MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA

INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN

AND

ENVIRONMENTAL ASSESSMENT

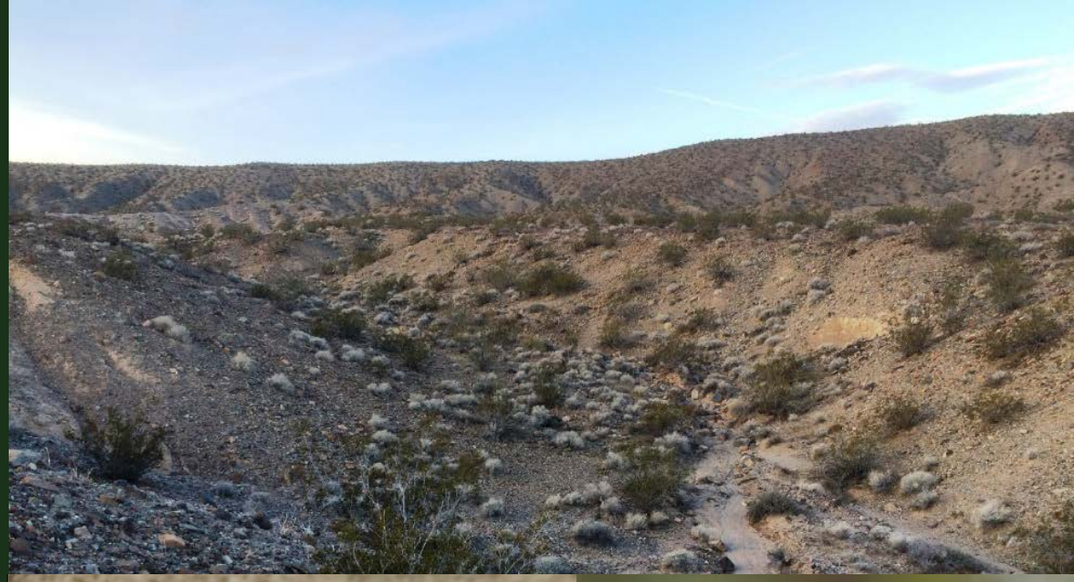
Prepared by:

Marine Corps Logistics Base
Barstow, California

and

Naval Facilities Engineering Command
Southwest

April 2017



INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN FOR MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA

PREPARED BY:

MARINE CORPS LOGISTICS BASE
BARSTOW, CALIFORNIA

AND

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WITH TECHNICAL ASSISTANCE FROM:

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SAN DIEGO, CALIFORNIA
PHOENIX, ARIZONA
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APRIL 2017

FORMAT PAGE

INRMP CONCURENCE AND ACCEPTANCE

This Integrated Natural Resources Management Plan (INRMP) provides for management and stewardship of the natural resources on Marine Corps Logistics Base (MCLB) Barstow, California. The INRMP was prepared in accordance with the standards, regulations, and procedures of the Department of Defense, Department of Navy, and the Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, *et seq.*); and in cooperation with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife.

By signature of their agency representative, the Department of Navy, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife agree to enter into a cooperative program for the protection, conservation, and management of natural resources present on MCLB Barstow. The objective of this agreement is the development and management of sustainable functioning ecological communities on MCLB Barstow, integrated with the missions of natural resource conservation, management, and protection agencies. To the extent that resources permit, this plan may be amended by mutual agreement of the authorized representatives of each stakeholder. This plan will become effective upon the date of the last signatory and shall continue in full force for a period of five years and until its update or revision, or until terminated by written notice to the other parties, in whole or in part, by any of the parties signing this agreement.

By the signature below, or an enclosed letter of concurrence, the Department of the Navy grants their concurrence with and acceptance of the Revised INRMP for MCLB Barstow.

Approving Official:

SSK

COLONEL SEKOU S. KAREGA
Commanding Officer
Marine Corps Logistics Base
Barstow, California

18 April 2017
Date

FORMAT PAGE

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This Integrated Natural Resources Management Plan (INRMP) provides for management and stewardship of the natural resources on Marine Corps Logistics Base (MCLB) Barstow, California. The INRMP was prepared in accordance with the standards, regulations, and procedures of the Department of Defense, Department of Navy, and the Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, *et seq.*); and in cooperation with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife.

