spread over various legislative status, including the Plant Quarantine Act, the Federal Plant Pest Act, and the Federal Noxious Weed Act of 1974.

### **Federal Noxious Weed Act of 1974, PL 93-629, as amended (7 USC §§ 2801-2814)**

The Federal Noxious Weed Act of 1974 (PL 93-629; 7 USC §§ 2801) provides for the management of undesirable plants and their regulation in interstate and foreign commerce.

### **Noxious Plant Control Act (43 USC 1241)**

The Noxious Plant Control Act (PL 90-583; 43 USC § 1241) provides for the control of noxious plants on lands under control or jurisdiction of the federal government.

## **C.3.2 Agricultural Production Laws**

### **Central Valley Project Improvement Act, PL 102 [106 Stat 4706]**

The U.S. Department of the Interior built a water infrastructure system in the 1930s to store and distribute approximately 20 percent of California's water. Given the location of the system, this effort was termed

the Central Valley Project (CVP). Water from the CVP is delivered to regional water districts for distribution to end-users.

Operation of the CVP has been substantially altered by the Central Valley Project Improvement Act (CVPIA) of 1992 (PL 102-575). The CVPIA commits the Bureau of Reclamation to providing substantial amounts of water for environmental management with stipulations that this supply is assured through greater agriculture and urban use efficiencies. The CVPIA requires the protection, restoration, and enhancement of fish and wildlife and their habitats. The act also dedicates 800,000 acre-feet of project yield to fish and wildlife purposes, provides for anadromous fish restoration, and creates a restoration fund financed by water and power users. The overall goals of the CVPIA include restoring ecosystems, protecting the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, improving operational flexibility of the CVP, and achieving a reasonable balance among competing demands for use of CVP water.

The Secretary of the Interior was granted a number of authorities as tools to accomplish these goals. These tools include voluntary land retirement from irrigated production, water banking, conservation measures, water right transfers, and conjunctive uses. In short, implementation of the CVPIA is affecting the management of lands throughout the Central Valley.

### **Outleasing for Grazing and Agriculture on Military Lands Act (10 USC §§ 2667)**

The Outleasing for Grazing and Agriculture on Military Lands Act provides for the outleasing of public lands.

### **Farmland Protection Policy Act of 1981, PL 97-98, as amended (7 USC §§ 4201-4209)**

The Farmland Protection Policy Act of 1981, PL 97-98, as amended (7 USC §§ 4201 -4209) requires all federal agencies to consider the effect of programs on farmland. Federal agencies are required to develop criteria to evaluate the effect of federal programs on the conversion of agricultural lands to nonagricultural uses. Federal agencies must, to the extent practicable, consider alternatives or mitigation that lessen the impact on farmland conversion.

## **C.3.3 Federal Cultural Resource Laws**

### **American Antiquities Act of 1906, PL 59-209 (16 USC §§ 431-433)**

The American Antiquities Act provides for the protection of items of archaeological significance, both historic and prehistoric. The Antiquities Act of 1906 (PL 59-209; 16 USC §§ 431 et seq., 1982) authorizes the President to designate as National Monuments historic and natural resources of national significance located on federally owned or controlled lands. The act further provides for the protection of all historic and prehistoric ruins and objects of antiquity located on federal lands by providing criminal sanctions against excavation, injury, or destruction of such antiquities, without the permission of the Department having jurisdiction over such resources. The Secretaries of the Interior, Agriculture, and Defense are further authorized to issue permits for archaeological investigations, on lands under their control, to recognized educational and scientific institutions for the purposes of systematically and professionally gathering data of scientific value.

### **American Indian Religious Freedom Act of 1978, PL 95-341, as amended (42 USC §§ 1996-1996a)**

The American Indian Religious Freedom Act of 1978 (PL 95-341; 42 USC § 1996) directs consultations with traditional leaders, where appropriate, to ensure continuity in religious practices on federal lands. It requires the federal government to protect the right of American Indian, Eskimo, Aleut, and Native Hawaiian to exercise traditional religious practices.

### **Archaeological and Historic Preservation Act (Moss-Bennett Act) of 1974, PL 86-532 (16 USC §§ 469-469c)**

The Archaeological and Historic Preservation Act of 1974 (Moss-Bennett Act; 16 USC §§ 469 et seq.) provides for the protection of historic and archaeological sites threatened by federal or federally funded or assisted construction projects.

### **Archaeological Resources Protection Act of 1979, PL 96-95 (16 USC §§ 470aa-470mm)**

The Archaeological Resources Protection Act of 1979 (16 USC §§ 470 et seq., 1982) sets up penalties for destruction or removal of archaeological materials from federal land without the proper permits. Requirements for obtaining these permits are also established by this regulation.

### **Historic Sites Act of 1935, PL 292 (16 USC §§ 461-467)**

The Historic Sites Act of 1935 (PL 74-292; 16 USC §§ 461 et seq., 1982) establishes as national policy the preservation for public use of historic sites, buildings, and objects by giving the Secretary of the Interior the power to make historic surveys and to document, evaluate, acquire, and preserve archaeological and historic sites across the country. This Act led to the eventual establishment within the National Park Service of the Historic Sites Survey, the Historic American Building Survey, the Historic American Engineering Record, and the National Historic Landmarks Program.

### **National Historic Preservation Act of 1966, PL 89-665, as amended (16 USC §§ 470-470x-6)**

The National Historic Preservation Act (NHPA) of 1966 (PL 89-665; 16 USC §§ 470 et seq.) provides for the preservation of historic properties throughout the U.S. This Act expanded the National Register of Historic Places (NRHP) and created an Advisory Council on Historic Preservation. Section 106 of the Act requires that federal agencies allow the Council an opportunity to comment, when their undertakings may affect NRHP resources or resources eligible for listing in the NRHP. Section 110 requires federal agencies to identify, evaluate, inventory, and protect National Register resources or resources eligible for the NRHP on property they control. The NHPA imposes no absolute preservation requirement, as long as the Navy follows and documents mandated procedures for any Navy decision not to preserve.

### **Native American Graves Protection and Repatriation Act of 1990, PL 101-601 (25 USC §§ 3001-3013)**

The Native American Graves Protection and Repatriation Act of 1990 (PL101-601; 25 USC §§ 3001 et seq.) gives ownership and control of Native American human remains, funerary objects, sacred objects and objects of cultural patrimony that are excavated or discovered on federal land to federally recognized American Indian tribes or Native Hawaiian organizations. The law also establishes criminal penalties for



trafficking in human remains or cultural objects, and requires agencies and museums that receive federal funding to inventory those items in their possession, identify the descendants of and repatriate those items.

### **C.3.4 Other Federal Laws**

#### **Americans with Disabilities Act of 1990**

This Act prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation.

#### **Anti-Deficiency Act (31 USC 1341 et seq.)**

This act places limitations on expending and obligating amounts for an officer or employee of the U.S. Government, including expenditures related to natural resources management efforts.

#### **Data Quality Act**

Under the Data Quality Act, which took effect 01 October 2002, federal agencies must ensure that the information it uses and disseminates meets certain quality standards. The Data Quality Act requires federal agencies to issue guidelines ensuring the quality, utility, objectivity and integrity of information that they disseminate and provide mechanisms for affected persons to correct such information by petitioning and challenging the quality of information it has used or disseminated. Two questions that remain unanswered about the Data Quality Act are whether agency information quality guidelines apply to rule-making and whether an agency's denial of a petition to correct information is able to be reviewed by the courts.

#### **Defense Appropriations Act**

The Defense Appropriations Act of 1991 Legacy Program (10 USC § 2701) provides for the stewardship of biological, geophysical, cultural, and historic resources on DoD lands.

#### **Disabled Sportsman Access Act of 1998**

The Paralyzed Veterans of America spearheaded the passage of the Disabled Sportsmen's Access Act of 1998 (PL 105-261). This Act establishes a mechanism by which outdoor recreation programs on military installations will be accessible to disabled veterans, dependents with disabilities, and all others with disabilities. These outdoor recreational opportunities will allow access to nearly 30 million acres of military lands for such sports as fishing, hunting, trapping, wildlife viewing, boating, trapping, and camping.

#### **Emergency Planning and Community Right-to-Know Act**

The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 (42 USC § 11001 et seq.) is also known as Title III of the Superfund Amendments and Reauthorization Act. The EPCRA focuses on the hazards associated with toxic chemical releases. Most notably, specific sections of EPCRA require immediate notification of releases of oil and hazardous substances and CERCLA-defined hazardous substances to state and local emergency response planners. The EPCRA requires state and local coordination in planning response actions to chemical emergencies. The EPCRA requires certain industries to submit information on chemical inventories and fugitive emissions.

## **Federal Facilities Compliance Act**

The Federal Facilities Compliance Act (42 USC § 6961) of 1992 amends the RCRA. It subjects federal agencies to civil and administrative penalties for noncompliance with federal, state, interstate, or local solid and hazardous waste requirements (Subtitles C and D of RCRA).

## **Military Construction and Authorization Act**

The Military Construction Authorization Act of 1975 (10 USC § 2665) allows the proceeds from the sale of recyclable material be credited to the installation to cover specified costs.

## **Military Construction Authorization Act-Leases; Non-Excess Property**

The Military Construction Authorization Act - Leases; Non-excess property (10 USC § 2667) provides for the outleasing of public lands.

## **Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping**

The Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping (10 USC § 2671) requires that all hunting, fishing, and trapping on military installations follow the Fish and Game laws of the state in which it is located, and are issued appropriate state licenses for the activities.

## **National Trails Systems Act**

The National Trail Systems Act of 1968 (16 USC § 1271) promotes development of recreational, scenic, and historic trails for persons of diverse interests and abilities.

## **Outdoor Recreation-Federal/State Program Act**

The Outdoor Recreation-Federal/State Program Act (PL 88-29; 16 USC §§ 460[L] et seq.) provides for the management of lands used for outdoor recreation. It requires consultations with the National Park Service regarding management.

# **C.4 Executive Orders**

## **C.4.1 Executive Orders Relevant to Natural Resources**

### **C.4.1.1 Environmental Executive Orders**

#### **Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423)**

EO 13423 “Strengthening Federal Environmental, Energy, and Transportation Management” (24 January 2007) required each DoD component to adopt an Environmental Management System (EMS). An EMS is a formal management framework that provides a systematic way to review and improve operations, create awareness, and improve environmental performance. Systematic environmental management as an integral part of day-to-day decision making and long-term planning processes is an important step in supporting mission readiness and effective use of resources. The most significant resource for every organization is their senior leadership's commitment and visibility in EMS implementation and

sustainability. A robust EMS is essential to sustaining compliance, reducing pollution and minimizing risk to mission. The Navy's EMS has a concerted focus on preventing pollution, consistent regulatory compliance, and reducing environmental impacts, including environmental practice for energy and transportation functions, using the “plan-do-check-act” management model (OPNAVINST 5090.1C CH-1). It conforms to the International Organization for Standardization 14001:2004 EMS standard.

### **Federal Leadership in Environmental, Energy, and Economic Performance (EO 13514)**

EO 13514 “Federal Leadership in Environmental, Energy, and Economic Performance” was signed on 05 October 2009. It expanded upon the energy reduction and environmental performance requirements of EO 13423. This EO sets numerous federal energy requirements in several areas, including: Accountability and Transparency; Strategic Sustainability Performance Planning; Greenhouse Gas Management; Sustainable Buildings and Communities; Water Efficiency; Electronic Products and Services; Fleet and Transportation Management; Pollution Prevention and Waste Reduction.

EO 13514 requires that each federal agency conduct a self audit of pollution prevention practices, using an accepted EMS framework. Components of the approach include advancing the national policy that, whenever feasible and cost-effective, pollution should be prevented or reduced at the source. Funding for regulatory compliance programs shall emphasize pollution prevention as a means to address environmental compliance. Each agency must reduce its use of toxic chemicals and hazardous substances; reduce the toxic release inventory and off-site transfers of toxic chemicals for treatment and disposal; develop a plan to phase out the procurement of Class I ozone-depleting substances for all non-excepted uses; and promote the sustainable management of federal facility lands through the implementation of cost-effective, environmentally sound landscaping practices, and programs to reduce adverse impacts to the natural environment.

### **C.4.1.2 Terrestrial and Aquatic Executive Orders**

#### **Floodplain Management (EO 11988)**

This EO states that executive agencies will preserve the natural and beneficial values served by floodplains while managing federal lands. Activities in floodplains must be evaluated for their impacts during project planning, and alternative sites outside the floodplain must be considered. This order includes wetlands that are within the 100-year floodplain and especially discourages filling.

#### **Off-Road Vehicles on Public Lands (EO 11989)**

The Off-Road Vehicles on Public Lands EO (EO 11989) provides for closing areas to use where soil, wildlife, or other resources are adversely affected. Amends EO 11644 by exempting fire, military, emergency, law enforcement, or combat/combat support vehicles.

#### **Protection of Wetlands (EO 11990)**

EO 11990 “Protection of Wetlands” requires federal agencies to provide leadership and “take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands” when:

- Acquiring, managing, and relinquishing of federal lands and facilities;
- Providing federally undertaken, financed, or assisted construction and improvements; and

- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Since the issuance of this EO, the focus of national policy has shifted from minimizing destruction, loss, and degradation of wetlands to no net loss of wetlands in carrying out the above federal activities. When considering a proposal's effect on survival and quality of wetlands, one factor is the "maintenance of natural systems, including conservation and long term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber resources."

Section 4 of the EO requires that when federally owned lands are leased and easement is assigned, or when disposed of to a non-federal party, a reference is included in the conveyance to identify any wetlands and indicate those uses which are restricted in such areas.

### **C.4.1.3 Wildlife Population Executive Orders**

#### **Migratory Birds (EO 13186)**

The Migratory Birds EO (EO 13186), issued 10 January 2001, directs executive departments to take certain actions regarding the protection of migratory birds. Among these actions is the development and implementation of a MOU with the USFWS within two years of the EO on the protection and conservation of migratory birds. Refer to discussion of the MBTA, above.

### **C.4.1.4 Species of Concern Executive Orders**

#### **Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342)**

Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342) restricts the use of chemical toxicants for mammal and bird control.

#### **Invasive Species (EO 13112)**

EO 13112 defines an invasive species as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health" (National Invasive Species Council [NISC] 2008). The definition includes many types of invasive species such as animals, plants, and microorganisms. It focuses upon invasive species that are harmful, rather than focusing on non-native species, most of which are not harmful.

The Invasive Species EO established the National Invasive Species Council (NISC). Members of NISC include the Secretaries of Defense, State, Transportation, Homeland Security, Treasury, and Health and Human Services; the Administrators of EPA and the National Aeronautics and Space Administration; as well as the Director of the U.S. Agency for International Development and the U.S. Trade Representative.

Federal activities are now coordinated through NISC (established by the EO) and the Aquatic Nuisance Species (ANS) Task Force. The ANS Task Force was established by the Nonindigenous Aquatic Nuisance Prevention and Control Act (NAA) of 1990 and the NISA of 1996. The NAA established a federal framework that promotes and coordinates research to assist state governments. The NAA develops and applies prevention and control strategies, establishes national priorities, educates and informs citizens, and coordinates public programs. The act calls upon states to develop and implement comprehensive state management plans to prevent introduction and control the spread of aquatic nuisance species.

To help coordinate NISC and the ANS Task Force, the U.S. Department of Commerce Policy Liaison to NISC also serves as the Department of Commerce representative to the ANS Task Force. In addition, NISC and the ANS Task Force have formed joint working groups on each of the following topics: pathways, risk analysis and screening. The task force and the species council are similar in that they perform coordinating functions but differ in their responsibilities: NISC focuses on all invasive species while the ANS Task Force focuses on aquatic invasive species. Although many of the same principles apply to managing aquatic and terrestrial invasive species, many management issues are unique to the aquatic environment and need to be addressed separately.

The goal of the NISC is to provide coordination, planning, and leadership for federal invasive species programs that support state, tribal, local, and private entities. To meet this goal, in 2001, the National Invasive Species Monitoring Plan (NISMP) was developed. The 2008-2012 NISMP is the first revision of the 2001 Plan, as mandated by EO 13112. This 2008-2012 NISMP directs federal efforts (including overall strategy and objectives) to prevent, control, and minimize invasive species and their impacts within a five year period. If necessary, it may be updated more frequently to reflect changes in circumstances, agency plans, and priorities. The 2008-2012 NISMP focuses on five strategic goals (NISC 2008):

- Prevention - preventing introduction and establishment of invasive species
- Early Detection and Rapid Response - a crucial secondary line of defense
- Control and Management - containing and reducing the spread of invasive populations
- Restoration - restore high-value ecosystems across scales
- Organizational Collaboration - maximize collaboration efforts among federal, state, local, tribal, and private groups

To accomplish these strategic goals critical support for efforts such as research, data and information management, education and outreach, and cooperation are included in pertinent sections of the NISC 2008-2012 NISMP.

The DoD has been tasked to act as a participant in various performance elements that support each of the five strategic goals discussed in the NISC 2008-2012 NISMP. These strategic goals, objectives, implementation tasks, and performance elements are applicable to both terrestrial and aquatic invasive species. Within the context of the NRTF Dixon INRMP, the performance elements that task the DoD as a participant, and the implementation tasks and objectives that they support are identified in Section 3.9 Invasive Species Management and Section 4.5.2 Integrated Pest Management as management strategies to address invasive species generally. These management strategies to support invasive species efforts have been modified from the federal guidance to specifically address NRTF Dixon.

#### **C.4.1.5 Cultural Resources Executive Orders**

##### **Indian Sacred Sites (EO 13007)**

EO 13007 “Indian Sacred Sites” provides for the protection of and access to Indian sacred sites.

##### **Protection and Enhancement of the Cultural Environment (EO 11593)**

EO 11593 “Protection and Enhancement of the Cultural Environment” directs federal agencies to take a leadership role in preserving, restoring, and maintaining the historic and cultural environment of the nation. Federal agencies must locate, inventory, and nominate to the NRHP all historic resources under their

jurisdiction or control. Until these processes are completed, agency heads must exercise caution to ensure that potentially qualified federal property is not inadvertently transferred, sold, demolished, or substantially altered. When planning projects, agencies are urged to request the opinion of the Secretary of the Interior as to the eligibility for NRHP listing of properties whose resource value is questionable or has not been inventoried. Agencies are directed to institute procedures, in consultation with the President's Advisory Council on Historic Preservation, to ensure that federal plans and programs contribute to the preservation and enhancement of non-federally owned historic resources. Protection of NRHP historic and archaeological sources is achieved by NRTF Dixon through implementation of the Historical and Archaeological Resources Protection Plan (Navy 1996), which guides the identification and management of significant historic resources and Native American traditional cultural properties at NRTF Dixon.

## **C.5 Federal Regulations, Directives, and Instructions**

### **C.5.1 Federal Regulations**

**10 CFR 436.** Federal Emergency Management and Planning Programs.

**18 CFR 1312.** Archaeological Resource Protection Act Regulations.

**29 CFR 1910.** Occupational Safety and Health Standards.

**29 CFR 1910.1200.** Hazard Communication Standard.

**29 CFR 1910.120.** Hazardous Waste and Emergency Response.

**32 CFR 172.** Department of Defense Regulations for the Disposition of Proceeds from Sales of Surplus Property.

**32 CFR 188.** Environmental Effects in the U.S. of DoD Actions.

**32 CFR 190.** Natural Resources Management Program.

**32 CFR 229.** Protection of Archaeological Resources: Uniform Regulations.

**32 CFR 650.** Environmental Effects Abroad of Major Federal Actions-Environmental Protection and Enhancement: Subpart H, Historic Preservation.

**32 CFR 775.** Procedures for Implementing NEPA. Department of the Navy policy to supplement DoD regulations (32 CFR 214) by providing policy and assigning responsibilities to the Navy and Marine Corps for implementing CEQ regulations and implementing NEPA.

**33 CFR 156.** U.S. Coast Guard Regulations for Universal Waste Management Standards.

**33 CFR 320-330.** Regulatory Programs of the USACE.

**33 CFR 330.** Dredge and Fill Nationwide Permit Program.

**36 CFR 60.** NRHP.

**36 CFR 63.** Determination of Eligibility for Inclusion in the NRHP.

**36 CFR 65.** National Historic Landmarks Program.

**36 CFR 67.** Historic Preservation Certificates.

- 36 CFR 68.** The Secretary of Interior's Standards for Historic Preservation Projects.
- 36 CFR 78.** Waiver of Federal Agency Responsibility under Section 110 of the NHPA.
- 36 CFR 79.** Curation of Federally Owned and Administered Archaeological Collections.
- 36 CFR 800.** NHPA Regulations for the Protection of Historic Properties.
- 40 CFR 6.** EPA Regulations on Implementation of NEPA Procedures.
- 40 CFR 50.** EPA Regulations on National Primary and Secondary Ambient Air Quality Standards.
- 40 CFR 51-52.** EPA Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans.
- 40 CFR 53.** EPA Regulations for Ambient Air Monitoring Reference and Equivalent Methods.
- 40 CFR 56.** EPA Regulations on Regional Consistency under the Clean Air Act.
- 40 CFR 58.** EPA Ambient Air Quality Surveillance Regulations.
- 40 CFR 60.** EPA Regulations on New Source Performance Standards.
- 40 CFR 61.** National Emissions Standards for Hazardous Air Pollutants.
- 40 CFR 62.** EPA Regulations on State Plans for Designated Facilities and Pollutants.
- 40 CFR 65.** EPA Regulations on Delayed Compliance Orders under the Clean Air Act.
- 40 CFR 66.** EPA Regulations for Assessment and Collection of Noncompliance Penalties.
- 40 CFR 68.** Chemical Accident Prevention Provisions.
- 40 CFR 69.** EPA Special Exemptions from Requirements of the Clean Air Act.
- 40 CFR 70.** State Operating Permit Programs.
- 40 CFR 80.** Regulation of Fuels and Fuel Additives.
- 40 CFR 81.** EPA Regulations Designating Areas for Air Quality Planning.
- 40 CFR 82.** EPA Stratospheric Ozone Protection Regulations.
- 40 CFR 86.** Control of Air Pollution from New and In-Use Motor Vehicle Engines: Certification and Test Procedures.
- 40 CFR 87.** EPA Regulations on Control of Air Pollution and Aircraft and Aircraft Engines.
- 40 CFR 104.** EPA Regulations on Public Hearings on Effluent Standards for Toxic Pollutants.
- 40 CFR 109.** EPA Regulations on Criteria for State, Local, and Regional Oil Removal Contingency Plans.
- 40 CFR 110.** EPA Regulations on Discharge of Oil.
- 40 CFR 112.** EPA Regulations on Oil Pollution Prevention.
- 40 CFR 113.** EPA Regulations on Liability for Small Onshore Oil Storage Facilities.
- 40 CFR 116-117.** EPA Regulations on Hazardous Substances.
- 40 CFR 122.** EPA NPDES Permit Regulations.

- 40 CFR 125.** EPA Regulations on Criteria and Standards for the NPDES.
- 40 CFR 129.** EPA Toxic Pollutant Effluent Standard.
- 40 CFR 130.** EPA Requirements for Water Quality Planning and Management.
- 40 CFR 141-143.** EPA National Drinking Water Regulations.
- 40 CFR 148.** EPA Regulations on Hazardous Waste Disposal Restrictions for Class I Wells.
- 40 CFR 150-186.** EPA Regulations for Pesticide Programs.
- 40 CFR 162.** EPA Regulations on Insecticide, Fungicide, and Rodenticide Use.
- 40 CFR 230.** EPA Interim Regulations on Discharge of Dredged or Fill Material into Navigable Waters.
- 40 CFR 231.** EPA Regulations on Disposal Site Determination under the CWA.
- 40 CFR 240-241.** EPA Guidelines for Thermal Processing of Solid Wastes and for the Land Disposal of Solid Wastes.
- 40 CFR 243.** EPA Guidelines for Solid Waste Storage and Collection.
- 40 CFR 244.** EPA Guidelines for Solid Waste Management of Beverage Containers.
- 40 CFR 245.** EPA Guidelines for Resource Recovery Facilities.
- 40 CFR 246.** EPA Guidelines for Source Separation for Materials Recovery.
- 40 CFR 247.** EPA Guidelines for Procurement of Products that Contain Recycled Materials.
- 40 CFR 248.** EPA Guidelines for Federal Procurement of Building Insulation Products Containing Recovered Materials.
- 40 CFR 249.** EPA Guidelines for Federal Procurement of Cement and Concrete Containing Fly Ash.
- 40 CFR 250.** EPA Guidelines for Federal Procurement of Paper and Paper Products Containing Recovered Materials.
- 40 CFR 252.** EPA Guidelines for Federal Procurement of Lubricating Oils Containing Re-fined Oil.
- 40 CFR 253.** EPA Guidelines for Federal Procurement of Retread Tires.
- 40 CFR 255.** EPA Guidelines for Identification of Regions and Agencies for Solid Waste Management.
- 40 CFR 257.** EPA Regulations on Criteria for Classification of Solid Waste Disposal Facilities and Practices.
- 40 CFR 259.** EPA Medical Waste Regulations.
- 40 CFR 260-270.** EPA Regulations Implementing the RCRA.
- 40 CFR 262.** EPA Regulations for Hazardous Waste Generators.
- 40 CFR 264.** EPA Regulations for Owners and Operators of Permitted Hazardous Waste Facilities.
- 40 CFR 268.** EPA Regulations on Land Disposal Restrictions.
- 40 CFR 273.** EPA Regulations for Universal Waste Management Standards.
- 40 CFR 279.** Used Oil Management Standards.



- 40 CFR 280.** Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks.
- 40 CFR 300.** National Oil and Hazardous Substances Pollution.
- 40 CFR 300.600.** National Oil and Hazardous Substances Pollution Contingency Plan, Designation of Federal Trustees.
- 40 CFR 300.615.** Responsibilities of Trustees.
- 40 CFR 302.** EPA Designation, Reportable Quantities, and Notification Requirements for Hazardous Substances under CERCLA.
- 40 CFR 355.** EPA Regulations for Emergency Planning and Notification under CERCLA.
- 40 CFR 370.** EPA Hazardous Chemical Reporting and Community Right-to-Know Requirements.
- 40 CFR 372.** EPA Toxic Chemical Release Reporting Regulations.
- 40 CFR 373.** EPA Regulations for Real Property Transactions under CERCLA.
- 40 CFR 403.** General Pretreatment Regulations for Existing and New Sources of Pollution.
- 40 CFR 413.** EPA Effluent Guidelines and Standards for Electro-plating.
- 40 CFR 414.** EPA Effluent Guidelines and Standards for Organic Chemicals.
- 40 CFR 415.** EPA Guidelines and Standards for Inorganic Chemicals.
- 40 CFR 417.** EPA Effluent Guidelines and Standards for Soaps and Detergents.
- 40 CFR 433.** EPA Effluent Guidelines and Standards for Metal Finishing.
- 40 CFR 504.** State Sludge Management Programs and Regulations.
- 40 CFR 760-761.** EPA Regulations for Controlling Polychlorinated Biphenyls.
- 40 CFR 1500-1508.** CEQ Regulations on Implementing NEPA Procedures.
- 41 CFR 41-47.** Disposal Regulations.
- 43 CFR 3.** Preservation of American Antiquities.
- 43 CFR 7.** Archaeological Resources Protection Act of 1979; Uniform Regulations.
- 43 CFR 10.** Native American Graves Protection and Repatriation Act Regulations.
- 43 CFR 11.** Department of the Interior Regulations on Natural Resource Damage Assessments.
- 49 CFR 100-199.** Department of Transportation Hazardous Materials Regulations.
- 49 CFR 126.** Pesticide Transportation.
- 49 CFR 194.** Oil Pollution Prevention Regulations for Onshore Pipelines.
- 50 CFR 10.** General Provision and Statutes Administered by the USFWS.
- 50 CFR 10.13.** List of Migratory Birds.
- 50 CFR 17.11 and 17.12.** USFWS List of Endangered and Threatened Wildlife.

**50 CFR 402.** Interagency Cooperation - ESA of 1973 as amended.

## **C.5.2 Federal Register Documentation**

**74 FR 59443.** Federal List of Endangered and Threatened Wildlife.

## **C.5.3 Department of the Interior Fish and Wildlife Service Memoranda**

**U.S. Fish and Wildlife Service Memorandum to Regional Directors, Regions 1-8, Delegation of INRMP Concurrence Authority (12 June 2009).**

## **C.5.4 Department of Defense Instructions, Directives, and Memorandums**

**U.S. Department of Defense Instruction 4150.07. (29 May 2008) DoD Pest Management Program**

**U.S. Department of Defense Instruction 4700.4. (24 January 1989) Natural Resources Management Program**

**U.S. Department of Defense Instruction 4715.03. (18 Mar 2011) Natural Resources Conservation Program**

DoDI 4715.03 implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under military control. The instruction states that “all DoD natural resources conservation program activities shall work to guarantee DoD continued access to its land, air, and water resources for realistic military training and testing and to sustain the long-term ecological integrity of the resource base and the ecosystem services it provides, in accordance with section 670a-670o of title 16, United States Code (U.S.C.) (also known as and hereafter referred to as the “Sikes Act” (Reference (h))).”

DoDI 4715.03 also designates DoD executive agents to lead the military services in implementing key conservation issues, including preparing, maintaining, and monitoring INRMPs on all military installations. The instruction notes that conservation management is a dynamic process yet prescribes that a consistent conservation management approach include those systematic procedures that should be used by each DoD installation, as follows:

- Assess military mission;
- Prepare detailed inventory of resources;
- Analyze and assess risk to the resources;
- Prepare and implement management plans;
- Monitor and assess results;
- Conduct needs assessment survey;

- Reassess inventories;
- Reanalyze and reassess risk to resources; and
- Adjust program as necessary.

### **U.S Department of Defense Instruction 4715.4. (18 June 96) Pollution Prevention**

### **U.S Department of Defense Instruction 4715.9. (03 May 96) Environmental Planning and Analysis**

### **U.S. Department of Defense Instruction 4715.16. (18 September 08) Cultural Resources Management**

DoDI 4715.16 establishes DoD policy and assigns responsibilities under the authority of DoD Directive (DoDD) 5134.01, “Under Secretary of Defense for Acquisition, Technology, and Logistics” (09 December 2005), and in accordance with DoDD 4715.1E, “Environment, Safety, and Occupational Health” (19 March 2005), to comply with applicable federal statutory and regulatory requirements, EOs, and Presidential memorandums for the integrated management of cultural resources on DoD managed lands (DoD 2008b).

DoDI 4715.16 establishes DoD cultural resources management policy to (DoD 2008b):

- Manage and maintain cultural resources under DoD control in a sustainable manner through a comprehensive program that considers the preservation of historic, archaeological, architectural, and cultural values; is mission supporting; and results in sound and responsible stewardship.
- Be an international and national leader in the stewardship of cultural resources by promoting and interpreting the cultural resources it manages to inspire DoD personnel and to encourage and maintain U.S. public support for its military.
- Consult in good faith with internal and external stakeholders and promote partnerships to manage and maintain cultural resources by developing and fostering positive partnerships with federal, tribal, state, and local government agencies; professional and advocacy organizations; and the general public.

### **U.S Department of Defense Instruction 6055.6. (10 October 2000) DoD Fire and Emergency Services Program**

### **U.S Department of Defense Instruction 5000.13. (13 December 1976) Natural Resources: The Secretary of Defense Natural Resources Conservation Award.**

**DoDD 4001.1. (04 September 1986).** Installation Management.

**DoDD 4140.1 (04 January 1993).** Material Management Policy.

**DoDD 4150.7 (22 April 1996).** DoD Pest Management Program.

**DoDD 4165.57 (08 November 1977).** Air Installations Compatible Use Zones.

**DoDD 4165.60 (27 July 1989).** Hazardous Material Pollution.

**DoDD 4165.60 (04 October 1976).** Solid Waste Management - Collection, Disposal, Resource Recovery, and Recycling Program.

**DoDD 4165.61 (09 August 1993).** Intergovernmental Coordination of DoD Federal Development Programs and Activities.

**DoDD 4700.1 (06 November 1978).** Natural Resources Conservation and Management. Provides for management of renewable natural resources on military lands.

**DoDD 4700.2 (15 July 1988).** Secretary of Defense Award for Natural Resources and Environmental Management.

**DoDD 4700.4 (24 January 1989).** Natural Resources Management Program.

**DoDD 4705.1 (09 July 1992).** Management of Land-based Water Resources in Support of Joint Contingency Operations.

**DoDD 4710.1 (21 June 1984).** Archaeological and Historic Resources Management. Establishes policies, procedures, and assigns responsibilities for the management of archaeological and historic resources located in and on waters and lands under DoD control. This Directive implements these guidelines consistent with federal law, EOs, and other DoD directives that deal with archaeological and historic preservation issues.

**DoDD 4715.DD-R (April 1996).** Draft Integrated Natural Resources Management in DoD.

**DoDD 4715.1 (24 February 1996).** Environmental Security.

**DoDD 4715.2 (03 May 1996).** DoD Regional Environmental Coordination.

**DoDD 4715.03 (18 March 2011).** Natural Resources Conservation Program.

**DoDD 4715.4 (18 June 1996).** Pollution Prevention.

**DoDD 4715.5 (22 April 1996).** Management of Environmental Compliance at Overseas Installations.

**DoDD 4715.6 (24 April 1996).** Environmental Compliance.

**DoDD 4715.7 (22 April 1996).** Environmental Restoration Program.

**DoDD 4715.8 (02 February 1998).** Environmental Education Training and Career Development.

**DoDD 4715.9 (03 May 1996).** Environmental Planning and Analysis.

**DoDD 4715.10 (24 April 1996).** Environmental Education Training and Career Development.

**DoDD 4715.11 (17 August 1999).** Environmental and Explosive Safety Management on DoD Active and Inactive Ranges within the U.S.

**DoDD 4715.12 (19 August 1999).** Environmental and Explosive Safety Management on DoD Active and Inactive Ranges Outside the U.S.

**DoDD 5030.41 (01 June 1977).** Oil and Hazardous Substances Pollution Prevention and Contingency Program.

**DoDD 6050.1 (30 July 1979).** Environmental Effects in the U.S. of DoD Actions.

**DoDD 6050.2 (19 April 1979).** Use of Off-Road Vehicles on DoD Lands. Provides policy for use of off-road vehicles on DoD lands.

**DoDD 6050.5 (29 October 1990).** DoD Hazard Communication Program.

**DoDD 6050.7 (31 March 1979).** Environmental Effects Abroad of Major DoD Actions.

**DoDD 6050.8 (27 February 1986).** Storage and Disposal of Non-DoD Owned Hazardous or Toxic Materials on DoD Installations.

**DoDD 6050.10 (20 September 1991).** DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installations.

**DoDD 6050.15 (14 June 1985).** Prevention of Oil Pollution from Ships Owned or Operated by DoD.

**DoDD 6050.16 (20 September 1991).** DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installation.

**DoDD 7000.14-R (18 March 1993).** DoD Financial Management Regulations.

**Deputy Under Secretary of Defense (Installations and Environment) Memorandum (10 October 2002).** Implementation of the Sikes Act (as amended): Updated Guidance with Attachment. The Deputy Undersecretary of Defense (Installations & Environment) Memorandum, 10 October 2002, improved coordination external to DoD (USFWS, state agencies, and the public) and internal to DoD (military operators and trainers, cultural resources managers, pest managers). It also added new tracking procedures, called metrics, to ensure proper INRMP coordination occurred and that projects were implemented.

**Assistant Deputy Undersecretary of Defense for Environment, Safety and Occupational Health Policy (01 November 2004 Memorandum).** The Supplemental DoD INRMP Guidance (01 November 2004 Memorandum) further defined the scope of the annual and five-year review, public comment on INRMP reviews, and ESA consultation. A formal review must be performed by the parties at least every five years. Less formal annual reviews facilitate adaptive management, during which INRMP goals, objectives, and must fund projects are reviewed, and a realistic schedule established to undertake proposed actions. The outcome of this joint review should be documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should be jointly executed or in some other way reflect the parties' mutual agreement.

**Office of the Under Secretary of Defense Memorandum. Implementation of Ecosystem Management in the Department of Defense (08 August 1994).** The goal of this policy was to maintain and improve the sustainability and native biological diversity of terrestrial and aquatic, including marine, ecosystems while supporting human needs, including the DoD mission. The policy goes on to state that military installations will use ecosystem management to: (1) restore and maintain ecological associations that are of local and regional importance and compatible with existing geophysical components (e.g. soil, water); (2) restore and maintain biological diversity; (3) restore and maintain ecological processes, structures, and functions; (4) adapt to changing conditions; (5) manage for viable populations, and (6) maintain ecologically appropriate perspectives of time and space. It is the precursor to DoDI 4715.03.

**Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands (17 May 2005).** This Memorandum provides supplemental guidance for Implementing Sikes Act Improvement Amendments requirements consistently throughout the DoD. It adds implementing guidance dated 10 October 2002 and 01 November

2004 same subject. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission.

**Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Integrated Natural Resources Management Plan Template (14 August 2006).**

**Memorandum of Understanding Among the U.S. Department of Defense and the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations (29 July 2013).**

**Memorandum of Understanding to Promote the Conservation of Migratory Birds between the U.S. Fish and Wildlife Service and the U.S. Department of Defense in Accordance with Executive Order 13186. Prepared by the Under Secretary of Defense for Acquisition, Technology, and Logistics in April 2007.**

## **C.5.5 Department of the Navy Manuals, Instructions, and Guidance**

**Commander, Navy Region Southwest Instruction 11000.1 (25 July 2013).** Assignment of Special Areas. Assigns NRTF Dixon as a Special Area to Navy Region Southwest.

**SECNAVINST 4000.35A (09 April 2001) (NOTAL).** Department of the Navy Cultural Resources Program.

**SECNAVINST 5090.8 (18 December 2000) (Deputy Assistant Secretary of the Navy (Installations & Environment)).** Policy for Environmental Protection, Natural Resources, and Cultural Resources Program.

**SECNAVINST 6240.6E (18 December 2000).** Implementation of DoD directives under DoDI 4700.4.

**SECNAVINST 6401-1A (16 August 1994).** Veterinary Health Services.

**OPNAVINST 5090.1C CH-1.** The Navy's Environmental Protection and Natural Resources Manual, termed Naval Operations Instruction (OPNAVINST) 5090.1C CH-1, requires that each Navy installation containing natural resources prepare a multiple-use natural resources management plan. OPNAVINST 5090.1C CH-1 specifically states that the conservation of natural resources and the military mission need not and shall not be mutually exclusive. OPNAVINST 5090.1C CH-1, Chapter 24 - Natural Resources Management, establishes Navy program requirements for ensuring military readiness and sustainability while complying with natural resources protection laws, and conserving and managing natural resources in the U.S., its territories, and possessions for both appropriated and non-appropriated fund activities. This dual dynamic of Stewardship and Readiness is essential for the long-term maintenance of military and natural resources sustainability. Navy commands shall accomplish the following when managing natural resources on Navy lands:

- Assign specific responsibility, provide centralized supervision, assign professionally trained personnel to the natural resources management program, and provide natural resources personnel with the opportunity to participate in natural resources management job training activities and professional meetings;

- Protect, conserve, and manage the watersheds, wetlands, natural landscapes, soils, forests, fish and wildlife, prime and unique farmland, and other natural resources as vital elements of an optimum natural resources program;
- Manage natural resources to provide outdoor recreation opportunities;
- Use and care for natural resources in the combination best serving the present and future needs of the U.S.;
- Provide for the optimum use of land and water areas and access thereto while maintaining ecological integrity; and
- Interact with the surrounding community to develop positive and productive community involvement, participation, and educational opportunities.

**OPNAVINST 5750.13 (10 November 1975).** Historical Properties of the Navy.

**OPNAVINST 6250.4C (11 April 2012).** Pest Management Programs. Requires Navy and Marine Corps to have a comprehensive Pest Management Plan. Discusses the need to control pest outbreaks, which affect the military mission, damage property, or impact the welfare of people.

**OPNAVINST 8000.16.** Environmental Security Management.

**OPNAVINST 8026.2A (15 June 2000).** Navy Munitions Disposition Policy.

**OPNAVINST 11000.17 (17 September 1999).** National Preservation Act Consultations Related to Base Realignment and Closure Actions.

**OPNAVINST 11010.20F (07 June 1996).** Facilities Projects Manual.

**NAVFAC P-73 (May 1987) Real Estate Procedure Manual, Volumes I and II; and Natural Resources Management Procedure Manual, Chapter 2 - Integrated Natural Resources Management Plans.** The Navy's Real Estate Manual, referred to as NAVFAC P-73, addresses all CNO natural resources program requirements, guidelines, and standards. NAVFAC P-73 states that the principles of multiple-use, ecosystem, and adaptive management shall be implemented on Navy facilities that meet the natural resources stipulations outlined in OPNAVINST 5090.1C CH-1 (discussed above). The manual provides guidance to Navy environmental personnel on the purpose of and need for INRMPs by outlining that the wise use of natural resources is essential to the continuation of the military mission. NAVFAC P-73 Chapter 2 - INRMPs requires that the following tasks are undertaken to meet the natural resources program objectives:

- Prepare, implement, and maintain, as a current working document, an INRMP for all Navy lands that have suitable habitat for conserving and managing natural resources. Each plan must adequately facilitate mission planning and decision-making to ensure compatibility of natural resources management with local, state, and federal objectives and policies.
- Implement land management practices that reduce grounds maintenance costs, use environmentally and economically beneficial landscaping practices, conserve soil and water, improve real estate values, protect coastal zones, wetlands, and floodplains, abate nonpoint sources of water pollution, control noxious weeds, and prevent erosion.
- Inventory wetlands and manage Navy land to avoid the net loss of size, function, or value of wetlands.

- Identify and protect federally threatened and endangered species on Navy lands, emphasizing mission requirements and interagency cooperation during consultation, species recovery planning, and management activities.
- Outlease all lands that are suitable and available for agricultural uses, consistent with operational requirements and long-term ecosystem management goals.
- Reduce the potential for bird and other animal collisions with aircraft in the airfield environment.
- Manage fish, wildlife, and plant resources within ecological limits, maintain appropriate wildlife population levels, and support optimum use of consumptive and non-consumptive fish and wildlife resources.

**NAVFACINST 6250.3H.** Applied Biology Program Services and Training. Requires the use of an integrated pest management approach to minimize the use of pesticides.

**NAVFACINST 11010.45 (30 June 2002).** Comprehensive Regional Planning Instruction (Land Use Module/Regional Shore Infrastructure Plan Links).

**NAVFACINST 11012.111A.** Land Use Conservation Planning.

**NAVFACINST MO-100.4.** Guidance on Special Interest Areas.

**Office of the Assistant Secretary (Installations and Environment) Memorandum for Commander Navy Installations Command (N45), Director Environmental Readiness Division (N45), Director Facilities and Services Division (CMC-LFL). Department of the Navy Natural Resources Program Metrics (22 August 2006).**

**Chief of Naval Operations (N45) Integrated Natural Resources Management Plan Guidance (10 April 2006) (5090 N456K/6U838101).** The INRMP Guidance was developed to provide natural resources managers at Navy installations with information necessary to prepare, update, and implement INRMPs. The Guidance was revised in close coordination with natural resources staff from Commander, Navy Installation Command and Commander, Naval Facilities Engineering Command. This guidance builds upon previous Navy INRMP guidance and incorporates requirements contained in the Deputy Undersecretary of Defense (Installations & Environment) Memorandum, dated October 10 2002, which promulgates new DoD Sikes Act Improvement Act guidance, and other relevant DoD guidance.

**CNO (N45) Policy Letter Preventing Feral Cat and Dog Populations on Navy Property (10 January 2002) (5090 Ser N456M/1U595820).**

**CNO (N45) Navy Environmental Management System Policy (06 December 2001) (5090 Ser N451G/1U595831).**



## C.6 California State Laws

### C.6.1 Water Resource Laws

#### California Water Code

The California Water Code Section 1243 declares the reservation of water for the enhancement and protection of fish and wildlife to be a beneficial use.

#### Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code §§ 13000 et seq.) is the State's primary water law. It gives SWRCB and the nine regional water quality control boards substantial authority to regulate water use.

According to this Act, water quality protection at NRTF Dixon is the responsibility of the SWRCB and the Central Valley Regional Water Quality Control Board (Central Valley Water Board). Authority comes from the State's Porter-Cologne Water Quality Control Act and the federal CWA. With the SWRCB setting statewide water quality objectives, the Central Valley Water Board carries out specific aspects of surface and groundwater regulations. NRTF Dixon is located in the Central Valley Water Board's Sacramento River Basin Planning Area (Central Valley Water Board 2011a).

The Water Quality Control Plan for the Sacramento River Basin (Basin Plan) contains the water quality standards and control measures for surface and ground waters of NRTF Dixon (Central Valley Water Board 2011a). The plan designates beneficial uses for water bodies and establishes water quality objectives, waste discharge requirements, and other implementation measures to protect those beneficial uses. State water quality standards also include a Nondegradation Policy. Water quality control measures include Total Maximum Daily Loads, which are often, but not always, adopted as Basin Plan amendments. The Sacramento River Basin Planning Area Water Board's Total Maximum Daily Load is maintained online.

In addition to the state standards in the Basin Plan, federal water quality standards for certain toxic pollutants apply to surface waters within California, including the Central Valley Region. These standards are contained in the National Toxics Rule (40 CFR 131.36) and the California Toxics Rule (40 CFR 131.37). The SWRCB has adopted a statewide implementation policy for the federal toxics standards, including summary tables listing the standards themselves. The federal standards have not yet been physically incorporated into the Basin Plan.

The National Toxics Rule and California Toxics Rule standards differ from federal water quality criteria in that they are enforceable. Federal criteria are non-enforceable, science-based thresholds that can be used in development of enforceable state water quality standards.

Implementation of the groundwater quality objectives occurs through the issuance of permits for waste discharges under the NPDES by the Central Valley Water Board. Regulations initially focused on controlling point source (end-of-pipe) discharges, such as from sewage treatment, industrial, and power plant outfalls. With control of point sources improving, emphasis has turned to regulating stormwater discharges from various sources through storm drains, as well as runoff sources of nonpoint source pollution. As the result of amendments to the CWA (Sec. 402[p]), storm drains are treated as a point source of pollution, required to come under NPDES permit. Enforcement of NPDES permits by the

Central Valley Water Board is done when monitoring or another source indicates a violation of permit conditions. Cease and Desist Orders and Cleanup and Abatement Orders, along with stiff financial penalties, can be issued for noncompliance.

## **C.6.2 Species of Concern Laws**

### **California Endangered Species Act**

The California Endangered Species Act (CESA) is very similar to the federal ESA and is administered by CDFW. The term endangered species is defined under CESA as a species of fish, wildlife or plant that is “in serious danger of becoming extinct throughout all, or a significant portion of its range.” It is concerned with species and subspecies native to California. CESA prohibits the “taking” of listed species, but in addition to protecting listed species, it also applies the take prohibitions to species that are candidates for listing. Certain listed bird species are further classified by CDFW as “fully protected,” wherein possession or taking of animals or parts thereof is prohibited at all times.

The California State Legislature has expressed its intent to protect, preserve and enhance endangered or rare species as issued in the Fish and Game Code (Div. 2, Chpt. 10 Native Plant Protection and Div. 3, Chpt. 1.5 Endangered Species). CESA violations can result in a fine of up to \$5,000 and/or one year in prison. While this law does not apply to federal actions, it does apply to state agencies and private landowners. In the spirit of the law and as a service to state agencies and private landowners, federal agencies operate under these guidelines.

## **C.7 State Regulations**

### **California Central Valley Regional Water Quality Control Board Long-term Irrigated Lands Regulatory Program**

The Central Valley Water Board and the California Environmental Protection Agency have developed a Long-term Irrigated Lands Regulatory Program (California Environmental Protection Agency and Central Valley Water Board 2011, 2012). It applies to all irrigated lands and managed wetlands in the Central Valley and regulates waste that leaves irrigated land and reaches groundwater or surface water. The definition of waste discharges under this program is sufficiently broad: “irrigation return flows, tailwater, drainage water, subsurface drainage generated by irrigating crop land or by installing and operating systems to lower the water table below irrigated lands (tile drains), stormwater runoff flowing from irrigated lands, and non-runoff discharges (e.g. aerial drift or overspray of pesticides...leaching of waste to groundwater, waste discharge to groundwater as a result of backflow of waste into wells...and irrigated agriculture waste discharged into unprotected wells and dry wells” (California Environmental Protection Agency and Central Valley Water Board 2011, 2012). As part of this program, growers are responsible for becoming part of a Coalition, if not already, or obtaining other proper regulatory coverage, conducting farm evaluations, making any necessary changes, and providing such information to the Coalition to report to the Board. NRTF Dixon is located within the Sacramento Valley Water Quality Coalition.<sup>1</sup> It also proposes additional monitoring and management requirements for growers in the Central Valley.

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<sup>1</sup> More information available online at: [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/irrigated\\_lands/](http://www.swrcb.ca.gov/rwqcb5/water_issues/irrigated_lands/).

## **C.8 Local Government**

There is a limited direct involvement with the NRTF Dixon natural resources program at the local, county, and municipal government levels.

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

## Appendix D: Applicable Memoranda of Understanding, Instructions, and Agreements

### D.1 Memoranda of Understanding

The U.S. Department of Defense (DoD) has signed numerous memoranda of agreement among agencies and non-governmental organizations for collaborative conservation and management initiatives, including those listed below that Naval Facilities Engineering Command Southwest may take advantage of to facilitate natural resources management at Naval Radio Transmitter Facility (NRTF) Dixon:

- Memorandum of Understanding (MOU) among the DoD, U.S. Fish and Wildlife Service, and International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations (07-2013). A copy of this MOU is included in this appendix.
- MOU with Watchable Wildlife, Inc. (10-2002)
- MOU for Support of Cooperative Agreement between the DoD and The Nature Conservancy (04-2005)
- MOU for the Continuation of the Cooperative Ecosystem Studies Units Network (05-2005)
- MOU between the DoD and the National Biological Information Infrastructure (06-2005)
- MOU for Conservation of Migratory Birds (07-2006)
- MOU for Federal Native Plant Conservation (09-2006)
- MOU between the DoD and Bat Conservation International (10-2006)
- MOU between U.S. Department of Agriculture Natural Resource Conservation Service and DoD to Promote Cooperative Conservation (11-2006)
- MOU among Federal Agencies for Achieving Objectives of Partners in Amphibian and Reptile Conservation (03-2007)
- MOU among Members of the North American Bird Conservation Initiative Committee (06-2007)
- MOU with North American Pollinator Protection Campaign (06-2007)

### D.2 Instructions

- Commander, Navy Region Southwest Instruction 11000.1, Assignment of Special Areas, 25 July 2013.

### D.3 Real Estate Agreements

Copies of the following documents are included in this appendix (refer to digital version):

- Example of NRTF Dixon Agricultural Outlease Agreement, including the Soil and Water Conservation Plan.
- Grant of Easement to Dixon Soil Conservation District for maintenance of NRTF Dixon western and southern perimeter drainage ditches and for drainage services. Dated 1954.
- Contract with Reclamation District 2068 (Yolano Reclamation District) for maintenance of NRTF Dixon northern and eastern perimeter drainage ditches and for drainage services. Dated 1951.
- Map illustrating the areas of NRTF Dixon for which the Dixon Soil Conservation District and the Yolano Reclamation District are responsible for drainage.
- Grant of Right of Way (Roadway Access) Easement located on Navy property provided to the Dixon Housing Authority to allow them access to two sewage oxidation ponds. Dated 12 February 2013.
- Grant of Sewer Line Easement located on Navy property provided to the Dixon Housing Authority to allow them access to a sewer line for maintenance and repair as needed. Dated 12 February 2013.
- Grant of Water Line Easement located on Navy property provided to the Dixon Housing Authority to allow them access to a water line for maintenance and repair as needed. Dated 12 February 2013.
- Grant of Power Line Easement located on Navy property provided to the Dixon Housing Authority to allow them access to a power line for maintenance and repair as needed. Dated 12 February 2013.

**MEMORANDUM OF UNDERSTANDING  
BETWEEN  
THE U.S. DEPARTMENT OF DEFENSE  
AND  
THE U.S. FISH AND WILDLIFE SERVICE  
AND  
THE ASSOCIATION OF FISH AND WILDLIFE AGENCIES  
FOR A  
COOPERATIVE INTEGRATED NATURAL RESOURCE MANAGEMENT PROGRAM  
ON MILITARY INSTALLATIONS**

**A. PURPOSE**

The purpose of this Memorandum of Understanding (MOU) is to further a cooperative relationship between the U.S. Department of Defense (DoD), U.S. Department of the Interior – Fish and Wildlife Service (FWS), and state fish and wildlife agencies (states) acting through the Association of Fish and Wildlife Agencies (AFWA) (hereafter referred to as the Parties) in preparing, reviewing, revising, updating and implementing Integrated Natural Resource Management Plans (INRMPs) for military installations.

**B. BACKGROUND**

In recognition that military lands have significant natural resources, Congress enacted the Sikes Act in 1960 to address wildlife conservation and public access on military installations. The 1997 amendments to the Sikes Act require the DoD to develop and implement an INRMP for each military installation with significant natural resources. A 2012 amendment to the Sikes Act now authorizes the preparation of INRMPs for state-owned National Guard installations used for training pursuant to chapter 5 of title 32 of the United States Code. DoD must prepare all INRMPs in cooperation with the FWS and states. Each INRMP must reflect the mutual agreement of the Parties concerning conservation, protection, and management of fish, wildlife, plants and their habitats on military lands.

INRMPs provide for the management of natural resources, including fish and wildlife and their habitats. To the maximum extent practicable, they incorporate ecosystem management principles, and describe procedures and projects that manage and maintain the landscapes necessary to sustain military-controlled lands for mission purposes. INRMPs also allow for multipurpose uses of resources, including public access appropriate for those uses, provided such access does not conflict with military land use, security requirements, safety, or ecosystem needs, including the needs of fish and wildlife resources. Effective communications and coordination among the Parties, initiated early in the planning process at national, regional, and the military installation levels, is essential to developing, reviewing, and implementing comprehensive INRMPs. When such partnering involves the participation and coordination of all Parties regarding existing FWS and state natural resources management plans or initiatives, such as threatened and endangered species recovery plans or State Wildlife Action Plans, the mutual agreement of all Parties is achieved more easily. INRMPs provide for the conservation

and rehabilitation of natural resources on military lands in ways that help ensure the readiness of the Armed Forces. Thus, a clear understanding of land use objectives for military lands should enable the Parties to have a common understanding of DoD's land management requirements.

This MOU addresses the responsibilities of the Parties to facilitate optimum management of natural resources on military installations. It replaces a DoD-FWS-AFWA MOU for *Cooperative Integrated Natural Resources Management Program on Military Installations* dated January 31, 2006, which expired January 31, 2011.

### **C. AUTHORITIES**

This MOU is established under the authority of the Sikes Act, as amended, 16 U.S.C. 670a-670f, which requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the FWS and states. The DoD's primary mission is national defense. DoD manages approximately 28 million acres of land and waters under the Sikes Act to support sustained military activities while conserving and protecting biological resources.

The FWS manages approximately 150 million acres of the National Wildlife Refuge System, and administers numerous fish and wildlife conservation and management statutes and authorities, including the: Fish and Wildlife Coordination Act, Migratory Bird Treaty Act of 1918, Endangered Species Act, Marine Mammal Protection Act, Bald and Golden Eagle Protection Act, Anadromous Fish Conservation Act, Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, Federal Noxious Weed Act, Alien Species Prevention Enforcement Act of 1992, North American Wetland Conservation Act, and Coastal Barrier Resources Act.

The states in general possess broad trustee and police powers over fish and wildlife within their borders, including – absent a clear expression of Congressional intent to the contrary – fish and wildlife on federal lands within their borders. Where Congress has given federal agencies certain conservation responsibilities, such as for migratory birds or species listed as threatened or endangered under the Endangered Species Act, the states, in most cases, have cooperative management responsibilities.

The Sikes Act (16 U.S.C. 670c-1) allows the Secretary of a military department to enter into cooperative agreements with the states, local governments, Indian tribes, nongovernmental organizations, and individuals to provide for the maintenance and improvement of natural resources, or to benefit natural and historic research, both on and off DoD installations.

The Sikes Act (16 U.S.C. 670a(d)(2)) also encourages the Secretary of Defense, to the greatest extent practicable, to enter into agreements to use the services, personnel, equipment, and facilities, with or without reimbursement, of the Secretary of the Interior or states in carrying out the provisions of this section.

The Economy Act (31 U.S.C. 1535 and 1536) allows a federal agency to enter into an agreement with another federal agency for services, when those services can be rendered in a more



convenient or cost effective manner by another federal agency.

#### **D. RESPONSIBILITIES**

The Parties to this agreement hereby enter into a cooperative program of INRMP development, review, and implementation with mutually agreed-upon fish and wildlife conservation objectives to satisfy Sikes Act goals.

##### **1. The DoD, the FWS and AFWA (Parties) mutually agree:**

- a. To meet at least annually at the headquarters' level to discuss implementation of this MOU. The DoD and FWS will alternate responsibilities for coordinating this annual meeting and any other meetings related to this MOU. Proposed amendments to the MOU should be presented in writing to the parties at least 15 days prior to the annual meeting. The terms of this MOU and any proposed amendments may be reviewed at the annual meeting. The meeting may also review mutual Sikes Act research and technology needs, accomplishments, and other emerging issues.
- b. To participate in a Sikes Act Tripartite Core Group consisting of representatives from the Parties. This Core Group will meet at least quarterly, coordinated by the DoD, to discuss and develop projects and guidance to help prepare and implement INRMPs and to discuss Sikes Act issues of national importance.
- c. To engage in sound management practices for natural resource protection and management pursuant to this MOU with full consideration for military readiness; native fish and wildlife; threatened, endangered and at-risk species; and the environment.
- d. To promote the sustainable multipurpose use of natural resources on military installations – including hunting, fishing, trapping, and non-consumptive uses such as wildlife viewing, boating, and camping – in ways that are consistent with DoD's primary military mission and to the extent reasonably practicable.
- e. To develop and implement supplemental Sikes Act MOUs or other agreements, as needed, at the regional and/or state level.
- f. To recognize the most current DoD and FWS Sikes Act Guidance as the guidance for communication and cooperation of the Parties represented by this MOU.
- g. To post current DoD, FWS, and state Sikes Act guidance documents within 14 days of completion on the following sites:
  - i. For DoD: <https://www.denix.osd.mil/nr>
  - ii. For FWS: [http://www.fws.gov/habitatconservation/sikes\\_act.html](http://www.fws.gov/habitatconservation/sikes_act.html)
  - iii. For the states: <http://www.fishwildlife.org>

- h. To cooperatively prepare and conduct full reviews of all new INRMPs in a timely manner.
- i. To require the DoD Components and appropriate FWS and state offices to conduct a review for operation and effect of each INRMP no less often than every five years, as required by the Sikes Act, and to document these reviews. As a means of facilitating and streamlining this statutory requirement, use the annual progress review of each INRMP as conducted by each DoD Component per DoD policy.
- j. To encourage collaboration in annual progress reviews between representatives from each military installation with an INRMP and appropriate representatives from the other Parties.
  - i. The Parties shall discuss the performance of each military installation in meeting relevant DoD Natural Resources Focus Area metrics, and potential improvements to INRMP implementation, such as new projects or management practices.
  - ii. Meetings may be in person or by another mutually acceptable means.
  - iii. The Parties shall discuss methods and projects that the FWS and states can implement that support INRMP goals and objectives.
- k. To streamline and expedite the review of INRMP updates or revisions, and to effectively address review for critical habitat exclusions based on the INRMP conservation benefit, when feasible:
  - i. DoD and the FWS will develop and implement a streamlined review process within six months of signature of this MOU that will allow for expedited review and approval (new signatures) of updated sections of each INRMP.
  - ii. DoD will provide a means of easily identifying all changes to each updated or revised INRMP when forwarding it for review.
  - iii. FWS will focus review on those parts of updated INRMPs that reflect changes from the previously reviewed version.
  - iv. FWS and the appropriate states will review all INRMPs with major revisions (e.g., changes required by mission realignments, the listing of new species or other significant action that has the potential to affect military operations or readiness).
  - v. DoD, FWS, and the states (acting through AFWA) will continue to seek opportunities to make INRMP review processes more efficient while sustaining and enhancing INRMP conservation effectiveness.
  - vi. The DoD Components may submit to the USFWS, a priority INRMP list

to address those installations seeking critical habitat exclusions to facilitate coordination with USFWS Endangered Species office.

vii. To ensure consistency, the Parties accept the following definitions:

- a) **Compliant INRMP:** An INRMP that has been both approved in writing, and reviewed, within the past five years, as to operation and effect, by authorized officials of DoD, DOI, and each appropriate state fish and wildlife agency.
- b) **Review for operation and effect:** A comprehensive, joint review by the parties to the INRMP, conducted no less often than every five years, to determine whether the plan needs an update or revision to continue to address adequately Sikes Act purposes and requirements.
- c) **INRMP update:** Any change to an INRMP that, if implemented, is not expected to result in consequences materially different from those in the existing INRMP and analyzed in an existing NEPA document. Such changes will not result in a significant environmental impact, and installations are not required to invite the public to review or to comment on the decision to continue implementing the updated INRMP.
- d) **INRMP revision:** Any change to an INRMP that, if implemented, may result in a significant environmental impact, including those not anticipated by the parties to the INRMP when the plan was last approved and/or reviewed as to operation and effect. All such revisions require approval by all parties to the INRMP, and will require a new or supplemental NEPA analysis.

l. That none of the Parties to the MOU is relinquishing any authority, responsibility, or duty established by law, regulation, policy, or directive.

m. To designate the officials listed below, or their delegates to participate in the activities pursuant to this MOU.

- i. DoD: Deputy Director, Natural Resources Conservation Compliance, ODUSD (I&E) ESOH
- ii. FWS: National Sikes Act Coordinator, Fish and Aquatic Conservation
- iii. AFWA: Director, Government Affairs

## 2. DoD agrees to:

- a. Communicate the establishment of this MOU to all DoD Components.
- b. Take the lead in developing policies and guidance related to INRMP development, updates, revisions, and implementation, and to ensure the involvement, as appropriate, in these processes of the FWS and state fish and wildlife agencies.

- c. Ensure distribution of the DoD and FWS Sikes Act Guidance to all appropriate DoD Components.
- d. Encourage DoD Components to invite appropriate FWS and state fish and wildlife agency offices to participate in annual INRMP reviews. All such invitations should be extended at least 15 business days in advance of the scheduled review to facilitate meaningful participation by all three Parties. Meetings may be in person or by other mutually agreed upon means.
- e. Encourage DoD Components to take full advantage of FWS and state fish and wildlife agency natural resources expertise through the use of Economy Act transfers and cooperative agreements. Encourage DoD Components and FWS to explore the use of the Fish and Wildlife Coordination Act for technical assistance, fish stocking, and other conservation projects. Priority should be given to projects that:
  - i. Sustain the military mission.
  - ii. Effectively apply ecosystem management principles.
  - iii. Consider the strategic planning priorities of the FWS and the state fish and wildlife agency.
- f. Encourage DoD Components to give priority to INRMP requirements that:
  - i. Sustain military mission activities while ensuring conservation of natural resources.
  - ii. Provide adequate staffing with the appropriate expertise for updating, revising, and implementing each INRMP within the scope of DoD Component responsibilities, mission, and funding constraints.
- g. Encourage DoD Components to discuss with the FWS and state fish and wildlife agencies all issues of mutual interest related to the protection, conservation, and management of fish and wildlife resources on DoD installations.
- h. Subject to mission, safety, security, and ecosystem requirements, provide public access to military installations to facilitate the sustainable multipurpose use of its natural resources.
- i. Identify natural resource research needs, and develop research proposals with input from the Parties.
- j. Identify opportunities to work with the DoD Components to facilitate:
  - i. Cooperative regional and local natural resource conservation partnerships and initiatives with FWS and state fish and wildlife agency offices.
  - ii. Natural resources conservation technology transfer and training initiatives

between the DoD Components, federal land management agencies, and state fish and wildlife agencies.

- k. Provide law enforcement support to protect fish, wildlife, and plant resources on military installations consistent with jurisdiction and authority.

**3. FWS agrees to:**

- a. Communicate the establishment of this MOU to each FWS Regional Office and appropriate field offices in close proximity to military installations.
- b. Distribute the DoD and FWS Sikes Act Guidelines to each FWS Regional Office and appropriate field office in close proximity to military installations.
- c. Designate regional and field office FWS liaisons to develop partnerships and help DoD implement joint management of ecosystem-based natural resource management programs, and provide a list of those liaisons to the DoD as needed.
- d. Provide technical assistance with the appropriate expertise to the DoD in managing its resources within the scope of FWS responsibilities and funding constraints.
- e. Encourage field offices to coordinate current and proposed FWS natural resource initiatives and research efforts with those that may relate to DoD installations, and to provide applicable installations with new and relevant information pertaining to distribution and/or research regarding listed and candidate species and species at-risk.
- f. Inform DoD Components and affected installations regarding upcoming and reasonably foreseeable proposed listing and critical habitat designations that may potentially affect military installations in a timely manner before publication of such proposals in the Federal Register.
- g. Encourage regional and field offices to expedite pending INRMP reviews that may affect foreseeable proposed listing of threatened and endangered species and critical habitat designations.
- h. Provide law enforcement support as appropriate to protect fish, wildlife, and plant resources on military installations within the jurisdiction of the FWS.
- i. Identify FWS refuges and other potential federal management areas in close proximity to military installations, and, where appropriate, participate in the joint management of ecosystem-based natural resource management projects that support INRMP and other planning goals, objectives, and implementation.

**4. AFWA agrees to:**

- a. Communicate the establishment of this MOU to each state fish and wildlife agency director and appropriate personnel.

- b. Distribute the DoD and FWS Sikes Act Guidelines to each state fish and wildlife agency director and appropriate staff.
- c. Facilitate and coordinate with the states to encourage them to:
  - i. Participate in developing, reviewing, updating, revising, approving and, as appropriate implementing INRMPs in a timely way upon request by military installation personnel.
  - ii. Designate state liaisons to help develop partnerships and to help DoD installation staff implement natural resource conservation and management programs.
  - iii. Identify state wildlife management areas in close proximity to military installations and, where appropriate, participate in the joint management of ecosystem-based natural resources projects that support INRMP goals, objectives, and implementation.
  - iv. Provide technical assistance to DoD installation staff in adaptively managing natural resources within the scope of state responsibilities, funding constraints, and expertise.
  - v. Identify state personnel needs to develop, review, update/revise, approve, and implement INRMPs, and facilitate the identification of funding opportunities to address the fulfillment of state priorities.
  - vi. Coordinate current and proposed state natural resources research efforts with those that may relate to DoD installations.
  - vii. Coordinate with DoD installations to develop new, and implement existing, conservation plans and strategies, including, but not limited to State Wildlife Action Plans; the National Fish, Wildlife and Plants Climate Adaptation Strategy; goals or initiatives of the North American Bird Conservation Initiative (NABCI) and/or Partners in Amphibian and Reptile Conservation (PARC); and the National Fish Habitat Action Plan.

**E. STATEMENT OF NO FINANCIAL OBLIGATION**

This MOU does not impose any financial obligation on the part of any signatory.

**F. ESTABLISHMENT OF COOPERATIVE AGREEMENTS**

The Parties are encouraged to enter into cooperative or interagency agreements to coordinate and implement natural resource management on military installations. If fiscal resources are required, the Parties must develop a separately funded cooperative or interagency agreement.

Such cooperative or interagency agreements may also be entered into under the authority of the Sikes Act (16 U.S.C. 670c-1). Interagency agreements may be entered into under the authority of the Economy Act (31 U.S.C. 1535 and 1536). The Parties should also explore opportunities to utilize the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-666c) to facilitate agreements for FWS technical assistance, fish stocking, and other conservation activities. Each funded cooperative or interagency agreement shall include a work plan and a financial plan that identify goals, objectives, and a budget and payment schedule. A cooperative or interagency agreement to accomplish a study or research also will include a study design and methodology in the work plan. It is understood and agreed that any funds allocated via these cooperative or interagency agreements shall be expended in accordance with its terms and in the manner prescribed by the fiscal regulations and/or administrative policies of the party making the funds available.

#### **G. AMENDMENTS**

This MOU may be amended at any time by mutual written agreement of the Parties.

#### **H. TERMINATION**

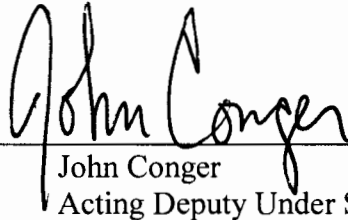
Any party to this MOU may remove itself upon sixty (60) days written notice to the other parties.

#### **I. EFFECTIVE DATE AND DURATION**

This MOU will be in effect upon date of final signature, and will continue for ten years from date of final signature. The parties will meet six (6) months prior to the expiration of this MOU to discuss potential modifications and renewal terms.

7-29-13

Date



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John Conger  
Acting Deputy Under Secretary of Defense  
(Installations and Environment)  
U.S. Department of Defense

6.24.13

Date

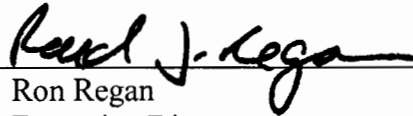


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Dan Ashe  
Director  
Fish and Wildlife Service  
U.S. Department of Interior

7-15/2013

Date



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Ron Regan  
Executive Director  
Association of Fish and Wildlife Agencies



Station: NRTF Dixon, California  
Parcel #: 4A01  
Contract #: N6247312RP00158

**DEPARTMENT OF THE NAVY  
LEASE FOR AGRICULTURAL PURPOSES**

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LEASE between \_\_\_\_\_ hereinafter called "LESSEE," and the United States of America, acting by and through the Department of the Navy, represented by the Commanding Officer, Naval Facilities Engineering Command Southwest, San Diego, California, hereinafter called the "GOVERNMENT."

- 1) **LEASED PROPERTY:** Under the terms and conditions of this "LEASE," the GOVERNMENT hereby leases to the LESSEE a portion of the NAVAL RADIO TRANSMITTING FACILITY, DIXON, CALIFORNIA, hereinafter called the "STATION." That portion is hereinafter called the "LEASED PROPERTY" and described as follows:
  - a) Parcel 4A01, consists of approximately 585 acres. **LESSEE shall install an irrigation pipeline at the northwest corner of Field 10, on a non-reimbursable basis, within the first year of the lease term.** Parcel 4A01 is identified and delineated in Appendix "A" of the Soil and Water Conservation Plan for Agricultural Outlease, attached and incorporated herein as Exhibit "A."
  - b) The 585 acres consist of the following:
    - +/- 368.0 Farmable acres (Fields 1-7 and 10)
    - +/- 217.0 Maintenance area (Fields 9 and 11)
- 2) **TERM:** The term of this LEASE will be for the period beginning upon execution by both parties and ending on September 30, 2017, UNLESS sooner terminated in accordance with Clauses 13 and 14 hereof.
- 3) **RENT:** LESSEE shall pay the GOVERNMENT rent in the amounts set forth below:

	Rental Per Acre/Per Year	Total Annual Rental Per Year
<b>Upon Execution by both parties – September 30, 2013 (Year One Term)</b>	\$_____	\$_____
<b>October 1, 2013 – September 30, 2017 (Years Two – Five Term)</b>	\$_____	\$_____

- a) LESSEE agrees to pay the GOVERNMENT an annual rental amount of \$\_\_\_\_\_ for Year One Term payable in advance at the rate of \$\_\_\_\_\_ **per** annum, semi-annum, quarterly (circle one) and an annual rental amount of \$\_\_\_\_\_ for Years Two – Five Term payable in advance at the rate of \$\_\_\_\_\_ **per** annum, semi-annum, quarterly (circle one) by check or postal money order made payable to the

**Disbursing Officer – DFAS Cleveland** and delivered to the Real Estate Contracting Officer, subject to any allowance for credit for work approved and performed pursuant to Clause 8 of this LEASE. Rental payments are acknowledged by the GOVERNMENT according to the date that the payment is received.

- 4) **USE:** The primary use of the STATION is for military operations. The agricultural LEASE operation is secondary and subject to the military requirements for the land. The LEASED PROPERTY shall be used solely for the agricultural purposes. Human occupancy is not allowed. Commercial wholesale or retail sales operations are not allowed on the LEASED PROPERTY. It is the express intent of the GOVERNMENT not to let the land lay fallow, but rather to have the available irrigation waters used to the maximum extent possible with sound agricultural practices. All uses of the lands of the LEASED PROPERTY shall be in accordance with and in full compliance with all applicable federal, state, and local environmental laws, regulations and/or ordinances, including but not limited to laws, regulations and/or ordinances concerning air emissions, water pollution prevention, and permitting requirements.
- 5) **WATER AVAILABILITY:**
- a) Irrigation water may be available for LESSEE'S use on the parcel from the irrigation water well and reservoir located in the northwest corner of the outlease (Field #3). See Appendix A for location. **The GOVERNMENT makes no guarantee, implied or expressed, regarding the condition and productivity of the groundwater well, or the quality, quantity, cost or availability of irrigation water available, or that may become available, from the groundwater well.** The LESSEE must provide all necessary motors, pumps, above-ground equipment and pertinent water transfer equipment to operate the well.
- b) Irrigation water may also be obtained from the Maine Prairie Water District at the northwest corner of field #9 at the Robben Road ditch when available. **The GOVERNMENT makes no guarantee implied or expressed regarding the quality, quantity or cost of water available, or that may become available, from the water district.** The LESSEE shall maintain compliance with all Central Valley Regional Water Quality Control Board rules and regulations as they may apply to their agricultural activities on the LEASE premises.
- 6) **SECURITY:** To secure the faithful performance of LESSEE'S obligations hereunder, LESSEE shall provide the GOVERNMENT with a security in the amount equal to 50% of the annual rent for Years Two – Five Term shown in Clause 3 (a) or **\$10,000.00**, whichever is **GREATER**. If the GOVERNMENT shall at any time determine that an increase in the amount of security is necessary to make same commensurate with LESSEE's obligations hereunder, LESSEE shall furnish additional security promptly upon request. The Security provided shall be in the form of:
- a) Performance Bond issued as a Corporate Surety and satisfactory to the GOVERNMENT in all respects.
- i) Performance Bond shall be payable to the **"Treasurer of the United States."**

b) Certificate of Deposit:

- i) Certificate of Deposit shall be accompanied by a Security Agreement, as provided by the Government, fully executed by LESSEE and GOVERNMENT and acknowledged by the financial institute issuing the Certificate of Deposit; and
- ii) Certificate of Deposit shall be made payable to the Lessee and the "Department of the Navy"; or

If LESSEE shall fully and faithfully comply with all the terms and conditions of this LEASE, the security shall be returned to the LESSEE upon the expiration or earlier termination of the LEASE.

7) **INSURANCE REQUIREMENTS:** Prior to award of the LEASE, the LESSEE shall submit a certificate of insurance meeting the following requirements. Public Liability and Property Damage shall meet the following requirements at a minimum:

\$1,000,000	Third Party Property Damage
\$1,000,000	Third Party Personal Injury Per Person
\$3,000,000	Third Party Personal Injury Per Accident

The policy/certificate of insurance shall contain the following endorsements:

- a) Loss, if any, under this policy shall be adjusted with (name of LESSEE) and the proceeds, at the election of the GOVERNMENT, shall be payable to (name of LESSEE); any proceeds not paid to (name of LESSEE) shall be payable to the Treasurer of the United States.
- b) The insurer waives any right of subrogation against the United States of America which might arise by reason of any payment made under this policy.
- c) The GOVERNMENT shall be given thirty (30) days written notice prior to making any material change in or the cancellation of the policy. Please strike out (and initial) any clauses that state "...failure to make such notice imposes no obligation or liability of any kind upon the company, etc..."
- d) The United States of America (Department of the Navy) is added as an additional insured in operations of the policyholder at or from the LEASED PROPERTY at Naval Radio Transmitting Facility, Dixon, California.
- e) This insurance certificate is for use of LEASED PROPERTY at Naval Radio Transmitting Facility, Dixon, California, contract number **N6247312RP00158** for Parcel 4A01.

If, at any time, the GOVERNMENT determines that the insurance maintained by the LESSEE does not in fact adequately protect the GOVERNMENT, LESSEE may be required to carry such other insurance in such form, for such amounts and for such periods of time, and with such insurers as the GOVERNMENT may from time to time require or approve.

**8) CONSERVATION AND MAINTENANCE WORK:**

- a) The LESSEE, shall at their own cost and expense, assume full responsibility for the following conservation and maintenance obligations in accordance with the specifications and guidelines set forth in Clauses 6 (A) (1) through (17) of the Soil and Water Conservation Plan of this LEASE, attached hereto as Exhibit "A" and made a part hereof.
- b) The LESSEE agrees to perform reimbursable Conservation and Maintenance related work on the LEASED PROPERTY as identified, approved and directed in advance by the GOVERNMENT. Upon prior written approval by the GOVERNMENT and subsequent completion of such work by the LESSEE and the acceptance of same by the GOVERNMENT, the LESSEE shall receive payment in full for the "Actual Costs" of work performed, or shall receive rent credit in the same amount against rents payable under the terms of this LEASE; provided, however, that in no event shall such rent credit exceed the total amount of rent called for in the LEASE.
- c) "Actual Costs" as used herein shall mean the sum of:
  - i. direct labor costs, and;
  - ii. direct material costs, when LESSEE has incurred such costs directly in the performance of any Conservation and Maintenance Work approved and directed by the Real Estate Contracting Officer. When LESSEE contracts with third parties for performance of any item of Conservation and Maintenance Work, "Actual Costs" as used herein, shall mean the amount of such contracts that have been approved in advance by the Real Estate Contracting Officer.
- d) Prior to commencement of any Conservation and Maintenance Work for which the LESSEE is to receive credit or payment from the GOVERNMENT, the LESSEE must have a Modification of Contract executed by the Real Estate Contracting Officer setting forth the terms, conditions and the amount of compensation to be paid upon completion of the reimbursable work to the satisfaction of the GOVERNMENT. The following procedures apply:
  - i. GOVERNMENT provides LESSEE with project specifications and written notice to obtain bids.
  - ii. LESSEE obtains a minimum of two bids from qualified contractors with a complete description of work and forwards such bids to the Real Estate Contracting Officer. LESSEE may elect to do the work him/her/itself, and LESSEE then must submit to the Real Estate Contracting Officer an itemized bid proposal covering all aspects of the project. In the event the LESSEE elects to do the work him/her/itself, no other bids are necessary, provided that the LESSEE's bid price does not exceed the GOVERNMENT'S cost estimate. For each project or service proposed, LESSEE must include with the project or service description an estimated cost to perform the work. The estimated cost shall be broken down by material, subcontract cost, labor, and overhead.
  - iii. Nothing in this LEASE shall preclude the LESSEE from contracting with a third-party contractor for the work. LESSEE shall require any contractor to have a Performance Bond with the penal amount of no less than the estimated cost of the work

contracted for. In compliance with Clause 33 (d) of this LEASE, LESSEE shall be solely responsible for obtaining any environmental permits required for the proposed work. Copies of all required environmental and/or construction permits shall be provided to the GOVERNMENT prior to execution of work.

- iv. GOVERNMENT shall review the bids (or single bid proposal if LESSEE elects to do the work him/her/itself), and if acceptable the GOVERNMENT shall enter into a Modification of Contract with LESSEE authorizing the project. The GOVERNMENT will retain the right to perform a technical review of any proposed work to be performed or personal property to be provided. A GOVERNMENT representative may oversee the work solely for the benefit of the GOVERNMENT, and such GOVERNMENT representative shall confirm satisfactory completion of the work to the Real Estate Contracting Officer. IN NO CASE SHALL LESSEE BEGIN ANY PROJECT WORK PRIOR TO RECEIVING A FULLY EXECUTED MODIFICATION OF LEASE THEREFORE.
- v. A “not to exceed cost ceiling” will be established in the Modification of Contract for the reimbursable project. The Real Estate Contracting Officer may, upon written request, with supporting rationale from the LESSEE, increase the “not to exceed cost ceiling.” Such request for an increase in said amount must be submitted, in writing, prior to incurring any cost in excess of the said amount and sufficiently in advance to provide for GOVERNMENT review of the request and, in any event, not less than ten (10) days prior to the date authorization is required. The LESSEE shall not be obligated to incur costs in excess of the “not to exceed cost ceiling.”
- vi. Upon receipt of a fully executed Modification of Contract, LESSEE shall begin work coordinating all details of the work including starting dates and time, and the location of the work with the STATION Point of Contact (POC), listed in this LEASE in Clause 35 (a) (ix) (c).
- vii. Upon completion of the work, the LESSEE shall submit to the GOVERNMENT an invoice signed by the LESSEE stating the full amount due for the work performed, together with all supporting documents, all bills of sale; receipts for labor and materials used in connection with the project; and in the event the LESSEE performed the work, an itemized bill for all labor and materials.
- viii. The incurred cost of performing such project or service will be subject to GOVERNMENT audit and should such audited allowable cost be less than the “not to exceed cost ceiling” amount authorized, then the amount of reimbursement or credit towards rent reduction to LESSEE shall be the audited, allowable incurred cost.
- ix. The GOVERNMENT shall inspect the work for adherence to specifications and quality of workmanship, and will review the receipts and bills of sale for adherence to the previously approved bid estimates. The Real Estate Contracting Officer must provide a written final acceptance of the work performed in order for LESSEE to obtain rent reduction credit for the work performance, or reimbursement for actual costs. If the project is acceptable, the Real Estate Contracting Officer will make arrangements for appropriate rental credit or reimbursement to the LESSEE in accordance with applicable provisions of this LEASE.

- x. Any bills of sale, purchase receipts, written warranty agreements and other indicia or documents of ownership shall be provided to the GOVERNMENT upon its acceptance of the improvement or personal property. Written warranties shall include but not be limited to a warranty that work performed conforms to the contract requirements and is free of any defect in equipment, material or design furnished or workmanship performed, and that the LESSEE or LESSEE's contractor will remedy any failure to conform or any defect. Additionally, warranty shall provide that LESSEE or LESSEE's contractor shall remedy any damage to GOVERNMENT owned or controlled real or personal property when that damage results from either contractor failure to conform to contract requirements or any defect of equipment, material, workmanship or design furnished. All warranties shall name the GOVERNMENT as an additional beneficiary. LESSEE shall enforce all warranties for the benefit of the GOVERNMENT, if directed to do so by the GOVERNMENT.
  - xi. Upon termination of this LEASE pursuant to Clauses 13 and 14, hereof, a final accounting will be performed and the balance of any rent accrued and payable to the GOVERNMENT will be due on demand. Notwithstanding termination, the GOVERNMENT reserves the right to have a final accounting at any time during the course of the LEASE, and to request that the value of any rent accrued up to that date and not already contractually obligated to any specific project or service to be performed, be paid to the GOVERNMENT on demand. Upon termination, at the GOVERNMENT'S option, LESSEE shall complete any work or service already contracted for, or if otherwise directed by GOVERNMENT, cease all project work, terminate any contract(s) for such work, and pay all accrued rent.
  - xii. All improvements constructed or installed under this clause are the property of the GOVERNMENT and shall remain in place and intact upon the expiration or earlier termination of this LEASE. Should the LESSEE fail to perform such work (either him/her/itself or via a contract), the GOVERNMENT may arrange for the work to be completed and LESSEE shall be required to reimburse the GOVERNMENT for costs incurred.
- 9) **GENERAL MAINTENANCE OBLIGATION:** LESSEE, at its own expense, shall so protect, preserve, maintain and repair the LEASED PROPERTY, that the same will at all times be kept in at least as good condition as when received, less ordinary wear and tear and/or loss or damage for which LESSEE is not specifically liable hereunder.
- 10) **RISK OF LOSS-INSURANCE:**
- a) LESSEE shall bear all risk of loss of or damage to the LEASED PROPERTY arising from any cause whatsoever, with or without fault by LESSEE; Provided, however, that LESSEE's liability for any loss or damage resulting from risks expressly required to be insured against under the LEASE shall not exceed the amount of insurance so required or the amount actually procured and maintained, whichever shall be the greater: Provided, further, that maintenance of the required insurance shall effect no limitation on LESSEE's liability with respect to any loss or damage resulting from the willful misconduct, lack of good faith, or negligence of LESSEE or any of its officers, agents, servants, employees, subtenants, licensees, and/or invitees.

- b) LESSEE shall procure and maintain, at its own expense, insurance on the LEASED PROPERTY in such initial amounts and types as may exceed, but shall not be less than, the minimum amounts and types specified in Clause 7 hereof. However, LESSEE shall provide, maintain, change or discontinue such insurance as the Local Government Representative may from time to time require and direct; Provided, LESSEE's liability for loss of or damage to the LEASED PROPERTY is modified accordingly; Provided, further, that if any insurance requirement is so changed an equitable adjustment shall be made in the amount of the Rent or Maximum Amount to be Expended specified in Clause 3 or 8 hereof so as to reflect any resultant savings or increased cost to LESSEE.
- c) All insurance which this LEASE requires LESSEE to carry on the LEASED PROPERTY shall be in such form, for such amounts, for such periods of time and with such insurers as the GOVERNMENT may from time to time require or approve. Each policy of insurance shall contain a provision for thirty (30) days written notice to the Real Estate Contracting Officer prior to the making of any material change in or the cancellation of the policy. LESSEE shall deliver promptly to the Real Estate Contracting Officer a certificate of insurance or a certified copy of each policy of insurance required by this LEASE, and LESSEE shall also deliver to the Real Estate Contracting Officer, no later than thirty (30) days prior to the expiration of any such policy, a certificate of insurance or a certified copy of each renewal policy covering the same risks. All insurance required or carried by LESSEE on any of the LEASED PROPERTY shall be for the protection of the GOVERNMENT and LESSEE against their respective risks and liabilities in connection with the LEASED PROPERTY. Each policy of insurance shall name both LESSEE and the United States of America (Department of the Navy) as the insured, and each policy of insurance against loss of or damage to the LEASED PROPERTY shall contain a loss payable clause reading as follows:
- i. "Loss, if any, under this policy shall be adjusted with (name of LESSEE) and the proceeds, at the election of the GOVERNMENT, shall be payable to (name of LESSEE); any proceeds not paid to (name of LESSEE) shall be payable to the Treasurer of the United States."
- d) In the event that any item or part of the LEASED PROPERTY shall require repair, rebuilding or replacement resulting from loss or damage, the risk of which is assumed by LESSEE under paragraph (a) of this Clause, LESSEE shall promptly give notice thereof to the Real Estate Contracting Officer and, to the extent of its liability as provided in paragraph (a) thereof, shall, upon demand, either compensate the GOVERNMENT for such loss or damage, or rebuild, replace or repair the item or items of the LEASED PROPERTY so lost or damaged, as the GOVERNMENT may elect. In the event that the GOVERNMENT shall direct LESSEE to effect any repair, rebuilding or replacement which the LESSEE is required to effect pursuant to this paragraph, the GOVERNMENT shall direct the payment to LESSEE of so much of the proceeds of any insurance carried by LESSEE and made available to the GOVERNMENT on account of loss of or damage to any item or part of the LEASED PROPERTY as may be necessary to enable LESSEE to effect such repair, rebuilding or replacement. In the event the GOVERNMENT shall elect not to require LESSEE to repair, rebuild or replace any item or part of the LEASED PROPERTY lost or damaged, LESSEE shall promptly pay to the GOVERNMENT out of any insurance proceeds collected by LESSEE such portion thereof as may be allocable to loss of or damage to the LEASED PROPERTY. When compliance with a GOVERNMENT request to effect any repair, rebuilding or replacement of any lost or damaged item or part

of the LEASED PROPERTY would involve the incurring of costs in excess of LESSEE's liability for such loss or damage under this Clause, LESSEE shall be under no obligation to effect same until after a satisfactory agreement has been reached between the GOVERNMENT and LESSEE with regard to GOVERNMENT reimbursement of such excess of costs to LESSEE.

- 11) **REPRESENTATIONS:** LESSEE has examined, knows and accepts the condition and state of repair of the LEASED PROPERTY and the STATION of which it forms a part, and acknowledges that the GOVERNMENT has made no representation concerning such condition and state of repair, nor has the GOVERNMENT made any agreement or promise to alter, improve, adapt, repair or keep in repair the same, or any item thereof or thereupon, which has not been fully set forth in this LEASE, which contains all the agreements made and entered into between the LESSEE and the GOVERNMENT.
- 12) **SUBJECTION TO EXISTING AND FUTURE EASEMENTS AND RIGHTS OF WAY:** This LEASE is subject to all outstanding easements and rights of way over, across, in and upon the LEASED PROPERTY, or any portion thereof, and to the right of the GOVERNMENT to grant such additional easements and/or rights of way over, across, in and upon the LEASED PROPERTY as the GOVERNMENT shall determine to be in the public interest; Provided, that any such additional easement or right of way shall be conditioned on the assumption by the Grantee thereof of liability to LESSEE for such damages as LESSEE shall suffer for property destroyed or property rendered unusable on account of Grantee's exercise of its rights thereunder. There is hereby reserved to the holders of such easements and rights of way as are presently outstanding or which may hereafter be granted, to any workers officially engaged in the construction, installation, maintenance, operation, repair, or replacement of facilities located thereon, and to any Federal, State or local official engaged in the official inspection thereof such reasonable rights of ingress and egress over the LEASED PROPERTY as shall be necessary for the performance of their duties with regard to such facilities.
- 13) **TERMINATION BY GOVERNMENT:**
- a) The GOVERNMENT shall have the right to terminate this LEASE, at any time, without prior notice, and regardless of any lack of breach by LESSEE of any of the terms and conditions of this LEASE. In the event of termination for any reason not involving a breach by LESSEE of the terms and conditions of the LEASE, the GOVERNMENT shall make an equitable adjustment of any advance rentals paid by the LESSEE hereunder. If the GOVERNMENT's use of the LEASED PROPERTY does not require immediate possession thereof, LESSEE shall be permitted, within such time as the Real Estate Contracting Officer shall prescribe to harvest, gather and remove from the LEASED PROPERTY such crops as can be so harvested and removed. However, if the GOVERNMENT'S requirements necessitate immediate repossession of the LEASED PROPERTY, LESSEE shall be precluded from such harvesting and removal of any growing or matured crops. LESSEE hereby specifically releases, remises, and forever discharges the GOVERNMENT from any and all liability or claims of loss or damage of any nature arising out of such termination and repossession, including, but not limited to destruction of, diminution in value of, or inability to harvest any growing crops.
  - b) In the event that the GOVERNMENT shall elect to terminate this LEASE on account of the breach by LESSEE of any of the terms and conditions hereof, no adjustment in advance



rentals paid by LESSEE shall be made, and the GOVERNMENT shall be entitled to recover and LESSEE shall pay to the GOVERNMENT:

- i. The costs incurred in resuming possession of the LEASED PROPERTY;
- ii. The costs incurred in performing any obligation on the part of LESSEE to be performed hereunder.
- iii. An amount equal to the aggregate of all rents, Long Term Maintenance Obligation and charges assumed hereunder and not theretofore paid or satisfied, less the net rentals, if any, collected by the GOVERNMENT on the reletting of the LEASED PROPERTY, which amounts shall be due and payable at the time when such rents, obligations and charges would have accrued or become due and payable under this LEASE.

14) **TERMINATION BY LESSEE:**

- a) LESSEE shall have the right to terminate this LEASE upon ninety (90) days written notice to the Real Estate Contracting Officer in the event of damage to or destruction of all of the improvements on the LEASED PROPERTY or such a substantial portion thereof as to render the LEASED PROPERTY incapable of use for the purposes for which it is leased hereunder; provided:
  - i. the Real Estate Contracting Officer either has not authorized or directed the repair, rebuilding or replacement of the improvements or has made no provision for payment for such repair, rebuilding or replacement by application of insurance proceeds or otherwise, and
  - ii. that such damage or destruction was not occasioned by the fault or negligence of LESSEE or any of its officers, agents, servants, employees, subtenants, licensees and/or invitees, or by any failure or refusal on the part of LESSEE to fully perform its obligations under this LEASE.
- b) The LESSEE has the right to terminate this LEASE at the end of the first year of the lease term, or at the end of any succeeding year of the lease term, by providing the GOVERNMENT at least 180 days advance written notice.

- 15) **SURRENDER:** Upon the expiration of this LEASE or its prior termination, LESSEE shall quietly and peacefully remove itself and all of its property from the LEASED PROPERTY and surrender the possession thereof to the GOVERNMENT; Provided, in the event the GOVERNMENT shall terminate this LEASE upon less than thirty (30) days notice, LESSEE shall be allowed a reasonable period of time, as determined by the Real Estate Contracting Officer, but in no event to exceed thirty (30) days from receipt of notice of termination, in which to remove all of its property from and terminate its operations on the LEASED PROPERTY. During such period prior to surrender, all obligations assumed by LESSEE under this LEASE shall remain in full force and effect; Provided, however, that if the Real Estate Contracting Officer shall, in his/her sole discretion, determine that such action is equitable under the circumstances, he/she may suspend, in whole or in part, any further accruals of Rent or Maximum Amount to be Expended between the date of termination of the LEASE and the date of final surrender of the LEASED PROPERTY.

- 16) **RESTORATION OF LEASED PROPERTY:** Before the expiration of the LEASE, or prior to surrender of the LEASED PROPERTY if the LEASE has been terminated prior to LEASE expiration (subject to the language below), LESSEE shall restore the LEASED PROPERTY and each item thereof or thereupon to the condition in which it was first received and used by LESSEE, or to such improved condition as may have resulted from any improvement made therein by the GOVERNMENT or by LESSEE, subject however, to ordinary wear and tear and loss or damage for which LESSEE is not expressly liable hereunder; Provided, in the event the GOVERNMENT shall terminate this LEASE upon less than thirty (30) days notice LESSEE shall have thirty (30) days from receipt of notice of termination to accomplish such restoration.
- 17) **INSTALLATIONS, ALTERATIONS, AND REMOVALS:**
- a) It is expressly agreed and understood that LESSEE will make no substantial alterations, additions or betterments to or installations upon the LEASED PROPERTY without the prior WRITTEN APPROVAL of the Real Estate Contracting Officer, and then only subject to the terms and conditions of such approval which may include an obligation of removal and restoration upon the expiration or termination of this LEASE. Except insofar as said terms and conditions may expressly provide otherwise, all such alterations, additions, betterments and installations made by LESSEE shall become the property of the GOVERNMENT when annexed or affixed to the LEASED PROPERTY or any part thereof.
  - b) All improvements constructed or installed by the LESSEE on the LEASED PROPERTY, with the limited exception of pumps, holding tanks, motors, portable offices, and other portable equipment, whether constructed or installed at LESSEE's expense or on a reimbursable basis, become the property of the GOVERNMENT upon expiration or earlier termination of the Lease, without any payment being made by the GOVERNMENT. With regard to pumps, holding tanks motors, portable offices, and other portable equipment, such items must be removed from the LEASED PROPERTY prior to the expiration or termination of this LEASE or any extension thereof. Provided, that in the event of termination by the GOVERNMENT upon less than thirty (30) days notice, LESSEE may remove such pumps, holding tanks motors, portable offices, and other portable equipment LESSEE has placed upon the LEASED PROPERTY within thirty (30) days from the receipt of notice of termination. All property not so removed shall be deemed abandoned by LESSEE and may be used or disposed of by the GOVERNMENT in any manner whatsoever without any liability to LESSEE, but such abandonment shall in no way reduce any obligation of LESSEE to the GOVERNMENT pursuant to Clause 16 hereof.
- 18) **INDEMNIFICATION BY LESSEE GOVERNMENT LIABILITY:** LESSEE covenants that it will indemnify and save and hold harmless the GOVERNMENT, its officers, agents, assignees, licensees and employees for and from any and all liability or claims for loss of or damage to any property owned by or in the custody of LESSEE, its officers, agents, servants, employees, subtenants, licensees, or invitees, or for the death of or injury to any of the same which may arise out of or be attributable to the condition, state of repair or LESSEE's use and occupancy of the LEASED PROPERTY, or the furnishing of any utilities or services, or any interruption therein or failure thereof, whether or not the same shall be occasioned by the negligence or lack of diligence of LESSEE, its officers, agents, servants or employees.
- 19) **UTILITIES AND SERVICES:** In the event that the GOVERNMENT shall furnish LESSEE with any utilities and/or services maintained by the GOVERNMENT which LESSEE may require in

connection with its use of the LEASED PROPERTY, LESSEE shall pay the GOVERNMENT the charges therefore in addition to the cash rent (and any other charges/payments) required under this LEASE. Notwithstanding the requirements set forth in Clause 3 (a), such charges for utilities and services, and the method of payment thereof shall be determined by the appropriate supplier of such service, in accordance with applicable laws and regulations, on such basis as the appropriate supplier of such service may establish which may include a requirement for the installation of adequate connecting and metering equipment at the sole cost and expense of LESSEE. It is expressly agreed and understood that the GOVERNMENT in no way warrants the continued maintenance or adequacy of any utilities and/or services furnished to the LESSEE. It is also expressly agreed and understood that the GOVERNMENT does not hereby guarantee that it will provide any specific utilities and/or services to the LESSEE.

- 20) **LIENS:** LESSEE shall promptly discharge or cause to be discharged any valid lien, right in rem, claim or demand of any kind, except one in favor of the GOVERNMENT, which at any time may arise or exist with respect to the LEASED PROPERTY or materials or equipment furnished therefore, or any part thereof, and if the same shall not be promptly discharged by LESSEE, the GOVERNMENT may discharge, or cause to be discharged, the same at the expense of LESSEE.
- 21) **ACCESS:** The GOVERNMENT shall have access to the LEASED PROPERTY at all reasonable times for any purposes not inconsistent with the quiet use and enjoyment thereof by LESSEE, including, but not limited to, the purpose of inspection.
- 22) **STATE AND LOCAL TAXES:** In the event that as a result of any future Act of Congress, subjecting GOVERNMENT-owned property to taxation, any taxes, assessments or similar charges are imposed by State or local authorities upon the LEASED PROPERTY (other than upon LESSEE's possessory interest therein), LESSEE shall pay the same when due and payable and this LEASE shall be renegotiated so as to accomplish an equitable reduction in the amount of the Rent of Maximum Amount to be Expended specified in Clause 3 hereof, which reduction shall in no event exceed the amount of such taxes, assessments, or similar charges; Provided, in event the parties hereto are unable to agree within ninety (90) days from the date of the imposition of such taxes, assessments, or similar charges, upon a rental which in the opinion of the Real Estate Contracting Officer constitutes a reasonable return to the GOVERNMENT on the LEASED PROPERTY, the Real Estate Contracting Officer shall have the right to determine the amount of the rental, which determination shall be unilaterally binding on LESSEE, subject to the LESSEE's appeal of such determination, which shall be treated as a dispute in accordance with the provisions of Clause 23 hereof.
- 23) **DISPUTES CLAUSE (July 2002):**
- a) This LEASE is subject to the provisions of the Contract Disputes Act of 1978, as amended, (41 U.S.C. § 7101-7109).
  - b) Except as provided in the Act, all disputes arising under or relating to this LEASE shall be resolved under this clause.
  - c) "Claim," as used in this clause, means a written demand or written assertion by the LESSEE or the GOVERNMENT seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of LEASE terms, or other relief arising

under or relating to this LEASE. However, a written demand or written assertion by the LESSEE seeking the payment of money exceeding \$100,000 is not a claim under the Act until certified. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

- i) A claim by the LESSEE shall be made in writing and, unless otherwise stated in this LEASE, submitted within 6 years after accrual of the claim to the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest for a written decision. A claim by the GOVERNMENT against the LESSEE shall be subject to a written decision by the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest.
  - (a) The LESSEE shall provide the certification specified in Clause 23 (c) (i) (c) of this clause when submitting any claim exceeding \$100,000.
  - (b) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.
  - (c) The certification shall state as follows:
 

“I certify that the claim is made in good faith; that the supporting data is accurate and complete to the best of LESSEE’s knowledge and belief; that the amount requested accurately reflects the LEASE adjustment for which the LESSEE believes the GOVERNMENT is liable; and that I am duly authorized to certify the claim on behalf of the LESSEE.”
- ii) The certification may be executed by any person duly authorized to bind the LESSEE with respect to the claim.
- d) For LESSEE claims of \$100,000 or less, the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest must, if requested in writing by the LESSEE, render a decision within 60 days of the request. For LESSEE-certified claims over \$100,000, the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest must, within 60 days, decide the claim or notify the LESSEE of the date by which the decision will be made.
- e) The Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest decision shall be final unless the LESSEE appeals or files a suit as provided in the Act.
- f) If the claim by the LESSEE is submitted to the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest or a claim by the GOVERNMENT is presented to the LESSEE, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the LESSEE refuses an offer for ADR, the LESSEE shall inform the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest, in writing, of the LESSEE’s specific reasons for rejecting the offer.
- g) The GOVERNMENT shall pay interest on the amount found due and unpaid from

- (i) the date that the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest receives the claim (certified, if required); or
- (ii) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in FAR 33.201, interest shall be paid from the date that the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.
- h) The LESSEE shall proceed diligently with performance of this LEASE, pending final resolution of any request for relief, claim, appeal, or action arising under the LEASE, and comply with any decision of the Real Estate Contracting Officer, Naval Facilities Engineering Command, Southwest.
- 24) **COVENANT AGAINST CONTINGENT FEES:** LESSEE warrants that no person or agency has been employed or retained to solicit or secure this LEASE upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, excepting bona fide employees or bona fide established commercial agencies maintained by LESSEE for the purpose of securing business. For breach or violation of this warranty, the GOVERNMENT shall have the right to annul this LEASE without liability or in its discretion to require LESSEE to pay, in addition to the rental or consideration, the full amount of such commission, percentage, brokerage, or contingent fee.
- 25) **OFFICIALS NOT TO BENEFIT:** No Member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this LEASE, or to any benefit to arise therefore, but this provision shall not be construed to extend to this LEASE if made with a corporation for its general benefit.
- 26) **FAILURE OF GOVERNMENT TO INSIST ON COMPLIANCE:** The failure of the GOVERNMENT to insist, in any one or more instances, upon performance of any of the terms, covenants or conditions of this LEASE shall not be construed as a waiver or relinquishment of the GOVERNMENT's right to the future performance of any such terms, covenants or conditions and LESSEE's obligations in respect to such future performance shall continue in full force and effect.
- 27) **ASSIGNMENT OR SUBLETTING:**
- a) The LESSEE is not permitted under any circumstances to make any assignment of this LEASE, or of any interest therein, or make any assignment of any property on the LEASED PROPERTY at any time.
- b) The LESSEE shall not sublet the LEASED PROPERTY or any part thereof, or any property thereon, nor grant any interest, privilege, or license whatsoever in connection with this LEASE without the prior written consent of the GOVERNMENT.

- c) The LESSEE shall submit requests for a sublease in writing within 180 days prior to the anniversary date of the LEASE. Only requests for subleases of the entire parcel will be considered. Requests for a sublease within the first year of the LEASE shall not be allowed. Requests for a sublease shall include an adequate reason and justification for the requested sublease and shall include payment of a Real Estate Processing Fee in the amount of \$1,500.00. Requests for a sublease shall include a copy of the proposed sublease agreement, and the proposed sublease agreement must provide that all the terms of the original LEASE expressly apply to the sublease agreement. If the request for a sublease is denied, the Real Estate Processing Fee will be returned, without interest, as soon as practicable.

**28) LABOR PROVISION – EQUAL OPPORTUNITY:**

- a) During the term of this LEASE the LESSEE agrees as follows:
- i. The LESSEE will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The LESSEE will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; selection for training, including apprenticeship. The LESSEE agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the GOVERNMENT setting forth the provisions of this nondiscrimination clause.
  - ii. The LESSEE will, in all solicitations or advertisements for employees placed by or on behalf of the LESSEE, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.
  - iii. The LESSEE will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided by the GOVERNMENT, advising the labor union or worker's representative of the LESSEE's commitments under this Equal Opportunity clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
  - iv. The LESSEE will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and with the rules, regulations, and orders of the Secretary of Labor.
  - v. The LESSEE will furnish all information and reports required by Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and by the rules, regulations, and orders of the Secretary of Labor or pursuant thereto, and will permit access to his books, records, and accounts by the GOVERNMENT (including but not limited to the Secretary of Labor), for purposes of investigating to ascertain compliance with such rules, regulations, and orders.

- vi. In the event of the LESSEE's noncompliance with the Equal Opportunity clause of this LEASE or with any of the above-referenced rules, regulations, or orders, this LEASE may be canceled, terminated or suspended in whole or in part and the LESSEE may be declared ineligible for further GOVERNMENT contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
  - vii. The LESSEE will include the provisions of Clauses 28 (a) (i) through 28 (a) (vii) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, so that such provisions will be binding upon each SUBLESSEE or vendor. The LESSEE will take such action with respect to any SUBLESSEE or purchase order as the GOVERNMENT may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the LESSEE becomes involved in, or is threatened with, litigation with SUBLESSEE or vendor as a result of such direction by the GOVERNMENT, the LESSEE may request the United States to enter into such litigation to protect the interests of the United States. However, the GOVERNMENT makes no guarantee as to whether the GOVERNMENT will enter into or participate in any such litigation.
- b) Convict Labor. In connection with the performance of work required by this LEASE, LESSEE agrees not to employ any person undergoing a sentence of imprisonment at hard labor.
- c) Contract Work Hours and Safety Standards Act (40 U.S.C. § 3701, et. Seq.). This LEASE, to the extent that it is a contract of a character specified in the Contract Work Hours and Safety Standards Act and is not covered by the Walsh-Healey Public Contracts Act (41 U.S.C. § 6501 et. seq.), is subject to the following provisions and exceptions of said Contract Work Hours Standards Safety Act and to all other provisions and exceptions of said law:
- i. The LESSEE shall not require or permit any laborer or mechanic in any workweek in which he is employed on any work under this contract to work in excess of 8 hours in any calendar day or in excess of 40 hours in such workweek on work subject to the provisions of the Contract Work Hours Standards Act unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all such hours worked in excess of 8 hours in any calendar day or in excess of 40 hours in such workweek, whichever is the greater number of overtime hours. The "basic rate of pay," as used in this clause, shall be the amount paid per hour, exclusive of the LESSEE's contribution or cost for fringe benefits and any cash payment made in lieu of providing fringe benefits, or the basic hourly rate contained in the wage determination, whichever is greater.
  - ii. In the event of any violation of the provisions of Clause 28 (c) (i) above, the

LESSEE shall be liable to any affected employee for any amounts due, and to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the provisions of Clause 28 (c) (i) above in the sum of \$10 for each calendar day on which such employee was required or permitted to be employed on such work in excess of 8 hours or in excess of the standard workweek of 40 hours without payment of the overtime wages required by Clause 28 (c) (i) above.

- 29) **GOVERNMENT RULES AND REGULATIONS:** LESSEE shall comply with such rules and regulations regarding STATION security, ingress, egress, safety and sanitation as may be prescribed, from time to time, by the Real Estate Contracting Officer or by the Commanding Officer of the STATION. Such rules and regulations are subject to change at any time.
- 30) **NOTICES:** No notice, order, direction, determination, requirement, consent, or approval under this LEASE (including but not limited to all attachments, exhibits and addenda thereto) shall be of any effect unless in writing. All notices required under this LEASE shall be addressed to LESSEE, or to the Real Estate Contracting Officer, as may be appropriate, at the addresses thereof specified in this LEASE or at such other addresses as may from time to time be agreed upon by the parties hereto. Note that specific provisions of this LEASE and attachments, exhibits and/or addenda thereto may indicate that the LESSEE shall provide notice to a representative of the GOVERNMENT other than the Real Estate Contracting Officer (e.g., the Public Works Officer). In such cases, LESSEE should provide the notice to the individual specified in the particular provision.
- 31) **INTEREST:** Notwithstanding any other provision of this LEASE, unless paid within thirty (30) days, all amounts that become payable by the LESSEE to the GOVERNMENT under this LEASE (net of any applicable tax credit under the Internal Revenue Code) shall bear interest from the date until paid and shall be subject to adjustments as provided by Part 6 of Appendix E of the Armed Services Procurement Regulation, as in effect on the date of this LEASE. The interest rate per annum shall be the interest rate in effect which has been established by the Secretary of the Treasury pursuant to Public Law 92-41; 85 STAT 97 for the Renegotiation Board, as of the date the amount becomes due as herein provided. Amounts shall be due upon the earliest one of (i) the date fixed pursuant to this LEASE; (ii) the date of the first written demand for payment, consistent with this LEASE, including demand consequent upon default termination; (iii) the date of transmittal by the GOVERNMENT to the LESSEE of a proposed supplemental agreement to confirm completed negotiations fixing the amount; or (iv) if this LEASE provides for revision of prices, the date of written notice to the LESSEE stating the amount of refund payable in connection with a pricing proposal or in connection with a negotiated pricing agreement not confirmed by LEASE amendment.
- 32) **ADMINISTRATION:** Any Real Estate Contracting Officer under the direction of the Commander, Naval Facilities Engineering Command Southwest, has complete charge of the administration of this LEASE, and shall exercise full supervision and general direction thereof insofar as the interests of the GOVERNMENT are affected.
- 33) **ENVIRONMENTAL PROVISIONS:** The following definitions shall apply to this LEASE:
- a) "Hazardous Material" means any substance:
- i. the presence of which requires investigation or remediation under any applicable



federal, state or local statute, regulation, ordinance, order, action, policy or common law; or

- ii. which is or becomes defined as a “hazardous waste,” or hazardous substance,” pollutant or contaminant pursuant to any federal, state or local statute, regulation, rule or ordinance now or hereafter in effect, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. § 9601 et seq) and/or the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 et. seq); and/or the California Health & Safety Code §§ 25100 et. seq.
  - iii. which is toxic, reactive, explosive, corrosive, ignitable, flammable, infectious, radioactive, carcinogenic, or otherwise hazardous and is or becomes regulated by any governmental authority, agency, department, commission, board, agency or instrumentality of the United States, the State of California or any political subdivision thereof; or
  - iv. which contains gasoline, diesel fuel or any other petroleum hydrocarbons, polychlorinated biphenyl's (PCBs), asbestos, or urea formaldehyde foam insulation.
- b) “Environmental Requirements” mean all applicable present and future statutes, regulations, rules, ordinances, codes, licenses, permits, orders, approvals, plans or authorizations and similar items of all governmental agencies, departments, commissions, boards, bureaus, or instrumentalities of the United States, states and political subdivisions thereof and all applicable judicial, administrative and regulatory decrees, judgments and orders relating to the protection of human health or the environment and occupational safety and public health and safety, including but not limited to those pertaining to reporting, licensing, permitting, investigation and remediation of emissions, discharges, release or threatened releases of Hazardous Materials, chemical substances, pollutants, contaminants or hazardous or toxic substances, materials or wastes.
- c) “Environmental Damages” mean all claims, judgments, damages, fines, liabilities, encumbrances, liens, costs and expenses of investigation and defense of any claim, whether or not such claim is defeated, and of any good faith settlement or judgment, of whatever kind or nature, contingent or otherwise, matured or unmatured, foreseeable or unforeseeable, including without limitation reasonable attorneys’ fees and consultants’ fees, any of which are incurred at any time as a result of (i) the release or threat of release of any hazardous substance, hazardous constituent, hazardous waste, pollutant, or contaminant into the environment; (ii) the existence of Hazardous Materials (A) upon or beneath the LEASED PROPERTY or (B) migrating or threatening to migrate from the LEASED PROPERTY, or (iii) a violation of Environmental Requirements pertaining to the LEASE, and including damages to personal injury or injury to property or natural resources occurring upon or off of the LEASED PROPERTY and all other costs incurred in connection with the investigation or remediation of such Hazardous Materials or violation of Environmental Requirements including the performance of any cleanup, remediation, removal, corrective action, response, abatement or monitoring work required by any federal, state or local government agency.

## d) Covenants and Requirements:

- i. LESSEE and its officers, employees, agents, and contractors shall be solely responsible for obtaining, at no cost to the GOVERNMENT, any and all environmental permits or approvals required for LESSEE's actions on the LEASE, independent of any existing federal, state, and/or local permits held by the Department of the Navy.
- ii. LESSEE and its officers, employees, agents, and contractors shall comply with all Environmental Requirements. LESSEE shall be solely responsible for any and all Environmental Damages, including but not limited to fines; penalties; environmental fees or taxes and any interest thereon; enforcement actions instituted in connection with LESSEE's use, or otherwise imputed to LESSEE by law through others' use or occupancy, of the LEASED PROPERTY; all costs of corrective action or response to include removal or remedial action incurred by the United States not inconsistent with the National Contingency Plan (NCP); any other necessary costs of response incurred by any other person consistent with the NCP; damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction or loss; and the costs of any health assessment or health effects study carried out under 42 U.S.C. § 9604.
- iii. Use, Storage, Treatment and Disposal of Hazardous Materials on LEASED PROPERTY
  - a) The LESSEE shall strictly comply with the Environmental Requirements, including but not limited to all applicable Federal, State, and local laws and regulations governing release reporting, use, storage, management, and disposal of Hazardous Materials on the LEASED PROPERTY. Except as specifically authorized by the Government in writing, LESSEE must provide at its own expense of such Hazardous Materials management complying with all Environmental Requirements. Government hazardous waste management facilities will not be available to LESSEE. Nor shall LESSEE permit its Hazardous Materials to be commingled with waste of the Department of the Navy. Any violations of the requirements of this condition shall be deemed a material breach of this Lease.
  - b) 10 U.S.C. § 2692 prohibits storage, treatment, or disposal of any material that is toxic or hazardous which is not owned either by the Department of Defense or by a member of the armed forces, on a Department of Defense installation unless the Secretary of the Navy grants a waiver for such activity. LESSEE covenants that it shall not store, produce, manufacture, generate, refine, treat, discharge, release, or dispose of upon, about, or beneath the LEASED PROPERTY any Hazardous Material except as specifically approved by the Secretary of Navy in accordance with 10 U.S.C. § 2692. **This prohibition does not apply to the proper use, temporary accumulation, and associated incidental storage of limited quantities of pesticides, insecticides, herbicides, fungicides, rodenticides, algacides, and fertilizers, or limited quantities of waste generated there from, pursuant to activities authorized under Paragraph 6 of the attached Exhibit "A."**

**Prior to the use of any such chemicals on the LEASED PROPERTY, LESSEE shall comply with the approval requirements of Paragraph 6 (A) (4) of the Soil and Water Conservation Plan.**

- c) In the event LESSEE desires to engage in an activity prohibited by 10 U.S.C. § 2692 on the LEASED PROPERTY, LESSEE shall notify the Government prior to engaging in such activity, and shall cooperate with the Government in the Government's efforts to obtain the waiver required by 10 U.S.C. § 2692. In addition, prior to implementing any changes in activities conducted under such waiver, LESSEE shall notify the Government of any such planned changes and shall cooperate with the Government in obtaining any additional waiver necessitated by the change.
- iv. Except as set forth in Clause 35 (a) (ii), LESSEE covenants that it shall not cause any Hazardous Material to be brought upon, treated, kept, stored, disposed of, discharged, released, produced, manufactured, generated, refined or used upon, about or beneath the LEASE except as specifically approved by the Secretary of the Navy in accordance with 10 U.S.C. §2692. If such approval is obtained, LESSEE shall strictly comply with the Environmental Requirements, including applicable Federal, State, and local laws and regulations governing use, storage, and release reporting of Hazardous Materials on the LEASE and the management/disposal of Hazardous Materials. Except as specifically authorized by the GOVERNMENT in writing, LESSEE must provide at its own expense for such Hazardous Materials management complying with all Environmental Requirements. Government hazardous waste management facilities will not be available to LESSEE. Nor shall LESSEE permit its Hazardous Materials to be commingled with waste of the Department of the Navy. Any violation of the requirements of this condition shall be deemed a material breach of this LEASE.
- v. If any Hazardous Material is brought upon, treated, kept, stored, disposed of, discharged, released, produced, manufactured, generated, refined or used upon, about or beneath the LEASED PROPERTY or any portion thereof in violation of subsections (ii) and (iii) above or is in existence in, on or under the LEASED PROPERTY, LESSEE shall, at the direction of the GOVERNMENT or any federal, state or local authority, remove or remediate such Hazardous Material and/or otherwise comply with the Environmental Requirements of such authority to insure compliance with all Environmental Requirements.
- vi. LESSEE releases, remits, and forever discharges the GOVERNMENT, its officers, agents and employees of and from any and all claims, causes of action, injuries, damages, and demands whatsoever in law or in equity arising out of, or connected with, LESSEE's use or otherwise imputed to LESSEE by law through others' use or occupancy of the LEASED PROPERTY. LESSEE agrees to indemnify, defend, and hold harmless the United States against all fines, claims, damages, lawsuits, judgments, and expenses arising out of such use and/or occupancy of the LEASED PROPERTY and not resulting from the negligence or willful intent or misconduct of GOVERNMENT, its officers, agents, and/or employees.

- vii. Any agency of the United States, its officers, agents, employees, and contractors, may enter upon the LEASED PROPERTY, at all reasonable times for any purposes including, but not limited to, purposes of inspection. The GOVERNMENT normally will give the LESSEE twenty-four (24) hours prior notice of its intention to enter the LEASE, unless it determines sooner entry is required for safety, environmental, operations, or security purposes. The LESSEE shall have no claim against the United States or any officer, agent, employee or contractor thereof, on account of any such entries. The GOVERNMENT's right of inspection shall be without prejudice to the right of duly constituted enforcement officials to make inspections. This right of GOVERNMENT access shall also include the right to conduct any environmental response actions the GOVERNMENT deems necessary.
- viii. Worker Protection Standard (WPS) for Agricultural Pesticides. The Lessee shall follow all WPS requirements on pesticide labels including: Personal Protective Equipment (PPE), Application Requirements, and Agricultural Use Requirements-Restricted-Entry Interval (REI), Early-Entry PPE and Non-hand Labor Early-Entry. The U.S. Environmental Protection Agency, or the California Environmental Protection Agency of Agriculture and Pest Protection can provide the Lessee with additional WPS information.
- ix. Pollution Prevention and Right-To-Know Information (August 2003)
  - a) *Definitions.* As used in this clause—"Priority chemical" means a chemical identified by the Interagency Environmental Leadership Workgroup or, alternatively, by an agency. "Toxic chemical" means a chemical or chemical category listed in 40 CFR 372.65.
  - b) Pursuant to Executive Order 13423 Federal facilities comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. §§ 11001-11050) and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. § 13101-13109).
  - c) The LESSEE shall provide all information needed by the Federal facility to comply with the following:
    - (i) The emergency planning reporting requirements of Section 302 of EPCRA.
    - (ii) The emergency notice requirements of Section 304 of EPCRA.
    - (iii) The list of Material Safety Data Sheets, required by Section 311 of EPCRA.
    - (iv) The emergency and hazardous chemical inventory forms of Section 312 of EPCRA.
    - (v) The toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA.
    - (vi) The toxic chemical, priority chemical, and hazardous substance release and use reduction goals of Sections 502 and 503 of Executive Order 13423.

34) **SAFETY AND HEALTH REQUIREMENTS:**

- a) LESSEES, employers, and/or business owners shall develop and implement a written safety and health program (SHP) for their employees involved in any agricultural operations under the GOVERNMENT'S agricultural lease program.
- b) The program shall be designed to identify, evaluate and control safety and health hazards and provide ways, means and methods to protect employees from potential injury or illness.
- c) Subcontractors shall develop and implement their own SHP and shall comply with the requirements of this guidance. If a subcontractor does not have its own SHP, the LESSEE or business owner shall include the subcontractor in his/her written SHP describing the subcontractor and its operation.
- d) A site safety and health officer (SSHO) shall be assigned and designated in writing and shall have the following qualifications:
  - i) A minimum of two (2) years experience in agricultural operations.
  - ii) A minimum of one (1) year of experience in implementing safety and health programs in an agricultural site.
  - iii) 10-hour OSHA safety class or equivalent within the last 5 years.
  - iv) Competent person training as needed.
- e) The SHP shall be continuously reviewed throughout the life of the LEASE. At a minimum, reviewed yearly and amended as necessary, especially when new hazards, not originally identified in the program, are discovered.
- f) A copy of the written SHP shall be on site and be made available to any contractor, subcontractor, to employees, OSHA, and other federal, state and local agency with regulatory authority over the site.
- g) Accident/mishap reporting: Any mishap or accident that requires reporting of injuries, illness, and property damage under OSHA shall be reported to the base's Officer of the Day (OOD) and the STATION POC within 24 hours of the incident. The LESSEE, employer, and/or business owner shall conduct an accident/mishap investigation and provide a copy of the report to the OOD and STATION POC within five (5) calendar days of the incident.

35) **SPECIAL PROVISIONS:**

- a) In accordance with Clause 29, Government Rules and Regulations hereof, the following additional requirements are prescribed at this time:
  - i) Possessory Interest Tax: Where applicable, the leasehold interest in GOVERNMENT-owned land may be subject to State and local taxation as a possessory interest in tax exempt real property. The amount of assessment to be charged to the LESSEE is determined by the County Assessor. Such taxes are the sole responsibility and liability of the LESSEE.
  - ii) LESSEE shall not store on the LEASED PROPERTY any property that is dangerous

- to public health or safety, without providing adequate safeguards. No property of this type shall be abandoned or destroyed on the Leased Property. The GOVERNMENT assumes no liability for damage to the Leased Property or for personal injuries sustained as a result of removal or use of the property that is dangerous to public health and safety. Furthermore, the GOVERNMENT shall be held harmless from any and all demands, suits, actions and claims arising from any storage, use or disposal of any property that is dangerous to public health and safety.
- iii) Notwithstanding Clause 33 (d) (iii), the LESSEE may store and use fuel and motor oil on parcels which have a dedicated ground water well, provided such fuel and motor oil is used exclusively for the operation of said groundwater well and appurtenances. Such storage containers shall be equipped with a locking valve and secured any time the pump is not in use. No such fuel or motor oil shall be abandoned or otherwise disposed of on the LEASED PROPERTY. The GOVERNMENT assumes no liability for damage to such property or for personal injuries sustained as a result of removal or use of such fuel or motor oil. Furthermore, the LESSEE shall hold the GOVERNMENT harmless from any and all liability or claims for damage to or loss of property, or for injury or death, which may arise out of or be attributable to any such use or disposal, in accordance with Clause 18 herein.
  - iv) In the event LESSEE stores fuel and/or motor oil, LESSEE shall bring secondary containment into compliance with 40 C.F.R Part 112.
  - v) LESSEE shall not mix or store pesticides, herbicides or fertilizers on the LEASED PROPERTY. LESSEE shall be allowed temporary staging of approved pesticides, herbicides or fertilizers. Temporary staging is defined as the duration of any application of the approved product. Under no circumstances shall LESSEE be allowed overnight staging. LESSEE shall conduct decontamination of applicators of pesticides, herbicides, and fertilizers off the LEASED PROPERTY.
  - vi) Cost Sharing Assistance: Cost sharing assistance may be available to the LESSEE under U. S. Department of Agriculture, Conservation Programs. The LESSEE, however, shall not apply for or accept any federal cost sharing payment for any soil and water conservation practice required by the LEASE that will result in duplicate payment for such practice. Projects completed as partial or entire consideration for the LEASE, or for which reimbursement is made by the Department of the Navy, are not qualified as cost sharing projects under the USDA Conservation Programs. Any LESSEE of the STATION's agricultural or grazing lands who wishes to enter into any U.S. Department of Agriculture Conservation Program contract or agreement shall do so solely at the discretion of and subject to the USDA rules and regulations. The GOVERNMENT, Department of Navy, makes no guarantee to the LESSEE regarding normal crop acreages, allotments for crops, or the status of outleased land as being qualified for USDA programs.
  - vii) The LESSEE shall be available at all times to correct emergency situations with regard to the LEASE. The LESSEE shall provide the STATION POC with emergency telephone numbers where the LESSEE may be contacted during working and non-working hours. The LESSEE shall also provide at least one alternative point of contact (name, address, and phone number) that may act on behalf of the LESSEE in emergency situations. The LESSEE or his alternate(s) shall be available for contact

seven days per week, 24 hours per day and should arrive on STATION within two hours after being notified in any way of an emergency.

- a) LESSEE Alternative Point of Contact authorized to act on behalf of the LESSEE in emergency situations:

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Home Telephone: \_\_\_\_\_  
Mobile Telephone: \_\_\_\_\_

viii) Hazardous Waste: All hazardous waste generated on the LEASED PROPERTY must be transported and disposed of offsite in accordance with federal, state, and local law. The LESSEE shall use its own EPA Identification Number and all hazardous waste shipments must be accompanied by a manifest listing the LESSEE's EPA ID Number. LESSEE shall provide copies of the manifests to the Base Environmental Department point of contact.

- ix) The LESSEE shall coordinate all activities with the STATION POC or his/her designated representative identified in below.

(a) Lease Issues

NAVFAC Real Estate (RE/POC)  
Naval Facilities Engineering Command Southwest  
Attn: Robert Ripley, Realty Specialist, Code: JV10.RR  
1220 Pacific Highway  
San Diego, California 92132-5190  
Telephone (619) 532-2331, Facsimile (619) 532-1242  
Email: [robert.ripley1@navy.mil](mailto:robert.ripley1@navy.mil)

(b) Soil and Water Conservation Plan Issues

Integrated Product Team (IPT) Desert  
Naval Facilities Engineering Command Southwest  
Attn: Carol Dahlstrom, Natural Resources, Code: JE20.CD  
1220 Pacific Highway  
San Diego, California 92132-5190  
Telephone: (619) 532-2269  
Email [carol.dahlstrom@navy.mil](mailto:carol.dahlstrom@navy.mil)

(c) Station Point of Contact (STATION POC):

Station Representative  
Attn: Don Svaldi  
Naval Radio Transmitting Facility, Dixon  
7200 Radio Station Road, Building 10  
Dixon, California 95620  
Telephone: (707) 678-1252

36) **EXECUTION BY LESSEE:**

LESSEE: \_\_\_\_\_  
(print)

Names of all Corporate officers, directors, and shareholders, partners of partnership, or officers or members of other business entity submitting bid:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Tax Identification #: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

FedEx Mailing Address: \_\_\_\_\_

Home Telephone: \_\_\_\_\_

Mobile Telephone: \_\_\_\_\_

24 Hour Emergency Telephone: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Fax: \_\_\_\_\_

\_\_\_\_\_  
Signature of Lessee Date

\_\_\_\_\_  
Title of Lessee Witness

For Corporation LESSEE, certification by Secretary or Assistant Secretary of the Corporation:

I certify that the person who signed this LEASE on behalf of LESSEE was then the Officer indicated and this agreement was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

(Corporate Seal) \_\_\_\_\_  
Signature

\_\_\_\_\_  
ITS Title



37) **EXECUTION BY THE GOVERNMENT:**

THE UNITED STATES OF AMERICA  
Department of the Navy  
Naval Facilities Engineering Command Southwest  
Real Estate Services (AM1)  
1220 Pacific Highway, Building 128  
San Diego, CA 92132

\_\_\_\_\_  
ALEXANDRA S. ELIAS  
Real Estate Contracting Officer

\_\_\_\_\_  
Date

38) **NAVY IDENTIFICATION DATA:**

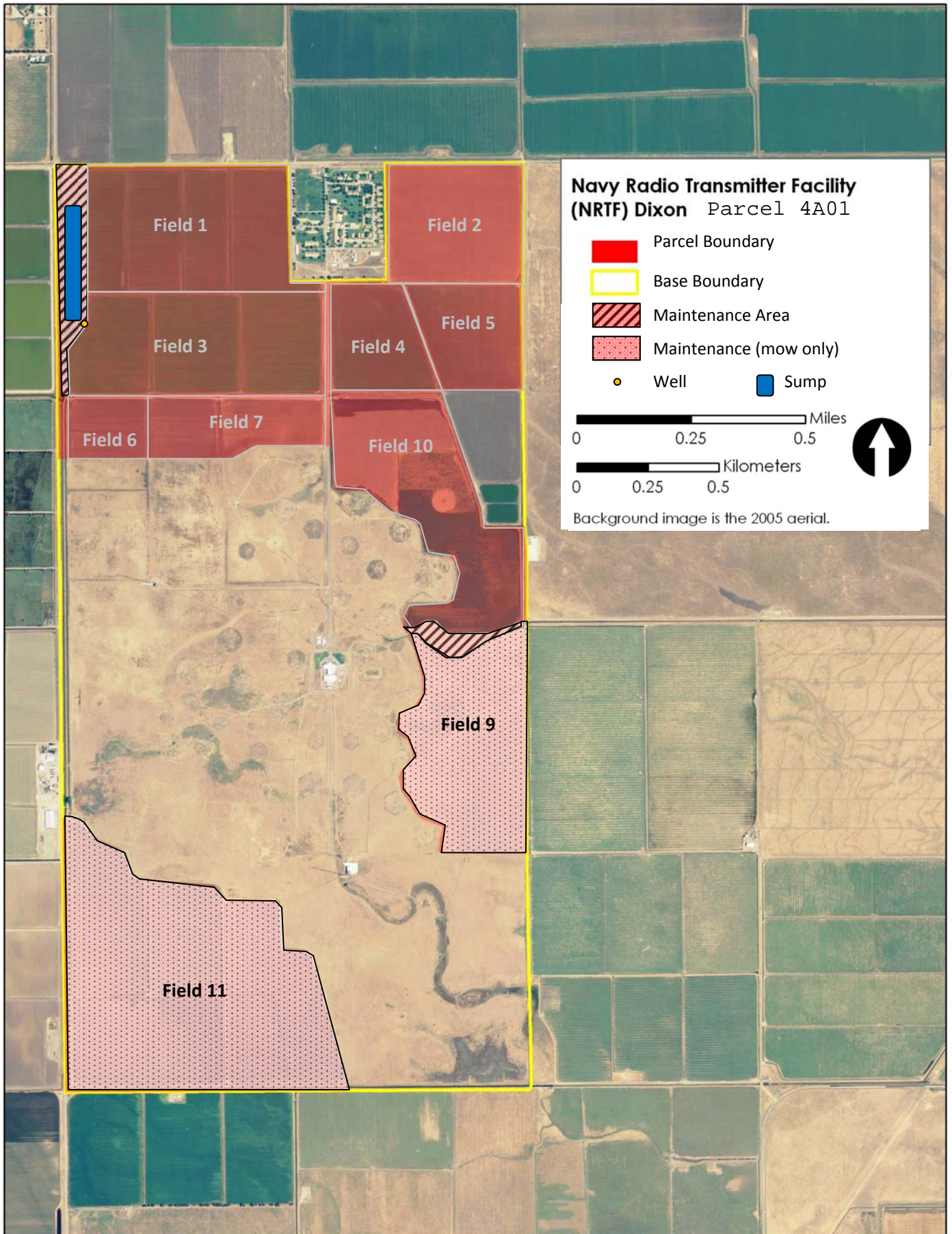
**N6247312RP00158, Parcel 4A01**

a. **NAME AND ADDRESS OF STATION:**

Naval Radio Transmitting Facility  
7200 Radio Station Road  
Dixon, California 95620

b. **REAL ESTATE CONTRACTING OFFICER/TITLE AND ADDRESS:**

Commanding Officer  
Real Estate Services (Code AM1.AE)  
Naval Facilities Engineering Command Southwest  
1220 Pacific Highway, Building 128  
San Diego, CA 92132



Appendix A: Soil and Water Conservation Plan for Agricultural Outlease

## Soil and Water Conservation Plan for Agricultural Outlease Outline of Conservation Work

### Continuous Responsibility

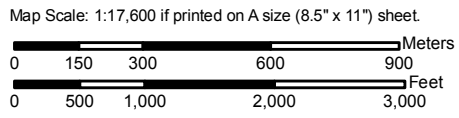
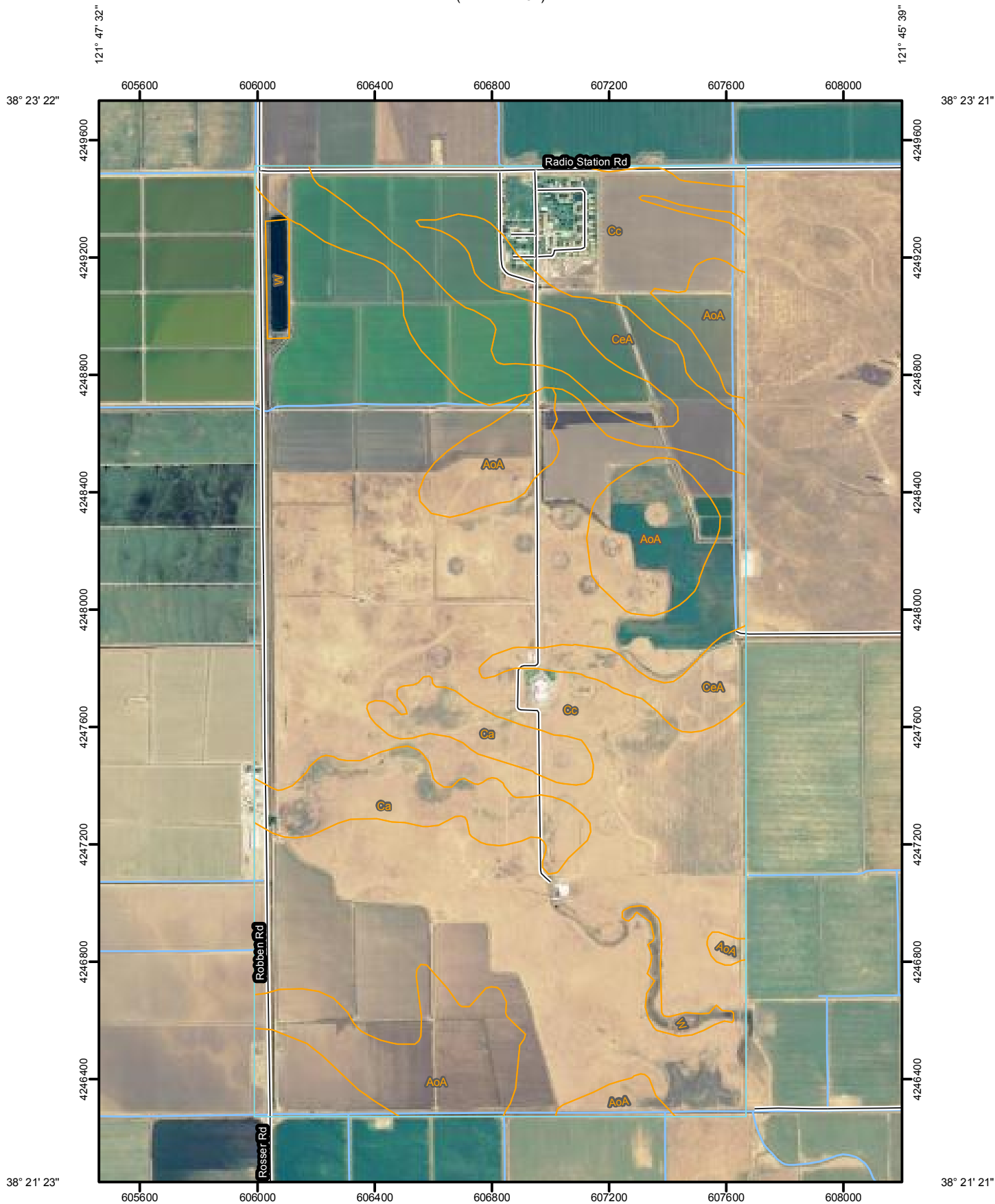
PARAGRAPH	DESCRIPTION	NOTES
6.A.1.	Irrigation Pipeline Installation	Install pipeline during the first year of the lease.
6.A.2.	Irrigation Management	
6.A.2.a.	Irrigation Ditches	
6.A.2.b.	Drain Ditches and Canals	
6.A.2.c.	Surface Storm Water Runoff	
6.A.3.	Groundwater Well Equipment and Appurtenances	Submittal Due for Parcels with wells
6.A.4	Water Quality Testing	Submittal Due for Parcels with wells and/or Parcels with approval to use off-station water
6.A.5	Harvested Crop Storage	
6.A.6.	Weed and Pest Management	
6.A.6.a.	Annual Plan for Pest Management	Submittal Due
6.A.6.b.	Pest Management Reporting	Reporting Requirement
6.A.6.c.	Non-chemical Weed Control	
6.A.6.d.	Chemical Weed and Pest Management	
6.A.6.d.1.	Pesticide Application and Disposal	
6.A.6.d.2.	Private Applicator Certification	
6.A.6.d.3.	Aerial Pesticide Application	Aerial Application Notification Requirement
6.A.6.e.	Mosquito abatement	
6.A.7.	Dust control	
6.A.8.	Minimum Tillage & Land Leveling	
6.A.9.	Soil Ripping & Damages to Government Property	
6.A.10.	Road Damage Prevention	
6.A.11.	Erosion Control	
6.A.12.	Fire Prevention	
6.A.12.a.	Equipment	
6.A.12.b.	Storage of Equipment and Flammable Materials	
6.A.12.c.	Spark-Producing Equipment	
6.A.12.d.	Crop Residue	
6.A.13.	Debris Removal	
6.A.14.	Fallow Land Management	
6.A.15.	Fence Maintenance	
6.A.16.	Maintenance Areas	
6.A.17.	CA regional water control board & Yolo/Solano Valley Air Management District	

## Soil and Water Conservation Plan for Agricultural Outlease Outline of Conservation Work




































### Requirements and Submittals

PARAGRAPH	DESCRIPTION	DUE	FREQUENCY
5.C.	Irrigation Water Available and Acreage Farmed (written request/ written concurrence)	As Applicable	As Applicable
6.A.1	Irrigation Pipeline Installation	1st Year of the Lease	once
6.A.3.	Well logs (applies to parcels with wells)	31-December	Annually
6.A.4.	Well water quality testing (applies to parcels with wells and/or parcels with approval to use off-station water)	Due within 30 days of well operation	As necessary
6.A.6.a.	Annual Pest Management Plan	15-Jan	Annually
6.A.6.b.	Navy Online Pesticide Reporting System (NOPRS) Access	15-Jan	First Lease Term
		31-December (1st-4th Lease Period)	Annually
6.A.6.b.	Pest Management Reporting	60-days prior to Lease expiration	
6.A.6.d.3.	Aerial Pesticide Application	24 Hours prior to Application	All Aerial Applications of Pesticides

Soil Map—Solano County, California  
(NRTF Dixon)



### MAP LEGEND

- Area of Interest (AOI)**
  -  Area of Interest (AOI)
- Soils**
  -  Soil Map Units
- Special Point Features**
  -  Blowout
  -  Borrow Pit
  -  Clay Spot
  -  Closed Depression
  -  Gravel Pit
  -  Gravelly Spot
  -  Landfill
  -  Lava Flow
  -  Marsh or swamp
  -  Mine or Quarry
  -  Miscellaneous Water
  -  Perennial Water
  -  Rock Outcrop
  -  Saline Spot
  -  Sandy Spot
  -  Severely Eroded Spot
  -  Sinkhole
  -  Slide or Slip
  -  Sodic Spot
  -  Spoil Area
  -  Stony Spot
- Special Line Features**
  -  Gully
  -  Short Steep Slope
  -  Other
- Political Features**
  -  Cities
- Water Features**
  -  Streams and Canals
- Transportation**
  -  Rails
  -  Interstate Highways
  -  US Routes
  -  Major Roads
-  Very Stony Spot
-  Wet Spot
-  Other

### MAP INFORMATION

Map Scale: 1:17,600 if printed on A size (8.5" × 11") sheet.  
 The soil surveys that comprise your AOI were mapped at 1:24,000.  
 Please rely on the bar scale on each map sheet for accurate map measurements.  
 Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
 Coordinate System: UTM Zone 10N NAD83  
 This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.  
 Soil Survey Area: Solano County, California  
 Survey Area Data: Version 5, Dec 12, 2007  
 Date(s) aerial images were photographed: 6/30/2005; 6/29/2005  
 The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

### Map Unit Legend

Solano County, California (CA095)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AoA	Antioch-San Ysidro complex, 0 to 2 percent slopes	167.4	12.5%
Ca	Capay silty clay loam	82.7	6.2%
Cc	Capay clay	941.5	70.1%
CeA	Clear Lake clay, 0 to 2 percent slopes	135.3	10.1%
W	Water	15.8	1.2%
<b>Totals for Area of Interest</b>		<b>1,342.7</b>	<b>100.0%</b>

**Soil and Capability Summary**  
**NRTF Dixon, California**  
**Solano County**

Soil Name	Symbol on Map	Land Capability Unit	Effective Rooting Depth	Soil Profile			Avg. Slope (%)	Erosion Status	Suitable Land Uses or Crops	Limiting Factors/ Remarks
				Texture		Available Water Capacity				
				Surface	Subsoil					
Capay silty clay loam	Ca	<u>Ils-3</u>	60"+	Silty clay loam	Silty clay loam	8-10"	0-2	None to slight	<u>Most climatically adapted field and row crops, pasture, orchard and vineyard.</u>	Restricted subsoil permeability
Capay clay	Cc	<u>Ils-5</u>	60"+	Clay, slightly acidic	Clay	8-10"	0-2	None to slight	<u>Most climatically adapted field and row crops, pasture, orchard and vineyard.</u>	Fine texture and slow permeability
Clear Lake clay	CeA	<u>Ils-5</u>	60"+	Clay, neutral	Clay	8-10"	0-2	None to slight	<u>Most climatically adapted field and row crops, pasture, orchard and vineyard.</u>	Fine texture and slow permeability
Antioch-San Ysidro complex	AoA	<u>Ils-3</u>	15-20"	Loam to fine sandy loam	Clay to heavy clay loam	2-4"	0-2	None to slight	<u>Most climatically adapted field and row crops</u>	Shallow depth, moderate saline-alkali; very slow subsoil permeability

Appendix E  
Soil and Water Conservation Plan for Agricultural Outlease

- (1) Pest Management Project Plan Instructions
- (2) Crop Duster Request Form



## **AGRICULTURAL CROP PEST MANAGEMENT PROJECT PLAN INSTRUCTIONS**

The purpose of the agricultural Crop Pest Management Project Plan is to provide Navy and Marine Corps installation agricultural outlease managers with information on the pest management activities and chemicals that may be used on leased property. The plan is to be completed by the Lessee and submitted to the installation's Integrated Pest Management Coordinator and the NAVFAC Southwest Contact. The form is to be updated whenever pest management practices or crops change. For the purposes of the plan, a pest includes diseases, arthropods, nematodes, weeds, rodents, and other organisms that cause harm or are detrimental to the production of the crop.

1. The three page form may be viewed in "Microsoft Word" and filled in and printed, or the form may be printed and the information written on the hard copy form. Use a dark pen and ensure that it is legible. If written entries exceed the space allotted, then use additional lines or sheets.
2. Complete one set of forms for each crop grown.
3. Block 1: Enter the name of the crop grown.
4. Block 2: Enter the season(s) in which the crop will be grown.
5. Block 3: List the specific pests under each category of pest: disease, arthropod, nematode, weed, and other pests. If the treatment will be the same or similar for several pests you may group them together as one pest group. Complete blocks 4 through 7 for each of the pests or pest groups.
  - a. Block 4: List the method(s) that are used by the farmer or pest control advisor to detect the pest. This may include visual observation, trapping, netting, etc. Write the word "Preventive" in this block if the treatment method is to prevent the pest from occurring.
  - b. Block 5: Enter the threshold level at which control will be initiated. If the treatment is preventive, then write "0." If a single observation of an organism or disease symptom is needed to initiate control, then write "1." For all others indicate the number of pests or infected/affected plants per surface unit (i.e. acre, hectare, sq foot).
  - c. Block 6: List the non-chemical methods to control or prevent the pests. If fertilizers are used, then enter "Fertilizer" in this block and do not include the name of chemical fertilizers in Block 7.
  - d. Block 7: List the complete names and EPA registration numbers (as written on the product label) of the chemicals to be used.





1. CROP:				
2. GROWING SEASON(S):				
3. PEST PROBLEM	4. Detection method	5. Action Threshold	6. Non-chemical Control	7. Chemical Control (Product name and EPA Reg No.)
<b>NEMATODES</b>				
<b>WEEDS</b>				
<b>OTHER</b>				

<b>1. CROP:</b>				
<b>2. GROWING SEASON(S):</b>				
<b>3. PEST PROBLEM</b>	<b>4. Detection method</b>	<b>5. Action Threshold</b>	<b>6. Non-chemical Control</b>	<b>7. Chemical Control (Product name and EPA Reg No.)</b>

**CROP DUSTER REQUEST FORM**

NOTE: ALL INFORMATION MUST BE COMPLETE PRIOR TO FINAL APPROVAL.

TIME/DATE: \_\_\_\_\_

NAME OF CALLER \_\_\_\_\_

FARMER \_\_\_\_\_

NAME OF DUSTER \_\_\_\_\_ TEL. NO. \_\_\_\_\_

NO. OF PLANES \_\_\_\_\_ REGISTRATION NOS. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

START \_\_\_\_\_

STOP \_\_\_\_\_

WORKING AREA: RANGE \_\_\_\_\_ TOWNSHIP \_\_\_\_\_ SECTIONS \_\_\_\_\_

RANGE \_\_\_\_\_ TOWNSHIP \_\_\_\_\_ SECTIONS \_\_\_\_\_

RANGE \_\_\_\_\_ TOWNSHIP \_\_\_\_\_ SECTIONS \_\_\_\_\_

RANGE \_\_\_\_\_ TOWNSHIP \_\_\_\_\_ SECTIONS \_\_\_\_\_

TYPE OF INSECTICIDE \_\_\_\_\_

RADIO EQUIPPED? YES \_\_\_\_\_ WILL USE: 126.2 124.1 125.95 134.1  
(CIRCLE ONE)

NO \_\_\_\_\_

CURRENT WEATHER \_\_\_\_\_

COORDINATION COMPLETED WITH \_\_\_\_\_ TOWER WATCH SUPERVISOR

ESSENTIAL INFORMATION PASSED TO DUSTER \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ W/S \_\_\_\_\_

ACTION TAKEN: APPROVED  
(CIRCLE ONE)

DISAPPROVED

\_\_\_\_\_  
INITIALS

Reviewed: 19 JAN 2006

**Navy Radio Transmitter Facility (NRTF) Dixon, CA  
Agricultural Lease Site Access and Gate Procedures.**

Access to the NRTF Dixon site is restricted to "Personnel Authorized by U.S. Government Regulation". Government physical security regulations require that access be monitored and controlled. At NRTF Dixon the Contract Project Manager is charged with ensuring physical security of the site.

The agricultural lessee and his/her employees are authorized users of the property covered in the Government Agricultural Lease, and therefore are considered authorized to access the NRTF Dixon Site in conjunction with farming activities. The lessee's access extends to areas covered by the AG Lease, including roads/easements to facilitate that access. Access is generally not permitted in or around antennas or within the Bldg. #10 Compound.

Currently there are five gates, but that number could change based on the requirements of the AG Lease, as coordinated with and approved by the U.S. Navy. The Main Gate is fixed and permanent, and is used for all official business at the site. The rest of the gates are used predominately for farm access in conjunction with the AG Lease.

1. The Main Gate is located at about the middle of the Northern boundary, on Radio Station Road. The gate has two sides, wide enough to handle tractor/trailer rigs and large farm vehicles. The "electronic side" is controlled by electronic keypad, with a phone (in a phone box) to coordinate access for deliveries. The "manual side" is locked using security padlocks.
2. The Northeast Small Vehicle Gate is in the North Fence off Radio Station Road, at the corner where the North and East Fence lines meet. It is manually controlled.
3. The Northwest Small Vehicle Gate is in the West Fence off Robben Road, at the corner where the West and North Fence lines meet. It is manually controlled.
4. The Southwest Small Vehicle Gate is in the West Fence, off Robben Road, at the corner where the West and South Fence lines meet. It is manually controlled. I recently recommended that the bridge associated with that gate is not safe for vehicles, and that only foot traffic should be allowed.
5. The West Personnel Gate is in the West Fence, off Robben Road, at about the midpoint between the Northern and Southern boundaries of the NRTF. It is across the road from the Robben Farms hay barn. It is manually controlled.

**Requirements:**

- A. All gates must be kept in a good state of repair, and have a positive locking mechanism. Gates used predominately in conjunction with the AG Lease will be maintained by the AG Lessee. The AG Lessee will repair any and all damages to the Main Gate caused by AG Lessee actions.
  
- B. All Gates will be closed and locked when not in actual use. The AG LESSEE (or his/her representative) will immediately report to the NRTF Dixon Operations Watch Operator (707-678-8990) or by using the Main Gate phone the use of any gate. Any gate left open will be physically attended at all times while left open. The Navy Operations Contract Watch Operator will record notifications of access and gate status in the NRTF Dixon Station Log. Information recorded will include the time the report was made, the name of the person reporting, and the current status of the gate.
  
- C. Gates found open and unattended by Navy or Navy Operations Contract Personnel will be closed and locked. That information will be recorded in the NRTF station log. The Site Manager will coordinate each such incident with the AG Lessee.
  
- D. The AG Lessee will notify the Navy Operations Watch Operator of any suspected unauthorized entries. The Watch Operator will notify the Site Manager, or in his/her absence the appropriate Navy Operations Contract Supervisor, whenever any unauthorized access is detected.

DISTRIBUTION: USN AG Lease Manager  
COR/TA  
NCTS SD  
NRTF SOP BINDER (CONSOLE)  
Lead Electronics Technician III  
Facilities Supervisor



GRANT OF EASEMENT

BOOK 721 PAGE 149

THIS INDENTURE, made and entered into by and between the UNITED STATES OF AMERICA, party of the first part, (hereinafter called the Grantor), and DIXON SOIL CONSERVATION DISTRICT, a political subdivision of the State of California, with address at Post Office Box 647, Dixon, California, party of the second part, (hereinafter called the Grantee)

W I T N E S S E T H:

WHEREAS, the Grantee has requested the conveyance to it of an easement for the construction, maintenance and operation of a drainage ditch over and across certain lands of the Grantor, being a portion of the U. S. Naval Radio Station, Dixon, Solano County, California, (hereinafter referred to as the Station) the location of the said ditch to be more particularly described hereinafter; and

WHEREAS, the Grantor's Secretary of the Navy has determined that the granting of such easement will not be incompatible with the public interest and such easement does not include any more land than is reasonably necessary for the purpose for which granted;

NOW, THEREFORE, in consideration of the premises and of the mutual benefits and advantages accruing to the parties hereto, and subject to the conditions and reservations hereinafter set out, the Grantor, represented by the Chief of the Bureau of Yards and Docks, acting under the direction of the Secretary of the Navy, pursuant to the Act of Congress of July 24, 1946 (60 Stat. 643, 43 USC 931b) as made applicable to the Secretary of the Navy by the Act of Congress

RECORDED AT REQUEST OF \_\_\_\_\_ DATE \_\_\_\_\_  
Official Records Department  
Solano County, California  
M. E. BUCKINGHAM, Recorder  
By \_\_\_\_\_ Deputy  
at \_\_\_\_\_ Min. post. \_\_\_\_\_ M. \_\_\_\_\_

of October 25, 1951 (65 Stat. 641, 50 USC Supp. V 171-1), hereby conveys to the Grantee, its successors and assigns, a permanent easement for the construction, maintenance and operation of a drainage ditch over and across a portion of the land comprising the Station, more particularly described as follows:

A strip of land 50 feet wide situate in Solano County, California, in Sections 8 and 17, Township 6 North, Range 2 East, MDB&M, said strip of land lying 25 feet measured at right angles on each side of the following described center line:

BEGINNING at a point in the north line of the aforesaid Section 8, distant thereon 59 feet easterly from the northwest corner of Section 8, (the north line of Section 8 being the north boundary of that certain 1285 acres of land, more or less, acquired by the United States of America in Civil Action No. 5150, had in the District Court of the United States in and for the Northern District of California, Northern Division), from said point of beginning thence, crossing said 1285 acres of land, more or less,

(1) Southerly, (parallel to and distant 59 feet easterly, measured at right angles, from the west line of Sections 8 and 17), a distance of 10,531 feet, more or less, to a point distant 29 feet northerly, measured at right angles, from the south line of Section 17; thence

(2) Easterly, (parallel to and distant 29 feet northerly, measured at right angles, from the south line of Section 17), a distance of 5221 feet, more or less, to a point of terminus in the east line of Section 17.

The northerly and easterly termini of said strip of land being a portion of the north and east boundaries respectively of the aforesaid 1285 acres of land, more or less, and

CONTAINING in said strip of land 18 acres, more or less.

This easement is granted subject to the following conditions and reservations:

1. That the construction, maintenance and operation of the drainage ditch shall be accomplished without cost or expense to the Grantor; and shall be done at the sole expense of the Grantee. All plans and specifications for such construction, maintenance and operation shall be submitted to and approved by the District Public Works Officer, Twelfth Naval District, San Bruno, California, (hereinafter called the Officer-in-Charge) prior to the commencement of such construction. Any changes in such plans and specifications contemplated by the Grantee in such construction, operation or maintenance, as the case may be, of such drainage ditch, likewise shall be submitted and approved by such Officer-in-Charge prior to the making of such changes.

2. That the use and occupation of the lands described herein, incident to the exercise by the Grantee of the easement herein conveyed, shall be subject to such rules and regulations from time to time, may be prescribed by the Officer-in-Charge in order to insure that such use and occupation does not unreasonably interfere with the Grantor's use and enjoyment of the Station.

3. That any property of the Grantor damaged or destroyed by the Grantee, arising out of the exercise by the

Grantee of the rights herein conveyed, shall be promptly repaired or replaced by the Grantee to the satisfaction of the Officer-in-Charge or, in lieu of such repair or replacement, the Grantee shall, if required by the Grantor, pay to the Grantor money in an amount sufficient to compensate for the loss sustained by the Grantor by reason of such damages to or destruction of the Grantor's property.

4. That the Grantor shall not be responsible for damages to property nor for injuries to persons which may arise from or be incident to the use and occupation of the lands described above for the construction, maintenance or operation of the said drainage ditch, nor for damages to property nor for injuries to the person of the Grantee's officers, agents, servants, employees, or others who may be on the Station at its or their invitation, or any one of them, arising from or incident to the Grantor's activities at the Station; and the Grantee shall hold the Grantor harmless of and from any and all claims which may arise out of or be attributable to any such damages or injuries, except to the extent that such damages or injuries are caused solely by the Grantor's negligence in its use and occupation of the Station.

5. That the Grantee, at reasonable intervals of time, shall inspect the said drainage ditch and immediately repair or correct any defect found to exist in the construction, maintenance or operation thereof. Such repair shall be made at the sole expense of the Grantee.

6. That the Grantor hereby reserves unto itself the right to the joint user of such drainage ditch; and reserves unto itself the further right to use the lands described above for any purpose or purposes and in such a manner

as not to unreasonably interfere with the Grantee's enjoyment of the easement herein granted.

7. That upon completion of the construction of such drainage ditch, the Grantee shall restore all lands, fencing and other facilities of the Grantor to the same or as good a condition as existed prior to the commencement of such construction, after giving effect to the existence of such drainage ditch; and shall provide, construct and install culverts across such drainage ditch at such place or places as may be prescribed by the Officer-in-Charge. All of such things shall be done by the Grantee at its sole expense.

8. That the Grantee shall provide, during all stages of construction, for access of emergency and fire-fighting equipment over roadways affected by such construction.

TO HAVE AND TO HOLD said easement unto the Grantee, its successors and assigns, for so long as such easement shall be used for drainage ditch purposes; PROVIDED, HOWEVER, that in the event of the failure of the Grantee to comply with the conditions herein set out, or for non-use for a period of two (2) consecutive years, or for abandonment of the rights granted hereunder, the easement herein granted shall cease and automatically shall revert to and be vested in the Grantor, without any necessity for re-entry by the Grantor on the lands described above or the filing of any action at law or in equity by the Grantor to regain possession; and PROVIDED, FURTHER, that upon termination of this grant of easement the Grantee, upon demand by the Grantor and without any expense to the Grantor, shall restore the lands described above to a condition satisfactory to the Grantor. In the event the Grantee shall fail, neglect

721 154

or refuse to restore the lands, as aforesaid, the Grantor shall have the option either to take the said drainage ditch as the property of the Grantor, without compensation therefor, or to perform the restoration work, as aforesaid, at the expense of the Grantee, in which event, the Grantee shall not have any claim for damages against the Grantor or its officers or agents by reason thereof.

IN WITNESS WHEREOF, the Grantor has caused this instrument to be executed by the Chief of the Bureau of Yards and Docks, for and in its behalf, and the seal of the Department of the Navy to be hereunto affixed, this 24<sup>th</sup> day of May, 1954.

UNITED STATES OF AMERICA

(SEAL)

BY [Signature]  
Chief of the Bureau of Yards and Docks, acting under the direction of the Secretary of the Navy

WITNESSES:

Margie L. Rogers  
Edgar J. Jenkins

COMMONWEALTH OF VIRGINIA )  
COUNTY OF ARLINGTON ) SS

I, Elizabeth M. [Signature], a Notary Public in and for the said County, do hereby certify that [Signature] party to that certain grant of easement bearing date of [Signature], 1954, hereunto annexed, personally appeared before me in said County, the said [Signature] being personally well known to me as the person who executed the said grant of easement, and acknowledged the same to be his free act and deed in his said capacity and the free act and deed of the United States of America.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal this 27 day of May, 1954.

NAVY DEPARTMENT  
BUREAU OF YARDS AND DOCKS

Duplicate  
Original

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CONTRACT NOy(U)-28909

RECLAMATION DISTRICT NO. 2068

DIXON, CALIFORNIA



DEPARTMENT OF THE NAVY  
NEGOTIATED DRAINAGE SERVICE CONTRACT

FOA

U. S. NAVAL RADIO STATION  
DIXON, CALIFORNIA

Duplicate  
Original

WATER MAIN CONTRACT NO. 2030  
DIXON, CALIFORNIA  
(Contractor)

Annual cost hereunder: \$300.00

Invoices will be rendered in sextuple to:

Officer in Charge, U. S. Naval Radio Station, Dixon, California, for certification of invoices as to receipt of service as provided in contract, and forwarding original and four copies to the Officer in Charge of this contract, via the Commanding Officer, U. S. Naval Communication Station, Federal Office Building, San Francisco, California

Payments will be made by: Officer in Charge, U. S. Navy Regional Accounts Office, Naval Supply Center, Oakland, California

Officer in Charge of this contract: H. F. RANSFORD, Captain (CEC) USN  
District Public Works Officer  
Twelfth Naval District  
Federal Office Building  
San Francisco, California

This negotiated contract is made pursuant to the provisions of Section 2(c)(10) of the Armed Services Procurement Act of 1947 (Public Law 413, 80th Congress), and any required determination and findings with respect thereto has been made.

APPROPRIATION CHARGEABLE:

Appropriation chg: 1721301.60 SWON 1952  
Allotment No: 50012  
Expenditure Acct: 44100  
Object Classification: 079  
Activity to be abstracted: (228) for (86<sup>6</sup>)



DEPARTMENT OF THE NAVY

NEGOTIATED DRAINAGE SERVICE CONTRACT

THIS CONTRACT, entered into as of 1 July 1951, by and between the UNITED STATES OF AMERICA, hereinafter called the Government, represented by the contracting officer executing this contract and the RECLAMATION DISTRICT NO. 2068, whose address is Dixon, California, hereinafter called the Contractor,

WITNESSETH that the parties hereto do mutually agree as follows:

ARTICLE I

SCOPE AND TERM OF CONTRACT

1. Subject to terms and conditions hereinafter set forth, the Contractor agrees to furnish to the Government and the Government agrees to purchase and receive from the Contractor drainage service (hereinafter called "service") requested by the Government from the Contractor at the premises to be served hereunder (hereinafter called the "service location"), all in accordance with Drainage Service Specifications attached hereto and made a part hereof.

2. This contract shall continue in effect from the commencement of service and thereafter until terminated at the option of the Government or the Contractor with respect to the contract in its entirety or with respect to the service location.

3. (a) For and in consideration of the faithful performance of the stipulations of this contract, the Contractor shall be paid by the designated disbursing office or officer, for service herein contracted for, at the rate and under the terms and conditions herein set forth.

(b) The Contractor hereby declares that said rate is not in excess of the lowest rate now available to any existing or prospective customer under like conditions of service, and agrees that during the life of this contract the Government shall continue to be billed on the lowest available rate for similar conditions of service.

(c) Recognition is given to the fact that the Government fiscal year ends on 30 June. Payments hereunder shall be contingent upon the availability of appropriations therefor, and shall not be made in advance of service rendered.

(d) All invoices for service shall be paid without penalty or interest and the Government shall be entitled to any discounts customarily applicable to payment of invoices by all customers of the Contractor.

(e) Invoices for service rendered hereunder shall contain dates of the beginning and the end of the billing period and such other pertinent data as shall be required by the Government.

(f) Invoices submitted by the Contractor shall bear the following certificate signed by an officer or authorized representative of the Contractor:

"I certify that the above bill is correct and just; that payment therefor has not been received." -

## ARTICLE II

### RATES AND CHARGES

1. For all service furnished under this contract to the service location the Government shall pay the Contractor at the rate specified in the "Drainage Service Specifications" which are attached hereto and made a part of this contract.

## ARTICLE III

### CONTRACTOR'S FACILITIES

1. The Contractor, at its expense, shall furnish, install, operate and maintain all facilities required to furnish service hereunder as specified in the Service Specifications.

2. The Government hereby grants to the Contractor, free of any rental or similar charge, but subject to the limitations specified in this contract, a revocable permit to enter the service location for any proper purpose under this contract, including use of the site or sites agreed upon by the parties hereto for the installation, operation and maintenance of the facilities of the Contractor required to be located upon Government premises, all of which facilities shall be and remain the sole property of the Contractor and shall, at all times during the life of this contract, be operated and maintained by the Contractor at its expense; and all taxes and other charges in connection therewith, together with all liability arising out of the negligence of the Contractor in the construction, operation or maintenance of such facilities shall be assumed by the Contractor. Authorized representatives of the Contractor will be allowed access to the facilities of the Contractor at suitable time to perform the obligations of the Contractor with respect to such facilities, provided that properly authorized Naval personnel having pertinent cognizance at each service location be notified at each such entry to permit such personnel to accompany the Contractor in discharge of the functions cited herein. Such facilities shall be removed and Government premises restored to their original condition by the Contractor at its expense within a reasonable time after the Government shall revoke the permit herein granted and in any event within a reasonable time after termination of this contract, provided that in the event of termination due to fault of the Contractor

such facilities may be retained in place at the option of the Government until service comparable to that provided for hereunder is obtained elsewhere. It is expressly understood, however, that proper military or Governmental authority may limit or restrict the right of access herein granted in any manner considered by such authority to be necessary for the national security.

#### ARTICLE IV

##### GENERAL PROVISIONS

1. Officials Not to Benefit. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.
2. Covenant Against Contingent Fees. This Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.
3. Assignment of Claims. No claim under this contract shall be assigned.
4. Convict Labor. In connection with the performance of this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment at hard labor.
5. Nondiscrimination in Employment. In connection with the performance of this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin; and further agrees to insert the foregoing provision in all subcontracts hereunder except subcontracts for standard commercial supplies or for raw materials.
6. Disputes. Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Contractor. Within 30 days from the date of receipt of such copy, the Contractor may appeal by mailing or otherwise furnishing to the Contracting Officer a written appeal addressed to the secretary, and the decision of the Secretary or his duly authorized representative for the hearing of such appeals shall be final and conclusive;

provided that, if no such appeal is taken, the decision of the Contracting Officer shall be final and conclusive. In connection with any appeal proceeding under this clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the Contracting Officer's decision.

7. Definitions. As used throughout this contract, the following terms have the meanings set forth below:

(a) The term "Secretary" means the Secretary, the Under Secretary, or any Assistant Secretary of the Department; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the Secretary.

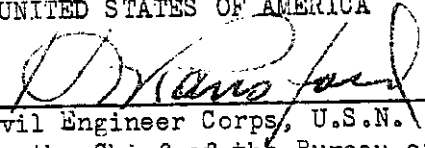
(b) The term "Contracting Officer" means the person executing this contract on behalf of the Government, and any other officer or civilian employee who is a properly designated Contracting Officer; and the term includes, except as otherwise provided in this contract, the authorized representative of a Contracting Officer acting within the limits of his authority.

(c) Except as otherwise provided in this contract, the term "subcontracts" includes purchase orders under this contract.

8. Conflicts. To the extent of any inconsistency between the provisions of this contract, and any schedule, rider or exhibit incorporated in this contract by reference or otherwise, or any of the Contractor's rules and regulations, the provisions of this contract shall control.

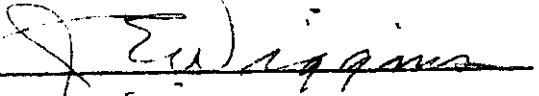
IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

By  H. F. RANSFORD, CAP  
Civil Engineer Corps, U.S.N.  
For the Chief of the Bureau of  
Yards and Docks, Navy Department

RECLAMATION DISTRICT #2068  
(Contractor)

By   
Title President

By   
5  
Title Secretary

DRAINAGE SERVICE SPECIFICATIONS

1. PREMISES TO BE SERVED:

U. S. Naval Radio Station, Dixon, California

Premises are Government owned.

2. DRAINAGE SERVICE:

Provide and maintain suitable drainage ditches and courses, to receive and carry away all surface water, located as follows:

- (a) Running south along the east boundary of the Station property to the southeast corner of Section 8, T6N, R2E, and therefrom running easterly to the Contractor's main District drainage canal.
- (b) Across the county road along the north boundary of the Station property.

Note: Item (a) includes cleaning and enlarging, to the extent necessary, existing ditches, and item (b) includes the installation, as necessary, of pipes larger than existing pipes at three locations along this course.

Continuation ditches leading from the above ditches and courses are to be maintained to provide proper drainage of water from the Station property.

The Government may discharge effluent from its septic tanks into the above described drainage facilities.

3. BILLING:

Flat rate of \$350.00 per annum, to be billed semi-annually on 1 January and 1 July of each year.

# RECLAMATION DISTRICT NO. 2068

## *Irrigated Farm Lands*

DIXON, CALIFORNIA

At a regular meeting of Reclamation District #2068 held in the District office October 12, 1951, the following resolution was passed;

Motion by Campbell, second by Ramsdell and carried unanimously that O. H. Timm, President of the Board of Trustees, and J. E. Wiggins, Secretary of Reclamation District #2068, be authorized to execute Contract NOy(U)-28909 between the Department of the Navy and Reclamation District #2068, under which contract the District will provide certain drainage services for the U. S. Naval Radio Station.

RECLAMATION DISTRICT #2068

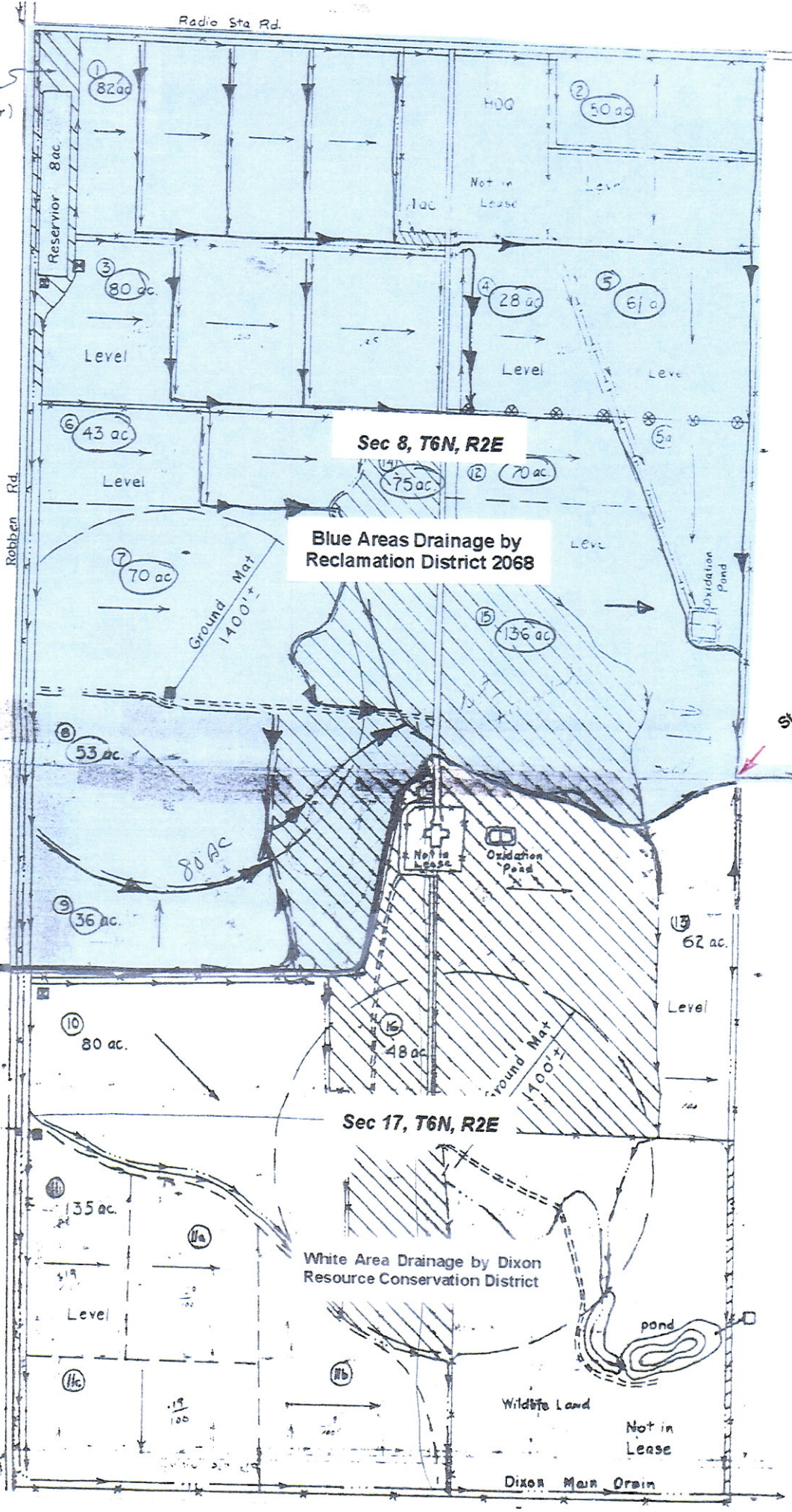
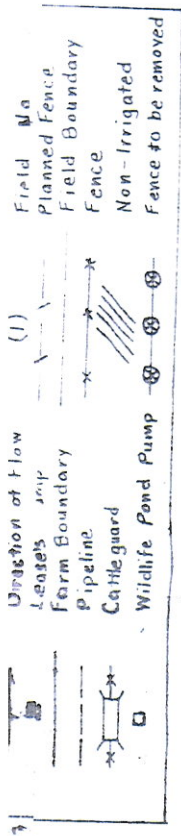
By J. E. Wiggins  
Secretary.

Seal

Radio Sta Rd.

5 ac Maintenance Area  
cl. 8 ac. Reservoir

2008  
6/10/20



Sec 8, T6N, R2E

Blue Areas Drainage by Reclamation District 2068

Sec 17, T6N, R2E

White Area Drainage by Dixon Resource Conservation District

Start of RD 2068 V1 Drain

RD 2068 V1 Drain

SEC 8, T6N, R2E

ty, California  
es  
60'  
11/4, 1978





**Marc C. Tonnesen**  
Assessor/Recorder

2/28/2013  
11:19 AM  
AR21  
51

**Filed for Record at Request of:**

Dixon Housing Authority

**When Recorded Return to:**

Dixon Housing Authority  
147 W. Main Street  
Woodland, California 95695

**P DIXON HOUSING AUTHORITY**

Doc#: 201300021452

Titles: 1 Pages: 18



Fees	0.00
Taxes	0.00
Other	0.00
<b>PAID</b>	<b>\$0.00</b>

EXEMPT FROM RECORDING FEE

(Government Code § 6103)

EXEMPT FROM DOCUMENTARY

TRANSFER TAX (Rev. &amp; Taxation Code § 11922)

N6247313RP00064

**GRANT OF EASEMENT**

THIS INDENTURE, made this 12 day of February, 2013, between the UNITED STATES OF AMERICA, acting by and through the Department of the Navy, (herein called the GRANTOR), and Dixon Housing Authority, (herein called the GRANTEE).

WHEREAS, the GRANTOR owns that certain real property identified as the Naval Radio Transmitting Facility, Dixon, California, located at 7290 Radio Station Road, in the City of Dixon, County of Solano, State of California, (hereinafter called the Installation); and

WHEREAS, the GRANTEE has requested an easement for right of way on, over, and across that portion of the Installation hereinafter described; and

WHEREAS, the Secretary of the Navy has found that the granting of such an easement on the terms and conditions hereinafter stated is necessary to facilitate the transfer of real property pursuant to Section 2841 of the National Defense Authorization Act for Fiscal Year 2004, Public Law 108-136 and is not incompatible with the public interest;

NOW THEREFORE, this INDENTURE witnesseth that and in compliance with the terms and conditions set forth herein, the GRANTOR, pursuant to the authority of 10 U.S.C. § 2668, hereby grants to the GRANTEE and its successors and assigns, in perpetuity, an easement for a right of way for road purposes on, over and across, that portion hereinafter described property for construction, installation, operation, maintenance, repair, and replacement of a right of way, and within that portion of the Installation (hereinafter called the Premises), described as Parcels 4 and 5 on Exhibit "A," and shown on a map marked Exhibit "B," both of which are attached hereto and made a part hereof.

The total area contained in the Premises is 1.60 acres, more or less.

THIS EASEMENT is granted subject to the following terms and conditions, which GRANTEE, by its acceptance hereof, specifically agrees to and consents to be bound by:

1. All work in connection with the construction, installation, operation, maintenance, repair, and replacement of the roadway shall be done without cost or expense to the GRANTOR.

2. The GRANTEE shall maintain the Premises and the roadway in good condition at all times and shall promptly make all repairs that may be necessary for the preservation of the condition of the Premises and the continued operation and maintenance of the roadway.

3. The GRANTEE's rights hereunder shall be subject to such reasonable rules and regulations as may be prescribed by the GRANTOR to assure that the exercise of those rights will not unreasonably interfere with the GRANTOR's activities at the Installation.

4. GRANTEE, at its expense, shall repair or restore any damage to utilities, landscaping, pavements, and facilities damaged or relocated during the construction, installation, operation, maintenance, repair and replacement of the roadway in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

5. Upon completion of any work performed in or upon the Premises, GRANTEE shall remove all equipment and unused or surplus materials, if any, and shall restore the surface thereof, including any roadways, curbs, or sidewalks to their original condition in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

6. Upon any termination of this easement, the GRANTEE, at its own expense, shall remove, to the extent requested by the GRANTOR, improvements, fixtures, and equipment installed or constructed hereunder, and shall restore the Premises to the same or as good a condition as that which existed prior to the exercise by the GRANTEE of its rights hereunder. The restoration shall be done in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

7. If the GRANTOR determines at any time that all or any part of the roadway, unduly interferes with any of its activities, the GRANTOR shall have the right to terminate this easement, in whole or in part, to the extent necessary to eliminate the interference; However, unless the GRANTOR shall have determined that relocation is not feasible, it shall offer to convey to the GRANTEE, without charge, a substitute easement permitting the GRANTEE to relocate all or any part of the roadway on adjacent GRANTOR property, which relocation shall be accomplished at the GRANTEE's cost and expense. The substitute easement shall contain the same terms and conditions as those in this easement, and shall bear the same expiration date, if any.

8. All or any part of this easement may be terminated upon failure by the GRANTEE to comply with any of its terms and conditions; upon abandonment of the rights granted herein; or upon nonuse of those rights for a period of two (2) consecutive years.

9. The GRANTOR may use the Premises of this easement for any purpose that does not unreasonably interfere with the use and enjoyment by the GRANTEE of the rights granted by this easement.

10. This easement is granted subject to all other existing easements, if any, of public record, and to such utility lines, roadways, or other improvements as may now be located on, over, or under the Premises.

11. The GRANTOR reserves the right to make whatever connections between the Road herein authorized and other roads on the Installation that the GRANTOR may consider necessary. It also reserves to itself easements for all purposes on, under, over, or across the Premises; provided, however, that such reserved easements shall be used in a manner that will not unreasonably interfere with the use and enjoyment by the GRANTEE of the easement rights granted herein.

12. The GRANTEE shall not transfer or assign this easement or any interest in it, or otherwise make any portion of, or rights in, the Premises available to any party without the prior written consent of the GRANTOR. If any assignment is made, with or without consent, the assignee shall be deemed to have assumed all of the obligations of the GRANTEE. However, in no event shall the GRANTEE be relieved of any of its obligations under this easement, except for an extension of its term that begins after an assignment, and then only if the GRANTOR shall have consented to it.

13. GRANTEE shall comply with all applicable environmental laws, ordinances, rules, and regulations and all other such Federal, state, and local environmental laws, ordinances, regulations, and standards that may become applicable to GRANTEE's activities on the Premises.

14. GRANTEE shall, at its sole cost and expense, be solely responsible for obtaining any environmental permits required for its activities on the Premises.

15. GRANTOR's rights under this easement specifically include the right for its representatives to inspect the Premises upon reasonable notice for compliance with environmental, safety, and occupational health laws and regulations, whether or not the GRANTOR is responsible for enforcing them. The inspections shall be made without prejudice to the right of duly constituted enforcement officials to make them. The GRANTEE shall have no claim on account of any entries against the United States or any of its officers, agents, employees, contractors, or subcontractors.

16. Storage, treatment, or disposal of toxic hazardous materials on the Premises is prohibited except as authorized by the GRANTOR in accordance with 10 U.S.C. § 2692.

17. The GRANTEE will not use Installation accumulation points for hazardous and other wastes or permit its hazardous wastes to be commingled with hazardous waste of the GRANTOR.

18. The GRANTEE shall be solely responsible for the Release, or threat of a Release, of any Toxic or Hazardous Material, as the result of any activity under this easement, and any preceding easements, licenses, or rights-of-way previously granted to GRANTEE, which results in Contamination of the environment, whether on, above or below the Premises or elsewhere. Any reporting, containment, removal, or other Remedial Action relating to a Release or threat of Release required by law or regulation as the result of any activity under this easement, or any preceding easement, license, or right-of-way, shall also be the responsibility of the GRANTEE.

19. The GRANTEE agrees to comply with the provisions of any health or safety plan in effect under the Installation Restoration Plan (IRP) or the Resource Conservation Recovery Act (RCRA) Corrective Action Program during the course of any of the above described response or Remedial Actions. Any inspection, survey, investigation, or other response or Remedial Action will, to the extent practicable, be coordinated with representatives designated by the GRANTOR. The GRANTEE shall have no claim on account of any entries onto the Premises for such purposes against the United States or its officers, agents, employees, contractors, or subcontractors. In addition, GRANTEE shall comply with all applicable Federal, state and local occupational safety and health regulations.

20. The GRANTOR shall not be responsible for damages to property or injuries to persons that may arise from, or be incident to, the use and occupation of the Premises by the GRANTEE, or for damages to the property or injuries to the persons of the GRANTOR's officers, agents, servants, or employees, or others who may be on the Premises at their invitation or the invitation of any one of them arising from or incident to governmental activities except as permitted under the Federal Tort Claims Act, 28 U.S.C. § 2671-2680.

21. GRANTEE shall indemnify and defend the GRANTOR against, and hold the GRANTOR harmless from, any costs, expenses, liabilities, fines, suits, actions, damages, liability and cause of action arising or growing out of, or in any way connected with, the occupation or use of the Premises by the GRANTEE and its employees, agents, servants, guests, and invitees. However, this liability shall not extend to matters caused by the GRANTOR's negligent or willful acts. This provision shall survive the expiration or termination of this easement and GRANTEE's obligations hereunder shall apply whenever the GRANTOR incurs costs or liabilities for the GRANTEE's actions.

22. The GRANTEE shall comply with any hazardous waste permit, storage, handling, and disposal requirements under the Solid Waste Disposal Act or its California equivalent. The GRANTEE must provide at its own expense any hazardous waste storage facilities, complying with all laws and regulations that it may need for storage. Installation hazardous waste storage facilities will not be available to the GRANTEE.

23. GRANTEE shall identify and notify GRANTOR of any activity that may affect federally regulated natural and cultural resources (listed threatened or endangered species, wetlands, waters of the United States, properties listed on or eligible for listing on the National Register of Historic Places, etc.) and provide information and mitigation that may be required to support consultation with the applicable regulatory agency.

24. GRANTEE shall, during the construction, installation, operation, maintenance, repair, and replacement of a right of way, upon inadvertently discovering Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony, as those terms are defined in 43.C.F.R. § 10.2(d), immediately notify GRANTOR, followed by written confirmation. The GRANTEE shall cease all activity in the area of the inadvertent discovery until directed otherwise by the Installation, and shall make all reasonable efforts to protect any Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony so discovered, consistent with 43 C.F.R. § 10.4(c).

## 25. Environmental.

a. For purposes of this easement the following terms shall have the following meanings:

"Toxic or Hazardous Materials" means all substances, pollutants, contaminants, and waste to which Applicable Environmental Laws pertain, expressly including but not limited to petroleum, petroleum products, and materials defined in 48 C.F.R. § 252.223-7006 (a)(2)(ii) and (iii).

"Contamination" means a level of Toxic or Hazardous Materials in the air, soil, or water (surface water or ground water), that exceeds levels allowed by Applicable Environmental Laws.

"Applicable Environmental Laws" means:

Federal, state, and local statutes, laws, ordinances, rules, and regulations, to which the GRANTOR is made subject by Federal law or to which the GRANTEE is made subject by Federal, state or local law;

Executive Orders of the President of the United States;

decisions of courts and administrative tribunals of competent jurisdiction;

administrative orders of regulatory agencies of competent jurisdiction (involuntary or on consent); and

regulations and directives of the Department of Defense, the Department of the Navy, and the Marine Corps (for Marine Corps installations only),

which pertain to the human environment (as defined at 40 C.F.R. § 1508.14); transportation of hazardous material; and human health and safety (including occupational safety).

Applicable Environmental Laws include, without limitation, the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 9601 et seq.), the Hazardous Material Transportation Act (49 U.S.C. § 1801, et seq.), the Resource Conservation and Recovery Act (42 U.S.C. § 6901, et seq.), the Federal Water Pollution Control Act (33 U.S.C. § 1251, et seq.), the Clean Air Act (42 U.S.C. § 7401, et seq.), the Toxic Substances Control Act (15 U.S.C. § 2601, et seq.), the Occupational Safety and Health Act (29 U.S.C. § 651, et seq.), and 10 U.S.C. § 2692, as amended.

"Release" means any discharge, spill, emission, leaking, pumping, injection, excavation, deposit, disposal, leaching, or migration into the environment, accidental or otherwise, or introduction into the environment by any other means or method.

"Remedial Action" means: investigating or monitoring the environmental condition of the Premises and clean-up, removal, response (including emergency response), and restoration of the Premises, as per Applicable Environmental Laws, due to the presence or suspected presence of Contamination or a Release or suspected Release of Toxic or Hazardous Materials.

b. If during the term of this easement the GRANTEE becomes aware that a Release of Toxic or Hazardous Materials has occurred due to acts or omissions of the GRANTEE, its agents, or contractors, whether or not such Release results in Contamination of the Premises, the GRANTEE will give notice to the GRANTOR within 24 hours of becoming aware of the Release, providing all relevant facts and circumstances. The GRANTOR may direct the GRANTEE to make a detailed written report of these facts and circumstances within a time certain.

c. The GRANTEE, at its sole expense, will promptly take all action necessary to comply with Applicable Environmental Laws pertaining to a Release described in subparagraph 25.b, including but not limited to: report the occurrence to appropriate Federal, state, or local regulatory authorities, if so directed by the GRANTOR; take timely and effective steps to minimize the Release and its impact on human health and the environment; and take Remedial Action. The GRANTOR may direct the GRANTEE to provide all information requested by the GRANTOR regarding such actions within a time certain. Without limitation of the foregoing, should the GRANTEE fail to take all such necessary action, the GRANTOR may, in its discretion, take Remedial Action as required to achieve compliance as set forth in subparagraph 25.d, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 21 herein.

d. The GRANTEE will ensure that all activities conducted on the Premises by the GRANTEE, its agents, or contractors are carried out in compliance with Applicable Environmental Laws. The GRANTEE will provide notice to the GRANTOR within 24 hours of receiving any complaint, order, directive, claim, citation, or notice from any governmental authority or any other person or entity alleging noncompliance with or a violation of Applicable Environmental Laws on the Premises. The GRANTEE, at its sole expense, will promptly take all necessary action directed by Federal, state, or local regulatory authorities of competent jurisdiction to achieve or regain compliance with Applicable Environmental Laws. The GRANTOR may direct the GRANTEE to make a detailed written report, within a time certain, of the facts and circumstances underlying the alleged noncompliance or violation. Without limitation of the foregoing, the GRANTOR, in response to acts or omissions of the GRANTEE, its agents, or contractors may, in its discretion, take Remedial Action to remedy Contamination on the Premises or to achieve or regain compliance with Applicable Environmental Laws, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 21 herein.

e. The GRANTOR may at any time inspect the Premises or cause the Premises to be inspected, to assess whether the operations of the GRANTEE, its agents, or contractors are in compliance with Applicable Environmental Laws. To assist in this evaluation, the GRANTEE, its agents, and contractors will provide to the GRANTOR, or another entity, as the GRANTOR may direct, for examination and copying, all relevant books, records, documents, and other material in their possession.

f. The GRANTOR, with good cause, may from time to time require the GRANTEE to conduct tests and analyses to assess whether the Premises are in compliance with

Applicable Environmental Laws, and based on the results thereof, to so certify to the GRANTOR. Such tests and analyses shall be conducted in a manner satisfactory to the GRANTOR by recognized professionals approved by the GRANTOR. If the GRANTOR and the GRANTEE cannot reach agreement as to what tests and analyses shall be conducted, by whom, and when, the GRANTOR may perform such tests and analyses or cause such tests and analyses to be performed. To the extent any such tests and analyses indicate that acts or omissions of the GRANTEE, or its agents or contractors, has resulted in noncompliance with or a violation of Applicable Environmental Laws, the GRANTOR may recover from the GRANTEE any costs associated with performing such tests and analyses or causing them to be performed in accordance with Paragraph 21 herein.

IN WITNESS WHEREOF, the GRANTOR, acting through the Department of the Navy, by its Real Estate Contracting Officer thereunto duly authorized, has caused this GRANT OF EASEMENT to be executed the day and year written first above.

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST

By: KAREN P. RINGEL

Karen P. Ringel  
REAL ESTATE CONTRACTING OFFICER

Date: 2/12/13

STATE OF CALIFORNIA  
County of San Diego

On this the 12<sup>th</sup> day of February, 2013, before me Ana Gabriela Jimenez Notary Public personally appeared Karen P. Ringel, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: [Handwritten Signature]



Notary Seal

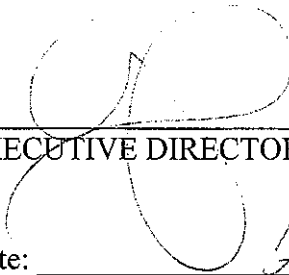


ACCEPTANCE:

GRANTEE hereby accepts this Grant of Easement and agrees to be bound by all the agreements, covenants, conditions, restrictions and reservations contained therein.

DIXON HOUSING AUTHORITY

By: LISA A. BAKER


---

 EXECUTIVE DIRECTOR  
 Date: February 21, 2013

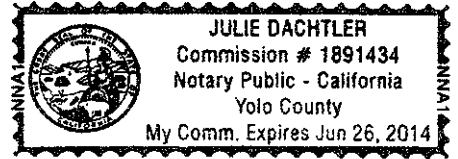
STATE OF CALIFORNIA  
County of Yolo

On this the 21<sup>st</sup> day of February, 2013, before me Julie Dachtler, Notary Public personally appeared Lisa A. Baker, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: Julie Dachtler



Notary Seal

**LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)**

Parcel 1-Main Housing Site

A tract of land being a portion of those lands acquired by the United States of America as described in Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 filed in the District Court of the United States in and for the Northern District of California, Northern Division in San Francisco, California, and also said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 is filed in Book 344, Page 192 in the Official Records of Solano County on May 25, 1946; said tract of land being a portion of the Northeast Quarter (NE1/4) of Section 8, Township 6 North, Range 2 East, Mount Diablo Base and Meridian, Solano County, California, more particularly described as follows:

Commencing for a Point of Reference at the North-Quarter (N1/4) corner of said Section 8 as shown on Record of Survey Map filed in Book 15 of Surveys at Page 51 in the Official Records of Solano County on October 17, 1980;

- i. thence along the north boundary line of said Northeast Quarter (NE1/4) of said Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51, East, 65.95 feet to the TRUE POINT OF BEGINNING;
1. thence, S0°15'01"E, 1039.89 feet;
2. thence along a non-tangent curve to the left having a radius of 77.32 feet through a central angle of 56°43'45" for an arc length of 76.55 feet, said curve has a radial bearing of S84°57'28"E from the beginning of curve to the radius point;
3. thence along a non-tangent curve to the left having a radius of 134.00 feet through a central angle of 38°21'24" for an arc length of 89.71 feet, said curve has a radial bearing of N38°18'47"E from the beginning of curve to the radius point;
4. thence, N89°42'24"E, 230.43 feet;
5. thence, N3°25'06"E, 15.00 feet;
6. thence, N89°59'36"E, 128.31 feet;
7. thence, N42°53'53"E, 147.01 feet;
8. thence, N 0°13'33"W, 48.17 feet;
9. thence, N89°44'56"E, 457.13 feet;
10. thence, N0°12'56"W, 962.17 feet to the north boundary line of said Northeast Quarter (NE1/4) of Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51;

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)

Parcel 1-Main Housing Site-Continued

11. thence along said north boundary line of said Northeast Quarter (NE1/4) of said Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51, West, 1029.83 feet to the TRUE POINT OF BEGINNING.