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By the signature below, or an enclosed letter of concurrence, the U.S. Fish and Wildlife Service grants their concurrence with and acceptance of the Revised INRMP for MCLB Barstow.

Approving Official:

G. Mendel Stewart

G. MENDEL STEWART
Field Supervisor
Carlsbad and Palm Springs Offices
U.S. Fish and Wildlife Service

May 22, 2017
Date

FORMAT PAGE

INRMP CONCURENCE AND ACCEPTANCE

This Integrated Natural Resources Management Plan (INRMP) provides for management and stewardship of the natural resources on Marine Corps Logistics Base (MCLB) Barstow, California. The INRMP was prepared in accordance with the standards, regulations, and procedures of the Department of Defense, Department of Navy, and the Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, *et seq.*); and in cooperation with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife.

By signature of their agency representative, the Department of Navy, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife agree to enter into a cooperative program for the protection, conservation, and management of natural resources present on MCLB Barstow. The objective of this agreement is the development and management of sustainable functioning ecological communities on MCLB Barstow, integrated with the missions of natural resource conservation, management, and protection agencies. To the extent that resources permit, this plan may be amended by mutual agreement of the authorized representatives of each stakeholder. This plan will become effective upon the date of the last signatory and shall continue in full force for a period of five years and until its update or revision, or until terminated by written notice to the other parties, in whole or in part, by any of the parties signing this agreement.

By the signature below, or an enclosed letter of concurrence, the California Department of Fish and Wildlife grants their concurrence with and acceptance of the Revised INRMP for MCLB Barstow.

Approving Official:

Chris Hoyer for — 5-17-17

LESLIE MACNAIR
Regional Director
Inland Deserts Region
California Department of Fish and Wildlife

Date

FORMAT PAGE

EXECUTIVE SUMMARY

The Marine Corps Logistics Base (MCLB) Barstow Integrated Natural Resources Management Plan (INRMP) will ensure that natural resource conservation measures and military operations on the Base are integrated and consistent with applicable environmental stewardship and legal requirements, specifically the Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, *et seq.* [Sikes Act]).

Marine Corps Order (MCO) P5090.2A, Environmental Compliance and Protection Manual, requires that all USMC installations having water and land suitable for the conservation and management of natural resources prepare and implement a comprehensive INRMP that includes all elements of natural resource management applicable to the installation. MCLB Barstow contains significant natural resources, including a federally listed species and designated critical habitat, which necessitate management and legal consideration. DoD Instruction (DoDI) 4715.03, Natural Resources Conservation Program, "provides procedures for DoD components and installations for developing, implementing, and evaluating effective natural resources management programs."

This plan has been written to provide effective management of natural resources on MCLB land and to ensure they remain available and in good condition to support the Base's military mission. This plan sets the agenda for managing MCLB Barstow's natural resources from 2017 through 2021.

The Sikes Act requires the Secretary of the Navy to prepare INRMPs in cooperation with the United States Fish and Wildlife Service (USFWS) and state wildlife agency, which in this case is the California Department of Fish and Wildlife (CDFW). This cooperation ensures that the INRMP reflects mutual agreement of these parties concerning conservation, protection, and management of fish and wildlife resources on the Base.

MCLB Barstow has identified three primary goals relating to natural resource management. Those goals, listed below, are compatible and consistent with United States Marine Corps (USMC) natural resources policy:

- **Goal 1:** Guarantee continued access for the military mission to MCLB Barstow's land, water, vegetation, and wildlife resources, while preserving, protecting, and enhancing the natural ecosystem and biodiversity.
- **Goal 2:** Ensure that all uses of MCLB Barstow land are compatible with the military mission and meet environmental compliance responsibilities.
- **Goal 3:** Provide the organizational capacity, support, and communication linkages necessary for effective strategic planning and daily administration of this INRMP and MCLB's natural resources.