Parcel 1 Area = 24.78 Acres.

**EXCEPTING AND RESERVING UNTO THE GRANTOR (U.S.A.)** a 20-foot wide electrical easement over the above-described Parcel 1 being described as follows:

Commencing for a Point of Reference at the northwest corner of the above-described Parcel 1:

- i. thence along the north boundary of said above-described Parcel 1, and said north boundary line of said Northeast Quarter (NE1/4) of Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51, East, 312.17 feet to the TRUE POINT OF BEGINNING of said 20-foot wide electrical easement lying 10.00 on each side of the following described centerline:
  1. thence, S0°09'30"E, 1135.27 feet to the south boundary line of the above-described Parcel 1 being the terminus of the herein described centerline.

Easement Area = 0.52 Acres.

Parcel 2-Sewage Ponds

A tract of land being a portion of those lands acquired by the United States of America as described in Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 filed in the District Court of the United States in and for the Northern District of California, Northern Division in San Francisco, California, and also said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 is filed in Book 344, Page 192 in the Official Records of Solano County on May 25, 1946; said tract of land being a portion of the East One-Half (E ½) of Section 8, Township 6 North, Range 2 East, Mount Diablo Base and Meridian, Solano County, California, more particularly described as follows:

Commencing for a Point of Reference at the Section Corner common to Sections 4,5,8 and 9 Township 6 North, Range 2 East, Mount Diablo Base and Meridian, as shown on Record of Survey Map filed in Book 15 of Surveys at Page 51 in the Official Records of Solano County on October 17, 1980:

- i. thence along the east boundary line of said Section 8, S0°10'57"E, 2635.68 feet to the East Quarter (E1/4) Corner of said Section 8;
- ii thence, N88°21'37"W, 52.90 feet to the TRUE POINT OF BEGINNING

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)

Parcel 2-Sewage Ponds- continued

1. thence, N88°29'35"W, 907.35 feet;
2. thence, S19°59'29"E, 1371.28 feet;
3. thence, S6°53'48"E, 230.90 feet;
4. thence, S89°26'37"E, 414.18 feet;
5. thence, N0°08'24"W, 1498.05 feet to the **TRUE POINT OF BEGINNING:**

Parcel 2 Area = 21.97 Acres.

Parcel 3 -Sewer Pipeline Easement (12 feet wide)

A strip of land being 12 feet wide lying across the lands acquired by the United States of America as described in said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 being more particularly described as follows:

Commencing for a Point of Reference at the beginning of course number 9 at the southeast corner of the abovementioned Parcel 1.

- i. thence along the east boundary line of the abovementioned Parcel 1, N0°12'56"W, 14.20 feet to the **TRUE POINT OF BEGINNING** of said 12-foot wide sewer pipeline easement and lying 6.00 on each side of the following described centerline:

1. thence, N89°47'31"E, 26.27 feet;
2. thence, S23°48'07"E, 425.99 feet;
3. thence, S19°11'59"E, 1348.37 feet to the north boundary line of the above-described Parcel 2 being the terminus of the herein described centerline.

Parcel 3 Area = 0.50 Acres.

**LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)**

**Parcel 4 – Roadway Access Easement (20 feet wide)**

A strip of land being 20 feet wide lying across the lands acquired by the United States of America as described in said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5:50 being more particularly described as follows:

Commencing for a Point of Reference at the northwest corner of the above-described Parcel 1:

- i. thence along the north boundary line of said Northeast Quarter (NE1/4) of Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51, West, 38.03 feet to the **TRUE POINT OF BEGINNING** of said 20-foot wide Roadway Access easement lying 10.00 on each side of the following described centerline:
  1. thence, S0°06'00"E, 1012.51 feet;
  2. thence along a non-tangent curve to the left having a radius 175.57 feet through a central angle of 73°31'22" for an arc distance of 225.29; said non-tangent curve has a radial bearing from the beginning of curve to the radius point of N89°54'39"E;
  3. thence, S73°44'41"E, 247.86 feet;
  4. thence along a non-tangent curve to the right having a radius 72.01 feet through a central angle of 44°50'52" for an arc distance of 56.37; said non-tangent curve has a radial bearing from the beginning of curve to the radius point of S32°23'34"W;
  5. thence, S0°10'44"E, 1300.20 feet to the terminus of the herein described centerline.

Parcel 4 Area = 1.31 Acres.

**Parcel 5 – Roadway Access Easement (10 feet wide)**

Commencing for a Point of Reference at the terminus of the centerline as described in course number 5 of the above-described Parcel 4:

- i. thence along said centerline as described in course number 5 of the above-described Parcel 4, N0°10'44"W, 5.00 feet;
- ii. thence, S89°25'10"E, 10.00 feet to the east boundary line of the above-described Parcel 4 being the **TRUE POINT OF BEGINNING** of said 10-foot wide Roadway Access easement lying 5.00 on each side of the following described centerline:

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)

Parcel 5 - Roadway Access Easement (10 feet wide) Continued

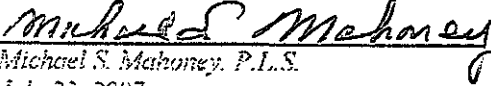
1. thence, S88°52'27"E, 1276.77 feet to the westerly boundary line of the above-described Parcel 2 being the terminus of the herein described centerline.

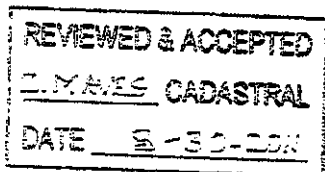
Parcel 5 Area = 0.29 Acres.

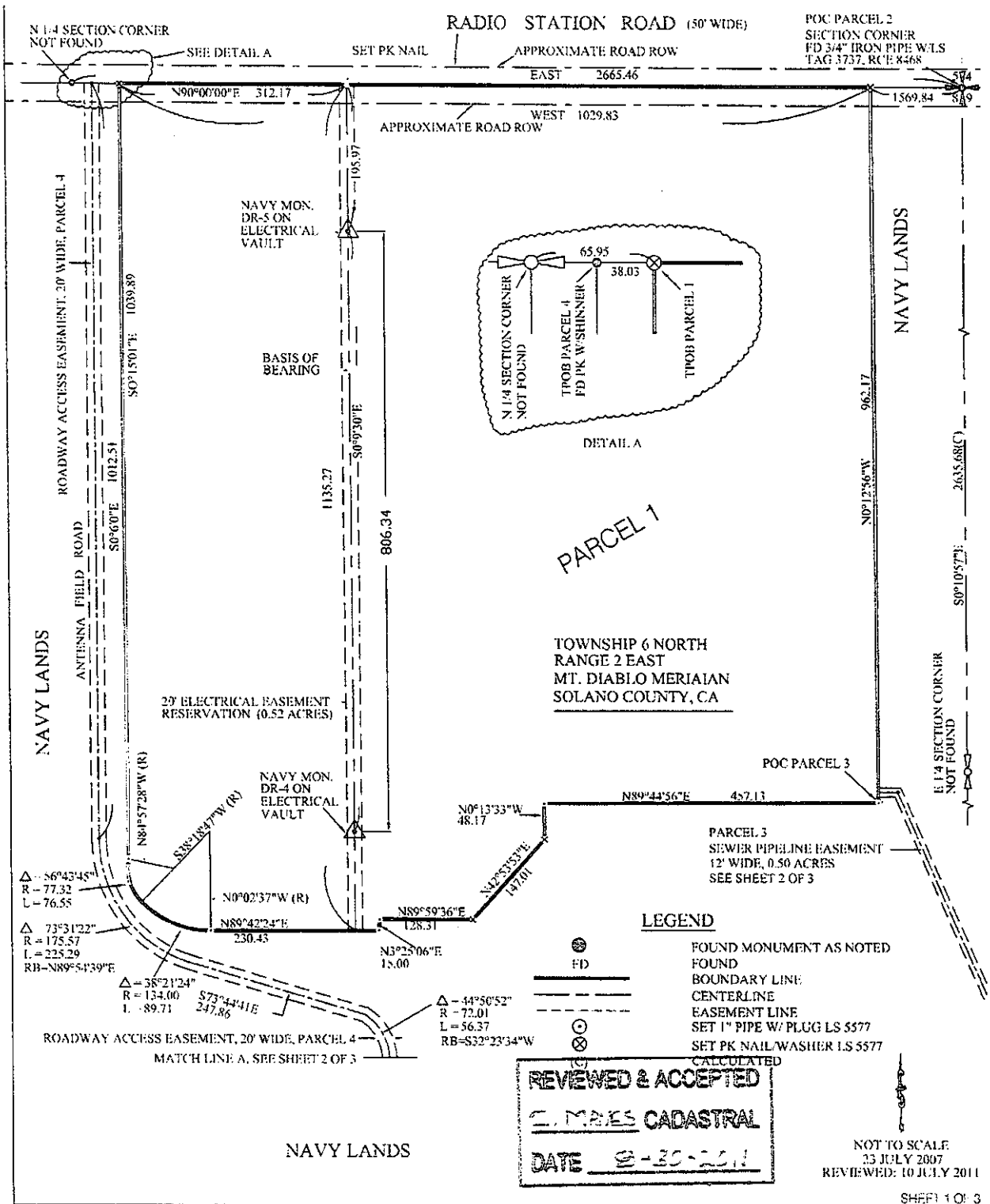
END OF LEGAL DESCRIPTION

All as shown on Plats to Accompany Legal Description sheets 1 through 3 entitled "LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON".

Prepared by:

  
Michael S. Mahoney, P.L.S.  
July 23, 2007



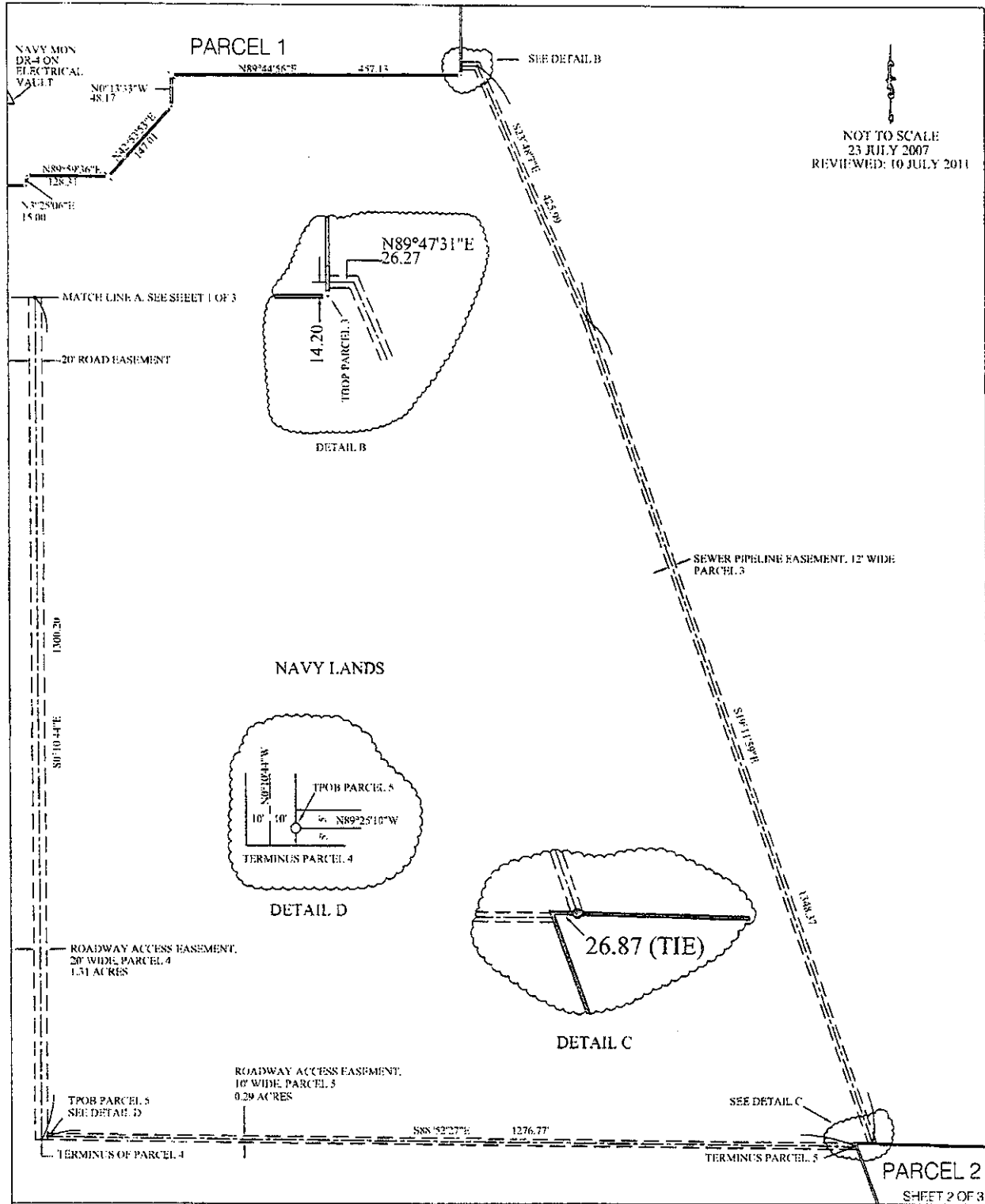


**PLAT TO ACCOMPANY LEGAL DESCRIPTION  
FOR LAND TRANSFER TO HOUSING AUTHORITY OF  
THE CITY OF DIXON (DIXON MIGRANT HOUSING)**

NAVAL RADIO TRANSMITTING FACILITY DIXON, CA.

Michael S. Manoney, L.S.  
California License Number: 6577  
Professional Land Surveyors  
901 Smith Lane, #117, San Bruno, CA 94066  
Phone/FAX (925) 244-9667

- Site Planning
- Title Investigations
- Legal Dispositions
- Surveying & Mapping



**PLAT TO ACCOMPANY LEGAL DESCRIPTION  
FOR LAND TRANSFER TO HOUSING AUTHORITY OF  
THE CITY OF DIXON (DIXON MIGRANT HOUSING)**

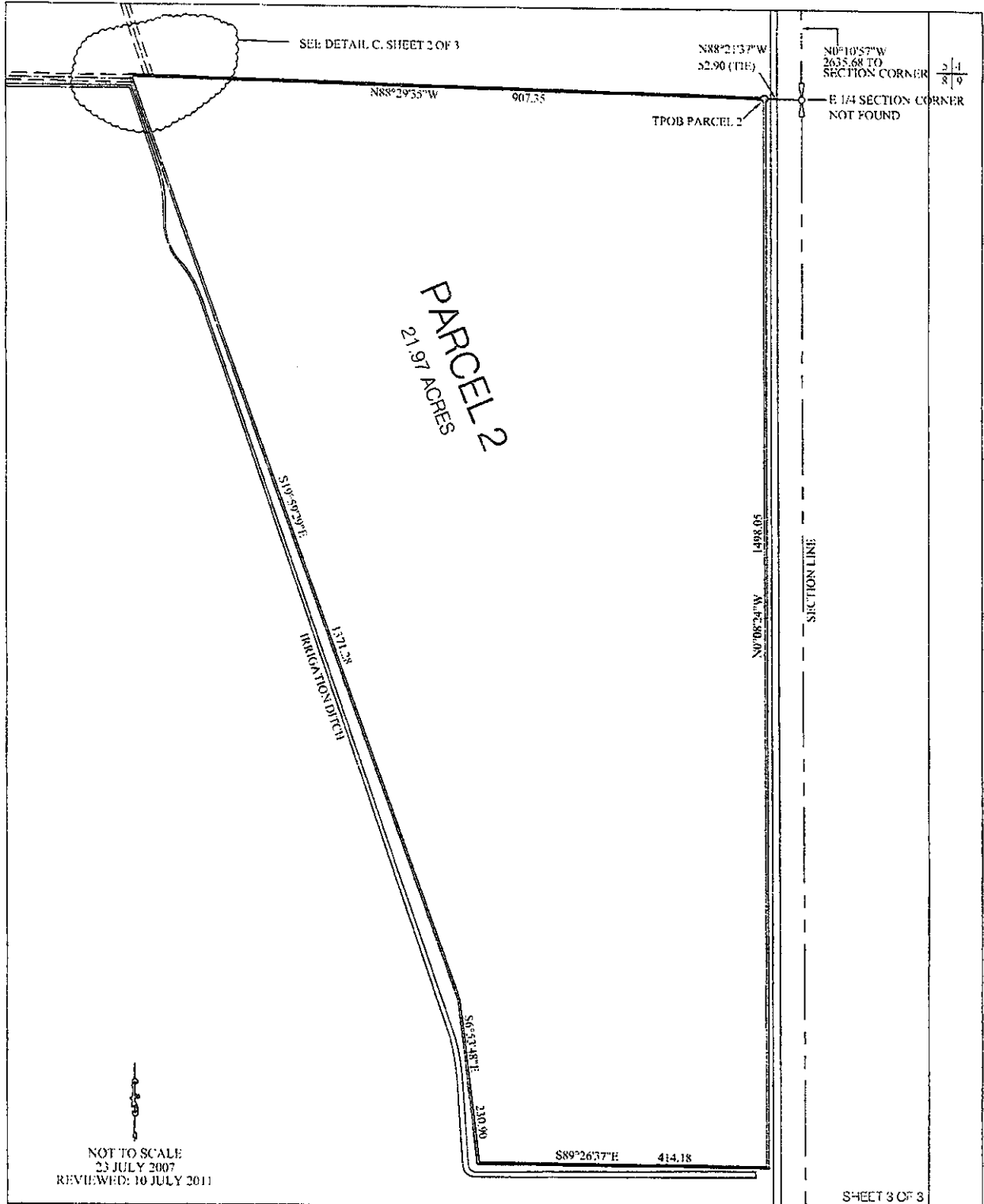
NAVAL RADIO TRANSMITTING FACILITY

DIXON, CA.

Michael S. Mahoney, P.L.S.  
California License Number 5077  
Professional Land Services  
901 Shasta Lane #117, San Bruno, CA 94066  
Phone/FAX 650-244-9667

- Site Planning
- Title Investigations
- Legal Descriptions
- Surveying & Mapping






**PLAT TO ACCOMPANY LEGAL DESCRIPTION  
FOR LAND TRANSFER TO HOUSING AUTHORITY OF  
THE CITY OF DIXON (DIXON MIGRANT HOUSING)**

NAVAL RADIO TRANSMITTING FACILITY

DIXON, CA.

Michael S. Mahoney, P.L.S.  
 California License No. 5577  
 Professional Land Services  
 901 Sneath Lane, #117, San Bruno, CA 94066  
 Phone/FAX (650) 244-8567

- Site Planning
- Title Investigations
- Legal Descriptions
- Surveying & Mapping



**Filed for Record at Request of:**

Dixon Housing Authority

**When Recorded Return to:**

Dixon Housing Authority  
147 West Main Street  
Woodland, California 98695

EXEMPT FROM RECORDING FEE  
(Government Code § 6103)  
EXEMPT FROM DOCUMENTARY  
TRANSFER TAX  
(Rev. & Taxation Code § 11922)

N6247312RP50064

*Handwritten initials and number 67*

**Certificate of Acceptance**

This is to certify that the interest in real property conveyed by the grant of easement dated February 12, 2013 from the United States of America, acting by and through the Department of Navy to the Dixon Housing Authority, a political corporation and/or governmental agency is hereby accepted by order of the Dixon Housing Authority Board of Commissioners on February 26, 2013 by the undersigned officers or agent on behalf of the Dixon Housing Authority pursuant to authority conferred by minute order of the Dixon Housing Authority adopted on December 18, 2012, and the grantee consents to recordation thereof by its duly authorized officers.

*Handwritten signature of William W. Holdener*  
\_\_\_\_\_  
William W. Holdener  
Dixon Housing Authority, Chairman

Date 2/27/13

*Handwritten signature of Lisa A. Baker*  
\_\_\_\_\_  
Lisa A. Baker  
Dixon Housing Authority, Executive Director

Date February 27, 2013

END OF DOCUMENT

Marc C. Tonnesen

11:19 AM

Assessor/Recorder

AR21

51

**Filed for Record at Request of:**

Dixon Housing Authority

**P DIXON HOUSING AUTHORITY**

Doc#: 201300021454

Titles: 1

Pages: 18



Fees	0.00
Taxes	0.00
Other	0.00
PAID	\$0.00

**When Recorded Return to:**

Dixon Housing Authority  
147 W. Main Street  
Woodland, California 95695

EXEMPT FROM RECORDING FEE  
(Government Code § 6103)  
EXEMPT FROM DOCUMENTARY  
TRANSFER TAX (Rev. & Taxation Code § 11922)

N6247313RP00066

**GRANT OF EASEMENT**

THIS INDENTURE, made this 12 day of February, 2013, between the UNITED STATES OF AMERICA, acting by and through the Department of the Navy, (herein called the GRANTOR), and Dixon Housing Authority, (herein called the GRANTEE).

WHEREAS, the GRANTOR owns that certain real property identified as the Naval Radio Transmitting Facility, Dixon, California, located at 7290 Radio Station Road, in the City of Dixon, County of Solano, State of California, (hereinafter called the Installation); and

WHEREAS, the GRANTEE has requested an easement for the construction, installation, operation, maintenance, repair, and replacement of a sewer line on, under, and across that portion of the Installation hereinafter described; and

WHEREAS, the Secretary of the Navy has found that the granting of such an easement on the terms and conditions hereinafter stated is necessary to facilitate the transfer of real property pursuant to Section 2841 of the National Defense Authorization Act for Fiscal Year 2004, Public Law 108-136 and is not incompatible with the public interest;

NOW THEREFORE, this INDENTURE witnesseth that and in compliance with the terms and conditions set forth herein, the GRANTOR, pursuant to the authority of 10 U.S.C. § 2668, hereby grants to the GRANTEE and its successors and assigns, in perpetuity, an easement for the construction, installation, operation, maintenance, repair, and replacement of an underground sewer line containing 8-inch pipes, such easement being under and within that portion of the Installation (hereinafter called the Premises), described as Parcel 3 on Exhibit "A," and shown on a map marked Exhibit "B," both of which are attached hereto and made a part hereof.

The total area contained in the Premises is .50 acres, more or less.

THIS EASEMENT is granted subject to the following terms and conditions, which GRANTEE, by its acceptance hereof, specifically agrees to and consents to be bound by:

1. All work in connection with the construction, installation, operation, maintenance, repair, and replacement of the sewer line shall be done without cost or expense to the GRANTOR.

2. The GRANTEE shall maintain the Premises and the sewer line in good condition at all times and shall promptly make all repairs that may be necessary for the preservation of the condition of the Premises and the continued operation and maintenance of the sewer line.

3. The GRANTEE's rights hereunder shall be subject to such reasonable rules and regulations as may be prescribed by the GRANTOR to assure that the exercise of those rights will not unreasonably interfere with the GRANTOR's activities at the Installation.

4. GRANTEE, at its expense, shall repair or restore any damage to utilities, landscaping, pavements, and facilities damaged or relocated during the construction, installation, operation, maintenance, repair and replacement of the sewer line in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

5. Upon completion of any work performed in or upon the Premises, GRANTEE shall remove all equipment and unused or surplus materials, if any, and shall restore the surface thereof, including any roadways, curbs, or sidewalks to their original condition in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

6. Upon any termination of this easement, the GRANTEE, at its own expense, shall remove, to the extent requested by the GRANTOR, improvements, fixtures, and equipment installed or constructed hereunder, and shall restore the Premises to the same or as good a condition as that which existed prior to the exercise by the GRANTEE of its rights hereunder. The restoration shall be done in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

7. If the GRANTOR determines at any time that all or any part of the sewer line, unduly interferes with any of its activities, the GRANTOR shall have the right to terminate this easement, in whole or in part, to the extent necessary to eliminate the interference; However, unless the GRANTOR shall have determined that relocation is not feasible, it shall offer to convey to the GRANTEE, without charge, a substitute easement permitting the GRANTEE to relocate all or any part of the sewer line on adjacent GRANTOR property, which relocation shall be accomplished at the GRANTEE's cost and expense. The substitute easement shall contain the same terms and conditions as those in this easement, and shall bear the same expiration date, if any.

8. All or any part of this easement may be terminated upon failure by the GRANTEE to comply with any of its terms and conditions; upon abandonment of the rights granted herein; or upon nonuse of those rights for a period of two (2) consecutive years.

9. The GRANTOR may use the Premises of this easement for any purpose that does not unreasonably interfere with the use and enjoyment by the GRANTEE of the rights granted by this easement.

10. This easement is granted subject to all other existing easements, if any, of public record, and to such utility lines, roadways, or other improvements as may now be located on, over, or under the Premises.

11. The GRANTEE shall not transfer or assign this easement or any interest in it, or otherwise make any portion of, or rights in, the Premises available to any party without the prior written consent of the GRANTOR. If any assignment is made, with or without consent, the assignee shall be deemed to have assumed all of the obligations of the GRANTEE. However, in no event shall the GRANTEE be relieved of any of its obligations under this easement, except for an extension of its term that begins after an assignment, and then only if the GRANTOR shall have consented to it.

12. GRANTEE shall comply with all applicable environmental laws, ordinances, rules, and regulations and all other such Federal, state, and local environmental laws, ordinances, regulations, and standards that may become applicable to GRANTEE's activities on the Premises.

13. GRANTEE shall, at its sole cost and expense, be solely responsible for obtaining any environmental permits required for its activities on the Premises.

14. GRANTOR's rights under this easement specifically include the right for its representatives to inspect the Premises upon reasonable notice for compliance with environmental, safety, and occupational health laws and regulations, whether or not the GRANTOR is responsible for enforcing them. The inspections shall be made without prejudice to the right of duly constituted enforcement officials to make them. The GRANTEE shall have no claim on account of any entries against the United States or any of its officers, agents, employees, contractors, or subcontractors.

15. Storage, treatment, or disposal of toxic hazardous materials on the Premises is prohibited except as authorized by the GRANTOR in accordance with 10 U.S.C. § 2692.

16. The GRANTEE will not use Installation accumulation points for hazardous and other wastes or permit its hazardous wastes to be commingled with hazardous waste of the GRANTOR.

17. The GRANTEE shall be solely responsible for the Release, or threat of a Release, of any Toxic or Hazardous Material as the result of any activity under this easement, and any preceding easements, licenses, or rights-of-way previously granted to GRANTEE, which results in Contamination of the environment, whether on, above or below the Premises or elsewhere. Any reporting, containment, removal, or other Remedial Action relating to a Release or threat of Release required by law or regulation as the result of any activity under this easement, or any preceding easement, license, or right-of-way, shall also be the responsibility of the GRANTEE.

18. The GRANTEE agrees to comply with the provisions of any health or safety plan in effect under the Installation Restoration Plan (IRP) or the Resource Conservation Recovery Act (RCRA) Corrective Action Program during the course of any of the above described Remedial Actions. Any inspection, survey, investigation, or other Remedial Action will, to the extent practicable, be coordinated with representatives designated by the GRANTOR. The GRANTEE shall have no claim on account of any entries onto the Premises for such purposes against the United States or its officers, agents, employees, contractors, or subcontractors. In

addition, GRANTEE shall comply with all applicable Federal, state and local occupational safety and health regulations.

19. The GRANTOR shall not be responsible for damages to property or injuries to persons that may arise from, or be incident to, the use and occupation of the Premises by the GRANTEE, or for damages to the property or injuries to the persons of the GRANTOR's officers, agents, servants, or employees, or others who may be on the Premises at their invitation or the invitation of any one of them arising from or incident to governmental activities except as permitted under the Federal Tort Claims Act, 28 U.S.C. § 2671-2680.

20. GRANTEE shall indemnify and defend the GRANTOR against, and hold the GRANTOR harmless from, any costs, expenses, liabilities, fines, suits, actions, damages, liability and cause of action arising or growing out of, or in any way connected with, the occupation or use of the Premises by the GRANTEE and its employees, agents, servants, guests, and invitees. However, this liability shall not extend to matters caused by the GRANTOR's negligent or willful acts. This provision shall survive the expiration or termination of this easement and GRANTEE's obligations hereunder shall apply whenever the GRANTOR incurs costs or liabilities for the GRANTEE's actions.

21. The GRANTEE shall comply with the hazardous waste permit, storage, handling, and disposal requirements under the Solid Waste Disposal Act or its California equivalent. The GRANTEE must provide at its own expense any hazardous waste storage facilities, complying with all laws and regulations that it may need for storage. Installation hazardous waste storage facilities will not be available to the GRANTEE.

22. GRANTEE shall identify and notify GRANTOR of any activity that may affect federally regulated natural or cultural resources (listed threatened or endangered species, wetlands, waters of the United States, properties listed on or eligible for listing on the National Register of Historic Places, etc.) and provide information and mitigation that may be required to support consultation with the applicable regulatory agency.

23. GRANTEE shall, during the construction, installation, operation, maintenance, repair, and replacement of the sewer line, upon inadvertently discovering Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony, as those terms are defined in 43.C.F.R. § 10.2(d), immediately notify GRANTOR, followed by written confirmation. The GRANTEE shall cease all activity in the area of the inadvertent discovery until directed otherwise by the Installation, and shall make all reasonable efforts to protect any Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony so discovered, consistent with 43 C.F.R. § 10.4(c).

24. Environmental.

a. For purposes of this easement the following terms shall have the following meanings:

"Toxic or Hazardous Materials" means all substances, pollutants, contaminants, and waste to which Applicable Environmental Laws pertain, expressly including but not limited to petroleum,

petroleum products, and materials defined in 48 C.F.R. § 252.223-7006 (a)(2)(ii) and (iii).

"Contamination" means a level of Toxic or Hazardous Materials in the air, soil, or water (surface water or ground water), that exceeds levels allowed by Applicable Environmental Laws.

"Applicable Environmental Laws" means:

Federal, state, and local statutes, laws, ordinances, rules, and regulations, to which the GRANTOR is made subject by Federal law or to which the GRANTEE is made subject by Federal, state or local law;

Executive Orders of the President of the United States;

decisions of courts and administrative tribunals of competent jurisdiction;

administrative orders of regulatory agencies of competent jurisdiction (involuntary or on consent); and

regulations and directives of the Department of Defense, the Department of the Navy, and the Marine Corps (for Marine Corps installations only),

which pertain to the human environment (as defined at 40 C.F.R. § 1508.14); transportation of hazardous material; and human health and safety (including occupational safety).

Applicable Environmental Laws include, without limitation, the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 9601 et seq.), the Hazardous Material Transportation Act (49 U.S.C. § 1801, et seq.), the Resource Conservation and Recovery Act (42 U.S.C. § 6901, et seq.), the Federal Water Pollution Control Act (33 U.S.C. § 1251, et seq.), the Clean Air Act (42 U.S.C. § 7401, et seq.), the Toxic Substances Control Act (15 U.S.C. § 2601, et seq.), the Occupational Safety and Health Act (29 U.S.C. § 651, et seq.), and 10 U.S.C. § 2692, as amended.

"Release" means any discharge, spill, emission, leaking, pumping, injection, excavation, deposit, disposal, leaching, or migration into the environment, accidental or otherwise, or introduction into the environment by any other means or method.

"Remedial Action" means: investigating or monitoring the environmental condition of the Premises and clean-up, removal, response (including emergency response), and restoration of the Premises, as per Applicable Environmental Laws, due to the presence or suspected presence of Contamination or a Release or suspected Release of Toxic or Hazardous Materials.

b. If during the term of this easement the GRANTEE becomes aware that a Release of Toxic or Hazardous Materials has occurred due to acts or omissions of the GRANTEE, its agents, or contractors, whether or not such Release results in Contamination of the Premises, the GRANTEE will give notice to the GRANTOR within 24 hours of becoming aware of the Release, providing all relevant facts and circumstances. The GRANTOR may

direct the GRANTEE to make a detailed written report of these facts and circumstances within a time certain.

c. The GRANTEE, at its sole expense, will promptly take all action necessary to comply with Applicable Environmental Laws pertaining to a Release described in Subparagraph 24.b, including but not limited to: report the occurrence to appropriate Federal, state, or local regulatory authorities, if so directed by the GRANTOR; take timely and effective steps to minimize the Release and its impact on human health and the environment; and take Remedial Action. The GRANTOR may direct the GRANTEE to provide all information requested by the GRANTOR regarding such actions within a time certain. Without limitation of the foregoing, should the GRANTEE fail to take all such necessary action, the GRANTOR may, in its discretion, take Remedial Action as required to achieve compliance as set forth in Subparagraph 24.d, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 20 herein.

d. The GRANTEE will ensure that all activities conducted on the Premises by the GRANTEE, its agents, or contractors are carried out in compliance with Applicable Environmental Laws. The GRANTEE will provide notice to the GRANTOR within 24 hours of receiving any complaint, order, directive, claim, citation, or notice from any governmental authority or any other person or entity alleging noncompliance with or a violation of Applicable Environmental Laws on the Premises. The GRANTEE, at its sole expense, will promptly take all necessary action directed by Federal, state, or local regulatory authorities of competent jurisdiction to achieve or regain compliance with Applicable Environmental Laws. The GRANTOR may direct the GRANTEE to make a detailed written report, within a time certain, of the facts and circumstances underlying the alleged noncompliance or violation. Without limitation of the foregoing, the GRANTOR, in response to acts or omissions of the GRANTEE, its agents, or contractors may, in its discretion, take Remedial Action to remedy Contamination on the Premises or to achieve or regain compliance with Applicable Environmental Laws, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 20 herein.

e. The GRANTOR may at any time inspect the Premises or cause the Premises to be inspected, to assess whether the operations of the GRANTEE, its agents, or contractors are in compliance with Applicable Environmental Laws. To assist in this evaluation, the GRANTEE, its agents, and contractors will provide to the GRANTOR, or another entity, as the GRANTOR may direct, for examination and copying, all relevant books, records, documents, and other material in their possession.

f. The GRANTOR, with good cause, may from time to time require the GRANTEE to conduct tests and analyses to assess whether the Premises are in compliance with Applicable Environmental Laws, and based on the results thereof, to so certify to the GRANTOR. Such tests and analyses shall be conducted in a manner satisfactory to the GRANTOR by recognized professionals approved by the GRANTOR. If the GRANTOR and the GRANTEE cannot reach agreement as to what tests and analyses shall be conducted, by whom, and when, the GRANTOR may perform such tests and analyses or cause such tests and



analyses to be performed. To the extent any such tests and analyses indicate that acts or omissions of the GRANTEE, or its agents or contractors, has resulted in noncompliance with or a violation of Applicable Environmental Laws, the GRANTOR may recover from the GRANTEE any costs associated with performing such tests and analyses or causing them to be performed in accordance with Paragraph 20 herein.

IN WITNESS WHEREOF, the GRANTOR, acting through the Department of the Navy, by its Real Estate Contracting Officer thereunto duly authorized, has caused this GRANT OF EASEMENT to be executed the day and year written first above.

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST

By: KAREN P. RINGEL

Karen P. Ringel  
REAL ESTATE CONTRACTING OFFICER

Date: 2/12/13

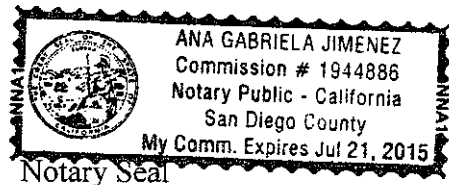
STATE OF CALIFORNIA  
County of San Diego

On this the 12th day of February, 2013, before me Ana Gabriela Jimenez Notary Public personally appeared Karen P. Ringel, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: [Handwritten Signature]



ACCEPTANCE:

GRANTEE hereby accepts this Grant of Easement and agrees to be bound by all the agreements, covenants, conditions, restrictions and reservations contained therein.

DIXON HOUSING AUTHORITY

By: LISA A. BAKER

EXECUTIVE DIRECTOR

Date: February 21, 2013

STATE OF CALIFORNIA

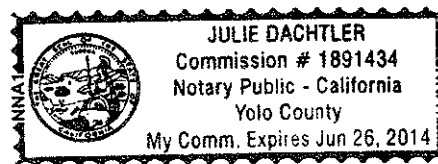
County of Yolo

On this the 21<sup>st</sup> day of February, 2013, before me Julie Dachtler, Notary Public personally appeared Lisa A. Baker, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: Julie Dachtler



Notary Seal

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)

Parcel 1-Main Housing Site

A tract of land being a portion of those lands acquired by the United States of America as described in Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 filed in the District Court of the United States in and for the Northern District of California, Northern Division in San Francisco, California, and also said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 is filed in Book 344, Page 192 in the Official Records of Solano County on May 25, 1946; said tract of land being a portion of the Northeast Quarter (NE1/4) of Section 8, Township 6 North, Range 2 East, Mount Diablo Base and Meridian, Solano County, California, more particularly described as follows:

Commencing for a Point of Reference at the North-Quarter (N1/4) corner of said Section 8 as shown on Record of Survey Map filed in Book 15 of Surveys at Page 51 in the Official Records of Solano County on October 17, 1980;

- i. thence along the north boundary line of said Northeast Quarter (NE1/4) of said Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51, East, 65.95 feet to the TRUE POINT OF BEGINNING:
1. thence, S0°15'01"E, 1039.89 feet;
2. thence along a non-tangent curve to the left having a radius of 77.32 feet through a central angle of 56°43'45" for an arc length of 76.55 feet, said curve has a radial bearing of S84°57'28"E from the beginning of curve to the radius point;
3. thence along a non-tangent curve to the left having a radius of 134.00 feet through a central angle of 38°21'24" for an arc length of 89.71 feet, said curve has a radial bearing of N38°18'47"E from the beginning of curve to the radius point;
4. thence, N89°42'24"E, 230.43 feet;
5. thence, N3°25'06"E, 15.00 feet;
6. thence, N89°59'36"E, 128.31 feet;
7. thence, N42°53'53"E, 147.01 feet;
8. thence, N 0°13'33"W, 48.17 feet;
9. thence, N89°44'56"E, 457.13 feet;
10. thence, N0°12'56"W, 962.17 feet to the north boundary line of said Northeast Quarter (NE1/4) of Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51;

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)

Parcel 1-Main Housing Site-Continued

11. thence along said north boundary line of said Northeast Quarter (NE1/4) of said Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51, West. 1029.83 feet to the TRUE POINT OF BEGINNING.

Parcel 1 Area = 24.78 Acres.

**EXCEPTING AND RESERVING UNTO THE GRANTOR (U.S.A.)** a 20-foot wide electrical easement over the above-described Parcel 1 being described as follows:

Commencing for a Point of Reference at the northwest corner of the above-described Parcel 1:

- i. thence along the north boundary of said above-described Parcel 1, and said north boundary line of said Northeast Quarter (NE1/4) of Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51, East. 312.17 feet to the TRUE POINT OF BEGINNING of said 20-foot wide electrical easement lying 10.00 on each side of the following described centerline:
1. thence, S0°09'30"E, 1135.27 feet to the south boundary line of the above-described Parcel 1 being the terminus of the herein described centerline.

Easement Area = 0.52 Acres.

Parcel 2-Sewage Ponds

A tract of land being a portion of those lands acquired by the United States of America as described in Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 filed in the District Court of the United States in and for the Northern District of California, Northern Division in San Francisco, California, and also said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5150 is filed in Book 344, Page 192 in the Official Records of Solano County on May 25, 1946: said tract of land being a portion of the East One-Half (E ½) of Section 8, Township 6 North, Range 2 East, Mount Diablo Base and Meridian, Solano County, California, more particularly described as follows:

Commencing for a Point of Reference at the Section Corner common to Sections 4, 5, 8 and 9 Township 6 North, Range 2 East, Mount Diablo Base and Meridian, as shown on Record of Survey Map filed in Book 15 of Surveys at Page 51 in the Official Records of Solano County on October 17, 1980:

- i. thence along the east boundary line of said Section 8, S0°10'57"E, 2635.68 feet to the East Quarter (E1/4) Corner of said Section 8;
- ii thence, N88°21'37"W, 52.90 feet to the TRUE POINT OF BEGINNING

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)

Parcel 2-Sewage Ponds- continued

1. thence, N88°29'35"W, 907.35 feet;
2. thence, S19°59'29"E, 1371.28 feet;
3. thence, S6°53'48"E, 230.90 feet;
4. thence, S89°26'37"E, 414.18 feet;
5. thence, N0°08'24"W, 1498.05 feet to the **TRUE POINT OF BEGINNING:**

Parcel 2 Area = 21.97 Acres.

Parcel 3 -Sewer Pipeline Easement (12 feet wide)

A strip of land being 12 feet wide lying across the lands acquired by the United States of America as described in said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5:50 being more particularly described as follows:

Commencing for a Point of Reference at the beginning of course number 9 at the southeast corner of the abovementioned Parcel 1.

- i. thence along the east boundary line of the abovementioned Parcel 1, N0°12'56"W, 14.20 feet to the **TRUE POINT OF BEGINNING** of said 12-foot wide sewer pipeline easement and lying 6.00 on each side of the following described centerline:

1. thence, N89°47'31"E, 26.27 feet;
2. thence, S23°48'07"E, 425.99 feet;
3. thence, S19°11'59"E, 1348.37 feet to the north boundary line of the above-described Parcel 2 being the terminus of the herein described centerline.

Parcel 3 Area = 0.50 Acres.

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)

Parcel 4 – Roadway Access Easement (20 feet wide)

A strip of land being 20 feet wide lying across the lands acquired by the United States of America as described in said Judgment on the Declaration of Taking for Condemnation Proceeding Civil No. 5:50 being more particularly described as follows:

Commencing for a Point of Reference at the northwest corner of the above-described Parcel 1:

- i. thence along the north boundary line of said Northeast Quarter (NE1/4) of Section 8 as shown on said Record of Survey Map filed in Book 15 of Surveys at Page 51. West, 38.03 feet to the **TRUE POINT OF BEGINNING** of said 20-foot wide Roadway Access easement lying 10.00 on each side of the following described centerline:
  1. thence, S0°06'00"E, 1012.51 feet;
  2. thence along a non-tangent curve to the left having a radius 175.57 feet through a central angle of 73°31'22" for an arc distance of 225.29; said non-tangent curve has a radial bearing from the beginning of curve to the radius point of N89°54'39"E;
  3. thence, S73°44'41"E, 247.86 feet;
  4. thence along a non-tangent curve to the right having a radius 72.01 feet through a central angle of 44°50'52" for an arc distance of 56.37; said non-tangent curve has a radial bearing from the beginning of curve to the radius point of S32°23'34"W;
  5. thence, S0°10'44"E, 1300.20 feet to the terminus of the herein described centerline.

Parcel 4 Area = 1.31 Acres.

Parcel 5 – Roadway Access Easement (10 feet wide)

Commencing for a Point of Reference at the terminus of the centerline as described in course number 5 of the above-described Parcel 4:

- i. thence along said centerline as described in course number 5 of the above-described Parcel 4, N0°10'44"W, 5.00 feet;
- ii. thence, S89°25'10"E, 10.00 feet to the east boundary line of the above-described Parcel 4 being the **TRUE POINT OF BEGINNING** of said 10-foot wide Roadway Access easement lying 5.00 on each side of the following described centerline:

LEGAL DESCRIPTION  
FOR  
LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON  
(DIXON MIGRANT HOUSING)  
(Continued)

Parcel 5 - Roadway Access Easement (10 feet wide) Continued

1. thence, S88°52'27"E, 1276.77 feet to the westerly boundary line of the above-described Parcel 2 being the terminus of the herein described centerline.

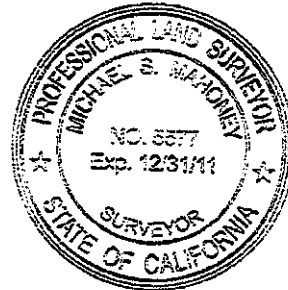
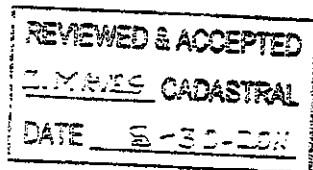
Parcel 5 Area - 0.29 Acres.

END OF LEGAL DESCRIPTION

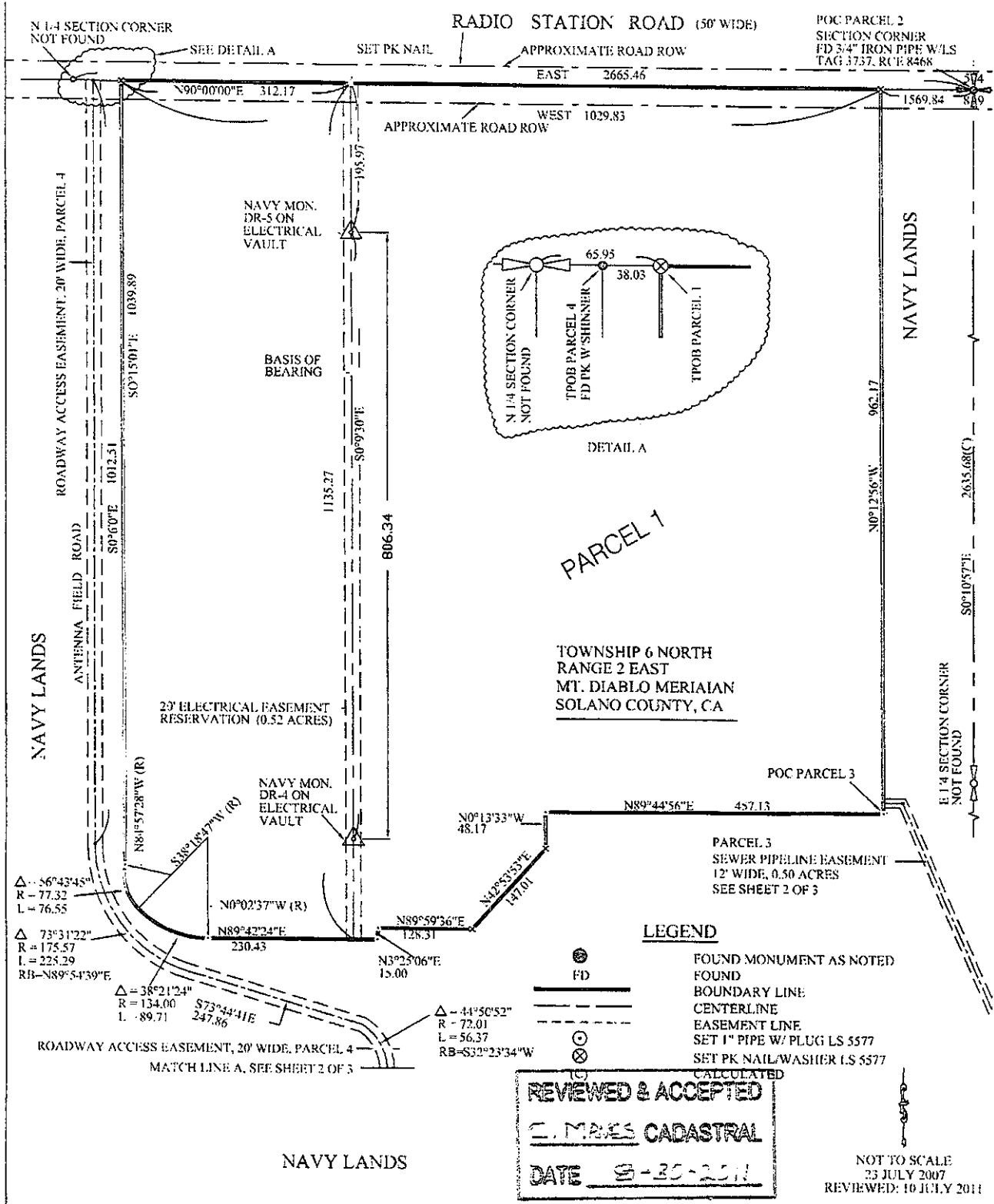
All as shown on Plats to Accompany Legal Description sheets 1 through 3 entitled "LAND TRANSFER TO HOUSING AUTHORITY OF THE CITY OF DIXON".

Prepared by:

*Michael S. Mahoney*  
Michael S. Mahoney, P.L.S.  
July 25, 2007







**PLAT TO ACCOMPANY LEGAL DESCRIPTION  
FOR LAND TRANSFER TO HOUSING AUTHORITY OF  
THE CITY OF DIXON (DIXON MIGRANT HOUSING)**

NAVAL RADIO TRANSMITTING FACILITY

DIXON, CA.

Exhibit "B"  
N6247313RP00066  
Page 1 of 3

Michael S. Mahoney, L.S.

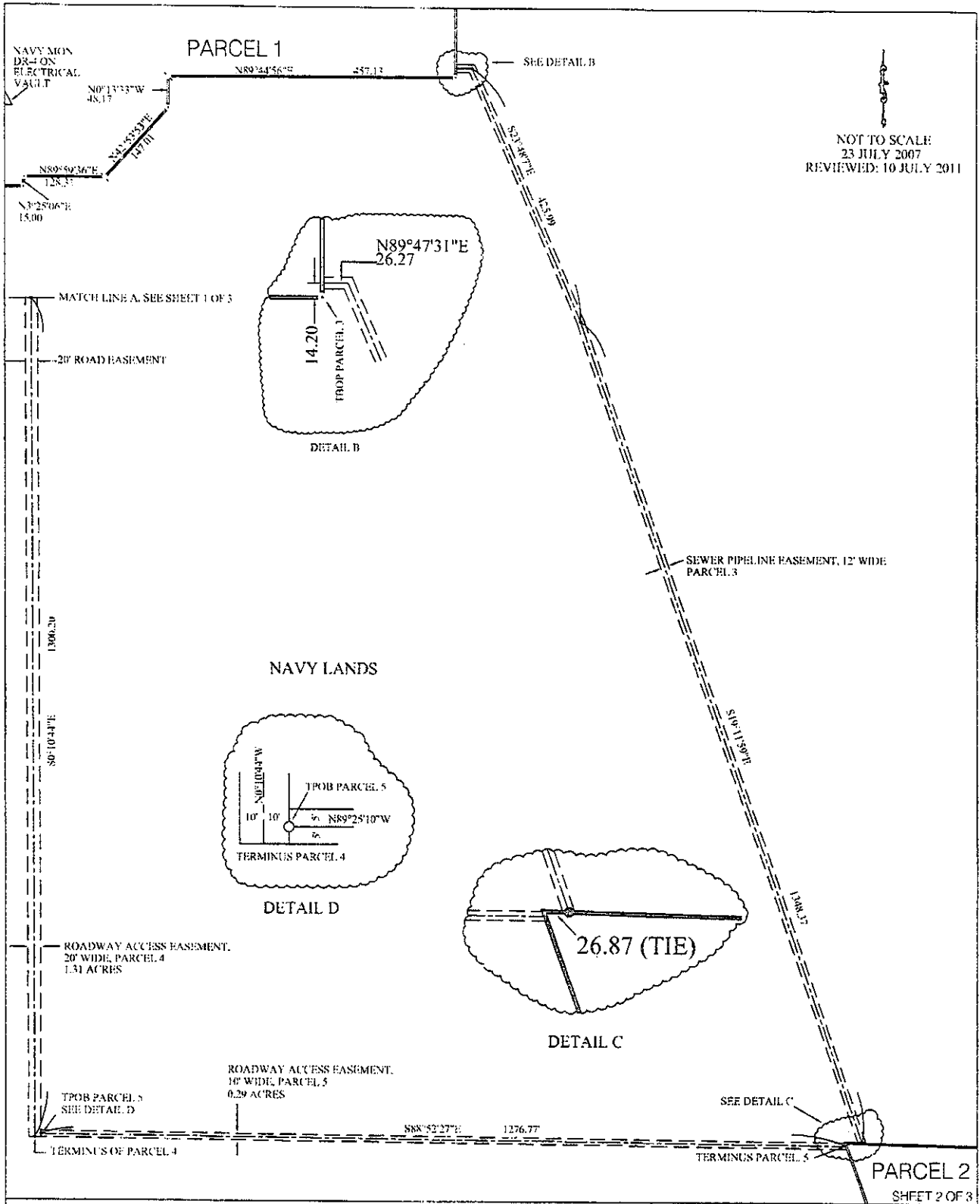
California License Number: 5577  
Professional Land Services  
901 Smooth Lane #117, San Bruno, CA 94066  
Phone/FAX: (650) 244-9687

- Site Planning
- Title Investigations
- Legal Descriptions
- Surveying & Mapping



NOT TO SCALE  
23 JULY 2007  
REVIEWED: 10 JULY 2011

SHEET 1 OF 3



**PLAT TO ACCOMPANY LEGAL DESCRIPTION  
FOR LAND TRANSFER TO HOUSING AUTHORITY OF  
THE CITY OF DIXON (DIXON MIGRANT HOUSING)**

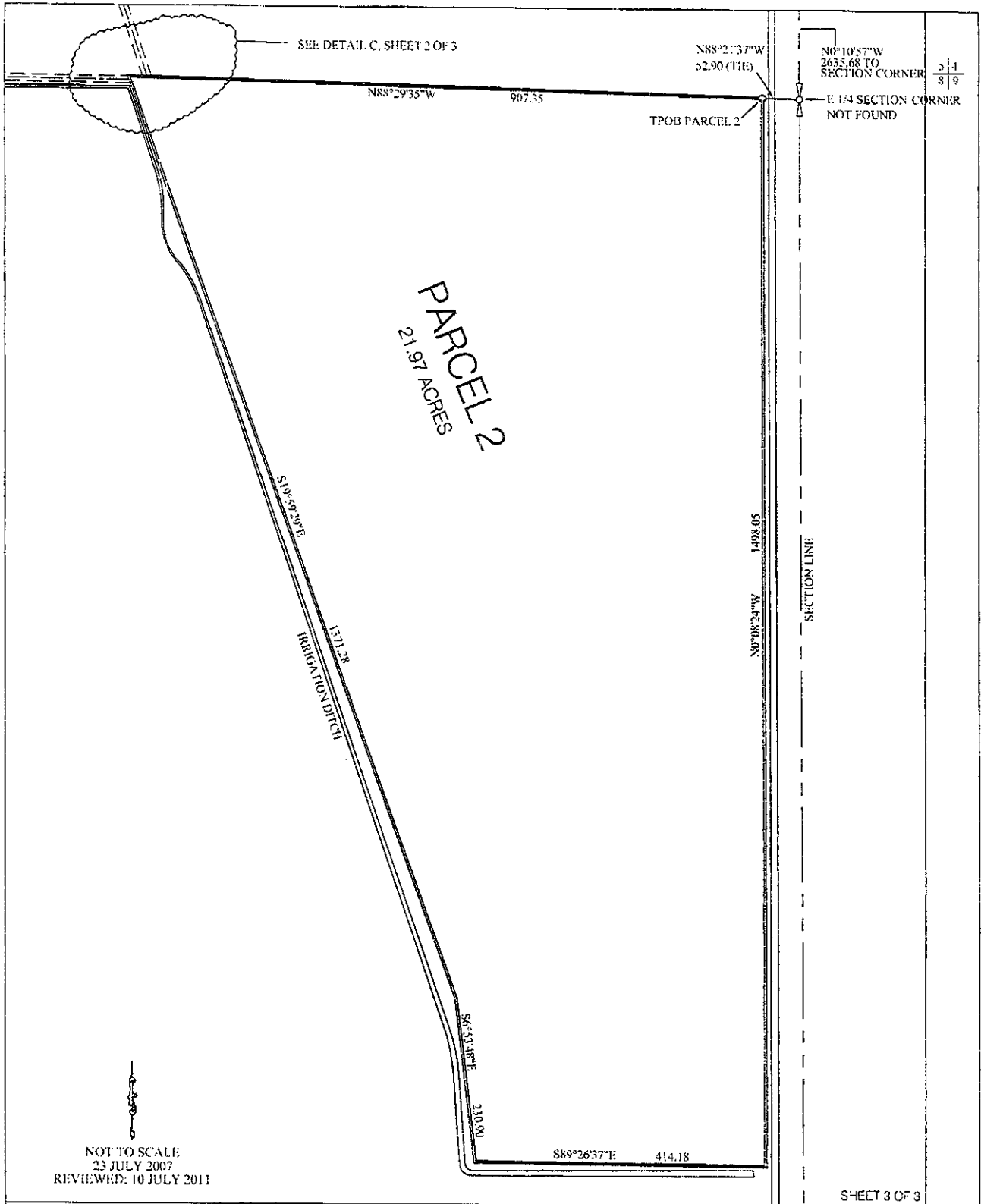
NAVAL RADIO TRANSMITTING FACILITY

DIXON, CA.

Michael S. Mahoney, P.L.S.  
California License Number 5077  
Professional Land Surveyor  
901 Srengin Lane #117, San Bruno CA 94066  
Phone/FAX (650) 244-9967

- Site Planning
- Title Investigations
- Legal Descriptions
- Surveying & Mapping






NOT TO SCALE  
 23 JULY 2007  
 REVIEWED: 10 JULY 2011

**PLAT TO ACCOMPANY LEGAL DESCRIPTION  
 FOR LAND TRANSFER TO HOUSING AUTHORITY OF  
 THE CITY OF DIXON (DIXON MIGRANT HOUSING)**

NAVAL RADIO TRANSMITTING FACILITY  
 DIXON, CA.

Michael S. Mahoney, P.L.S.  
 California License Number: 5577  
 Professional Land Services  
 901 Sneath Lane, # 117, San Bruno, CA 94066  
 Phone/FAX (650) 244-6667

- Site Planning
- Title Investigations
- Legal Descriptions
- Surveying & Mapping



**Filed for Record at Request of:**

Dixon Housing Authority

**When Recorded Return to:**

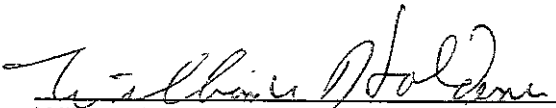
Dixon Housing Authority  
147 West Main Street  
Woodland, California 98695

EXEMPT FROM RECORDING FEE  
(Government Code § 6103)  
EXEMPT FROM DOCUMENTARY  
TRANSFER TAX  
(Rev. & Taxation Code § 11922)

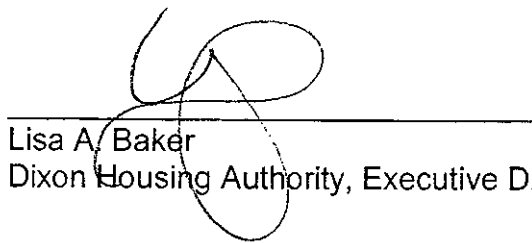
N6247312RP50064

**Certificate of Acceptance**

This is to certify that the interest in real property conveyed by the grant of easement dated February 12, 2013 from the United States of America, acting by and through the Department of Navy to the Dixon Housing Authority, a political corporation and/or governmental agency is hereby accepted by order of the Dixon Housing Authority Board of Commissioners on February 26, 2013 by the undersigned officers or agent on behalf of the Dixon Housing Authority pursuant to authority conferred by minute order of the Dixon Housing Authority adopted on December 18, 2012, and the grantee consents to recordation thereof by its duly authorized officers.

  
\_\_\_\_\_  
William W. Holdener  
Dixon Housing Authority, Chairman

Date 2/27/13

  
\_\_\_\_\_  
Lisa A. Baker  
Dixon Housing Authority, Executive Director

Date February 27, 2013

END OF DOCUMENT

**Marc C. Tonnesen**  
Assessor/Recorder

**P DIXON HOUSING AUTHORITY**

**Filed for Record at Request of:**

Dixon Housing Authority

Doc#: **201300021451**

Titles: 1      Pages: 18



Fees	0.00
Taxes	0.00
Other	0.00
PAID	\$0.00

**When Recorded Return to:**

Dixon Housing Authority  
147 W. Main Street  
Woodland, California 95695

EXEMPT FROM RECORDING FEE  
(Government Code § 6103)  
EXEMPT FROM DOCUMENTARY  
TRANSFER TAX (Rev. & Taxation Code § 11922)

N6247313RP00063

**GRANT OF EASEMENT**

THIS INDENTURE, made this 12 day of February, 2013, between the UNITED STATES OF AMERICA, acting by and through the Department of the Navy, (herein called the GRANTOR), and Dixon Housing Authority, (herein called the GRANTEE).

WHEREAS, the GRANTOR owns that certain real property identified as the Naval Radio Transmitting Facility, Dixon, California, located at 7290 Radio Station Road, in the City of Dixon, County of Solano, State of California, (hereinafter called the Installation); and

WHEREAS, the GRANTEE has requested an easement for the construction, installation, operation, maintenance, repair, and replacement of a water line on, under, and across that portion of the Installation hereinafter described; and

WHEREAS, the Secretary of the Navy has found that the granting of such an easement on the terms and conditions hereinafter stated is necessary to facilitate the transfer of real property pursuant to Section 2841 of the National Defense Authorization Act for Fiscal Year 2004, Public Law 108-136 and is not incompatible with the public interest;

NOW THEREFORE, this INDENTURE witnesseth that and in compliance with the terms and conditions set forth herein, the GRANTOR, pursuant to the authority of 10 U.S.C. § 2668, hereby grants to the GRANTEE and its successors and assigns, in perpetuity, an easement for the construction, installation, operation, maintenance, repair, and replacement of a water line, such easement being on, under and within that portion of the Installation (hereinafter called the Premises), described as Parcel 8 on Exhibit "A," and shown on a map marked Exhibit "B," both of which are attached hereto and made a part hereof.

The total area contained in the Premises is 173.37 square feet, more or less.

THIS EASEMENT is granted subject to the following terms and conditions, which GRANTEE, by its acceptance hereof, specifically agrees to and consents to be bound by:

1. All work in connection with the construction, installation, operation, maintenance, repair, and replacement of the water line shall be done without cost or expense to the GRANTOR.

2. The GRANTEE shall maintain the Premises and the water line in good condition at all times and shall promptly make all repairs that may be necessary for the preservation of the condition of the Premises and the continued operation and maintenance of the water line.

3. The GRANTEE's rights hereunder shall be subject to such reasonable rules and regulations as may be prescribed by the GRANTOR to assure that the exercise of those rights will not unreasonably interfere with the GRANTOR's activities at the Installation.

4. GRANTEE, at its expense, shall repair or restore any damage to utilities, landscaping, pavements, and facilities damaged or relocated during the construction, installation, operation, maintenance, repair and replacement of the water line in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

5. Upon completion of any work performed in or upon the Premises, GRANTEE shall remove all equipment and unused or surplus materials, if any, and shall restore the surface thereof, including any roadways, curbs, or sidewalks to their original condition in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

6. Upon any termination of this easement, the GRANTEE, at its own expense, shall remove, to the extent requested by the GRANTOR, improvements, fixtures, and equipment installed or constructed hereunder, and shall restore the Premises to the same or as good a condition as that which existed prior to the exercise by the GRANTEE of its rights hereunder. The restoration shall be done in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

7. If the GRANTOR determines at any time that all or any part of the water line, unduly interferes with any of its activities, the GRANTOR shall have the right to terminate this easement, in whole or in part, to the extent necessary to eliminate the interference; However, unless the GRANTOR shall have determined that relocation is not feasible, it shall offer to convey to the GRANTEE, without charge, a substitute easement permitting the GRANTEE to relocate all or any part of the water line on adjacent GRANTOR property, which relocation shall be accomplished at the GRANTEE's cost and expense. The substitute easement shall contain the same terms and conditions as those in this easement, and shall bear the same expiration date, if any.

8. All or any part of this easement may be terminated upon failure by the GRANTEE to comply with any of its terms and conditions; upon abandonment of the rights granted herein; or upon nonuse of those rights for a period of two (2) consecutive years.

9. The GRANTOR may use the Premises of this easement for any purpose that does not unreasonably interfere with the use and enjoyment by the GRANTEE of the rights granted by this easement.

10. This easement is granted subject to all other existing easements, if any, of public record, and to such utility lines, roadways, or other improvements as may now be located on, over, or under the Premises.

11. The GRANTEE shall not transfer or assign this easement or any interest in it, or otherwise make any portion of, or rights in, the Premises available to any party without the prior written consent of the GRANTOR. If any assignment is made, with or without consent, the assignee shall be deemed to have assumed all of the obligations of the GRANTEE. However, in no event shall the GRANTEE be relieved of any of its obligations under this easement, except for an extension of its term that begins after an assignment, and then only if the GRANTOR shall have consented to it.

12. GRANTEE shall comply with all applicable environmental laws, ordinances, rules, and regulations and all other such Federal, state, and local environmental laws, ordinances, regulations, and standards that may become applicable to GRANTEE's activities on the Premises.

13. GRANTEE shall, at its sole cost and expense, be solely responsible for obtaining any environmental permits required for its activities on the Premises.

14. GRANTOR's rights under this easement specifically include the right for its representatives to inspect the Premises upon reasonable notice for compliance with environmental, safety, and occupational health laws and regulations, whether or not the GRANTOR is responsible for enforcing them. The inspections shall be made without prejudice to the right of duly constituted enforcement officials to make them. The GRANTEE shall have no claim on account of any entries against the United States or any of its officers, agents, employees, contractors, or subcontractors.

15. Storage, treatment, or disposal of toxic hazardous materials on the Premises is prohibited except as authorized by the GRANTOR in accordance with 10 U.S.C. § 2692.

16. The GRANTEE will not use Installation accumulation points for hazardous and other wastes or permit its hazardous wastes to be commingled with hazardous waste of the GRANTOR.

17. The GRANTEE shall be solely responsible for the Release, or threat of a Release, of any Toxic or Hazardous Material as the result of any activity under this easement, and any preceding easements, licenses, or rights-of-way previously granted to GRANTEE, which results in Contamination of the environment, whether on, above or below the Premises or elsewhere. Any reporting, containment, removal, or other Remedial Action relating to a Release or threat of Release required by law or regulation as the result of any activity under this easement, or any preceding easement, license, or right-of-way, shall also be the responsibility of the GRANTEE.

18. The GRANTEE agrees to comply with the provisions of any health or safety plan in effect under the Installation Restoration Plan (IRP) or the Resource Conservation Recovery Act (RCRA) Corrective Action Program during the course of any of the above described Remedial Actions. Any inspection, survey, investigation, or other Remedial Action will, to the extent practicable, be coordinated with representatives designated by the GRANTOR. The GRANTEE shall have no claim on account of any entries onto the Premises for such purposes against the United States or its officers, agents, employees, contractors, or subcontractors. In

addition, GRANTEE shall comply with all applicable Federal, state and local occupational safety and health regulations.

19. The GRANTOR shall not be responsible for damages to property or injuries to persons that may arise from, or be incident to, the use and occupation of the Premises by the GRANTEE, or for damages to the property or injuries to the persons of the GRANTOR's officers, agents, servants, or employees, or others who may be on the Premises at their invitation or the invitation of any one of them arising from or incident to governmental activities except as permitted under the Federal Tort Claims Act, 28 U.S.C. § 2671-2680.

20. GRANTEE shall indemnify and defend the GRANTOR against, and hold the GRANTOR harmless from, any costs, expenses, liabilities, fines, suits, actions, damages, liability and cause of action arising or growing out of, or in any way connected with, the occupation or use of the Premises by the GRANTEE and its employees, agents, servants, guests, and invitees. However, this liability shall not extend to matters caused by the GRANTOR's negligent or willful acts. This provision shall survive the expiration or termination of this easement and GRANTEE's obligations hereunder shall apply whenever the GRANTOR incurs costs or liabilities for the GRANTEE's actions.

21. The GRANTEE shall comply with the hazardous waste permit, storage, handling, and disposal requirements under the Solid Waste Disposal Act or its California equivalent. The GRANTEE must provide at its own expense any hazardous waste storage facilities, complying with all laws and regulations that it may need for storage. Installation hazardous waste storage facilities will not be available to the GRANTEE.

22. GRANTEE shall identify and notify GRANTOR of any activity that may affect federally regulated natural or cultural resources (listed threatened or endangered species, wetlands, waters of the United States, properties listed on or eligible for listing on the National Register of Historic Places, etc.) and provide information and mitigation that may be required to support consultation with the applicable regulatory agency.

23. GRANTEE shall, during the construction, installation, operation, maintenance, repair, and replacement of the water line, upon inadvertently discovering Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony, as those terms are defined in 43.C.F.R. § 10.2(d), immediately notify GRANTOR, followed by written confirmation. The GRANTEE shall cease all activity in the area of the inadvertent discovery until directed otherwise by the Installation, and shall make all reasonable efforts to protect any Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony so discovered, consistent with 43 C.F.R. § 10.4(c).

24. Environmental.

a. For purposes of this easement the following terms shall have the following meanings:

"Toxic or Hazardous Materials" means all substances, pollutants, contaminants, and waste to which Applicable Environmental Laws pertain, expressly including but not limited to petroleum,



petroleum products, and materials defined in 48 C.F.R. § 252.223-7006 (a)(2)(ii) and (iii).

"Contamination" means a level of Toxic or Hazardous Materials in the air, soil, or water (surface water or ground water), that exceeds levels allowed by Applicable Environmental Laws.

"Applicable Environmental Laws" means:

Federal, state, and local statutes, laws, ordinances, rules, and regulations, to which the GRANTOR is made subject by Federal law or to which the GRANTEE is made subject by Federal, state or local law;

Executive Orders of the President of the United States;

decisions of courts and administrative tribunals of competent jurisdiction;

administrative orders of regulatory agencies of competent jurisdiction (involuntary or on consent); and

regulations and directives of the Department of Defense, the Department of the Navy, and the Marine Corps (for Marine Corps installations only),

which pertain to the human environment (as defined at 40 C.F.R. § 1508.14); transportation of hazardous material; and human health and safety (including occupational safety).

Applicable Environmental Laws include, without limitation, the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 9601 et seq.), the Hazardous Material Transportation Act (49 U.S.C. § 1801, et seq.), the Resource Conservation and Recovery Act (42 U.S.C. § 6901, et seq.), the Federal Water Pollution Control Act (33 U.S.C. § 1251, et seq.), the Clean Air Act (42 U.S.C. § 7401, et seq.), the Toxic Substances Control Act (15 U.S.C. § 2601, et seq.), the Occupational Safety and Health Act (29 U.S.C. § 651, et seq.), and 10 U.S.C. § 2692, as amended.

"Release" means any discharge, spill, emission, leaking, pumping, injection, excavation, deposit, disposal, leaching, or migration into the environment, accidental or otherwise, or introduction into the environment by any other means or method.

"Remedial Action" means: investigating or monitoring the environmental condition of the Premises and clean-up, removal, response (including emergency response), and restoration of the Premises, as per Applicable Environmental Laws, due to the presence or suspected presence of Contamination or a Release or suspected Release of Toxic or Hazardous Materials.

b. If during the term of this easement the GRANTEE becomes aware that a Release of Toxic or Hazardous Materials has occurred due to acts or omissions of the GRANTEE, its agents, or contractors, whether or not such Release results in Contamination of the Premises, the GRANTEE will give notice to the GRANTOR within 24 hours of becoming aware of the Release, providing all relevant facts and circumstances. The GRANTOR may

direct the GRANTEE to make a detailed written report of these facts and circumstances within a time certain.

c. The GRANTEE, at its sole expense, will promptly take all action necessary to comply with Applicable Environmental Laws pertaining to a Release described in Subparagraph 24.b, including but not limited to: report the occurrence to appropriate Federal, state, or local regulatory authorities, if so directed by the GRANTOR; take timely and effective steps to minimize the Release and its impact on human health and the environment; and take Remedial Action. The GRANTOR may direct the GRANTEE to provide all information requested by the GRANTOR regarding such actions within a time certain. Without limitation of the foregoing, should the GRANTEE fail to take all such necessary action, the GRANTOR may, in its discretion, take Remedial Action as required to achieve compliance as set forth in Subparagraph 24.d, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 20 herein.

d. The GRANTEE will ensure that all activities conducted on the Premises by the GRANTEE, its agents, or contractors are carried out in compliance with Applicable Environmental Laws. The GRANTEE will provide notice to the GRANTOR within 24 hours of receiving any complaint, order, directive, claim, citation, or notice from any governmental authority or any other person or entity alleging noncompliance with or a violation of Applicable Environmental Laws on the Premises. The GRANTEE, at its sole expense, will promptly take all necessary action directed by Federal, state, or local regulatory authorities of competent jurisdiction to achieve or regain compliance with Applicable Environmental Laws. The GRANTOR may direct the GRANTEE to make a detailed written report, within a time certain, of the facts and circumstances underlying the alleged noncompliance or violation. Without limitation of the foregoing, the GRANTOR, in response to acts or omissions of the GRANTEE, its agents, or contractors may, in its discretion, take Remedial Action to remedy Contamination on the Premises or to achieve or regain compliance with Applicable Environmental Laws, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 20 herein.

e. The GRANTOR may at any time inspect the Premises or cause the Premises to be inspected, to assess whether the operations of the GRANTEE, its agents, or contractors are in compliance with Applicable Environmental Laws. To assist in this evaluation, the GRANTEE, its agents, and contractors will provide to the GRANTOR, or another entity, as the GRANTOR may direct, for examination and copying, all relevant books, records, documents, and other material in their possession.

f. The GRANTOR, with good cause, may from time to time require the GRANTEE to conduct tests and analyses to assess whether the Premises are in compliance with Applicable Environmental Laws, and based on the results thereof, to so certify to the GRANTOR. Such tests and analyses shall be conducted in a manner satisfactory to the GRANTOR by recognized professionals approved by the GRANTOR. If the GRANTOR and the GRANTEE cannot reach agreement as to what tests and analyses shall be conducted, by whom, and when, the GRANTOR may perform such tests and analyses or cause such tests and

analyses to be performed. To the extent any such tests and analyses indicate that acts or omissions of the GRANTEE, or its agents or contractors, has resulted in noncompliance with or a violation of Applicable Environmental Laws, the GRANTOR may recover from the GRANTEE any costs associated with performing such tests and analyses or causing them to be performed in accordance with Paragraph 20 herein.

IN WITNESS WHEREOF, the GRANTOR, acting through the Department of the Navy, by its Real Estate Contracting Officer thereunto duly authorized, has caused this GRANT OF EASEMENT to be executed the day and year written first above.

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST

By: KAREN P. RINGEL

Karen P. Ringel  
REAL ESTATE CONTRACTING OFFICER

Date: 2/12/13

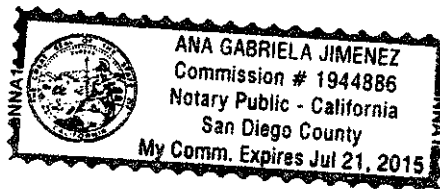
STATE OF CALIFORNIA  
County of San Diego

On this the 12<sup>th</sup> day of February, 2013, before me Ana Gabriela Jimenez, Notary Public personally appeared Karen P. Ringel, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: [Handwritten Signature]



Notary Seal

ACCEPTANCE:

GRANTEE hereby accepts this Grant of Easement and agrees to be bound by all the agreements, covenants, conditions, restrictions and reservations contained therein.

DIXON HOUSING AUTHORITY

By: LISA A. BAKER

  
\_\_\_\_\_  
EXECUTIVE DIRECTOR

Date: February 21, 2013

STATE OF CALIFORNIA

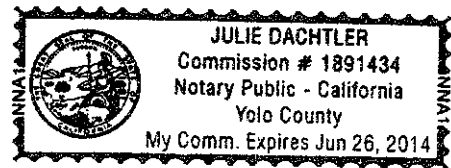
County of Yolo

On this the 21<sup>st</sup> day of February, 2013, before me Julie Dachtler, Notary Public personally appeared Lisa A. Baker, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: Julie Dachtler



Notary Seal

January 8, 2013

LEGAL DESCRIPTION FOR EASEMENTS GRANTED TO  
THE HOUSING AUTHORITY OF THE CITY OF DIXON (DIXON MIGRANT HOUSING)

Portions of the northeast quarter of Section 8, Township 6 North, Range 2 East, Mount Diablo Base and Meridian according to official plat thereof in the unincorporated area of the County of Solano, State of California.

PARCEL 6 ELECTRIC EASEMENT

An easement for electric utilities and ingress and egress thereto being a strip of land, ten (10) feet in width, lying five (5) feet on each side of the following described centerline:

Commencing at the southwest corner of the land transfer to Dixon Housing Authority described as Parcel 1, Main Housing site, being the easterly terminus of a 134.00 foot radius curve on the southerly line of said land transfer; thence easterly along said southerly line South 89°58'50" East 203.13 feet to the TRUE POINT OF BEGINNING; thence South 00°02'14" West 29.27 feet to the POINT OF TERMINUS.

The sidelines of said strip of land shall be prolonged or shortened so as to begin at said southerly line of land transfer and end perpendicular to said centerline.

Parcel 6 Containing 292.69 square feet.

PARCEL 7 ELECTRIC EASEMENT

An easement for electric utilities and ingress and egress thereto being a strip of land, ten (10) feet in width, lying five (5) feet on each side of the following described centerline:

Commencing at the southwest corner of the land transfer to Dixon Housing Authority described as Parcel 1, Main Housing site, being the easterly terminus of a 134.00 foot radius curve on the southerly line of said land transfer; thence easterly along said southerly line there of the following courses: South 89°58'50" East 230.43; thence North 03°43'52" East 15.00 feet; thence North 89°41'38" East 128.31 feet; thence North 43°12'39" East 147.01 feet; thence North 00°05'13" East 22.19 feet to a point hereinafter described as Point "A" and the TRUE POINT OF BEGINNING; thence leaving said southerly line South 89°49'13" East 427.33; thence North 00°28'18" West 26.86 feet to a point on said southerly line.

The sidelines of said strip of land shall be prolonged or shortened so as to begin and end on said southerly line of land transfer.

JN 132608 (25105722)

January 8, 2013

Parcel 7 Containing 4,541.92 square feet.

**PARCEL 8 WATER EASEMENT**

Commencing at the above described Point "A" on the southerly line of said land transfer; thence continuing northerly along said southerly line North  $00^{\circ}05'13''$  East 15.75 feet to the TRUE POINT OF BEGINNING; thence leaving said southerly line South  $89^{\circ}54'07''$  East 16.94 feet; thence North  $00^{\circ}04'44''$  East 10.24 feet to a point on said southerly line; thence westerly along said southerly line North  $89^{\circ}56'18''$  West 16.93 feet to an angle point therein; thence southerly along said southerly line South  $00^{\circ}05'13''$  West 10.23 feet to the TRUE POINT OF BEGINNING.

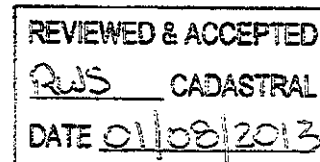
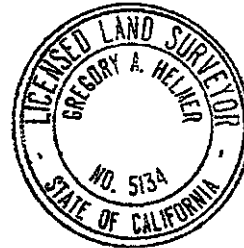
Parcel 8 Containing 173.37 square feet.

See Plat attached hereto and made a part hereof.

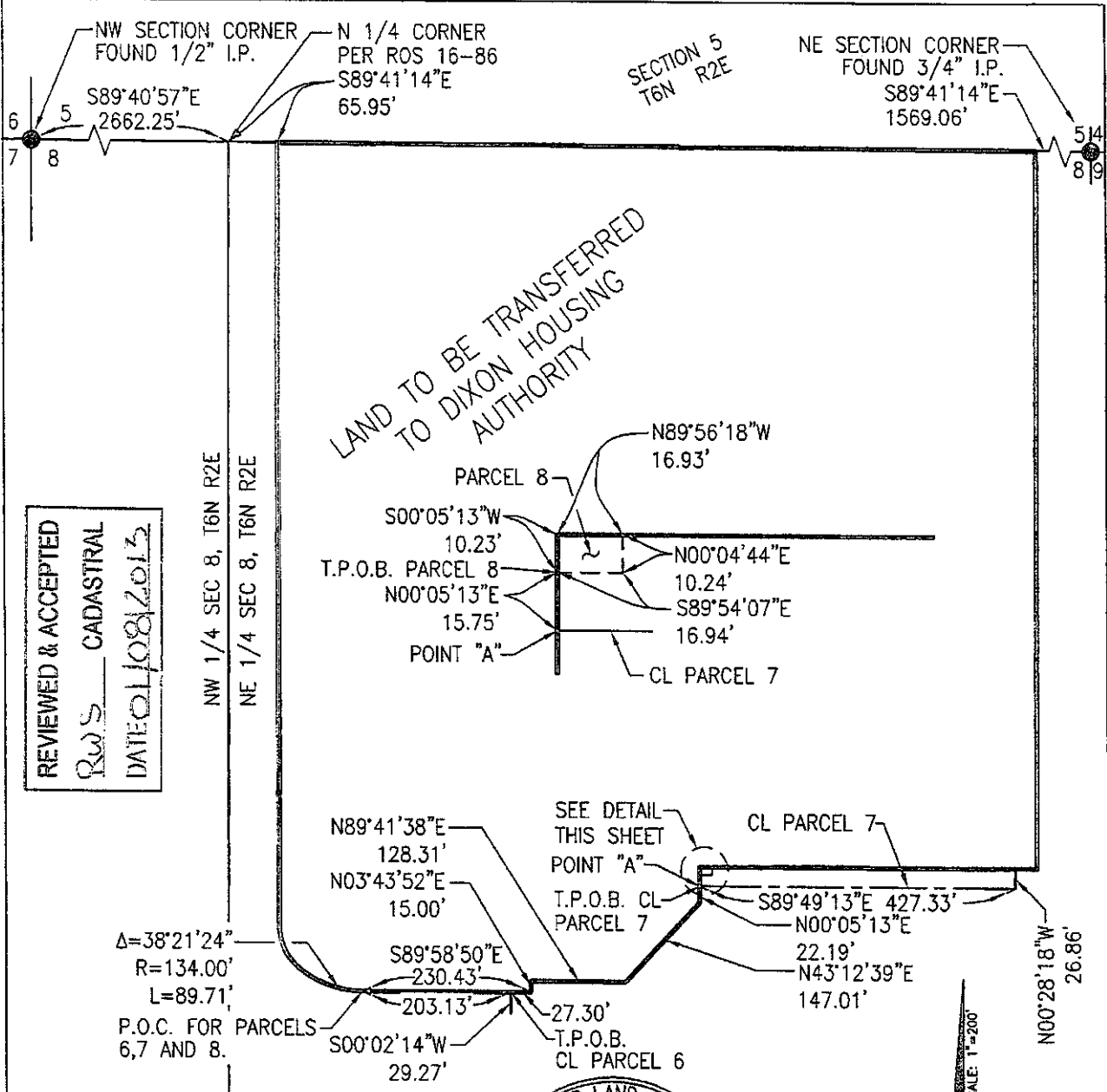
This description was prepared by me or under my direction.



-----  
Gregory A. Helmer, LS 5134



JN 132608 (25105722)

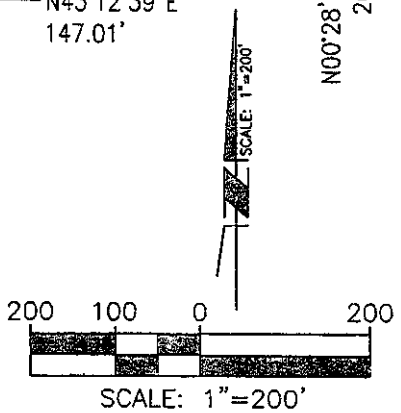
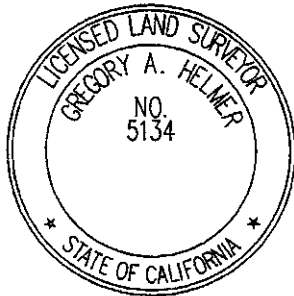


REVIEWED & ACCEPTED  
 ROS CADASTRAL  
 DATE 01/08/2013

**LEGEND**

CL = CENTERLINE  
 POC = POINT OF COMMENCEMENT  
 T.P.O.B. = POINT OF BEGINNING

----- CENTERLINE OF 10' WIDE ELECTRICAL EASEMENT  
 - - - - - WATER EASEMENT



**RBF** PLANNING • DESIGN • CONSTRUCTION  
 CONSULTING

9705 CLAREMONT MESA BOULEVARD, SUITE 100  
 SAN DIEGO, CALIFORNIA 92131-6204  
 619.514.6000 • FAX 619.514.5001 • WWW.RBF.COM

PLAT TO ACCOMPANY LEGAL DESCRIPTION  
 FOR EASEMENTS GRANTED TO DIXON  
 SOLANO COUNTY HOUSING AUTHORITY CALIFORNIA

DRAWN BY: R. MISELL APPROVED BY: SCALE: 1"=200' DATE: 01-08-2013 SHEET 1 OF 1



**Filed for Record at Request of:**

Dixon Housing Authority

**When Recorded Return to:**

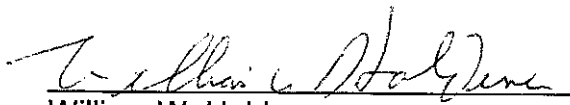
Dixon Housing Authority  
147 West Main Street  
Woodland, California 98695

EXEMPT FROM RECORDING FEE  
(Government Code § 6103)  
EXEMPT FROM DOCUMENTARY  
TRANSFER TAX  
(Rev. & Taxation Code § 11922)

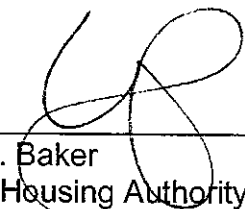
N6247312RP50063

**Certificate of Acceptance**

This is to certify that the interest in real property conveyed by the grant of easement dated February 12, 2013 from the United States of America, acting by and through the Department of Navy to the Dixon Housing Authority, a political corporation and/or governmental agency is hereby accepted by order of the Dixon Housing Authority Board of Commissioners on February 26, 2013 by the undersigned officers or agent on behalf of the Dixon Housing Authority pursuant to authority conferred by minute order of the Dixon Housing Authority adopted on December 18, 2012, and the grantee consents to recordation thereof by its duly authorized officers.

  
\_\_\_\_\_  
William W. Holdener  
Dixon Housing Authority, Chairman

Date 2/27/13

  
\_\_\_\_\_  
Lisa A. Baker  
Dixon Housing Authority, Executive Director

Date February 27, 2013

END OF  
DOCUMENT



**Marc C. Tonnesen**  
Assessor/Recorder

**Filed for Record at Request of:**

Dixon Housing Authority

**When Recorded Return to:**

Dixon Housing Authority  
147 W. Main Street  
Woodland, California 95695

**P DIXON HOUSING AUTHORITY**

Doc#: 201300021453

Titles: 1      Pages: 13



Fees	0.00
Taxes	0.00
Other	0.00
PAID	\$0.00

EXEMPT FROM RECORDING FEE  
(Government Code § 6103)  
EXEMPT FROM DOCUMENTARY  
TRANSFER TAX (Rev. & Taxation Code § 11922)

N6247313RP00065

**GRANT OF EASEMENT**

THIS INDENTURE, made this 12 day of February, 2013, between the UNITED STATES OF AMERICA, acting by and through the Department of the Navy, (herein called the GRANTOR), and Dixon Housing Authority, (herein called the GRANTEE).

WHEREAS, the GRANTOR owns that certain real property identified as the Naval Radio Transmitting Facility, Dixon, California, located at 7290 Radio Station Road, in the City of Dixon, County of Solano, State of California, (hereinafter called the Installation); and

WHEREAS, the GRANTEE has requested an easement for the construction, installation, operation, maintenance, repair, and replacement of power lines and poles on, over, and across that portion of the Installation hereinafter described; and

WHEREAS, the Secretary of the Navy has found that the granting of such an easement on the terms and conditions hereinafter stated is necessary to facilitate the transfer of real property pursuant to Section 2841 of the National Defense Authorization Act for Fiscal Year 2004, Public Law 108-136 and is not incompatible with the public interest;

NOW THEREFORE, this INDENTURE witnesseth that and in compliance with the terms and conditions set forth herein, the GRANTOR, pursuant to the authority of 10 U.S.C. § 2668, hereby grants to the GRANTEE and its successors and assigns, in perpetuity, an easement for the construction, installation, operation, maintenance, repair, and replacement of overhead power lines and poles, such easement being over, on, and within that portion of the Installation (hereinafter called the Premises), described as Parcels 6 and 7 on Exhibit "A," and shown on a map marked Exhibit "B," both of which are attached hereto and made a part hereof.

The total area contained in the Premises is .11 acres, more or less.

THIS EASEMENT is granted subject to the following terms and conditions, which GRANTEE, by its acceptance hereof, specifically agrees to and consents to be bound by:

1. All work in connection with the construction, installation, operation, maintenance, repair, and replacement of the power lines and poles shall be done without cost or expense to the GRANTOR.

2. The GRANTEE shall maintain the Premises and the power lines and poles in good condition at all times and shall promptly make all repairs that may be necessary for the preservation of the condition of the Premises and the continued operation and maintenance of the power lines and poles.

3. The GRANTEE's rights hereunder shall be subject to such reasonable rules and regulations as may be prescribed by the GRANTOR to assure that the exercise of those rights will not unreasonably interfere with the GRANTOR's activities at the Installation.

4. GRANTEE, at its expense, shall repair or restore any damage to utilities, landscaping, pavements, and facilities damaged or relocated during the construction, installation, operation, maintenance, repair and replacement of the power lines and poles in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

5. Upon completion of any work performed in or upon the Premises, GRANTEE shall remove all equipment and unused or surplus materials, if any, and shall restore the surface thereof, including any roadways, curbs, or sidewalks to their original condition in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

6. Upon any termination of this easement, the GRANTEE, at its own expense, shall remove, to the extent requested by the GRANTOR, improvements, fixtures, and equipment installed or constructed hereunder, and shall restore the Premises to the same or as good a condition as that which existed prior to the exercise by the GRANTEE of its rights hereunder. The restoration shall be done in a manner satisfactory to the Commanding Officer, Naval Facilities Engineering Command, Southwest.

7. If the GRANTOR determines at any time that all or any part of the power lines or poles, unduly interferes with any of its activities, the GRANTOR shall have the right to terminate this easement, in whole or in part, to the extent necessary to eliminate the interference; However, unless the GRANTOR shall have determined that relocation is not feasible, it shall offer to convey to the GRANTEE, without charge, a substitute easement permitting the GRANTEE to relocate all or any part of the power lines or poles on adjacent GRANTOR property, which relocation shall be accomplished at the GRANTEE's cost and expense. The substitute easement shall contain the same terms and conditions as those in this easement, and shall bear the same expiration date, if any.

8. All or any part of this easement may be terminated upon failure by the GRANTEE to comply with any of its terms and conditions; upon abandonment of the rights granted herein; or upon nonuse of those rights for a period of two (2) consecutive years.

9. The GRANTOR may use the Premises of this easement for any purpose that does not unreasonably interfere with the use and enjoyment by the GRANTEE of the rights granted by this easement.

10. This easement is granted subject to all other existing easements, if any, of public record, and to such utility lines, roadways, or other improvements as may now be located on, over, or under the Premises.

11. The GRANTEE shall not transfer or assign this easement or any interest in it, or otherwise make any portion of, or rights in, the Premises available to any party without the prior written consent of the GRANTOR. If any assignment is made, with or without consent, the assignee shall be deemed to have assumed all of the obligations of the GRANTEE. However, in no event shall the GRANTEE be relieved of any of its obligations under this easement, except for an extension of its term that begins after an assignment, and then only if the GRANTOR shall have consented to it.

12. GRANTEE shall comply with all applicable environmental laws, ordinances, rules, and regulations and all other such Federal, state, and local environmental laws, ordinances, regulations, and standards that may become applicable to GRANTEE's activities on the Premises.

13. GRANTEE shall, at its sole cost and expense, be solely responsible for obtaining any environmental permits required for its activities on the Premises.

14. GRANTOR's rights under this easement specifically include the right for its representatives to inspect the Premises upon reasonable notice for compliance with environmental, safety, and occupational health laws and regulations, whether or not the GRANTOR is responsible for enforcing them. The inspections shall be made without prejudice to the right of duly constituted enforcement officials to make them. The GRANTEE shall have no claim on account of any entries against the United States or any of its officers, agents, employees, contractors, or subcontractors.

15. Storage, treatment, or disposal of toxic hazardous materials on the Premises is prohibited except as authorized by the GRANTOR in accordance with 10 U.S.C. § 2692.

16. The GRANTEE will not use Installation accumulation points for hazardous and other wastes or permit its hazardous wastes to be commingled with hazardous waste of the GRANTOR.

17. The GRANTEE shall be solely responsible for the Release, or threat of a Release, of any Toxic or Hazardous Material, as the result of any activity under this easement, and any preceding easements, licenses, or rights-of-way previously granted to GRANTEE, which results in Contamination of the environment, whether on, above or below the Premises or elsewhere. Any reporting, containment, removal, or other Remedial Action relating to a Release or threat of Release required by law or regulation as the result of any activity under this easement, or any preceding easement, license, or right-of-way, shall also be the responsibility of the GRANTEE.

18. The GRANTEE agrees to comply with the provisions of any health or safety plan in effect under the Installation Restoration Plan (IRP) or the Resource Conservation Recovery Act (RCRA) Corrective Action Program during the course of any of the above described

Remedial Actions. Any inspection, survey, investigation, or other Remedial Action will, to the extent practicable, be coordinated with representatives designated by the GRANTOR. The GRANTEE shall have no claim on account of any entries onto the Premises for such purposes against the United States or its officers, agents, employees, contractors, or subcontractors. In addition, GRANTEE shall comply with all applicable Federal, state and local occupational safety and health regulations.

19. The GRANTOR shall not be responsible for damages to property or injuries to persons that may arise from, or be incident to, the use and occupation of the Premises by the GRANTEE, or for damages to the property or injuries to the persons of the GRANTOR's officers, agents, servants, or employees, or others who may be on the Premises at their invitation or the invitation of any one of them arising from or incident to governmental activities except as permitted under the Federal Tort Claims Act, 28 U.S.C. § 2671-2680.

20. GRANTEE shall indemnify and defend the GRANTOR against, and hold the GRANTOR harmless from, any costs, expenses, liabilities, fines, suits, actions, damages, liability and cause of action arising or growing out of, or in any way connected with, the occupation or use of the Premises by the GRANTEE and its employees, agents, servants, guests, and invitees. However, this liability shall not extend to matters caused by the GRANTOR's negligent or willful acts. This provision shall survive the expiration or termination of this easement and GRANTEE's obligations hereunder shall apply whenever the GRANTOR incurs costs or liabilities for the GRANTEE's actions.

21. The GRANTEE shall comply with any hazardous waste permit, storage, handling, and disposal requirements under the Solid Waste Disposal Act or its California equivalent. The GRANTEE must provide at its own expense any hazardous waste storage facilities, complying with all laws and regulations that it may need for storage. Installation hazardous waste storage facilities will not be available to the GRANTEE.

22. GRANTEE shall identify and notify GRANTOR of any activity that may affect federally regulated natural or cultural resources (listed threatened or endangered species, wetlands, waters of the United States, properties listed on or eligible for listing on the National Register of Historic Places, etc.) and provide information and mitigation that may be required to support consultation with the applicable regulatory agency.

23. GRANTEE shall, during the construction, installation, operation, maintenance, repair, and replacement of the power lines or poles, upon inadvertently discovering Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony, as those terms are defined in 43.C.F.R. § 10.2(d), immediately notify GRANTOR, followed by written confirmation. The GRANTEE shall cease all activity in the area of the inadvertent discovery until directed otherwise by the Installation, and shall make all reasonable efforts to protect any Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony so discovered, consistent with 43 C.F.R. § 10.4(c).