This plan is intended to guide the effective management of MCLB Barstow's natural resources so as to ensure that its land remains available and in good condition to support the Base's military mission with "no net loss" of military training capability. To ensure frequent and

continued use of land for military training now and in the future, management programs and actions in this INRMP ensures natural resource utilization on the MCLB Barstow is: 1) sustainable; 2) in accordance with laws and regulations; and 3) integrated with existing military Base plans and mission requirements. For MCLB Barstow to meet its goals of environmental stewardship, the following key natural resources issues are specifically addressed in the revised INRMP and considered for plan implementation:

- Base planning strategies will continue to consider the desert tortoise (*Gopherus agassizii*), a federally listed threatened species, to ensure that individuals and habitat are adequately protected. Critical tortoise habitat identified in the southern portion of the Rifle Range must be specifically addressed.
- Water resources management requires a regional approach to secure adequate water quality and supplies for MCLB Barstow's current needs and long-term mission requirements.
- Migratory bird management strategies to protect and enhance ecosystems will be implemented in compliance with the Migratory Bird Treaty Act.
- The impacts of climate change and its impacts to natural resources will be monitored.

This INRMP provides a brief summary of MCLB Barstow's history and current land uses, natural resources, natural resource management programs, and their goals, and objectives. Also developed is a list of actions planned for the next five years to implement this INRMP including a timeframe that outlines each project activity and how often it will occur (see Appendix C). Actions are listed by program area and include priority classification, frequency, and legal drivers.

An Environmental Assessment for INRMP implementation was prepared concurrently with this revised INRMP and is provided in Appendix G. The National Environmental Policy Act process for that EA provided an opportunity for public review and comment, and the Base considered all comments before approving the revised INRMP.

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LIST OF ACRONYMS AND ABBREVIATIONS

BASH	Bird/Animal Aircraft Strike Hazard
BEAP	Base Exterior Architecture Plan
BEQ	Bachelors Enlisted Quarters
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practices
BNSF	BNSF Railway
BO	Biological Opinion
CAAQS	California Ambient Air Quality Standards
CAL-IPC	California Invasive Plant Council
Cal-PIF	California Partners in Flight
CAX	Combined Arms Exercises
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulation
CM	Carbon Monoxide
CMC	Commandant of the Marine Corps
CNPS	California Native Plant Society
CO	Commanding Officer
CO_2	Carbon Dioxide
COLS	Common Output Level Standards
CWA	Clean Water Act
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoN	Department of the Navy
DWMA	Desert Wildlife Management Area
EA	Environmental Assessment
ECE	Environmental Compliance Evaluation
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
°F	Degrees Fahrenheit

FR	Federal Register
FY	Fiscal Year
FYDP	Future Years Defense Program
GIS	Geographic Information System
HQMC	Headquarters Marine Corps
ICMP	Integrated Contingency Management Plan
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPMP	Integrated Pest Management Plan
JWoUS	Jurisdictional Waters of the United States
LHA	Landing Helicopter Assault
LHD	Landing Helicopter Dock
LZ	Landing Zone
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCIWest	Marine Corps Installations West
MCLB	Marine Corps Logistics Base
MCO	Marine Corps Order
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MWA	Mojave Water Agency
NAAQS	National Ambient Air Quality Standards
N/A	Not Applicable
NAVFAC SW	Naval Facilities Engineering Command Southwest
Nebo	Nebo Main Base
NEPA	National Environmental Policy Act
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
NRI	National Resources Inventory
O_3	Ozone
ORV	Off-Road Vehicle
Pb	Lead
PM_{10}	Suspended particulate matter less than or equal to 10 microns in diameter
PM_{25}	Fine particulate matter less than or equal to 2.5 microns in diameter

POAM	Projects, Objectives, Actions, and Milestones
RCMP	Range Complex Management Plan
RR	Rifle Ranges
SCAG	Southern California Association of Governments
Sikes Act	Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, *et seq.*)
SO_2	Sulfur Dioxide
TDI	Tierra Data, Inc.
U.S.	United States
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps
WFMP	Wildland Fire Management Plan

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It is essential to protect the natural resources of Marine Corps Logistics Base Barstow to ensure that it will continue to fulfill its duties to provide infrastructure, services and support to the United States Marine Corps forces, tenant activities, and other customers.