24. Environmental.

a. For purposes of this easement the following terms shall have the following meanings:

"Toxic or Hazardous Materials" means all substances, pollutants, contaminants, and waste to which Applicable Environmental Laws pertain, expressly including but not limited to petroleum, petroleum products, and materials defined in 48 C.F.R. § 252.223-7006 (a)(2) and (iii).

"Contamination" means a level of Toxic or Hazardous Materials in the air, soil, or water (surface water or ground water), that exceeds levels allowed by Applicable Environmental Laws.

"Applicable Environmental Laws" means:

Federal, state, and local statutes, laws, ordinances, rules, and regulations, to which the GRANTOR is made subject by Federal law or to which the GRANTEE is made subject by Federal, state or local law;

Executive Orders of the President of the United States;

decisions of courts and administrative tribunals of competent jurisdiction;

administrative orders of regulatory agencies of competent jurisdiction (involuntary or on consent); and

regulations and directives of the Department of Defense, the Department of the Navy, and the Marine Corps (for Marine Corps installations only),

which pertain to the human environment (as defined at 40 C.F.R. § 1508.14); transportation of hazardous material; and human health and safety (including occupational safety).

Applicable Environmental Laws include, without limitation, the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 9601 et seq.), the Hazardous Material Transportation Act (49 U.S.C. § 1801, et seq.), the Resource Conservation and Recovery Act (42 U.S.C. § 6901, et seq.), the Federal Water Pollution Control Act (33 U.S.C. § 1251, et seq.), the Clean Air Act (42 U.S.C. § 7401, et seq.), the Toxic Substances Control Act (15 U.S.C. § 2601, et seq.), the Occupational Safety and Health Act (29 U.S.C. § 651, et seq.), and 10 U.S.C. § 2692, as amended.

"Release" means any discharge, spill, emission, leaking, pumping, injection, excavation, deposit, disposal, leaching, or migration into the environment, accidental or otherwise, or introduction into the environment by any other means or method.

"Remedial Action" means: investigating or monitoring the environmental condition of the Premises and clean-up, removal, response (including emergency response), and restoration of the

Premises, as per Applicable Environmental Laws, due to the presence or suspected presence of Contamination or a Release or suspected Release of Toxic or Hazardous Materials.

b. If during the term of this easement the GRANTEE becomes aware that a Release of Toxic or Hazardous Materials has occurred due to acts or omissions of the GRANTEE, its agents, or contractors, whether or not such Release results in Contamination of the Premises, the GRANTEE will give notice to the GRANTOR within 24 hours of becoming aware of the Release, providing all relevant facts and circumstances. The GRANTOR may direct the GRANTEE to make a detailed written report of these facts and circumstances within a time certain.

c. The GRANTEE, at its sole expense, will promptly take all action necessary to comply with Applicable Environmental Laws pertaining to a Release described in Subparagraph 24.b, including but not limited to: report the occurrence to appropriate Federal, state, or local regulatory authorities, if so directed by the GRANTOR; take timely and effective steps to minimize the Release and its impact on human health and the environment; and take Remedial Action. The GRANTOR may direct the GRANTEE to provide all information requested by the GRANTOR regarding such actions within a time certain. Without limitation of the foregoing, should the GRANTEE fail to take all such necessary action, the GRANTOR may, in its discretion, take Remedial Action as required to achieve compliance as set forth in Subparagraph 24.d, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 20 herein.

d. The GRANTEE will ensure that all activities conducted on the Premises by the GRANTEE, its agents, or contractors are carried out in compliance with Applicable Environmental Laws. The GRANTEE will provide notice to the GRANTOR within 24 hours of receiving any complaint, order, directive, claim, citation, or notice from any governmental authority or any other person or entity alleging noncompliance with or a violation of Applicable Environmental Laws on the Premises. The GRANTEE, at its sole expense, will promptly take all necessary action directed by Federal, state, or local regulatory authorities of competent jurisdiction to achieve or regain compliance with Applicable Environmental Laws. The GRANTOR may direct the GRANTEE to make a detailed written report, within a time certain, of the facts and circumstances underlying the alleged noncompliance or violation. Without limitation of the foregoing, the GRANTOR, in response to acts or omissions of the GRANTEE, its agents, or contractors may, in its discretion, take Remedial Action to remedy Contamination on the Premises or to achieve or regain compliance with Applicable Environmental Laws, and GRANTEE shall be required to indemnify the GRANTOR for any costs associated with such discretionary action by the GRANTOR in accordance with Paragraph 20 herein.

e. The GRANTOR may at any time inspect the Premises or cause the Premises to be inspected, to assess whether the operations of the GRANTEE, its agents, or contractors are in compliance with Applicable Environmental Laws. To assist in this evaluation, the GRANTEE, its agents, and contractors will provide to the GRANTOR, or another entity, as the GRANTOR may direct, for examination and copying, all relevant books, records, documents, and other material in their possession.



f. The GRANTOR, with good cause, may from time to time require the GRANTEE to conduct tests and analyses to assess whether the Premises are in compliance with Applicable Environmental Laws, and based on the results thereof, to so certify to the GRANTOR. Such tests and analyses shall be conducted in a manner satisfactory to the GRANTOR by recognized professionals approved by the GRANTOR. If the GRANTOR and the GRANTEE cannot reach agreement as to what tests and analyses shall be conducted, by whom, and when, the GRANTOR may perform such tests and analyses or cause such tests and analyses to be performed. To the extent any such tests and analyses indicate that acts or omissions of the GRANTEE, or its agents or contractors, has resulted in noncompliance with or a violation of Applicable Environmental Laws, the GRANTOR may recover from the GRANTEE any costs associated with performing such tests and analyses or causing them to be performed in accordance with Paragraph 20 herein.

IN WITNESS WHEREOF, the GRANTOR, acting through the Department of the Navy, by its Real Estate Contracting Officer thereunto duly authorized, has caused this GRANT OF EASEMENT to be executed the day and year written first above.

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST

By: KAREN P. RINGEL

Karen P. Ringel  
REAL ESTATE CONTRACTING OFFICER

Date: Feb 12, 2013

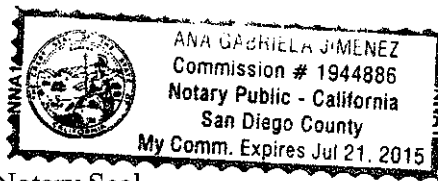
STATE OF CALIFORNIA  
County of San Diego

On this the 12<sup>th</sup> day of February, 2013, before me Ana Gabriela Jimenez, Notary Public, personally appeared Karen P. Ringel, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: [Handwritten Signature]



Notary Seal

ACCEPTANCE:

GRANTEE hereby accepts this Grant of Easement and agrees to be bound by all the agreements, covenants, conditions, restrictions and reservations contained therein.

DIXON HOUSING AUTHORITY

By: LISA A. BAKER

\_\_\_\_\_  
EXECUTIVE DIRECTOR

Date: February 21, 2013

STATE OF CALIFORNIA

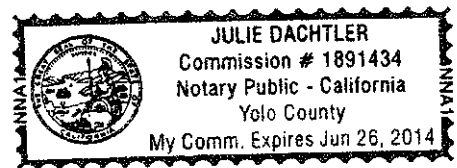
County of Yolo

On this the 21<sup>st</sup> day of February, 2013, before me Julie Dachtler, Notary Public personally appeared Lisa A. Baker, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: Julie Dachtler



Notary Seal

January 8, 2013

**LEGAL DESCRIPTION FOR EASEMENTS GRANTED TO  
THE HOUSING AUTHORITY OF THE CITY OF DIXON (DIXON MIGRANT HOUSING)**

Portions of the northeast quarter of Section 8, Township 6 North, Range 2 East, Mount Diablo Base and Meridian according to official plat thereof in the unincorporated area of the County of Solano, State of California.

**PARCEL 6 ELECTRIC EASEMENT**

An easement for electric utilities and ingress and egress thereto being a strip of land, ten (10) feet in width, lying five (5) feet on each side of the following described centerline:

Commencing at the southwest corner of the land transfer to Dixon Housing Authority described as Parcel 1, Main Housing site, being the easterly terminus of a 134.00 foot radius curve on the southerly line of said land transfer; thence easterly along said southerly line South 89°58'50" East 203.13 feet to the **TRUE POINT OF BEGINNING**; thence South 00°02'14" West 29.27 feet to the **POINT OF TERMINUS**.

The sidelines of said strip of land shall be prolonged or shortened so as to begin at said southerly line of land transfer and end perpendicular to said centerline.

Parcel 6 Containing 292.69 square feet.

**PARCEL 7 ELECTRIC EASEMENT**

An easement for electric utilities and ingress and egress thereto being a strip of land, ten (10) feet in width, lying five (5) feet on each side of the following described centerline:

Commencing at the southwest corner of the land transfer to Dixon Housing Authority described as Parcel 1, Main Housing site, being the easterly terminus of a 134.00 foot radius curve on the southerly line of said land transfer; thence easterly along said southerly line there of the following courses: South 89°58'50" East 230.43; thence North 03°43'52" East 15.00 feet; thence North 89°41'38" East 128.31 feet; thence North 43°12'39" East 147.01 feet; thence North 00°05'13" East 22.19 feet to a point hereinafter described as Point "A" and the **TRUE POINT OF BEGINNING**; thence leaving said southerly line South 89°49'13" East 427.33; thence North 00°28'18" West 26.86 feet to a point on said southerly line.

The sidelines of said strip of land shall be prolonged or shortened so as to begin and end on said southerly line of land transfer.

JN 132608 (25105722)

January 8, 2013

Parcel 7 Containing 4,541.92 square feet.

PARCEL 8 WATER EASEMENT

Commencing at the above described Point "A" on the southerly line of said land transfer; thence continuing northerly along said southerly line North  $00^{\circ}05'13''$  East 15.75 feet to the TRUE POINT OF BEGINNING; thence leaving said southerly line South  $89^{\circ}54'07''$  East 16.94 feet; thence North  $00^{\circ}04'44''$  East 10.24 feet to a point on said southerly line; thence westerly along said southerly line North  $89^{\circ}56'18''$  West 16.93 feet to an angle point therein; thence southerly along said southerly line South  $00^{\circ}05'13''$  West 10.23 feet to the TRUE POINT OF BEGINNING.

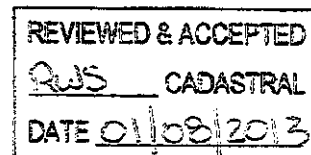
Parcel 8 Containing 173.37 square feet.

See Plat attached hereto and made a part hereof.

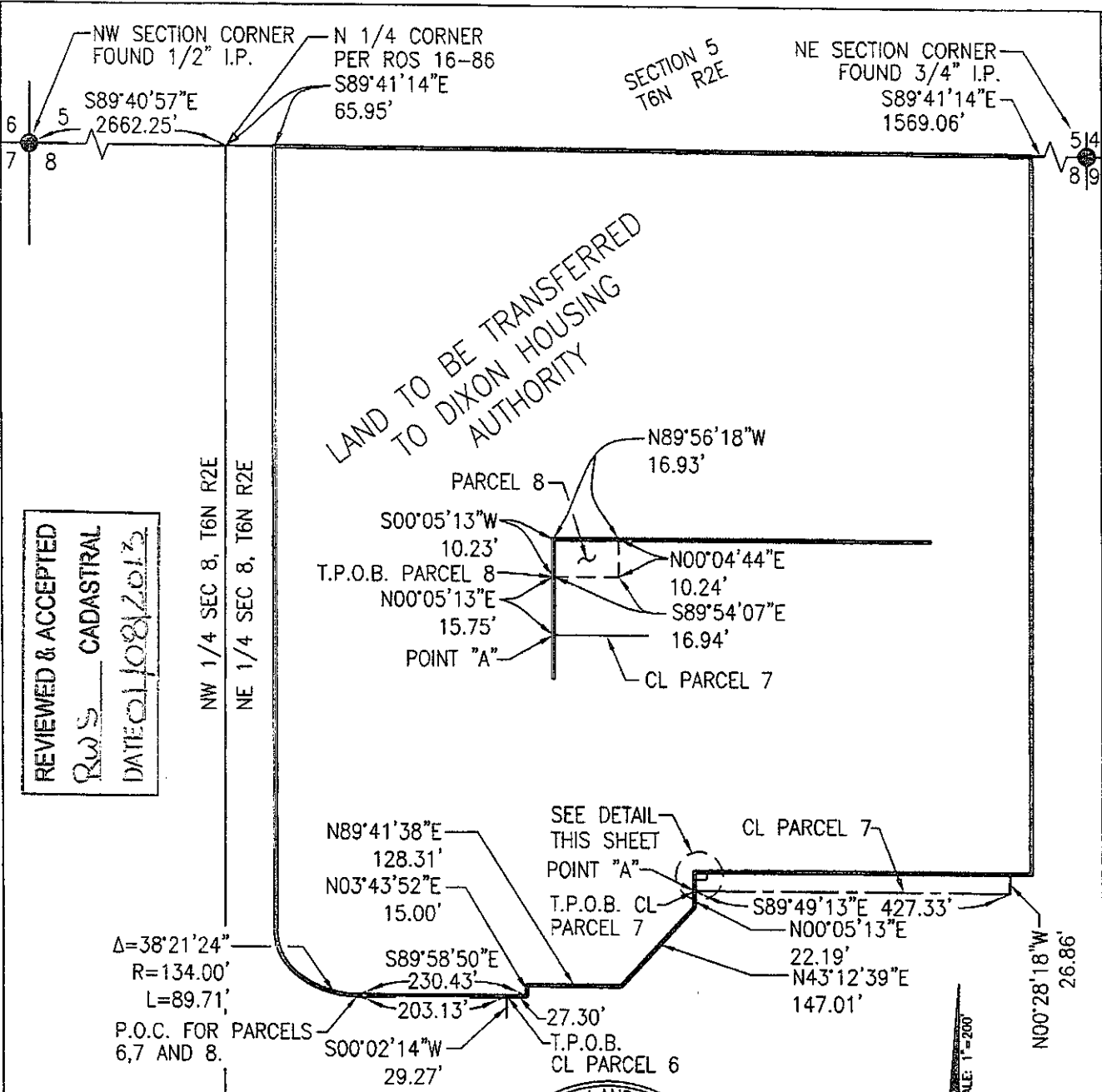
This description was prepared by me or under my direction.



-----  
Gregory A. Helmer, LS 5134

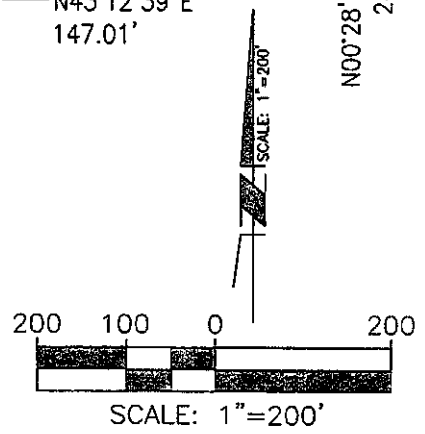


JN 132608 (25105722)



**LEGEND**

- CL = CENTERLINE
- POC = POINT OF COMMENCEMENT
- T.P.O.B. = POINT OF BEGINNING
- CENTERLINE OF 10' WIDE ELECTRICAL EASEMENT
- WATER EASEMENT



**RDF** CONSULTING  
 PLANNING • DESIGN • CONSTRUCTION  
 9765 CLAREMONT MESA BOULEVARD, SUITE 100  
 SAN DIEGO, CALIFORNIA 92124-4324  
 (619) 449-0000 • FAX (619) 449-0001 • WWW.RDF.COM

**PLAT TO ACCOMPANY LEGAL DESCRIPTION FOR EASEMENTS GRANTED TO DIXON SOLANO COUNTY HOUSING AUTHORITY CALIFORNIA**

DRAWN BY: R. MISELL	APPROVED BY:	SCALE: 1"=200'	DATE: 01-08-2013	SHEET 1 OF 1
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**Filed for Record at Request of:**

Dixon Housing Authority

**When Recorded Return to:**

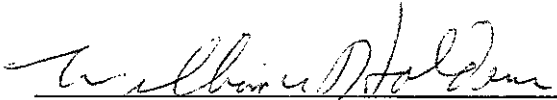
Dixon Housing Authority  
147 West Main Street  
Woodland, California 98695

EXEMPT FROM RECORDING FEE  
(Government Code § 6103)  
EXEMPT FROM DOCUMENTARY  
TRANSFER TAX  
(Rev. & Taxation Code § 11922)

N6247312RP50065

**Certificate of Acceptance**

This is to certify that the interest in real property conveyed by the grant of easement dated February 12, 2013 from the United States of America, acting by and through the Department of Navy to the Dixon Housing Authority, a political corporation and/or governmental agency is hereby accepted by order of the Dixon Housing Authority Board of Commissioners on February 26, 2013 by the undersigned officers or agent on behalf of the Dixon Housing Authority pursuant to authority conferred by minute order of the Dixon Housing Authority adopted on December 18, 2012, and the grantee consents to recordation thereof by its duly authorized officers.



William W. Holdener  
Dixon Housing Authority, Chairman

Date 2/27/13



Lisa A. Baker  
Dixon Housing Authority, Executive Director

Date February 27, 2013

END OF DOCUMENT







# **Naval Radio Transmitter Facility Dixon**

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## **Integrated Natural Resources Management Plan**

### **Appendix E: Natural Resources Manager Appointment Letter**

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DEPARTMENT OF THE NAVY  
COMMANDER NAVY REGION SOUTHWEST  
937 NO. HARBOR DR.  
SAN DIEGO, CA 92132-0058

IN REPLY REFER TO:

5090  
Ser N4A/045

**SEP 12 2013**

From: Commander, Navy Region Southwest  
To: Ms. Conception Flores, (NAVFAC SW N45)

Subj: DELEGATION AS NAVAL RADIO TRANSMITTER FACILITY, DIXON, CA  
NATURAL RESOURCES COORDINATOR

Ref: (a) OPNAVINST 5090.1C CH-1, Chapter 24, Section 13.5(e)

1. Reference (a) requires Commanding Officers (CO) of shore activities holding Class 1 plant accounts to appoint, by letter, an installation Natural Resources (NR) Manager/Coordinator. By notice of this letter, you are appointed to this position for Naval Radio Transmitter Facility (NRTF) Dixon, CA.

2. Your responsibilities as NR Coordinator are as follows:

a. Prepare and maintain the NRTF Dixon Integrated Natural Resources Management Plan (INRMP) including updates.

b. Ensure the designated NRTF Dixon CO and NRTF Dixon Installation Environmental Program Director are informed of NR issues, conditions of natural resources on NRTF Dixon, objectives of the NRTF Dixon INRMP, potential or actual conflicts between mission requirements and natural resources mandates.

3. This designation remains in effect until cancelled or superseded in writing by another letter bearing the same subject.

A handwritten signature in black ink, appearing to read "M. L. Obermiller", with a stylized flourish at the end.

M. L. OBERMILLER  
By direction

Copy to:  
NAVFAC SW (Code EV42.KL)





# Naval Radio Transmitter Facility Dixon

## Integrated Natural Resources Management Plan

### Appendix F: Installation Restoration Sites

Table F-1 includes details on the three open and two closed Installation Restoration Program sites and one open Munitions Response Program site at Naval Radio Transmitter Facility (NRTF) Dixon.

*Table F-1. Installation Restoration Sites at Naval Radio Transmitter Facility Dixon, California.*

Name	Key Issue	Status	Projected Clean-Up/ Closure Date	Central Valley Water Board Case #	CDTSC Case #
Munitions Response Program Site 1: Limited Firing Range	The former Munitions Response Program Site 1, Limited Firing Range Area is located southeast of the transmitter building, within the Natural Resources Management Area of the installation. It is an undeveloped area of the installation that contains an intermittent stream and some wetland areas. The area was used for recreational pistol firing, skeet shooting, and pheasant hunting between 1941 and 1979. The real acreage of the range is unknown but the traditional layout of a skeet range has been used to define its initial boundaries (30 acres). Based on interviews and observations made during a preliminary assessment, the area was not used for military training and was constructed for recreational purposes only. Personnel could shoot into a soil berm or hand-thrown skeet targets. The berm may have been used both as a target and a firing line. The soil berm is relatively intact in the former firing area and is approximately 8 feet high, 60 feet wide, and 100 feet long. The Site Inspection Report was finalized in December 2010. A cleanup remedial action to remove lead contamination in the berm is scheduled for 2017.	Open	2017	166-43—5	100278—5
Site 1: Waste Blowdown Area	The Navy identified Site 1, the Waste Blowdown Area, in 1988 after a preliminary assessment. Site 1 occupies about 750 square feet and is located near the west-central portion of NRTF Dixon, adjacent to the backup generator facility and Buildings 52, 53, and 54. The backup generator facility served the main transmitter facility, Building 10, located south of the site. Building 52 is the generator's operations building; the backup generators are/were located in Buildings 53 and 54. Site 1 is the area believed to have received discharges of blowdown material over a 20-year period, consisting of waste oil and a small amount of carbon from generator exhaust. Two 15-gallon drums were used to store blowdown material from the generators. The ground surface at Site 1 is mostly uncovered and contains native grassland vegetation. Asphalt pavement covers the ground surface around the nearby buildings and roadways. Based on data collected during groundwater sampling in May and November 2010 (in addition to previous investigations to assess potential environmental impacts in 1988, 1990, 1993, and 1997/1998), the Navy submitted a report to the CDTSC and Central Valley Regional Water Quality Control Board (Central Valley Water Board) on 16 June 2011 recommending closure of Site 1 and no further action, citing concurrence from the Central Valley Water Board. In an email dated 22 July 2011, the CDTSC deferred to the Central Valley Water Board for site closure. The Central Valley Water Board concurred with the No Further Action Determination in a letter dated 05 October 2011. Regulatory concurrence for closure of Site 1 was received on 09 October 2011.	Closed	October 2011	166-43—4	100278—4

Name	Key Issue	Status	Projected Clean-Up/ Closure Date	Central Valley Water Board Case #	CDTSC Case #
Site 2: Landfill Area A	<p>Site 2 is a former waste disposal site, historically referred to as Landfill Area A and is located near the southeast corner of NRTF Dixon. It occupies approximately 2 acres, 500 feet by 200 feet. Disposal practices likely included trench and fill operations that occurred from the late 1940s to the early 1970s. Materials disposed of at the site potentially included household and municipal wastes. An electromagnetic geophysical survey conducted in 1989 indicated the presence of a centrally located, east-west trending anomaly at Site 2, but a ground-penetrating radar indicated no reflection patterns characteristic of trench disposal.</p> <p>Previous investigation conducted by the Navy showed a significant release of contaminants did not occur and contaminant plumes were not identified in groundwater. The Water Quality Site Assessment technical memorandum concluded that the current or future impairment of groundwater beneficial uses from site releases was unlikely and supported the Navy's conclusion presented in the Record of Findings that no-further-action status was warranted for Sites 2 and 3 with respect to groundwater quality and its beneficial uses. However, the Central Valley Water Board recommended more recent groundwater monitoring to support site closure since the last monitoring was conducted in 1998 and both Sites 2 and 3 potentially have waste remaining in place. The Navy agreed to evaluate the need for additional groundwater monitoring (see also Site 5, below). The additional groundwater monitoring was completed in 2010. An Updated Focused Feasibility Study for sites 2 and 3 was finalized in December 2011. A proposed plan for Site 2 was distributed to the public in July 2012 and a public meeting was held in August 2012. The Site 2 Record of Decision for excavation was finalized September 2012; it was signed by the Navy (03 December 2012), the Central Valley Water Board (10 December 2012) and the CDTSC (15 February 2013). The remedial action is planned for 2014.</p>	Open	2016	166-43—3	100278—3
Site 3: Landfill Area B	<p>Site 3 was a former waste disposal site and was historically referred to as Landfill Area B. It occupies 2 acres (250 by 350 feet, an east-west trending trench), near the south-central portion of NRTF Dixon. Disposal practices likely included trench and fill operations that occurred from the late 1940s to the early 1970s. Materials disposed of at Site 3 potentially included household and municipal wastes. Native soils cover the former disposal area (a thickness of at least 1.5 feet). The site is covered with native grassland vegetation and a subsection of the antenna mat for the south tower runs 12-18 inches beneath the site.</p> <p>The Central Valley Water Board did not agree with the Navy's recommendation for closure and No Further Action (see Site 2 description, above). Additional groundwater monitoring was completed in 2010 and an Updated Focused Feasibility Study for sites 2 and 3 was finalized in December 2011.</p>	Open	Unknown	166-43— 2	100278—2

Name	Key Issue	Status	Projected Clean-Up/ Closure Date	Central Valley Water Board Case #	CDTSC Case #
Site 4: Automobile Landfill	<p>Site 4 occupies 0.44 acres and was a former repository for automobile debris and is now covered by native grassland vegetation with no visible standing water.</p> <p>Investigations conducted at the site have included a preliminary assessment and supplemental site investigation, soil and groundwater sampling, record of findings, and water quality site assessment. A screening level of ecological risk assessment was also conducted in order to determine whether any release of contamination affected the environment. In 1999 the Navy removed automobile parts from the site, accompanied by testing of excavated soil. Results of the tests showed that the naturally occurring metals and the single detection of petroleum hydrocarbons in the soil did not pose a threat to human health or the environment, and the excavation with was backfilled with the stockpiled soils. The Central Valley Water Board did not agree with the Navy's proposed No Further Action. The Navy conducted subsequent groundwater monitoring in November 2010 and in June 2011 submitted to the regulatory agencies a Record of Decision for no further action in soils and groundwater (with the exception of metals in groundwater). The no further action Record of Decision was finalized in February 2012 and was signed by the Navy and the CDTSC in March 2012 and the Central Valley Water Board in April 2012.</p>	Closed	April 2012	166-43—1	100278—1
Site 5: Basewide Groundwater (Facility-Wide)	<p>Groundwater sampling at Installation Restoration Program Sites 1, 2, 3, and 4 was conducted in 2010 at the request of the Central Valley Water Board, in order to support site closure (since the last monitoring was conducted in 1998 and sites potentially had waste remaining in place). Based on the results of this sampling, Installation Restoration Program Site 5 was created to re-evaluate the groundwater across the entire installation for possible presence of metals (currently at levels below regulatory thresholds). A draft preliminary assessment was submitted to the regulatory agencies in January 2013 with agency comments received in March 2013. The Navy is recommending no further action for this site.</p>	Open	Unknown	166-43—6	100278—6
<p>Sources: NAVFAC Southwest 2010b, 2011a, 2011b, 2011c, 2011d, 2011e, 2012; Central Valley Water Board 2011b; E. Casados, pers. com. 2013.</p>					

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# Naval Radio Transmitter Facility Dixon

## Integrated Natural Resources Management Plan

### Appendix G: Research Requirements

This appendix fulfills the Research Requirements Appendix required in Integrated Natural Resources Management Plans (INRMPs), according to a Memorandum dated 14 August 2006 from the Office of the Under Secretary of Defense for the Deputy Assistant Secretary of the Navy (Environment) regarding the INRMP Template. The 2006 Memorandum stated that research requirements are projects that would be nice to do by an installation but there is no legal obligation to support. The concept behind this appendix is to allow the installation and other entities (e.g. the Department of Defense Strategic Environmental Research and Development Program) to quickly assess any projects available for funding if it became available. The table below identifies all the natural resources management strategies included in Chapters 3 and 4 of the Naval Radio Transmitter Facility Dixon (NRTF) INRMP that represent discretionary research tasks that Naval Facilities Engineering Command Southwest can perform in support of the conservation and stewardship of Naval Radio Transmitter Facility Dixon's natural resources.

*Table G-1. Natural resource management strategies for research from Chapters 3 and 4 of the Integrated Natural Resources Management Plan.*

<b>INRMP Management Strategy</b>
<b>Section 3.1 Ecoregional Setting and Managing with an Ecosystem Approach</b>
NONE
<b>Section 3.3 Physical Conditions and Managing the Physical and Chemical Environment</b>
NONE
<b>Section 3.3.3 Soil Resources and Condition</b>
NONE
<b>Section 3.3.4 Water Resources, Water Quality and Floodplains</b>
Objective 3. III.A. Identify any special or unique flora and fauna associated with floodplains in order to identify the natural and beneficial functions provided by floodplains.
<b>Section 3.3.5 Wildland Fire Management</b>
NONE
<b>Section 3.4 Vegetation Communities and Habitats</b>
Objective 1. V. Promote collaboration and partnerships with outside researchers and organizations to benefit the vegetation community and habitat management program at NRTF Dixon, when practicable.
<b>Section 3.4.3 Wetlands and Jurisdictional Waters</b>
NONE
<b>Section 3.5 Fish and Wildlife Management</b>
NONE
<b>Section 3.5.1 Aquatic and Terrestrial Invertebrates</b>
III. Evaluate the impact that non-native bullfrogs may have on native invertebrates, including fairy shrimp, at the installation. Develop management actions if needed, with a goal to control bullfrog populations in areas with sensitive wildlife.
<b>Section 3.5.2 Pollinators</b>
V. As feasible, develop and distribute educational materials on pollinators, including a pollinator protection guide for managers specific for NRTF Dixon.
<b>Section 3.5.3 Fishes</b>
NONE
<b>Section 3.5.4 Reptiles and Amphibians</b>
NONE

**Section 3.5.5 Birds**

NONE

**Section 3.5.6 Mammals**

NONE

**Section 3.5.7 Bats**

NONE

**Section 3.6 Special Status Plants**

NONE

**Section 3.7 Threatened and Endangered Species and Critical Habitat**

NONE

**Section 3.8 Other Special Status Wildlife Species**

Objective 2.

II.A. Support ongoing and new research on distribution and ecology of species warranting Navy stewardship. Seek opportunities to partner with academic institutions and other outside researchers to facilitate resource data collection.

IV. Seek opportunities to develop partnerships with institutions, organizations, and other researchers to develop and improve knowledge and management of special status species at NRTF Dixon and to contribute to regional initiatives for those species.

**Section 3.9 Invasive Species Management**

V. Promote cooperative interagency efforts and other partnerships to collect data on invasive species populations in the area and methods and responsibilities for their control.

**Section 3.10 Pest and Predator Control**

NONE

**Section 3.11 Data Integration, Access, and Reporting**

NONE

**Section 4.1 Sustainability of the Military Mission and the Natural Environment**

NONE

**Section 4.1.1 No Net Loss to the Military Mission**

NONE

**Section 4.1.2 Integrated Military Mission and Sustainable Land Use Decisions**

NONE

**Section 4.1.3 Infrastructure and Grounds**

NONE

**Section 4.1.3.1 Communication Towers and Power Lines**

NONE

**Section 4.1.3.2 Construction and Facility, Grounds, and Roadside Maintenance**

NONE

**Section 4.1.3.3 Fencelines and Buffer Zones**

NONE

**Section 4.1.4 Adapting to Effects of Climate Change and Regional Growth and Conservation Initiatives**

III.C. Identify data and research needs for ensuring an effective response to the consequences of climate change.

IV. Identify restoration projects to adapt habitat elements for specific species which may be impacted by climate change.

V.A. Identify and implement regional conservation designs that provide stepping stones for species to move to sites with suitable climates.

**Section 4.2 Management of Other Uses and Real Estate Outgrants**

NONE

**Section 4.2.1 Agricultural Outlease Management**

NONE

**Section 4.2.2 Livestock Grazing**

NONE

**Section 4.3 Public Access and Outdoor Recreation**

NONE

**Section 4.4 Environmental Education and Public Outreach**

NONE

**Section 4.5 Integrating Other Internal Plans and Programs**

NONE

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**Section 4.5.1 Integrated Cultural Resources Management Planning**

NONE

**Section 4.5.2 Integrated Pest Management**

NONE

**Section 4.5.3 Installation Restoration Program**

NONE

**Section 4.5.4 Hazardous Material Spill Prevention and Response**

NONE

**Section 4.6 NEPA Compliance**

NONE

**Section 4.7 Natural Resources Consultation Planning**

NONE

**Section 4.8 Natural Resources Law Enforcement**

NONE

**Section 4.9 Beneficial Partnerships and Collaborative Planning**

NONE

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

## Appendix H: Soil Descriptions

### Antioch-San Ysidro Complex

Taxonomic Class: Fine, smectitic, thermic Typic Natrixeralfs.

Capability Class: IVs-3 irrigated, not placed in a range site.

Soil Description: The Antioch San-Ysidro complex consists of moderately well drained soils on terraces. The soils formed in alluvium from sedimentary sources. When these soils are uncultivated, the vegetation is annual grasses and forbs. These soils are moderately well to somewhat poorly drained, with slow to medium runoff, and very slow permeability. Effective rooting depth is 15–20 inches. Available water capacity is 3.5–5.5 inches.

### Capay Silty Clay Loam

Taxonomic Class: Fine, smectitic, thermic Typic Haploxererts.

Capability Class: IIs-3 irrigated, not placed in a range site.

Soil Description: The Capay series consists of very deep, moderately well drained soils that formed in moderately fine and fine textured alluvium, derived from mostly sandstone and shale. Capay soils are on alluvial fans, alluvial flats, interfan basins, and basin rims.

### Capay Clay

Taxonomic Class: Fine, smectitic, thermic Typic Haploxererts.

Capability Class: IIs-5 irrigated, not placed in a range site.

Soil Description: This soil is nearly level on basin rims. Surface run-off is very slow and erosion is only a slight hazard. Available water capacity is 8–10 inches.

### Clear Lake Clay

Taxonomic Class: Fine, smectitic, thermic Xeric Endoaquerts.

Capability Class: IIs-5 irrigated, not placed in a range site.

Soil Description: This soil is nearly level on basins. It is poorly drained, but drainage has been improved by leveling, using open drains, and general lowering of the water table to a depth of 5 feet. Surface runoff is very slow. There is no erosion hazard, and water capacity is 8–10 inches.

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

### Appendix I: Applicable Reports

The following documents are included in this appendix (refer to digital version):

- Smallwood, K.S., and M. Morrison. 2008. Burrowing Owls at Dixon Naval Radio Transmitter Facility. Prepared for U.S. Department of the Navy, Naval Facilities Engineering Command, Southwest. March 11.
- Tierra Data Inc. 2012. Navy Radio Transmitter Facility Dixon Biological Resources Surveys. Prepared under contract with Naval Facilities Engineering Command Southwest. Contract No: N62473-06-D-2402 DO 0027. December.

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# **BURROWING OWLS AT DIXON NAVAL RADIO TRANSMITTER FACILITY**



March 11, 2008

## **Prepared for:**

U.S. Department of the Navy  
Naval Facilities Engineering Command, Southwest  
Desert Integrated Products Team  
1220 Pacific Highway  
San Diego, CA 92132-5190

## **Prepared by:**

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# BURROWING OWLS AT DIXON NAVAL RADIO TRANSMITTER FACILITY

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## INTRODUCTION

Naval Radio Transmitter Facility, Dixon, California (NRTF Dixon) was constructed in 1941 to establish a fleet communications facility. In 1979, NRTF Dixon was converted from a Navy-operated facility to a contractor-operated facility. The Navy retains ownership of the land, while the contractor is responsible for operating and maintaining all communications equipment, structures, support facilities, buildings, and grounds necessary to fulfill the military mission. Some of the facilities at NRTF Dixon are also used as nesting habitat by burrowing owl (*Athene cunicularia*), which is a sensitive species. The burrowing owl is listed by the federal government as a species of concern, and by state government at a species of special concern. It is also protected by the Migratory Bird Treaty Act and by California Department of Fish and Game regulations directed toward raptors.

Burrowing owls are found throughout the antenna field, nesting in ground squirrel burrows, within the concrete half-rounds used to cover the transmitting cables (Figure 1), and within artificial burrows constructed for the owls (Figure 2). In October 2000, eight artificial burrows were installed on the facility, seven doubles and one single, for a total of 15 artificial burrows with 2 entrances each (Figure 3). Each burrow consisted of a single plastic irrigation valve box with two sections of 6-8 inch corrugated plastic drainpipe for means of ingress and egress. Approximately 24-36 inches of soil was placed on top of each artificial burrow with a wooden post at each site for roosting purposes.

Our primary objective was to perform surveys to determine the distribution and abundance of the burrowing owl at NRTF Dixon. We also assessed the condition of the constructed mounds housing the artificial burrows. Finally, based on what we learned from our surveys, we recommend management strategies to conserve burrowing owls at NRTF Dixon while also minimizing damage caused by ground squirrels that may have benefitted from the installation of artificial burrowing owl burrows and other NRTF activities.



Figure 1. Cable covers are used as nest sites where gaps in the covers allow burrowing owls access to the interior.

Figure 2. A pair of burrowing owls on a constructed mound over two artificial burrows. Another constructed mound is visible in the background. A corrugated plastic drainpipe is also visible protruding from the mound's base to the left of the owls. Plastic was laid over the mounds by station personnel in an effort to control weeds on the mounds.



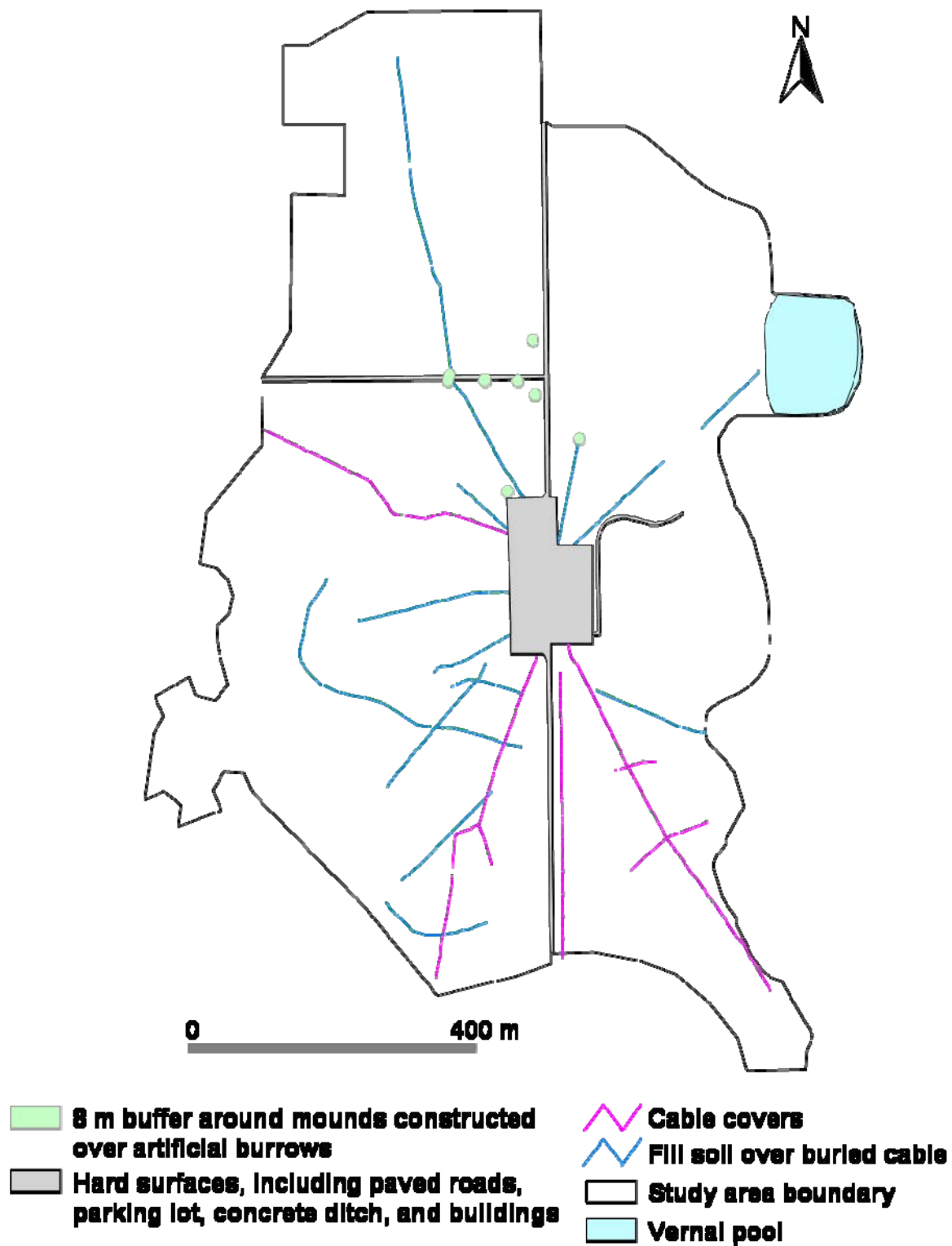


Figure 3. The landscape elements we related to burrowing owl and ground squirrel distributions, including the locations of artificial burrows, hard surfaces, known fill soil, and cable covers.

## **STUDY AREA**

NRTF Dixon is approximately seven miles southeast of Dixon, in Solano County, California. The facility is considered part of the Sacramento Valley, approximately 65 miles northwest of Stockton and 65 northeast of San Francisco. NRTF Dixon encompasses about 497 ha and includes a 24,000-square-foot transmitter building, associated antenna fields, support facilities, a commercial Pacific Gas and Electric Company (PG&E) electrical power substation, and two diesel-powered generators. NRTF Dixon maintains high-frequency transmitters, antennas, and associated ancillary equipment, as well as two low-frequency transmitters and two 600-foot low-frequency antennas.

The grassland vegetation under the antenna arrays is maintained short by regular mowing. This relatively shorter vegetation compared to the grassland outside the antenna arrays can attract ground squirrels and burrowing owls, both species of which tend to select more exposed environments as burrowing or nesting sites. The antenna arrays and their supporting guy wires also provide burrowing owls convenient and abundant perch sites, so males can often be seen perched on this equipment while guarding nest burrows.

Power to the antenna arrays is delivered via cable, some of which is buried and some is laid on the ground surface. The buried cable is covered by fill soil, which is an attraction to burrowing animals such as ground squirrels. Fill soil would more strongly attract burrowing animals in the vicinity of NRTF Dixon because the undisturbed soils are clays and clay loams, which can be very difficult to burrow in. The cables laid on the ground are covered by 24-inch diameter half-rounds (cable covers). Sometimes there are gaps in these cable covers, and these gaps are utilized by burrowing owls as entry ways to nest sites within the cable covers. Burrowing owls have nested within these cable covers for many years without any conflict to the operation of the facility.

Other structures of the NRTF Dixon that may benefit burrowing owls include paved road surfaces and concrete-lined ditches, which are often undermined by ground squirrels and the resulting cavities used by burrowing owls as nest sites. Burrowing owls also find additional perch opportunities along the cyclone fence surrounding the main building complex, road signs, and on signs marking buried cable.

## **METHODS**

We surveyed NRTF Dixon for burrowing owls and ground squirrels in May and June of 2006 and 2007. Although most owls occurred within the antenna fields and around the support facilities, the entire facility was surveyed for the presence of owls and squirrels, though at lower intensity than applied within the antenna field. Outside the antenna field we walked the interior

perimeter of the NRTF boundary, as well as multiple transects through the middle of the grasslands, marshes, and agricultural fields comprising these areas. Within the antenna field, we walked systematic transects at 12-15 m intervals in 2006, except for within the perimeter of antenna arrays for safety reasons. We used binoculars to search for owls and squirrels within the antenna arrays.

To record all burrowing owl burrows and the approximate centers of ground squirrel burrow systems, we used a Trimble Pathfinder Pro-XRS GPS in 2007 and a Trimble Geo-XT in 2007, both of which were accurate to <1 m. Burrows used by burrowing owls were determined by the flushing of burrowing owls from the burrow, the occurrence of a male sentry outside the burrow, and the occurrence of pellets, wash, feathers, and decorations. All evidence used to conclude a burrow was in use was recorded as attribute data in the GPS.

All artificial burrows were visited and the condition of the burrows, owl activity, and other observations recorded. Photos were taken to record condition of the mounds.

We compared the spatial distribution of burrows of burrowing owls and ground squirrels to the distribution and relative availability of specific landscape elements, including the antenna arrays, the artificial burrows within constructed mounds, hard surfaces such as paved roads, parking lots, and a concrete-lined ditch, fill soil overlying buried cable, and linearly arranged inverted half-rounds used to cover cable laid on the ground. We used chi-square analysis to test for associations between burrow locations and these landscape elements. We also created buffers around some of the landscape elements at 1-m intervals to characterize the degree of clustering of burrows at or around these elements. Densities of burrows within the areas defined by these buffers (i.e., burrows/ha) were calculated and related to the buffered distance from the landscape element.

To help put the number of nesting pairs we counted into perspective, we obtained burrowing owl population density estimates and study area sizes used to estimate the density estimates from Coulombe (1971), Thomsen (1971), Martin (1973), Butts (1976), Gleason and Johnson (1985), Haug and Oliphant (1990), Rodriguez-Estrella and Ortega-Rubio (1993a, b), Trulio (1993), Leptich (1994), Desmond and Savidge (1996), Johnson (1997), Botelho and Arrowood (1998), Wiley (1998), DeSante et al. (2004), Teaschner (2005), and Smallwood et al. (2008). Following the methods of Smallwood (1995) and Smallwood and Schonewald (1996), we regressed  $\log_{10}$  density on  $\log_{10}$  study area size using linear regression analysis because most of the variation in intra-specific density estimates can be explained by study area size due to mathematical artifact of the predictor variable appearing as the denominator of the density estimate. This method allowed us to account for the effect of study area size on variation in burrowing owl nesting density, and to therefore make more reliable comparisons of density estimates.

## RESULTS

In 2006 we mapped the locations of 43 burrowing owl nest burrows within the antenna field (Figure 4), and in 2007 we mapped the locations of 24 burrowing owl nest burrows (Figure 5). Thus we observed a 44% decline in nesting pairs between years. Outside the antenna array, we found no additional burrowing owl nests in 2006, but we found another 2 nests in 2007 at the extreme northeast corner of Dixon NRTF (Figure 6). The nesting density within the antenna field was 52 pairs/km<sup>2</sup> in 2006 and 29 pairs/km<sup>2</sup> in 2007. The 2006 density was higher than any we have seen reported in the scientific literature, after accounting for the effect of study area size (Figure 7). Reported nesting density declines as study area size increases according to an inverse power function ( $r^2 = 0.76$ , RMSE = 0.41, d.f. = 1, 92,  $P < 0.001$ ):

$$\log_{10} Y = 0.895 - 0.706 \times \log_{10} X.$$

The positive unstandardized residuals from this model were largest for NRTF Dixon, meaning our estimates deviated most from the mean among the reported estimates. After transforming all  $\log_{10}$  value to the original measurement scale, our 2006 estimate was 5.8 times larger than predicted by the model, and our 2007 estimate was 3.2 times larger.

We also mapped burrows that were used by burrowing owls, but not for nesting. In 2006 we mapped 21 of these burrows, or 33% of the total burrows, and in 2007 we mapped 2, or 8% of the total.

In 2006 we recorded 252 ground squirrel burrow complexes throughout the antenna field, or 305 complexes per km<sup>2</sup>, and we also recorded 3 pocket gopher burrow systems, or 3.66 per km<sup>2</sup> (Figure 8) .

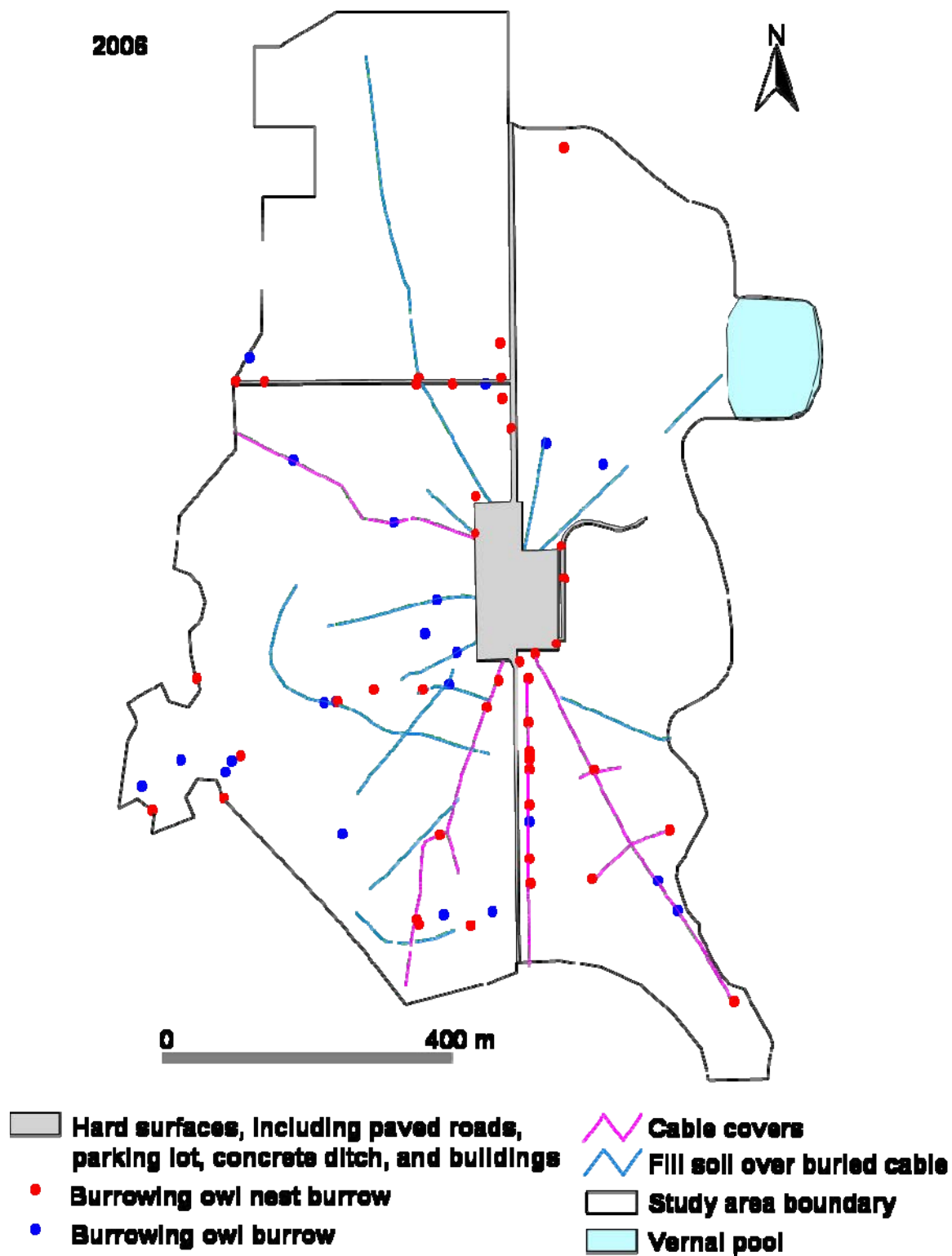


Figure 4. The spatial distribution of burrowing owl burrows in the NRTF Dixon antenna field in 2006.



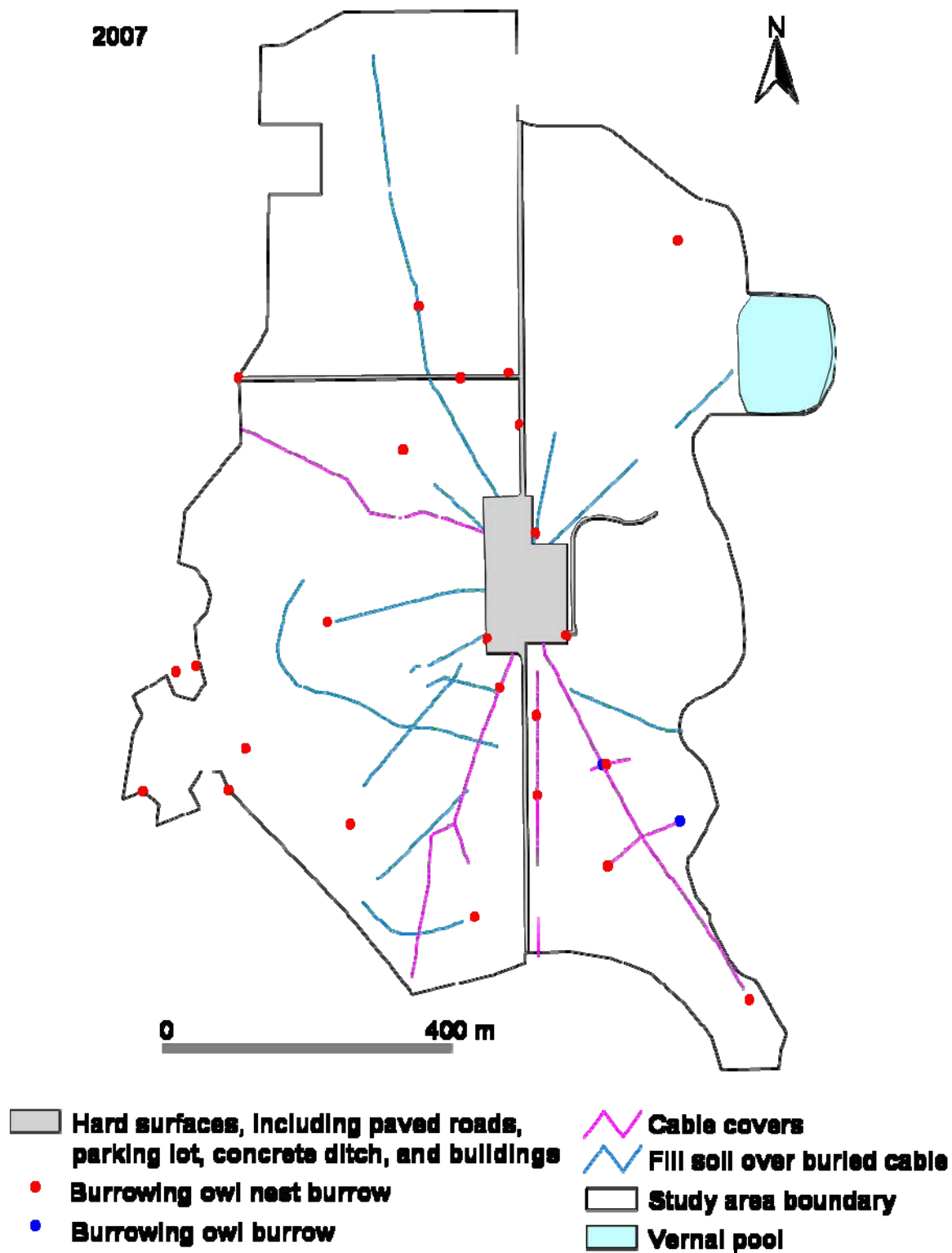


Figure 5. The spatial distribution of burrowing owl burrows in the NRTF Dixon antenna field in 2007.

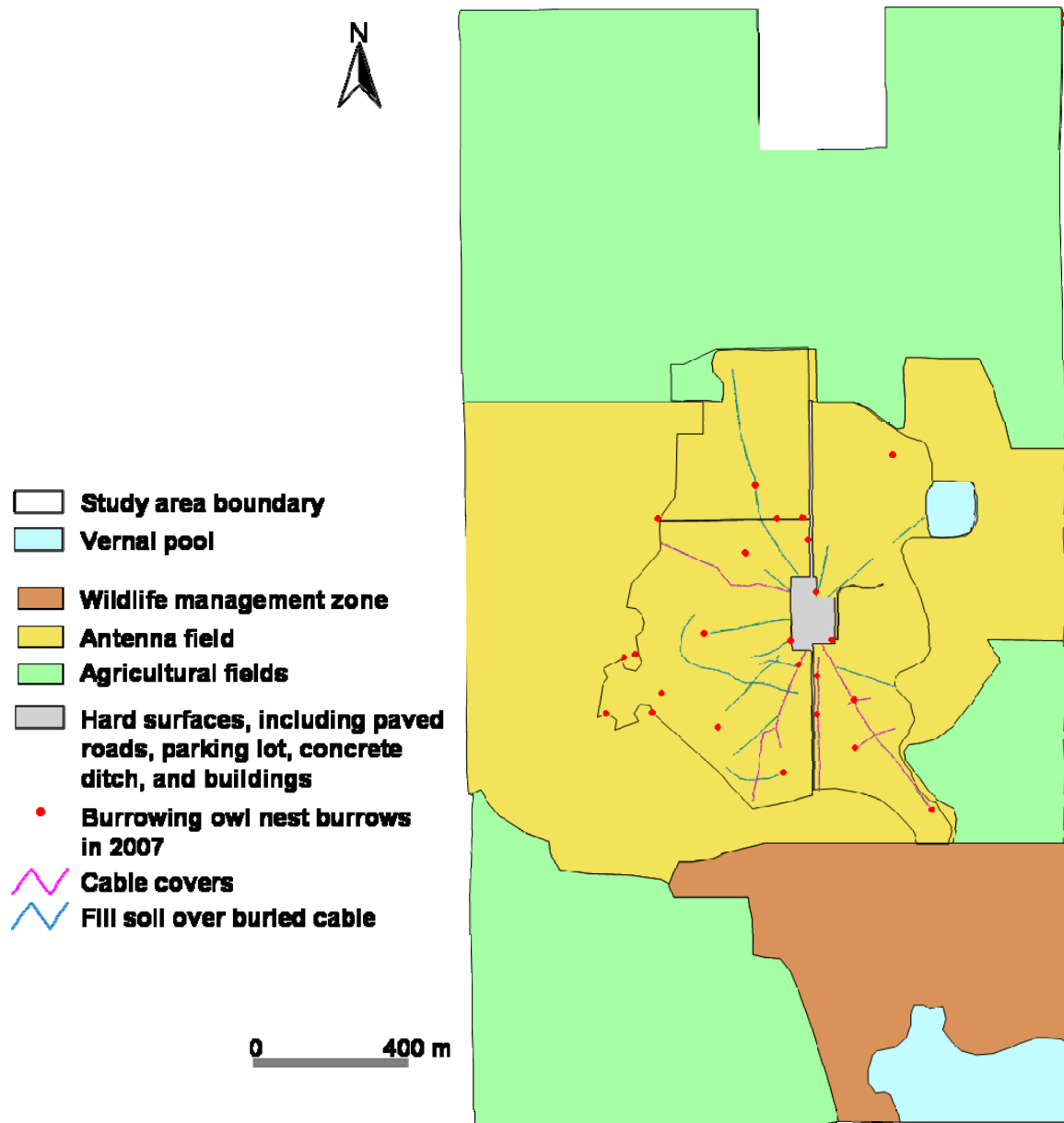


Figure 6. Land management zones in NRTF Dixon. The map also depicts the two burrowing owl nest burrows found at the northeast corner of NRTF Dixon.

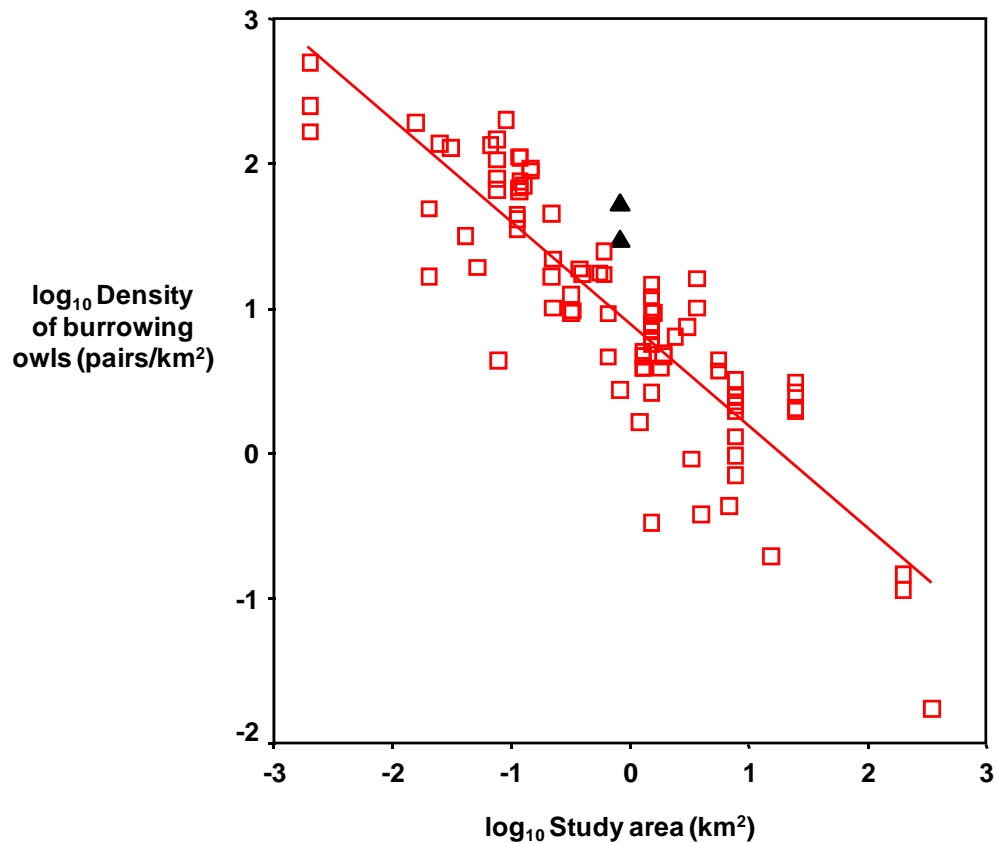


Figure 7. Burrowing owl nesting density declines with increasing study area size as an inverse power function. The density estimates for Dixon NRTF are depicted in the graph as filled black triangles.

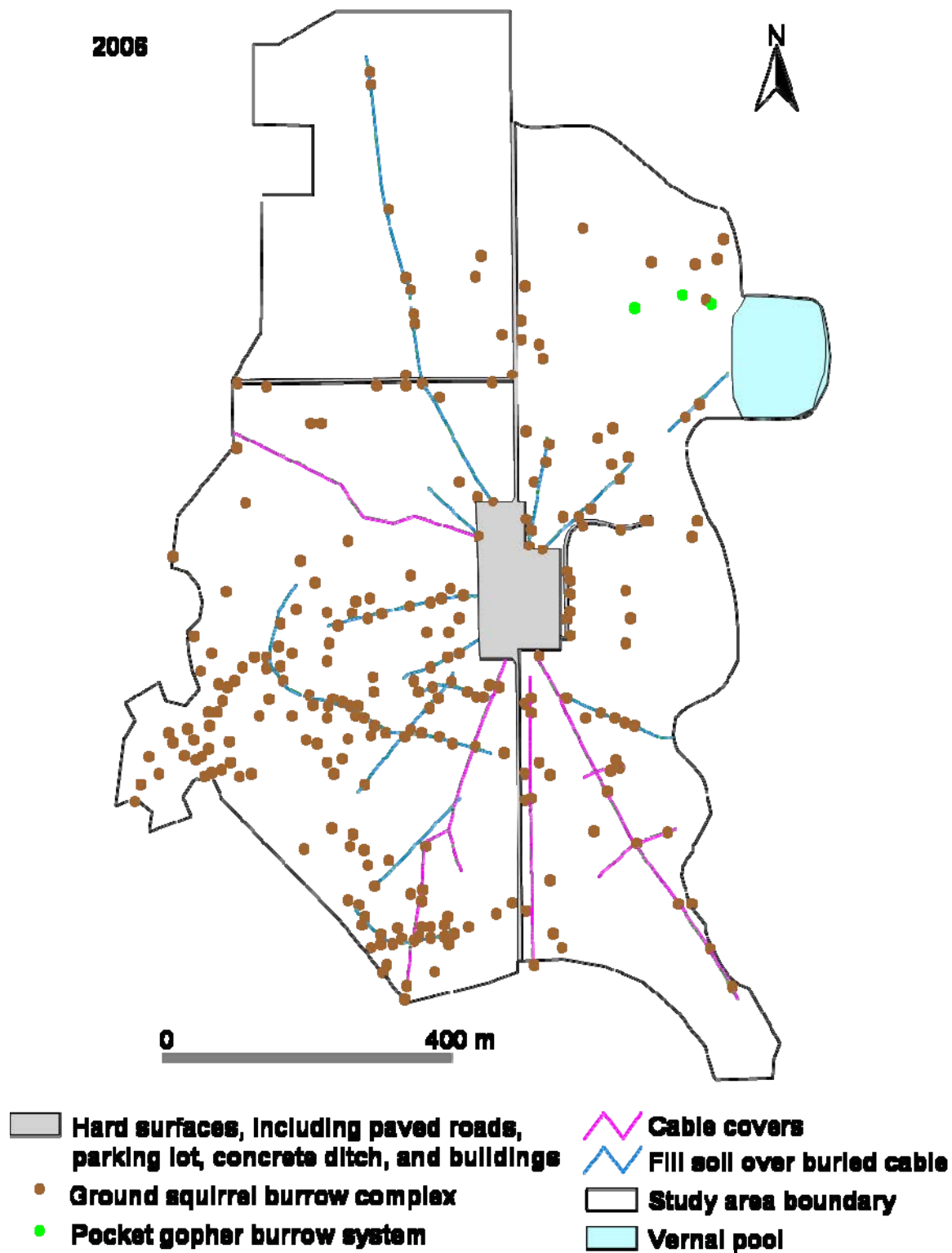


Figure 8. The spatial distributions of ground squirrel and pocket gopher burrow systems in the NRTF Dixon antenna field in 2006.

*Landscape associations.*--The ground squirrels were closely associated with disturbed soils within the antenna field (Table 1, Figure 9). Ground squirrels selected antenna arrays at only 0.14 the frequency other than expected, and they selected the matrix grassland at only 0.66 the frequency other than expected. On the other hand, they strongly selected areas within 2 m of hard surfaces, areas within 10 m of fill soil over buried cable, cable covers, and constructed burrow mounds (Table 1). Half of all the ground squirrel burrows were at or near disturbed soils, and we suspect that most of the rest of the burrow complexes were also on or near disturbed soils that, because the evidence was not obvious, we did not characterize as disturbed.

Burrowing owl nest burrows were also closely associated with measured landscape attributes during both years of our study (Tables 2 and 3, Figure 10). In 2006 nest burrows were absent from the matrix grassland and occurred within antenna arrays no more often than expected from a uniform distribution of nest burrows. They were strongly associated with hard surfaces, cable covers and constructed mounds over artificial burrows, although the latter involved only 6 nest burrows in the comparison (Table 2, Figure 10). In 2007 nest burrows were found within antenna arrays at twice the rate other than expected, but they were nearly absent from matrix grassland. Otherwise, they were associated strongly with disturbed soils, and especially cable covers (Table 3, Figure 10). A large measure of effect was measured at constructed mounds over artificial burrows, but only 1 nest burrow was found at these constructed mounds in 2007, so was much less reliable than the association measured at other landscape attributes or at constructed mounds the year before.

Ground squirrel complexes and burrowing owl nests were highly clustered around cable covers, with densities quickly declining with increasing distance away from the cable covers (Figures 11 and 12). Ground squirrel complexes were also clustered around fill soil over buried cable. Overall, ground squirrel burrow density was much lower around hard surfaces than around cable covers or fill soil, but it increased slightly with increasing distance from the edge of the hard surfaces (Figure 11). Burrowing owl nesting density did not change much with distance from hard surfaces and fill soil over buried cable out to 10 m, but their densities around these features were much lower than at cable covers (Figure 12).

Table 1. Ground squirrel burrow complexes strongly associated with mapped landscape elements ( $\chi^2 = 518.32$ , d.f. = 5,  $P < 0.0001$ ).

Landscape element	Number of burrows			$\chi^2$
	Observed	Expected	Obs / Exp	
Matrix grassland	124	187.12	0.66	21.29
Antenna arrays	5	34.53	0.14	25.26
Hard surfaces	18	10.55	1.71	5.26
Fill soil on buried cable	82	17.32	4.74	241.60
Cable covers	21	2.43	8.66	142.20
Constructed burrow mound	2	0.05	43.33	82.71

Table 2. Burrowing owl nest burrows in 2006 strongly associated with mapped landscape elements ( $\chi^2 = 5,107.59$ , d.f. = 5,  $P < 0.0001$ ).

Landscape element	Number of burrows			$\chi^2$
	Observed	Expected	Obs / Exp	
Matrix grassland	0	32.67	0.00	32.67
Antenna arrays	6	6.03	1.00	0.00
Hard surfaces	11	1.84	5.97	45.53
Fill soil on buried cable	5	3.02	1.65	1.29
Cable covers	16	0.42	37.77	572.76
Constructed burrow mound	6	0.01	744.56	4455.34

Table 3. Burrowing owl nest burrows in 2007 strongly associated with mapped landscape elements ( $\chi^2 = 361.41$ , d.f. = 5,  $P < 0.0001$ ).

Landscape element	Number of burrows			$\chi^2$
	Observed	Expected	Obs / Exp	
Matrix grassland	2	17.82	0.11	14.05
Antenna arrays	7	3.29	2.13	4.19
Hard surfaces	5	1.00	4.98	15.88
Fill soil on buried cable	4	1.65	2.43	3.35
Cable covers	5	0.23	21.64	98.43
Constructed burrow mound	1	0.00	227.50	225.51

Figure 9. Associations of ground squirrel burrow systems in 2006 and landscape elements within the Dixon NRTF antenna field.

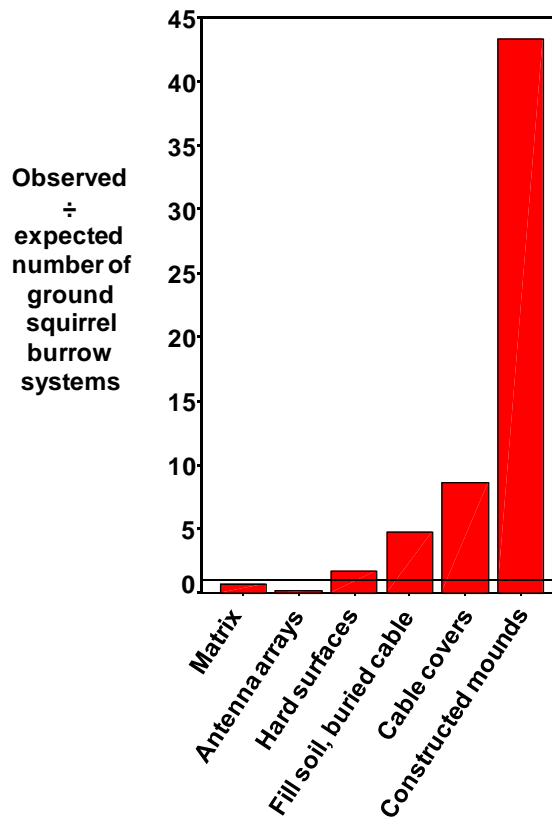


Figure 10. Associations of burrowing owl nest burrows in 2006 and 2007 and landscape elements within the Dixon NRTF antenna field.

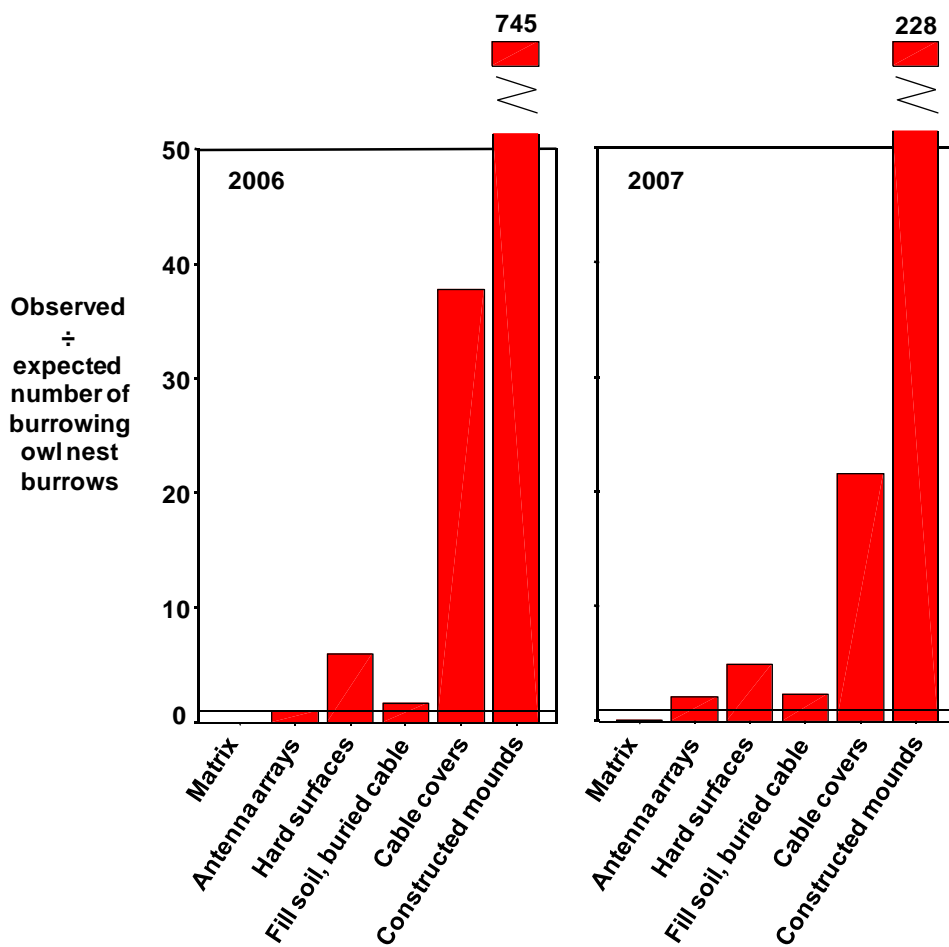
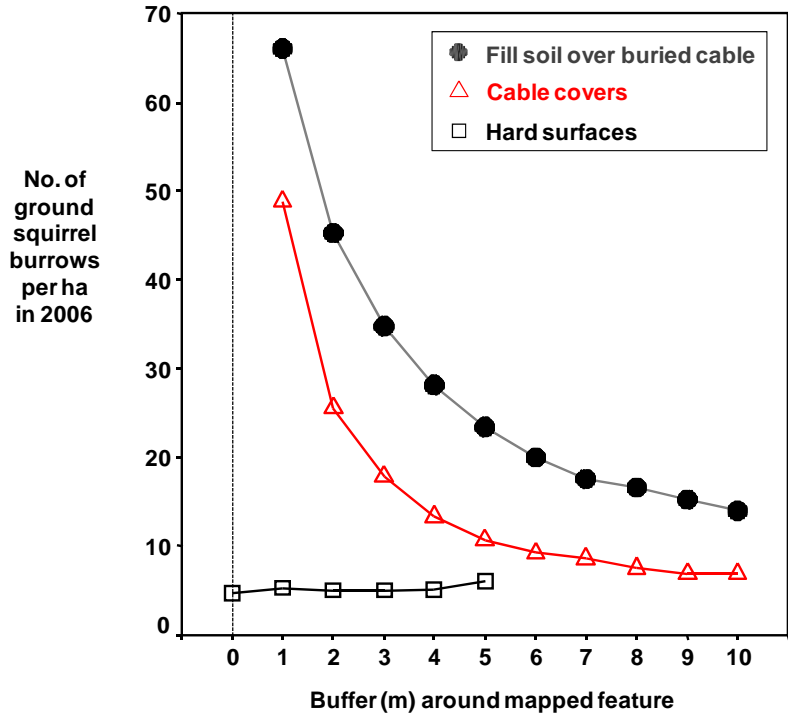


Figure 11. Ground squirrel burrow systems were strongly clustered along buried cable and cable covers, but much less clustered around hard surfaces such as paved roads, parking lots and concrete ditches.



No. of burrowing owl nest burrows per ha

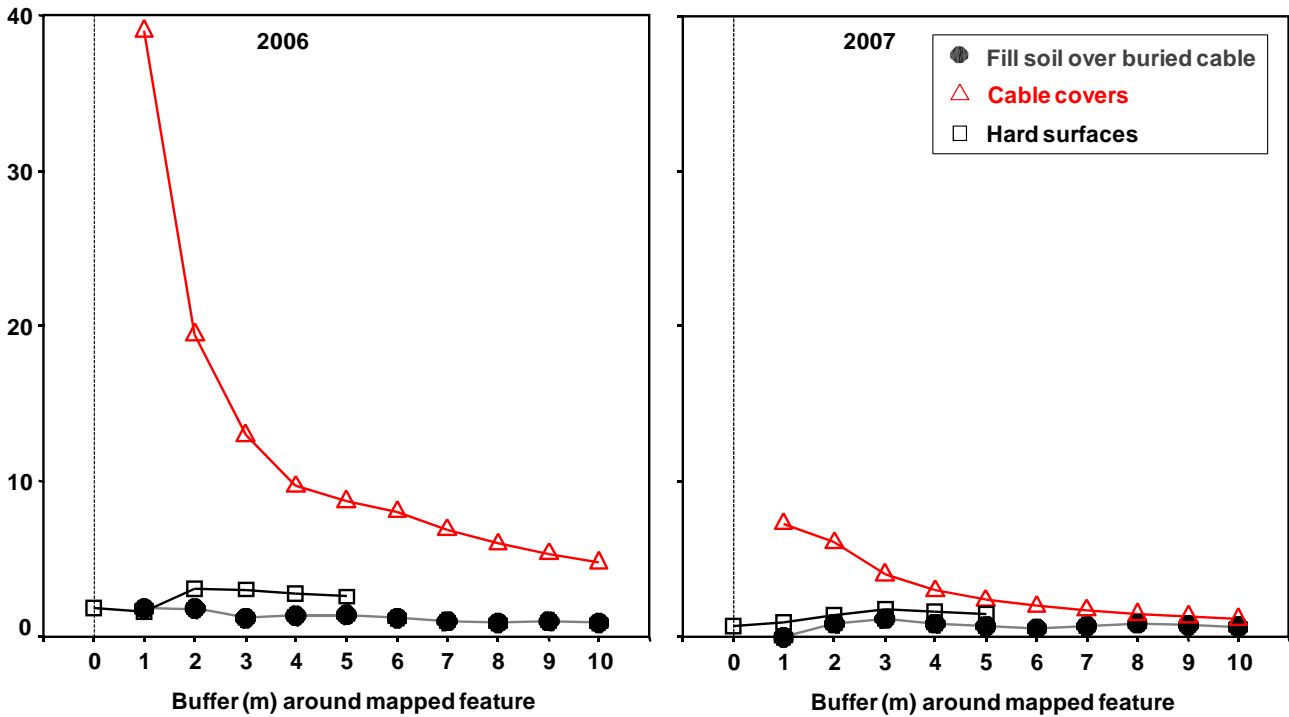


Figure 12. Burrowing owl nest burrows were strongly clustered along cable covers, especially in 2006, but they were not clustered along buried cable or around hard surfaces.



*Condition of artificial burrows.*—Of the 15 artificial burrows in 8 constructed mounds, 6 were occupied by nesting burrowing owls in 2006 and only 1 was occupied in 2007. This 83% decline in nesting pairs on these mounds nearly doubled the decline observed throughout the NRTF Dixon antenna field. The condition of the mounds deteriorated substantially between 2006 and 2007 due to ground squirrel burrowing and weed establishment (Figures 13-16). NRTF Dixon personnel placed plastic on the mounds in 2005 to attempt to control weeds, but by 2007 most of the plastic had been destroyed.



Figure 13. Mound 3 in 2006 (top photo) and 2007 (bottom photo).



Figure 14. Mound 5 in 2006 (top photo) and 2007 (bottom photo), but note that the photos were taken from different angles.



Figure 15. Mound 6 in 2006 (top photo) and 2007 (bottom photo), along with mounds 7 and 8 in the background, Also note the top photo includes 3 burrowing owls, one on each mound.



Figure 16. Mound 1 in 2006 (top photo) and 2007 (bottom photo).

## **DISCUSSION**

### **Population size and distribution**

The burrowing owl population at NRTF Dixon exhibited the highest density of nesting pairs we have seen reported in the scientific literature, after adjusting the comparison of densities by the size of the study area. It also appears to be the largest remaining population of this species in Solano and Yolo Counties. A recent comparison of observations by experts in the area indicated burrowing owls had recently declined in number and in number of locations in Yolo and Solano Counties, largely due to residential and commercial development (Johnson 1997; Smallwood, unpubl. data; Julia Camp, Jim Estep, Gary Santolo, Pers. Comm.). Other than the populations at NRTF Dixon and the Wildhorse Golf Course in north Davis, only groups of 1 to 3 pairs nest at scattered locations within these Counties.

### **Habitat associations**

The burrowing owls at NRTF Dixon strongly selected the artificial burrows in constructed mounds, but their selection of these burrows declined substantially in 2007. By 2007 ground squirrels had burrowed throughout the mounds, and tall weeds proliferated on them. Whereas the artificial burrows greatly benefitted burrowing owls at NRTF Dixon, their usefulness may be close to an end. If NRTF Dixon is to continue to conserve burrowing owls, then it is time to either restore the artificial burrows and their mound structures or implement alternative measures. Given the difficulty in maintaining the mounds, we suggest alternative measures may prove more efficient. Also, NRTF Dixon personnel feel that the mounds have attracted ground squirrels, and that since the mounds were constructed ground squirrels have caused damage to nearby facilities and infrastructure (Don Svaldi, Pers. Comm.). Alternatives will be discussed below.

Burrowing owls also nested within the cable covers. Not only did the cable covers provide convenient nest sites for burrowing owls, but they also rise above ground just high enough for burrowing owls to perch upon for detecting approaching predators (e.g., Figure 1). Considering both the total number of owls using cable covers and the magnitude of the observed to expected ratio associated with their use, it appears cable covers were the most important nesting structure to burrowing owls in NRTF Dixon.

Nests were also in burrows constructed by ground squirrels under and into asphalt roads servicing the antenna arrays. However, NRTF Dixon personnel regarded these burrows as damage to infrastructure, and in need of repair. One pair of owls also nested in a culvert, and one nested in a hollowed out utility pole used as a perimeter marker of an antenna array. Some

owls nested under a concrete-lined ditch, but this concrete lining did not extend far enough to serve more than only a few pairs of owls.

Ground squirrel burrows in the mowed grasslands within antenna arrays were also used as nest sites by burrowing owls. The antenna arrays appeared to have been more strongly selected in 2007, but reason was unknown for the increase in the observed to expected ratio of nesting pairs in these areas. Owls nesting under the antenna arrays regularly perched on the antennae, near their burrows.

### **Ground squirrels**

Compared to other annual grassland environments we have worked on, the density of ground squirrel burrow complexes at NRTF Dixon was relatively low, at 305 complexes per km<sup>2</sup>. For example, at Vasco Caves Regional Preserve in Contra Costa County, an area of 381 ha supported 470 complexes per km<sup>2</sup> (Smallwood et al. 2008). Just north of Fresno, California, Smallwood (2002) reported, that a 66.7 ha grassland supported 470 ground squirrel complexes per km<sup>2</sup>. At Naval Air Station Lemoore a 43 ha grassland supported 835 ground squirrel complexes in 2006, or 1,942 per km<sup>2</sup> (Smallwood and Morrison 2007). However, we should note that in 2007 the ground squirrel population at Lemoore plummeted to 86 complexes, or 200 per km<sup>2</sup> (Smallwood and Morrison 2008). However, in a 15.1 ha hilltop grassland at Naval Weapons Station, Seal Beach, Detachment Concord, we mapped 1 ground squirrel burrow complex, or 6.62 complexes per km<sup>2</sup> (Smallwood and Morrison 2006). Based on most of our experience, we conclude that ground squirrel density at NRTF Dixon was relatively low.

However, the ground squirrel population at NRTF Dixon would have been much lower had it not been for ground disturbance and the presence of infrastructure on the site. The clay soils underlying NRTF Dixon are difficult to burrow into. We found few ground squirrel burrows in soils that were not obviously disturbed, and we suspect that most if not all of these burrows were into soils that were disturbed sometime in the past, but the evidence of their disturbance was not sufficiently obvious for us to notice. Probably, closer inspection of the ground, or consultation with NRTF Dixon personnel, would reveal the ground was disturbed where these burrows were found. Some of these burrows were arranged linearly on the landscape (Figure 8), hinting at buried cable, water pipes, or other structures.

Considering the total numbers of burrows and the observed to expected ratios, ground squirrels were most strongly associated with fill soil over buried cables or other structures. They also associated strongly with cable covers, hard surfaces, and constructed mounds for artificial burrowing owl burrows. Ground squirrel use of hard surfaces was especially intense where disturbed soils such as fill or constructed mounds occurred nearby the hard surfaces. For example, most of the roadway damage was next to constructed mounds over artificial burrowing

owl burrows (Figures 17 and 18), as was much of the damage to the asphalt pad around the building complex (Figure 19). Fuel deliveries to Dixon NRTF have been increasingly difficult due to collapse of the asphalt pad at the main transmitter facility. The cyclone fence surrounding the main transmitter facility was falling over due to undermining by the squirrels. NRTF Dixon staff has resorted to using concrete to patch roads damaged by ground squirrels.

Figure 17. Ground squirrel damage to an antenna access road. Note burrow entrances in middle of road, and concrete patches between constructed mounds with artificial burrowing owl burrows in background.



Figure 18. Ground squirrel damage to an antenna access road. Note concrete patch between constructed mounds with artificial burrowing owl burrows.

Figure 19. Ground squirrel damage along the edge of an asphalt pad of the main transmitter facility. Note cyclone fence falling over, and note constructed mound with artificial burrowing owl burrows in background (top right corner of photo).



### **Management recommendations**

We recommend that the burrowing owl population at NRTF Dixon continue to be monitored, due to the substantial decrease in the number of nesting pairs observed between 2006 and 2007, and due to the emerging importance of NRTF Dixon to burrowing owls in the region. Possibly, the decrease we observed was due to natural inter-annual variation in burrowing owl abundance, but it is also possible the decrease was due to deteriorating conditions at NRTF Dixon. The performance of the artificial burrows appears to have declined during our study, and was likely declining prior to our study. It would be worthwhile to survey the burrowing owls at NRTF Dixon again this year.

We recommend that productivity data be collected from burrowing owls at NRTF Dixon. This would require repeat visits to owl nests to note the number of young emerging, or the task could be accomplished with the use of a burrow probe. A burrow probe is a camera on a flexible extender that can be inserted into a burrow to observe the burrow's contents.

We recommend the artificial burrows be relocated to the western aspect of the antenna field, and that new, alternative artificial burrows be installed there, as well. We see a lot of potential in constructing artificial burrows by using the same half-rounds as used to cover cables in NRTF Dixon. NRTF Dixon has a surplus of half-rounds that could be deployed as artificial burrows.



We suggest the effectiveness of these half-rounds as burrows could be improved by partially covering one end of a contiguously placed set of half-rounds and by partly covering the sides with soil. We also recommend that the cost-effectiveness of these alternatives, including the costs of maintenance, be measured in a controlled experiment (Figure 20).

We suggest that the ground squirrel distribution in NRTF Dixon could be shifted away from the main transmitter facility and roadways by relocating artificial burrowing owl burrows away from the core aspects of the antenna field. It might be necessary to control ground squirrels that will not leave the vicinity of key facilities and where damage continues, but these locations number only one or two at NRTF Dixon. We also suggest minimizing ground disturbances around the main transmitter facility and around roads, because the squirrels rely heavily on disturbed ground within a matrix of clay soils. We believe it is possible to substantially reduce ground squirrel interference with Navy operations while also conserving burrowing owls. Further, we believe that with little expense and very low long-term maintenance costs, burrowing owls could be increased in number and spatial extent at NRTF Dixon, and that this accomplishment would be regionally important to burrowing owl conservation.

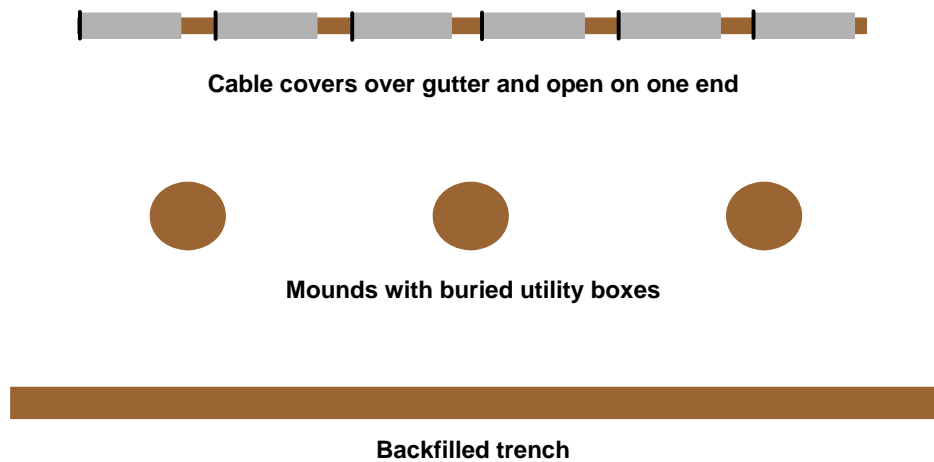


Figure 20. An example arrangement of burrowing owl burrow treatments, but not to scale. The arrangement could be randomized in each plot at sites located safely away from the antenna field and main facilities. The cable covers at the top of the figure are simply half-rounds which are available in surplus at NRTF Dixon. The circles in the middle of the figure depict the constructed mounds over artificial burrows, similar to those already in use at NRTF Dixon. The backfilled trench at the bottom of the graph would simply be a trench dug with a trencher and re-buried, in order to provide loosened soil that ground squirrels could dig into.

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# Navy Radio Transmitter Facility Dixon

## Biological Resources Surveys



*Final*  
**December 2012**

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## Acronyms and Abbreviations

Acronym/Abbreviation	Definition
°C	degree(s) Celsius
°F	degree(s) Fahrenheit
BCC	Bird of Conservation Concern
BCI	Bat Conservation International
BSSC	Bird Species of Special Concern
CDFG	California Department of Fish and Game
CF ZCAIM	Compact Flash Storage Zero-Crossings Analysis Interface Module
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
GIS	Geographic Information System
GPS	Global Positioning System
ha	hectare(s)
IVC	International Vegetation Classification
km	kilometer(s)
NRMA	Natural Resources Management Area
NRTF	Naval Radio Transmitting Facility
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USNVC	U.S. National Vegetation Classification System
VegCAMP	Vegetation Classification and Mapping Program
VRA	Vegetation Rapid Assessment

# 1.0 Introduction

Naval Radio Transmitter Facility (NRTF) Dixon is approximately 7 miles (11 kilometers [km]) southeast of Dixon, in Solano County, California. The facility is located within the Sacramento Valley, approximately 25 miles (40 km) southwest of Sacramento, 65 miles (105 km) northwest of Stockton, and 65 miles (105 km) northeast of San Francisco (Map 1-1). The property is located 7 miles (11 km) southeast of Interstate 80, and east of Highway 113 at the intersection of Robben Road and Radio Station Road.

NRTF Dixon encompasses approximately 1,280 acres (518 hectares [ha]) (Map 1-2) and includes a 24,000-square-foot (7,315-square-meter) transmitter building, associated antenna fields, support facilities, a commercial Pacific Gas and Electric Company electrical power substation, and two diesel powered generators. NRTF Dixon maintains high-frequency transmitters, antennas, and associated ancillary equipment, as well as two low-frequency transmitters and two 600-foot (183-meter [m]) low-frequency antennas.

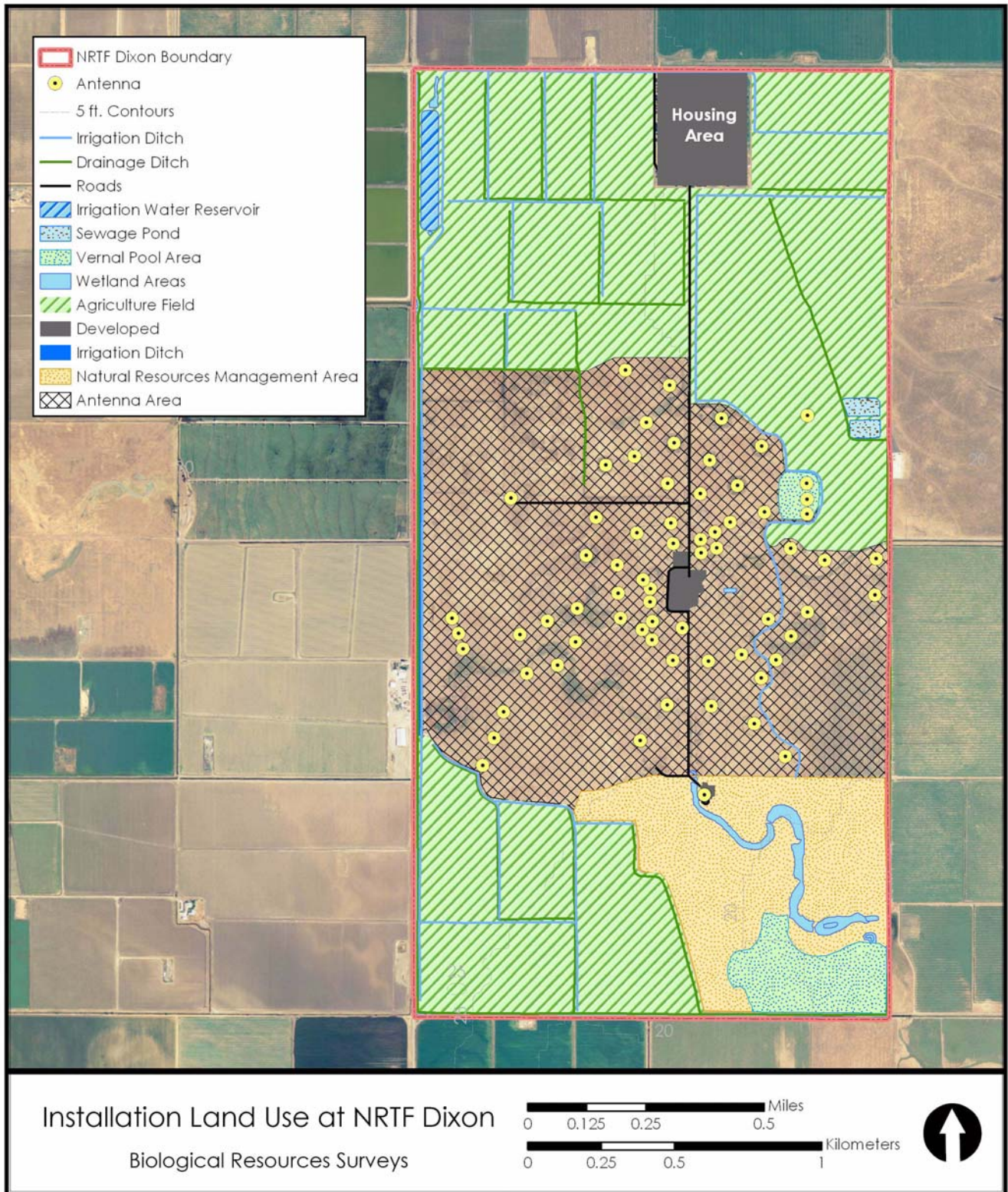
Approximately 514 acres (208 ha) of open space are occupied by the antenna field, which is not separated from the agricultural parcel (there is some overlap between the antenna field and the agricultural lease, so acreages cited here total slightly more than the 1,280 acres noted in the preceding paragraph). Ground cover in this area is primarily grassland, which is mowed to reduce fire hazard. Agricultural fields comprise nearly 603 acres (244 ha) of NRTF Dixon. The housing area at the north end of the property covers close to 34 acres (14 ha).

Approximately 153 acres (62 ha) in the southeastern corner of the facility has been termed a Natural Resources Management Area (NRMA). The NRMA was set aside because of a large vernal pool, seasonal wetlands, man-made ponds, and freshwater marsh on the property. It provides habitat for wildlife and was used in the past as a recreation area for barbecues and picnics when military personnel were still residing on NRTF Dixon.

NRTF Dixon contains five open Installation Restoration Program sites and one Munitions Response Program site. The Installation Restoration Program sites are known as Site 1–Waste Blowdown Area, which is mostly asphalt with some grassy areas; Site 2–Landfill Area A, which is covered with an agricultural field; Site 3–Landfill Area B, which is covered with grasslands; Site 4–Automobile Landfill, which is covered with grasslands and is within the NRMA; and Site 5–Basewide Groundwater. The Munitions Response Program site is known as Munitions Response Program Site 1–Limited Firing Range. All sites are subject to continued monitoring.



Map 1-1. Regional location of Naval Radio Transmitter Facility Dixon.



Map 1-2. Naval Radio Transmitter Facility Dixon land use.

## 1.1 Project Objective

---

Tierra Data Inc. was contracted to conduct natural resources surveys within those areas and acreages as shown in Map 1-2 as part of this contract task order. Natural resources surveys were conducted for the entire acreage (1,280 acres [518 ha]) of NRTF Dixon including:

- Vegetation survey
- Herpetological survey
- General avian survey
- Small mammal survey

## 1.2 General Site Conditions

---

The Central Valley of California contains three geographic subregions: the Sacramento Valley, the San Joaquin Valley, and the region of the confluence of the Sacramento River and San Joaquin River at the Sacramento-San Joaquin Delta (hereinafter 'the Delta'). Together these geographic subregions are approximately 450 miles (724 km) long, and average 50 miles (80 km) wide. NRTF Dixon straddles the boundary between the Sacramento Valley and Delta regions.

NRTF Dixon lies within the Yolo-American Basin ecological sub-region of the Great Central Valley ecoregion (U.S. Forest Service [USFS] 1995). This nearly level ecological sub-region is underlain geologically by alluvium. Prior to extensive channelization and the construction of levees, fluvial erosion and deposition were the main geomorphic process that characterized the Yolo-American Basin (USFS 1995). The Yolo-American Basin was once covered by extensive needlegrass grasslands, wetlands, and riparian woodlands (USFS 1995). Prior to European settlement, fire and floods were the major forms of ecological disturbance. Today the region is dominated by agriculture, with local agriculture by-and-large producing alfalfa, tomatoes, and walnuts (California Department of Food and Agriculture 2010).

NRTF Dixon straddles the northwestern border of the Delta region, a prominent geographic feature that has defined much of the region's historical, political, and ecological context. In the Delta, fresh water from the San Joaquin and Sacramento Rivers mix with salt water from San Francisco Bay. Encompassing 1,600 square miles (2,575 square kilometers) of waterways, the San Francisco Bay and Delta together form the West Coast's largest estuary and the second-largest estuary in the nation (California Department of Fish and Game [CDFG] 2007).

- The federal Central Valley Project and the State Water Project constitute the largest agriculture and municipal water supply system in the U.S.

The Delta was formed as a freshwater marsh, underlain by thick peat layers that formed from decaying tules. Natural channels were shifting, creating a complex and dynamic ecosystem where there was no clear distinction between aquatic and terrestrial components (Moyle et al. 2010). Over the last 100 years, canals, levees, and channelization have isolated farmland from water courses, creating a clear distinction between aquatic and terrestrial habitats.

As the Delta is now the hub of much of the state's water supply, it is arguably California's most important water resource (CDFG 2007). Large pumping stations feed Delta water into both the federal Central Valley Project to farmland in the southern Central Valley, and to the State Water Project to metropolitan areas in southern California. These two projects constitute the largest agriculture and municipal water-supply system in the United States (Moyle et al. 2010). Other water is extracted for use in the Delta itself (National Academy of Sciences 2010). Channelization and the construction of levees to serve these ends and have severely altered both natural geomorphic and ecological processes of the Delta. This has resulted in subsidence and extirpation of species such as the beaver, tule elk, and grizzly bear (Moyle et al. 2010). Most former wetland and marsh areas of the delta have been drained for agriculture, and are protected by an aging collection of levees (Moyle et al. 2010). The Delta, as it exists today, supports an assemblage of primarily exotic species. Current natural resource management in the Delta is highly focused on the conservation of delta smelt (*Hypomesus transpacificus*), winter-run and fall-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley steelhead (*Oncorhynchus mykiss*), and green sturgeon (*Acipenser medirostris*) (Moyle et al. 2010).

Three-quarters of NRTF Dixon fall within the Delta Smelt Critical Habitat, designated by the U.S. Fish and Wildlife Service (USFWS) in 1984. At the installation, this critical habitat boundary is the same as the political boundary of the 'Legal Delta' as defined by the 1959 Delta Protection Act (as presented in Lund et al. 2007); as a result, NRTF Dixon straddles this boundary. The 1959 Delta Protection Act defined an area where the State Water Project and Central Valley Project management activities would be coordinated to keep the Delta water fresh enough for agriculture and human use (Lund et al. 2007).

A literature review was conducted during these surveys to support the assessment and mapping of natural resources values and constraints, including special status species. This review helped to provide efficiency and focus to the field work, and to validate and build on work of the critical issues study. These more detailed surveys were designed to fill in potential data gaps that might contribute to management constraints. The Geographic Information System (GIS) datasets were reviewed to assess their level of completeness and every effort was made to address any data gaps coincident with other surveys. The literature review included all known databases of the California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and Solano County records, as well as those of non-government native plant societies.

## 1.2.1 Climate

The climate of the region is characterized by a typical Mediterranean regime of dry, hot, summers and cool, moist, winters. Air temperature movement is moderated by the influence of San Francisco Bay. Oceanic influence on climate is slight near NRTF Dixon, which can receive some marine air through the Carquinez Straits (USFS 1995). Rainfall regime is typical of the central and northern regions of the

Great Central Valley with rainfall occurring mostly November through April. Light snowfall in winter is rare but not unknown (Western Regional Climate Center 2010).

### Precipitation

The normal precipitation at NRTF Dixon is approximately 17.1 inches (43.4 centimeters) annually (Figure 1-1), most of which falls from October through April (Figure 1-2).

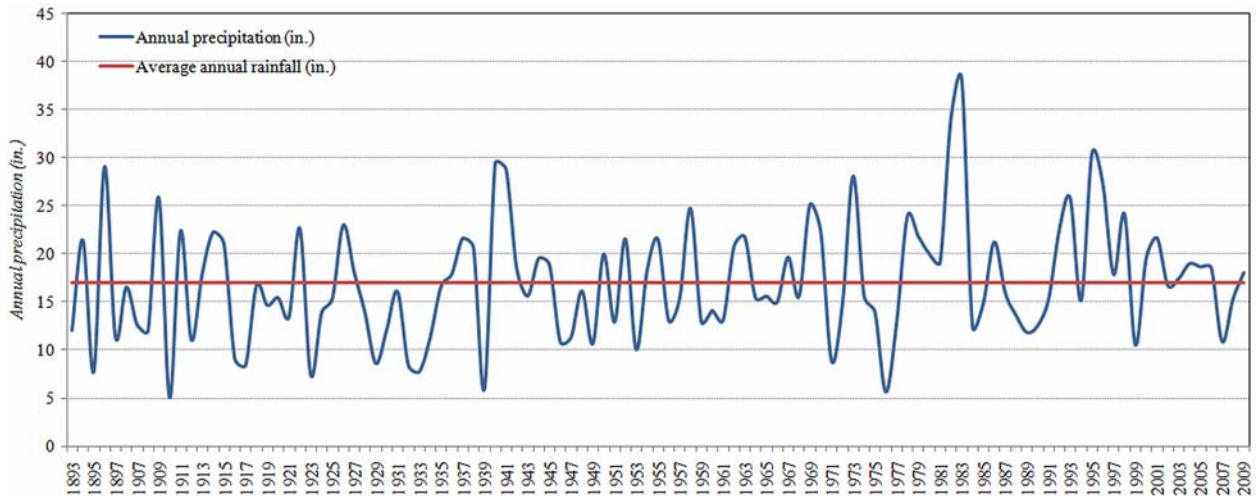


Figure 1-1. Annual rainfall in the vicinity of Naval Radio Transmitter Facility Dixon from 1893 to 2009 (Data source: Western Regional Climate Center, Davis weather station; [2010 data not available]).

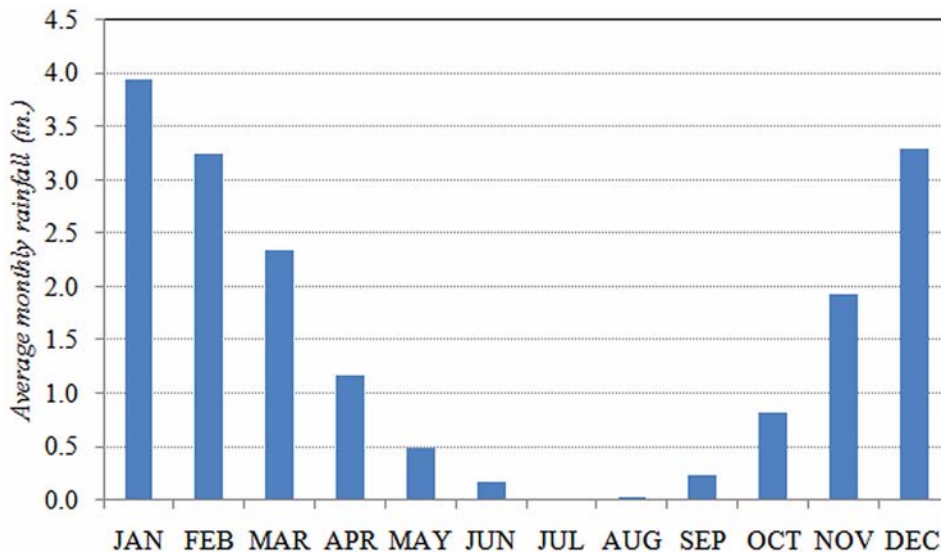


Figure 1-2. Average monthly rainfall in the vicinity of Naval Radio Transmitter Facility Dixon from 1893 to 2009 (Data source: Western Regional Climate Center, Davis weather station).

### Monthly Temperatures

Summer temperatures in Dixon range from 54 degrees Fahrenheit (°F) (12 degrees Celsius [°C]) to 92°F (33°C); winter temperatures range from 36°F (2°C) to 59°F (15°C) (Figure 1-3).



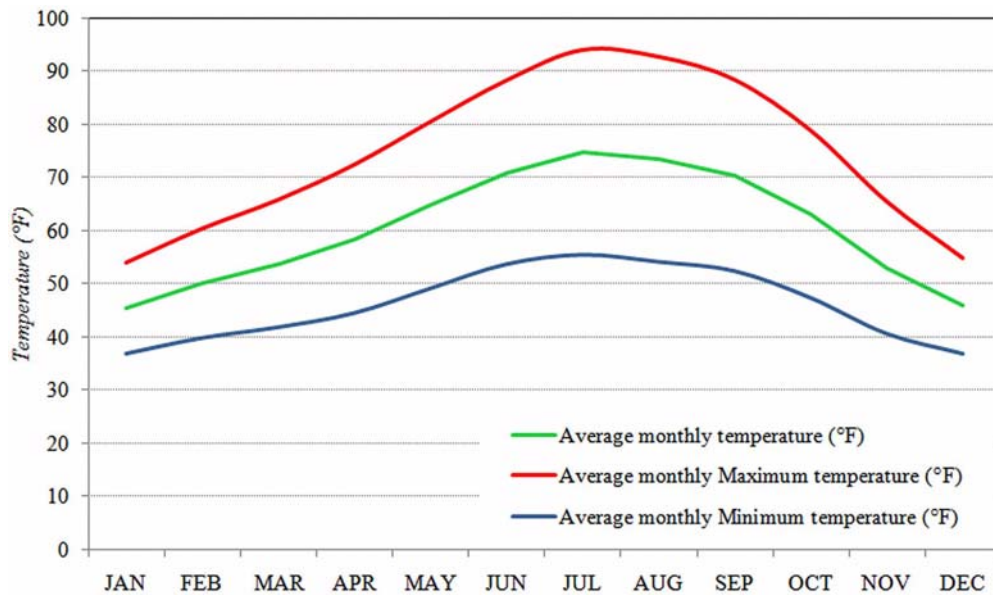


Figure 1-3. Average monthly temperature regime in the vicinity of NRTF Dixon (Data source: Western Regional Climate Center, Davis weather station).

### 1.2.2 Wind

Prevailing winds at NRTF Dixon are from the south-southwest, except in December and January when winds are from the north, northwest (Western Regional Climate Center 2010). Winds average six miles (10 km) per hour. Average monthly wind speed values for nearby Vacaville airport are presented in Table 1-1.

Table 1-1. Monthly and annual wind speed in miles per hour for Vacaville Airport (Western Regional Climate Center 2010).

Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1998-2006	4.4	5.5	6.3	7.1	7.0	7.5	7.3	6.7	5.9	5.5	4.4	4.9	6.0

### 1.2.3 Tule Fog

Commonly occurring during the rainy season between November and March, heavy ground fog, or so-called tule fog, is a common winter climatic phenomenon of the Sacramento Valley. This dense fog is the product of both winter atmospheric conditions and geography (National Oceanic and Atmospheric Administration 2001). By late fall cool season storms bring rain to the valley floor, thereby adding low-level atmospheric moisture. High pressure, building aloft behind the storms, limits vertical air movement from the valley air basin. As the ground cools during long winter nights, it cools the adjacent air and forms fog as temperatures reach dew points (National Oceanic and Atmospheric Administration 2001). The total number of average fog days per year in Sacramento (the closest recording station) is 34, with a majority of fog days occurring between November and February (Western Regional Climate Center 2010).

## 2.0 Field Schedule and Focus Species List

### 2.1 Field Schedule

The following table (Table 2-1) describes field personnel, survey type and dates of field work.

*Table 2-1. Field visits associated with the biological surveys at Naval Radio Transmitter Facility Dixon.*

<b>Date(s)</b>	<b>Surveyor(s)</b>	<b>Surveys Conducted</b>
7/30–8/1/2009	Harry Smead, Kate Goodenough	Herpetological and Ornithological Surveys
8/04–8/6/2009	Shawn Smallwood	Small Mammal Trapping
11/12/2009	Shawn Smallwood	Small Mammal Trapping
11/13–11/15/2009	Harry Smead, Kate Goodenough, Shawn Smallwood	Herpetological, Ornithological, and Bat Surveys, and Small Mammal Trapping
1/28–1/30/2010	Kate Goodenough	Ornithological Surveys
1/30–1/31/2010	Kate Goodenough, Jim Kellogg	Ornithological and Bat Surveys
2/9–2/12/2010	Shawn Smallwood	Small Mammal Trapping
2/18/2010	Harry Smead	Herpetological Surveys
5/5–5/7/2010	Shawn Smallwood	Small Mammal Trapping and Ornithological Surveys
6/4–6/5/2010	Harry Smead, Joseph Kean	Herpetological and Vegetation Assessment Surveys
6/4–6/6/2010	Harry Smead, Joseph Kean	Bat Surveys
7/5/10	Jim Kellogg	Bat Surveys

### 2.2 Focus Species

Table 2-2 provides a list of special status plant species with potential to occur in the survey area. Map 2-1 depicts known locations of CNDDDB records within 5 miles (8 km) of NRTF Dixon.

Table 2-3 lists special status wildlife species that could potentially occur at NRTF Dixon.

Table 2-2. Special status plants inhabiting or potentially inhabiting the vicinity of Naval Radio Transmitter Facility Dixon.

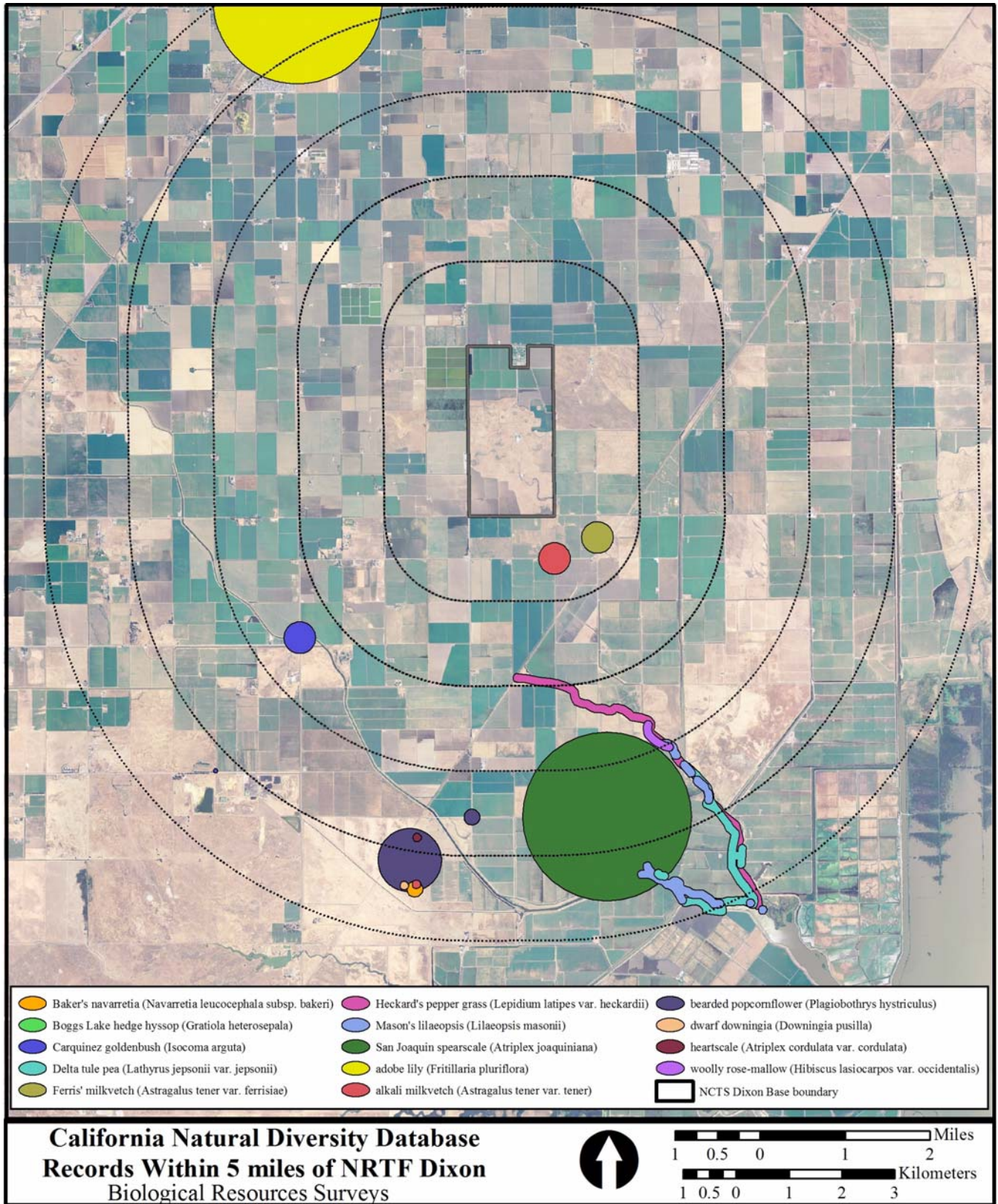
Scientific Name	Common Name	Status	Presence	Habitat	Known Locations
<i>Astragalus tenervar. ferrisiae</i>	Ferris's milkvetch	-/-/1B.1	P	Meadow and seep, valley and foothill grassland (subalkaline flat)	
<i>Astragalus tenervar. tener</i>	alkali milkvetch	-/-/1B.2	P	Playas, valley and foothill grassland (adobe clay), vernal pools/alkaline	
<i>Atriplex cordulata var. cordulata</i>	heartscale	-/-/1B.2	P	Meadows and seeps, valley grassland (sandy)/saline or alkaline	
<i>Atriplex joaquinana</i>	San Joaquin spearscale	-/-/1B.2	P	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland	
<i>Chamaesyce hooveri</i>	Hoover's spurge	FT/-/1B.2	P	Valley grassland, freshwater wetland, wetland-riparian, vernal pool	Formerly known from region.
<i>Vahlodea atropurpurea</i>	mountain hairgrass	-/-/4.3	P	Wetland-riparian areas and meadows	
<i>Fritillaria pluriflora</i>	adobe lily	-/-/1B.2	P	Valley grassland/often adobe	
<i>Gratiola heterosepala</i>	Boggs Lake hedge hyssop	-/SE/1B.2	P	Marsh and swamp (lake margins), vernal pool/clay	
<i>Hibiscus lasiocarpus var. occidentalis</i>	woolly rose-mallow	-/-/1B.2	P	Marshes and swamps (freshwater)	
<i>Isocoma arguta</i>	Carquinez golden-bush	-/-/1B.1	P	Valley and foothill grassland (alkaline)	
<i>Lasthenia burkei</i>	Burke's goldfields	FE/SE/1B.1	C*	Meadows and seeps, vernal pools	
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE/-/1B.1	P	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools/mesic	Critical Habitat designated in the vicinity of NRTF Dixon-south of Vacaville, north of Travis Air Force Base.
<i>Lathyrus jepsonii var. jepsonii</i>	Delta tule pea	-/-/1B.2	P	Marshes and swamps (freshwater and brackish)	
<i>Legenere limosa</i>	false Venus' looking glass	-/-/1B.1	P	Valley grassland, freshwater wetlands, wetland-riparian, vernal-pool	
<i>Lepidium latipes var. heckardii</i>	Heckard's pepper grass	-/-/1B.2	P	Valley grassland (alkaline flats)	
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	-/Rare/1B.1	P	Marsh and swamp (brackish or freshwater), riparian scrub	
<i>Navaretia leucocephala subsp. bakeri</i>	Baker's navaretia	-/-/1B.1	P	Meadow and seep, valley grassland, vernal pool/mesic	
<i>Navaretia myersii</i>	pincushion navaretia	-/-/1B.1	C*	Vernal pools, often acidic	Fewer than 20 occurrences.
<i>Orcuttia pilosa</i>	hairy Orcutt grass	FE/SE/1B.1	P	Vernal pools	Stanislaus, Madera, Tehama, Merced, Glenn counties.
<i>Neostapfia colusana</i>	Colusa grass	FT/SE/1B.1	P	Valley grassland, freshwater wetland, wetland-riparian, vernal-pool	Colusa, Merced, Solano, Stanislaus counties.
<i>Plagiobothrys hystriculus</i>	bearded popcornflower	-/-/1B.1	P	Valley grassland (mesic), vernal pools margins/often vernal swales	
<i>Tuctoria mucronata</i>	Crampton's tuctoria	FE/SE/1B.1	P	Vernal pools in Solano/Yolo County	Jepson Prairie.

Sources: CNDDDB 2012; CNPS 2010; USFWS 2008; Navy 1987, 2000; Holton Associates 1987. All possible plants are those with CNDDDB recorded sightings within the vicinity of NRTF Dixon. \* = Presence of pincushion navaretia (*Navaretia myersii*) and Burke's goldfields (*Lasthenia burkei*) was confirmed in the 2002 Integrated Natural Resources Management Plan. They were not observed during the 2009-2010 Tierra Data Inc. surveys.

Codes:

**Federal Status:** FE = Endangered; FT = Threatened. **State/CDFG Status:** SE = Endangered. **CNPS Rare Plant Rank:** 1B = Plants Rare, Threatened, or Endangered in California and Elsewhere; 4 = Plants of Limited Distribution - A Watch List.

**CNPS Threat Rank:** 0.1 = Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat); 0.2 = Fairly threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat); 0.3 = Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known). **Presence:** P = Possible; C = Confirmed.



Map 2-1. California Natural Diversity Database records for plant species potentially occurring on Naval Radio Transmitter Facility Dixon property.

Table 2-3. Federally threatened, federally endangered, and sensitive wildlife species potentially occurring on, or in the vicinity of, Naval Radio Transmitter Facility Dixon .

Scientific Name	Common Name	Status Federal/ State	Presence	Habitat	Known Locations
<b>Invertebrates</b>					
<i>Branchinecta conservatio</i>	conservancy fairy shrimp	FE/-	P	Endemic to vernal pools in California. Inhabit relatively large and turbid vernal pools called playa pools.	Restricted to the Central Valley, except for one population in the Central Coast in Ventura County. Eight populations throughout the state. The two closest: Yolo Bypass Wildlife Area, Yolo County and Jepson Prairie, Solano County with 14 records. Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT/-	P	Grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains; static rain-filled pools. Small, clear-water sandstone-depression pools, grassed swales, earth slumps or basalt-flow depression pools.	Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	FE/-	P	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT/-	P	Occurs only in the Central Valley of California, in association with blue elderberry ( <i>Sambucus mexicana</i> ). Prefers to lay eggs in elderberry stems 2 to 8 inches in diameter; some preference shown for "stressed" elderberries.	
<i>Elaphrus viridis</i>	delta green ground beetle	FT/-	P	Typically found along the margins of vernal pools and in bare areas along trails and roadsides, where individuals often hide in cracks in the mud and under low-growing vegetation. Primarily associated with Pescadero clay (the clay base to vernal pools and lakes), the Solano-Pescadero complex, Solano loam, and Pescadero clay loam. Beetles are also known to frequent upland habitat—they have been found hundreds of meters from the nearest shoreline—but only during the wet season.	Rediscovered in 1974 at Jepson Prairie in Solano County. As of 2007, there were seven extant populations in that area, including Jepson Prairie Preserve, Wilcox Ranch, Calhoun Cut Ecological Reserve, Barker Slough Management Unit, the Michael Remy vernal pool preserve, the Burke Ranch, and Campbell Ranch. Critical Habitat designated in the vicinity of NRTF Dixon.
<b>Fishes</b>					
<i>Hypomesus transpacificus</i>	delta smelt	FT/SE	P	Require specific environmental conditions and habitat types: freshwater flow; water quality; shallow open waters for migration, spawning, egg incubation, rearing, and larval and juvenile transport from spawning to rearing habitats. Rarely occur in water with more than 10-12 parts per thousand salinity. Preferred temperature range in the lab is 34 to 78°F (1 to 25°C), though may be found in warmer waters in the Delta. Require nursery habitats in low salinity zones with salinity from 2 to 7 parts per thousand. Feed primarily on small planktonic crustaceans and occasionally on insect larvae.	Endemic to San Francisco Bay and Sacramento-San Joaquin Delta Estuary. Only found from San Pablo Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo Counties. Three-quarters of NRTF Dixon falls within designated Critical Habitat.
<b>Amphibians</b>					
<i>Ambystoma californiense</i>	California tiger salamander	FT/ST	P	Annual grasslands and grassy understory of valley-foothill hardwood habitats in central and northern California. Requires underground refuges, especially ground squirrel ( <i>Spermophilus beecheyi</i> ) burrows, and vernal pools or other seasonal water sources for breeding.	Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Rana draytonii</i>	California red-legged frog	FT/SSC	P	Lowlands and foothills in a variety of aquatic, riparian and upland environments near permanent sources of water.	

Table 2-3. Federally threatened, federally endangered, and sensitive wildlife species potentially occurring on, or in the vicinity of, Naval Radio Transmitter Facility Dixon (Continued).

Scientific Name	Common Name	Status Federal/ State	Presence	Habitat	Known Locations
<i>Spea hammondi</i>	western spadefoot toad	-/SSC	C	Occurs primarily in grassland environments, but can also be found in valley-foothill hardwood woodlands. Shallow, temporary ponds are used for breeding and egg-laying.	
<b>Reptiles</b>					
<i>Actinemys marmorata</i>	western pond turtle	-/SSC	P	Permanent or nearly permanent ponds, lakes, streams, irrigation ditches or permanent pools along intermittent streams in a wide variety of habitat types. Require basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks. Omnivorous feeding habits.	
<i>Actinemys marmorata marmorata</i>	northwestern pond turtle	-/SSC	P	Aquatic habitat of ponds, marshes, streams, and irrigation ditches that have abundant emergent or riparian vegetation.	
<i>Thamnophis gigas</i>	giant garter snake	FT/ST	P	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches.	
<b>Birds</b>					
<i>Circus cyaneus</i>	northern harrier	-/SSC	C	Uses tall grasses and forbs in wetland, or at wetland/field border, for cover; roosts on ground. Nests on ground in shrubby vegetation, usually at marsh edge. Mostly nests in emergent wetland or along rivers or lakes, but may nest in grasslands, grain fields, or on sagebrush flats several miles from water.	
<i>Elanus leucurus</i>	white-tailed kite	-/FP	C	Uses herbaceous lowlands with variable tree growth and dense population of voles. Substantial groves of dense, broad-leaved deciduous trees used for nesting and roosting.	
<i>Buteo swainsoni</i>	Swainson's hawk	BCC/ST	C	Breeds in stands of sparse juniper-sage flats, riparian areas, and oak savannahs. Requires adjacent suitable foraging habitat such as grasslands, alfalfa, or grain fields supporting rodent populations.	
<i>Athene cunicularia</i>	burrowing owl	SC/SSC	C	Burrow sites occur in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester dependent upon burrowing mammals (i.e. California ground squirrel).	
<i>Asio flammeus</i>	short-eared owl	-/SSC	C	Found in open, treeless areas with elevated sites for perches, and dense vegetation (tall grasses, brush, ditches, and wetlands) for roosting and nesting. Nests on dry ground in a depression concealed in vegetation, and lined with grasses, forbs, sticks, and feathers; occasionally nests in a burrow.	
<i>Aquila chrysaetos</i>	golden eagle	BCC/FP	P	Annual grassland to above timberline forest habitats. Favors grass/forb, shrub/sapling, and open-canopied young woodlands of blue oak. Requires cliffs or large live or dead trees for nesting.	Has been observed perched on powerlines in the vicinity of NRTF Dixon.
<i>Charadrius montanus</i>	mountain plover	PT, BCC/ SSC	P	Short grass plains, low rolling grass hills, freshly plowed agricultural fields, and newly sprouting grain fields. Often associated with short vegetation and bare ground.	
<i>Numenius americanus</i>	long-billed curlew	BCC/-	C	Upland shortgrass prairies and wet meadows are used for nesting; coastal estuaries, open grasslands, and croplands are used in winter.	

Table 2-3. Federally threatened, federally endangered, and sensitive wildlife species potentially occurring on, or in the vicinity of, Naval Radio Transmitter Facility Dixon (Continued).

Scientific Name	Common Name	Status Federal/State	Presence	Habitat	Known Locations
<i>Lanius ludovicianus</i>	loggerhead shrike	BCC/SSC	C	Inhabits open areas with sparse shrubs, trees, and other perches.	
<i>Icteria virens</i>	yellow-breasted chat	-/SSC	C	Requires riparian thickets of willow and other brushy tangles near watercourses for cover, building nests 2-8 feet (0.6-2.4 m) above ground.	
<i>Agelaius tricolor</i>	tricolored blackbird	SC/SSC	P	Inhabits dense cattail marshes, marshy meadows and rangeland; most numerous in the Central Valley and the vicinity of California.	
<i>Pica nuttalli</i>	yellow-billed magpie	BCC/-	C	Prefers open oak and riparian woodland, and farm and ranchland with tall trees in the vicinity of grassland, pasture, and cropland. It is omnivorous and opportunistic in its feeding.	A common, yearlong resident of the Central Valley and coastal mountain ranges south from San Francisco Bay to Santa Barbara County.
<i>Pelecanus erythrorhynchos</i>	American white pelican	-/SSC	C	Locally uncommon to common on large lakes and estuaries in Central Valley. Rests during the day and roosts at night along water edges, on beaches, sandbars, or old driftwood.	Now nests only at large lakes in Klamath Basin. Migrant flocks pass overhead mostly in spring and fall throughout California.
<i>Chlidonias niger</i>	black tern	-/SSC	C	Uses fresh emergent wetlands, lakes, ponds, moist grasslands, and agricultural fields. Often nests in dense wetland vegetation. Needs fresh water while breeding.	
<i>Melospiza melodia</i>	song sparrow (Modesto population)	-/SSC	C	Endemic to California. Affinity for emergent freshwater marshes dominated by tules ( <i>Scirpus</i> sp.) and cattails ( <i>Typha</i> sp.) as well as riparian willow ( <i>Salix</i> sp.) thickets. Also nest along vegetated irrigation canals and levees.	Resides only in the north-central portion of the Central Valley. Highest densities occur in Butte Sink area of Sacramento Valley and in Sacramento-San Joaquin River Delta.
<b>Mammals</b>					
<i>Antrozous pallidus</i>	pallid bat	-/SSC	C	Common in grasslands and desert regions, in California they are associated with oak woodlands at lower elevations and may roost in tree cavities, rock crevices and manmade structures. Yearlong residents in most areas, they travel up to 1.5 miles (2.4 km) from their day roost to forage.	Occur throughout California, except in the high Sierra Nevada, from Shasta to Kern Counties and the northwestern corner of the state.
<i>Sorex ornatus sinuosus</i>	Suisun shrew	-/SSC	U	Prefers the dense, low-lying cover of pickleweed ( <i>Salicornia</i> sp.). Less abundant and more restricted in distribution than the salt-marsh harvest mouse.	Occurs only in San Pablo and Suisun Bays.
<i>Lasiurus blossevillii</i>	western red bat	-/SSC	P	Prefers edges or habitat mosaics that have trees for roosting and open areas for foraging. Roosts primarily in trees often in edge habitats adjacent to streams, fields or urban areas. Preferred roost sites are protected from above, open below, and located above dark ground-cover.	
<i>Reithrodontomys raviventris</i>	salt marsh harvest mouse	FE/SE	U	Pickleweed saline emergent wetland is preferred habitat where it may be locally common. Wetland habitat value increases with depth, density and degree of mixing with fat hen and alkali heath. Grasslands adjacent to pickleweed marsh used only when new grass growth affords suitable cover in spring and summer months.	Mostly restricted to a band extending from San Mateo County and Alameda County south along both sides of San Francisco Bay to Santa Clara County. Isolated populations occur in Marin and Contra Costa Counties.
Sources: CNDDDB 2012; USFWS 2008; CNPS 2010; Navy 1987, 2000; Holton Associates 1987					
Codes:					
Federal Status: FE = Endangered; FT = Threatened; PT = Proposed Threatened; SC = Species of Concern; BCC = Birds of Conservation Concern. State/CDFG Status: SE = Endangered; ST = Threatened; SSC = California species of special concern; FP = Fully Protected. Presence: P = Possible; C = Confirmed; U = Unknown.					

## 3.0 Vegetation Mapping

### 3.1 Introduction

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The International Vegetation Classification (IVC) system combines both physiognomic and floristic approaches of classification, based on vegetation as currently exists on the landscape. This system has won broad acceptance, including from the Federal Geographic Data Committee, which has accepted it as the standard approach to be used by all U.S. federal agencies (Federal Geographic Data Committee 2006). In North America, the IVC consists of the U.S. National Vegetation Classification System (USNVC) and the Canadian Vegetation Classification System.

The IVC consists of a seven-level hierarchy, with lower, finer levels nested into progressively coarser levels. The finest level, an association, corresponds to an “element of biological diversity,” although the next higher level (alliance) may also be considered an element in cases where associations have not yet been defined within the alliance. The association concept encompasses both the dominant species (those that cover the greatest area) and diagnostic species (those found consistently in some vegetation types but not others) regardless of whether they are large trees or diminutive understory plants. This means associations can reflect a greater ecological specificity than can a “cover type” or other type based solely on the dominant species of the upper stratum.

- For complete information on the International Vegetation Classification system refer to the standard reference, *International Classification of Ecological Communities: Terrestrial Vegetation of the United States. Volume I, The National Vegetation Classification System: Development, Status and Applications* (Grossman et al. 1998).

The USNVC framework also combines physiognomic standards at the higher levels with floristic standards at the lower levels. A first approximation of vegetation classified with the USNVC was published in 1998 (Grossman et al. 1998). The most current units of the USNVC are now maintained on the NatureServe Explorer website. The USNVC is strictly a jurisdictional subset of the IVC. The USNVC is being developed by NatureServe and its natural heritage member programs in partnership with the Federal Geographic Data Committee Vegetation Subcommittee, the Ecological Society of America Vegetation Classification Panel (see Jennings et al. 2003) and federal partners. The classification hierarchy is summarized as follows in Table 3-1. Please refer to the standard reference (Grossman et al. 1998) for complete information.



Table 3-1. A summary of the International Vegetation Classification hierarchy. Please refer to the standard reference (Grossman et al. 1998) for complete information.

Level	Primary Basis for Classification	Level Divisions and Examples
Class	The type, height, and relative percentage of cover of the dominant, uppermost vegetation	Seven classes: Forest, Woodland, Shrubland, Dwarf-Shrubland, Herbaceous, Nonvascular, and Sparse Vegetation
Subclass	For Forest, Woodland, Shrubland, and Dwarf - Shrubland classes: leaf character	Three subclasses in each: evergreen, deciduous, and mixed evergreen-deciduous (no mixed evergreen-deciduous, dwarf-shrubland subclasses have been defined)
	For Herbaceous Class: persistence and growth-form	Four subclasses: perennial grasslands, perennial forb vegetation, annual grass and forb vegetation, and hydromorphic vegetation
	For Nonvascular Class: relative dominance of nonvascular vegetation type	Three subclasses: lichens, mosses, algae
	For Sparse Vegetation Class: particle sizes of the substrate features	Three subclasses: consolidated rock; boulder, gravel, cobble, or talus; and unconsolidated material (soil, sand, or ash).
Group	Varies by class: leaf characteristics, broad climatic types, presence and character of woody strata, major topographic position types or landforms	About 60 Groups. Example: Temperate or Subpolar Needle-Leaved Evergreen Forest
Subgroup	Relative human impact	Two subgroups: Natural/Semi-natural or Cultural
Formation	Additional structural and environmental factors, including hydrology	Many. Example: Saturated Temperate or Subpolar Needle-Leaved Evergreen Forest
Alliance (symbol /) <sup>†*</sup>	Dominant/diagnostic species, usually of the uppermost or dominant stratum	Many. Example: <i>Picea mariana</i> Saturated Forest Alliance
Community Association (symbol -) <sup>*</sup>	Additional dominant/diagnostic species from any strata	Many. Example: <i>Picea mariana</i> / <i>Alnus incana</i> / <i>Sphagnum</i> spp. Forest

<sup>†</sup> Was formerly called a "Series" under Sawyer/Keeler-Wolf.  
<sup>\*</sup>The following conventions apply to alliance and association names: A hyphen ("-") indicates species occurring in the same stratum. A slash ("/") indicates species occurring in different strata.

### 3.1.1 Overview of the Vegetation Classification and Mapping System in California

The currently accepted vegetation mapping system for use in California was first described in the Manual of California Vegetation (MCV) (Sawyer and Keeler-Wolf 1995) with an updated list of vegetation types published on-line in 2003 (CDFG 2003). The MCV 2nd Edition was published in 2009 (Sawyer et al. 2009). The vegetation mapping protocols laid out in the Manual of California Vegetation were adopted by CDFG as the standard for the CDFG's Vegetation Classification and Mapping Program (VegCAMP). The VegCAMP system is a systematic, hierarchical, floristic-level classification system that can be tiered up to both the IVC and USNVC systems. The MCV is arranged by tree, shrub, and herbaceous dominated vegetation with keys to each of the three main groups included. Within each group are described vegetation alliances, the principal classification unit. An alliance is a floristically defined vegetation type identified by its dominant and/or characteristic species. Alliances are defined by using basic rules of dominance (the type is named by the single or shared dominant species in the highest strata in a given stand of vegetation) (Sawyer et al. 2009). For each alliance description, the species composition, structure, physical and geographical settings are discussed.

An association is a refinement within an alliance. For example, when a coast live oak (*Quercus agrifolia*) woodland has a prominent understory canopy of California sagebrush (*Artemisia californica*) it is defined as a Coast Live Oak/California Sagebrush Association. This association would be listed hierarchically within the alliance to which the top-most stratum belongs but would provide an extra layer of detail to the final vegetation map.

The following terminology is used to allow consistent descriptions of vegetation Alliances within the VegCAMP system:

- **Abundant:** A species that is very likely to be encountered; it need not be dominant.
- **Chaparral:** A shrubland dominated by species having evergreen, leathery leaves such as chamise (*Adenostoma* spp.), manzanita (*Arctostaphylos* spp.), or scrub oaks (*Quercus* spp.).
- **Coastal Scrub [=Coastal Sage Scrub]:** A shrubland dominated by species having evergreen or deciduous, non-leathery leaves, such as California buckwheat (*Eriogonum fasciculatum*), California sagebrush, coyote brush (*Baccharis pilularis*), or sages (*Salvia* spp.).
- **Dominant [Dominance]:** An abundant species with high crown cover, especially in relation to other species in the stand.
- **Exotic [=Alien, Introduced]:** A species that is judged to be a non-native member of the California flora.
- **Herb [Herbaceous]:** Plant lacking woody stems above ground; may be annual or perennial. Includes aquatics, forbs, and grasses.
- **Important [Importance]:** Two or more species with similar abundance and crown cover in relation to other species in the stand.
- **Shrub:** A woody plant with a short ultimate height, commonly with 2+ stems from the base.
- **Shrublands:** Areas where shrubs dominate, including chaparrals, chenopod scrubs, coastal scrubs, and desert scrubs.
- **Similarity:** Used with term “important” to indicate species with equal abundance and crown cover in a stand.
- **Stand:** An actual piece of California's vegetation in which plant composition and structure are uniform.
- **Subshrub:** Plant with woody lower stems and herbaceous upper stems that die back seasonally.
- **Tree:** Woody plant with a tall final height; commonly with one stem [trunk] from the base.

## 3.2 Methods

A map of all major vegetation types of NRTF Dixon was created by applying widely accepted field protocol using state-of-the-art technology and software. Vegetation class types were defined using VegCAMP protocol surveys on all lands encompassed by NRTF Dixon. Current vegetation layers in GIS areas that already had vegetation data were updated and new vegetation layers were created for those areas that did not already have them. Other land cover types, such as agricultural areas and urban/developed areas, were also demarcated.

- The VRA survey style was developed by CNPS. Surveyors are trained through workshops taught throughout California.

Vegetation Rapid Assessment (VRA) datasheets were used to record vegetation and habitat conditions during the performance of the field surveys. This survey style was developed by CNPS, and vegetation surveyors trained through a course of workshops taught throughout California. Specific assessment locations within the polygons were subjectively selected in the field, based on uniform

plant community characteristics. In doing so, data is collected at a location chosen to provide the best possible representation of vegetation within the entire polygon. Percent cover of each plant taxon within the polygon was documented as both an actual percentage and as a cover class (<1%, 1-5%, 5-15%, 15-25%, 25-50%, 50-75%, >75%). All fields on datasheets associated with this type of survey effort were filled out for each polygon. A sample VRA datasheet is provided in Appendix A.

### 3.2.1 Aerial Photography Interpretation

A set of high resolution aerial photographs (2005) of the property was used for preliminary mapping purposes. Maps were created using Environmental Systems Research Institute ArcView/ArcMap software. The detailed aerial photos were then used to delineate vegetation boundaries into a GIS data layer, as well as unique ecosites and topographic features that were identified. It is understood that many communities or vegetation types change gradually into an adjacent one through a broad ecotone. When the ecotone exceeded the minimum mapping unit, or if several types coexisted in a complex mosaic, the ecotone or mosaic was mapped in its own right as a separate unit. Generally the minimum mapping unit (the smallest area to be delineated) was one acre (0.4 ha) for riparian areas and two acres (0.8 ha) for upland communities. However, in many cases smaller polygons were created when unique species assemblages were encountered. Also roads in the area often subdivide a large polygon into two or more smaller polygons, which individually might consist of less than two acres (0.8 ha). Whenever discernible, interpreters assigned a vegetation type directly to each polygon from the aerial photo for future interpretation in the field. Other land cover types, such as disturbed areas, developed areas, and paved roads, were also demarcated (unpaved roads in the area were too narrow to warrant being separated out from surrounding vegetation).

### 3.2.2 Ground Truthing

Given that exact identification of plant species assemblages is not possible using aerial photos alone, extensive ground-truthing was conducted to identify the vegetation composition of the property. The dirt and paved roads provided ready access to much of the site for visual verification of the vegetation mapping. Field crews walked out from the roads to assess each polygon previously delineated from aerial imagery. This effort involved identifying the dominant plant species, checking the reliability of the aerial photo interpretation, and collecting all data required to complete a VRA datasheet for each community type. Boundary lines were amended as necessary by drawing modified boundaries on detailed aerial maps in hand during field work. The location of each VRA was documented, using global positioning system (GPS) points as per protocol. In addition to the GPS points, photographs were taken in all cardinal directions, the first photo facing north and the following photos taken in clockwise direction (N-E-S-W). Photos were taken as part of the standard vegetation classification and are valuable as a representation of the plant community at a precise location within a polygon.

### 3.2.3 GIS Data Development

As the vegetation mapping progressed, a GIS data layer was developed to track the status of the effort, identifying areas which remained to be ground-truthed. GPS waypoints and hand-drawn lines on field maps were used to amend the GIS layer as needed. Vegetation community types were named, according to VegCAMP protocols, to reflect the dominant or co-dominant plant species present (from one to three plant names per canopy layer). The classification of plant communities to association level is considered optional during VRA surveys. However, if it is evident that close to co-dominance between species may be occurring, it is helpful to mention both species for a better understanding of the plant community characteristics.

## 3.3 Results

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### 3.3.1 General Vegetation Conditions

The property at NRTF Dixon is a combination of agricultural fields, maintained grasslands, and natural plant communities. Exotic grass and forb species occur throughout the entire property; in some cases they are the primary component of the vegetation community. Some of the exotics that occur on the property are considered highly aggressive by authoritative sources (California Invasive Plant Council 2006). There are very few shrub or tree species present on the property and most plant communities consists of a mix of annual and perennial grasses and forbs.

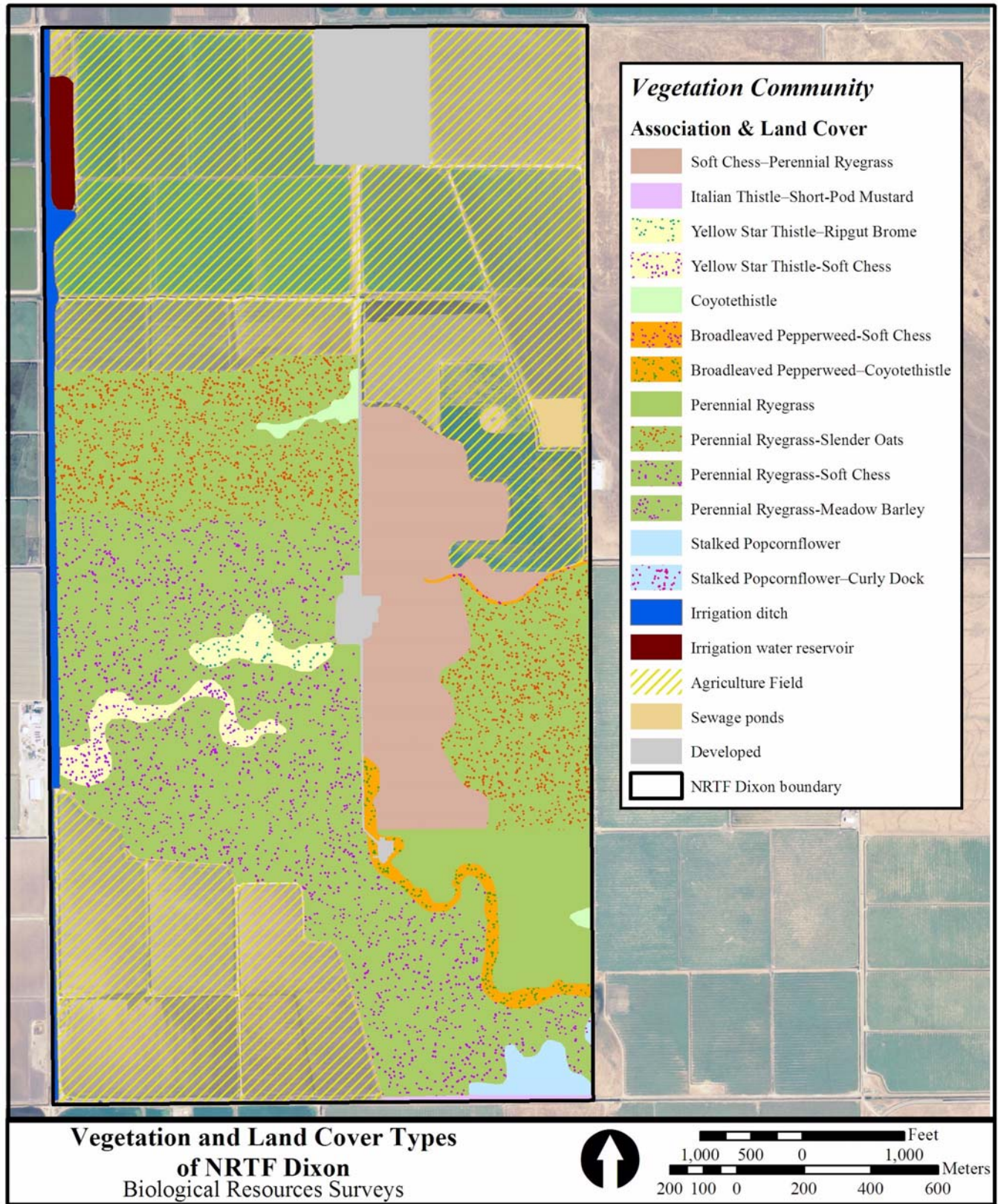
### 3.3.2 Vegetation Communities

Almost half of the property at NRTF Dixon is used for agricultural purposes, primarily for growing forage (Map 3-1). The second habitat that contributes largely to vegetation on the property is Perennial Ryegrass (*Festuca perennis*) Semi-Natural Stand,<sup>1</sup> covering approximately 38% of NRTF Dixon. In these areas perennial ryegrass is either the dominant species present or nearly co-dominant with other grass species, creating various plant associations. In most cases the grass species in the communities were quite dense. However, the grass is mowed near developed areas of the property; for example, along roads and beneath and around antenna structures.

Although most of the property is influenced by agricultural activities or general maintenance practices, in addition to exotic species presence, several distinct species assemblages encompassed here are quite unique (Table 3-2). A few vernal pools occur on the property, and are nearly devoid of exotics. These ephemeral wetlands create valuable habitat for various animal species, while inundated. Beyond that, the abundance of specialized plant life, displayed annually in these areas as the pools dry, is also exceptional.

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1. The 2nd Edition of the Manual of California Vegetation adopts the term Semi-Natural Stand to define areas characterized by non-native species that can display dominance over a broad range of environmental conditions, as opposed to Alliances, which are characterized by native species that occur within a more limited breadth of environments.



Map 3-1. Vegetation communities at the Naval Radio Transmitter Facility Dixon property.

Table 3-2. Vegetation communities at Naval Radio Transmitter Facility Dixon in 2010.

Vegetation Communities	Acres	% of Total
<b>Soft Chess (<i>Bromus hordeaceus</i>) Semi-Natural Stands</b>	<b>95.6</b>	<b>7.4</b>
Soft Chess ( <i>Bromus hordeaceus</i> )–Perennial Ryegrass ( <i>Festuca perennis</i> ) Association	95.6	7.4
<b>Yellow Star Thistle (<i>Centaurea solstitialis</i>) Semi-Natural Stands</b>	<b>22.0</b>	<b>1.7</b>
Yellow Star Thistle ( <i>Centaurea solstitialis</i> )–Ripgut Brome ( <i>Bromus diandrus</i> ) Association	8.8	<1
Yellow Star Thistle ( <i>Centaurea solstitialis</i> )–Soft Chess ( <i>Bromus hordeaceus</i> ) Association	13.2	1
<b>Italian Thistle (<i>Carduus pycnocephalus</i>) Semi-Natural Stands</b>	<b>2.7</b>	<b>&lt;1</b>
Italian Thistle ( <i>Carduus pycnocephalus</i> )–Shortpod Mustard ( <i>Hirschfeldia incana</i> ) Association	2.7	<1
<b>Stalked Popcornflower (<i>Plagiobothrys stipitatus</i>) Alliance</b>	<b>8.9</b>	<b>&lt;1</b>
Stalked Popcornflower ( <i>Plagiobothrys stipitatus</i> ) Association	8.5	<1
Stalked Popcornflower ( <i>Plagiobothrys stipitatus</i> )–Curly Dock ( <i>Rumex crispus</i> ) Association	0.4	<1
<b>Coyotethistle Alliance (<i>Eryngium vaseyi</i>)</b>	<b>4.0</b>	<b>&lt;1</b>
<b>Broadleaved Pepperweed (<i>Lepidium latifolium</i>) Semi-Natural Stands</b>	<b>14.1</b>	<b>1</b>
Broadleaved Pepperweed ( <i>Lepidium latifolium</i> )–Soft Chess ( <i>Bromus hordeaceus</i> ) Association	1.2	<1
Broadleaved Pepperweed ( <i>Lepidium latifolium</i> )–Coyotethistle ( <i>Eryngium vaseyi</i> ) Association	12.9	1
<b>Perennial Ryegrass (<i>Festuca perennis</i>) Semi-Natural Stands</b>	<b>492.8</b>	<b>38.3</b>
Perennial Ryegrass ( <i>Festuca perennis</i> ) Association	44.8	3.4
Perennial Ryegrass ( <i>Festuca perennis</i> )–Slender Oat ( <i>Avena barbata</i> ) Association	168.1	13.0
Perennial Ryegrass ( <i>Festuca perennis</i> )–Soft Chess ( <i>Bromus hordeaceus</i> ) Association	78.2	6.1
Perennial Ryegrass ( <i>Festuca perennis</i> )–Meadow Barley ( <i>Hordeum brachyantherum</i> ) Association	201.7	15.6
<b>Other Land Cover Types</b>	<b>648.2</b>	<b>50.3</b>
Agriculture Field	574.7	44.6
Irrigation Water Reservoir	6.8	<1
Irrigation Ditch	19.1	1.5
Sewage Ponds	4.4	<1
Developed (including Housing Area)	43.2	3.4

Some of the alliance-association communities identified during the course of this survey area are not yet explicitly described in the 2nd Edition of the Manual of California Vegetation (Sawyer et al. 2009). However, in all cases similar vegetation types have been defined and were used as reference for the habitat descriptions of the plant communities at NRTF Dixon.

Completed VRA datasheets are presented in Appendix A and Appendix B presents photopoints taken from each VRA area. Appendix C presents a list of all plant species documented on NRTF Dixon.

### Soft Chess Semi-Natural Stands

Soft chess (*Bromus hordeaceus*) is a non-native annual grass, which typically occurs in open fields and often in disturbed areas. Native to Eurasia, this species is found throughout most of the western United States at elevations under 3,280 feet (1,000 m); it is less common within the desert province of California (Baldwin et al. 2012). Soft chess is considered a desirable and nutritious feed for cattle by ranchers. It is adapted to more mesic conditions than red brome (*Bromus madritensis*). The often fast-burning and cool fires that occur within plant communities dominated by annual bromes do

not typically kill the brome seeds (Sawyer et al. 2009). However, prescribed burns are used to kill this particular brome's seeds; the relatively high moisture content within the seeds makes them vulnerable to boiling, which diminishes seed viability.

This entire alliance on the NRTF Dixon property is comprised of the Soft Chess–Perennial Ryegrass Association described below.

### *Associations*

#### **Soft Chess–Perennial Ryegrass Association**

- The Soft Chess-Perennial Ryegrass Association covers approximately 95 acres at NRTF Dixon.

The ecology of this association (Photo 3-1) is similar to the Soft Chess Semi-Natural Stands described above; however, the co-dominance of perennial ryegrass indicates conditions are somewhat wet (Baldwin et al. 2012). This association covers approximately 95.6 acres (38.7 ha) of the property at NRTF Dixon and is primarily composed of non-native species.



*Photo 3-1. Soft Chess-Perennial Ryegrass Association at Naval Radio Transmitter Facility Dixon.*

The majority of this association is managed for fire control, given most of this association includes antenna structures. Maintenance activities include mowing and string trimming, which affect the height structure of this plant community, and thus its value for wildlife. The maintenance activities also result in an altered fire regime, which influences the plant composition within this association over time, depending on timing and height of the management regime.

#### **Yellow Star Thistle Semi-Natural Stands**

Yellow star thistle (*Centaurea solstitialis*) is an invasive non-native annual that occurs within disturbed grasslands and woodlands as well as roadsides and pastures below 4,265 feet (1,300 m). Native to southern Europe, this non-native species is cumulatively toxic to horses (Baldwin et al. 2012). It is considered the most serious range

weed in the western United States and covers millions of hectares throughout California. The species can create dense monoculture stands and develop seed banks that are viable for approximately three years; thus management approaches should consider multiple-year intensive measures (Sawyer et al. 2009).

- Yellow Star Thistle Semi-Natural Stands contain yellow star thistle, an invasive plant cumulatively toxic to horses.

There are 22 acres (8.9 ha) of this alliance at the NRTF Dixon property, which is comprised of two different associations described below. In both cases the co-dominance is between yellow star thistle and a non-native annual grass species. In the absence of management, it is possible that yellow star thistle will out compete the non-native grasses.

### *Associations*

#### **Yellow Star Thistle–Ripgut Brome Association**

The association with ripgut brome (*Bromus diandrus*) as a co-dominant species with yellow star thistle covers 8.8 acres (3.6 ha) of NRTF Dixon. The presence of ripgut brome suggests that this location may receive more water than the nearby Yellow Star Thistle–Soft Chess Association. This association is found southwest of the transmitter building, which may be the source of the increased water as runoff from the developed area.

#### **Yellow Star Thistle–Soft Chess Association**

The Yellow Star Thistle–Soft Chess Association (Photo 3-2) covers 13.2 acres (5.3 ha) on the Station. The association is present in a somewhat meandering pattern which may be the result of previous disturbance during grading activities. This association is similar to the Yellow Star Thistle–Ripgut Brome Association in most ways; however, soft chess is relatively considered a more desirable species because it is better forage for wildlife.



Photo 3-2. Yellow Star Thistle–Soft Chess Association at Naval Radio Transmitter Facility Dixon.



## Italian Thistle Semi-Natural Stands

Italian thistle (*Carduus pycnocephalus*) is an invasive, non-native, annual herbaceous species that occurs within roadsides, pastures, and disturbed areas below 3,900 feet (1,200 m). The species is native to the Mediterranean and is found throughout northern America (Baldwin et al. 2012). This is a provisional semi-natural stand that is not currently identified in the MCV (Sawyer et al. 2009). The entire plant community on NRTF Dixon property is comprised of the Italian Thistle–Short-Pod Mustard (*Hirschfeldia incana*) Association.

### Association

#### Italian Thistle–Short-Pod Mustard Association

This association (Photo 3-3) makes up 2.7 acres (1.1 ha) of NRTF Dixon property. The association is located on the southern boundary of the property and occurs on an elevated bank. The bank is likely the result of disturbance from agriculture and grading activities, which created a raised linear mound. The bank, which acts as a barrier between adjacent agricultural lands, is almost entirely covered with non-native plant species. The bank also appears as an impoundment to some degree, creating an area to the north that is ephemerally inundated.



Photo 3-3. Italian Thistle–Short-Pod Mustard Association at Naval Radio Transmitter Facility Dixon.

## Stalked Popcornflower Alliance

- Stalked Popcornflower is a provisional natural stand type, which is not currently identified in the MCV.

Stalked popcornflower (*Plagiobothrys stipitatus*) is a native annual that occurs throughout California within wet sites and vernal pools below 4,900 feet (1,500 m) (Baldwin et al. 2012). This plant community occurs on 8.9 acres (3.6 ha) of NRTF Dixon and is comprised of two associations as described below. This is a provisional natural stand type, not currently identified in the MCV and thus, neither are the associations that follow (Sawyer et al. 2009). The popcornflower fields offer opportunities for plants of specialized life forms to occur on NRTF Dixon property.

## Associations

### Stalked Popcornflower Association

The Stalked Popcornflower Association (Photo 3-4) covers 8.5 acres (3.4 ha) of NRTF Dixon. This association is located on the southern portion of the property, adjacent to a manmade bank, an impoundment to some degree. This bank prevents water from exiting the property at this location, resulting in a seasonally inundated wetland. The relatively large pooling location supports several native plant species, which are not observed elsewhere on the property.



Photo 3-4. Stalked Popcornflower Association at Naval Radio Transmitter Facility Dixon.

### Stalked Popcornflower–Curly Dock Association

This association is very similar to the Stalked Popcornflower Association, but the presence of curly dock (*Rumex crispus*) was abundant enough to be considered co-dominant. Curly dock, native to Eurasia, is found worldwide in wet and disturbed locations below 8,800 feet (2,700 m) (Baldwin et al. 2012). Its abundance within this association suggests that this location is seasonally inundated, and it is likely that it has been historically disturbed from nearby agricultural activities.

### Coyotethistle Alliance

Coyotethistle (*Eryngium vaseyi*) is a native species that occurs in vernal pools and alkaline depressions between 33 and 1,900 feet (10–600 m) (Baldwin et al. 2012). There are two separate patches of this alliance (Photo 3-5) on NRTF Dixon, which total four acres (1.6 ha). The southeastern portion of this plant community appears inundated from adjacent, off-property agricultural activities. The other location on the property is most likely the result of seasonal road runoff. This plant community contains several native plant species typical of local seasonal wetlands. This vegetation type is not currently identified in the MCV (Sawyer et al. 2009).



Photo 3-5. Coyotethistle Alliance at Naval Radio Transmitter Facility Dixon.

### Broadleaved Pepperweed Semi-Natural Stands

Broadleaved pepperweed (*Lepidium latifolium*) is a perennial non-native found in several land cover types including fields, grasslands, saline meadows, and disturbed areas below 8,200 feet (2,500 m) throughout California and the United States. The rhizomatous species is native to Eurasia and is considered invasive in many habitats in North America (Baldwin et al. 2012). The semi-natural herbaceous stand can create dense monospecific patches. Broadleaved pepperweed regenerates quickly after fires from the underground rhizomes, yet stands of this species generally don't sustain fires (Sawyer et al. 2009).

#### Associations

##### Broadleaved Pepperweed–Soft Chess Association

- Broadleaved Pepperweed-Soft Chess Association is located in a narrow meandering drainage, possibly a manmade canal historically used to transfer pumped water, on the eastern portion of NRTF Dixon.

This association contains soft chess as a co-dominant and covers 1.2 acres (0.5 ha) of NRTF Dixon. The association is located in a narrow meandering drainage on the eastern side of the property. The drainage appears to be a manmade canal that may have been used historically to transfer pumped water. The seasonally inundated location allows the dense growth of broadleaved pepperweed; however, the association is likely constricted to this area given the conditions of the surrounding habitat and maintenance activities.

##### Broadleaved Pepperweed–Coyotethistle Association

This association has coyotethistle as a co-dominant (Photo 3-6) and is found within a wide drainage containing several native plant species. The association occurs on 12.9 acres (5.2 ha) in southeastern NRTF Dixon. The meandering drainage is a manmade depression seasonally inundated, giving rise to ephemeral pooling areas. The broadleaved pepperweed is less dense in this association than the vegetation community described above. Once again, distribution of the broadleaved pepperweed appears to be restricted to areas that receive relatively high(er) amounts of water.



*Photo 3-6. Broadleaved Pepperweed Semi-Natural Stands at Naval Radio Transmitter Facility Dixon.*

- Perennial Ryegrass can be an annual, as well as a perennial, based on environmental conditions.

### Perennial Ryegrass Semi-Natural Stands

Perennial ryegrass is a non-native species that occurs within dry to moist disturbed sites and abandoned fields below 3,280 feet (1,000 m) throughout North America. The species is native to Europe and can be an annual, as well as perennial, based on environmental conditions (Baldwin et al. 2012). This vegetation type is widespread and the adaptable perennial ryegrass grows on several different soil substrates. The stands burn readily and resprout (Sawyer et al. 2009).

This alliance includes a total of 492.8 acres (199.4 ha), 44.8 acres (18.1 ha) of which consists of perennial ryegrass at the association level in one large section of NRTF Dixon (Photo 3-7). It appears that this portion of the property was previously managed; however, it is currently left as a disturbed natural area. Beyond the perennial ryegrass, the curly dock found within this vegetation type also suggests that the area receives relatively high(er) amounts of water. The source of some of the water may be the adjacent agricultural field to the east.



*Photo 3-7. Perennial Ryegrass Semi-Natural Stands at Naval Radio Transmitter Facility Dixon.*

## *Associations*

### **Perennial Ryegrass–Slender Oats Association**

This association is similar to the Perennial Ryegrass Semi-Natural Stands; however, the abundant slender oat (*Avena barbata*) is present at a co-dominant level. This association covers 168.1 acres (68 ha) of NRTF Dixon and some of the vegetation cover is managed to protect antenna structures. It appears that the association is the result of previous disturbance from historical agricultural activities.

### **Perennial Ryegrass-Soft Chess Association**

This association is similar to the Perennial Ryegrass Semi-Natural Stands with soft chess present as a co-dominant species. The vegetation type is composed of dense non-native plant species covering 78.2 acres (31.6 ha) of the Station.

### ***Perennial Ryegrass–Meadow Barley Association***

This association is similar to the Perennial Ryegrass Semi-Natural Stands yet meadow barley (*Hordeum brachyantherum*), a native perennial grass species, is co-dominant. This association covers 201.7 acres (81.6 ha) of the Station and is the largest single vegetation cover on the property.

## **Other Land Cover Types**

### ***Agriculture Fields***

Agriculture fields (Photo 3-8) are the primary land use type on the NRTF Dixon property covering 547.7 acres (221.7 ha). Various crops have been grown on the property, historically. Recent crops have principally been alfalfa and hay; the fields appear to be kept active on a regular basis.



*Photo 3-8. Agricultural field at Naval Radio Transmitter Facility Dixon.*

### *Developed*

Very little property is developed to the point of no vegetation. The developed areas (Photo 3-9) generally include manicured vegetation (including small lawns) surrounding the structures, roads, and some fences. Landscaping around buildings in the housing area includes trees, shrubbery, and ground cover plants.



*Photo 3-9. Developed area at Naval Radio Transmitter Facility Dixon.*

### *Irrigation Ditch*

There is an irrigation ditch (Photo 3-10) that runs along the western side of the property, which includes a holding pond used to irrigate adjacent fields. The vegetation along the ditch differs from the adjacent land. Given that the species composition along the ditch is highly variable due to irrigation activities and because this does not constitute a vegetation community, they were not assessed as such.



*Photo 3-10. Irrigation ditch at Naval Radio Transmitter Facility Dixon.*

## 3.4 Discussion

The introduction of non-native species within this region is extensive and evident within the project site; non-native presence has significantly degraded natural resources at NRTF Dixon. The plant species list shown in Appendix C includes a column indicating species listed by the California Invasive Plant Council (2006). In certain cases, infestations are still at manageable levels; it is important that management activities address these areas prior to the problematic populations becoming practically uncontrollable. In doing so, it may be possible to prevent the encroachment of invasive species into areas that are currently not managed for noxious weeds. Adjacent seed sources are not confined by typical agricultural boundaries.

The flora composition is to some extent natural for a few of the vegetation communities on the property. The majority of these vegetation communities are located within the NRMA; which is presumably why they remain in such good condition. While the NRMA includes the large vernal pool habitat on the southeastern edge of the property (Photo 3-11), there is an additional centrally located ephemeral wetland that does not currently appear to be managed to preserve the natural resources of the native vegetation community. This area is classified as a coyotethistle community on the vegetation map, north of the transmitter building. It is likely that this site experienced some loss of historic species, due to the intense agriculture now abundant throughout most of the Sacramento Valley. These two seasonally inundated areas contribute greatly to the natural diversity of the property, are unlike any other vegetation on the site, and are likely considered of importance on a local and possibly regional scale in terms of natural resources habitat.



*Photo 3-11. Vernal pooling area within the Natural Resource Management Area at Naval Radio Transmitter Facility Dixon.*

## 4.0 Wildlife Surveys

Presence/absence surveys were conducted for all special status species and species of special concern for which potential habitat was observed on NRTF Dixon. An exception was the delta smelt because, while a saline slough exists on the property it does not contain sufficient water to support fish. All surveys were carried out by qualified biologists with experience in habitat assessment and the ability to identify targeted species. Field observations were completed during the period of time when each targeted species was expected to be found. In this survey effort, surveys were timed to take place over the course of one year, encompassing all seasons. By doing so, beyond increasing the likelihood of encountering resident species, habitat evaluation and observations could include seasonal use by non-residents. Table 2-1 details dates of site visits and the field activities that occurred during each time period.

The NRTF Dixon property is located on the western side of the Great Valley ecoregion. As shown in the map (Map 4-1), the area is close in proximity to several other ecoregions including the Northern California Interior and Coast Ranges, as well as the Northern California Coast and Central California Coast and Coast Ranges. Given this local diversity in terms of ecological characteristics, and the rather large range of some animals, the NRTF Dixon property has the potential to be inhabited, if not simply utilized, by numerous wildlife species. Nearly the only local property that is not entirely influenced by agricultural activities, NRTF Dixon's contributions to a natural environment may make it appealing to wildlife.

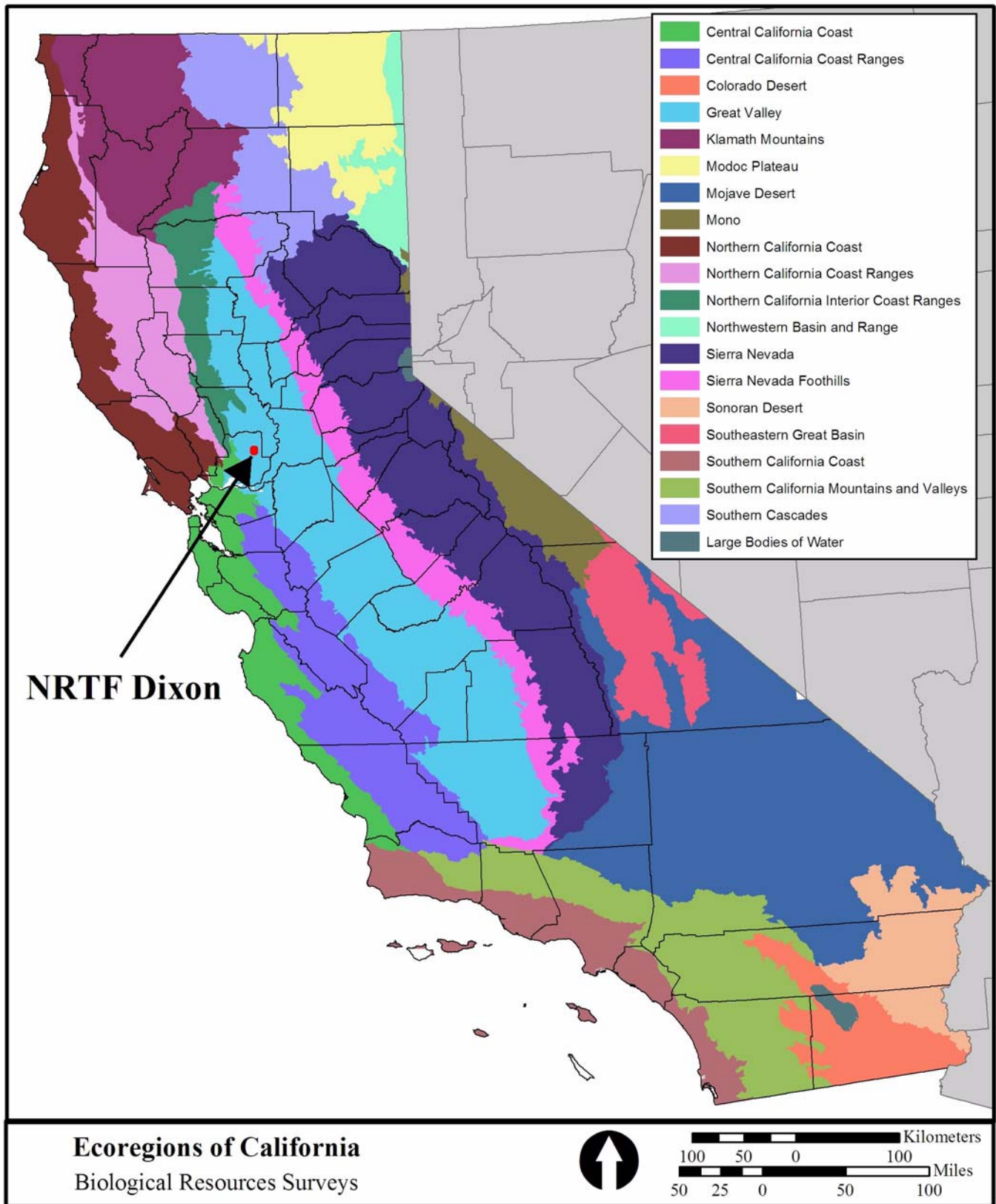
### 4.1 Herpetological Surveys

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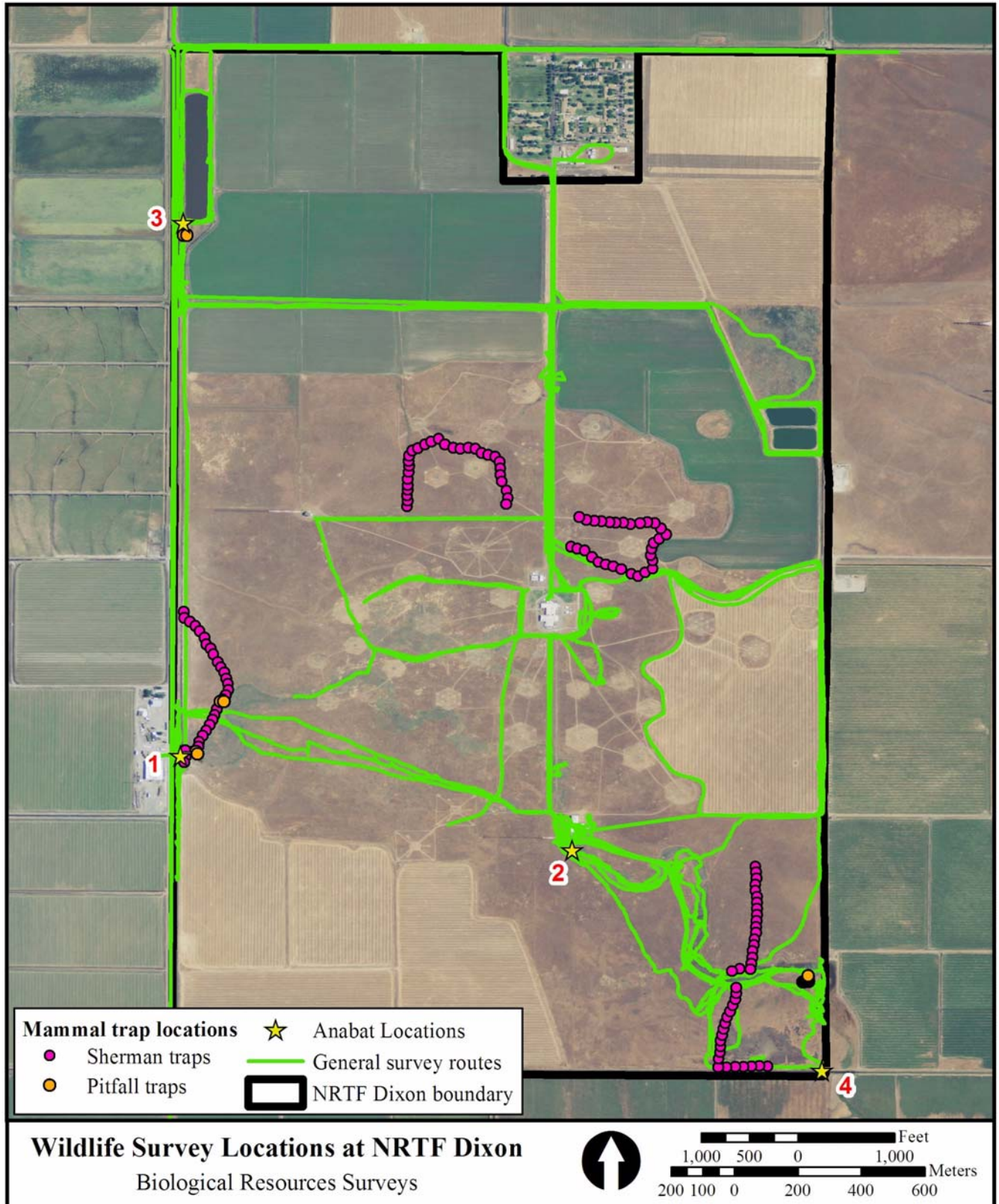
#### 4.1.1 Methods

Wandering transect surveys were performed throughout various habitats on the property that were determined suitable for reptiles and amphibians. During the surveys all observations were recorded and environmental characteristics that contribute to the habitat, both beneficially or negatively, were noted. Additionally, pitfall traps were placed in key locations. Pitfall traps were opened only when the field crew was present on the property, remaining open during these visits. Pitfall traps were checked regularly during the morning and evening. Night surveys were also conducted to search for nocturnal species. A list of animals that could potentially occur at NRTF Dixon is shown in Table 4-1.





Map 4-1. Ecoregions of California as designated by the U.S. Department of Agriculture.



Map 4-2. Wildlife survey locations at Naval Radio Transmitter Facility Dixon in 2009-2010.

Table 4-1. Herpetological species with potential to occur on the Naval Radio Transmitter Facility Dixon property.

Common name	Species name	Status*	Presence on NRTF Dixon
<b>Salamanders</b>			
California tiger salamander	<i>Ambystoma californiense</i>	FT, CT, CSC	
rough skinned newt	<i>Taricha granulosa</i>		
California newt	<i>Taricha torosa</i>		
California slender salamander	<i>Batrachoseps attenuatus</i>		yes
<b>Frogs</b>			
western spadefoot	<i>Spea hammondi</i>	CSC	possible calls heard, unconfirmed
western toad	<i>Anaxyrus boreas halophilus</i>		
Pacific tree frog	<i>Pseudacris regilla</i>		yes
bullfrog	<i>Lithobates catesbeianus</i>	I	
California red-legged frog	<i>Rana draytonii</i>	FT, CSC	
<b>Turtles</b>			
western pond turtle	<i>Actinemys marmorata</i>	CSC	
<b>Lizards</b>			
western fence lizard	<i>Sceloporus occidentalis</i>		yes
southern alligator lizard	<i>Elgaria multicarinata</i>		yes
western skink	<i>Plestiodon skiltonianus skiltonianus</i>		
western whiptail	<i>Aspidoscelis tigris mundus</i>		
<b>Snakes</b>			
rubber boa	<i>Charina bottae</i>		
ring-necked snake	<i>Diadophis punctatus amabilis</i>		
sharp-tailed snake	<i>Contia tenuis</i>		
western yellow-bellied racer	<i>Coluber constrictor mormon</i>		
California whipsnake	<i>Masticophis lateralis</i>		
Pacific gopher snake	<i>Pituophis catenifer catenifer</i>		possible sighting, unconfirmed
California kingsnake	<i>Lampropeltis getula</i>		
valley garter snake	<i>Thamnophis sirtalis fitchi</i>		
giant garter snake	<i>Thamnophis gigas</i>	FT, CT	
coast garter snake	<i>Thamnophis elegans terrestris</i>		
nightsnake	<i>Hypsiglena ochrorhyncha</i>		
western rattlesnake	<i>Crotalus oreganus oreganus</i>		
Codes: Federal Status: FE = Endangered; FT = Threatened; PT = Proposed threatened; CL = Candidate for listing; SC = Species of Concern. State/CDFG Status: CT = California Threatened; CSC = California Species of Special Concern; I = Invasive.			

## 4.1.2 Results

Herpetological surveys were performed on nine days during the course of this survey effort. As a result of these surveys, a total of four herpetofauna species were positively identified as occurring on the NRTF Dixon property (See Table 4-1), while two others were recorded as unconfirmed (fleeting visual or audial detections that could not be positively verified). The entire property was evaluated for potential herpetofauna habitat. Much of the agricultural lands were determined to present less than ideal habitat value, although some herpetofauna may be occasionally observed there.

All water courses were examined for amphibians and garter snakes (*Thamnophis* spp.). The stream and the storage pond on the west side were found with red swamp crayfish (*Procambarus clarkii*) in low abundance. Crayfish can be detrimental to native amphibians and reptile populations. No amphibians were found during day or night surveys in any of the aquatic habitats of NRTF Dixon.

## Southern Alligator Lizards



Photo 4-1. Southern alligator lizard observed at Naval Radio Transmitter Facility Dixon.

Two southern alligator lizards (*Elgaria multicarinata*) were found on the dike around the storage pond during the night survey effort. A third southern alligator lizard was found under debris in the south central maintained area of the property (Photo 4-1). The southern alligator lizard has a wide distribution in wetter habitats throughout the state and is common in urban habitats. They are mostly nocturnal and eat a variety of prey including insects, spiders, lizards, small snakes, and small mice. The tail of this lizard is autotomic (easily breaks off when threatened) and prehensile (capable of grasping objects). The southern alligator lizard may climb into vegetation and debris, using its tail in search of prey.

## California Slender Salamanders



Photo 4-2. Slender salamander found at Naval Radio Transmitter Facility Dixon.

California slender salamanders (*Batrachoseps attenuatus*) were found under debris in the central southeastern portion of the maintained area (Photo 4-2). Slender salamanders are typically discovered in the fall and spring in moist soil under debris such as rocks and wood. California slender salamanders are fairly small. The full grown adults are only 3 to 5.5 inches (8 to 14 centimeters) long, including their very long tail (CaliforniaHerps.com 2010). During the drier part of the year, the slender salamander retreats underground or in small hidden spaces to conserve moisture (CDFG 2008). California slender salamanders eat tiny invertebrates such as mites, collembola, and other very small insects they encounter. Slender salamanders cannot swim and must avoid inundation, where they would likely drown. Unlike most salamanders, the slender salamander does not lay eggs in water. Interestingly, range maps do not show this species in this particular area; therefore, this finding may indicate a distribution extension.

## Pacific Treefrogs



Photo 4-3. Pacific treefrog observed at Naval Radio Transmitter Facility Dixon.

During winter surveys many Pacific treefrogs (*Pseudacris regilla*) (Photo 4-3) were found in several locations scattered throughout NRTF Dixon. The main concentration of Pacific treefrogs was in NRMA 5, along the waterway and the pond in NRMA 1. However, treefrogs were heard in other locations, such as ditches and the irrigation reservoir. Also notable was a large rain pool on the west side of the entrance road, which contained frogs. Pacific treefrogs are quite common and occupy a variety of habitats throughout the state, including very dry habitat, such as chaparral. Treefrogs are capable of moving great distances to find water for breeding purposes. Pacific treefrogs are nocturnal (unless in water) to reduce moisture loss. During the day these frogs hide in rodent holes and moist soil under debris. Pacific treefrogs eat a variety of invertebrates. Males of this species have a very loud, distinctive call.

## Western Fence Lizards



Photo 4-4. Western fence lizard observed at Naval Radio Transmitter Facility Dixon.

Western fence lizards (*Sceloporus occidentalis*), sometimes called blue bellies because of the brilliant metallic blue patches on their ventral surfaces (Photo 4-4), were observed in a few areas on NRTF Dixon. The yellow patches differentiate this lizard from the sagebrush lizard (*Sceloporus graciosus*), a similar sceloporine lizard possessing a blue belly. Western fence lizards are usually near vertical surfaces where they sit and survey the territory. Fence lizards eat a variety of insects and spiders. The western fence lizard is one of the most common lizards in the western United States, found within most habitats excluding some of the hot deserts.

### 4.1.3 Discussion

The primary purpose of this particular survey effort was to determine the herpetological species occupying NRTF Dixon, and identify locations where such species may be found. This survey covered all habitats with potential to support herpetological species, conducted when target species were optimally detectable. The surveys were performed at various times throughout the day, distributed in time as equally as possible between periods of optimal detection. All habitat types within the project area received an equal level of effort, and surveys did not take place during weather conditions which could contribute to biased results. Weather conditions considered when conducting the surveys included temperature extremes, precipitation, and winds greater than four on the Beaufort Scale. Incidental observations made during other surveys and site visits were also recorded.

Overall, the NRTF Dixon project area is quite unique. It appears the original habitat was low-lying grassland with plenty of water. Range maps in the Peterson Field Guide (Collins and Conant 1998) show a wide variety of animals occurring in the general area. However, the habitats on NRTF Dixon for some animals are not ideal and some of the species in Table 4-1 are quite rare, and often difficult to detect.

#### Species That May Occur But Were Not Found

Beyond recorded occurrences, a general habitat assessment enabled a determination as to what types of species could occur on the property, although not physically detected.

#### Western Spadefoot

One or two calls of the western spadefoot toad (*Spea hammondi*) were heard, among hundreds of Pacific treefrogs in the wildlife area; however, no spadefoots were seen. Western spadefoots live in and around temporary ponds and pools. They normally stay buried in the ground, surfacing to breed after a heavy rain. Before the ground dries the spadefoot toad will again bury its body. During the winter survey spadefoot calls were detected, yet again, no spadefoots were observed.

## Western Toad

There were no western toads (*Anaxyrus boreas halophilus*) encountered or heard during this survey effort. Western toads are common in rural areas, occupying a wide variety of habitats including areas fairly distant from water. To conserve moisture western toads typically remain underground throughout the day, hunting for insects at night. In the spring, western toads breed in nearly any available freshwater. Given the wide range of this species, it is likely they occur on NRTF Dixon during certain times of the year, although none were encountered during this survey.

## Bullfrog

No bullfrogs (*Lithobates catesbeianus*) were encountered or heard during this survey effort. It was surprising that no bullfrogs were found; they were recorded as present in surveys conducted in conjunction with the 2002 INRMP. It is expected the species still occurs on the property. Where there is permanent water, bullfrogs are usually found in streams, rivers, ponds, and lakes. Bullfrogs are not native to California and considered a reason for the population reduction of many species that previously resided in aquatic habitats. Bullfrogs eat a variety of frogs, salamanders, fish, crayfish, rodents, and sometimes birds.

## Red-Legged Frog

It is unlikely that any red-legged frogs (*Rana draytonii*) occur on the property. The distribution of the red-legged frog does not include the Great Valley. The species' range typically includes the Sierra Nevada and its foothills as well as the coast and coast ranges.

## California Kingsnake

The California kingsnake (*Lampropeltis getula*) inhabits a variety of habitats and is found in nearly every California county. Kingsnakes eat reptiles and occasionally birds and rodents (Stebbins 2003). The presence of the California kingsnake on NRTF Dixon is quite likely.

- Several snakes inhabit the vicinity of NRTF Dixon, including three of the most common California snakes: California king, gopher, and rattlesnake.

## Gopher Snakes

Gopher snakes (*Pituophis catenifer catenifer*) are found in almost any California habitat; their distribution includes most of the entire western United States. Gopher snakes eat rabbits, rodents, birds, and reptiles (Stebbins 2003). A surveyor encountered a snake briefly, near a stack of telephone poles in the northeast corner of NRTF Dixon, thought to be gopher snake.

## Rattlesnakes

The northern Pacific rattlesnake or western rattlesnake (*Crotalus oreganus oreganus*) inhabits a wide variety of habitat throughout California, occurring in almost all areas except some desert environments. These rattlesnakes usually prefer overhead cover because they are slow moving, easily falling prey to hawks. Although there is a relatively low shrub or tree abundance for cover on NRTF Dixon, it

is possible the snakes occur. There is debris on the property under which they may be found. Northern Pacific rattlesnakes eat rabbits, rodents, birds, reptiles and amphibians (Stebbins 2003).

### Garter Snakes

Three garter snake species are known to inhabit the vicinity, all similar in characteristics. Distribution maps of the giant garter snake (*Thamnophis gigas*) and the valley garter snake (*Thamnophis sirtalis fitchi*) overlap the NRTF Dixon area (Stebbins 2003). Giant garter snakes are very aquatic, found in the water. Giant garter snakes are listed as federally and state threatened. Common garter snakes or valley garter snakes are found in or near water. Western terrestrial garter snakes or coast garter snakes (*Thamnophis elegans terrestris*) are also usually found near water. Habitat for garter snakes is present in and along the streams, ponds and agricultural areas of NRTF Dixon. Giant garter snakes and valley garter snakes mostly eat fish, frogs and toads, but coast garter snakes eat more slugs, snails and insects (Stebbins 2003).

### Western Yellow-Bellied Racer

The western yellow-bellied racer snake inhabits the general vicinity of NRTF Dixon, although none were found on the property. These long, green to brown snakes are often observed in grassy areas near rocks, logs and debris (Stebbins 2003). This snake has a long narrow head and eats rabbits, rodents, birds, and reptiles. Western yellow-bellied racers are very fast-moving.

### Western Pond Turtles

Western pond turtles (*Actinemys marmorata*) live in streams, ponds, pools, and lakes. They also sometimes inhabit irrigation ditches (Stebbins 2003). Western pond turtles eat a variety of aquatic plants, insects, crayfish, tadpoles, fish and carrion. The streams, ditches and irrigation reservoir could support a western pond turtle; however, none were observed during this survey.

## 4.2 Bird Surveys

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General avian surveys were conducted four times, between July 2009 and May 2010, at NRTF Dixon. Because NRTF Dixon consists primarily of agriculture, developed and landscaped areas, mowed grasslands around the radio towers, and other anthropogenically-influenced features, a large number of avian species utilize the varying landscapes, including species listed as sensitive by the state and/or federal government, such as Swainson's hawk (*Buteo swainsoni*) and burrowing owl (*Athene cunicularia*). Trees planted as windbreaks between agricultural fields and as landscaping in residential areas provide nesting and roosting habitat for birds foraging over agricultural and grassland fields. Similarly, canals running between the agricultural fields provide habitat for species preferring riparian habitat and shrub cover. Photo 4-5 shows white-faced ibis (*Plegadis chihi*) at NRTF Dixon.



Photo 4-5. White faced ibis at Naval Radio Transmitter Facility Dixon in 2010.

- Portions of NRTF Dixon, including the NRMA, provide good habitat for a variety of avian species.

Mowed grasslands surrounding the antennae field provide nesting and foraging habitat for a number of grassland species; many considered special status by the State of California, due to the disappearance of this habitat over much of the Central Valley. As mentioned earlier, the southeastern corner of the property has been designated a NRMA containing seasonal wetlands, vernal pools, and man-made ponds. This portion of NRTF Dixon provides good habitat for a variety of avian species within its pockets of natural habitat. Other man-made holding ponds scattered around NRTF Dixon provide open water habitat for migrating and wintering waterfowl and shorebird species.

## 4.2.1 Methods

General avian surveys were conducted to develop a species list and to identify the distribution of these species across the variety of habitats at NRTF Dixon. Surveys were designed to develop as comprehensive a list as possible, with seasonal surveys performed to detect breeding, migratory, and wintering species utilizing the area. Particular attention was paid to those species listed under a special status (endangered, threatened, or species of concern) by either the USFWS or CDFG. Three surveys covering NRTF Dixon were conducted by biologists, Katherine Goodenough and Harry Smead; one each from 30 July–01 August 2009, 13–15 November 2009, and 28–30 January 2010; with a fourth survey performed by biologist, Shawn Smallwood in May 2010 in conjunction with small mammal trapping. All habitats were surveyed during each time period and a comprehensive species list was developed for the property. See Table 2-1 for the survey schedule and Table 4-2 for the species list.

## 4.2.2 Results

A total of 67 bird species were recorded at NRTF Dixon during these surveys (Table 4-2). Of these, seven are considered either Birds of Conservation Concern (BCC) by the USFWS, or Bird Species of Special Concern (BSSC) by the CDFG. While the surveys were not designed to determine the breeding status of every species observed, approximately one-half to two-thirds of these species breed on or near NRTF Dixon.



Table 4-2. Comprehensive avian species list for Naval Radio Transmitter Facility Dixon, during four surveys performed over the course of 2009–2010 .

Common Name	Scientific Name	Status	July 2009	Nov 2009	Jan 2010	May 2010
American avocet	<i>Recurvirostra americana</i>			X	X	X
American crow	<i>Corvus brachyrhynchos</i>		X	X	X	
American goldfinch	<i>Spinus tristis</i>		X			
American kestrel	<i>Falco sparverius</i>		X	X	X	X
American pipit	<i>Anthus rubescens</i>				X	
barn owl	<i>Tyto alba</i>					X
barn swallow	<i>Hirundo rustica</i>		X			
black phoebe	<i>Sayornis nigricans</i>			X	X	
black-crowned night heron	<i>Nycticorax nycticorax</i>		X			X
black-necked stilt	<i>Himantopus mexicanus</i>				X	X
Brewer's blackbird	<i>Euphagus cyanocephalus</i>		X	X	X	X
brown-headed cowbird	<i>Molothrus ater</i>		X	X		X
bufflehead	<i>Bucephala albeola</i>				X	
burrowing owl	<i>Athene cunicularium</i>	BCC, BSSC	X	X	X	
Canada goose	<i>Branta canadensis</i>		X		X	X
cattle egret	<i>Bubulcus ibis</i>		X			X
common goldeneye	<i>Bucephala clangula</i>				X	
common merganser	<i>Mergus merganser</i>				X	
common raven	<i>Corvus corax</i>		X	X		
common yellowthroat	<i>Geothlypis trichas</i>			X	X	
dunlin	<i>Calidris alba</i>			X		
European starling	<i>Sturnus vulgaris</i>		X	X		
Forster's tern	<i>Sterna forsteri</i>					X
gadwall	<i>Anas strepera</i>				X	
golden-crowned sparrow	<i>Zonotrichia atricapilla</i>			X	X	
great blue heron	<i>Ardea herodias</i>			X		X
great egret	<i>Ardea alba</i>		X	X	X	X
great horned owl	<i>Bubo virginianus</i>		X	X		X
greater yellowlegs	<i>Tringa melanoleuca</i>			X		
horned lark	<i>Eremophila alpestris</i>		X			
house finch	<i>Carpodacus mexicanus</i>		X	X	X	
house sparrow	<i>Passer domesticus</i>		X	X	X	X
killdeer	<i>Charadrius vociferus</i>		X	X	X	X
lark sparrow	<i>Chondestes grammacus</i>		X	X		
lazuli bunting	<i>Passerina amoena</i>		X			
least sandpiper	<i>Calidris minutilla</i>			X		
lincoln's sparrow	<i>Melospiza lincolni</i>		X	X		
loggerhead shrike	<i>Lanius ludovicianus</i>	BCC, BSSC	X	X		X
long-billed curlew	<i>Numenius americanus</i>	BCC				X
long-billed dowitcher	<i>Limnodromus scolopaceus</i>					X
mallard	<i>Anas platyrhynchos</i>				X	
marsh wren	<i>Cistothorus palustris</i>		X	X	X	
mourning dove	<i>Zenaida macroura</i>		X	X		X
northern harrier	<i>Circus cyaneus</i>	BSSC	X	X	X	X
northern mockingbird	<i>Mimus polyglottos</i>		X	X		
northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>		X			
northern shoveler	<i>Anas clypeata</i>				X	
prairie falcon	<i>Falco mexicanus</i>		X	X		
purple finch	<i>Carpodacus purpureus</i>		X	X		

Table 4-2. Comprehensive avian species list for Naval Radio Transmitter Facility Dixon, during four surveys performed over the course of 2009–2010 (Continued).