1.0 INTRODUCTION

This Integrated Natural Resources Management Plan (INRMP) provides for the continued stewardship and management of natural resources on Marine Corps Logistics Base (MCLB) Barstow. It continues to incorporate, to the maximum extent practicable, ecosystem management principles and adaptive strategies and provides the landscape necessary for the sustainment of military land uses. This INRMP is intended to guide the effective management of the Base's natural resources so as to ensure its land remains available and in good condition to support its military mission with "no net loss" of military training capability.

This INRMP provides a brief description of MCLB Barstow and its natural resources as well as a list of natural resource management programs and their goals and actions planned for the next five years. Also developed is a five-year time frame that outlines each project activity and how often it will occur (Appendix A). Actions are listed by program area and include priority classification, frequency, and regulatory drivers.

1.1 Purpose

The purpose of this INRMP is to ensure that natural resources conservation measures and military operations on the Base are integrated and consistent with applicable environmental stewardship and legal requirements. This plan has been written to assist the Commanding Officer (CO) of MCLB Barstow in providing effective management of its natural resources to ensure that land remains available and in good condition to support the Base's military mission. This plan builds on and supersedes the 2011 MCLB Barstow INRMP and sets the agenda for managing MCLB Barstow's natural resources from 2017 through 2021.

The INRMP is intended to be a technical document used by persons planning and/or preparing Base approvals, management actions, orders, instructions, guidelines, standard operating procedures, and other plans. The INRMP provides technical guidance for the integration of

natural resource issues and concerns for facilities and operational planning, in accordance with the National Environmental Policy Act (NEPA) decision-making processes.

This INRMP is not intended to be used by persons operating in the field, other than the Environmental Division. Field personnel are expected to be operating under Base guidelines, plans, orders, or other approvals that have been developed using the INRMP, have had environmental compliance review, and, where applicable, have had regulatory approvals and/or permitting.

1.1.1 Military Mission

As one of only two logistics bases operated by the United States Marine Corps (USMC), MCLB Barstow serves an important role as a major West Coast Marine Corps Logistics and Maintenance Center. Its primary mission is twofold: (1) to procure, maintain, store, and issue all classes of supplies and equipment and (2) to repair and rebuild USMC-owned and other Department of Defense (DoD) equipment. MCLB Barstow furnishes supplies for USMC facilities worldwide and is a direct support provider for all installations. MCLB Barstow is also responsible for the technical training of Marines, developing and maintaining their skills and job efficiency.

MCLB Barstow serves as a major West Coast Marine Corps Logistics and Maintenance Center.

1.2 Authority

The Endangered Species Act (ESA), Clean Water Act (CWA), and Migratory Bird Treaty Act (MBTA) all require military installations to protect certain biological resources. However, the Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, *et seq.* [Sikes Act]) requires installations to use INRMPs as defined plans to protect sensitive natural resources. Marine Corps Order (MCO) P5090.2A, *Environmental Compliance and Protection*

Manual, requires that all USMC installations having water and land suitable for the conservation and management of natural resources prepare and implement a comprehensive INRMP that includes all elements of natural resource management applicable to the installation. MCLB Barstow contains significant natural resources, including a federally listed species and designated critical habitat, which necessitate management and legal consideration. DoD Instruction (DoDI) 4715.03, *Natural Resources Conservation Program,* "provides procedures for DoD components and installations for developing, implementing, and evaluating effective natural resources management programs."

The Sikes Act states that the INRMP shall provide for the following:

- No net loss in the capability of military installation land to support the Installation's military mission
- Fish and wildlife management and recreation, land management, and forest management
- Fish and wildlife habitat enhancement or modifications
- Wetlands protection, enhancement, and restoration, where necessary for the support of fish, wildlife, or plants
- Integration of various activities conducted under the plan, as well as consistency among those activities
- Establishment of specific natural resource goals, objectives, and time frames for proposed actions
- Sustainable use by the public of natural resources to the extent that the use is consistent with the military mission and the needs of the fish and wildlife resources
- Public access to the military installation as necessary and appropriate, subject to the requirements enacted to ensure safety and military security
- Enforcement of natural resources laws and regulation
- Other activities that the Secretary of the military department determines to be appropriate

This INRMP integrates these Sikes Act elements and has been tailored to the unique mission and environmentally sensitive resources of MCLB Barstow.

This INRMP also integrates the requirements of natural resources legislation and regulations as well as DoD, Department of the Navy (DoN), and USMC directives, instructions, orders, and policies.

1.3 Scope

The INRMP provides the basis for the conservation and enhancement of natural resources by reducing potential adverse effects on the species and habitat found on the Base and simultaneously conserving biodiversity. Implementation of this INRMP will improve long-range planning at MCLB Barstow, decrease long-term environmental costs, reduce liabilities from environmental noncompliance, and improve the overall condition of natural resources and the land to support the military mission. Implementation of this INRMP will also increase overall

knowledge of MCLB Barstow's ecosystems through surveys, research, internal environmental awareness, and outreach programs.

The INRMP defines the level of management and provides the vehicle by which the USMC may participate in developing regional planning efforts with organizations such as the Desert Managers Group and the Bureau of Land Management (BLM).

1.4 Roles and Responsibilities

1.4.1 United States Marine Corps

The CO of MCLB Barstow reports to Commanding General, Marine Corps Installations West (MCIWest), located at Camp Pendleton, California. Figure 1-1 shows the chain of command for MCIWest, including MCLB Barstow, other California installations, USMC Air Bases Western Area, and Marine Corps Air Station (MCAS) Yuma, Arizona. The CO and Executive Officer are responsible for the adequacy and condition of facilities and supporting services that directly impact the readiness, relevance, and capabilities of Marines, tenant organizations, and other temporary users.

The CO is responsible for ensuring that activities and operations on the Base fully comply with federal, state, and local laws/regulations and with written DoD, DoN, and USMC policies. The CO is charged with 19 tasks under the *Environmental Compliance and Protection Manual* (MCO P5090.2A) to oversee the Base's natural resources program and ensure its ability to carry out the military mission.

1.4.2 Naval Facilities Engineering Command Southwest

Naval Facilities Engineering Command Southwest (NAVFAC SW) is responsible for the planning, engineering/design, construction, real estate (including acquisition and disposal), 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 USMC installations within its geographic area of responsibility, as well as support to other federal agencies in California.