Common Name	Scientific Name	Status	July 2009	Nov 2009	Jan 2010	May 2010
red-tailed hawk	<i>Buteo jamaicensis</i>		X	X	X	X
red-winged blackbird	<i>Agelaius phoeniceus</i>		X	X	X	X
ring-billed gull	<i>Larus delawarensis</i>		X	X	X	
rock dove	<i>Columba livia</i>			X		X
savannah sparrow	<i>Passerculus sandwichensis</i>		X	X		
snowy egret	<i>Egretta thula</i>		X	X		X
song sparrow	<i>Melospiza melodia</i>	BCC, BSSC	X	X	X	X
Swainson's hawk	<i>Buteo swainsoni</i>	ST	X			X
tree swallow	<i>Tachycineta bicolor</i>		X			
turkey vulture	<i>Cathartes aura</i>		X	X		X
western gull	<i>Larus occidentalis</i>			X		
western kingbird	<i>Tyrannus verticalis</i>		X			
western meadowlark	<i>Sturnella neglecta</i>		X	X	X	X
white-crowned sparrow	<i>Zonotrichia leucophrys</i>			X	X	
white-faced Ibis	<i>Plegadis chihi</i>		X			X
white-tailed kite	<i>Elanus leucurus</i>	FP		X	X	
willet	<i>Tringa semipalmata</i>			X		
yellow-rumped warbler	<i>Dendroica coronata</i>			X	X	

Codes:  
 Status: FP = Fully Protected; BCC = Bird of Conservation Concern (USFWS); BSSC = Bird Species of Special Concern (CDFG).

### 4.2.3 Discussion

Most of the species observed during general avian surveys were widespread species that have adapted well to agriculture and development in the Central Valley. A few, however, are more restricted in their distribution. At NRTF Dixon, these species are generally grassland-dependent species. This habitat is declining across much of the continental United States, and in California’s Central Valley in particular. The presence of short, mowed fields around the radio antennae provide a good base for species such as the western meadowlark (*Sturnella neglecta*), American kestrel (*Falco sparverius*), and a number of special status species.

- Three special status avian species breed at NRTF Dixon, three are potential breeders here, and one special status avian species is a winter visitor.

Of the seven special status species observed, three are known to breed at NRTF Dixon: burrowing owl (Photo 4-6), northern harrier (*Circus cyaneus*), and Swainson's hawk. Three remaining species are either likely or potential breeders: loggerhead shrike (*Lanius ludovicianus*), Modesto song sparrow (*Melospiza melodia mailliardi*), and white-tailed kite (*Elanus leucurus*). One species, the long-billed curlew (*Numenius americanus*), is a winter visitor to NRTF Dixon.

#### Burrowing Owl

- The burrowing owl breeds at NRTF Dixon.

Burrowing owls are both a BCC (USFWS) and a BSSC (CDFG), on both their breeding grounds and at wintering sites. In California, this species usually remains in one area year-round, although migrants from more northerly populations do move into the State during the non-breeding season. At NRTF Dixon, burrowing owls are a relatively abundant breeder and year-round resident. They breed in ground squirrel burrows, artificial mounds, and cable covers, primarily in the antennae field. Burrowing owls forage over the short

grass in this area, as well as in the surrounding agricultural fields, particularly where rodents are abundant. Recent studies indicate a decrease in the population, due mainly to insufficient breeding locations (Smallwood and Morrison 2008), but the area remains a stronghold for the species in the Sacramento Valley.



Photo 4-6. Burrowing owls at Naval Radio Transmitter Facility Dixon 2010.

- The northern harrier breeds at NRTF Dixon.

### Northern Harrier

The northern harrier is a widespread species throughout California in the winter, but only breeds at scattered locations near marshland and grassland areas. Because of its restricted distribution in the State, it is listed as a BSSC by the CDFG in the breeding season. At NRTF Dixon, this species was seen in all seasons, and confirmed as breeding on the installation.

- No Swainson's hawks were observed during the non-breeding season at NRTF Dixon.

### Swainson's Hawk

Swainson's hawk is a State threatened species, as it nests in only a few locations through the Central Valley. At NRTF Dixon, one pair of Swainson's hawks were observed nesting near the entrance gate (Smallwood 2010). This species hunts over the open grasslands and agricultural fields at the property during the breeding season, but disperses south during the non-breeding season, during which no individuals were noted on the property.

- The loggerhead shrike is a likely breeding resident at NRTF Dixon.

### Loggerhead Shrike

The loggerhead shrike is a declining species throughout its range in North America, including California, and is listed as a BCC (USFWS) and a BSSC (CDFG). At NRTF Dixon, this species was seen throughout the installation in the July and November surveys, and is a likely breeding resident.

- The song sparrow was observed during the avian survey and most likely breeds at NRTF Dixon.

### Song Sparrow

The song sparrow (*Melospiza melodia*) is one of the most diverse songbirds in North America, with a number of recognized subspecies. In California, a number of the endemic subspecies, particularly those restricted to salt marshes are special status species. The Modesto

population of the song sparrow from the Sacramento Valley was formerly recognized as a distinct subspecies, but its status is currently unclear. This population is primarily a riparian species, occurring alongside creeks and rivers. At NRTF Dixon, it is found in the shrubby areas alongside the irrigation canals, as well as in wetland areas and near larger bodies of water. It is most likely a breeding resident of the property, as it was observed during all surveys.

### White-Tailed Kite

- The raptor, white-tailed kite, is a potential breeder at NRTF Dixon.

The white-tailed kite breeds throughout most of central and southwestern California, and is listed as fully protected by the State of California. This raptor spends much of its time in open country, where it hunts rodents and large insects. At NRTF Dixon, it is a potential breeder, but is more likely to be seen during the non-breeding season when it disperses throughout a larger area.

### Long-Billed Curlew

- The long-billed curlew is a visitor to NRTF Dixon.

The long-billed curlew, is listed as a BCC by the USFWS. This species breeds on dry prairies and plains in the western United States and migrates to spend its winters in California and points farther south. During migration and the non-breeding season, this species spends its time on mudflats and agricultural fields, such as at NRTF Dixon. During the avian surveys, this species was only observed in May 2010, when it was likely migrating back to its breeding grounds.

## 4.3 Mammal Surveys

### 4.3.1 Bat Surveys

#### 4.3.1.1 Methods

Surveys to document the bat community within the project area were conducted through active searches of known and potential activity sites and placement of ultrasonic acoustic detection units at various locales throughout the project area. The analysis of the sonar tracings by the passive recorders (described below) was done by Michael J. O'Farrell, a mammalogist and recognized expert on bats.

James Kellogg, experienced biologist in bat identification and Anabat technology, conducted field visits and deployed the bat monitoring equipment. Locations were determined during an initial site visit, when active searches identified areas likely to contain the most bat activity. After the assessment was made, the areas with highest likelihood of bat productivity; roosting structures, flying corridors, and abundant prey were identified, and a bat monitoring device was installed (See Map 4-2).

Active searches took place from dusk to midnight (highest level of bat activity), which involved walking various areas of the property, observing bat activity. In doing so the amount of bat recordings were

maximized, compared to a random selection of locations. The stations recorded bat activity over the course of the evening and into the morning, until dawn.

- Anabats were placed at four locations at NRTF Dixon to collect bat data.

Mobile acoustic monitoring (Anabat) units were placed at four locations (Map 4-2; Photo 4-7 through Photo 4-9). Each Anabat contained a microphone encased in a protective shroud, which utilized a reflector plate to collect bat vocalizations, mounted on a ground level stand (Photo 4-10). The reflector plate was oriented to provide a 45 degree angle upwards for the volume of detection. The remaining equipment consisted of an Anabat II bat detector, a Compact Flash storage Zero-crossings Analysis Interface Module (CF ZCAIM) and a rechargeable battery, within a weatherproof NEMA case. The detector and CF ZCAIM were from Titley Electronics, Ballina, New South Wales, Australia. The reflector/shroud assembly (bat-hat) was from EME Systems, Berkeley, California.



*Photo 4-7. Anabat unit at survey Site 1, depicted in Map 4-2.*



*Photo 4-8. Location of anabat unit Site 2, depicted in Map 4-2.*



*Photo 4-9. Anabat unit at survey Site 3, depicted in Map 4-2.*



Photo 4-10. Anabat survey Site 4, along irrigation drainage, depicted in Map 4-2.

The battery capacity (7.5 amp hour) provided sufficient power to operate the equipment all night, each night for approximately one week. The acoustic data were stored as a single digital file on a Compact Flash memory card. Each location file is interpreted using CFCread, an Anabat utility software, which produces discrete Anabat sequence files varying in size from 1 to 15 seconds in length. The algorithm adds a length of silence following recognized bat calls; that is, a file will be created within >5 seconds of silence following a bat call. If bat calls are continuous for >15 seconds, a file will be created at 15 seconds intervals. Each Anabat sequence filename is named with a time date code (e.g., B8012024.16#, where B = 2001, 8 = August, 01 = day of the month, 2024.16 = 8:24:16 PM).

- Bat species are identified by the sonar sounds they emit, which the Anabat unit records, and a bat expert evaluates.

Bat species are identifiable by the unique sonar sounds they emit while in flight. All recordings were evaluated by Michael J. O'Farrell, a bat expert specialized in reading sonar recordings to determine species. Identification of species used the methods of O'Farrell et al. (1999) based on frequency characteristics, call shape, and comparison with a comprehensive library of vocal signatures developed by O'Farrell and colleagues. Thus, species richness (number of species verified as present) was obtained for each location.

### 4.3.2 Results

Bats were recorded over 16 nights of passive acoustic surveys at locations where Anabat units were deployed. The most productive was adjacent to the agricultural reservoir (Location #3), most likely due to available forage resulting from agricultural activities.

Over three survey periods Anabat sonar detection units were placed at a total of four locations (Location 1# was sampled all three times, while the second Anabat unit was placed at a new location each time). Detectors were left to record overnight. A total of seven bat species were recorded (Table 4-3). Out of 303 records (Table 4-4), 278 were of the Mexican free-tailed bat (*Tadarida brasiliensis*).

Table 4-3. Bat species recorded at Naval Radio Transmitter Facility Dixon.

Scientific Name	Common Name	Conservation Guilds
<i>Antrozous pallidus</i>	pallid bat	CA, CL, TR, BB, WS, DW
<i>Eptesicus fuscus</i>	big brown bat	CA, TR, BB, WS, FW, CL
<i>Lasiurus cinereus</i>	hoary bat	TR, FW, WS
<i>Myotis ciliolabrum</i>	western small-footed myotis	CA, CL, TR, FW, WS
<i>Myotis lucifugus</i>	little brown bat	TR, BB, WS, CL, CA, FW
<i>Myotis yumanensis</i>	Yuma myotis	TR, BB, WS, CA, CL, FW
<i>Tadarida brasiliensis</i>	Mexican free-tailed bat	CA, CL, BB, TR, WS, DW

BB - Bridge and Building Roosting Habitat; CA - Natural Cave, Mine Shaft and Adit Roosting Habitat; CL - Cliff, Crevice and Talus Roosting Habitat; DW - Desert Wash Foraging Habitat; FW - Forest and Woodland Foraging Habitat; TR - Tree Roosting Habitat; WS - Water Source Foraging and Watering Habitat

Table 4-4. Naval Air Station Lemoore bat data, 2009-2010.

Anabat Station	Location	Scientific Name	Common Name	11/13-14/2009	1/31/2010	6/10/2010	Total No. of Recordings
1		<i>Antrozous pallidus</i>	pallid bat			1	1
		<i>Eptesicus fuscus</i>	big brown bat			1	1
		<i>Lasiurus cinereus</i>	hoary bat	1		2	3
		<i>Myotis yumanensis</i>	Yuma myotis	3		1	1
		<i>Tadarida brasiliensis</i>	Mexican free-tailed bat	2	3	29	33
2		<i>Myotis yumanensis</i>	Yuma myotis		2		2
		<i>Tadarida brasiliensis</i>	Mexican free-tailed bat		4		4
3		<i>Antrozous pallidus</i>	pallid bat			1	2
		<i>Lasiurus cinereus</i>	hoary bat			1	2
		<i>Myotis ciliolabrum</i>	western small-footed myotis			1	2
		<i>Myotis lucifugus</i>	little brown bat			4	4
		<i>Myotis yumanensis</i>	Yuma myotis			4	4
		<i>Tadarida brasiliensis</i>	Mexican free-tailed bat			243	243
4		none detected		-	-	-	-

Figure 4-1 through Figure 4-7 show some of the time-frequency displays of calls recorded during the bat surveys.



Figure 4-1. Vocal signature of the pallid bat (*Antrozous pallidus*).



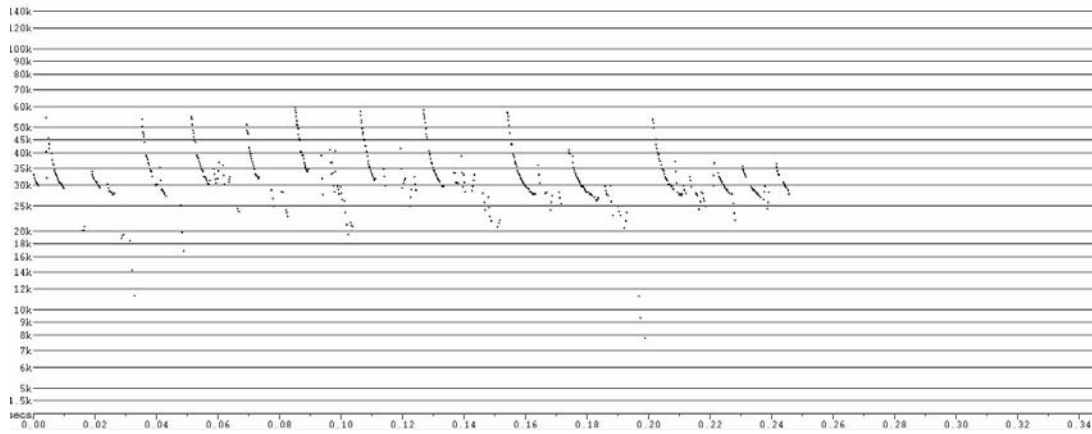


Figure 4-2. Vocal signature of the big brown bat (*Eptesicus fuscus*).

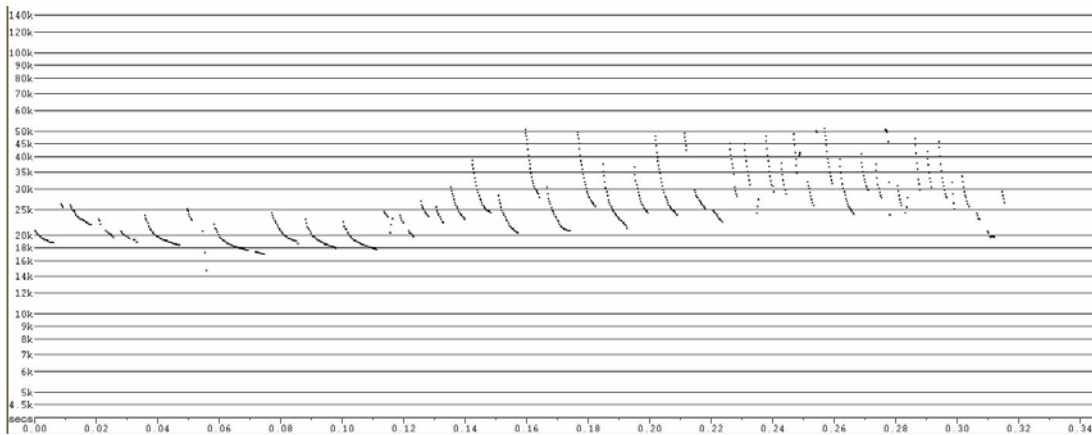


Figure 4-3. Vocal signature of the hoary bat (*Lasiurus cinereus*).

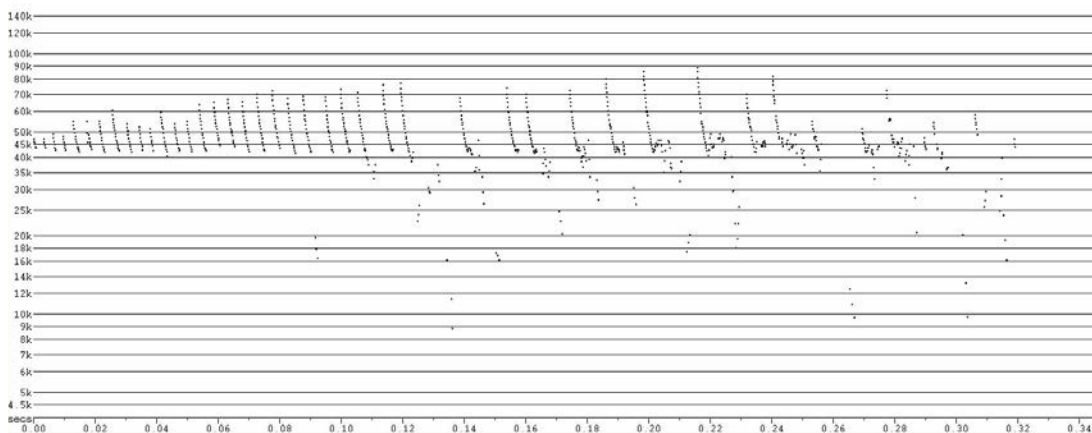


Figure 4-4. Vocal signature of the western small-footed myotis (*Myotis ciliolabrum*).

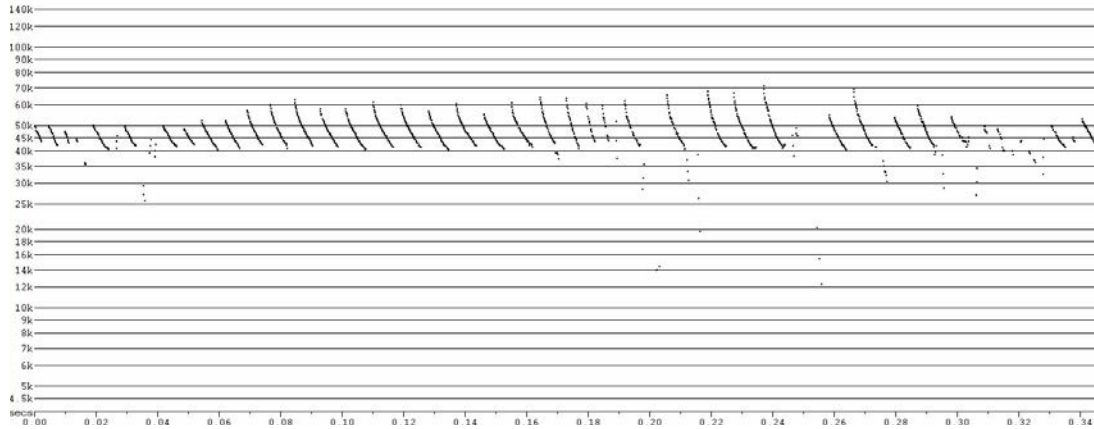


Figure 4-5. Vocal signature of the little brown bat (*Myotis lucifugus*).

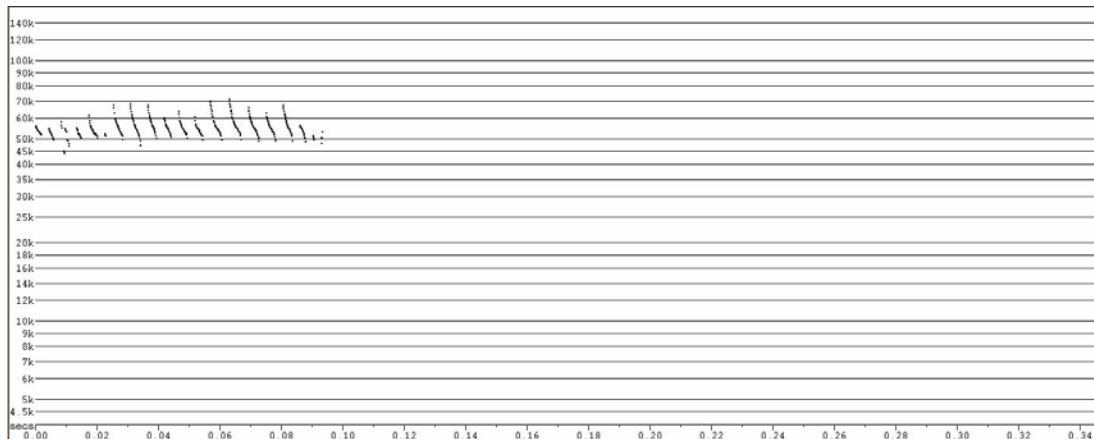


Figure 4-6. Vocal signature of the Yuma myotis (*Myotis yumanensis*).

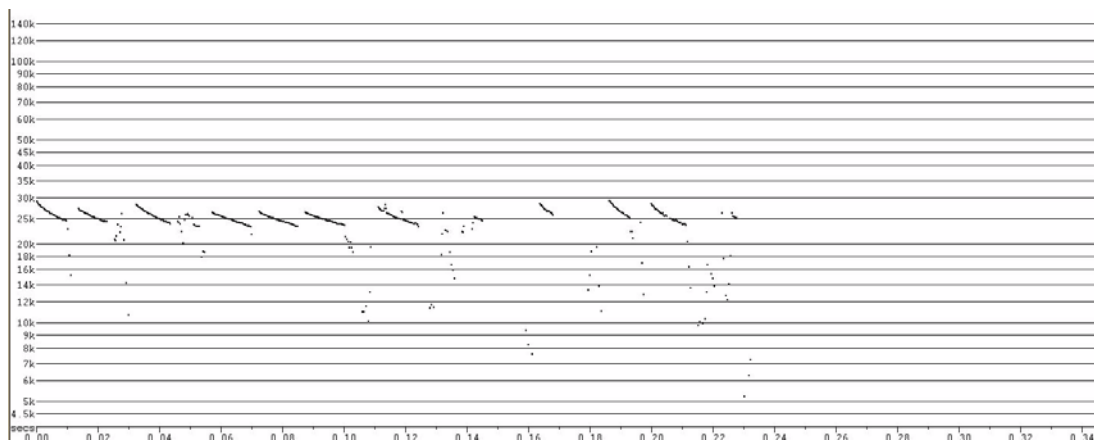


Figure 4-7. Vocal signature of the Mexican free-tailed bat (*Tadarida brasiliensis*).

### 4.3.3 Discussion

Seven species of bat were identified, with the greatest number of recordings (288 out of 303) and species (all seven) noted in the spring survey. Of interest is the presence of the little brown bat (*Myotis lucifugus*), which has previously not been known to occur in the Central Valley. Its closest known habitat includes the mountain ranges to the east and west of the installation.

#### Pallid Bat

The pallid bat (*Antrozonus pallidus*) is found throughout California and most of the southwestern United States and northern Mexico in a wide range of habitat from low desert to coniferous forest (Bat Conservation International [BCI] 2010). It is a year-round resident that hibernates, and rouses occasionally to drink and forage through the winter. Day roosts may include rocks, mines, caves, hollow trees, buildings and bridges. Night roosts include bridges, caves, and mines. The pallid bat's food includes large moths and ground arthropods (scorpions, centipedes, millipedes, grasshoppers, long-horned beetles, Jerusalem crickets). Pallid bats may actually land to take prey (Bradley et al. 2006).

#### Big Brown Bat

Found throughout the continental United States and Mexico (BCI 2010), the big brown bat (*Eptesicus fuscus*) is widespread and regionally common. It is found in many habitats such as pinyon-juniper, blackbrush, creosote, sagebrush, agriculture, and urban. It is a year-round resident that hibernates, arousing on occasion to forage and drink. Roosting in groups of up to several hundred, during the day it may use caves, trees, mines, buildings or bridges. Night roosts are typically more open settings such as buildings, mines and bridges. The big brown bat favors beetles and caddis flies. Foraging occurs in the open, over land and water, as well as in forested and other edge environments.

#### Hoary Bat

The hoary bat (*Lasiurus cinereus*) occurs throughout the continental United States and Mexico (BCI 2010) but some aspects of its distribution and natural history are not well known. This is a species associated with woodlands, forests, agriculture habitats, and possibly parks and gardens. Also found in valley basins in pure stands of Rocky Mountain juniper (*Juniperus scopulorum*) (Bradley et al. 2006). It is a summer resident that migrates, but probably hibernates in parts of its winter range (Bradley et al. 2006). It is a solitary rooster in trees. Favored food appears to be moths, dragonflies, and beetles. Foraging is generally high over tree canopy, especially near watercourses. It may travel long distances to forage, up to 25 miles (40 km) from its roost (Bradley et al. 2006). Loss of riparian habitat is a threat to this species. Windmills may pose a significant threat to this species, especially during migration (Bradley et al. 2006).

#### Western Small-Footed Myotis

The western small-footed myotis (*Myotis ciliolabrum*) is widespread throughout the western United States and Mexico (BCI 2010). It occupies desert scrub, grasslands, sagebrush steppe, and blackbrush,

greasewood, pinyon-juniper woodlands, pine-fir forests, agriculture, and urban areas. It is a year-round resident, hibernating individually or in large colonies. Roosts have been found in caves, mines, and trees. It forages in the open, consuming small moths, flies, ants, and beetles.

### Little Brown Bat

- Documented in the bat survey, the little brown bat was not known previously as occurring in the Central Valley.

The little brown bat is found throughout much of the United States, Canada and Mexico (BCI 2010), but its distribution and abundance is not well understood. It may migrate between summer and winter roosts elevationally. Roosting sites include hollow trees, rock outcrops, buildings, and occasionally mines and caves. It depends heavily on small aquatic insects, but also consumes terrestrial insects.

### Yuma Myotis

The Yuma myotis (*Myotis yumanensis*) is known from much of the western United States and Mexico (BCI 2010). Reflecting this wide distribution, it may occur in a full range of habitats including sagebrush, salt desert scrub, agriculture, playa, and riparian. It is more tolerant of human disturbance than other bats. It is a year-round resident. It roosts day and night in buildings or under bridges. Day roosts may also include trees, rock crevices, mines, or caves. It depends primarily on aquatic insects for food. It is usually foraging over relatively still water such as ponds, reservoirs, or pools.

### Mexican Free-Tailed Bat

The Mexican free-tailed bat is widespread through most of the southern United States and Mexico (BCI 2010), ranging from the low desert to high mountains. It is a summer resident found in a wide range of habitats. Migrations of 1,143 miles (1,840 km) are documented for this species (Wilkins 1989). Day roosts may include cliff faces, mines, caves, buildings, bridges, and hollow trees. Colonies may number in the millions in some areas (Bradley et al. 2006). It primarily consumes moths. Some individuals are known to travel more than 25 miles (40 km) to reach feeding grounds and feed more than 984 feet (300 m) above the ground (Bradley et al. 2006).

## 4.3.4 Small Mammal Surveys

### 4.3.4.1 Methods

Surveys for small mammals at NRTF Dixon were conducted by trapping and through observation of sign (i.e. scat, burrows, etc.). Two different trapping techniques were used and were designed to capture small rodents, including mice, voles, and shrews. Trapping was done in different parts of the installation during each trapping effort, to cover the entire installation over the course of the year.

- August 2009, southeast portion
- November 2009, west-central and southeastern
- February 2010, central portion

- May 2010, northern portion

Mice and voles were targeted with the use of live traps four times over the course of the year; each time in a different area of the installation. From 04–06 August 2009, trapping occurred in the southeast portion of NRTF Dixon, within an area designated for environmental management. The west-central and southeastern portions of the installation were the focus of trapping from 12–15 November 2009. From 09–12 February 2010, trapping was done in the installation's central portion. The northern portion of NRTF Dixon was covered from 05–07 May 2010. At each location, extra large Sherman folding live traps were placed about 66 feet (20 m) apart. Traps were left overnight and were checked each morning. Thermal protection in the form of grass clumps laid atop and to the sides of traps was used to protect the traps from excess heat and/or cold.

Shrews were targeted with by spreading 14 pitfall traps across three sites at NRTF Dixon: along the western border of the installation, just south of the tail-water return pond in the northwest portion of the installation, and in the NRMA north of the large vernal pool complex. The pitfall traps were connected by drift fencing constructed of pet screen or sheet metal, and were covered by plywood boards placed flush over the buckets during the daytime and three inches (8 centimeters) above the buckets at night. These traps were opened in the evening and checked and closed in the morning. The pitfall traps were installed in November 2009, but subsequently discontinued, due to inaccessibility during the winter months, and extremely costly and maintenance-intensive in the spring.

While setting and checking small mammal and pitfall traps, observations of individuals, sign, and scat of all mammals was also noted within same areas of the installation. Sign included both burrows (as for pocket gophers) and runways (used by voles).

#### 4.3.4.2 Results

*Sherman small mammal traps.* Over the course of one year, spanning 2009–2010, four trapping efforts at NRTF Dixon yielded 110 captures in 417.5 trap nights (Table 4-5). None of the captured animals were injured or perished, and all were returned to the wild. The deer mouse (*Peromyscus maniculatus*) was by far the most common capture, followed by the house mouse (*Mus musculus*), western harvest mouse (*Reithrodontomys megalotus*), and California vole (*Microtus californicus*). However, California voles are notoriously difficult to capture in Sherman live traps in most locations, so infrequent capture does not indicate low abundance of this species. In fact, California vole sign (runways and burrows primarily) was observed in great numbers, across the entire installation. Trapping success of small mammals was greatest along the western border of NRTF Dixon, west of the main facilities.

*Pitfall traps for shrews.* No shrews and no mammals of any species were captured after 30 trap nights at NRTF Dixon. We do not believe that these negative findings are definitive to determine that shrews are absent from the installation. Due to the difficulty of trapping

- A larger effort or a more cost-effective method may be needed to determine shrew presence.

them, either a larger effort or a more cost-effective trapping method would be needed to conclusively determine shrew presence at NRTF Dixon.

Table 4-5. Small mammal trap summary per quarter at Naval Radio Transmitter Facility Dixon, 2009–2010.

	AUG 2009	NOV 2009	FEB 2010	MAY 2010	Total
Open	90	63	69	96	318
Closed but open	0	2	2	1	5
<i>Peromyscus maniculatus</i>	24	31	20	22	97
<i>Microtus californicus</i>	0	1	1	0	2
<i>Reithrodontomys megalotus</i>	1	0	0	1	2
<i>Mus musculus</i>	5	4	0	0	9
Total captures	30	36	21	23	110
Trap nights	120	89	89	119.5	417.5
Captures/trap night	25%	40.4%	23.6%	19.2%	26.3%

Other incidental observations of mammals at NRTF Dixon included: river otter (*Lontra canadensis*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), and Botta's pocket gopher (*Thomomys bottae*).

#### 4.3.4.3 Discussion

Most of the species observed at NRTF Dixon are common, wide-ranging species found throughout California. No special status or restricted-range species were observed, or expected to occur at the installation. The only somewhat unexpected observance was of the northern river otter, which is fairly common in California in lakes and streams, but was not known from the project area previously.

- The northern river otter, not known within the project area previously, was found during the survey.

Species, which were not observed and that might be expected to occur on the installation, based on range information from the CDFG, include: opossum (*Didelphis virginiana*), ornate shrew (*Sorex ornatus*), western gray squirrel (*Sciurus griseus*), San Joaquin pocket mouse (*Perognathus inornatus*), common muskrat (*Ondatra zibethicus*), black rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), ringtail (*Bassariscus astutus*), long-tailed weasel (*Mustela frenata*), American mink (*Mustela vison*), American badger (*Taxidea taxus*), western spotted skunk (*Spilogale gracilis*), and bobcat (*Lynx rufus*). A number of these species are more indicative of forested areas (e.g. western gray squirrel, opossum, ringtail, gray fox, and bobcat). Forest habitat in large enough patches to support most of these species does not exist on NRTF Dixon, thus, while these species are possibly found here, they are not likely. The remaining species, however, are more likely to be found in developed, farmland, and grassland habitats, as well as along streams or lakes (muskrat and American mink), which are present at NRTF Dixon.

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# Appendix A: VRA Datasheets

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**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 3 POLY 5	MAP 3	6/4/10	J.L.K. + H.S.

GPS wpt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop  
 GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 901-904 (N)  
 Stand Size (acres): <1, (1-5), >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: \_\_\_\_\_ 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 5 Litter: 15 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 80 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes / No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes / No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: *strip of non-native herbaceous cover between two large areas composed of NNG, thistles and HIRING occur in patchy dense patches with CENSOL and NNG between patches \* small road runs through western end of polygon & property*

Disturbance code / Intensity (L,M,H): 05, H / 15, M / 19, L / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 95

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / <1 Regenerating Tree: \_\_\_\_\_ Shrub: 1 Herbaceous: 95  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / 05 Regenerating Tree: \_\_\_\_\_ Shrub: 03 Herbaceous: 63

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%

Strata	Species	% cover	C	Strata	Species	% cover	C
H	SILMAR	1		H	AMNSINKIA MEN	<1	
H	BRODIA	1		H	BULL Thistle	<1	
H	CENSOL	35		H	CALMAC	<1	
H	CARPIN	5		H	SONASP	<1	
H	BROHOR	25		H	BRODIA flower	<1	
H	HORDEUM sp (long awn)	5		S	RACPIL	1	
H	LOLPER	1		H	RUMEX	<1	
H	HIRING	5		H	Grass "1"	1	
H	AVEBAR	<1		H	LEPLAT	1	

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: CENSOL

Field-assessed association name (optional): CENSOL - BROHOR

Adjacent alliances/direction: agriculture / W / NNG / N

Confidence in alliance identification: L M (H) Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub P Tree P Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association:
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP1 - POLYG	MAP1	6/5/10	J.Ko

GPS wpyt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop  
 GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 993-976 (N)

Stand Size (acres): <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 3 Litter: 25 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 72 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes / No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes / No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: unmanaged space between riparian structures and dense NNG, may blightily influenced indirectly by management activities

Disturbance code / Intensity (L,M,H): D5, H 15, L / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 75

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: <1 Herbaceous: 75  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: 02 Herbaceous: 02

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	LEPLAT	1		H	HIRINC	<1	
H	CENSOL	40		S	BACPIL	<1	
H	BROHOR	10		H	CARPIN	1	
H	BRODIA	25		H	AVEBAR	1	
H	BRODEAF	<1		H	LALPER	1	
H	HORDEUM (10/long grass)	5		H	ERICIC	<1	
H	FSCCAL	<1		H	LACSER	<1	
H	AMSMEN	<1					
H	RUMEX	<1					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: CENSOL

Field-assessed association name (optional): CENSOL - BRODIA

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb \_\_\_\_\_ Shrub \_\_\_\_\_ Tree \_\_\_\_\_ Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_





**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1 - POLV 8	MAP 1	6/4/10	(J.K.) + A.S.

GPS wpt #: M18 GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop

GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 897.900  N

Stand Size (acres): <1, 1-5,  >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m

Exposure, Actual °: \_\_\_\_\_ NE NW SE SW  Flat Variable All | Steepness, Actual °:  0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower  bottom | Micro: convex  flat concave undulating

Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ |  Upland or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H20: BA Stems: 7 Litter: 89 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: 1 Fines: 3 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present?  Yes / No | % Hoof punch \_\_\_\_\_

Fire evidence: Yes  No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: Naval Radio Facility, maintained and controlled prior to WWII

Disturbance code / Intensity (L,M,H): 05/H 15/H / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH : T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 95

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 95

Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 02

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular.

% cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	LACSER	<1		H	EROTIC	<1	
H	MAD sp. (var. weed)	<1		H	SONASP	<1	
H	MIPPOL	<1		H	RUM sp.	<1	
H	BROHOR	40		H	ANARV	<1	
H	LOLLIUM PER	35		H	LEPLAT	<1	
H	BRODIA	5		H	CALMAC	<1	
H	AVERAR	<1		H	CHENOPOD	<1	
H	LOTUS sp.	<1		H	EUPPEP	<1	
H	HORINT	<1		H	CENSOL	<1	

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: BROMUS HORDEACDUS

Field-assessed association name (optional): BROHOR - LOLPER

Adjacent alliances/direction: LOLPER / E / \_\_\_\_\_

Confidence in alliance identification: L M  H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P/L Shrub - Tree - Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes /  No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association:
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP1 POLY1A	MAP1	6/4/10	J.K. + H.S.

GPS wypt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop

GPS within stand? Yes  No  If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 935-938

Stand Size (acres):  <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat  Variable  All | Steepness, Actual °: \_\_\_\_\_ 0°  1-5° 5-25° > 25

Topography: Macro: top upper mid lower  bottom | Micro:  convex flat concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ |  Upland or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 5 Litter: 15 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 80 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes  No  | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes  No  Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: man-made bank along developed drainage

Disturbance code / Intensity (L,M,H): 06/H 32/M \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 95

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 95  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 03

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%

Strata	Species	% cover	C	Strata	Species	% cover	C
H	RUMEX	<1		H	AVEBAR	1	
H	LOLPER	10		H	HIRTNC	20	
H	BROHOR	10		H	FRIBOT	<1	
H	BRODIA	<1		H	MESAMINT	<1	
H	CENSOL	5					
H	Italian thistle	35					
H	milk thistle	5					
H	BRODIA	<1					
H	SONOLE	<1					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: CARPIN

Field-assessed association name (optional): CARPIN-HIRTNC

Adjacent alliances/direction: rice paddy area N developed drainage ditches S

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb \_\_\_\_\_ Shrub \_\_\_\_\_ Tree \_\_\_\_\_ Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 2 POLY #1	MAP 1	6/4/10	J.K. + H.S.

GPS wpyt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop  
 GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 931-934 (N)  
 Stand Size (acres): <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: \_\_\_\_\_ 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating → slightly  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 2 Litter: 10 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 88 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes / No | % Hoof punch <1  
 Fire evidence: Yes  No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: beautiful large pool, seasonal inundated  
no snakes, ditch lined with clothes to the south

Disturbance code / Intensity (L,M,H): 05/L / / / / / "Other" \_\_\_\_\_ /

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 60

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 60  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 61

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%

Strata	Species	% cover	C	Strata	Species	% cover	C
H	MESAMINT	10		H	HORINT	<1	
H	ERINGIUM	1		H	BRODIA	<1	
H	CRYPTANTHA	25					
H	LASCAL	5					
H	RUMEX	2					
H	JUNCUS	5					
H	White flower sp? → HFLCUR	20					
H	LOLPER	<1					
H	LEPLAT	<1					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: CRYPTANTHA

Field-assessed association name (optional): CRYPTANTHA - WHITEFLOWER - JUNCUS

Adjacent alliances/direction: wood patch 1 S 1 N 1 N

Confidence in alliance identification: L M  H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub \_\_\_\_\_ Tree \_\_\_\_\_ Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
M001 POLY2	MAP 4	6/4/10	(J.K.) + H.S.

GPS wypt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side

UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop

GPS within stand? Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 905-908 (N)

Stand Size (acres): 1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m

Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: \_\_\_\_\_ (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H20: \_\_\_\_\_ BA Stems: 2 Litter: 10 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 88 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes / No | % Hoof punch \_\_\_\_\_

Fire evidence: Yes No Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: seasonally inundated, possibly man-made -> there is a lip basin been managed in a long time

Disturbance code / Intensity (L,M,H): 05/6 12/1? \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 70

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 70

Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 01

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.

% cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%

Strata	Species	% cover	C	Strata	Species	% cover	C
H	RUMEX	15		H	MESAMINT	<1	
H	CRYPTANTHA	50					
H	FRINGIUM	<1					
H	JUNCUS sp.	<1					
H	LEPLAT	<1					
H	LASCAL	1					
H	CALMAC	<1					
H	LYTHIRUM	<1					
H	LOTUS sp.	<1					

Unusual species: Musa mini species

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: CRYPTANTHA

Field-assessed association name (optional): CRYPTANTHA - RUMEX

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub - Tree - Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_





**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1-POLY3	MAP 1	6/4/10	J.K. + H.S.

GPS wpt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop  
 GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 953-956 (IV)

Stand Size (acres): <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: \_\_\_\_\_ 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: \_\_\_\_\_ (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: 1 BA Stems: \_\_\_\_\_ Litter: \_\_\_\_\_ Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: \_\_\_\_\_ =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes / No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes / No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: manmade drainage canal, "seasonally" inundated water in the concrete portion (may be pumped H<sub>2</sub>O)

Disturbance code / Intensity (L,M,H): 05 / H 08 / M / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 80

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 80  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 08

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	HIRTNC	<1		H	LENSOL	2	
H	Dallas grass	<1		H	LACSER	<1	
H	LEPLAT	50		H	DIS SPI	<1	
H	BROHOR	20		H	Filaris	<1	
H	SILMAR	<1		H	TYPHA sp.	<1	
H	Juncus sp.	<1		H	PICECH	<1	
H	POLMON	<1		H	CALMAC	<1	
H	SONARV	<1		H	SGNOLE	<1	
H	RUMEX	<1		H	LOLPER	10	

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: LEPLAT chamaep

Field-assessed association name (optional): LEPLAT-BROHOR

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub \_\_\_\_\_ Tree \_\_\_\_\_ Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1 - POLY 4	MAP 1	6/4/10	J.K.

GPS wpyt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop  
 GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 449-952  N  
 Stand Size (acres): <1,  1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW  Flat  Variable  All | Steepness, Actual °: \_\_\_\_\_  0°  1-5°  5-25°  > 25

Topography: Macro: top upper mid lower  bottom | Micro: convex  flat  concave  undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ |  Upland or  Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 10 Litter: 60 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 30 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes /  No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes  No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: mixed NNG, most majority dissect and hayed standard black-tailed jacksnipe, a few patches of uncut grass w/in the polygon around radio structure forming circles

Disturbance code / Intensity (L,M,H): 05/H 03/H / / / / "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)  
 Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 90  
 % Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 90  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 01  
 Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	LEPLAT	<1					
H	LOLPER	60					
H	BRSHOR	15					
H	AVEBAR	20					
H	ERISET	<1					
H	BRODIA	<1					
H	RUMEX	<1					
H	LACSER	<1					
H	MEDPOL	<1					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: Rye grass Hay Lolium perenne  
 Field-assessed association name (optional): Lolium perenne/Ave Bar  
 Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Confidence in alliance identification: L M  H Explain: \_\_\_\_\_  
 Phenology (E,P,L): Herb L Shrub - Tree - Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1 - POLY 7	M1P7	6/4/10	J.K. + H.S.

GPS wpt #: M1P7 GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop

GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 940-943  N

Stand Size (acres): <1,  1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW  Flat Variable All | Steepness, Actual °: \_\_\_\_\_  0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower  bottom | Micro: convex flat  concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or  Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 3 Litter: 77 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 25 =100%

% Current year bioturbation  Past bioturbation present?  Yes / No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes  No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: riparian strip left unmanaged, turned into a natural area, a seasonal pool was created along drainage seasonally inundated.

Disturbance code / Intensity (L,M,H): 05 / H 08 / M 16 / M / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 60

% Cover - Conifer tree / Hardwood tree: <1 Regenerating Tree: \_\_\_\_\_ Shrub: <1 Herbaceous: 60  
 Height Class - Conifer tree / Hardwood tree: 10b Regenerating Tree: \_\_\_\_\_ Shrub: 03 Herbaceous: 02

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	CENSOL	2		H	ERINGIUM	25	
H	LEPLAT	35		H	HORDEUM sp	<1	
H	BRHOR	1		H	LASCAL	<1	
H	LOLPER	5		H	PHILARIS - minor	<1	
H	POLMON	5		H	SONASP	<1	
H	CRYPTANTHA	5		T	SALGUT (black willow)	<1	
H	DISSPI	<1		H	DOWCUS	<1	
H	RUMEX	<1		H	CALMAC	<1	
H	JUNCUS	<1		S	BACPIL	<1	

Unusual species: Brodia and the mint sp.

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: Lepidium

Field-assessed association name (optional): Lepidium - eringium

Adjacent alliances/direction: BRHOR / E

Confidence in alliance identification: L M  H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub P Tree P Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**  
 Relevé or Rapid Assessment (circle one) (Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1 - POLY 9	MAP 1	6/5/10	J.B. + H.S.
GPS wypt #: _____ GPS name: _____ Datum: _____ or NAD83. Bearing, left axis at SW pt _____ (degrees) of <u>Long</u> / Short side			
UTME _____ UTMN _____ Zone: 10 / 11 (circle one) Error: ± _____ ft / m / pdop			
GPS within stand? Yes / No If No, cite from waypoint to stand, distance _____ (meters) & bearing _____ (degrees)			
Elevation: _____ ft / m Camera Name/Photograph #'s: 981-984 (N)			
Stand Size (acres): <1, 1-5, >5   Plot Size (m <sup>2</sup> ): 10 / 100 / 400 / 1000   Plot Shape _____ x _____ ft / m or Circle Radius _____ ft / m			
Exposure, Actual °: _____ NE NW SE SW <u>Flat</u> Variable All   Steepness, Actual °: _____ <u>0°</u> 1-5° 5-25° > 25			
Topography: Macro: top upper mid lower <u>bottom</u>   Micro: convex flat <u>concave</u> undulating			
Geology code: _____ Soil Texture code: _____   Upland or <u>Wetland/Riparian</u> (circle one)			
% Surface cover: _____ (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)			
H20: _____ BA Stems: <u>2</u> Litter: <u>88</u> Bedrock: _____ Boulder: _____ Stone: _____ Cobble: _____ Gravel: _____ Fines: <u>10</u> =100%			
% Current year bioturbation _____ Past bioturbation present? Yes / <u>No</u>   % Hoof punch _____			
Fire evidence: Yes / <u>No</u> / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.			
Site history, stand age, comments: <u>once vernal pool! seasonally inundated so/</u> <u>indicator plant, slightly concave to flat</u>			
Disturbance code / Intensity (L,M,H): <u>05, L</u> / _____ / _____ / _____ / _____ / _____ "Other" _____ / _____			

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (>12" plant ht.), H2 (>12" ht.)      % Non-Vasc cover: \_\_\_\_\_      Total % Vasc Veg cover: 40

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 40

Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 21

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	RUMEX	1		H	SPAAMS	<1	
H	LEPLAT	1		H	MESAMINT	2	
H	ERYNGIUM	25		H	LACSER	<1	
H	JUNCUS sp.	<1		H	PSILOCARPUS - sp.	<1	
H	CRYPTANTHA	1		H	HORDEM (small mine)	1	
H	POLMON	<1		H	LOLPER	2	
H	DOWCUS	<1		H	Silver Puff UROLIN	<1	
H	LASCAL	5		H	SONARV	<1	
H	LYTHRUM HYS	<1		H	Mimulus photo taken	<1	

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: ERYNGIUM

Field-assessed association name (optional): ERYNGIUM Vernal Pool

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub \_\_\_\_\_ Tree \_\_\_\_\_ Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_





**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP1 POLY10	MAP2	6/4/10	J.K. + H.S.

GPS wpt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop  
 GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 945.948 (N)  
 Stand Size (acres): <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_ x \_\_\_ ft / m or Circle Radius \_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: BA Stems: 10 Litter: 70 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 20 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: *old building possibly an antenna w/in polygon  
 dense NNG w/ a few natives, a few radio structures  
 w/ a little maintained area around them*

Disturbance code / Intensity (L,M,H): 05 / H / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 95

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 95  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 01

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	LOLPER	65		H	BROHOR	10	
H	LUPRIG	<1		H	CENSOL	<1	
H	AVEBAR	<1		H	SONAS?	<1	
H	RUMEX	<1		H	LACSER	<1	
H	LGTUS sp	<1		H	TRIWIL	<1	
H	LEPLAT	1		H	SPAAMB?	<1	
H	HORDEUM sp (about 20%)	20		H	FROCTC	<1	
H	MADIA sp (SAT)	<1					
H	HIRINC	<1					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: LOLPER grassland

Field-assessed association name (optional): LOLPER - HORBRA

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub \_\_\_\_\_ Tree \_\_\_\_\_ Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1 - POLY III	MAP 1	6/5/10	(J.K.)

GPS wpt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop  
 GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 957-960 (N)

Stand Size (acres): <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m  
 Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: \_\_\_\_\_ 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: \_\_\_\_\_ (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 5 Litter: 55 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 40 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes / No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: previously managed -> likely mowed, currently left as a natural area that is relatively untouched

Disturbance code / Intensity (L,M,H): 05 / H / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)  
 Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 90

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 90  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 07

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	LOLPER	50		H	LUPBLC	<	
H	BROHOR	35		H	TRIFOLIUM sp	<	
H	AVEBAR	<1		H	TRIWIL	<	
H	KUMEX	1					
H	LACTUCYA (prickly lettuce)	2					
H	BRODIAEA	2					
H	LEPLAT	<					
H	HORDEUM (w/ long awns)	<					
H	SONOLE	<					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: LOLPER

Field-assessed association name (optional): LOLPER - BRODIAEA BROHOR

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub - Tree - Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



# CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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## I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1 - POLY 12	MAP 1	6/5/10	J.K.
GPS wpt #: _____ GPS name: _____ Datum: _____ or NAD83. Bearing, left axis at SW pt _____ (degrees) of <u>Long</u> / Short side			
UTME _____ UTMN _____ Zone: 10 / 11 (circle one) Error: ± _____ ft / m / pdop			
GPS within stand? <input checked="" type="checkbox"/> Yes / No If No, cite from waypoint to stand, distance _____ (meters) & bearing _____ (degrees)			
Elevation: _____ ft / m Camera Name/Photograph #'s: 961-964 (N)			
Stand Size (acres): <1, 1-5, >5   Plot Size (m <sup>2</sup> ): 10 / 100 / 400 / 1000   Plot Shape _____ x _____ ft / m or Circle Radius _____ ft / m			
Exposure, Actual °: _____ NE NW SE SW <input checked="" type="checkbox"/> Flat Variable All   Steepness, Actual °: <input checked="" type="checkbox"/> 0° 1-5° 5-25° > 25			
Topography: Macro: top upper mid lower <input checked="" type="checkbox"/> bottom   Micro: convex <input checked="" type="checkbox"/> flat concave undulating			
Geology code: _____ Soil Texture code: _____   <input checked="" type="checkbox"/> Upland or Wetland/Riparian (circle one)			
% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)			
H20: _____ BA Stems: 5 Litter: 40 Bedrock: _____ Boulder: _____ Stone: _____ Cobble: _____ Gravel: _____ Fines: 55 =100%			
% Current year bioturbation _____ Past bioturbation present? Yes / <input checked="" type="checkbox"/> No   % Hoof punch _____			
Fire evidence: Yes / <input checked="" type="checkbox"/> No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.			
Site history, stand age, comments: previously managed most likely, currently left to be natural area			

Disturbance code / Intensity (L,M,H): 05 / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

## II. HABITAT AND VEGETATION DESCRIPTION

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 90

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 90

Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 02

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	LOLPER	75		H	LEPLAT	<1	
H	RUMEX	1		H	EIBICIS	<1	
H	ERYGIUM	<1		H	BRODEAE	<1	
H	HORDEUM (short aums)	5					
H	ERTFOL	<1					
H	LACSER	1					
H	BROHOR	5					
H	TRIFOLIUM sp (inverted)	<1					
H	AVEBAR	1					

Unusual species: \_\_\_\_\_

## III. INTERPRETATION OF STAND

Field-assessed vegetation alliance name: LOLPER

Field-assessed association name (optional): LOLPER -

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M  H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb P Shrub - Tree - Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes /  No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association:
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP 1 - POLY 13	MAP 1	6/5/10	(J.K.) + H.S.

GPS wpyt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side

UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop

GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 969-972 (N)

Stand Size (acres): <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m

Exposure, Actual °: \_\_\_\_\_ NE NW SE SW  Flat Variable All | Steepness, Actual °:  0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower  bottom | Micro: convex  flat concave undulating

Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or  Wetland/Riparian (circle one)

% Surface cover: \_\_\_\_\_ (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H20: \_\_\_\_\_ BA Stems: 1 Litter: 30 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 69 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes /  No | % Hoof punch \_\_\_\_\_

Fire evidence: Yes /  No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: occasional flooding - all the grass has been killed due to inundation, possibly flooded by adjacent canal

Disturbance code / Intensity (L,M,H): 05 / L / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH : T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (>12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 25

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 25

Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 21

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular.

% cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	ERISIT	1		H	ZANTHUM?	<1	
H	SPAAMB	<1		H	POWCHS	<1	
H	HORDEUM MUR	<1		H	LOLPER	<1	
H	ERYGIUM	20					
H	RUMEX	1					
H	JUNCUS sp	2					
H	LEPLAT	<1					
H	(Unknown grass)	<1					
H	CRYPTANTHA	1					

Unusual species: DOWNIGIA

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: ERYNGIUM

Field-assessed association name (optional): \_\_\_\_\_

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M  H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb E Shrub \_\_\_\_\_ Tree \_\_\_\_\_ Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_





**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**  
 Relevé or Rapid Assessment (circle one) (Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MADJ - POLY14	MAP2	6/5/10	J.K. + H.S.
GPS wypt #: _____ GPS name: _____ Datum: _____ or NAD83. Bearing, left axis at SW pt _____ (degrees) of <u>Long</u> / Short side			
UTME _____ UTMN _____ Zone: 10 / 11 (circle one) Error: ± _____ ft / m / pdop			
GPS within stand? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If No, cite from waypoint to stand, distance _____ (meters) & bearing _____ (degrees)			
Elevation: _____ ft / m Camera Name/Photograph #'s: 977-980 (N)			
Stand Size (acres): <1, 1-5, >5   Plot Size (m <sup>2</sup> ): 10 / 100 / 400 / 1000   Plot Shape _____ x _____ ft / m or Circle Radius _____ ft / m			
Exposure, Actual °: _____ NE NW SE SW <u>Flat</u> Variable All   Steepness, Actual °: <u>0°</u> 1-5° 5-25° > 25			
Topography: Macro: top upper mid lower <u>bottom</u>   Micro: convex <u>flat</u> concave undulating			
Geology code: _____ Soil Texture code: _____   Upland or Wetland/Riparian (circle one)			
% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)			
H20: BA Stems: <u>5</u> Litter: <u>60</u> Bedrock: _____ Boulder: _____ Stone: _____ Cobble: _____ Gravel: _____ Fines: <u>35</u> =100%			
% Current year bioturbation _____ Past bioturbation present? Yes / <u>No</u>   % Hoof punch _____			
Fire evidence: Yes / <u>No</u> / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.			
Site history, stand age, comments: <u>previously farmed not often and not recently</u>			

Disturbance code / Intensity (L,M,H): 05, H 03, L / / / / "Other" / /

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH: T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 90

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 90

Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 01

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	AVEBAR	25		H	PROHOR	5	
H	LACSER	<1					
H	LOLPER	60					
H	RUMEX	<1					
H	BRODEAF	<1					
H	LOTUS sp.	<1					
H	TRIWIL	<1					
H	ASTRAGALUS sp.	<1					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: \_\_\_\_\_

Field-assessed association name (optional): \_\_\_\_\_

Adjacent alliances/direction: \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb Shrub Tree Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_



**CNPS and CDFG Combined Vegetation Rapid Assessment and Relevé Field Form**

Relevé or Rapid Assessment (circle one)

(Revised March 22, 2010)

For Office Use:	Final database #:	Final vegetation type name:	Alliance Association
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**I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION**

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):
MAP1-POLY15	MAP1	1/5/10	J.K. + H.S.

GPS wypt #: \_\_\_\_\_ GPS name: \_\_\_\_\_ Datum: \_\_\_\_\_ or NAD83. Bearing, left axis at SW pt \_\_\_\_\_ (degrees) of Long / Short side  
 UTME \_\_\_\_\_ UTMN \_\_\_\_\_ Zone: 10 / 11 (circle one) Error: ± \_\_\_\_\_ ft / m / pdop

GPS within stand?  Yes / No If No, cite from waypoint to stand, distance \_\_\_\_\_ (meters) & bearing \_\_\_\_\_ (degrees)

Elevation: \_\_\_\_\_ ft / m Camera Name/Photograph #'s: 990-993 (10)

Stand Size (acres): <1, 1-5, >5 | Plot Size (m<sup>2</sup>): 10 / 100 / 400 / 1000 | Plot Shape \_\_\_\_\_ x \_\_\_\_\_ ft / m or Circle Radius \_\_\_\_\_ ft / m

Exposure, Actual °: \_\_\_\_\_ NE NW SE SW Flat Variable All | Steepness, Actual °: 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating  
 Geology code: \_\_\_\_\_ Soil Texture code: \_\_\_\_\_ | Upland or Wetland/Riparian (circle one)

% Surface cover: \_\_\_\_\_ (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)  
 H20: \_\_\_\_\_ BA Stems: 5 Litter: 3 Bedrock: \_\_\_\_\_ Boulder: \_\_\_\_\_ Stone: \_\_\_\_\_ Cobble: \_\_\_\_\_ Gravel: \_\_\_\_\_ Fines: 65 =100%

% Current year bioturbation \_\_\_\_\_ Past bioturbation present? Yes / No | % Hoof punch \_\_\_\_\_  
 Fire evidence: Yes / No / Unknown (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:  
 \_\_\_\_\_  
 \_\_\_\_\_

Disturbance code / Intensity (L,M,H): 15 / L 05 / H / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ "Other" \_\_\_\_\_ / \_\_\_\_\_

**II. HABITAT AND VEGETATION DESCRIPTION**

Tree DBH : T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)  
 Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: \_\_\_\_\_ Total % Vasc Veg cover: 95

% Cover - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 93  
 Height Class - Conifer tree / Hardwood tree: \_\_\_\_\_ / \_\_\_\_\_ Regenerating Tree: \_\_\_\_\_ Shrub: \_\_\_\_\_ Herbaceous: 02

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Species, Stratum, and % cover. Stratum categories: T=Tree, S=Shrub, H=Herb, E=SEedling, A=SApling, N=Non-vascular.  
 % cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover	C	Strata	Species	% cover	C
H	LOLPER	76					
H	BRODIAE	1					
H	AVERAR	10					
H	RUMEX	2					
H	FLACIS	1					
H	FRYNGIUM	1					
H	Tidy tip	<1					
H	unknown grass - POA	<1					
H	DONCUS	<1					

Unusual species: \_\_\_\_\_

**III. INTERPRETATION OF STAND**

Field-assessed vegetation alliance name: \_\_\_\_\_

Field-assessed association name (optional): \_\_\_\_\_

Adjacent alliances/direction: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Confidence in alliance identification: L M H Explain: \_\_\_\_\_

Phenology (E,P,L): Herb Shrub Tree Other identification or mapping information: \_\_\_\_\_

Is poly >1 type: Yes / No If yes, explain: \_\_\_\_\_





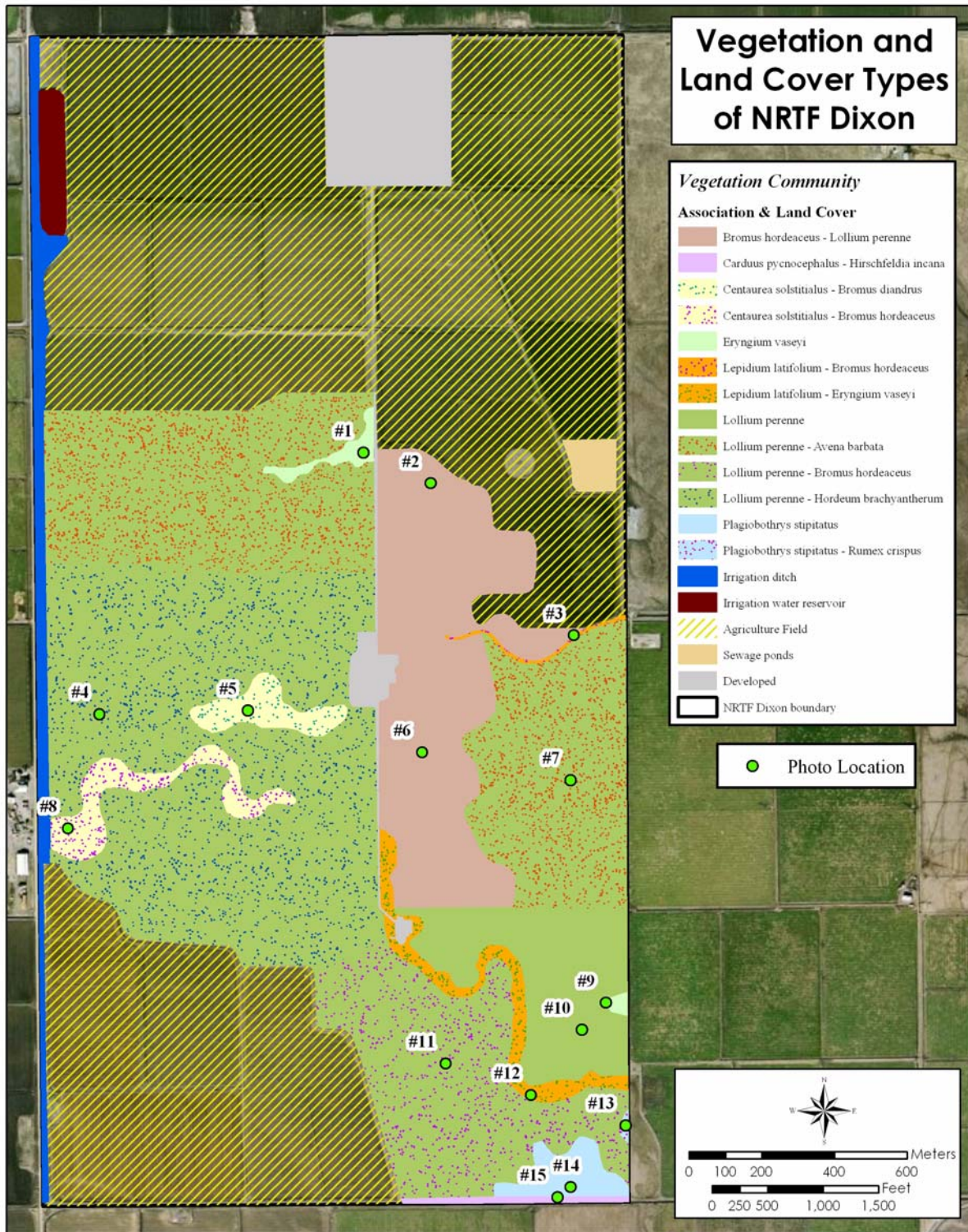
	Spring	Spring	Spring	May	August 2009		November 2009		February 2010		May 2010	
Mallard			X		4	V			12	V		V
Turkey vulture	X	X	X		X	V	>3	V			1	V
White-tailed kite		X					2-3	V	2	V		
Northern harrier	nest	nest	X	X	1-2	V	>1	V	2	V	2	V
Swainson's hawk	X				8	V					2	V
Red-tailed hawk	X	X	X	X	1-2	V	2-3	V	1-2	V	1	V
Ferruginous hawk							1	V				
Prairie falcon					2	V						
American kestrel	X	X	X	X	2	V	2-3	V	1-2	V	1	V
Ring-necked pheasant				X								V
Forster's tern											1	V
Black tern					12	V						
Gull sp.					1	V						
Long-billed curlew			X	X	X	V	>2	V, A			1	V
Whimbrel	X	X										
American avocet											Some	
Black-necked stilt	X		X								Some	V
Long-billed dowitcher											25	V
Killdeer	X	X	X	X	X	V	>5	V	2-4	V	many	V
Dunlin									4-6	V		
Great horned owl				X	1	V	2	V			1	V
Barn owl			X		1	V	1-2	V			1	V
Burrowing owl	X	X	X	X	Many	V	Many	V	Many	V	62	V
Common poorwill	X						1	A	1	A		
Barn swallow	X		X	X	X	V	2	V				V
Cliff swallow		X	X	X								V
Swallow sp.					X	V						
Mourning dove	X	X	X	X	X	V					many	V
Rock pigeon			X		X	V					flock	V
Common raven	X	X	X	X			2-4	V, A				V
American crow	X	X	X	X	>2	V	>2	V	>4	V		V
European starling		X	X	X	X	V			10	V		V
Loggerhead shrike	X	X	X	X	X	V	2-4	V	2	V	some	V
Northern mockingbird					X	V						
Western kingbird	X		X		X	V						V
Say's phoebe									2	V		
Black phoebe							1	V				
Yellow-rumped warbler							Many	V				
House sparrow											some	V

	Spring	Spring	Spring	May	August 2009	November 2009	February 2010	May 2010
White-crowned sparrow						>4	V	
Golden-crowned sparrow		X						
Savannah sparrow			X			Many	V	
Lark sparrow						Many	V	
Song sparrow								few
Brown-headed cowbird								some
Red-winged blackbird	X	X	X	X		Some	V	Many
Brewer's blackbird				X	X	V	Many	V
Western meadowlark	X	X	X	X	Many	V	Many	V
House finch		X						
American goldfinch			X			>1	A	





# Appendix B: VRA Photopoints



Map B-1. Rapid Assessment photo locations at Naval Radio Transmitter Facility Dixon.

**Location #1: *Eryngium vaseyi* Alliance**



Photo Location #1 - North (6/5/2010)



Photo Location #1 - South (6/5/2010)



Photo Location #1 - East (6/5/2010)



Photo Location #1 - West (6/5/2010)

**Location #2: *Bromus hordeaceus*-*Lolium perenne* Alliance**



Photo Location #2 - North (6/5/2010)



Photo Location #2 - South (6/5/2010)



Photo Location #2 - East (6/5/2010)



Photo Location #2 - West (6/5/2010)

**Location #3: *Lepidium latifolium*-*Bromus hordeaceus* Alliance**



Photo Location #3 - North (6/4/2010)



Photo Location #3 - South (6/4/2010)



Photo Location #3 - East (6/4/2010)



Photo Location #3 - West (6/4/2010)

**Location #4: *Lolium perrene*-*Hordeum brachyantherum* Alliance**



Photo Location #4 - North (6/4/2010)



Photo Location #4 - South (6/4/2010)



Photo Location #4 - East (6/4/2010)



Photo Location #4 - West (6/4/2010)

**Location #5: *Centaurea solstitialis*-*Bromus hordeaceus* Alliance**



Photo Location #5 - North (6/5/2010)



Photo Location #5 - South (6/5/2010)



Photo Location #5 - East (6/5/2010)



Photo Location #5 - West (6/5/2010)

**Location #6: *Bromus hordeaceus*-*Lolium perenne* Alliance**



Photo Location #6 - North (6/4/2010)



Photo Location #6 - South (6/4/2010)



Photo Location #6 - East (6/4/2010)



Photo Location #6 - West (6/4/2010)

**Location #7: *Lolium perenne*-*Avena barbata* Alliance**



Photo Location #7 - North (6/4/2010)



Photo Location #7 - South (6/4/2010)



Photo Location #7 - East (6/4/2010)



Photo Location #7 - West (6/4/2010)



**Location #8: *Centaurea solstitialis*-*Bromus hordeaceus* Alliance**



Photo Location #8 - North (6/4/2010)



Photo Location #8 - South (6/4/2010)



Photo Location #8 - East (6/4/2010)



Photo Location #8 - West (6/4/2010)

**Location #9: *Eryngium vaseyi* Alliance**



Photo Location #9 - North (6/5/2010)



Photo Location #9 - South (6/5/2010)



Photo Location #9 - East (6/5/2010)



Photo Location #9 - West (6/5/2010)

**Location #10: *Lolium perenne* Alliance**



Photo Location #10 - North (6/5/2010)



Photo Location #10 - South (6/5/2010)



Photo Location #10 - East (6/5/2010)



Photo Location #10 - West (6/5/2010)

**Location #11: *Lolium perenne*-*Bromus hordeaceus* Alliance**



Photo Location #11 - North (6/5/2010)



Photo Location #11 - South (6/5/2010)



Photo Location #11 - East (6/5/2010)



Photo Location #11 - West (6/5/2010)

**Location #12: *Lepidium latifolium*-*Eryngium vaseyi* Alliance**



Photo Location #12 - North (6/4/2010)



Photo Location #12 - South (6/4/2010)



Photo Location #12 - East (6/4/2010)



Photo Location #12 - West (6/4/2010)

**Location #13: *Plagiobothrys stipitatus*-*Rumex crispus* Alliance**



Photo Location #13 - North (6/4/2010)



Photo Location #13 - South (6/4/2010)



Photo Location #13 - East (6/4/2010)



Photo Location #13 - West (6/4/2010)

**Location #14: *Plagiobothrys stipitatus* Alliance**



Photo Location #14 - North (6/4/2010)



Photo Location #14 - South (6/4/2010)



Photo Location #14 - East (6/4/2010)



Photo Location #14 - West (6/4/2010)

**Location #15: *Carduus pycnocephalus*-*Hirschfeldia incana* Alliance**



Photo Location #15 - North (6/4/2010)



Photo Location #15 - South (6/4/2010)



Photo Location #15 - East (6/4/2010)



Photo Location #15 - West (6/4/2010)



# Appendix C: Species Lists

Table C-1. Plant species documented at Naval Radio Transmitter Facility Dixon .

Common Name	Scientific Name	Native to CA? (Yes/No)	CDFA Status	Cal-IPC Status
<i>Eudicots</i>				
blow-wives	<i>Achyrachaena mollis</i>	Yes	-	-
Pacific foxtail	<i>Alopecurus saccatus</i>	Yes	-	-
rough pigweed	<i>Amaranthus retroflexus</i>	No	-	-
common fiddleneck	<i>Amsinckia intermedia</i>	Yes	-	-
spearscale	<i>Atriplex prostrata</i>	Yes	-	-
tumbling oracle	<i>Atriplex rosea</i>	No	-	-
Pacific azolla	<i>Azolla filiculoides</i>	Yes	-	-
coyote bush	<i>Baccharis pilularis*</i>	Yes	-	-
common blennosperma	<i>Blennosperma nanum</i>	Yes	-	-
black mustard	<i>Brassica nigra*</i>	No	-	M
red maids	<i>Calandrinia ciliata</i>	Yes	-	-
water-starwort	<i>Callitriche spp.</i>	Yes	-	-
Italian thistle	<i>Carduus pycnocephalus</i>	No	C	M
valley tassels	<i>Castilleja attenuata</i>	Yes	-	-
field orthocarpus	<i>Castilleja campestris</i>	Yes	-	-
yellow star-thistle	<i>Centaurea solstitialis</i>	No	C	H
common spikeweed	<i>Centromadia pungens</i>	Yes	-	-
chicory	<i>Cichorium intybus</i>	No	-	-
yellowspine thistle	<i>Cirsium ochrocentrum</i>	No	A	-
miner's lettuce	<i>Claytonia perfoliata</i>	Yes	-	-
field bindweed	<i>Convolvulus arvensis</i>	No	C	-
California-aster	<i>Corethrogyne filaginifolia*</i>	Yes	-	-
doveweed	<i>Croton setigerus</i>	Yes	-	-
clearwater cryptantha	<i>Cryptantha intermedia</i>	Yes	-	-
Jimson weed	<i>Datura sp.*</i>	Undetermined <sup>2</sup>	-	-
downingia	<i>Downingia sp.</i>	Yes	-	-
willow herb	<i>Epilobium pallustre</i>	Yes	-	-
horseweed	<i>Erigeron canadensis</i>	Yes	-	-
broadleaf filaree	<i>Erodium botrys</i>	No	-	-
redstem filaree	<i>Erodium cicutarium</i>	No	-	L
coyote-thistle	<i>Eryngium vaseyi</i>	Yes	-	-
foxtail fescue	<i>Festuca myuros</i>	No	-	-
cranesbill	<i>Geranium molle</i>	No	-	-
common hedge-hyssop	<i>Gratiola ebracteata</i>	Yes	-	-
seaside heliotrope	<i>Heliotropium curassavicum</i>	Yes	-	-
bristly ox-tongue	<i>Helminthotheca echioides*</i>	No	-	L
hayfield tarweed	<i>Hemizonia congesta ssp. luzullifolia</i>	Yes	-	-
hesperexax	<i>Hesperexax sp.</i>	Yes	-	-
shortpod mustard	<i>Hirschfeldia incana</i>	No	-	-
smooth cat's-ear	<i>Hypochaeris glabra</i>	No	-	L
prickly lettuce	<i>Lactuca serriola</i>	No	-	-
Burke's goldfields	<i>Lasthenia burkei</i>	Yes	-	-
vernal pool goldfields	<i>Lasthenia fremontii</i>	Yes	-	-

Table C-1. Plant species documented at Naval Radio Transmitter Facility Dixon (Continued).

Common Name	Scientific Name	Native to CA? (Yes/No)	CDFA Status	Cal-IPC Status
smooth goldfields	<i>Lasthenia glaberrima</i>	Yes	-	-
common tidytips	<i>Layia platyglossa</i>	Yes	-	-
duckweed	<i>Lemna sp.</i>	Yes	-	-
perennial pepperweed	<i>Lepidium latifolium*</i>	No	B	H
common peppergrass	<i>Lepidium nitidum</i>	Yes	-	-
biscuitroot	<i>Lomatium spp.</i>	Yes	-	-
birdfoot trefoil	<i>Lotus corniculatus</i>	No	-	-
miniature lupine	<i>Lupinus bicolor</i>	Yes	-	-
tarweed	<i>Madia sp.</i>	Yes	-	-
cheeseweed	<i>Malva parviflora</i>	No	-	-
alkali-mallow	<i>Malvella leprosa (formerly Sida hederacea)</i>	Yes	-	-
hairy pepperwort	<i>Marsilea vestita var. vestita</i>	Yes	-	-
spotted burclover	<i>Medicago arabica</i>	No	-	-
sourclover	<i>Mellilotus indicus</i>	No	-	-
tricolor monkeyflower	<i>Mimulus tricolor</i>	Yes	-	-
mouse-tail	<i>Myosurus sp.</i>	Yes	-	-
Eurasian milfoil	<i>Myriophyllum spicatum</i>	No	C	H
whitehead navarretia	<i>Navarretia leucocephala</i>	Yes	-	-
pincushion plant	<i>Navarretia myersii</i>	Yes	-	-
Water smartweed	<i>Persicaria amphibia</i>	Yes	-	-
willow weed	<i>Persicaria lapathifolia*</i>	Yes	-	-
slender popcornflower	<i>Plagiobothrys stipitatus</i>	Yes	-	-
English plantain	<i>Plantago lanceolata</i>	No	-	L
mesa mint	<i>Pogogyne zizyphoroides</i>	Unknown <sup>3</sup>	-	-
common knotweed	<i>Polygonum aviculare subsp. depressum</i>	No	-	-
knotweed, smartweed	<i>Polypogon sp.*</i>	Undetermined <sup>2</sup>	-	-
Fremont cottonwood	<i>Populus fremontii</i>	Yes	-	-
long-leaved pondweed	<i>Potamogeton nodosus</i>	Yes	-	-
woolly marbles	<i>Psilocarphus brevissimus</i>	Yes	-	-
buttercup	<i>Ranunculus ssp.</i>	Undetermined <sup>2</sup>	-	-
curly dock	<i>Rumex crispus</i>	No	-	L
Goodding's black willow	<i>Salix gooddingii</i>	Yes	-	-
Russian-thistle	<i>Salsola tragus</i>	No	C	L
milk thistle	<i>Silybum marianum</i>	No	-	L
sow thistle	<i>Sonchus sp.*</i>	No	-	-
common chickweed	<i>Stellaria media</i>	No	-	-
small wirelettuce	<i>Stephanomeria exigua</i>	Yes	-	-
lacepod	<i>Thysanocarpus sp.</i>	Yes	-	-
dwarf sack clover	<i>Trifolium depauperatum</i>	Yes	-	-
rose clover	<i>Trifolium hirtum</i>	No	-	M
tomcat clover	<i>Trifolium willdenovii</i>	Yes	-	-
butter-and-eggs	<i>Triphysaria eriantha</i>	Yes	-	-
broad-leaved cattail	<i>Typha latifolia</i>	Yes	-	-
puslane speedwell	<i>Veronica peregrina ssp. xalapensis</i>	Yes	-	-
cocklebur	<i>Xanthium strumarium</i>	Yes	-	-
<b>Monocots</b>				
purple nutsedge	<i>Cyperus rotundus</i>	No	B	-
umbrella sedge	<i>Cyperus sp.*</i>	Undetermined <sup>2</sup>	-	-
spikerush	<i>Eleocharis ssp.</i>	Yes <sup>1</sup>	-	-

Table C-1. Plant species documented at Naval Radio Transmitter Facility Dixon (Continued).

Common Name	Scientific Name	Native to CA? (Yes/No)	CDFA Status	Cal-IPC Status
California poppy	<i>Eschscholzia californica</i>	Yes	-	-
Baltic rush	<i>Juncus balticus</i>	Yes	-	-
toad rush	<i>Juncus bufonius</i>	Yes	-	-
lily	<i>Lilium sp.</i>	Yes	-	-
common tule	<i>Scirpus acutus</i>	Yes	-	-
narrow-leaved cattail	<i>Typha angustifolium</i>	Yes	-	-
goatgrass	<i>Aegilops sp.*</i>	No	B	-
slender wild oat	<i>Avena barbata</i>	No	-	M
wild oat	<i>Avena fatua</i>	No	-	M
little quaking grass	<i>Briza minor</i>	No	-	-
ripgut grass	<i>Bromus diandrus</i>	No	-	M
soft brome	<i>Bromus hordeaceus ssp. molliformis</i>	No	-	L
red brome, foxtail chess	<i>Bromus madritensis ssp. rubens*</i>	No	-	H
annual hairgrass	<i>Deschampsia danthonioides</i>	Yes	-	-
saltgrass	<i>Distichlis spicata</i>	Yes	-	-
barnyard grass	<i>Echinochloa crus-galli</i>	No	-	-
blue wildrye	<i>Elymus glaucus</i>	Yes	-	-
Italian ryegrass	<i>Festuca perennis</i>	No	-	M
nit grass	<i>Gastridium phleoides</i>	No	-	-
mannagrass	<i>Glyceria sp.</i>	Yes <sup>1</sup>	-	-
common velvet grass	<i>Holcus lanatus</i>	No	-	M
meadow barley	<i>Hordeum brachyantherum</i>	Yes	-	-
Mediterranean barley	<i>Hordeum marinum sp. gussoneanum</i>	No	-	M
foxtail barley	<i>Hordeum murinum ssp. leporinum</i>	No	-	-
rice cutgrass	<i>Leersia oryzoides</i>	Yes	-	-
Wimmera ryegrass	<i>Lolium rigidum</i>	No	-	-
Dallis grass	<i>Paspalum dilatatum</i>	No	-	-
Lemmon's canarygrass	<i>Phalaris lemmonii</i>	Yes	-	-
annual semaphore grass	<i>Pleuropogon californicus</i>	Yes	-	-
knotroot bristlegrass	<i>Setaria parviflora*</i>	Yes	-	-
johnsongrass	<i>Sorghum halepense</i>	No	C	-

Note: Nomenclature corresponds to the Jepson Manual 2009.

1 Most species of this genus found in CA are native

2 Some species of this genus are native and some are nonnative

3 No reference could be located that addressed whether this species is native

\* = Species observed during the 2009-2010 Tierra Data Inc. surveys, and not included in the INRMP 2002.

Source: Cal-IPC 2006. CDFA 2010. Holton Associates 1987, US Navy 1987, US Navy 2000

California Department of Food and Agriculture (CDFA 2010) Noxious Weed status:

List A - Weed species for which CDFA policies call for eradication, containment or entry refusal.

List B - Widespread species that are difficult to contain; CDFA allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions.

List C - Weeds that are so widespread that CDFA does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

California Invasive Plant Council (Cal-IPC 2006) status:

High - Severe ecological impacts. Moderate to high dispersal rates. Widespread distribution.

Moderate - Substantial ecological impacts. Moderate to high dispersal rates. Limited to widespread distribution. Establishment depends on ecological disturbance.

Limited - Minor ecological impacts. Low to moderate dispersal rates. Limited distribution, but may be locally persistent and problematic.

Table C-2. Wildlife species known to occur on the Naval Radio Transmitter Facility Dixon property .

Common name	Species name	Status*
<b>Amphibians &amp; Reptiles</b>		
California slender salamander	<i>Batrachoseps attenuatus</i>	
western spadefoot	<i>Spea hammondi</i>	CSC
Pacific tree frog	<i>Pseudacris regilla</i>	
western fence lizard	<i>Sceloporus occidentalis</i>	
southern alligator lizard	<i>Elgaria multicarinata</i>	
Pacific gopher snake	<i>Pituophis catenifer catenifer</i>	
<b>Birds</b>		
American avocet	<i>Recurvirostra americana</i>	
American crow	<i>Corvus brachyrhynchos</i>	
American goldfinch	<i>Spinus tristis</i>	
American kestrel	<i>Falco sparverius</i>	
American pipit	<i>Anthus rubescens</i>	
barn owl	<i>Tyto alba</i>	
barn swallow	<i>Hirundo rustica</i>	
black phoebe	<i>Sayornis nigricans</i>	
black-crowned night heron	<i>Nycticorax nycticorax</i>	
black-necked stilt	<i>Himantopus mexicanus</i>	
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	
brown-headed cowbird	<i>Molothrus ater</i>	
bufflehead	<i>Bucephala albeola</i>	
burrowing owl	<i>Athene cunicularium</i>	BCC, SSC
Canada goose	<i>Branta canadensis</i>	
cattle egret	<i>Bubulcus ibis</i>	
common goldeneye	<i>Bucephala clangula</i>	
common merganser	<i>Mergus merganser</i>	
common raven	<i>Corvus corax</i>	
common yellowthroat	<i>Geothlypis trichas</i>	
dunlin	<i>Calidris alba</i>	
European starling	<i>Sturnus vulgaris</i>	
Forster's tern	<i>Sterna forsteri</i>	
gadwall	<i>Anas strepera</i>	
golden-crowned sparrow	<i>Zonotrichia atricapilla</i>	
great blue heron	<i>Ardea herodias</i>	
great egret	<i>Ardea alba</i>	
great horned owl	<i>Bubo virginianus</i>	
greater yellowlegs	<i>Tringa melanoleuca</i>	
horned lark	<i>Eremophila alpestris</i>	
house finch	<i>Carpodacus mexicanus</i>	
house sparrow	<i>Passer domesticus</i>	
killdeer	<i>Charadrius vociferus</i>	
lark sparrow	<i>Chondestes grammacus</i>	
lazuli bunting	<i>Passerina amoena</i>	
least sandpiper	<i>Calidris minutilla</i>	
lincoln's sparrow	<i>Melospiza lincolnii</i>	
loggerhead shrike	<i>Lanius ludovicianus</i>	BCC, SSC
long-billed curlew	<i>Numenius americanus</i>	BCC
long-billed dowitcher	<i>Limnodromus scolopaceus</i>	

Table C-2. Wildlife species known to occur on the Naval Radio Transmitter Facility Dixon property (Continued).

Common name	Species name	Status*
mallard	<i>Anas platyrhynchos</i>	
marsh wren	<i>Cistothorus palustris</i>	
mourning dove	<i>Zenaida macroura</i>	
northern harrier	<i>Circus cyaneus</i>	SSC
northern mockingbird	<i>Mimus polyglottos</i>	
northern rough-winged swallow	<i>Stelgidopteryx serripennus</i>	
northern shoveler	<i>Anas clypeata</i>	
prairie falcon	<i>Falco mexicanus</i>	
purple finch	<i>Carpodacus purpureus</i>	
red-tailed hawk	<i>Buteo jamaicensis</i>	
red-winged blackbird	<i>Agelaius phoeniceus</i>	
ring-billed gull	<i>Larus delawarensis</i>	
rock dove	<i>Columba livia</i>	
savannah sparrow	<i>Passerculus sandwichensis</i>	
snowy egret	<i>Egretta thula</i>	
song sparrow	<i>Melospiza melodia</i>	BCC, SSC
Swainson's hawk	<i>Buteo swainsoni</i>	ST
tree swallow	<i>Tachycineta bicolor</i>	
turkey vulture	<i>Cathartes aura</i>	
western gull	<i>Larus occidentalis</i>	
western kingbird	<i>Tyrannus verticalis</i>	
western meadowlark	<i>Sturnella neglecta</i>	
white-crowned sparrow	<i>Zonotrichia leucophrys</i>	
white-faced Ibis	<i>Plegadis chihi</i>	
white-tailed kite	<i>Elanus leucurus</i>	FP
willet	<i>Tringa semipalmata</i>	
yellow-rumped warbler	<i>Dendroica coronata</i>	
<b>Mammals</b>		
pallid bat	<i>Antrozous pallidus</i>	SSC
big brown bat	<i>Eptesicus fuscus</i>	
hoary bat	<i>Lasiurus cinereus</i>	
western small-footed myotis	<i>Myotis ciliolabrum</i>	
little brown bat	<i>Myotis lucifugus</i>	
Yuma myotis	<i>Myotis yumanensis</i>	
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	
California vole	<i>Microtus californicus</i>	
Western harvest mouse	<i>Reithrodontomys megalotus</i>	
House mouse	<i>Mus musculus</i>	
Deer mouse	<i>Peromyscus maniculatus</i>	
Coyote	<i>Canis latrans</i>	
Striped skunk	<i>Mephitis mephitis</i>	
Raccoon	<i>Procyon lotor</i>	
Desert cottontail	<i>Sylvilagus audubonii</i>	
Black-tailed jackrabbit	<i>Lepus californicus</i>	
California ground squirrel	<i>Spermophilus beecheyi</i>	
Botta's pocket gopher	<i>Thomomys bottae</i>	
Codes:		
Federal Status: FE = Endangered; FT = Threatened; PT = Proposed threatened; CL = Candidate for listing; SC = Species of Concern		
State/CDFG Status: CT = California Threatened; SSC = California species of special concern		

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# Naval Radio Transmitter Facility Dixon

## Integrated Natural Resources Management Plan

# Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon

## J.1 Plants Documented at NRTF Dixon

Table J-1. Plant species documented at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	Native to CA? (Yes/No)	CDFA Status	Cal-IPC Status
<b>Eudicots</b>				
blow-wives	<i>Achyraea mollis</i>	Yes	-	-
Pacific foxtail	<i>Alopecurus saccatus</i>	Yes	-	-
rough pigweed	<i>Amaranthus retroflexus</i>	No	-	-
common fiddleneck	<i>Amsinckia intermedia</i>	Yes	-	-
sparscale	<i>Atriplex prostrata</i>	Yes	-	-
tumbling oracle	<i>Atriplex rosea</i>	No	-	-
Pacific azolla	<i>Azolla filiculoides</i>	Yes	-	-
coyote bush	<i>Baccharis pilularis*</i>	Yes	-	-
common blennosperma	<i>Blennosperma nanum</i>	Yes	-	-
black mustard	<i>Brassica nigra*</i>	No	-	M
red maids	<i>Calandrinia ciliata</i>	Yes	-	-
water-starwort	<i>Callitriche</i> spp.	Yes	-	-
Italian thistle	<i>Carduus pycnocephalus</i>	No	C	M
valley tassels	<i>Castilleja attenuata</i>	Yes	-	-
field orthocarpus	<i>Castilleja campestris</i>	Yes	-	-
yellow star-thistle	<i>Centaurea solstitialis</i>	No	C	H
common spikeweed	<i>Centromadia pungens</i>	Yes	-	-
chicory	<i>Cichorium intybus</i>	No	-	-
yellowspine thistle	<i>Cirsium ochrocentrum</i>	No	A	-
miner's lettuce	<i>Claytonia perfoliata</i>	Yes	-	-
field bindweed	<i>Convolvulus arvensis</i>	No	C	-
California-aster	<i>Corethrogyne filaginifolia*</i>	Yes	-	-
doveweed	<i>Croton setigerus</i>	Yes	-	-
clearwater cryptantha	<i>Cryptantha intermedia</i>	Yes	-	-
Jimson weed	<i>Datura</i> sp.*	Undetermined <sup>2</sup>	-	-
downingia	<i>Downingia</i> sp.	Yes	-	-
willow herb	<i>Epilobium pallustre</i>	Yes	-	-
horseweed	<i>Erigeron canadensis</i>	Yes	-	-
broadleaf filaree	<i>Erodium botrys</i>	No	-	-
redstem filaree	<i>Erodium cicutarium</i>	No	-	L
coyote-thistle	<i>Eryngium vaseyi</i>	Yes	-	-
foxtail fescue	<i>Festuca myuros</i>	No	-	-
cranesbill	<i>Geranium molle</i>	No	-	-
common hedge-hyssop	<i>Gratiola ebracteata</i>	Yes	-	-
seaside heliotrope	<i>Heliotropium curassavicum</i>	Yes	-	-
bristly ox-tongue	<i>Helminthotheca echioides*</i>	No	-	L
hayfield tarweed	<i>Hemizonia congesta</i> ssp. <i>luzulifolia</i>	Yes	-	-
hesperexax	<i>Hesperexax</i> sp.	Yes	-	-
shortpod mustard	<i>Hirschfeldia incana</i>	No	-	-
smooth cat's-ear	<i>Hypochaeris glabra</i>	No	-	L
prickly lettuce	<i>Lactuca serriola</i>	No	-	-

Common Name	Scientific Name	Native to CA? (Yes/No)	CDFA Status	Cal-IPC Status
Burke's goldfields	<i>Lasthenia burkei</i>	Yes	-	-
vernal pool goldfields	<i>Lasthenia fremontii</i>	Yes	-	-
smooth goldfields	<i>Lasthenia glaberrima</i>	Yes	-	-
common tidytips	<i>Layia platyglossa</i>	Yes	-	-
duckweed	<i>Lemna</i> sp.	Yes	-	-
broadleaved pepperweed	<i>Lepidium latifolium</i> *	No	B	H
common peppergrass	<i>Lepidium nitidum</i>	Yes	-	-
biscuitroot	<i>Lomatium</i> spp.	Yes	-	-
birdfoot trefoil	<i>Lotus corniculatus</i>	No	-	-
miniature lupine	<i>Lupinus bicolor</i>	Yes	-	-
tarweed	<i>Madia</i> sp.	Yes	-	-
cheeseweed	<i>Malva parviflora</i>	No	-	-
alkali-mallow	<i>Malvella leprosa</i> (formerly <i>Sida hederacea</i> )	Yes	-	-
hairy pepperwort	<i>Marsilea vestita</i> var. <i>vestita</i>	Yes	-	-
spotted burclover	<i>Medicago arabica</i>	No	-	-
sourclover	<i>Melilotus indicus</i>	No	-	-
tricolor monkeyflower	<i>Mimulus tricolor</i>	Yes	-	-
mouse-tail	<i>Myosurus</i> sp.	Yes	-	-
Eurasian milfoil	<i>Myriophyllum spicatum</i>	No	C	H
whitehead navarretia	<i>Navarretia leucocephala</i>	Yes	-	-
pincushion plant	<i>Navarretia myersii</i>	Yes	-	-
water smartweed	<i>Persicaria amphibia</i>	Yes	-	-
willow weed	<i>Persicaria lapathifolia</i> *	Yes	-	-
slender popcornflower	<i>Plagiobothrys stipitatus</i>	Yes	-	-
English plantain	<i>Plantago lanceolata</i>	No	-	L
mesa mint	<i>Pogogyne zizyphoroides</i>	Unknown <sup>3</sup>	-	-
common knotweed	<i>Polygonum aviculare</i> ssp. <i>depressum</i>	No	-	-
knotweed, smartweed	<i>Polypogon</i> sp.*	Undetermined <sup>2</sup>	-	-
Fremont cottonwood	<i>Populus fremontii</i>	Yes	-	-
long-leaved pondweed	<i>Potamogeton nodosus</i>	Yes	-	-
woolly marbles	<i>Psilocarphus brevissimus</i>	Yes	-	-
buttercup	<i>Ranunculus</i> ssp.	Undetermined <sup>2</sup>	-	-
curly dock	<i>Rumex crispus</i>	No	-	L
Goodding's black willow	<i>Salix gooddingii</i>	Yes	-	-
Russian-thistle	<i>Salsola tragus</i>	No	C	L
milk thistle	<i>Silybum marianum</i>	No	-	L
sow thistle	<i>Sonchus</i> sp.*	No	-	-
common chickweed	<i>Stellaria media</i>	No	-	-
small wirelettuce	<i>Stephanomeria exigua</i>	Yes	-	-
lacepod	<i>Thysanocarpus</i> sp.	Yes	-	-
dwarf sack clover	<i>Trifolium depauperatum</i>	Yes	-	-
rose clover	<i>Trifolium hirtum</i>	No	-	M
tomcat clover	<i>Trifolium willdenovii</i>	Yes	-	-
butter-and-eggs	<i>Triphysaria eriantha</i>	Yes	-	-
broad-leaved cattail	<i>Typha latifolia</i>	Yes	-	-
pulsane speedwell	<i>Veronica peregrina</i> ssp. <i>xalapensis</i>	Yes	-	-
cocklebur	<i>Xanthium strumarium</i>	Yes	-	-
<b>Monocots</b>				
purple nutsedge	<i>Cyperus rotundus</i>	No	B	-
umbrella sedge	<i>Cyperus</i> sp.*	Undetermined <sup>2</sup>	-	-
spikerush	<i>Eleocharis</i> ssp.	Yes <sup>1</sup>	-	-
California poppy	<i>Eschscholzia californica</i>	Yes	-	-
Baltic rush	<i>Juncus balticus</i>	Yes	-	-
toad rush	<i>Juncus bufonius</i>	Yes	-	-
lily	<i>Lilium</i> sp.	Yes	-	-
common tule	<i>Scirpus acutus</i>	Yes	-	-
narrow-leaved cattail	<i>Typha angustifolium</i>	Yes	-	-
goatgrass	<i>Aegilops</i> sp.*	No	B	-
slender wild oat	<i>Avena barbata</i>	No	-	M
wild oat	<i>Avena fatua</i>	No	-	M



Common Name	Scientific Name	Native to CA? (Yes/No)	CDFA Status	Cal-IPC Status
little quaking grass	<i>Briza minor</i>	No	-	-
ripgut grass	<i>Bromus diandrus</i>	No	-	M
soft brome	<i>Bromus hordeaceus</i> ssp. <i>molliformis</i>	No	-	L
red brome, foxtail chess	<i>Bromus madritensis</i> ssp. <i>rubens</i> *	No	-	H
annual hairgrass	<i>Deschampsia danthonioides</i>	Yes	-	-
saltgrass	<i>Distichlis spicata</i>	Yes	-	-
barnyard grass	<i>Echinochloa crus-galli</i>	No	-	-
blue wildrye	<i>Elymus glaucus</i>	Yes	-	-
Italian ryegrass	<i>Festuca perennis</i>	No	-	M
nit grass	<i>Gastridium phleoides</i>	No	-	-
mannagrass	<i>Glyceria</i> sp.	Yes <sup>1</sup>	-	-
common velvet grass	<i>Holcus lanatus</i>	No	-	M
meadow barley	<i>Hordeum brachyantherum</i>	Yes	-	-
Mediterranean barley	<i>Hordeum marinum</i> sp. <i>gussoneanum</i>	No	-	M
foxtail barley	<i>Hordeum murinum</i> ssp. <i>leporinum</i>	No	-	-
rice cutgrass	<i>Leersia oryzoides</i>	Yes	-	-
Wimmera ryegrass	<i>Lolium rigidum</i>	No	-	-
Dallis grass	<i>Paspalum dilatatum</i>	No	-	-
Lemmon's canarygrass	<i>Phalaris lemmonii</i>	Yes	-	-
annual semaphore grass	<i>Pleuropogon californicus</i>	Yes	-	-
knotroot bristlegrass	<i>Setaria parviflora</i> *	Yes	-	-
johnsongrass	<i>Sorghum halepense</i>	No	C	-

Note: Nomenclature corresponds to the Jepson Manual Second Edition (Baldwin et al. 2012).

<sup>1</sup> Most species of this genus found in California are native

<sup>2</sup> Some species of this genus are native and some are nonnative

<sup>3</sup> No reference could be located that addressed whether this species is native

\* = Species observed during the 2009-2010 Tierra Data Inc. surveys, and not included in the INRMP 2002

Sources: Cal-IPC 2006; CDFA 2010; Holton Associates 1987; Navy 1987, 2000c, 2002; Tierra Data Inc. 2012

California Department of Food and Agriculture (CDFA 2010) Noxious Weed status:

List A - Weed species for which CDFA policies call for eradication, containment or entry refusal.

List B - Widespread species that are difficult to contain; CDFA allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions.

List C - Weeds that are so widespread that CDFA does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

California Invasive Plant Council (Cal-IPC 2006) status:

High (H) - Severe ecological impacts. Moderate to high dispersal rates. Widespread distribution.

Moderate (M) - Substantial ecological impacts. Moderate to high dispersal rates. Limited to widespread distribution. Establishment depends on ecological disturbance.

Limited (L) - Minor ecological impacts. Low to moderate dispersal rates. Limited distribution, but may be locally persistent and problematic.

## J.2 Invasive Plant Species Documented at NRTF Dixon

Lists of noxious or invasive weeds are maintained by federal and state agencies and a private nonprofit organization. The U.S. Department of Agriculture noxious weed program and the California Department of Food and Agriculture noxious weed program emphasize weeds that are threats to agriculture, including grazed rangeland. A few species on the state noxious weed lists are native species that are considered agricultural pests. The California Invasive Plant Council (Cal-IPC) maintains lists that emphasize non-native plants that are considered threats to wildlands and native ecosystems. None of the plant species recorded at NRTF Dixon are on the federal noxious weed list.

Table J-2. Noxious or invasive weeds at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	CDFA Status	Cal-IPC Status
goatgrass	<i>Aegilops</i> sp.*	B	-
slender wild oat	<i>Avena barbata</i> *	-	M
wild oat	<i>Avena fatua</i>	-	M
black mustard	<i>Brassica nigra</i> *	-	M
ripgut grass	<i>Bromus diandrus</i>	-	M
soft brome OR foxtail chess	<i>Bromus hordeaceus</i>	-	L
Foxtail brome	<i>Bromus madritensis</i> ssp. <i>rubens</i> *	-	H

Common Name	Scientific Name	CDFA Status	Cal-IPC Status
Italian thistle	<i>Carduus pycnocephalus</i>	C	M
yellow star-thistle	<i>Centaurea solstitialis</i>	C	H
yellowspine thistle	<i>Cirsium ochrocentrum</i>	A	-
field bindweed	<i>Convolvulus arvensis</i>	C	-
purple nutsedge	<i>Cyperus rotundus</i>	B	-
redstem filaree	<i>Erodium cicutarium</i>	-	L
common velvet grass	<i>Holcus lanatus</i>	-	M
Mediterranean barley	<i>Hordeum marinum ssp. gussoneanum</i>	-	M
smooth cat's-ear	<i>Hypochoeris glabra</i>	-	L
broadleaved pepperweed	<i>Lepidium latifolium*</i>	B	H
Italian ryegrass	<i>Lolium multiflorum</i>	-	M
Eurasian milfoil	<i>Myriophyllum spicatum</i>	C	H
bristly ox-tongue	<i>Picris echioides*</i>	-	L
English plantain	<i>Plantago lanceolata</i>	-	L
curly dock	<i>Rumex crispus</i>	-	L
Russian thistle	<i>Salsola tragus</i>	C	L
milk thistle	<i>Silybum marianum</i>	-	L
johnsongrass	<i>Sorghum halepense</i>	C	-
rose clover	<i>Trifolium hirtium</i>	-	M

Note: Nomenclature corresponds to the Jepson Manual Second Edition (Baldwin et al. 2012).

\* = Species observed during the 2009-2010 Tierra Data Inc. surveys, and not included in the INRMP 2002.

Sources: Cal-IPC 2006; CDFA 2010; Holton Associates 1987; Navy 1987, 2000c, 2002; Tierra Data Inc. 2012

California Department of Food and Agriculture (CDFA 2010) Noxious Weed status:

List A - Weed species for which CDFA policies call for eradication, containment or entry refusal.

List B - Widespread species that are difficult to contain; CDFA allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions.

List C - Weeds that are so widespread that CDFA does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

California Invasive Plant Council (Cal-IPC 2006) status:

High (H) - Severe ecological impacts. Moderate to high dispersal rates. Widespread distribution.

Moderate (M) - Substantial ecological impacts. Moderate to high dispersal rates. Limited to widespread distribution. Establishment depends on ecological disturbance

Limited (L) - Minor ecological impacts. Low to moderate dispersal rates. Limited distribution, but may be locally persistent and problematic.

### J.3 Reptiles and Amphibians Documented at NRTF Dixon

Table J-3. Reptile and amphibian species observed at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	Status (Intl/Fed/State)
<b>Reptiles</b>		
garter snake <sup>b</sup>	<i>Thamnophis sp.</i>	n/a
Pacific gopher snake <sup>a, b</sup>	<i>Pituophis catenifer catenifer</i>	n/a
southern alligator lizard	<i>Elgia multicarinata multicarinata</i>	n/a
western fence lizard <sup>c</sup>	<i>Sceloporus occidentalis</i>	n/a
western yellow-bellied racer <sup>a, b</sup>	<i>Coluber constrictor mormon</i>	n/a
<b>Amphibians</b>		
bullfrog <sup>a</sup>	<i>Lithobates catesbeianus</i>	n/a
California slender salamander	<i>Batrachoseps attenuatus</i>	n/a
Pacific treefrog	<i>Pseudacris regilla</i>	n/a
western spadefoot toad <sup>c</sup>	<i>Spea hammondi</i>	- / - /SSC

Codes:

International: None of the reptile or amphibian species documented at NRTF Dixon are on the lists maintained by the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

Federal: None of the reptile or amphibian species have a federal special status.

State: SSC = California Species of Special Concern.

n/a: Not applicable - the species does not have any special status listing.

Sources: CITES 2012; CDFG 2011; Navy 2002; Tierra Data Inc. 2012; Smallwood 2010

<sup>a</sup> = Species recorded in INRMP 2002.

<sup>b</sup> = Species observed by Shawn Smallwood (2010), incidental sighting.

<sup>c</sup> = Species observed during 2009 - 2010 Tierra Data Inc. surveys and not previously recorded at NRTF Dixon.

## J.4 Birds Documented at NRTF Dixon

Table J-4. Bird species observed at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	Status Intl/Fed/State	NRTF Dixon Affiliation
<b>Landbirds</b>			
American crow	<i>Corvus brachyrhynchos</i>	n/a	year round resident, possible breeding
American goldfinch	<i>Spinus tristis</i>	n/a	year round, unknown breeding
American pipit	<i>Anthus rubescens</i>	n/a	winter migrant
American robin a	<i>Turdus migratorius</i>	n/a	year round resident, possible breeding
barn swallow	<i>Hirundo rustica</i>	n/a	summer resident, confirmed breeding at NRTF Dixon
belted kingfisher a	<i>Megaceryle alcyon</i>	n/a	year round, unknown breeding
black phoebe	<i>Sayornis nigricans</i>	n/a	year round resident, possible breeding
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	n/a	year round resident, possible breeding
brown-headed cowbird	<i>Molothrus ater</i>	n/a	year round, unknown breeding
cliff swallow	<i>Petrochelidon pyrrhonota</i>	n/a	summer resident, confirmed breeding at NRTF Dixon
common poorwill b	<i>Phalaenoptilus nuttallii</i>	n/a	summer migrant, unknown breeding
common raven	<i>Corvus corax</i>	n/a	year round resident, possible breeding
common yellowthroat c	<i>Geothlypis trichas</i>	n/a	year round, unknown breeding
dark-eyed junco a	<i>Junco hyemalis</i>	n/a	winter migrant
European starling	<i>Sturnus vulgaris</i>	n/a	year round resident, possible breeding
golden-crowned sparrow b,c	<i>Zonotrichia atricapilla</i>	n/a	winter migrant
horned lark	<i>Eremophila alpestris</i>	n/a	year round resident, possible breeding
house finch	<i>Carpodacus mexicanus</i>	n/a	year round resident, possible breeding
house sparrow	<i>Passer domesticus</i>	n/a	year round resident, possible breeding
lark sparrow b,c	<i>Chondestes grammacus</i>	n/a	year round, unknown breeding
lazuli bunting c	<i>Passerina amoena</i>	n/a	summer migrant, unknown breeding
Lincoln's sparrow	<i>Melospiza lincolni</i>	n/a	year round, unknown breeding
loggerhead shrike	<i>Lanius ludovicianus</i>	-/ BCC/ SSC	year round resident, confirmed breeding at NRTF Dixon
marsh wren	<i>Cistochorus palustris</i>	n/a	year round, unknown breeding
mourning dove	<i>Zenaida macroura</i>	n/a	year round resident, confirmed breeding at NRTF Dixon
northern mockingbird	<i>Mimus polyglottos</i>	n/a	year round resident, possible breeding
northern rough-winged swallow c	<i>Stelgidopteryx serripennis</i>	n/a	summer migrant, unknown breeding
purple finch	<i>Carpodacus purpureus</i>	n/a	migratory
red-winged blackbird	<i>Agelaius phoeniceus</i>	n/a	year round resident, possible breeding
ring-necked pheasant	<i>Phasianus colchicus</i>	n/a	year round resident, possible breeding
rock pigeon	<i>Columba livia</i>	n/a	year round resident, possible breeding
rufous-crowned sparrow c	<i>Aimophila ruficeps</i>	n/a	migratory
savannah sparrow	<i>Passerculus sandwichensis</i>	n/a	year round resident, possible breeding
Say's phoebe b	<i>Sayornis saya</i>	n/a	winter migrant
song sparrow (Modesto pop.)	<i>Melospiza melodia</i>	-/- SSC	year round resident, possible breeding
Swainson's thrush c	<i>Catharus ustulatus</i>	n/a	migratory
tree swallow	<i>Tachycineta bicolor</i>	n/a	summer resident, possible breeding
western kingbird	<i>Tyrannus verticalis</i>	n/a	summer migrant, unknown breeding
western meadowlark	<i>Sturnella neglecta</i>	n/a	year round resident, possible breeding
white-crowned sparrow	<i>Zonotrichia leucophrys</i>	n/a	winter migrant
yellow-billed magpie a	<i>Pica nuttalli</i>	-/ BCC/ -	year round, unknown breeding
yellow-breasted chat c	<i>Icteria virens</i>	-/- SSC	summer migrant, unknown breeding
yellow-rumped warbler	<i>Dendroica coronata</i>	n/a	year round, unknown breeding
<b>Raptors</b>			
American kestrel	<i>Falco sparverius</i>	CITES/ -/ -	year round resident, possible breeding
barn owl	<i>Tyto alba</i>	CITES/ -/ -	year round, unknown breeding
burrowing owl	<i>Athene cunicularia</i>	CITES/BCC/SSC	year round resident, confirmed breeding at NRTF Dixon
ferruginous hawk	<i>Buteo regalis</i>	CITES/ -/ -	winter migrant
great horned owl	<i>Bubo virginianus</i>	CITES/ -/ -	year round resident, confirmed breeding at NRTF Dixon
merlin a	<i>Falco columbarius</i>	CITES/ -/ -	winter migrant
northern harrier	<i>Circus cyaneus</i>	CITES/ -/ SSC	year round resident, possible breeding
prairie falcon	<i>Falco mexicanus</i>	CITES/ -/ -	year round, unknown breeding
red-tailed hawk	<i>Buteo jamaicensis</i>	CITES/ -/ -	year round, unknown breeding
rough-legged hawk a	<i>Buteo lagopus</i>	CITES/ -/ -	winter migrant
short-eared owl a	<i>Asio flammeus</i>	CITES/ -/ SSC	year round, unknown breeding

Common Name	Scientific Name	Status Intl/Fed/State	NRTF Dixon Affiliation
Swainson's hawk	<i>Buteo swainsoni</i>	CITES/ -/ ST	summer resident, confirmed breeding at NRTF Dixon
turkey vulture	<i>Cathartes aura</i>	n/a	year round, unknown breeding
white-tailed kite	<i>Elanus leucurus</i>	CITES/ -/ CFP	year round, unknown breeding
<b>Shorebirds</b>			
American avocet	<i>Recurvirostra americana</i>	n/a	year round, unknown breeding
black-bellied plover <sup>a</sup>	<i>Pluvialis squatarola</i>	n/a	migratory
black-necked stilt	<i>Himantopus mexicanus</i>	n/a	year round, unknown breeding
dunlin	<i>Calidris alpina</i>	n/a	migratory
greater yellowlegs	<i>Tringa melanoleuca</i>	n/a	winter migrant
killdeer	<i>Charadrius vociferous</i>	n/a	year round resident, possible breeding
least sandpiper	<i>Calidris minutilla</i>	n/a	migratory
long-billed curlew	<i>Numenius americanus</i>	-/ BCC/ -	winter migrant
long-billed dowitcher <sup>c</sup>	<i>Limnodromus scolopaceus</i>	n/a	winter migrant
sanderling <sup>a</sup>	<i>Calidris alba</i>	n/a	migratory
western sandpiper <sup>a</sup>	<i>Calidris mauri</i>	n/a	migratory
whimbrel <sup>b</sup>	<i>Numenius phaeopus</i>	-/ BCC/ -	migratory
white-faced ibis <sup>b, c</sup>	<i>Plegadis chihi</i>	n/a	migratory
willet <sup>c</sup>	<i>Tringa semipalmata</i>	n/a	migratory
Wilson's snipe <sup>a, *</sup>	<i>Gallinago delicata</i>	n/a	year round, unknown breeding
<b>Marshbirds</b>			
American bittern <sup>a, b</sup>	<i>Botaurus lentiginosus</i>	n/a	year round, unknown breeding
American coot <sup>a</sup>	<i>Fulica americana</i>	n/a	year round, unknown breeding
black-crowned night-heron	<i>Nycticorax nycticorax</i>	n/a	year round, unknown breeding
cattle egret <sup>c</sup>	<i>Bubulcus ibis</i>	CITES/ -/ -	year round, unknown breeding
great blue heron	<i>Ardea herodias</i>	n/a	year round, unknown breeding
great egret	<i>Ardea alba</i>	n/a	year round, no breeding
snowy egret	<i>Egretta thula</i>	n/a	year round, unknown breeding
<b>Seabirds</b>			
American white pelican <sup>b</sup>	<i>Pelecanus erythrorhynchos</i>	-/ -/ SSC	migratory
black tern <sup>b</sup>	<i>Chlidonias niger</i>	-/ -/ SSC	summer migrant, unknown breeding
California gull <sup>a</sup>	<i>Larus californicus</i>	n/a	winter migrant
double-crested cormorant <sup>a</sup>	<i>Phalacrocorax auritus</i>	n/a	winter migrant
Forster's tern <sup>c</sup>	<i>Sterna forsteri</i>	n/a	summer migrant, unknown breeding
herring gull <sup>a</sup>	<i>Larus argentatus</i>	n/a	migratory
ring-billed gull	<i>Larus delawarensis</i>	n/a	winter migrant
western gull <sup>c</sup>	<i>Larus occidentalis</i>	n/a	migratory
<b>Waterfowl</b>			
American wigeon <sup>a</sup>	<i>Anas americana</i>	n/a	winter migrant
bufflehead <sup>c</sup>	<i>Bucephala albeola</i>	n/a	winter migrant
Canada goose	<i>Branta canadensis</i>	CITES/ -/ -	year round, unknown breeding
canvasback <sup>a</sup>	<i>Aythya valisineria</i>	n/a	winter migrant
cinnamon teal <sup>c</sup>	<i>Anas cyanoptera</i>	n/a	year round, unknown breeding
common goldeneye <sup>c</sup>	<i>Bucephala clangula</i>	n/a	winter migrant
common merganser <sup>c</sup>	<i>Mergus merganser</i>	n/a	winter migrant
gadwall	<i>Anas strepera</i>	n/a	winter migrant
green-winged teal <sup>c</sup>	<i>Anas crecca</i>	CITES/ -/ -	migratory
mallard	<i>Anas platyrhynchos</i>	n/a	year round, unknown breeding
northern pintail <sup>a</sup>	<i>Anas acuta</i>	CITES/ -/ -	year round, unknown breeding
northern shoveler	<i>Anas clypeata</i>	CITES/ -/ -	year round, unknown breeding
pied-billed grebe <sup>a</sup>	<i>Podilymbus podiceps</i>	n/a	year round, unknown breeding
ring-necked duck <sup>a</sup>	<i>Aythya collaris</i>	n/a	winter migrant
ruddy duck <sup>a</sup>	<i>Oxyura jamaicensis</i>	n/a	year round, unknown breeding
snow goose <sup>a</sup>	<i>Chen caerulescens</i>	n/a	winter migrant

**Codes:**

International: CITES = species is included on a list maintained by the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

Federal: BCC = USFWS Birds of Conservation Concern.

State: SSC = California Species of Special Concern; ST = State Threatened; CFP = California Fully Protected.

n/a: Not applicable - the species does not have any special status listing.

**Sources:** CITES 2012; USFWS 2008a; CDFG 2011; CDFW 2013a; Navy 2002; Tierra Data Inc. 2012; Smallwood 2010.\* = Due to taxonomic changes, common snipe (*Gallinago gallinago*) was split into two species: common snipe (*G. gallinago*) in the Old World and Wilson's snipe (*G. delicata*) in North America. This INRMP has renamed the common snipe previously recorded in INRMP 2002 accordingly.

a = Species recorded in INRMP 2002; b = Species observed by Shawn Smallwood. Incidental sighting; c = Species observed during 2009 - 2010 Tierra Data Inc. bird surveys and not recorded in the INRMP 2002.

## J.5 Mammals Documented at NRTF Dixon

Table J-5. Mammal species observed at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	Status Int/Fed/State
big brown bat <sup>b</sup>	<i>Eptesicus fuscus</i>	n/a
Botta's pocket gopher <sup>b</sup>	<i>Thomomys bottae</i>	n/a
black-tailed jackrabbit	<i>Lepus californicus</i>	n/a
California ground squirrel	<i>Spermophilus beecheyi</i>	n/a
California vole	<i>Microtus californicus</i>	n/a
coyote	<i>Canis latrans</i>	n/a
deer mouse	<i>Peromyscus maniculatus</i>	n/a
desert cottontail	<i>Sylvilagus audubonii</i>	n/a
hoary bat <sup>b</sup>	<i>Lasiurus cinereus</i>	n/a
house mouse	<i>Mus musculus</i>	n/a
little brown bat <sup>b</sup>	<i>Myotis lucifugus</i>	n/a
Mexican free-tailed bat <sup>b</sup>	<i>Tadarida brasiliensis</i>	n/a
muskrat <sup>a</sup>	<i>Ondatra zibethicus</i>	n/a
Norway rat <sup>a</sup>	<i>Rattus norvegicus</i>	n/a
ornate shrew <sup>a</sup>	<i>Sorex ornatus</i>	n/a
pallid bat <sup>b</sup>	<i>Antrozous pallidus</i>	- / - / SSC
raccoon	<i>Procyon lotor</i>	n/a
river otter	<i>Lutra canadensis</i>	n/a
striped skunk	<i>Mephitis mephitis</i>	n/a
western harvest mouse	<i>Reithrodontomys megalotis</i>	n/a
western small-footed		
myotis bat <sup>b</sup>	<i>Myotis ciliolabrum</i>	n/a
western spotted skunk <sup>a</sup>	<i>Spilogale gracilis</i>	n/a
Yuma myotis bat <sup>b</sup>	<i>Myotis yumanensis</i>	n/a

**Codes:**

International: None of the mammal species documented at NRTF Dixon are on the lists maintained by the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

Federal: None of the mammal species have a federal special status.

State: SSC = California Species of Special Concern.

n/a: Not applicable - the species does not have any special status listing.

**Sources:** CITES 2012; CDFG 2011; Navy 2002; Tierra Data Inc. 2012

a = Species recorded in INRMP 2002 and not observed during 2009 - 2010 Tierra Data Inc. surveys.

b = Species observed during 2009 - 2010 Tierra Data Inc. small mammal trapping surveys and not previously recorded in INRMP 2002.

## J.6 Special Status Plants Documented or Potentially Occurring at NRTF Dixon

Table J-6. Special status plants inhabiting or potentially inhabiting the vicinity of Naval Radio Transmitter Facility Dixon, California.

Scientific Name	Common Name	Status Fed/State/ CNPS	Presence	Habitat	Known Locations
<i>Astragalus tener</i> var. <i>ferrisiae</i>	Ferris's milk-vetch	-/-1B.1	P	Meadow and seep, valley and foothill grassland (subalkaline flat)	CNDDDB record of this species approximately 0.5 miles southeast of installation's southeast corner.
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk-vetch	-/-1B.2	P	Playas, valley and foothill grassland (adobe clay), vernal pools/alkaline.	CNDDDB record of this species approximately 0.5 miles south of installation's southeast corner.
<i>Atriplex cordulata</i>	heartscale	-/-1B.2	P	Meadows and seeps, valley grassland (sandy)/saline or alkaline.	
<i>Atriplex joaquiniana</i>	San Joaquin spearscale	-/-1B.2	P	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland.	
<i>Chamaesyce hooveri</i>	Hoover's spurge	FT/-1B.2	P	Valley grassland, freshwater wetland, wetland-riparian, vernal pool	Formerly known from region
<i>Deschampsia atropurpurea</i>	mountain hairgrass	-/-4.3	P	Wetland-riparian areas and meadows.	
<i>Fritillaria pluriflora</i>	adobe-lily	-/-1B.2	P	Valley grassland/often adobe	
<i>Gnaphalium heterosepala</i>	Boggs Lake hedge- hyssop	-/SE/1B.2	P	Marsh and swamp (lake margins), vernal pool/clay	
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	woolly rose-mallow	-/-1B.2	P	Marshes and swamps (freshwater)	
<i>Isocoma arguta</i>	Carquinez goldenbush	-/-1B.1	P	Valley and foothill grassland (alkaline)	
<i>Lasthenia burkei</i>	Burke's goldfields	FE/SE/1B.1	C*	Meadows and seeps, vernal pools.	Records are localized to southern Lake, southern Mendocino, and northern Sonoma counties. Presence at NRTF Dixon likely mis-identified during previous surveys.
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE/-1B.1	P	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools/mesic	Critical Habitat designated in the vicinity of NRTF Dixon-south of Vacaville, north of Travis Air Force Base.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	-/-1B.2	P	Marshes and swamps (freshwater and brackish)	
<i>Legenere limosa</i>	false Venus' looking glass, legenere	-/-1B.1	P	Valley grassland, freshwater wetlands, wetland-riparian, vernal-pool	
<i>Lepidium latipes</i> var. <i>heckardii</i>	Heckard's pepper-grass	-/-1B.2	P	Valley grassland (alkaline flats)	CNDDDB record approximately two miles south of the installation.
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	-/SR/1B.1	P	Marsh and swamp (brackish or freshwater), riparian scrub	
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	Baker's navarretia	-/-1B.1	P	Meadow and seep, valley grassland, vernal pool/mesic	

Scientific Name	Common Name	Status Fed/State/ CNPS	Presence	Habitat	Known Locations
<i>Navarretia myersii</i>	pincushion navarretia	-/1B.1	C*	Vernal pools, often acidic.	Fewer than 20 occurrences. Records are localized to foothill vernal pools in Sacramento, Amador, and Merced counties. Presence at NRTF Dixon likely misidentified during previous surveys
<i>Orcuttia pilosa</i>	Hairy Orcutt grass	FE/SE/1B.1	P	Vernal pools	Stanislaus, Madera, Tehama, Merced, Glenn
<i>Neostapfia colusana</i>	Colusa grass	FT/SE/1B.1	P	Valley grassland, freshwater wetland, wetland-riparian, vernal-pool	Jepson Prairie. CH designated in the vicinity of the installation. Documented locations include Colusa, Merced, Solano, Stanislaus counties.
<i>Plagiobothrys hystriculus</i>	bearded popcorn-flower	-/1B.1	P	Valley grassland (mesic), vernal pools margins/often vernal swales	
<i>Tuctoria mucronata</i>	Solano grass, Crampton's tuctoria	FE/SE/1B.1	P	Vernal pools in Solano/Yolo County	Jepson Prairie. CH designated in the vicinity of the installation.

Sources: CDFW 2013b; CNDDDB 2013; CNPS 2013; Holton Associates 1987; Navy 1987, 2000b, 2002; Tierra Data Inc. 2012.

All possible plants are those with CNDDDB recorded sightings within the vicinity of NRTF Dixon.

\* = Presence of pincushion navarretia (*Navarretia myersii*) and Burke's goldfields (*Lasthenia burkei*) was suggested in the INRMP 2002. They were not observed during the Tierra Data Inc. 2009-2010 surveys and their documented ranges do not overlap with NRTF Dixon. They are likely misidentifications during prior surveys.

**Codes**

Federal Status: FE = Endangered; FT = Threatened; PT = Proposed threatened; CL = Candidate for listing

State/CDFW Status: ST = Threatened; SR = State Rare; SSC = California Species of Special concern

Present: P = Potential; C = Confirmed

CNPS Rare Plant Rank: 1B = Plants Rare, Threatened, or Endangered in California and Elsewhere; 4 = Plants of Limited Distribution - A Watch List

CNPS Threat Rank:

0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat);

0.2 = Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

0.3 = Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

## J.7 Special Status Wildlife Species Documented or Potentially Occurring at NRTF Dixon

Table J-7. Federally threatened, federally endangered, and sensitive wildlife species potentially occurring on or in the vicinity of Naval Radio Transmitter Facility Dixon, California.

Scientific Name	Common Name	Status		Presence	Habitat	Known Locations
		Intl/Fed/State				
<b>Invertebrates</b>						
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	-/ FT/ -		P	Grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains, static rain-filled pools. Small, clear-water sandstone-depression pools, grassed swales, earth slumps or basalt-flow depression pools.	Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	-/ FE/ -		P	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Branchinecta conservatio</i>	Conservancy fairy shrimp	-/ FE/ -		P	Endemic to vernal pools in California. Inhabit relatively large and turbid vernal pools called playa pools.	Restricted to the Central Valley, except for one population in the Central Coast in Ventura County. Eight populations throughout the state. The two closest: Yolo Bypass Wildlife Area, Yolo County and Jepson Prairie, Solano County with 14 records. Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	-/ FT/ -		P	Occurs only in the Central Valley of California, in association with blue elderberry ( <i>Sambucus mexicana</i> ). Prefers to lay eggs in elderberry stems two to eight inches in diameter; some preference shown for "stressed" elderberries.	
<i>Elaphrus viridis</i>	delta green ground beetle	-/ FT/ -		P	Typically found along the margins of vernal pools and in bare areas along trails and roadsides, where individuals often hide in cracks in the mud and under low-growing vegetation. Primarily associated with Pescadero clay (the clay base to vernal pools and lakes), the Solano-Pescadero complex, Solano loam, and Pescadero clay loam. Beetles are also known to frequent upland habitat—they have been found hundreds of meters from the nearest shoreline—but only during the wet season.	Rediscovered in 1974 at Jepson Prairie in Solano County. As of 2007, there were 7 extant populations in that area, including Jepson Prairie Preserve, Wilcox Ranch, Calhoun Cut Ecological Reserve, Barker Slough Management Unit, the Michael Remy vernal pool preserve, the Burke Ranch, and Campbell Ranch. Critical Habitat designated in the vicinity of NRTF Dixon.
<b>Fishes</b>						
<i>Hypomesus transpacificus</i>	delta smelt	-/ FT/ SE		P	Require specific environmental conditions and habitat types: freshwater flow; water quality; shallow open waters for migration, spawning, egg incubation, rearing, and larval and juvenile transport from spawning to rearing habitats. Rarely occur in water with more than 10-12 ppt salinity. Preferred temperature range in the lab is 45 to 78 degrees Fahrenheit, though may be found in warmer waters in the Delta. Require nursery habitats in low salinity zones with salinity from 2 to 7 ppt. Feed primarily on small planktonic crustaceans and occasionally on insect larvae.	Endemic to San Francisco Bay and Sacramento-San Joaquin Delta Estuary. Only found from San Pablo Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo Counties. Three-quarters of NRTF Dixon falls within designated Critical Habitat.



Scientific Name	Common Name	Status Intl/Fed/State	Presence	Habitat	Known Locations
<b>Amphibians</b>					
<i>Ambystoma californiense</i>	California tiger salamander	-/ FT/ ST	P	Annual grasslands and grassy understory of valley-foothill hardwood habitats in central and northern California. Requires underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	Critical Habitat designated in the vicinity of NRTF Dixon.
<i>Rana aurora draytonii</i>	California red-legged frog	-/ FT/ SSC	P	Lowlands and foothills in a variety of aquatic, riparian and upland environments near permanent sources of water.	
<i>Spea hammondi</i>	western spadefoot toad	-/ -/ SSC	C	Occurs primarily in grassland environments, but can also be found in valley-foothill hardwood woodlands. Shallow, temporary ponds are used for breeding and egg-laying.	
<b>Reptiles</b>					
<i>Actinemys marmorata</i>	western pond turtle	-/ -/ SSC	P	Permanent or nearly permanent ponds, lakes, streams, irrigation ditches or permanent pools along intermittent streams in a wide variety of habitat types. Require basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks. Omnivorous feeding habits.	
<i>Actinemys marmorata marmorata</i>	northwestern pond turtle	-/ -/ SSC	P	Aquatic habitat of ponds, marshes, streams, and irrigation ditches that have abundant emergent or riparian vegetation.	
<i>Thamnophis gigas</i>	giant garter snake	-/ FT/ ST	P	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches.	
<b>Birds</b>					
<i>Circus cyaneus</i>	northern harrier	CITES/ -/ SSC	C	Uses tall grasses and forbs in wetland, or at wetland/field border, for cover; roosts on ground. Nests on ground in shrubby vegetation, usually at marsh edge. Mostly nests in emergent wetland or along rivers or lakes, but may nest in grasslands, grain fields, or on sagebrush flats several miles from water.	
<i>Elanus leucurus</i>	white-tailed kite	CITES/ -/ CFP	C	Uses herbaceous lowlands with variable tree growth and dense population of voles. Substantial groves of dense, broad-leaved deciduous trees used for nesting and roosting.	
<i>Buteo swainsoni</i>	Swainson's hawk	CITES/ -/ ST	C	Breeds in stands of sparse juniper-sage flats, riparian areas and oak savannahs. Requires adjacent suitable foraging habit such as grasslands, alfalfa or grain fields supporting rodent populations.	
<i>Athene cucularia</i>	burrowing owl	CITES/ BCC/ SSC	C	Burrow sites occur in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester dependent upon burrowing mammals (i.e. California ground squirrel).	
<i>Asio flammeus</i>	short-eared owl	CITES/ -/ SSC	C	Found in open, treeless areas with elevated sites for perches, and dense vegetation (tall grasses, brush, ditches, and wetlands) for roosting and nesting. Nests on dry ground in a depression concealed in vegetation, and lined with grasses, forbs, sticks, and feathers; occasionally nests in a burrow.	

Scientific Name	Common Name	Status		Presence	Habitat	Known Locations
		Intl/Fed/State				
<i>Aquila chrysaetos</i>	golden eagle	- / -	CFP	P	Annual grassland to above timberline forest habitats. Favors grass/forb, shrub/sapling, and open-canopied young woodlands of blue oak. Requires cliffs or large live or dead trees for nesting.	Has been observed perched on powerlines in the vicinity of NRTF Dixon.
<i>Charadrius montanus</i>	mountain plover	- /	BCC/ SSC	P	Short grass plains, low rolling grass hills, freshly plowed agricultural fields and newly sprouting grain fields. Often associated with short vegetation and bare ground.	
<i>Numenius americanus</i>	long-billed curlew	- /	BCC/ -	C	Upland shortgrass prairies and wet meadows are used for nesting; coastal estuaries, open grasslands, and croplands are used in winter.	
<i>Lanius ludovicianus</i>	loggerhead shrike	- /	BCC/ SSC	C	Inhabits open areas with sparse shrubs, trees and other perches.	
<i>Icteria virens</i>	yellow-breasted chat	- / -	SSC	C	Requires riparian thickets of willow and other brushy tangles near watercourses for cover, building nests 2-8 feet above ground.	
<i>Agelaius tricolor</i>	tricolored blackbird	- /	BCC/ SSC	P	Inhabits dense cattail marshes, marshy meadows and rangeland; most numerous in the Central Valley and the vicinity of California.	
<i>Pica nuttalli</i>	yellow-billed magpie	- /	BCC/ -	C	Prefers open oak and riparian woodland, and farm and ranchland with tall trees in the vicinity of grassland, pasture, and cropland. It is omnivorous and opportunistic in its feeding.	A common, yearlong resident of the Central Valley and coastal mountain ranges south from San Francisco Bay to Santa Barbara County.
<i>Pelecanus erythrorhynchos</i>	American white pelican	- / -	SSC	C	Locally uncommon to common on large lakes and estuaries in Central Valley. Rests during the day and roosts at night along water edges, on beaches, sandbars, or old driftwood.	Now nests only at large lakes in Klamath Basin. Migrant flocks pass overhead mostly in spring and fall throughout California.
<i>Chlidonias niger</i>	black tern	- / -	SSC	C	Uses fresh emergent wetlands, lakes, ponds, moist grasslands, and agricultural fields. Often nests in dense wetland vegetation. Needs fresh water while breeding.	
<i>Numenius phaeopus</i>	whimbrel	- /	BCC/ -	C	Prefers flooded fields, wet meadows, croplands and the margins of riverine and lacustrine habitats.	
<i>Melospiza melodia</i>	song sparrow (Modesto population)	- / -	SSC	C	Endemic to California. Affinity for emergent freshwater marshes dominated by tules ( <i>Scirpus</i> ) and cattails ( <i>Typha</i> sp.) as well as riparian willow ( <i>Salix</i> sp.) thickets. Also nest along vegetated irrigation canals and levees.	Resides only in the north-central portion of the Central Valley. Highest densities occur in Butte Sink area of Sacramento Valley and in Sacramento-San Joaquin River Delta.
<b>Mammals</b>						
<i>Antrozous pallidus</i>	pallid bat	- / -	SSC	C	Common in grasslands and desert regions, in California they are associated with oak woodlands at lower elevations and may roost in tree cavities, rock crevices and man-made structures. Yearlong residents in most areas, they travel up to 1.5 miles from their day roost in order to forage.	Occur throughout California, except in the high Sierra Nevada, from Shasta to Kern counties and the northwestern corner of the state.
<i>Sorex ornatus sinuosus</i>	Suisun shrew	- / -	SSC	U	Prefers the dense, low-lying cover of pickleweed ( <i>Salicornia</i> sp.). Less abundant and more restricted in distribution than the salt-marsh harvest mouse.	Occurs only in San Pablo and Suisun bays.

Scientific Name	Common Name	Status		Presence	Habitat	Known Locations
		Intl/Fed/State				
<i>Lasiurus blossevillii</i>	western red bat	- / -	SSC	P	Prefers edges or habitat mosaics that have trees for roosting and open areas for foraging. Roosts primarily in trees often in edge habitats adjacent to streams, fields or urban areas. Preferred roost sites are protected from above, open below and located above dark ground-cover.	
<i>Reithrodontomys raviventris</i>	salt marsh harvest mouse	- /	FE/ SE	U	Pickleweed saline emergent wetland is preferred habitat where it may be locally common. Wetland habitat value increases with depth, density and degree of mixing with fat hen and alkali heath. Grasslands adjacent to pickleweed marsh used only when new grass growth affords suitable cover in spring and summer months.	Mostly restricted to a band extending from San Mateo County and Alameda County south along both sides of San Francisco Bay to Santa Clara County. Isolated populations occur in Marin and Contra Costa Counties.

Sources: CITES 2012; USFWS 2008a; CDFG 2011; CDFW 2013a, 2013b; CNDDDB 2013; Holton Associates 1987; Navy 1987, 2000b, 2002; Tierra Data Inc. 2012.

#### Codes

International Status: CITES = species is included on a list maintained by the Convention on International Trade in Endangered Species of Wild Fauna and Flora.  
 Federal Status: FE = Federally Endangered; FT = Federally Threatened; PT = Proposed threatened; CL = Candidate for listing; BCC = Bird of Conservation Concern  
 State/CDFW Status: ST = State Threatened; SSC = California Species of Special Concern; CFP = California Fully Protected  
 Presence: P = Potential; C = Confirmed; U = Unlikely

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

### Appendix K: Reporting on Migratory Bird Management

Each Integrated Natural Resource Management Plan (INRMP) must address the conservation of birds and their habitat to promote and support migratory birds in compliance with the Migratory Bird Treaty Act (MBTA), Executive Order (EO) 13186, and any subsequent rules and agreements. U.S. Department of the Navy (Navy) policy is that, during annual reviews of INRMPs, installations will discuss with the U.S. Fish and Wildlife Service (USFWS) any conservation measures implemented and the effectiveness of these measures in avoiding, minimizing, or mitigating the “take” of migratory birds (Navy 2006).

#### Department of Defense Migratory Bird Rule and Guidance

The U.S. Department of Defense (DoD) has specific requirements under implementation of MBTA regulations. Following a U.S. District Court decision that granted an injunction on live fire military training on behalf of a private party, Congress enacted the 2003 National Defense Authorization Act, which authorized an interim period during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities. During this interim period, Congress also directed the Secretary of Interior to, not later than one year after enactment of the National Defense Authorization Act, promulgate a regulation to deal with the incidental take of migratory birds in conjunction with military readiness activities from the take prohibition of the MBTA. Under the 2003 National Defense Authorization Bill, the House Armed Services Committee authorized a set of initiatives intended to “restore a balance between protecting the environment and military readiness.” One of these initiatives, regarding the MBTA, stated:

*The MBTA of 1918 is the primary legislation protecting migratory birds; it prohibits the taking or pursuing of migratory birds, their eggs, feathers, or nests. Special guidance and exceptions are included for some game species and some nuisance pests. The USFWS is the soul authority on coordinating and supervising all federal migratory bird management activities.*

The Migratory Bird Treaty Act allows federal agencies to obtain permits to remove migratory birds for economic or safety reasons, such as clearing geese from a golf course or runway. However, a federal court ruled in March 2002 that Navy activities at a training range near Guam violated the MBTA because the court felt that the law does not allow for permits for the accidental taking of birds during military readiness activities. As a result, the court temporarily shut down military training at the facility. In order to ensure that DoD can operate all of its facilities without further interruptions of this nature, the conferees provided the DoD with authority under which the MBTA would not apply to the incidental taking of a migratory bird by DoD during an authorized military readiness activity. In addition, the conferees directed the Secretary of the Interior, with the concurrence of DoD, to exercise its authority within one year to initiate regulations that would exempt DoD from the MBTA for incidental takings of migratory birds during authorized military readiness activities.

The Migratory Bird Rule relates to military readiness activities and was established in accordance with Section 315 of the National Defense Authorization Act for Fiscal Year 2003. The final rule, “Migratory Bird Permits: Take of Migratory Birds by the Armed Forces,” was published as 50 Code of Federal

Regulations (CFR) Part 21 in the 28 February Federal Register (pg. 8931-8950). It authorizes the military to take migratory birds under the MBTA without a permit, but if the military determines that the activity will “significantly” affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize/mitigate the impacts. Currently, operation of the antennas at NRTF Dixon are classified as the only military readiness activity at the installation. Any bird strikes resulting from a collision with the antennas and guy wires at NRTF Dixon would be considered military readiness under the exemption of the Migratory Bird Rule since the antennas facilitate communications of the Navy's Pacific Fleet and, thus, are considered essential to the military mission.<sup>1</sup>

This is different from the USFWS-DoD Memorandum of Understanding (MOU) (Federal Register 30 August 2006) which addresses the conservation of migratory birds on military lands in relation to all activities except readiness. Its guidance covers all activities at NRTF Dixon, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The MOU provides guidance to the DoD for the conservation of migratory birds and does not authorize any take. The key to implementing the MBTA Rule and guidance documents on the MOU between the USFWS and DoD are the wording of the authorization for take that requires an understanding of the definition of the following terms:

- *Population*, as used in Section 21.15, is a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.
- *Significant adverse effect on a population*, used in Section 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is “biologically viable” when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem are not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

In April 2007, guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186 (17 January 2001). This guidance covers all activities on Navy property including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups.

The guidance emphasizes interdisciplinary collaboration in the framework of North American Bird Conservation Initiative Bird Conservation Regions, collaborative inventory, and long-term monitoring.

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<sup>1</sup> Activities to maintain the antennas, such as mowing around them for fire abatement or any repairs of them, would not be considered under the military readiness exemption if such activities were to take or impact migratory birds. Military readiness activity, as defined in Public Law 107-314, § 315(f), 116 Stat. 2458 (Dec. 2, 2002) [Public Law § 319 (c)(1)], “includes all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. It does not include (a) routine operation of installation operating support functions, such as: administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; morale, welfare, and recreation activities; shops; and mess halls, (b) operation of industrial activities, or (c) construction or demolition of facilities listed above.”

Many questions remain about how to implement the Migratory Bird Rule and the new guidance on the USFWS-DoD MOU. For example, how the evaluation of significance needs to be addressed in decision documents is still being worked out. Since the impact assessment must be conducted on populations of migratory birds, there may be a need to collect better population baseline data.

Conservation measures under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces must report to the USFWS any migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

### **Executive Order 13186 and Department of Defense Migratory Bird MOU**

For DoD activities other than military readiness, migratory bird concerns are addressed through an MOU (July 2006) developed in accordance with EO 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds”, signed 10 January 2001. The USFWS-DoD MOU (Federal Register 30 August 2006) that evolved out of the requirements of the EO addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the DoD will conserve migratory birds and does not authorize any take. In April 2007, further guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186. This guidance covers all activities at Naval Radio Transmitter Facility (NRTF) Dixon, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The guidance emphasizes interdisciplinary collaboration in the framework of North American Bird Conservation Initiative Bird Conservation Regions, collaborative inventory and long-term monitoring. The EO directs executive departments to take certain actions regarding the protection of migratory birds.

A Council for the Conservation of Migratory Birds was established to help agencies implement the EO. The EO requires National Environmental Policy Act (NEPA) evaluations to include effects on migratory birds and that advance notice or annual reports must be made to the USFWS concerning actions that result in the taking of migratory birds. The EO also requires agencies to control the establishment of exotic species that may endanger migratory birds and their habitat. Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within Administration budgetary limits, and in harmony with agency missions:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance the habitat of migratory birds, as practicable;
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- Design migratory bird habitat and population conservation principles, measures, and practices into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.), as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;
- Within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance, ensure that agency plans and actions promote programs and

recommendations of comprehensive migratory bird planning efforts such as Partners in Flight (PIF), U.S. National Shorebird Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Plan, and other planning efforts, as well as guidance from other sources, including the Food and Agricultural Organization's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;

- Ensure that environmental analyses of federal actions required by NEPA or other established environmental review processes evaluate the impacts of actions and agency plans on migratory birds, with an emphasis on species of concern;
- Provide notice to the USFWS in advance of conducting an action that is intended to take migratory birds, or annually report to USFWS on the number of individuals of each species of migratory birds intentionally taken during any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control;
- Minimize the intentional take of species of concern by: (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. With respect to intentional take, the MOU shall be consistent with the appropriate sections of 50 CFR parts 10, 21, and 22;
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental impacts of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;
- Within the scope of its statutorily-designated authorities, control the import, export, and establishment in the wild of live exotic animals and plants that may be harmful to migratory bird resources;
- Promote research and information exchange related to the conservation of migratory bird resources, including coordinated inventorying and monitoring and the collection and assessment of information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with USFWS, the U.S. Geological Service-Biological Resources Division, and other appropriate repositories of such data (e.g. the Cornell Laboratory of Ornithology);
- Provide training and information to appropriate employees on methods and means of avoiding or minimizing the take of migratory birds and conserving and restoring migratory bird habitat;
- Promote migratory bird conservation during international activities and with other countries and international partners, in consultation with the Department of State, as appropriate or relevant to the agency's authorities;
- Recognize and promote economic and recreational values of birds, as appropriate; and
- Develop partnerships with non-federal entities to further bird conservation.

### **Assessment of Migratory Bird Reporting Capability**

While conflicts between military mission and migratory bird protection have generally been avoided, questions remain about how to report significant population impacts, if any, under the Migratory Bird



Rule (50 CFR Part 21 - Military Readiness Exemption). Impacts from bird strikes against the antennas at NRTF Dixon are likely minimal. However, data would help to support this conclusion and would enhance the Navy's compliance with the Military Readiness Exemption of the Migratory Bird Rule. Naval Facilities Engineering Command (NAVFAC) Southwest, on behalf of NRTF Dixon, proposes to develop an Avian Protection Plan to monitor bird strikes to demonstrate that there is no significant impact to resident or migratory bird populations, including the frequency of strikes and if particular species are being impacted. Avoidance and minimization measures (such as retrofits to the antennas to reduce strikes) should be implemented as necessary. Focusing routine maintenance of habitat areas (e.g. mowing) outside of the breeding season will also reduce MBTA-related impacts and concerns. If conducting activities during the breeding season, avoidance and minimization measures (such as pre-clearance surveys) should be employed. This is particularly important for grassland species, such as burrowing owls, which nest on the ground in high grass. Passively relocating burrowing owls, and other species as needed, may help to reduce potential threats from installation management activities. In conjunction with a breeding bird survey, an assessment of current and proposed installation management activities and their potential impacts on birds during the breeding season should also be conducted.

NAVFAC Southwest, on behalf of NRTF Dixon, plans to support major bird conservation initiatives where DoD is a partner (EO 13186 and USFWS-DoD MOU). Improved baseline information (nesting, habitat use, etc.) would contribute to these initiatives and improve the installation's ability to analyze impacts when the need arises. Furthermore, habitat value maps could be translated into best management practices and avoidance/minimization measures under NEPA and project review processes, as well as contribute to the Under Secretary of Defense's intent (Memo 3 April 2007) for implementing EO 13186 and promoting the conservation of migratory birds.

### **Migratory Birds and the NRTF Dixon INRMP**

Many natural resources management activities undertaken in this INRMP benefit migratory birds, including pest and predator control, habitat management, erosion control, managing for healthy habitats with minimal human activity, and invasive weed management. In addition, USFWS Birds of Conservation Concern that use NRTF Dixon natural resources are identified. Planned monitoring and regularly scheduled surveys are performed on NRTF Dixon in compliance with the Migratory Bird Rule for all avian groups and potentially affected bird species.

Of all avian species identified to utilize NRTF Dixon, 26 have some special status assigned by government agencies or international convention (Table K-1): Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2012); Birds of Conservation Concern (BCC; USFWS 2008a); California Threatened (ST; California Department of Fish and Wildlife 2013a); Bird Species of Special Concern (SSC; California Department of Fish and Game 2011); California Fully Protected (CFP; California Department of Fish and Game 2011); and also see Appendix J: Species Documented and Special Status Species Potentially Occurring at NRTF Dixon and Section 3.8 Other Special Status Wildlife Species.

Table K-1. Special status bird species observed at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	Status		NRTF Dixon Affiliation
		Intl/Fed/State		
<b>Landbirds</b>				
loggerhead shrike	<i>Lanius ludovicianus</i>	-/ BCC/ SSC		year round resident, confirmed breeding at NRTF Dixon
song sparrow (Modesto pop.)	<i>Melospiza melodia</i>	-/ -/ SSC		year round resident, possible breeding
yellow-billed magpie <sup>a</sup>	<i>Pica nuttalli</i>	-/ BCC/ -		year round, unknown breeding
yellow-breasted chat <sup>c</sup>	<i>Icteria virens</i>	-/ -/ SSC		summer migrant, unknown breeding
<b>Raptors</b>				
American kestrel	<i>Falco sparverius</i>	CITES/ -/ -		year round resident, possible breeding
barn owl	<i>Tyto alba</i>	CITES/ -/ -		year round, unknown breeding
burrowing owl	<i>Athene cunicularia</i>	CITES/BCC/SSC		year round resident, confirmed breeding at NRTF Dixon
ferruginous hawk	<i>Buteo regalis</i>	CITES/ -/ -		winter migrant
great horned owl	<i>Bubo virginianus</i>	CITES/ -/ -		year round resident, confirmed breeding at NRTF Dixon
merlin <sup>a</sup>	<i>Falco columbarius</i>	CITES/ -/ -		winter migrant
northern harrier	<i>Circus cyaneus</i>	CITES/ -/ SSC		year round resident, possible breeding
prairie falcon	<i>Falco mexicanus</i>	CITES/ -/ -		year round, unknown breeding
red-tailed hawk	<i>Buteo jamaicensis</i>	CITES/ -/ -		year round, unknown breeding
rough-legged hawk <sup>a</sup>	<i>Buteo lagopus</i>	CITES/ -/ -		winter migrant
short-eared owl <sup>a</sup>	<i>Asio flammeus</i>	CITES/ -/ SSC		year round, unknown breeding
Swainson's hawk	<i>Buteo swainsoni</i>	CITES/ -/ ST		summer resident, confirmed breeding at NRTF Dixon
white-tailed kite	<i>Elanus leucurus</i>	CITES/ -/ CFP		year round, unknown breeding
<b>Shorebirds</b>				
long-billed curlew	<i>Numenius americanus</i>	-/ BCC/ -		winter migrant
whimbrel <sup>b</sup>	<i>Numenius phaeopus</i>	-/ BCC/ -		migratory
<b>Marshbirds</b>				
cattle egret <sup>c</sup>	<i>Bubulcus ibis</i>	CITES/ -/ -		year round, unknown breeding
<b>Seabirds</b>				
American white pelican <sup>b</sup>	<i>Pelecanus erythrorhynchos</i>	-/ -/ SSC		migratory
black tern <sup>b</sup>	<i>Chlidonias niger</i>	-/ -/ SSC		summer migrant, unknown breeding
<b>Waterfowl</b>				
Canada goose	<i>Branta canadensis</i>	CITES/ -/ -		year round, unknown breeding
green-winged teal <sup>c</sup>	<i>Anas crecca</i>	CITES/ -/ -		migratory
northern pintail	<i>Anas acuta</i>	CITES/ -/ -		year round, unknown breeding
northern shoveler	<i>Anas clypeata</i>	CITES/ -/ -		year round, unknown breeding

**Codes:**

International: CITES = species is included on a list maintained by the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

Federal: BCC = USFWS Birds of Conservation Concern.

State: SSC = California Species of Special Concern; ST = State Threatened; CFP = California Fully Protected.

**Sources:** CITES 2012; USFWS 2008a; CDFG 2011; CDFW 2013a; Navy 2002; Tierra Data Inc. 2012; Smallwood 2010.

The following management measures are implemented by this INRMP:

## Objective 1

Minimize impacts to migratory bird populations from installation activities, as practicable. Protect and restore key habitats, where feasible, for migratory and resident birds at NRTF Dixon, concentrating on grassland and wetland areas.

### Parameters

- I. Protect migratory bird populations by avoiding and minimizing impacts to birds using conservation principles, standards, and practices, as compatible with mission requirements (EO 13186).
  - A. Comply with the military readiness MBTA-Migratory Bird Rule by developing and implementing conservation measures for the effects of military readiness activities on migratory birds if there may be a significant adverse impact on a migratory bird population.
    1. Prepare an Avian Protection Plan. Its primary function would be to monitor bird strikes against the antennas and their guy wires to assess if there is a significant impact to resident and

migratory bird populations and to facilitate any reporting that may be required per 50 CFR Part 21 Migratory Bird Rule. It should also include monitoring and assessment strategies for other activities identified as potentially impacting resident and migratory birds, such as pesticide applications and mowing treatments. Develop management measures as needed.

- B.** Comply with the MBTA for non-readiness activities. Conduct an assessment of non-readiness activities that could impact resident or migratory birds on the installation and apply avoidance and minimization measures for those activities if they pose any threat. As feasible, avoid activities in areas with known nesting birds during the breeding season to avoid take.
  - C.** Implement installation-level Best Management Practices (BMPs) for migratory bird protection based on the resources and data available. These BMPs should ensure the protection and conservation of species protected under the MBTA during tree removal and maintenance activities and during construction, demolition, renovation, and maintenance activities at NRTF Dixon through coordination with the appropriate office/department.
  - D.** Identify and protect key nesting areas, migration routes, important prey base areas, and concentration for birds of prey by employing avoidance and minimization measures during NEPA compliance and the site approval process. Consider nesting areas and sensitive wildlife concentration areas.
- II.** Implement habitat-based strategies for conservation of migratory birds (EO 13186). Identify and map high-value habitats for management focus birds at NRTF Dixon. Improvements should consider the importance of wetlands for birds, controlling invasive species, and promoting habitat structural diversity.
  - III.** Consider installing raptor nesting platforms to encourage raptor use of the installation.
  - IV.** Develop and enhance conservation partnerships to further the work of bird conservation (EO 13186; DoD-USFWS MOU; Undersecretary of Defense Memo [2007], Sikes Act [as amended]).
    - A.** Use cooperative assistance from wildlife agencies, organizations, and volunteers to help collect needed data.

*DoD policy states that migratory bird programs shall be established in support of and consistent with the military mission. Two ventures, the PIF and the Riparian Habitat Joint Venture (RHJV) were created to protect songbird populations and conserve habitat to stop their decline. The DoDPIF is a coordinated framework for incorporating migratory bird habitat management efforts into INRMPs (DoDPIF 2007). California PIF (2000) and RHJV (2004) are regional PIF plans applicable to NRTF Dixon that guide its participation in the DoDPIF partnership program. The DoD's strategy focuses on inventory, on-the-ground management practices, education, and long-term monitoring (DoD 4715.DD-R 1996).*

## Objective 2

Continue to monitor avian use of NRTF Dixon to improve the inventory and inform on population trends and distributions, as well as to facilitate and guide natural resource management decisions.

### Parameters

- I.** Conduct inventory and monitoring regularly for the adaptive management of birds, focusing on BCC and other indicator species. Consider establishing survey walking transects in appropriate habitat to promote consistency across surveys and monitoring.
  - A.** Conduct an installation-wide avian survey every five years. Continue to maintain and update the installation bird checklist, by season, of birds occurring on NRTF Dixon or in the vicinity.

- B. Report to the national military database DoD Bird Conservation Database (<http://www.dodpif.org/projects/>) the results of bird surveys, research and monitoring, and species accounts.
  - C. Conduct a focused breeding bird survey to better assess the distribution and abundance of species breeding at NRTF Dixon.
  - D. Conduct surveys of burrowing owl populations on NRTF Dixon and implement species-specific management strategies as practicable (Section 3.8 Other Special Status Wildlife Species).
- II. Monitor the effectiveness of bird management practices and adjust management strategies, as appropriate. Identify management focus species that could be affected by installation activities.

*Coordination with the DoD Coordinated Bird Monitoring Plan includes an approach that is driven by installation issues; considers quantitative methods; coordinates with other initiatives and with natural resource managers; is consistent with the DoD plan for monitoring species of concern on DoD lands; and considers the DoD role in continental bird monitoring programs (EO 13186; DoD-USFWS MOU; Under Secretary of Defense Memo 2007).*

### Objective 3

Conduct species level surveys that target the presence of special status species in the habitats where they may occur.

#### Parameters

- I. Fund and conduct surveys for special status species, using established methodology and qualified biologists certified to conduct special status species surveys.
- II. Incorporate data into natural resource management and Geographical Information System databases.

### Objective 4

Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings, to establish a foundation for potential future partnerships and as a way to monitor habitat health.

#### Parameters

- I. Based on results of surveys, species warranting Navy consideration and the habitats that support them should be protected to the extent practicable.
  - A. Use species information and their habitat requirements to guide the development of project-specific BMPs.
  - B. Maintain contact with regional specialists and regulatory agencies regarding the listing status of unique species known or thought to occur on NRTF Dixon.
  - C. Stay updated on agency decisions, published material, and meetings that change the listing status of species.
  - D. Ensure environmental review adequately considers impacts to special status species so that avoidance and minimization measures can be properly implemented.
- II. Continue to resolve baseline biological data gaps.

- A.** Support ongoing and new research on distribution and ecology of species warranting Navy stewardship. Seek opportunities to partner with academic institutions and other outside researchers to facilitate natural resource data collection.
  - B.** Continue to inventory, monitor, and map existing species warranting Navy stewardship.
- III.** Develop species-specific management measures for special status species known to breed on the installation, particularly the burrowing owl and Swainson's hawk.
  - A.** Develop management strategies and priorities for the burrowing owl at NRTF Dixon as part of an overall habitat management plan for the installation.
  - B.** Comply with the MBTA and protect burrowing owls and Swainson's hawks from disturbance from routine maintenance and construction (Section 3.5.5 Birds). Incorporate avoidance and minimization measures from the CDFW staff report for the burrowing owl (California Department of Fish and Game 2012), including use of exclusion zones, where necessary.<sup>2</sup>
  - C.** In concert with improving burrowing owl habitat at NRTF Dixon, remove the artificial burrows and burrow mounds that have deteriorated and are no longer used. Encourage their use of the installation away from areas critical to the military mission and from infrastructure, buildings, and antennas to preserve their integrity and functionality.
  - D.** Provide adequate protection to burrowing owls from pest predators that are known to dig up burrows.
  - E.** Ensure that environmental review for any change in agricultural practice adequately considers impacts to Swainson's hawk and other sensitive species so that avoidance and minimization measures can be properly implemented.
  - F.** Install raptor nesting platforms in appropriate areas, compatible with the military mission, to complement existing trees as suitable nesting habitat for Swainson's hawk and other birds of prey.
- IV.** Seek opportunities to develop partnerships with institutions, organizations, and other researchers to develop and improve knowledge and management of special status species at NRTF Dixon and to contribute to regional initiatives for those species.

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<sup>2</sup> Available online at: <http://www.dfg.ca.gov/wildlife/nongame/docs/BUOWStaffReport.pdf>

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# Naval Radio Transmitter Facility Dixon

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## Integrated Natural Resources Management Plan

# Appendix L: Reporting on Benefits for Endangered Species and Critical Habitat Concerns

## L.1 Introduction

The objective of this Appendix is to identify, within the Integrated Natural Resources Management Plan (INRMP), all management and conservation efforts for a federally listed species that the U.S. Fish and Wildlife Service (USFWS) would need to consider in making a determination under the Sikes Act (as amended) not to designate Critical Habitat on an installation. This will speed the review process by identifying potential projects/actions for the installation, allowing the USFWS to obviate the need to designate Critical Habitat on military installations.

This appendix addresses the following considerations:

- The current status of Critical Habitat at Naval Radio Transmitter Facility (NRTF) Dixon;
- A description of the current and potential populations of federally listed species at NRTF Dixon, including a description of the areas exhibiting Primary Constituent Elements (PCEs) for federally listed species with designated or proposed Critical Habitat; and
- The details of the INRMP's plan that: (1) provide a conservation benefit to a federally listed species; (2) provide certainty that the management plan will be implemented; and (3) provide certainty that the conservation effort(s) will be effective.

It is possible that other federally listed species previously undocumented at NRTF Dixon exist on the installation. Until they are confirmed present, they are addressed here insofar as habitat management activities that would benefit them. In addition, implementation of an INRMP ecosystem approach at NRTF Dixon is discussed as it regards contributions to achieving a habitat management-first strategy to benefit federally listed species.

### NRTF Dixon Habitat Management Approach

The primary objective of the natural resources program is to ensure continued access to land required to accomplish the Navy's mission by maintaining these resources in a healthy condition. As a part of this program, the goals and objectives of NRTF Dixon's federally endangered, threatened and sensitive species management are to protect, conserve, and enhance those populations in accordance with all applicable federal and Navy regulations. This is critical to the mission because biodiversity conservation contributes to overall ecosystem integrity and sustainability, which in turn supports the military mission by maintaining natural landscapes for realistic military operations. Habitat management and enhancement activities proposed in this INRMP would benefit the native and natural condition of native habitats at NRTF Dixon that could support such species.

Programs to protect endangered, threatened, and sensitive species and their associated habitats are budgeted and supported by NRTF Dixon and Commander, Navy Region Southwest. Management of federally listed threatened and endangered species will continue to be accomplished by managing land uses in close coordination with the USFWS and with other appropriate land managers. Any action that may potentially affect (positively or negatively) the continued existence of a federally endangered or threatened species must undergo consultation with the USFWS (Section 4.7: Natural Resources Consultation Planning). Management programs are coordinated with the USFWS as appropriate and required. Informal consultation is undertaken on a case-by-case basis by Naval Engineering Facilities Command (NAVFAC) Southwest on behalf of NRTF Dixon.

## **L.2 Critical Habitat - Designated, Proposed, and Exempted**

Currently, there is designated Critical Habitat for the delta smelt (*Hypomesus transpacificus*) on three-quarters of the installation (Map L-1). The delta smelt Critical Habitat boundary coincides with the boundary of the Delta Protection Act of 1959 in the upper watershed of the San Joaquin Delta in which NRTF Dixon is located. The delta smelt is not known to occur at NRTF Dixon.

## **L.3 Current Populations, Habitat and Primary Constituent Elements of Federally Listed Species at NRTF Dixon**

### **L.3.1 Delta Smelt (Federally Threatened and State Endangered)**

It is unlikely that habitat conditions suitable for delta smelt exist at NRTF Dixon and that a population of this species currently uses resources at the installation. However, it is possible that aquatic habitats on NRTF Dixon do connect, at least occasionally, to the San Joaquin Delta through a slough at the southeast corner of the installation (Section 3.7: Threatened and Endangered Species and Critical Habitat).

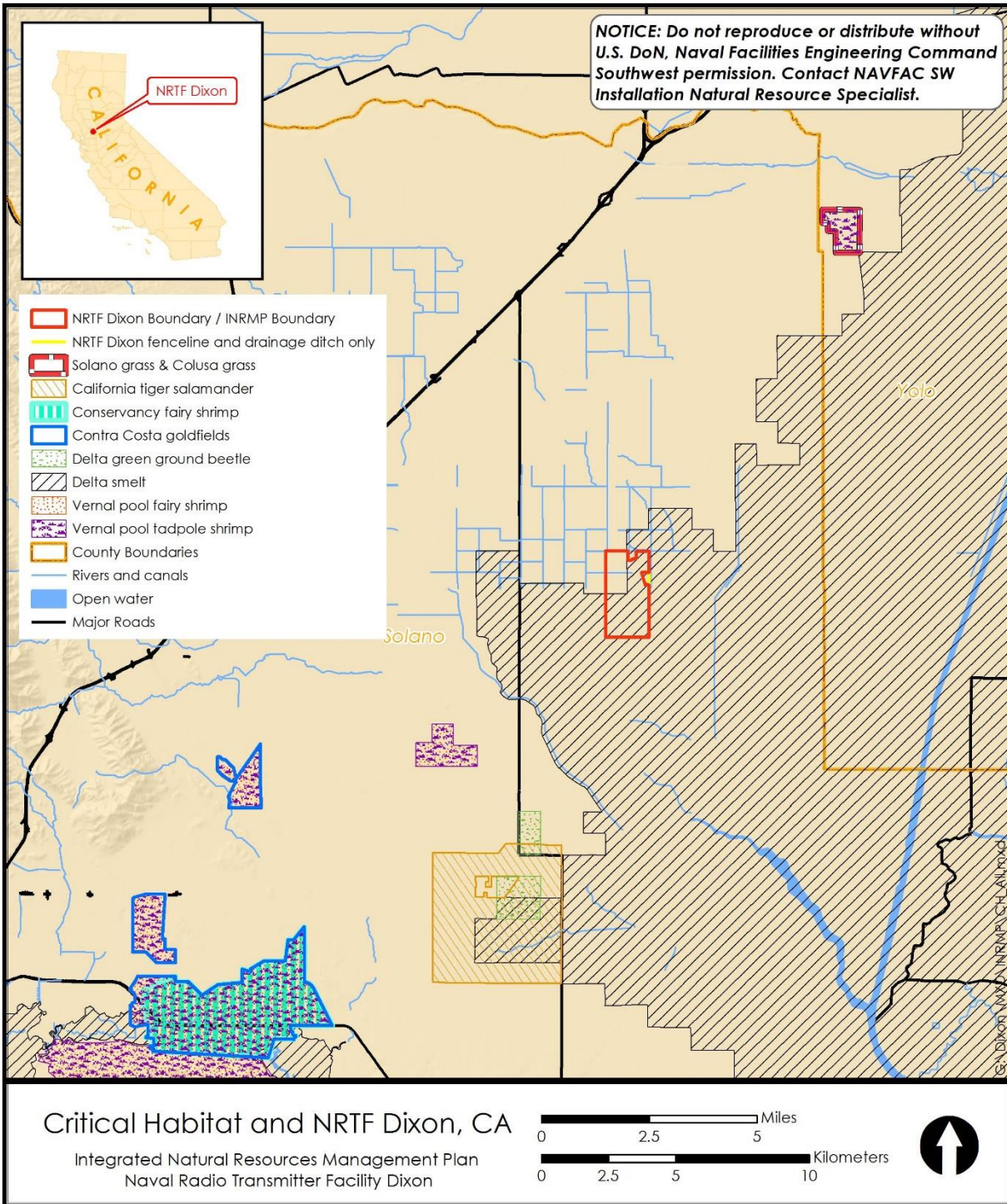
Management for delta smelt Critical Habitat at NRTF Dixon is achieved through management of the installation's habitats and resources, primarily its aquatic resources and wetlands. Habitat management and enhancement activities proposed in this INRMP would improve the native and natural condition of wetland and aquatic habitat at NRTF Dixon and thus would help to avoid negative influence on any downstream delta smelt habitat that may be connected to installation habitats.

Table L-1 states the PCEs for this species as defined by the USFWS and describes the habitat at NRTF Dixon that might fit these categories. Recent meetings with the USFWS and NAVFAC Southwest have determined that no PCEs necessary for the delta smelt are present on NRTF Dixon.

### **L.3.2 Federally Listed Species Potentially Present at NRTF Dixon**

Baseline surveys conducted since those that contributed to the 2002 NRTF Dixon INRMP have not documented the presence of any new federally listed species on the installation (Tierra Data Inc. 2012). Protection of and management for any as yet undocumented federally threatened and endangered species populations at NRTF Dixon continues through management of potentially suitable habitat and resources on the installation. Table L-2 identifies federally listed species that could potentially occur at NRTF Dixon, based on presence of species and designation of Critical Habitat for them at locations in the vicinity of the installation.





Map L-1. Critical Habitat designation on and in the vicinity of Naval Radio Transmitter Facility Dixon, California.<sup>1</sup>

<sup>1</sup> All maps in the INRMP were compiled by Tierra Data Inc., except if noted, using data believed to be accurate at the time of publication. However, a degree of error is inherent in all maps. The maps are distributed "AS-IS," without warranties of any kind, either expressed or implied, including, but not limited to, warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of the maps to define the limits or jurisdiction of any federal, state, or local government. The maps are intended for use only at the published scale. Detailed on-the-ground surveys and historical analyses of sites may differ from the maps.

*Table L-1. Primary Constituent Elements for the Delta Smelt at Naval Radio Transmitter Facility Dixon, California.*

Primary Constituent Elements	Conditions on NRTF Dixon, California
<p>The PCEs for the delta smelt determined by the USFWS are presented below as the USFWS identifies them according to required habitat characteristics. The USFWS also discusses them in detail according to their role in supporting the different life stages of the delta smelt: Spawning Habitat, Larval and Juvenile Transport, Rearing Habitat, and Adult Migration. Three historical reference points (Sacramento-San Joaquin River confluence, upstream limit of Suisun Bay at Chipps Island, and middle of Suisun Bay at Roe Island) were used to develop these PCEs (reference year: 1968).</p> <p>The USFWS also emphasizes maintenance of the naturally-occurring variability found in healthy estuarine ecosystems to support recovery of the delta smelt.</p>	<p>Connection of NRTF Dixon water resources and aquatic habitats to the Delta is unknown. There is a slough in the southeast corner of the installation. Future investigations should determine if a connection exists, and if so, (a) if it would reasonably allow delta smelt access to the installation and if this is likely, and/or (b) how habitat management actions on the installation may affect (downstream) delta smelt habitat.</p>
<p><b>(1) Salinity Concentrations Required to Maintain Delta Smelt Habitat for Spawning, Larval and Juvenile Transport, Rearing, and Adult Migration</b></p> <p>Delta smelt are euryhaline (tolerate a wide range of salinities) species; however, they rarely occur in water with more than 10-12 parts per thousand salinity (about one-third seawater). The species spends a large part of its annual life span in the freshwater edge of the mixing zone (zone of mixing or entrapment at the saltwater-freshwater interface). Delta smelt larvae move downstream (after hatching in upstream Delta waters) until they reach nursery habitat in the "low salinity zone" where the salinity ranges from approximately 2 to 7 parts per thousand. Maintenance of the 2 parts per thousand isohaline according to the historical conditions (reference point: 1968) and suitable water quality (low concentrations of pollutants) is necessary to support delta smelt larvae and juveniles in their rearing habitat, and to complement other elements of required habitats to support the species in its different life stages (described below).</p>	<p>Given the location of NRTF Dixon within the San Joaquin Delta, it is likely that delta smelt would only be found in the area during the spawning period. The NRTF Dixon region of the Delta is not located within the mixing zone.</p> <p>Salinity of NRTF Dixon aquatic habitats is unknown.</p>
<p><b>(2) Physical Habitat: Shallow Open Waters and Water Quality in Spawning Habitat</b></p> <p>Delta smelt spawn in shallow, fresh or slightly brackish water upstream of the mixing zone, mostly in tidally-influenced backwater sloughs and channel edgewater. Such protective, food-rich environments are needed to provide delta smelt an environment in which to mature to adulthood. To ensure egg hatching and larval viability, they should also provide suitable water quality (low concentrations of pollutants) and substrates for egg attachments (e.g. submerged tree roots and branches and emergent vegetation).</p> <p>Areas identified as important for delta smelt spawning habitat include Barker, Lindsey, Cache, Prospect, Georgiana, Beaver, Hog, and Sycamore sloughs and the Sacramento River in the Delta and the tributaries of northern Suisun Bay.</p>	<p>Irrigation ditches within and along the perimeter of NRTF Dixon are shallow and open. Vernal pool wetland habitats in the natural resource management area of the installation only have shallow and open standing water during the wet season.</p> <p>Spawning of the delta smelt has been known to occur in Cache Slough approximately 7 miles south of NRTF Dixon. Haas Slough, which is approximately a little over one mile south of NRTF Dixon, connects to Cache Slough.</p>
<p><b>(3) Water and River Flow: Freshwater Flow and Water Quality for Larval and Juvenile Transport and Adult Migration</b></p> <p>Delta smelt probably evolved within the naturally turbid (silt and particulate-laden) environment of the Delta and likely rely on certain levels of background turbidity at different life stages and for certain behaviors. For example, delta smelt are thought to require a turbid environment for efficient, successful foraging and to avoid predators; laboratory studies found that delta smelt larval feeding increased with increased turbidity. Adequate river flow is also necessary to transport larvae from upstream spawning areas to their shallow, productive rearing or nursery habitat.</p> <p>Unrestricted access to suitable spawning habitat in a period that may extend from December to July must also be provided. Adequate flow and suitable water quality (low concentrations of pollutants) may need to be maintained to attract migrating adults.</p> <p>Channels and tributaries that provide such transport or avenues for migration must be protected from physical disturbance and flow disruption and also prevent interception of larval transport by the State and Federal water projects and smaller agricultural diversions of the Delta.</p>	<p>Irrigation ditches within and along the perimeter of NRTF Dixon and the vernal pool wetland areas in the natural resource management area are not turbid, but rather standing water bodies/habitats.</p>
<p><b>Sources:</b>                      Federal Register / Vol. 75, No. 66 / Wednesday, April 7, 2010 / Proposed Rules Page 17667 "Endangered And Threatened Wildlife and Plants; 12-Month Finding on a Petition to Reclassify the Delta Smelt From Threatened to Endangered Throughout Its Range."                      Federal Register / Vol. 59, No. 242 / Monday, December 19, 1994 / Rules and Regulations Page 65256 "Endangered and Threatened Wildlife and Plants; Critical Habitat Determination for the Delta Smelt."</p>	

Table L-2. Federally listed species that potentially could occur at Naval Radio Transmitter Facility Dixon, California.

Common Name	Scientific Name	Federal/State/CNPS Status	Presence at NRTF Dixon	Critical Habitat (CH) Designated? (Map 3-10)
Colusa grass	<i>Neostapfia colusana</i>	FT/SE/1B.1	Not documented.	Yes. CH designated approximately 10 miles northeast of NRTF Dixon at Yolo County Grasslands Regional Park. Also positively identified at Jepson Prairie Preserve, approximately 5 miles southwest of NRTF Dixon, although CH is not designated there.
Solano grass (Crampton's tuctoria)	<i>Tuctoria mucronata</i>	FE/SE/1B.1	Not documented.	Yes. CH designated approximately 10 miles northeast of NRTF Dixon at Yolo County Grasslands Regional Park.
Contra Costa goldfields	<i>Lasthenia conjugens</i>	FE/ - /1B.1	Not documented.	Yes. CH designated on lands surrounding Travis Air Force Base, approximately 10–12 miles southwest of NRTF Dixon.
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE/ - / -	Not documented.	Yes. CH designated on lands just south of Travis Air Force Base, approximately 12 miles southwest of NRTF Dixon.
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT/ - / -	Not documented.	Yes. Multiple subunits throughout California and Oregon. The closest to NRTF Dixon are located 10 miles northeast (Yolo County Grasslands Regional Park) and 5 miles southwest of the installation.
vernal pool tadpole shrimp	<i>Lepidurus packardi</i>	FE/ - / -	Not documented.	Yes. Multiple subunits throughout California, some of which coincide with vernal pool fairy shrimp critical habitat. The closest to NRTF Dixon are to the southwest, including the same area 5 miles southwest of the installation as described for the vernal pool fairy shrimp.
delta green ground beetle	<i>Elaphrus viridis</i>	FT/ - / -	Not documented.	Yes. Two vernal pools in Solano County, south of the City of Dixon. Located approximately 5 miles south and slightly west of NRTF Dixon.
delta smelt	<i>Hypomesus transpacificus</i>	FT/SE/ -	Not documented.	Yes. CH coincides with the boundary of the Delta Protection Act of 1959 in the upper watershed of the San Joaquin Delta in which three-quarters of NRTF Dixon is located.
giant garter snake	<i>Thamnophis gigas</i>	FT/ST/ -	Reported sighting, but presence unconfirmed by an expert.	None.
California tiger salamander (Central Population)	<i>Ambystoma californiense</i>	FT/ST/ -	Not documented.	Yes. CH designated on 5,699 acres at Jepson Prairie Preserve, located approximately 6 miles southwest of NRTF Dixon, among other areas throughout the Central Valley. This unit represents the northwestern portion of the species' distribution.

**Codes:** FE = Federally Endangered, FT = Federally Threatened, SE = State Endangered, ST = State Threatened  
 CNPS Rare Plant Rank 1B = Plants Rare, Threatened or Endangered in California and Elsewhere  
 CNPS Threat Rank 0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

**Sources:**

CDFW 2013a, CDFW 2013b, CNPS 2013  
 Colusa grass, Solano grass, Contra Costa goldfields, Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp Critical Habitat: USFWS 11 August 2005.  
 Delta Green Ground Beetle Critical Habitat: USFWS 08 August 1980.  
 Delta Smelt Critical Habitat: USFWS 19 December 1994.  
 California Tiger Salamander Critical Habitat: USFWS 23 August 2005.

Table L-3, Table L-4, Table L-5, and Table L-6 state the PCEs for these species as defined by the USFWS and describes the habitat at NRTF Dixon that would be most likely fit these categories.

*Table L-3. Primary Constituent Elements for Colusa grass, Solano grass, and Contra Costa Goldfields at Naval Radio Transmitter Facility Dixon, California.*

Primary Constituent Elements	Conditions on NRTF Dixon, California
<p><b>(1) Topographic Features in a Matrix of Uplands that Connect Depressional Features, Providing for Dispersal and Hydroperiods</b></p> <p>Topographic features characterized by isolated mound and intermound complex within a matrix of surrounding uplands that result in continuously, or intermittently, flowing surface water in the depressional features including swales connecting the pools described in PCE (2), providing for dispersal and promoting hydroperiods of adequate length in the pools.</p>	<p>The vernal pool habitat in the installation’s natural resource management area contains some swales and mounds within a matrix of grasslands that provide for connectivity of the vernal pools there. The degree to which flowing surface water is supported is unknown.</p>
<p><b>(2) Depressional Features that Hold Water to Promote Successful Reproduction of Annual Native Wetland Species</b></p> <p>Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and typically exclude both native and non-native upland plant species in all but the driest years. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands.</p>	<p>Vernal pools are present in the installation’s natural resource management area. They are underlain by Capay clay and Antioch Ysidro complex soil types and are inundated during winter rains and hold water for periods greater than 18 days. They are not permanently flooded. NRTF Dixon’s seasonally inundated vernal pools are dominated by Stalked popcornflower (<i>Plagiobothrys stipitatus</i>) association, which is a native annual. Other seasonally inundated areas include: Coyotethistle (<i>Eryngium vaseyi</i>) alliance, a native perennial herb; and Broadleaved pepperweed (<i>Lepidium latifolium</i>)-Coyotethistle association. Although broadleaved pepperweed is a non-native invasive perennial herb, its cover is less dense in the swale running through the management area and appears to be restricted to areas that receive higher amounts of water. It is possible there are additional vernal pools on the installation, some of which may be suitable for Colusa grass, Solano grass, and Contra Costa goldfields, which are not yet reflected in the most recent NRTF Dixon wetland survey.</p>

**Source:**  
 Federal Register / Vol. 70, No. 154/ Thursday, August 11, 2005/ Rules and Regulations Page 46924 “Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Evaluation of Economic Exclusions From August 2003 Final Designation.”

*Table L-4. Primary Constituent Elements for the Conservancy Fairy Shrimp, Vernal Pool Fairy Shrimp, and Vernal Pool Tadpole Shrimp at NRTF Dixon, California.*

Primary Constituent Elements	Conditions on NRTF Dixon, California
<p>Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp occupy a variety of vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. While there are many observations of the environmental conditions where conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp have been found, specific pool characteristics that determine suitability for vernal pool fairy shrimp hatching, growth, and reproduction are not well understood (USFWS 11 August 2005).</p> <p>The PCEs of critical habitat for conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp are the habitat components that provide the following:</p>	
<p><b>(1) Topographic Features in a Matrix of Uplands that Connect Depressional Features, Providing for Dispersal and Hydroperiods</b></p>	
<p>Topographic features characterized by mounds and swales, and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools described in PCE (2), providing for dispersal and promoting hydroperiods of adequate length in the pools.</p>	<p>The vernal pool habitat in the installation's natural resources management area contains some swales and mounds within a matrix of grasslands that provide for connectivity of the vernal pools there. The degree to which flowing surface water is supported is unknown.</p>
<p><b>(2) Depressional Features that Hold Water to Provide for Incubation, Maturation, and Reproduction</b></p>	
<p>Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands.</p>	<p>Vernal pools are present in the installation's natural resources management area. They are underlain by Capay clay and Antioch Ysidro complex soil types and are inundated during winter rains and hold water for periods greater than 18 days. They are not permanently flooded. It is possible there are additional vernal pools on the installation, some of which may be suitable for the conservancy fairy shrimp, vernal pool fairy shrimp or vernal pool tadpole shrimp, which are not yet reflected in the most recent NRTF Dixon wetland survey.</p>
<p><b>(3) Sources of Food</b></p>	
<p>Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding.</p>	<p>Potential sources of food for the vernal pool fairy shrimp in the vernal pools at NRTF Dixon have not been assessed. However, overland flow does contribute to the vernal pool habitat in the natural resources management area (including from adjacent agricultural properties). It is likely there is detritus in the pools.</p>
<p><b>(4) Shelter</b></p>	
<p>Structure within the pools described in PCE (2), consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.</p>	<p>Within the NRTF Dixon natural resources management area, seasonally inundated vernal pools are occupied by several plant associations and alliances including: Stalked popcornflower (<i>Plagiobothrys stipitatus</i>) association; Coyotethistle (<i>Eryngium vaseyi</i>) alliance; and Broadleaved pepperweed (<i>Lepidium latifolium</i>)-Coyotethistle association. Although the last is non-native, the cover of broadleaved pepperweed is less dense in the swale running through the management area and appears to be restricted to areas that receive higher amounts of water. All of the above could potentially provide suitable shelter for the vernal pool fairy shrimp or vernal pool tadpole shrimp.</p>
<p><b>Sources:</b>                      Federal Register / Vol. 70, No. 154/ Thursday, August 11, 2005/ Rules and Regulations Page 46924 "Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Evaluation of Economic Exclusions From August 2003 Final Designation."                      USFWS 2005. USFWS 2007a. USFWS 2007b.</p>	

Table L-5. Primary Constituent Elements for the Delta Green Ground Beetle at NRTF Dixon, California.

Primary Constituent Elements	Conditions on NRTF Dixon, California
<p>Little or nothing is known about the sites or requirements for egg-laying by the delta green ground beetle, its fecundity or survivorship, details of larval habitat, ecology, behavior, prey, or sites or requirements for pupation. Most of what is known about the delta green ground beetle and its habitat has been gathered through a number of various observations and studies (USFWS 2005). The USFWS identifies the known constituent elements essential to the continued existence of the delta green ground beetle as: the vernal pools with their surrounding vegetation and the land areas which surround and drain into these pools (USFWS 08 August 1980). These are elaborated on below by drawing on the most recent 5-year review and recovery plan for this species.</p>	
<p><b>(1) Vernal Pool Lake Habitat</b></p>	
<ul style="list-style-type: none"> <li>▪ Proximity to Water.</li>   <li>▪ Soil Type: Delta green ground beetles are primarily associated with Pescadero Clay (which forms the clay base to vernal pools and lakes), the Solano-Pescadero Complex, Solano Loam, and the Pescadero Clay Loam soil types.</li> <li>▪ Cracks in Soil: Cracks in the soil are believed to be used as dry season refugia for larvae and diapausing pupae. Adult beetles presumably emerge from pupation after the onset of winter rains.</li> <li>▪ Vegetative Cover: Beetles are believed to be associated with <i>Navarretia</i> cover and <i>Downingia</i> cover (both vernal pool plant species). It is speculated that <i>Navarretia leucocephala</i> ssp. <i>bakeri</i> (Baker's navarretia) may be a good habitat indicator for the delta green ground beetle. No excessive build-up of invasive plants.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Proximity to Water: During the wet season vernal pool wetland habitats concentrated in the natural resources management area have standing water.</li> <li>▪ Soils: Vernal pool wetland habitats concentrated in the natural resources management area contain Capay clay and Antioch Ysidro complex soil types.</li> <li>▪ Cracks in the Soil: It is unknown if these form in the vernal pool habitat in the natural resources management area.</li> <li>▪ Vegetative Cover: It is unknown whether <i>Navarretia leucocephala</i> ssp. <i>bakeri</i> and <i>Downingia</i> occur in the vernal pool area at NRTF Dixon. Generally, vegetative cover in this area is high, definitely above 25 percent. Though, there are some areas that do contain invasive plant species.</li> </ul>
<p>The preferred microhabitat of the delta green ground beetle is not well understood. Researchers have usually found adults around the margins of vernal pools and in bare areas along trails and roadsides where individuals often hide in cracks in the mud and under low-growing vegetation such as <i>Erodium</i> sp. (filaree) and <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>. Over 80 percent of 200 beetles observed by Olcott Lake in 1985 were within 1.5 meters of the water's edge where soil conditions were very moist and very low growing vegetation provided cover of 25 to 100 percent.</p>	
<p><b>(2) Matrix of Upland Grassland</b></p>	
<p>The fact that individuals have occasionally been found along trails far from water suggests that they may range into grassland. The beetle's habitat may vary with the amount and frequency of rainfall. When the vernal pools become too full, the beetles are apparently pushed back away from the pool margins, and could then occur more widely in the grasslands surrounding pools and other water bodies. Some beetles have been found hundreds of meters from the nearest shoreline, but only during the wet season. In the absence of studies, it appears likely that the grassland matrix surrounding suitable areas of vernal pools or playa pools has habitat value for the species (USFWS 2005).</p>	<p>Upland grassland communities surround the vernal pool habitat located within the natural resources management area at NRTF Dixon. Dominant associations include: <i>Bromus hordeaceus</i> - <i>Lolium perenne</i> (annual brome grassland) and <i>Lolium perenne</i> and <i>Lolium perenne</i> - <i>Bromus hordeaceus</i> (perennial ryegrass fields).</p>
<p><b>(3) Presence of Prey Species</b></p>	
<p>It is believed that the presence of springtails (Collembola), the most important prey source for the delta green ground beetle, is a required habitat trait (Arnold and Kavanaugh 2007).</p>	<p>It is unknown whether springtails occur at NRTF Dixon. Future invertebrate surveys focused in the natural resources management area should provide more insight into their possible presence on the installation.</p>
<p><b>Sources:</b>                  Federal Register / Vol. 45, No. 155/ Friday, August 8, 1980 / Rules and Regulations Page 52807 "Endangered and Threatened Wildlife and Plants; Listing the Delta Green Ground Beetle as a Threatened Species with Critical Habitat."                  USFWS 2005. USFWS 2009a.</p>	

Table L-6. Primary Constituent Elements for the California Tiger Salamander at NRTF Dixon, California.

Primary Constituent Elements	Conditions on NRTF Dixon, California
<p>Critical habitat for the Central population of the California tiger salamander includes essential aquatic habitat features, essential upland (nonbreeding season) habitat features with underground refugia, and essential dispersal habitat features connecting occupied California tiger salamander locations to each other (USFWS 23 August 2005).</p>	
<p><b>(1) Aquatic Habitat</b></p>	<p>Vernal pools are present in the installation’s natural resources management area. They are underlain by Capay clay and Antioch Ysidro complex soil types and are inundated during winter rains and hold water for significant periods. It is possible there are additional vernal pools on the installation, some of which may suitable for the California tiger salamander, which are not yet reflected in the most recent NRTF Dixon wetland survey.</p>
<p>Standing bodies of fresh water (including natural and manmade, e.g. stock ponds), vernal pools, and other ephemeral or permanent water bodies which typically support inundation during winter rains and hold water for a minimum of 12 weeks in a year of average rainfall (the amount of time needed for salamander larvae to metamorphose into juveniles capable of surviving in upland habitats).</p> <p>This habitat is necessary to provide space, food, and cover necessary to support reproduction and to sustain early life history stages of larval and juvenile California tiger salamanders.</p>	
<p><b>(2) Adjacent Upland Habitat as Refugia during Non-Breeding Season</b></p>	<p>Upland grassland communities surround the vernal pool habitat located within the natural resources management area at NRTF Dixon. Dominant associations include: <i>Bromus hordeaceus</i> - <i>Lolium perenne</i> (annual brome grassland) and <i>Lolium perenne</i> and <i>Lolium perenne</i> - <i>Bromus hordeaceus</i> (perennial ryegrass fields). The presence of burrowing owls and ground squirrels on the installation also provide underground burrows that could serve as refugia for the California tiger salamander, depending on their proximity to the vernal pools.</p>
<p>Upland habitats adjacent and accessible to and from breeding ponds that contain small mammal burrows or other underground habitat (refugia) that California tiger salamander (both adults and juveniles) depend upon for food, shelter, and protection from the elements and predation.</p> <p>Adult and juvenile California tiger salamanders are primarily terrestrial; adults enter aquatic habitats only for relatively short periods of time to breed. For the majority of their life cycle, this species survives within upland habitats containing underground refugia, without which the Central population cannot persist.</p>	
<p><b>(3) Upland Dispersal Habitat between Occupied Locations</b></p>	<p>High resolution delineation of the vernal pools with the natural resources management area at NRTF Dixon has not occurred. Currently, the vernal pool extent area is identified on Map 3-8. It is possible that the upland grassland within the natural resources management area (described above) could occur between individual vernal pools located within the vernal pool area identified and provide suitable dispersal habitat for the California tiger salamander. Dispersal to other vernal pools off installation property is also possible, though unlikely considering presence of adjacent agricultural lands on both the eastern and southern boundaries of NRTF Dixon, in addition to the existence of a manmade berm (functioning as an impoundment) along the southern boundary of the installation near the southeastern corner.</p>
<p>Accessible upland dispersal habitat between occupied locations that allow for movement between such sites.</p> <p>Reproductive output in most years is not sufficient to maintain populations, due to low lifetime reproductive success (salamanders reach sexual maturity at four or five years of age, they may only survive for more than ten years, many only breed once, and there is low survivorship of metamorphosed individuals). This suggests that the species requires occasional large breeding events to prevent extirpation or extinction. Moreover, isolated populations are more vulnerable to random natural events and human-induced impacts. As a result, upland dispersal habitat is essential for maintaining the metapopulation structure of the species through gene flow and for recolonization of sites that may become temporarily extirpated.</p>	
<p><b>Source:</b> Federal Register/ Vol. 70, No. 162/ Tuesday, August 23, 2005/ Rules and Regulations/ Page 49380. "Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California Tiger Salamander, Central Population."</p>	

## L.4 Conservation Benefit, Implementation and Effectiveness

### Critical Habitat

The Endangered Species Act (ESA) was revised via the National Defense Authorization Act of 2004, Public Law 108-136, to recognize INRMP conservation measures and species benefit that could obviate the need for Critical Habitat designation on Navy lands and/or preclude it based on impacts to national security.

Section 4(a)(3) of the revised ESA states that: “The Secretary [of the Interior] shall not designate as Critical Habitat any lands or other geographical areas owned or controlled by the U.S. Department of Defense (DoD), or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act Improvement Act (16 U.S. Code [USC] 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which Critical Habitat is proposed for designation.”

Under the ESA, the term “Critical Habitat” is defined as the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection. Critical habitat also includes specific areas, known as unoccupied habitat, that are outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary of Interior that such areas are essential for the conservation of the species (Navy 2006).

Management for long-term conservation of the species involves both occupied and unoccupied habitat. For occupied habitat, the installation first determines whether the area contains the physical and biological features essential to the conservation of the species and whether this area has or needs special management or protection. Additional special management is not required if adequate management or protection is already in place.

Land management of unoccupied habitat areas should also be addressed in the INRMP, even if the listed species that could potentially occupy that habitat is not present on the installation. This will help to prevent the designation of critical habitat for species that could occur or historically occurred on the installation but are not currently present. Again, special management is not required if adequate management or protection is already in place.

Section 4(b)(2) of the revised ESA further states that: “The Secretary shall designate critical habitat, and make revisions, thereto, under subsection (a)(3) of this section on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.”

All Navy installations with federally listed threatened or endangered species, proposed federally listed threatened or endangered species, candidate species, or unoccupied habitat for a listed species where Critical Habitat may be designated, must structure the INRMP to avoid the designation of Critical Habitat. The INRMP may obviate the need for Critical Habitat if it specifically addresses both the benefit provided to the listed species and the provisions made for the long-term conservation of the species. The species benefit must be clearly identifiable in the document and should be referenced as a specific topic in the INRMP table of contents.

### **USFWS Three-Point Criteria**

The USFWS uses a three-point criteria test to determine if an INRMP provides a benefit to the species. An installation is strongly encouraged to use these criteria, listed below, when structuring its INRMP to avoid the need for a Critical Habitat designation:



1. The plan<sup>2</sup> provides a conservation benefit to the species. The cumulative benefits of the management activities identified in a management plan, for the length of the plan, must maintain or provide for an increase in a species' population, or the enhancement or restoration of its habitat within the area covered by the plan [i.e. those areas deemed essential to the conservation of the species]. A conservation benefit may result from reducing fragmentation of habitat, maintaining or increasing populations, ensuring against catastrophic events, enhancing and restoring habitats, buffering protected areas, or testing and implementing new conservation strategies.
2. The plan provides certainty that the management plan will be implemented. Persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all the necessary authorizations or approvals. An implementation schedule, including completion dates, for the conservation effort is provided in the plan.
3. The plan provides certainty that the conservation effort will be effective. The following criteria will be considered when determining the effectiveness of the conservation effort. The plan includes (a) biological goals (broad guiding principles for the program) and objectives (measurable targets for achieving the goals); (b) quantifiable, scientifically valid parameters that will demonstrate achievement of objectives and standards for these parameters by which progress will be measured are identified; (c) provisions for monitoring and, where appropriate, adaptive management; (d) provisions for reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided; and (e) a duration sufficient to implement the plan and achieve the benefits of its goals and objectives.

The federally threatened delta smelt Critical Habitat and any federally listed species with the potential to use habitat on the installation need to be addressed for NRTF Dixon.

## **L.4.1 NRTF Dixon Ecosystem**

### **L.4.1.1 The Plan provides a conservation benefit to the federally listed species.**

NRTF Dixon natural resources, including special status species, will be managed through an ecosystem management approach. Goals have been developed to guide the ecosystem management approach at NRTF Dixon; these are discussed under the third criteria in this section concerning the NRTF Dixon ecosystem. The objectives and management strategies developed to support the NRTF Dixon INRMP ecosystem management goals are included in Chapter 3: Natural Resources Current Condition and Management, Chapter 4: Sustainability and Compatible Use at NRTF Dixon, and Chapter 5: Implementation Strategy. The INRMP topics that are addressed in Chapters 3, 4, and 5 are identified in Table L-7, Table L-8, and Table L-9, respectively. The majority of the INRMP topics identified in the tables below are supported by an objective and management strategy. Relevant INRMP topics that did not have an explicit objective and management strategy are still included, considering their contribution to achieving ecosystem management at NRTF Dixon.

The INRMP topics included in Chapters 3 through 5, implemented together in an integrated approach, provide a direct cumulative benefit to the NRTF Dixon ecosystem, associated terrestrial and aquatic habitats, terrestrial and aquatic flora, resident and migratory wildlife populations, and special status species.

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<sup>2</sup> For NRTF Dixon, "the plan" refers to the INRMP itself.

*Table L-7. Chapter 3 Natural Resource Management Objectives and Strategies Topics.*

<b>INRMP Section</b>	<b>INRMP Natural Resource Management Topic</b>
3.1	Ecoregional Setting and Managing with an Ecosystem Approach
3.3	Physical Conditions and Managing the Physical and Chemical Environment
3.3.3	Soil Resources and Condition
3.3.4	Water Resources, Water Quality, and Floodplains
3.3.5	Wildland Fire Management
3.4	Vegetation Communities and Habitats
3.4.3	Wetlands and Jurisdictional Waters
3.5	Fish and Wildlife Management
3.5.1	Aquatic and Terrestrial Invertebrates
3.5.2	Pollinators
3.5.3	Fishes
3.5.4	Reptiles and Amphibians
3.5.5	Birds
3.5.6	Mammals
3.5.7	Bats
3.6	Special Status Plants
3.7	Threatened and Endangered Species and Critical Habitat
3.8	Other Special Status Species and Wildlife
3.9	Invasive Species Management
3.10	Pest and Predator Control
3.11	Data Integration, Access, and Reporting

*Table L-8. Chapter 4 Sustainability and Compatible Use Topics.*

<b>INRMP Section</b>	<b>INRMP Natural Resource Management Topics</b>
4.1	Sustainability of the Military Mission and the Natural Environment
4.1.2	Integrated Military Mission and Sustainable Land Use Decisions
4.1.3	Infrastructure and Grounds
4.1.3.1	Communication Towers and Power Lines
4.1.3.2	Construction and Facility, Grounds, and Roadside Maintenance
4.1.3.3	Fencelines and Buffer Zones
4.1.4	Adapting to Effects of Climate Change and Regional Growth and Conservation Initiatives
4.2	Management of Other Uses and Real Estate Outgrants
4.2.1	Agricultural Outlease Management
4.2.2	Livestock Grazing
4.3	Public Access and Outdoor Recreation
4.4	Environmental Education and Public Outreach
4.5	Integrating Other Internal Plans and Programs
4.5.1	Integrated Cultural Resources Management Planning
4.5.2	Integrated Pest Management
4.5.3	Installation Restoration Program
4.5.4	Hazardous Material Spill Prevention and Response
4.6	NEPA Compliance
4.7	Natural Resources Consultation Planning
4.8	Natural Resources Law Enforcement
4.9	Beneficial Partnerships and Collaborative Planning

*Table L-9. Chapter 5 Implementation Strategy Topics.*

INRMP Section	INRMP Natural Resources Management Topics
5.1	General Considerations
5.2	Staffing and Personnel Training
5.3	INRMP Review and Metrics
5.3.1	INRMP Metrics
5.4	INRMP Project Programming and Budgeting
5.4.1	Funding Classifications
5.4.2	Implementation Schedule
5.4.3	Federal Anti-Deficiency Act
5.4.4	Funding Sources
5.4.4.1	Department of Defense Funding Sources
5.4.4.2	External Assistance
5.4.5	Research Funding Requirements
5.5	INRMP Implementation Summary

#### **L.4.1.2 The Plan provides certainty that the management plan will be implemented.**

The following is an excerpt from Section 1.2: Authority that describes the authority for NAVFAC Southwest natural resource managers to implement the NRTF Dixon INRMP and to ensure that the INRMP will be implemented:

The Sikes Act (as amended) directs the DoD to take the appropriate management actions necessary to protect and enhance the land and water resources on all installations under its control. The DoD Directive 4700.4 Natural Resources Management Program and DoDI 4715.03 are implemented herein to establish fundamental land management policies and procedures for all military lands to preserve the military mission, and at the same time protect the natural resources. In Chapter 24 of OPNAVINST 5090.1C CH-1, program responsibilities and standards are set for complying with resource protection laws, regulations and Executive Orders (EOs) to conserve and manage natural resources on Navy installations in the United States and its territories and possessions. Finally, the CNO INRMP Guidance for Navy Installations, How to Prepare, Implement, and Revise INRMPs (April 2006) supplies guidelines on the process and procedure for developing an INRMP. Additional policy, regulation, and legislation regarding land management are contained in the remaining references, cited in this chapter.

Federal and state legal requirements that are primary drivers for natural resources management are listed in Appendix B (U.S. Codes [USC], Public Laws, EOs, and Code of Federal Regulations).

Organization of this INRMP contains all the elements of the DoD Template for INRMPs (OUSD Acquisition, Technology and Logistics Memorandum, 14 August 2006 [DoD 2006]). Since both DoD and Navy guidance (DoDI 4715.03, CNO Guidance of April 2006, and OPNAVINST 5090.1C CH-1) are more comprehensive than that identified in the DoD Template, the outline has been re-worked so that additional material is added in the document to ensure compliance with all guidelines (Navy 2006, 2011b). A cross-walk between the DoD Template and this INRMP's content is provided in the front of this INRMP, after the Table of Contents.

Furthermore, persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all the necessary authorizations or approvals. The following is an excerpt from Section 5.2: Staffing and Personnel Training that identifies this in the Plan:

The Sikes Act (as amended) specifically requires that there be "sufficient numbers of professionally trained natural resources management and natural resources enforcement

personnel to be available and assigned responsibility” to implement an INRMP. Staff should also be provided opportunities and support to receive both comprehensive training specific to their job and supplemental training and professional development in a timely manner, as needed, to ensure proper and efficient management of natural resources (Department of Defense Instruction [DoDI] 4715.03; OPNAVINST 5090.1C CH-1).

As NAVFAC Southwest is responsible for natural resources management at NRTF Dixon, they maintain professionally trained personnel with various specialized skills for managing NRTF Dixon resources. NAVFAC Southwest identifies personnel requirements to accomplish INRMP goals and objectives, allocates existing budgetary and personnel resources, and identifies staffing needs based on any additional current and future projects. Personnel within NAVFAC Southwest assigned to natural resources management are the core staff responsible for implementing the INRMP. Through oversight and monitoring, these personnel ensure that a consistent conservation program is carried out by using strategies outlined in this Plan to support the Navy mission and achieve INRMP goals and objectives.

Cooperative projects among different Navy organizations are monitored by the originating or controlling office, as specified prior to project implementation.

NAVFAC Southwest also coordinates with the Operations and Maintenance contractor at NRTF Dixon for natural resources management when needed.

Current opportunities for training and professional development provided to NAVFAC Southwest natural resources staff have been sufficient to adequately implement the NRTF Dixon INRMP and manage natural resources on the installation. However, with expanding natural resources management needs (including anticipated surveys, delineations, and updating Geographic Information Systems [GIS] records), there is a need for additional training; future surveys may identify sensitive species that will need to be managed for.

Training may be obtained from a variety of sources, including universities, regulatory agencies, professional societies, and other Navy or military organizations. These training opportunities may be offered in the forms of structured courses or conferences, workshops, and symposia. The following is a topic list for training opportunities, certifications, workshops, conferences, and other professional development that natural resources staff responsible for NRTF Dixon should consider participating in, as needed:

- Integrated Pesticide/Pest Management training;
- Wetland management training;
- Endangered species management training;
- Raptor management and/or banding permit;
- GIS and Global Positioning System training to enable collaborative work between Natural Resources Management staff, GIS staff, and contractors for Natural Resources Management purposes such as data management and generation;
- Climate change training;
- National Marine Fish and Wildlife Association annual workshop;
- North American Wildlife and Natural Resources Conference;
- Partners in Flight national, regional, and state meetings (generally in conjunction with other listed meetings);
- USFWS National Conservation Training Center webinars and online training;

- Naval Civil Engineering Corps Officers School (CECOS) Natural Resources Compliance training;
- CECOS Advanced Environmental Law;
- CECOS Environmental Negotiation Workshop; and
- CECOS Environmental GIS/Geostatistics course.

NAVFAC Southwest should also represent NRTF Dixon at the following annual workshops or professional conferences as appropriate and funding allows: National Military Fish and Wildlife Association annual workshop; North American Wildlife and Natural Resources Conference; Partners in Flight national, regional, and state meetings.

The following is an excerpt from Section 5.5: INRMP Implementation Summary that summarizes the objectives and strategies for INRMP implementation and summarizes the INRMP and its schedule:

The approach and actions that support INRMP implementation are identified in this section. Following these are Table L-10, Table L-11, Table L-12, and Table L-13 that summarize various aspects of the implementation of this INRMP.

The purpose of Table L-13 is to summarize all projects or activities that NAVFAC Southwest intends to implement over the duration of the INRMP time-frame. It is organized according to INRMP management topic. Management strategies presented in Chapter 3 Natural Resources Condition and Management, Chapter 4 Sustainability and Compatible Use at NRTF Dixon, and Chapter 5 Implementation Strategy identify the means by which NAVFAC Southwest on behalf of NRTF Dixon intends to achieve desired future conditions. Management actions, such as EPR projects, are specific projects or activities that provide NAVFAC Southwest a mechanism to strive towards achieving those desired future conditions. Individual EPR projects may address multiple management strategies encompassing various INRMP management topics. This Implementation Table parallels the structure of the INRMP as presented in Chapters 3 and 4. In order to reduce redundancy, all INRMP management strategies presented in these sections are incorporated by reference in the INRMP Section column of the table. Management strategies that pertain to special status species have their own sections rather than including special status species management strategies in the broader sections that pertain to wildlife populations.

Table L-10 identifies the various EPR project codes and descriptions that are referenced in the EPR Number column of Table L-13; these include the EPR number or placeholder for future EPR projects if appropriate. Table L-11 identifies the applicable funding sources for each project; for more information on funding sources refer to Section 5.4.4: Funding Sources. Table L-12 identifies the applicable INRMP legal drivers, or compliance requirements, for all of the various INRMP management projects or activities. All projects listed in Table L-13 support compliance with OPNAVINST 5090.1C CH-1 and DoDI 4715.03.

Effective implementation of the NRTF Dixon INRMP relies on organizational capacity, communication, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of installation lands by the Navy, as required by the Sikes Act (as amended). Investigating and utilizing all appropriate avenues and partnerships to achieve the goals and objectives of this INRMP will contribute to the best possible management and most efficient use of funds.

Implementing a balanced, multiple-use natural resources program can be accomplished through:

- Professional management (NAVFAC P-73 Volume II) with ongoing training and professional development opportunities;
- Prioritizing and allocating funding to support compliance requirements with emphasis on INRMP actions and projects in the order of ERL 4 (must fund), ERL 3, ERL 2, and ERL 1 (OPNAVINST 5090.1C CH-1, DoDI 4715.03, Section 5.4.1: Funding Classifications). Budget priorities for threatened and endangered species management, especially compliance with Biological Opinions, should receive the highest possible budgeting priority, and support the need to avoid Critical Habitat designations under Section 4(b)(2) of the ESA, or Section 4(a)3 of the ESA (exemption from Critical Habitat designations for national security reasons);
- Identifying new funding sources from federal, state, local, and nonprofit organizations with an interest in achieving the goals and objectives of this INRMP in partnership with NAVFAC Southwest to further NRTF Dixon natural resources management goals and compliance (for non-ERL 4 must fund items). Partnerships can strengthen natural resources management actions locally and regionally, particularly when supporting mutual goals of this INRMP and the California Wildlife Action Plan or other regional plans;
- Seeking recognition for natural resource work conducted at NRTF Dixon to showcase management accomplishments; and
- Continuing to ensure effective communication, adaptive oversight and policy leadership through the Navy Natural Resources Strategic Plan.

*Table L-10. Integrated Natural Resources Management Plan environmental program requirements, project codes and descriptions.*

<b>EPR Project Code</b>	<b>Description</b>
0088614100	CH SW NCTS Dixon INRMP and Associated Surveys
00886NR091	3 SAR SW Burrowing Owl Burrow Survey and Mapping Project
00886NR107	EO 11990 SW NCTS Dixon - Vernal Pool Survey, Mapping and Wetland Delineation
00886NR108	Sikes SW NCTS Dixon - Natural Resource Mgmt Area Fence Maintenance
00886NR110	Sikes SW NCTS Dixon - Development and Implementation of a Wildlife Habitat Enhancement Plan
00886NR112	EO 13112 SW NCTS Dixon - Invasive Weed Management
00886NR114	Sikes SW NCTS Dixon Flora and Fauna Surveys
00886NR200	MBTA SW NCTS Dixon Avian Protection Plan Development and Implementation
00886NR201	Sikes SW NCTS Dixon Wildland Fire Protection Plan
00886IPMPS	Integrated Pest Management Plan NCTS Dixon

*Table L-11. INRMP Project Funding Sources.*

<b>Funding Source</b>	<b>Description</b>
NAVFAC SW In-House	NAVFAC SW Office responsible for NRTF Dixon natural resources management and INRMP implementation funding
Other Navy In-House	Other NAVFAC SW Department or Division funding
O&MN	Operations and Maintenance Navy funding
Ag. Funds	Agricultural/Grazing Outleasing funding
DoD Legacy	DoD Legacy funding
Partnership	Research institution, non-governmental organization, or other partnership funding
Project Proponent	Project proponent funding

Table L-12. INRMP Implementation Table Management Project or Activity Legal Drivers.

<b>Acronym</b>	<b>Description</b>
BEPA	Bald and Golden Eagle Protection Act
CAA	Clean Air Act
CA ILRP	California Central Valley Regional Water Quality Control Board Long-term Irrigated Lands Regulatory Program
CESA	California Endangered Species Act
WAP	California Wildlife Action Plan
CWA	Clean Water Act
DQA	Data Quality Act
DoD Partnership	Partnership for Amphibian and Reptile Conservation (PARC), Partners in Flight (PIF), Pollinator Partnership, etc.
EO 11988	Floodplain Management
EO 11514	Protection and Enhancement of Environmental Quality
EO 11990	Protection of Wetlands
EO 11991	Protection and Enhancement of Environmental Quality
EO 12342	Environmental Safeguard for Animal Damage Control on Federal Lands
EO 13112	Invasive Species
EO 13186	Migratory Birds
EO 13423	Strengthening Federal Environmental, Energy, and Transportation Management
EO 13514	Federal Leadership in Environmental, Energy, and Economic Performance
ESA	Endangered Species Act
FNWA	Federal Noxious Weed Act
LRPPA	Legacy Resource Protection Program Act
MBTA	Migratory Bird Treaty Act
Migratory Bird Rule	50 CFR Part 21 Migratory Bird Permits: Take of Migratory Birds by the Armed Forces, 28 February 2007
NAVFAC P-73, Vol. II	NAVFAC, P-73. (May 1987) Real Estate Procedural Manual and Natural Resources Management Procedural Manual
Navy Guidance for INRMPs	Chief of Naval Operations (N45) Integrated Natural Resources Management Program Guidance. 10 April 2006
NEPA	National Environmental Policy Act
OPNAVINST 5090.1C CH-1	Environmental Protection and Natural Resources Manual (as amended)
OPPA	Oil Pollution Prevention Act
PPA	Plant Protection Act
Presidential Memorandum of April 1994	Presidential Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds, 26 April 1994
QDR	2010 Quadrennial Defense Review
RCRA-HSWA	Resource Conservation and Recovery Act - Hazardous and Solid Waste Amendments
SCA	Soil Conservation Act, 16 USC §§ 590a et seq.
Sikes Act (as amended)	Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960, as amended.
DoDI 4715.03	DoD Natural Resources Conservation Program
DoDI 6055.06	DoD Fire and Emergency Services Program
WPFPA	Watershed Protection and Flood Prevention Act

Table L-13. Integrated Natural Resources Management Plan Implementation Summary, including assignment of priorities based on legal driver behind each project.

INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule	Natural Resource Focus Areas	Cost Estimate
<b>Chapter 3 Natural Resources Current Condition and Management</b>								
<b>Section 3.1: Ecoregional Setting and Managing with an Ecosystem Approach</b>								
	O&MN	00886NR110	Develop and implement a comprehensive, integrated habitat management plan that includes target conditions and best practices.	4	Sikes Act (as amended), ESA, EO 13186, EO 13112, EO 11990, DoDI 4715.03.	Ongoing 2019	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	\$48,808 and \$62,269
	O&MN	00886NR110	Implement a coordinated monitoring program using land health and focal species indicators.	3	Sikes Act (as amended), ESA, MBTA, EO 13186, EO 13112, EO 11990, DoDI 4715.03, OPNAVINST 5090.1C CH-1.	Ongoing 2020	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness 5. Team Adequacy 6. INRMP Project Implementation	\$48,808 and \$62,269
<b>Section 3.3: Physical Conditions and Managing the Physical and Chemical Environment</b>								
<b>Section 3.3.5: Wildland Fire Management</b>								
	O&MN, NAVFAC Southwest In-House	00886NR201	Develop and implement a Wildland Fire Management Plan for NRTF Dixon. In it, include a fire management approach for NRTF Dixon that standardizes current fire prevention and control strategies. Update as necessary.	4	ESA, DoDI 6055.6, DoDI 4715.03	5 years 2018	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness	\$53,868
<b>Section 3.4: Vegetation Communities and Habitats</b>								
	O&MN	00886NR110	When feasible, enhance vegetation communities and habitats to improve their native condition and support beneficial uses. Incorporate habitat enhancement monitoring, including monitoring of indicator or management focus species. Prioritize activities for wetland and vernal pool areas. Develop a restoration plant list to guide habitat enhancement activities.	4	Sikes Act (as amended), MBTA, EO 13186, EO 11990, DoDI 4715.03	Ongoing 2020	1. Ecosystem Integrity 3. Fish and Wildlife Management and Public Use	\$48,808 and \$62,269
<b>Section 3.4.3: Wetlands and Jurisdictional Waters</b>								
	O&MN, NAVFAC Southwest In-House, Project Proponent	00886NR107	Inventory and map wetland habitats and U.S. Army Corps of Engineers jurisdictional waters of the U.S. Determine whether surface waterway connections to the San Joaquin Delta are sufficient to deem them jurisdictional.	4	CWA, NEPA, OPNAVINST 5090.1C CH-1, EO 11990, DoDI 4715.03	Ongoing 2016	1. Ecosystem Integrity	\$53,540
<b>Section 3.5: Fish and Wildlife Management</b>								
<b>Section 3.5.1: Aquatic and Terrestrial Invertebrates</b>								
	O&MN	00886NR114	Conduct a baseline invertebrate survey and program for surveys as part of installation-wide flora and fauna surveys.	4	Sikes Act (as amended), DoDI 4715.03	5 years 2016	1. Ecosystem Integrity	\$90,272
<b>Section 3.5.2: Pollinators</b>								
	O&MN, Partnership, DoD Legacy	0088614100	Conduct a baseline survey to determine presence, distribution and abundance of important pollinator species and the plants dependent upon them.	4	Sikes Act (as amended), DoD partnership	5 years 2016	1. Ecosystem Integrity	\$22,293



INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule		Natural Resource Focus Areas	Cost Estimate
	O&MN, NAVFAC Southwest In-House, Other Navy In-House, Partnership, DoD Legacy	00886NR110	Identify and establish pollinator-friendly landscapes where feasible, particularly as a part of habitat enhancement activities and in coordination with facility maintenance and/or construction activities. Avoid and minimize impacts to pollinators.	4	Sikes Act (as amended), DoD partnership	Ongoing	2019 - 2020	1. Ecosystem Integrity	\$48,808 and \$62,269
<b>Section 3.5.4: Reptiles and Amphibians</b>									
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR114, 0088614100	Identify management focus reptiles and amphibians and conduct surveys to determine existing populations. Monitor to determine management needs. Investigate impact of non-native invasive amphibians and crustaceans on native amphibians. If necessary, develop a control program for these invasive species.	4	Sikes Act (as amended), EO 13112	Ongoing	2016	1. Ecosystem Integrity	\$90,272; \$22,293
<b>Section 3.5.5: Birds</b>									
	O&MN, NAVFAC Southwest In-House, Other Navy In-House, Partnership	00886NR114, 0088614100	Conduct a focused breeding bird survey to better assess the distribution and abundance of species breeding on NRTF Dixon.	4	Sikes Act (as amended), MBTA, Migratory Bird Rule, EO 13186	Ongoing	2016	1. Ecosystem Integrity	\$90,272; \$22,293
	O&MN, NAVFAC Southwest In-House	00886NR200	Develop and implement an Avian Protection Plan to monitor and document frequency and species of bird strikes against antennas and guy wires. Incorporate additional monitoring and assessment strategies into the plan for those activities identified as potentially impacting resident and migratory birds.	4	MBTA, Sikes Act (as amended), DoDI 4715.03, EO 13186, Migratory Bird Rule	Ongoing	2017	1. Ecosystem Integrity	\$63,923
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR114, 0088614100	Conduct migratory and resident bird surveys. When feasible, conduct habitat enhancement management activities to conserve bird populations and develop and maintain information on status and trend of populations and habitat.	4	Sikes Act (as amended), MBTA, BEPA, EO 13186	Ongoing	2016	1. Ecosystem Integrity	\$90,272; \$22,293
<b>Section 3.5.6: Mammals</b>									
	O&MN	00886NR114, 0088614100	Conduct mammal surveys as part of installation-wide flora and fauna surveys every five years.	4	Sikes Act (as amended), DoDI 4715.03	5 years	2016	1. Ecosystem Integrity	\$90,272; \$22,293
<b>Section 3.5.7: Bats</b>									
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR114, 0088614100	Inventory and monitor bat populations on NRTF Dixon as part of base-wide flora and fauna surveys and pollinator-focused surveys. In concert, further investigate the presence of the little brown bat and pallid bat at NRTF Dixon and their reliance on installation resources.	4	Sikes Act (as amended), DoDI 4715.03	Ongoing	2016	1. Ecosystem Integrity 4. Partnership Effectiveness	\$90,272; \$22,293
<b>Section 3.6: Special Status Plants</b>									
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR107, 0088614100, 00886NR114	Conduct rare plant searches at high potential areas within the grassland and natural resources management area. If present, monitor all plants populations that are federally listed or candidates for listing that may be found on the installation and develop appropriate management actions as needed.	4	Sikes Act (as amended), ESA, DoDI 4715.03	5 years/ Ongoing	2016	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	\$53,540; \$22,293; \$90,272

INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule		Natural Resource Focus Areas	Cost Estimate
<b>Section 3.7: Threatened and Endangered Species and Critical Habitat</b>									
	O&MN	00886NR107, 0088614100, 00886NR114	Every three years, conduct focused surveys for federally threatened and endangered species and species that are candidates for listing that potentially occur at NRTF Dixon, particularly in the vernal pool and wetland areas.	4	ESA, Sikes Act (as amended), DoDI 4715.03	3 years	2016	2. Listed Species and Critical Habitat	\$53,540; \$22,293; \$90,272
	O&MN	00886NR107, 0088614100	Conduct monitoring for any federally listed species or species that are candidates for listing that are present on NRTF Dixon.	4	ESA, Sikes Act (as amended), DoDI 4715.03	Ongoing	2016	2. Listed Species and Critical Habitat	\$53,540; \$22,293
<b>Section 3.8: Other Special Status Wildlife Species</b>									
	O&MN, NAVFAC Southwest In-House	0088614100 00886NR107	Conduct surveys for special status species. Monitor and map special status species on a regular basis as part of baseline surveys.	4	ESA, Sikes Act (as amended), DoDI 4715.03	Ongoing	2016	1. Ecosystem Integrity	\$22,293; \$53,540
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR091	Conduct surveys for burrowing owls and map results. Consider removing artificial burrows and burrow mounds. Consider developing different habitat management techniques for the burrowing owl to encourage use away from sensitive infrastructure at NRTF Dixon.	4	Sikes Act (as amended) - no net loss provision, EO 13186, DoDI 4715.03	Ongoing	2016	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 7. INRMP Impact on the Installation Mission	\$33,343
	O&MN	00886NR110	Install raptor nesting platforms in appropriate areas compatible with the military mission to complement existing trees as suitable nesting habitat for Swainson's hawk and other birds of prey.	4	Sikes Act (as amended), DoDI 4715.03	Ongoing	2019	1. Ecosystem Integrity 4. Partnership Effectiveness	\$48,808 and \$62,269
<b>Section 3.9: Invasive Species Management</b>									
	O&MN	00886IPMPS	Develop and implement an Integrated Pest Management Plan for NRTF Dixon that includes prevention measures. Review Plan and update as necessary.	4	Sikes Act (as amended), OPNAVINST 5090.1C CH-1, DoDI 4150.07, OPNAVINST 6250.4C, EO 13112, PPA, FNWA	Ongoing	2016	1. Ecosystem Integrity	\$13,135
	O&MN, NAVFAC Southwest In-House	00886NR112	Conduct invasive plant species management and control activities that are effective and do not threaten existing or potential sensitive species. Update control measures as needs and conditions change.	4	Sikes Act (as amended), EO 13112, FNWA, DoDI 4715.03	Ongoing	2016	1. Ecosystem Integrity	\$32,122
<b>Section 3.11: Data Integration, Access, and Reporting</b>									
	O&MN, NAVFAC Southwest In-House	N/A	Develop an integrated database for NRTF Dixon natural resource management information and data, including Geographic Information System (GIS).	3	Sikes Act (as amended), DoDI 4715.03, DQA	Ongoing	2025	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 4. Partnership Effectiveness 5. Team Adequacy 6. INRMP Project Implementation 7. INRMP Impact on the Installation Mission	N/A
	O&MN, NAVFAC Southwest In-House	N/A	Convert the map of antennas and their ground mats/ guy wires into a GIS file so that it can be combined with the natural resource layers to show the extent of their overlap.	3	Sikes Act (as amended)	One Time	2017	1. Ecosystem Integrity	N/A

INRMP Section	Funding Source	EPR Number	Description of Project or Activity	ERL Number	Legal Driver	Implementation Schedule	Natural Resource Focus Areas	Cost Estimate
<b>Chapter 4 Sustainability and Compatible Use at NRTF Dixon</b>								
<b>Section 4.1.3: Infrastructure and Grounds</b>								
<b>Section 4.1.3.2: Construction and Facility, Grounds, and Roadside Maintenance</b>								
	NAVFAC Southwest In-House	N/A	When necessary, conduct clearance surveys for nesting birds and burrowing owls seven days before mowing activities.	4	Sikes Act (as amended), MBTA	Ongoing 2014	1. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	N/A
<b>Section 4.1.3.3: Fencelines and Buffer Zones</b>								
	O&MN, NAVFAC Southwest In-House	00886NR108	Maintain/ install fencing around the NRMA. Ensure that fencing used does not prevent wildlife from accessing the area or that it does not hinder necessary management activities such as invasive species control.	4	Sikes Act (as amended), DoDI 4715.03	5 years 2019	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	\$60,286
<b>Section 4.1.4: Adapting to Effects of Climate Change and Regional Growth and Conservation Initiatives</b>								
	O&MN, NAVFAC Southwest In-House, Partnership	00886NR110	Develop a natural resources program framework for adapting to climate change, to include a Vulnerability Assessment for vernal pools and analysis of flood potential via the Delta, and recommendations for restoration work to ensure sustainability of military operations and healthy habitats.	4	DoDI 4715.03, QDR	Ongoing 2015	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 4. Partnership Effectiveness	\$48,808 and \$62,269
<b>Section 4.3: Public Access and Outdoor Recreation</b>								
	O&MN, NAVFAC Southwest In-House	00886NR108	Install and maintain appropriate signs in key areas to minimize unauthorized access and protect sensitive areas.	3	Sikes Act (as amended)	Ongoing 2019	1. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	\$60,286

### **L.4.1.3 The Plan provides certainty that the conservation effort will be effective.**

#### **Goal**

The following is the NRTF Dixon INRMP vision and goal as identified in Section 1.6: INRMP Vision, Goals and Objectives:

The vision for the INRMP is that the Navy achieves its current and evolving mission requirements while conserving its natural resources. This INRMP's goal is to:

*Provide the guidelines, means, and mechanism for assuring long-term sustainability and vitality of both the military mission and health of NRTF Dixon's natural resources.*

This INRMP aims to improve the condition of an ecosystem that contains land and water dedicated to the support of national security. In doing so, it intends to achieve long-term certainty and permanence for the Navy mission. This includes seeking maximum landscape and natural ecosystem health, productivity, biodiversity, recovery of habitats and species at risk. It also leads the Navy in institutionalizing a Navy Conservation Ethic.

To achieve this vision and goal, work should contribute to the following standards of success:

- Navy mission accomplishment that is unimpeded;
- A net gain in agricultural productivity, natural biodiversity, and sensitive species recovery;
- Natural resources that are resilient and self-recoverable with minimal human intervention;
- Navy projects that are not delayed and contribute no net loss to conservation goals;
- Interagency partnerships that result in mutual benefits and improved cost-effectiveness of the work undertaken; and
- A growing internal (NRTF Dixon) and external (public) conservation ethic as measured by natural resources program partnerships, with public access that is necessary and appropriate for the use of the installation, subject to safety and security requirements.

#### **Parameters**

The specific objectives and management strategies for federally threatened and endangered species potentially present at NRTF Dixon are identified in the relevant discussion that follows in this Appendix.

#### **Monitoring**

The specific monitoring activities for federally threatened and endangered species potentially present at NRTF Dixon are identified in the relevant discussion that follows in this Appendix.

#### **Report Progress on Implementation**

The following is from Section 5.3: INRMP Review and Metrics that describes measures to be taken to ensure that the provisions for reporting progress on implementation are adhered to:

The INRMP review and revision process is described in Section 1.10: INRMP Review and Revision Process.

NAVFAC Southwest, on behalf of NRTF Dixon, ensures compliance with DoD Directive 4715.DD-R 1996, which requires installations to improve and refine natural resources management by adaptively adjusting success criteria and priorities based on past accomplishments, new risks and threats, new biological information, and changes in policy. NAVFAC Southwest complies with all recent DoD INRMP guidance and the Sikes Act (as amended) for both five-year and annual reviews of the NRTF Dixon INRMP (Section 1.10: INRMP Review and Revision Process).

Upon request from Chief of Naval Operations/Commander, Navy Installations Command and Commander, Navy Region Southwest, NAVFAC Southwest coordinates natural resources requirements with other federal, state, or local agencies, including the acquisition of INRMP mutual agreement between the Navy, USFWS, and California Department of Fish and Wildlife (CDFW). NAVFAC Southwest provides a notice of intent to prepare or revise the INRMP to the USFWS Field Office and the CDFW, and ensures that the USFWS Regional Sikes Act Coordinator is notified. Annual reviews are conducted in compliance with the Sikes Act (as amended) in coordination with the USFWS and the CDFW and any other INRMP stakeholders at the discretion of the Natural Resources Program Manager. The annual reviews are intended to verify the following:

- Current information on all conservation metrics is available.
- All *must fund* projects and activities have been budgeted for and implementation is on schedule.
- All required trained natural resources positions are filled or are in the process of being filled.
- Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.
- All required coordination has occurred.
- All significant changes in the installation's mission requirements or its natural resources have been identified.
- The INRMP objectives remain valid.

NAVFAC Southwest also tracks INRMP implementation and disseminates related information to others as appropriate. They maintain natural resources program information needed to satisfy reporting requirements, legislative information requests, and to support project requests. This information is collected in the NAVFAC Natural Resources Data Call Station and applicable GIS programs.

As a guide for addressing annual INRMP review, the Navy Natural Resources Metrics are used to assess INRMP implementation, measure conservation efforts, ensure no net loss of military testing and training lands, and understand the conservation program's installation mission support and indicate the success of partnerships. They are used to gather and report essential information required by Congress, Executive Orders (EOs), existing United States laws, and the DoD on an annual basis. There are seven Focus Areas that comprise the Natural Resources Metrics to be evaluated during the annual review of the Natural Resources Program/INRMP.

1. Ecosystem Integrity
2. Listed Species and Critical Habitat
3. Fish and Wildlife Management and Public Use
4. Partnership Effectiveness
5. Team Adequacy

6. INRMP Project Implementation
7. INRMP Impact on the Installation Mission

A full copy of the most recent Natural Resources Metrics questions are presented in Appendix M: Metrics Questions and are available on the Navy Conservation Website (Figure 5-1). They use the Navy and Marine Corps Natural Resources Metrics Builder Reference Guide (04 May 2005), and are updated annually.

## L.4.2 Threatened and Endangered Species and Critical Habitat

### L.4.2.1 The Plan provides a conservation benefit to the species.

The Plan will provide a cumulative benefit to threatened and endangered species and Critical Habitat at NRTF Dixon through protection of potential habitat (including avoiding impacts to downstream delta smelt habitat that may be connected to NRTF Dixon wetlands and aquatic resources) by reducing threats, restoration of any applicable habitat that will be protected and managed in perpetuity, and surveying and monitoring for potential populations. The INRMP will provide a cumulative benefit to the threatened and endangered species and Critical Habitat through implementation of objectives and management strategies for the following sections:

Section 3.1: Ecoregional Setting and Managing with an Ecosystem Approach
Section 3.1.1: Core Ecosystem Values and Services
Section 3.3: Physical Conditions and Managing the Physical and Chemical Environment
Section 3.3.4: Water Resources, Water Quality and Floodplains
Section 3.3.4.2: Surface Water, Floodplains, and Water Quality
Section 3.3.5: Wildland Fire Management
Section 3.4: Vegetation Communities and Habitats
Section 3.4.1: Vegetation Communities
Section 3.4.2: Land Cover/Use and Habitat
Section 3.4.3: Wetlands and Jurisdictional Waters
Section 3.4.3.1: Vernal Pools
Section 3.5: Fish and Wildlife Management
Section 3.5.1: Aquatic and Terrestrial Invertebrates
Section 3.5.2: Pollinators
Section 3.5.3: Fishes
Section 3.5.4: Reptiles and Amphibians
Section 3.5.5: Birds
Section 3.5.6: Mammals
Section 3.5.7: Bats
Section 3.6: Special Status Plants
Section 3.7.1: Colusa Grass (Federally Threatened, State Endangered)
Section 3.7.2: Solano Grass (Federally and State Endangered)
Section 3.7.3: Contra Costa Goldfields (Federally Endangered)
Section 3.7.4: Conservancy Fairy Shrimp (Federally Endangered)
Section 3.7.5: Vernal Pool Fairy Shrimp (Federally Threatened)
Section 3.7.6: Vernal Pool Tadpole Shrimp (Federally Endangered)
Section 3.7.7: Delta Green Ground Beetle (Federally Threatened)
Section 3.7.8: Delta Smelt (Federally Threatened, State Endangered)
Section 3.7.9: Giant Garter Snake (Federally and State Threatened)
Section 3.7.10: California Tiger Salamander (Federally and State Threatened)
Section 3.8: Other Special Status Wildlife Species
Section 3.9: Invasive Species Management
Section 3.10: Pest and Predator Control
Section 3.11: Data Integration, Access, and Reporting
Section 4.1: Sustainability of the Military Mission and the Natural Environment

Section 4.1.2: Integrated Military Mission and Sustainable Land Use Decisions
Section 4.1.3: Infrastructure and Grounds
Section 4.1.3.1: Communication Towers and Power Lines
Section 4.1.3.2: Construction and Facility, Grounds, and Roadside Maintenance
Section 4.1.3.3: Fencelines and Buffer Zones
Section 4.1.4: Adapting to Effects of Climate Change and Regional Growth and Conservation Initiatives
Section 4.4: Environmental Education and Public Outreach
Section 4.5: Integrating Other Internal Plans and Programs
Section 4.5.2: Integrated Pest Management
Section 4.6: NEPA Compliance
Section 4.7: Natural Resources Consultation Planning
Section 4.8: Natural Resources Law Enforcement
Section 4.9: Beneficial Partnerships and Collaborative Planning

#### L.4.2.2 The Plan provides certainty that the management plan will be implemented.

Projects that will be implemented at NRTF Dixon that will provide a direct and/or cumulative benefit threatened and endangered species, Critical Habitat, and other suitable habitats at NRTF Dixon include:

EPR Project Code	Description
0088614100	CH SW NCTS Dixon INRMP and Associated Surveys
00886NR091	3 SAR SW Burrowing Owl Burrow Survey and Mapping Project
00886NR107	EO 11990 SW NCTS Dixon - Vernal Pool Survey, Mapping and Wetland Delineation
00886NR108	Sikes SW NCTS Dixon - Natural Resource Mgmt Area Fence Maintenance
00886NR110	Sikes SW NCTS Dixon - Development and Implementation of a Wildlife Habitat Enhancement Plan
00886NR112	EO 13112 SW NCTS Dixon - Invasive Weed Management
00886NR114	Sikes SW NCTS Dixon Flora and Fauna Surveys
00886NR200	MBTA SW NCTS Dixon Avian Protection Plan Development and Implementation
00886NR201	Sikes SW NCTS Dixon Wildland Fire Protection Plan
00886IPMPS	Integrated Pest Management Plan NCTS Dixon

All of these projects are assigned the highest priority possible for funding, meaning that there is a compliance responsibility that cannot wait another year (DoDI 4715.03).

#### L.4.2.3 The Plan provides certainty that the conservation effort will be effective.

##### Objective 1

Conduct surveys for presence of federally listed species, species proposed for listing, and federal candidate species for listing.

##### Parameters

- I. Conduct surveys (using established methodology) of listed species to determine presence or absence of species during breeding and non-breeding season.
  - A. Develop a standard format and database to collect and maintain records of observations.
  - B. Develop an accurate and complete Geographic Information System database of all federally listed species, species of special management concern, and related features at NRTF Dixon.
- II. Continue to survey for federally listed threatened and endangered species and candidate species potentially occurring at NRTF Dixon as part of regular species surveys, including newly listed species.
- III. Track the listing status of species proposed for listing under the ESA.

## Objective 2

Protect and conserve federally listed species, species proposed for listing, federal candidate species for listing, and their habitats that occur at NRTF Dixon in accordance with ESA.

### Parameters

- I. If any federally listed species are confirmed present NRTF Dixon, appropriate management plans and monitoring activities shall be developed for them in consultation with the USFWS, and incorporated into the natural resources management program and the INRMP.
- II. Implement habitat management approaches described in this INRMP, which benefit native and listed species.
  - A. As they are developed and as needed, integrate species-specific management actions/plans into general habitat management plans for NRTF Dixon.
  - B. Protect habitats potentially utilized by listed species from disturbance, in particular wetlands and vernal pools in the Natural Resources Management Area. Determine appropriate Best Management Practices for pesticide applications necessary in these areas.
  - C. Monitor implementation of activities and adjust as needed based on results.
- III. Given the designation of Critical Habitat, yet absence of the delta smelt and lack of its PCEs, on NRTF Dixon, continue to seek USFWS input in implementing projects and/or habitat enhancement activities that may impact aquatic habitats at NRTF Dixon or downstream delta waters.
  - A. Investigate the potential connection of NRTF Dixon water resources, aquatic and wetland habitats with downstream San Joaquin Delta waters which may be inhabited by the delta smelt. The smelt is known to spawn in Cache Slough, 7 miles south of NRTF Dixon. Haas Slough, a little more than 1 mile south of the installation, connects to Cache Slough.
- IV. Seek opportunities to develop partnerships with institutions, organizations, and other researchers to develop and improve knowledge and management of federally listed species at NRTF Dixon and to contribute to regional initiatives for those species.

### Monitoring

Section 3.7: Threatened and Endangered Species and Critical Habitat includes provisions for threatened and endangered species surveys as well as monitoring implementation of actions to benefit any suitable habitats of federally listed species that may occur on the installation or their habitats downstream that are connected to NRTF Dixon.

### Report Progress on Implementation

Refer to the discussion of reporting progress (Section L.4.1.3: The Plan provides certainty that the conservation effort will be effective.) on implementation for NRTF Dixon ecosystem management activities for the means by which NRTF Dixon will annually update and report on progress of implementation for the INRMP, including management activities pertaining to or affecting threatened and endangered species and Critical Habitat at NRTF Dixon.

INRMP updates, review, and coordination with other departments and agencies (including USFWS and CDFW) occur on an annual basis. This includes documenting INRMP natural resources management actions and project progress.





# **Naval Radio Transmitter Facility Dixon**

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## **Integrated Natural Resources Management Plan**

# **Appendix M: Natural Resources Conservation Metrics**

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# Annual Navy Natural Resources Conservation Metrics Reference Guide



Last Revised: September 2013

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## Background

In May 2004, the Naval Facilities Engineering Command (NAVFAC) was tasked to develop a metric system that would provide a better understanding of the Navy Natural Resources Program's relationship to installation missions and an indication of the success of partnerships with the USFWS and State fish and game agencies, with which the Navy develops and implements Integrated Natural Resource Management Plans (INRMPs). In August 2011, the Navy Natural Resources Metrics were updated to reflect current policy and incorporate feedback received from Navy users. The Natural Resources Metrics were designed to assess the health of the Natural Resources Program and the status of implementation of the conservation goals and objectives of the INRMP for each Navy installation. Natural Resources Metrics evaluate the effectiveness of ecosystem-based management, while ensuring no net loss of military training lands across the Navy.

The Sikes Act requires each of the Military Services to provide an annual update on the status of each installation's (facility or site) Natural Resources Management Program, Integrated Natural Resources Management Plan (INRMP), and INRMP implementation (DoDI 4715.03). The annual Natural Resources Conservation Metrics (formerly known as INRMP Conservation Metrics, Annual Reviews or INRMP Metrics) will make the process of reporting easier and more accurate. In addition, the annual review meeting and documentation of the metrics will further encourage a working dialogue and good relationships with the Navy's Sikes Act partners, the U.S. Fish and Wildlife Services (USFWS), State Fish and Wildlife agencies, and, when appropriate, National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). It should also encourage INRMP implementation and make the annual reporting process more efficient.

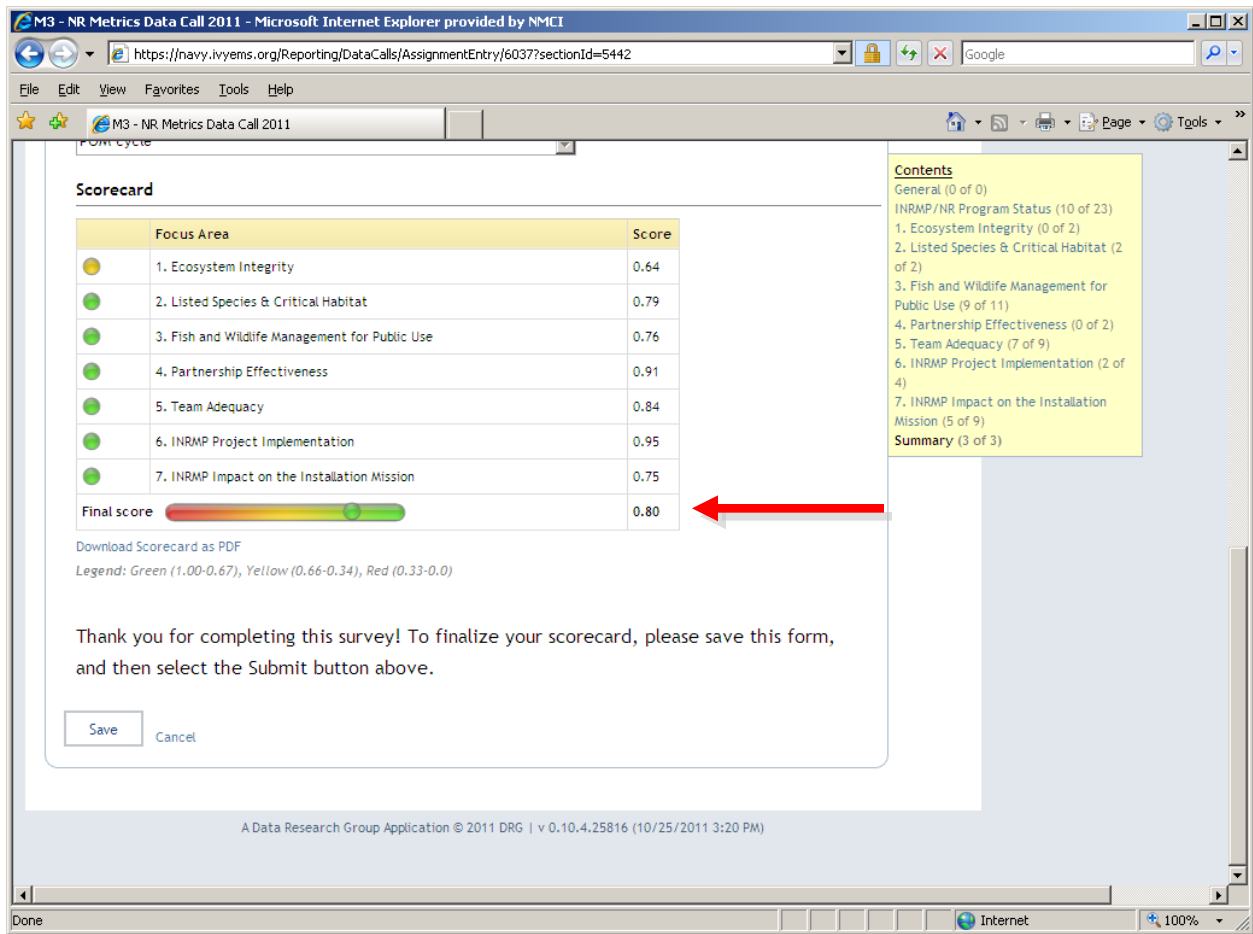
## Purpose

The Natural Resources Conservation Metrics were developed to support the annual Natural Resources Program reviews between the Navy and its Sikes Act partners, the USFWS and State Fish and Wildlife agencies, by gathering and reporting essential information required by Congress, Executive Orders, existing U.S. laws, Department of Defense, the Department of the Navy, and the U.S. Navy.. This document summarizes the Natural Resources Conservation Metrics by Focus Area, including questions and associated explanations. Metrics include responding to questions regarding the status of the INRMP, evaluation of seven focus areas, updates on agriculture outlease programs, updates on forestry programs, good news story contributions and a overall Natural Resources Program summary.

The seven (7) Focus Areas to be evaluated during the annual review of the Natural Resources Program/INRMP include the following:

1. Natural Resources Management (Ecosystem Integrity)
2. Listed Species and Critical Habitat
3. Recreational Use and Access
4. Sikes Act Cooperation (Partnership Effectiveness)
5. Team Adequacy
6. INRMP Implementation
7. Natural Resources Program Support of the Installation Mission

Each of the seven (7) Focus Areas contains questions that can be evaluated. Questions are weighted, with responses to questions having different values, ranging from 0.0 to 1.0. Each Focus Area is scored, using a rating scheme of **Green (1.0-0.67)**, **Yellow (0.66-0.34)**, and **Red (0.33-0.0)**, resulting in a comprehensive scorecard for the entire Natural Resources Metrics for each Navy installation (Figure 1). In some cases a threshold or percentage has been established to determine the upper echelon (green level) score for a given focus area.



**Figure 1.** Example of Natural Resources Conservation Metrics Scorecard.

## General Navigation of Data Call

There are some general buttons/tools that you should be aware of to facilitate your completion of the data call (Fig. 2).

**Contents (yellow box):** Click on the links in the Contents box to navigate between each Focus Area of the data call. The Contents box is located along the right side of the questions.

**Preload Values button (optional):** To load in the previous year's answers, click on the Preload Values button. This is optional. **If data is preloaded, it should be done prior to entering any new data, as it may be overwritten by the preloaded data.** Once data is preloaded, please review and validate the data to ensure accuracy. The preloaded data is editable. The Preload Values button is located at the top of the page in the header.

**Submit button:** Click on the Submit button to submit the 100% completed data call once all questions are answered. The Submit button is located at the top of the page in the header.

**No Response button:** Click on the No Response button to submit the data call with no questions answered. This will be reported as a final “No Response”. If any questions were answered, they will not be counted or viewed. You can use the No Response button for multiple special areas at once. Note: Please enter some feedback explaining why a “No Response” was submitted. The feedback should be submitted by using the Feedback button.

**Discard Draft button:** Click on the Discard Draft button to delete all data entered in the data call questionnaire. This is a quick way for the user to reset the data call and re-enter data. The Discard Draft button is located at the top of the page in the header.

**Feedback button:** Click on the Feedback button to submit a suggestion for system improvement directly to the website administrators. This information is not tracked as part of the data call submission. The Feedback button is located at the top of the page in the header.

**Printer icon:** Click the Printer icon to download a PDF copy of the questions/answers of the data call. Make sure to click on the drop-down arrow next to the printer. From the menu that appears, click on the 'Print as PDF' link. This will open up an Adobe Acrobat file that contains all the questions and answer options for the data call. The Printer icon can be used to generate a list of the questions/answer options prior to the data call being completed, and it can be used to generate a list of the questions/answers provided after the data call has been completed. The Printer icon is located on the top of the page in the header.

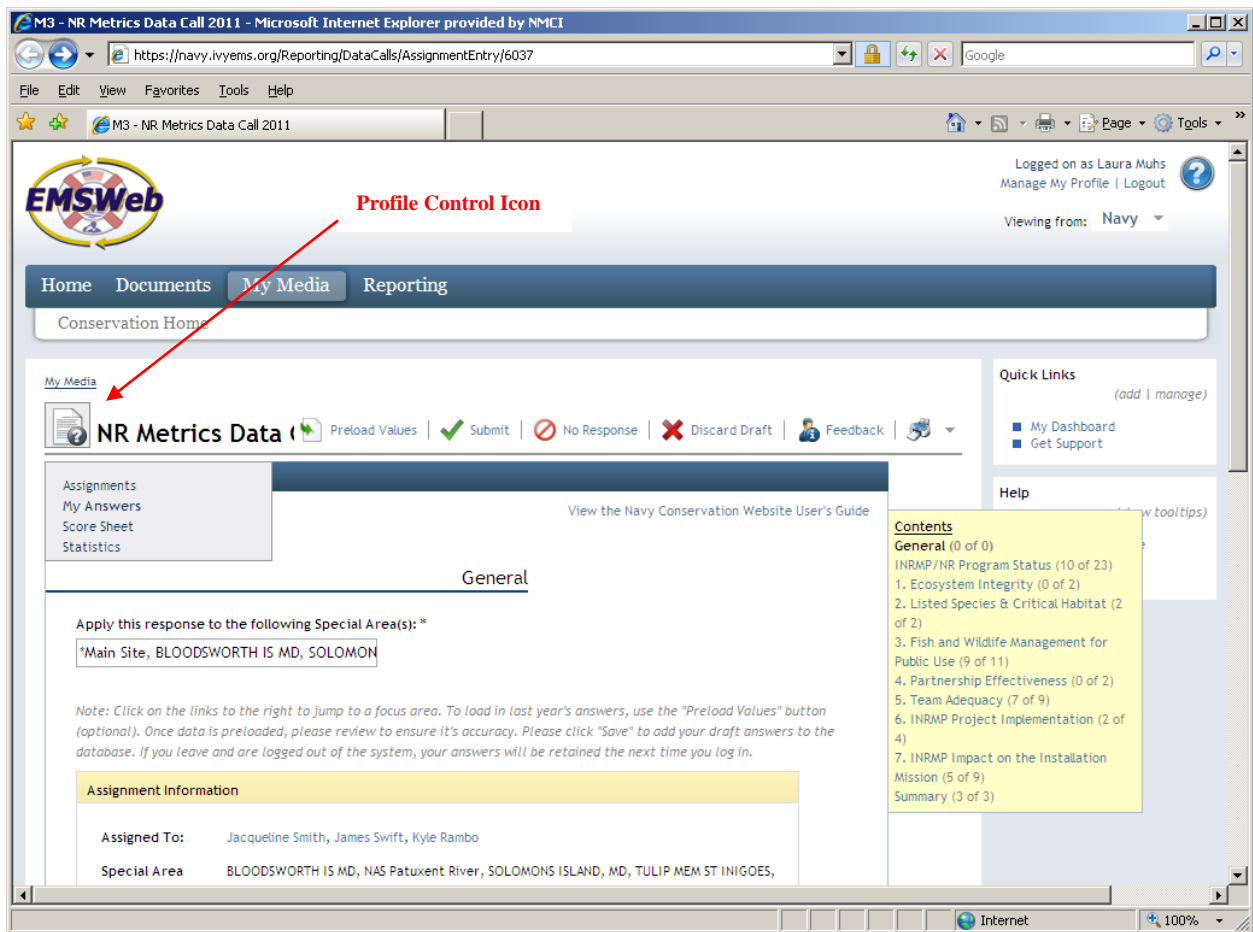
**View the Navy Conservation Website User Guide link:** Click on this link to open the Navy Conservation Website User Guide. This Guide provides users with an overview of the Navy Conservation Website and contains information to familiarize them with the basics and allow them to begin using the system. This link is located at the top of the page just under the header.

**Profile Control icon:** When the icon is clicked, a drop down menu will appear and give you four control items for the data call. These are used to view the results of the submitted data. The Profile Control icon is located at the top of the page, left of the header.

- **Assignments:** Click on the Assignments link to be directed back to the Assignments table that shows (1) who the data call was assigned to for each installation and special area and (2) the status of completion of the data call for each installation and special area.

- **My Answers:** Click on the My Answers link to be directed back to the data call questionnaire.
- **Score Sheet:** Click on the Score Sheet link to be directed to a data call summary table of the responses made by Focus Area for each Region/installation/special area. The Score Sheet view will vary depending on what level in the Organization you select from the Assignments table.
- **Statistics:** Click on the Statistics link to be directed to summary statistics for each question in the data call. The Statistics view will vary depending on what level in the Organization you select from the Assignments table. Click on the chart icon under each question to get an expanded view of the specific answers received per installation/special area.

**Save button:** Click on the Save button to save your draft answers to the database. Once data is saved, your answers will be retained the next time you log in, if you leave or are logged out of the system. The Save button is located at the bottom of the page below the questions.



**Figure 2 - General buttons and navigation to be used for completing the Natural Resources Conservation Metrics data call.**



## Natural Resources Conservation Metrics Welcome Page

A welcome page is displayed along with the attendee list on the lower half of the page. Select “New item” to add information for each attendee who participates in the Natural Resources Conservation Metrics review meeting. One person (usually a Navy Civilian) should be designated the lead of the group. Some baseline information from past reporting periods can be saved and “preloaded”.

The screenshot shows the EMSWeb NR Metrics 2013 Preview page. The page is titled "NR Metrics 2013 Preview" and is viewed from the "Navy" perspective. The main content area is titled "General" and contains a welcome message: "Welcome to the Annual Navy Natural Resources Metrics!". Below the welcome message is a note: "This site has been designed to help guide you step-by-step through a series of questions that will inform decision-makers on the status of your Natural Resources program." A link is provided: "Link to the Conservation Website User Guide: [Natural Resources Support Documents](#)".

The "Table of Contents" sidebar on the right lists the following sections:

- Introduction
- Navy INRMP Status Check/Data Call
- 1. Natural Resources Management (Ecosystem Integrity)
- 2. Listed Species & Critical Habitat
- 3. Recreational Use and Access
- 4. Sikes Act Cooperation (Partnership Effectiveness)
- 5. Team Adequacy
- 6. INRMP Implementation
- 7. INRMP (NR Program) Support of the Installation Mission
- AG and Forestry Questions
- Summary

The "Attendee List" table at the bottom has the following structure:

Name	Organization	Phone	Email	Lead
New Item				

**Figure 3** - The introduction page features the attendee list on the lower half of the page.

A Table of Contents (yellow box) is displayed to the right which allows easier navigation within the many sections of the data call.

A Link to the Conservation Website User Guide and support documents (such as this text) is also provided on this page. Users can save changes to each section and revisit the site if needed at a later time to complete the entire data call. The numbered sections (1 through 7) are used to generate the scorecard. The other sections which are not scored are used for annual reporting to OPNAV, ASN and Congress.

## Navy INRMP Status Check

**Objective:** This purpose of this section of the Natural Resources Conservation Metrics data call is to gather required information associated with the Natural Resources program, specifically the status of Integrated Natural Resources Management Plans (INRMP). Responses to the questions in this section are not scored as a part of the Natural Resources Conservation Metrics data call. These questions have been added here to collect information that will support the Defense Environmental Program Annual Report to Congress (DEPARC) and Office of the Secretary of Defense Environmental Management Review (EMR). By combining these questions with responses to the metric's seven focus areas, Natural Resources Manager are only required to only respond to a single annual data call. Data provided in previous year's data calls may be available and values pre-loaded for the following questions (see the Navy Conservation Website User's Guide for additional information on preloading data to questions).

1. Has the site/installation been surveyed to determine if significant natural resources exist?

*Options: No, Yes*

1a. If the site has been surveyed, were significant natural resources found?

*Options: No, Yes*

1b. If the site has not been surveyed, please explain why a survey has not been conducted.

*Explanation: Significant - Resources identified as having special importance to an installation and/or its ecosystem. Natural resources may be significant on a local, regional, national, or international scale. All threatened, endangered and at-risk species are significant natural resources that normally will require an INRMP. Installations that actively manage fish and wildlife, forestry, vegetation and erosion control, agricultural outleasing or grazing, or wetlands protection should be evaluated for significance, but normally will require an INRMP. An evaluation for significance should also consider the degree of active management, special natural features, aesthetics, outdoor recreational opportunities, and the ecological context of the installation. (DoDI 4715.03)*

1.c. For those installations where it has been determined that an INRMP is NOT necessary due to insufficient natural resources or other rationale, please provide signed documentation to substantiate this assessment and answer the question below.

*Options: Approved Waiver Provided Below, Not Applicable*

To provide signed documentation to substantiate that an INRMP is NOT necessary, [click here](#).

2. If significant natural resources were found, is there a compliant INRMP that covers this site?

*Options: No, Yes*

*Explanation: Compliant INRMP – A complete plan that meets the purposes of the Sikes Act (§101(a)(3)(A-C)), contains the required plan elements (§101(b)(1)(A-J)), and has been reviewed for operation and effect within the past 5 years (§101(2)(b)(2)). (CNO-N45)*

2.a. Name of First Compliant INRMP (Long text name)

2.b. Date of First Compliant INRMP (Expected date: 2001/2002)

2.c. What type of NEPA Documentation was done for the first compliant INRMP?

*Options: EA / FONSI, EIS / ROD*

2.d. When was the NEPA completed for the first compliant INRMP? *Format: MM/DD/YYYY*

2.e. Please enter the name and date of the most current INRMP that covers this site/installation?

Name:

*Date: The date that the Regional Commander/Commanding Officer endorsed (signed) the most recent INRMP (with valid NEPA coverage) and/or a review for operation and effect.*

2.f. If the most current INRMP was used to exempt the site/installation from the designation of critical habitat for a federally listed species under ESA Section (4(a)(3)(B)(i) please list those species below:

2.g. If there is no INRMP for the site, but an INRMP is needed, has funding been requested to develop an INRMP?

*Options: Yes, No*

2.g.1. If funding has been requested, what is the expected date to receive funding?

If the response to 2.g was "Yes", please enter the expected date to receive funding for a new/updated INRMP.

2.g.2. If no funding has been requested, please explain.

If the response to 2.g. "No", please explain why there is no funding requested for a new/updated INRMP.

3. Has a 5-year INRMP review for operation and effect been completed for the most recent INRMP? \*

**REVIEW FOR OPERATION AND EFFECT** – *A comprehensive review by the Parties, at least once every 5 years, to evaluate the extent to which the goals and objectives of the INRMP continue to meet the purpose of the Sikes Act, which is to carry out a program that provides for the conservation and rehabilitation of natural resources on military installations. The outcome of this review will assist in determining if the INRMP requires a revision (§101(f)(1)(A)). (CNON45) The annual review can qualify for the 5-year review for operation and effect, which is legally required by the Sikes Act, if mutually agreed upon by both partners (i.e. USFWS and State).*

*Options: Yes, No, N/A*

3.a. If a 5-year INRMP review for operation and effect been completed, did the review result in an addendum/appendix, update or revision of the INRMP?

**DEFINITION [REVISION]** – *A substantive change to an INRMP that requires coordination and mutual agreement by the Parties. [List examples of things that would trigger a revision – Navy needs to review current list.] A revision is not minor changes to the INRMP text, work plans, or projects. Rather, these changes are updates that should be made as a result of annual reviews*

*per DoD policy, to ensure the INRMP reflects the current condition of the natural resources and program goals and objectives.*

(CNO-N45)

*Options: Addendum/Amendment, Update, Revision*

3.b. What is the expected completion date of the Addendum/Amendment, Update, Revision?

3.c. If a 5-year INRMP review for operation and effect has not been completed; please explain why a review for operation and effect has not been completed?

**REMINDER:** IF YOUR INRMP IS OLDER THAN 3 YEARS OLD THE REVIEW FOR OPERATION AND EFFECT ADMINISTRATIVE PROCESS SHOULD BE UNDERWAY IN CASE THE INRMP NEEDS TO BE UPDATED/REVISED.

4. Has USFWS concurrence been received on the most recent INRMP or review for operation and effect?

*DEFINITION [REVIEW FOR OPERATION AND EFFECT] – A comprehensive review by the Parties, at least once every 5 years, to evaluate the extent to which the goals and objectives of the INRMP continue to meet the purpose of the Sikes Act, which is to carry out a program that provides for the conservation and rehabilitation of natural resources on military installations. The outcome of this review will assist in determining if the INRMP requires a revision (§101(f)(1)(A)).*

*Options: Yes, No*

4.a. **If question 4 is "Yes"**, which USFWS Region(s) are applicable? (Choose all that apply)

*Options: Pacific Region (Region 1) , Southwest Region (Region 2) , Great Lakes-Big Rivers Region (Region 3) , Southeast Region (Region 4) , Northeast Region (Region 5) , Mountain-Prairie Region (Region 6), Alaska Region (Region 7) , California and Nevada Region (Region 8) , Headquarters, Washington D.C. (Region 9)*

4.b. List the Field Office(s), if applicable, that signed concurrence documentation.

Office Name:

City:

State:

4.c. **If answer to question 4 is "Yes"**, what is the date of concurrence? (*MM/DD/YYYY*)

4.d. **If answer to question 4 is "No"**, what is the reason for the delay?

4.e Was an ESA Section 7 Consultation completed with USFWS for the INRMP?

*Options: Yes, No, N/A*

4.f. Which USFWS field office do you regularly conduct ESA Section 7 consultations with typically?

Office Name:

City:

State:

4.g. Did the Threatened and Endangered Species Listing and Recovery personnel participate in the INRMP review, update or revisions?

This question is intended to clarify whether USFWS personnel responsible for listing and recovery, specifically the designation of critical habitat have been participating in the review of your site/installation INRMP.

*Options: Yes, No, N/A*

5. Has NMFS concurrence been received on the most recent INRMP or review for operation and effect?\*

*Options: Yes, No, N/A*

5.a. **If question 5. is "Yes"**, which NMFS Region(s) are applicable? (Choose all that apply)

*Options: Alaska, Southeast and Caribbean, North-East, North-West, Pacific Island, Southwest*

5.b. List the local office, if applicable, that signed concurrence documentation.

Office Name

City

State

5.c. If question 5. is "Yes", what is the date of concurrence? (*MM/DD/YYYY*)

5.d. If question 5. is "No", what is the reason for the delay?

5.e. Was an ESA Section 7 Consultation completed with NMFS for the INRMP?

*Options: Yes, No, N/A*

5.f. Did the Threatened and Endangered Species Listing and Recovery personnel participate in the INRMP review, update or revisions? This question is intended to clarify whether USFWS personnel responsible for listing and recovery, specifically the designation of critical habitat have been participating in the review of your site/installation INRMP.

*Options: Yes, No, N/A*

6. Has State fish and wildlife agency(ies) concurrence been received on the most recent INRMP or review for operation and effect?\*

*Options: Yes, No, N/A*

6.a. If question 6 is "Yes", which State fish and wildlife agency(ies)?

Office Name:

City:

State:

6.b. **If answer to question 6 is "Yes"**, what is the date of concurrence?

6.c. **If answer to question 6 is "No"**, what is the reason for the delay?

7. If the INRMP was update/revised did the INRMP require new or supplementation NEPA?\*

*Options: Yes, No*

7.a. If so, what was the type of NEPA?

*Options: CATEX, EA / FONSI, EIS / ROD*

7.b. When was the NEPA completed? (MM/DD/YYYY)

8. Has Regional Commander or Installation Commanding Officer concurrence been received on the most recent INRMP or review for operation and effect?\*

*Options: Yes, No*

8.a. **If question 8. is "Yes"**, If yes, date of concurrence?

8.b. **If question 8. is "No"**, what is the reason for the delay?

9. If the Regional Commander has final authority over whether your site/installation INRMP is compliant has the Regional Commander concurred with/signed the most recent INRMP or review for operation and effect?\*

*Options: Yes, No, N/A*

9.a. **If question 9. is "Yes"**, If yes, date of concurrence?

9.b. **If question 9. is "No"**, what is the reason for the delay?

10. Please upload the following documents where applicable:

- a. INRMP
- b. INRMP NEPA documentation
- c. Signed correspondence letters with agencies
- d. 5-year operation & effect review letter
- e. Annual review briefs to Commanding Officer or Regional Commander
- f. INRMP Waiver Letter

11. Please confirm if you have uploaded or sent any INRMP related documents. [Select one]

- Uploaded directly to Conservation website document library
- Uploaded through Army SAFE website
- Uploaded through NAVFAC File Transfer System (NFTS)
- Sent by U.S. Mail
- Documents not uploaded or sent

## Focus Area 1: Natural Resources Management (Ecosystem Integrity)

**Focus Area Purpose:** Evaluate the effectiveness of management activities for conserving and rehabilitating installation natural resources as defined in the INRMP.

**Objective:** According to the DoDI 4715.3, the goal of ecosystem management is to ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, that approach shall maintain and improve the sustainability and biological diversity of terrestrial and aquatic (including marine) ecosystems while supporting sustainable economies, human use, and the environment required for realistic military training operations.

This Focus Area is intended to define the ecosystems that occur on the installation and assess the integrity of these ecosystems. The term, integrity, refers to the quality of state of being complete, unbroken condition, wholeness, entirety, unimpaired, without significant damage, good condition, or general soundness. Terrestrial ecosystems are defined by first selecting a Landcover Class, then a Biogeographic Division, and finally Ecological System from the drop-down menu at the top of the page, which refers to the Nature Serve’s [“Ecological Systems of the United States: A Working Classification of US Terrestrial Systems”](#). Marine ecosystems (identified from [NOAA’s Coastal and Marine Ecological Classification Standard](#)), including only the Benthic Biotic Component, Surface Geology Component, and Water Column Component of the classification scheme, have been appended to the list. Marine ecosystems are presented in the same format as terrestrial ecosystems with CMECS Components categorized under Land Cover Class and NOAA’s Large Marine Ecosystems categorized under Biogeographic Divisions. Locally-defined ecosystems may be added by selecting “Other” from the drop-down list.

*Note: Answer questions 1-5 for each ecosystem selected.*

### Assessment of Ecosystem Integrity

*Select “New Item” to add an ecosystem and begin answering questions.*

*Note: Refer to the list of ecosystems hyperlinked in the instructions above the Ecosystems drop-down menu in this Focus Area. This list may be added to by selecting ‘Other’ and entering the locally-defined ecosystem in the comment box.*

Add item to table then select Ecosystem [Dynamic list of ecosystems is displayed]

1. Has the ecosystem been identified in the INRMP? (Y/N) [Scored]
2. If the ecosystem has been identified in the INRMP, to what degree are the INRMP goals and objectives being achieved? [Scored]

Answers:

0 = Not Achieved (0)

1 = Somewhat Achieved (0.5)

2 = Fully Achieved (1.0)

3. What is the level of effect Natural Resources management actions have had on desired outcomes within the installation? [Scored]

Answers:

- 0 – Actions have not been effective (0)
- 1 – Actions have had a limited effect on conditions (0.5)
- 2 – Actions have had a positive effect on conditions (1.0)

4. To what extent is the ecological system on the installation fragmented due to land conversion?

*Options: Ecosystem and habitat fragmentation is the result of five (5) of the phenomena, Ecosystem fragmentation is the result of four (4) of the phenomena, Ecosystem fragmentation is the result of three (3) of the phenomena, Ecosystem fragmentation is the result of two (2) of the phenomena, Ecosystem fragmentation is the result of one (1) of the phenomena, No fragmentation*

*Explanation: Habitat fragmentation includes five discrete phenomena: (1) Reduction in the total area of the habitat; (2) Decrease of the interior to edge ratio; (3) Isolation of one habitat fragment from other areas of habitat; (4) Breaking up of one patch of habitat into several smaller patches; and (5) Decrease in the average size of each patch of habitat.*

5. To what degree is the ecological system vulnerable to stressors?

*Options: Completely Vulnerable, Severely Vulnerable to Stress, Highly Vulnerable to Stress, Moderately Vulnerable to Stress, Slightly Vulnerable to Stress, Not Vulnerable to Stress*

*Explanation: Environmental stressors (physical, chemical, and/or biological) result from environmental and/or anthropogenic factors, such as wildfires, pollution, invasive species, disease, climate change, competition, etc.*

6. Is the ecosystem effectively managed to sustain viable populations of species?

*Options: Not effectively managed, Minimally effective management, Moderately effective management, Effectively managed*

General Ecosystem Integrity Questions (outside of the table)

7. Are conservation easements, or buffers, in place to provide an ecosystem integrity benefit on the installation? (Y/N/NA) [Scored]

Answers:

- N (0) = opportunity exists, but easements/buffers have not been pursued
- Y(1.00) = buffers and/or easements are in place to provide benefits
- N/A = no opportunity, development is immediately adjacent to installation

8. Are Conservation Banking actions used to achieve positive outcomes and /or INRMP goals and objectives?

(Yes/No) [Not scored]



8.a If yes, please describe below.

To complete this focus area; please enter Findings and Recommendations in the space provided below. Findings and Recommendations are required if the score for this focus area results in a Yellow or Red score. You will be unable to proceed to the next focus area until Findings and Recommendations have been entered. In short, a “finding” is usually an activity or issue to be addressed, and a “recommendation” is the proposed solution or action needed to address the finding.

If your score is Green, Findings and Recommendations serve are optional, however they can provide clarification to the answers provided for the Focus Area, and they are encouraged in order to provide a better understanding of existing activities, issues to be addressed, and unique circumstances.

**Findings:** \_\_\_\_\_

**Recommendations:** \_\_\_\_\_

Please enter Findings and Recommendations. Findings and Recommendations serve as additional clarification to the answers provided for this Focus Area, and they are encouraged in order to provide a better understanding of existing activities, issues to be addressed, and unique circumstances. *Note: You will need to enter all answers to the above questions directly into the Navy Conservation Website prior to providing responses to Findings and Recommendations. Answers supplied online are scored, which generates a green-yellow-red score for each response. Findings and Recommendations are required for each ecosystem that scored as a yellow or red.*

**Findings:** Findings are required for answers that scored yellow or red. Findings explain why the score is yellow or red. Findings are encouraged for answers that scored green. This allows you to document natural resources management practices that are benefiting ecosystem integrity.

**Recommendations:** Recommendations are required for answers that scored yellow or red. Recommendations explain how the Findings will be mitigated. Recommendations are encouraged for answers that scored green. This allows you to document natural resources management practices that may be implemented to further improve ecosystem integrity.

**Comment on this Focus Area and associated Questions:** Select this link below each question if you would like to elaborate on the answer provided. This is also a good way to document unique circumstances and the assumptions made by all partners that contributed to the answer.

[Save] [Save and Go to Next Section]

## Focus Area 2: Listed Species and Critical Habitat

**Focus Area Purpose:** Evaluates the extent to which federally listed species have been identified and the INRMP provides conservation benefits to these species and their habitats.

**Supplemental Information:** The intent of this Focus Area is to identify the federally listed species that occur on a Navy installation, as well as assess if an INRMP provides the conservation benefits necessary to preclude designation of critical habitat for a particular species. The USFWS has defined criteria to determine if an INRMP provides adequate special management or protection. These criteria must be addressed in the INRMP to demonstrate that designation of critical habitat is not necessary, the Natural Resource Program and/or INRMP provides a conservation benefit, that the installation is implementing the necessary measures to protect and conserve the habitat, and provide certainty that the conservation effort will be effective. Answer the questions for each of the federally listed species selected from the preloaded list. The list is comprised of USFWS and NMFS federally threatened and endangered species.

*Note: Answer questions 1-6 for each federally listed species selected.*

### Assessment of Listed Species and Critical Habitat

*Select "New Item" to add a species and begin answering questions.*

General species information -

If you are entering a federally listed species, please select it below.

*Note: Refer to the USFWS (<http://www.fws.gov/endangered/>) for a list of federally listed species.*

If you are entering a state listed species, candidate species, or species at risk, please enter the species name below. [See table down below]

*Note: Answering the Species Assessment questions below for state listed species, candidate species, or species at risk is optional, but it may be beneficial to begin documenting how the INRMP/Natural Resources program may be benefiting these species.*

1. Have surveys been completed for this species on the installation?

*Options: Yes, No*

2. Do existing surveys provide adequate data on habitat conditions on the installation? (Y/N)

*Options: Yes, No*

3. Do existing surveys provide adequate data on population presence and numbers on the installation? (Y/N)

*Options: Yes, No*

4. To what extent are quantifiable goals, objectives, and monitoring requirements in place to address the conservation needs of the species? (0-4, NA)

Answers:

0= None (0)

1= Minimal (0.25)

2= Moderate (0.50)

3= Good (0.75)

4= Excellent (1.00)

N/A

5. Has critical habitat been proposed or designated for the species during the reporting period on the installation (per Federal Register [FR] Final Rule)? (Y/N/)

Answers:

Yes (0)

No (1.0)

N/A (Critical habitat designation was not proposed)

6. If critical habitat was proposed for this species but has not been designated during the reporting period on the installation, under which provision of the ESA (Sec. 4) was exemption or exclusion granted?

Answers:

National Security (Exclusion) (0)

INRMP (Exemption) (1.0)

N/A (Critical habitat designation was not proposed)

7. If any exempted or excluded habitat exists for this species on the installation, are projects/actions clearly identified in the INRMP to support the management of the habitat/ecosystems?

Answers:

No (0)

Yes (1.0)

N/A

8. If a designated critical habitat exemption or exclusion was obtained in a previous year for this species on the installation, are those projects/actions that support the exemption clearly identified in EPRWeb?

*Options: Yes, No, N/A*

9. Have any conservation recommendations pertaining to this species been identified during the reporting period that should be considered for incorporation in the INRMP?

*Options: Yes, No*

Unoccupied Critical Habitat Questions –

1. Has critical habitat (unoccupied) for any federally listed species not found on the installation been designated on the installation? (Y/N)
  - a. For which species? [Select each species and answer the following questions]
  
2. Have management projects/actions addressing unoccupied critical habitat been clearly identified in the INRMP?  
*Options: Yes, No, N/A*
  
3. Have management projects/actions addressing unoccupied critical habitat been clearly identified in the EPRWeb?  
*Options: Yes, No, N/A*

#### Candidate Species/Species of Concern Question

*Instruction: This section allows users to add Federal Candidate species that occur on Navy installations, as well as State-listed species and State identified Species of Concern for tracking purposes.*

1. Does the ecosystem management approach outlined in the INRMP provide conservation benefits to this candidate species/species of concern?

*Options: Yes, No*

Please enter Findings and Recommendations. Findings and Recommendations serve as additional clarification to the answers provided for this Focus Area, and they are encouraged in order to provide a better understanding of existing activities, issues to be addressed, and unique circumstances. *Note: You will need to enter all answers to the above questions directly into the Navy Conservation Website prior to providing responses to Findings and Recommendations. Answers supplied online are scored, which generates a green-yellow-red score for each response. Findings and Recommendations are required for each ecosystem that scored as a yellow or red.*

**Findings:** Findings are required for answers that scored yellow or red. Findings explain why the score is yellow or red. Findings are encouraged for answers that scored green. This allows you to document natural resources management practices that are benefiting listed species.

**Recommendations:** Recommendations are required for answers that scored yellow or red. Recommendations explain how the Findings will be mitigated. Recommendations are encouraged for answers that scored green. This allows you to document natural resources management practices that may be implemented to further improve management of listed species.

**Comment on this Focus Area and associated Questions:** Select this link below each question if you would like to elaborate on the answer provided. This is also a good way to document the assumptions made by all partners that contributed to the answer.



## Focus Area 3: Recreational Use and Access

**Focus Area Purpose:** Evaluate the availability and adequacy of public recreational use opportunities, such as fishing and hunting, and access for handicapped and disabled persons, given security and safety requirements for the installation.

1. Are there Natural Resources related recreational opportunities on the installation?

*Options: N/A: Landscape doesn't support recreational opportunities, No, Yes*

2. If recreational opportunities are available, are they offered to the public?

*Options: N/A: Recreational opportunities are not available, No, Yes*

3. If recreational opportunities are available, are they offered to DoD personnel?

*Options: N/A: Recreational opportunities are not available, No, Yes*

4. If recreational opportunities are available, are they accessible by disabled veterans/Americans?

*Options: N/A: Recreational opportunities are not available, No, Yes*

5. Are fees collected for outdoor recreational opportunities?

*Options: N/A, No, Yes*

6. Are the recreational facilities in good condition?

*Options: N/A, No, Yes*

7. Are sustainable harvest goals in the INRMP effective for the management of the species' population?

*Options: Effective, Highly effective, Minimal effectiveness, Moderate effectiveness, N/A: Recreational opportunities do not include hunting and fishing, Not effective*

8. To what extent did the installation develop and provide public outreach/educational awareness, e.g. environmental educational opportunities, natural resource field trips/tours, pamphlets?

*Options: Excellent outreach, Good outreach, Low outreach, Moderate outreach, N/A, No public outreach provided*

9. Is there an active conservation law enforcement program (CLEP) on the installation?

(Y/N/NA)

Answers:

N (0) If answer is No or NA, then proceed to next Focus Area

Y (1.00)

NA (recreational opportunities do not include hunting and fishing)

Please enter Findings and Recommendations. Findings and Recommendations serve as additional clarification to the answers provided for this Focus Area, and they are encouraged in order to provide a better understanding of existing activities, issues to be addressed, and unique circumstances.

**Findings:** Findings explain why the score is yellow or red. Findings are encouraged for all answers. This allows you to document issues related to the questions on recreational opportunities.

**Recommendations:** Recommendations explain how the Findings will be mitigated. Recommendations are encouraged for all answers. This allows you to document recommendations agreed upon by all partners.

**Comment on this Focus Area and associated Questions:** Select this link below each question if you would like to elaborate on the answer provided. This is also a good way to document the assumptions made by all partners that contributed to the answer.

## Focus Area 4: Sikes Act Cooperation (Partnership Effectiveness)

**Focus Area Purpose:** Determine to what degree USFWS, State Fish and Wildlife Agency and, when appropriate, NMFS Service, partnerships are cooperative and result in effective INRMP development, review for operation and effect, and mutual agreement.

1. Was the USFWS invited to participate in the annual INRMP/Natural Resources Program review?

*Options: Yes, No*

1.a. By what method was the USFWS invited to participate in the annual INRMP/Natural Resources Program review? *Options: Telephone call, Electronic mail, Official letter, Multiple methods, Other, NA (USFWS was not invited)*

1b. Did the USFWS respond to the invitation to participate in the annual INRMP/Natural Resources Program review? *Options: Yes, No, Not Applicable*

1c. How many attempts were made to invite the USFWS to participate in the annual INRMP/Natural Resources Program review?

*Options: 0-3, 4-6, 7-10, >10, N/A (USFWS was not invited)*

1d. Did the USFWS participate in the annual INRMP/Natural Resources Program review?

*Options: Yes, No*

1e. If the USFWS participated in the annual INRMP/Natural Resources Program review, was it recognized as a review for operation and effect? *Options: Yes, No*

1f. If the USFWS did not participate in the annual review, what type of correspondence was received from the USFWS to inform the installation that they were not able to participate?

*Options: Telephone Call, Electronic mail, Official letter, Other*

1g. If the USFWS did not participate in the annual INRMP/Natural Resources Program review, was a separate meeting held/correspondence sent as a review for operation and effect? (Y/N)

When? *Options: Yes, No*

1.h. Was a report of the previous year's annual review submitted to the USFWS during this reporting period? *Options: Yes, No*

2. Was the State Fish and Wildlife Agency invited to participate in the annual INRMP/Natural Resources Program review? *Options: Yes, No*

2a. By what method was the State Fish and Wildlife Agency invited to participate in the annual INRMP/Natural Resources Program review? [Not Scored]

Answers:

Telephone call



Electronic mail  
Official Letter  
Multiple methods  
Other  
NA (the State Fish and Wildlife Agency was not invited)

2b. Did the State Fish and Wildlife Agency respond to the invitation to participate in the annual INRMP/Natural Resources Program review? (Y/N/NA) [Not Scored]

2c. How many attempts were made to invite the State Fish and Wildlife Agency to participate in the annual INRMP/Natural Resources Program review? [Not Scored]

*Options: 0-3, 4-6, 7-10, >10, N/A (the State Fish and Wildlife Agency was not invited)*

2d. Did the State Fish and Wildlife Agency participate in the annual INRMP/Natural Resources Program review? *Options: Yes, No*

2e. If the State Fish and Wildlife Agency participated in the annual INRMP/Natural Resources Program review, was it recognized as a review for operation and effect? *Options: Yes, No*

2f. If the State Fish and Wildlife Agency did not participate in the annual review, what type of correspondence was received from the State Fish and Wildlife Agency to inform the installation that they were not able to participate?

*Options: Telephone call, Electronic mail, Official letter, Other*

2g. If the State Fish and Wildlife Agency did not participate in the annual INRMP/Natural Resources Program review, was a separate meeting held/correspondence sent as a review for operation and effect? *Options: Yes, No – Provide date*

2h. Was a report of the previous year's annual review submitted to the State Fish and Wildlife Agency during this reporting period? (Y/N) [Scored]

3. Was NMFS invited to participate in the annual INRMP/Natural Resources Program review, if applicable? *Options: Yes, No, N/A*

3a. By what method was NMFS invited to participate in the annual INRMP/Natural Resources Program review, if applicable?

*Options: Telephone call, Electronic mail, Official letter, Multiple, Other, NA*

3b. Did NMFS respond to the invitation to participate in the annual INRMP/Natural Resources Program review, if applicable? *Options: Yes, No, N/A*

3c. How many attempts were made to invite the NMFS to participate in the annual INRMP/Natural Resources Program review, if applicable?

*Options: 0-3, 4-6, 7-10, >10, N/A*

3d. Did NMFS participate in the annual INRMP/Natural Resources Program review, if applicable? *Options: Yes, No, N/A*

3e. If NMFS participated in the annual INRMP/Natural Resources Program review, was it recognized as a review for operation and effect, if applicable? *Options: Yes, No, N/A*

3f. If NMFS did not participate in the annual INRMP/Natural Resources Program review, was a separate meeting held/correspondence sent as a review for operation and effect, if applicable? *Options: Yes, No, N/A – Provide dates*

3g. If NMFS did not participate in the annual review, what type of correspondence was received from NMFS to inform the installation that they were not able to participate, if applicable? *Answers: Telephone Call, Electronic mail, Official Letter, Other, N/A*

3h. Was a report of the previous year's annual review submitted to NMFS during this reporting period, if applicable? *Yes, No, N/A*

4. What is the level of collaboration/cooperation between Sikes Act partners? *Answers: None, Minimal collaboration/cooperation, Satisfactory collaboration/cooperation, Effective collaboration/cooperation, Highly effective collaboration/cooperation*

5. How well are installation natural resource management goals and objectives aligned with conservation goals of Sikes Act partners, e.g. USFWS regional goals and State Wildlife Action Plans (SWAPs)? *Answers: Not aligned, Somewhat aligned, Completely aligned*

**Findings:** \_\_\_\_\_

**Recommendations:** \_\_\_\_\_

Please enter Findings and Recommendations. Findings and Recommendations serve as additional clarification to the answers provided for this Focus Area, and they are encouraged in order to provide a better understanding of existing activities, issues to be addressed, and unique circumstances. *Note: You will need to enter all answers to the above questions directly into the Navy Conservation Website prior to providing responses to Findings and Recommendations. Answers supplied online are scored, which generates a green-yellow-red score for each response. Findings and Recommendations are required for each ecosystem that scored as a yellow or red.*

**Comment on this Focus Area and associated Questions** Select this link below each question if you would like to elaborate on the answer provided. This is also a good way to document the assumptions made by all partners that contributed to the answer.

## Focus Area 5: Team Adequacy

**Focus Area Purpose:** Assess the adequacy of the natural resources team (professionally trained natural resources management and/or installation support personnel) in accomplishing INRMP/Natural Resources Program goals and objectives at each installation.

1. Is there a Navy professional Natural Resources Manager assigned by the Regional Commander/Installation Commanding Officer?

*Options: No, Yes*

2. Is there an on-site Navy professional Natural Resources Manager?

*Options: No, Yes*

3. Is there adequate installation staff assigned or available to properly implement the INRMP/Natural Resources Program goals and objectives? *Options: No, Yes*

4. How well do higher echelon offices support the installation natural resources program, e.g. reach back support for execution, policy support, etc.)? *Answers: No support, Minimal support, Satisfactory support, Well supported, Very well supported*

5. The team is enhanced by the use of contractors.

*Options: Agree, Disagree, N/A, Somewhat agree, Strongly agree, Uncertain*

6. The team is enhanced by the use of volunteers.

*Options: Agree, Disagree, N/A, Somewhat agree, Strongly agree, Uncertain*

7. The Natural Resources team is adequately trained to accomplish its duties to ensure compliance.

*Options: Agree, Disagree, Somewhat agree, Strongly agree, Uncertain*

Please enter Findings and Recommendations. Findings and Recommendations serve as additional clarification to the answers provided for this Focus Area, and they are encouraged in order to provide a better understanding of existing activities, issues to be addressed, and unique circumstances.

**Findings:** Findings explain why the score is yellow or red. Findings are encouraged regardless of the score. This allows you to document issues related to the questions on team adequacy.

**Findings:** \_\_\_\_\_

**Recommendations:** Recommendations explain how the Findings will be mitigated. Recommendations are encouraged for all answers. This allows you to document recommendations agreed upon by all partners.

**Recommendations:** \_\_\_\_\_

**Comment on this Focus Area and associated Questions** Select this link below each question if you would like to elaborate on the answer provided. This is also a good way to document the assumptions made by all partners that contributed to the answer.

## Focus Area 6: INRMP Implementation

**Focus Area Purpose:** Evaluates the execution of actions taken to meet goals and objectives outlined in the INRMP.

**Supplemental Information:** The intent of this Focus Area is to assess how well actions are being implemented to execute the goals and objectives of the INRMP. Actions can include projects submitted via EPRWeb, as well as activities executed with alternative funds, not programmed through EPRWeb, or project that do not require funding including those that are carried out by the use of volunteers or cooperative partnerships with other entities.

### Assessment of INRMP Project Implementation

*Select a project from the list below (imported from EPRWeb) to begin answering questions. If this is an incomplete list, select “New Item” to add additional INRMP projects/actions, e.g. emergent projects or actions that do not require funding, and begin answering questions.*

### Assessment of INRMP Implementation table -

Project Number	Project Title	Funding Source	Funds Obligated	Funds Spent
EPRweb data	EPRweb data	EPRweb data	EPRweb data	User Validates

*Note: All Natural Resources Program requirements must be entered into EPRWeb. All projects/actions, regardless of funding source (such as OM&N, MIS, Forestry Reserve Account, Agricultural Outlease Program funds, and Sikes Act fees, etc.) must be in EPRWeb. Conservation recommendations identified during regulatory consultation (e.g. ESA Section 7, EFH, etc.), over the past year, may have resulted in the development of emergent requirements. These projects should also be evaluated during this annual review.*

1. Is the INRMP action on schedule?

*Options: No, Yes*

2. What is the current status of the INRMP action?

*Options: Not Requested; Not Completed; Programmed; Not in EPRWeb, Project Not Yet Underway, Funding Not Received, In EPRWeb; Funding Received; SOW Prepared; Awarded/Executed; Project Underway, Project Now In-Progress; Project Completed*

3. The action was designed to meet the goals and objectives of the INRMP. *Options:*

*Disagree, Neither agree nor disagree, Somewhat Agree, Agree, Strongly Agree*

4. How much progress has been made in implementing the action? *Progress to date: 0%-25%; 26%-50%; 51%-75%; 76%-100%*

5. If the INRMP action provided an ecosystem integrity benefit, select the ecosystem benefited. (user selects from ecosystem list built in Focus Area #1)

#### Listed Species Implementation Table Questions -

*For each INRMP action executed during the reporting period for the installation, the following questions are asked to evaluate the amount of funding spent on listed species related-actions.*

1. INRMP Action? (user selects from a list of actions pre-populated from EPRWeb, plus additional actions added by the user in this Focus Area, that may have listed species funding associated with it) [Non-Scored]
2. Species? (user selects from federally listed species list built in Focus Area #2)
3. Amount Spent? (user enters dollar amount)

#### General INRMP Implementation Questions –

1. Do the goals and objectives of the INRMP/Natural Resources Program support other conservation partnerships/initiatives? *Options: No, Yes*
2. Which conservation partnerships/initiatives are supported? [Select all that apply]
3. To what level is the Natural Resource program and/or INRMP meeting USFWS conservation management expectations? (0-4)  
*Options: Dissatisfied, Minimally satisfied, Somewhat satisfied, Completely satisfied, More than satisfied*
4. To what level is the Natural Resource and/or INRMP meeting State Fish and Wildlife Agency conservation management expectations? (0-4)  
*Options: Dissatisfied, Minimally satisfied, Somewhat satisfied, Completely satisfied, More than satisfied*
1. To what level are Natural Resource program executions meeting NMFS conservation management expectations, if applicable?  
*Options: Dissatisfied, Minimally satisfied, Somewhat satisfied, Completely satisfied, More than satisfied, N/A*
2. Are migratory birds adequately addressed in the INRMP for this installation to support the mission and needed NEPA analyses? *Options: Yes, No*
3. To what extent has the INRMP/Natural Resources program successfully supported other mission areas? (e.g. encroachment, BASH, range support, port operations, air operations, facilities management, etc.)

*Options: Not supported, minimally supported, satisfactorily supported, well supported, Very well supported*

5. Are Cooperative Agreements used to execute natural resources program requirements?  
(Y/N) [Non-Scored]

6. Describe any obstacles to INRMP implementation. (user enters text) [Non-Scored]

**Findings:** \_\_\_\_\_

**Recommendations:** \_\_\_\_\_

**Comment on this Focus Area and associated Questions** Select this link below each question if you would like to elaborate on the answer provided. This is also a good way to document the assumptions made by all partners that contributed to the answer.

*Proceed to next section*

## Focus Area 7: INRMP Support of the Installation Mission

**Objective:** This Focus Area is designed to measure the level to which existing Natural Resources compliance requirements and associated actions support the installation's ability to sustain the current operational mission.

### Mission statement

*Note: The installation's mission statement may be preloaded. If not, please enter it here.*

1. The Natural Resources program effectively considers current mission requirements. (0-4)

*Options: Agree, Disagree, Neutral, Strongly agree, Strongly disagree*

2. What is the level of coordination between natural resources personnel and other installation departments and military staff? (0-4)

*Options: Effective coordination, Highly effective coordination, Minimal coordination, No coordination, Satisfactory coordination*

3. To what extent does the INRMP successfully support the mission by minimizing possible constraints imposed by regulatory requirements? (0-4)

*Options: Minimally supported, Not supported, Satisfactorily supported, Very well supported, Well supported*

4. To what extent has there been a net loss of training lands or mission-related operational/training activities?

*Options: Mission has seen benefits, Mission is fully impeded; training activities cannot be conducted, Mission/Training activities are somewhat impeded with workarounds, Neutral, No loss occurred*

5. Please provide examples of how the INRMP or Natural Resources Program has resulted in any mission impacts (work-around, etc) or specific benefits (e.g. able to increase training areas by 100 acres). [Narrative]

Please provide examples of how the INRMP or Natural Resources Program has resulted in any mission impacts (work-around, etc) or specific benefits (e.g. able to increase training areas by 100 acres).

Please enter Findings and Recommendations. Findings and Recommendations serve as additional clarification to the answers provided for this Focus Area, and they are encouraged in order to provide a better understanding of existing activities, issues to be addressed, and unique circumstances.

**Findings:** Findings explain why the score is yellow or red. Findings are encouraged for all answers. This allows you to document issues related to the questions on INRMP Impact on Installation Mission.

**Recommendations:** Recommendations explain how the Findings will be mitigated. Recommendations are encouraged for all answers. This allows you to document recommendations agreed upon by all partners.

**Comment on this question:** Select this link below each question if you would like to elaborate on the



answer provided. This is also a good way to document the assumptions made by all partners that contributed to the answer.

**Findings:** \_\_\_\_\_

**Recommendations:** \_\_\_\_\_

**Comment on this Focus Area and associated Questions** Select this link below each question if you would like to elaborate on the answer provided. This is also a good way to document the assumptions made by all partners that contributed to the answer.

### Agriculture and Forestry Questions

S1. There is an active agriculture out-lease program on this installation.

Answer: True, False

S2. There is an active forestry program on this installation.

Answer: True, False

If your response was “True” to either or both of the above questions, please complete the next section.

### Agricultural Out-lease Program Questions

1. What is the total number # of leased areas?
2. What is the total number # of leased acres?
3. What is the Annual lease income?
4. What are the annual expenses?
5. Do any leases involve in-kind payments?
6. What is the number of in-kind leases?
7. Are leases for: crop production, hay, grazing, other?
8. What is the primary land use where AG out-leasing occurs?
9. Are additional lands available for AG out-leasing?
10. What is the number of additional acres available?
11. Do you have an apiary program? *Yes, No*
12. If so, is the apiary activity part of the AG out-lease program?
13. How many personnel are funded through AG out-lease funds?
14. Primary installation AG program POC:

[Input] First Name, Last Name, Phone, Email

### Forestry Program Questions

1. What is the number of forested acres?
2. Do you have a commercial forest program? *Yes, No*
3. What is the annual program revenue?

4. What are the annual expenses?
5. What is the number acres regenerated through planting?
6. How many acres are naturally regenerated?
7. What is the number of acres of longleaf pine (*Pinus palustris*)?
8. What are the primary commercial species managed?
9. Is prescribed burning used? (Y/N)
10. What is the number of acres burned in the past year?
11. How many personnel are funded through forestry funds?
12. Primary installation forestry program POC:  
[Input] First Name, Last Name, Phone, Email

## Summary

1. As a result of this year’s annual for operation and effect, have any conservation recommendations identified that should be considered for incorporation into the INRMP? (e.g. ESA Section 7, EFH, etc.)

*Options: No, Yes*

*Explanation: The purpose of this question is to assess whether the INRMP needs to be updated, either in content or projects to be implemented, as a result of the outcome of the annual review for operation and effect that was conducted.*

2. What are the findings and recommendations that resulted from the annual review? (Narrative) [Not Scored]

*A “finding” in general is something within the Natural Resources Program that needs further attention. Examples include: Communication, Coordination, Methodology, Activities to be included or excluded, Timing or schedule adjustments, etc.*

3. In addition to any recommendations submitted in the previous 7 Focus Areas, please provide any additional or general recommendations? (Narrative) [Not Scored]




*A “recommendation” in general is a solution to a finding (see above) that would improve some aspect of the Natural Resources program. Examples include: Regular meetings or increased communication, increased focus or emphasis on conservation measures, adjustments to methods used, increased or decreased activities that may provide benefits to a given resource(s).*

4. List the top three accomplishments for the Natural Resources Program during this reporting period.

4a. \_\_\_\_\_

4b. \_\_\_\_\_

4c. \_\_\_\_\_

[Natural Resources Metrics summary score card displayed here] 0-33  34 - 66  67-100 

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