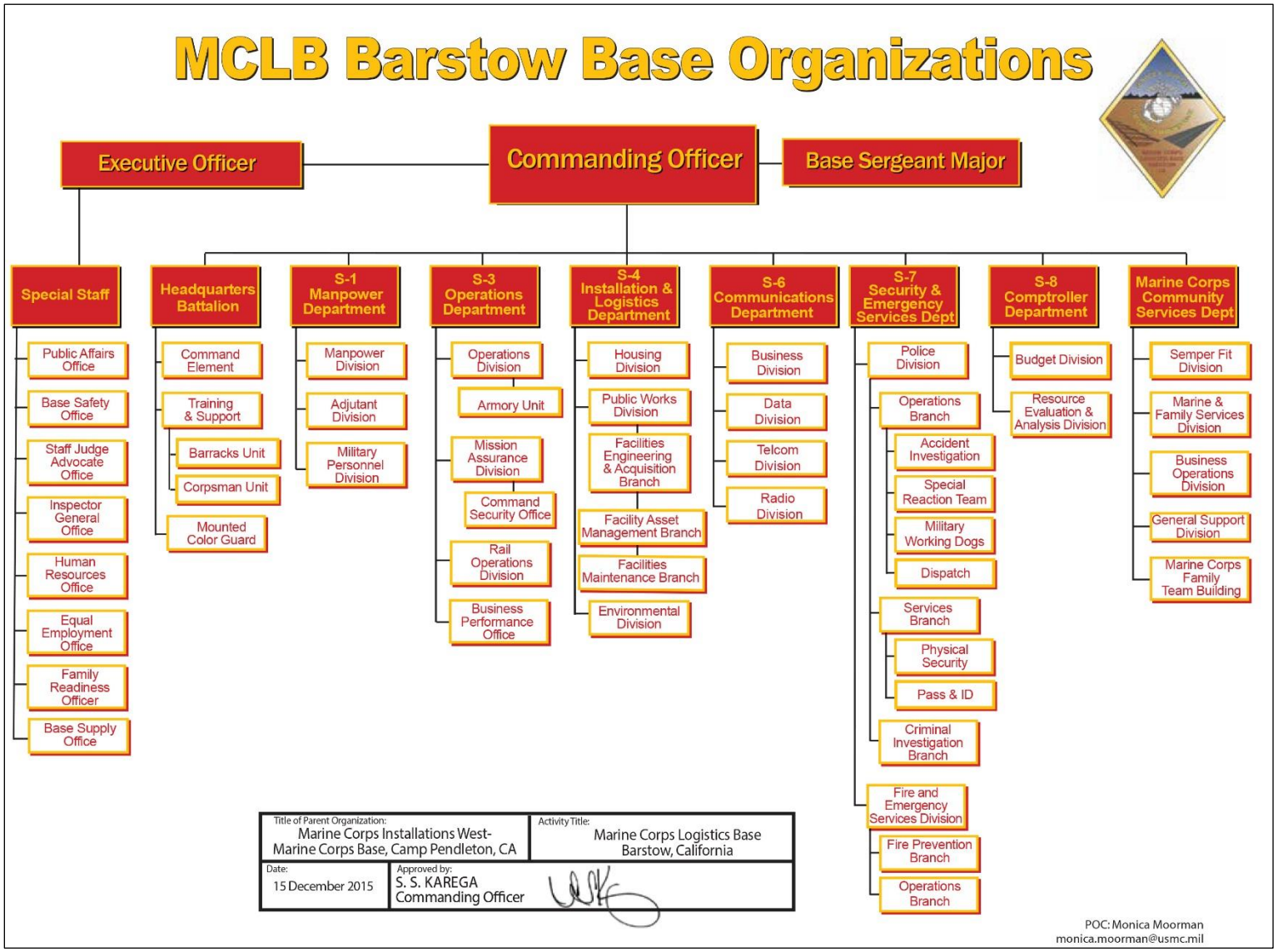

Figure 1-1. Chain of Command of MCIWest

1.4.3 Federal and State Wildlife Agencies

The Sikes Act requires the Secretary of the Navy to prepare INRMPs in cooperation with the U.S. Fish and Wildlife Service (USFWS) and state wildlife agency, which in this case is the California Department of Fish and Wildlife (CDFW). This cooperation ensures that the INRMP reflects mutual agreement of these parties concerning conservation, protection, and management of fish and wildlife resources on the installation. Mutual agreement is only required, however, with respect to fish and wildlife management elements. No element of the Sikes Act is intended to either enlarge or diminish the existing responsibility and authority of the wildlife agencies concerning natural resources management on military land. (See Appendix A for review/concurrence documents.)

A Memorandum of Understanding (MOU) signed in January 2006 established a cooperative agreement among the DoD, U.S. Department of the Interior, USFWS, and state fish and wildlife agencies as represented by the Association of Fish and Wildlife Agencies. The MOU recognizes the partnerships necessary to prepare, review, and implement INRMPs on military installations.

Accordingly, this INRMP has been prepared in accordance with the Sikes Act and in cooperation with the USFWS and CDFW. Implementation of this INRMP will be undertaken with the cooperation of the USFWS and CDFW. This INRMP is a living document and will be periodically updated to reflect improved management practices, changes in proposed actions within MCLB Barstow, and agency comments or concerns about ongoing or proposed activities. Per DoD policy, the MCLB Barstow Environmental Division will review the INRMP annually in cooperation with the USFWS and CDFW.

1.4.4 Tribal Agencies

DoDI 4710.02, *DoD Interactions with Federally-Recognized Tribes,* states that DoD components shall afford tribes that have a cultural or historical affiliation with land encompassed by the installation an opportunity to consult on the development of INRMPs if tribal treaty rights or other rights to natural resources may be affected. If such tribes are identified, DoD components shall incorporate a standard process for consultation in INRMPs whenever issues arise between the tribe and the DoD component. DoD components shall involve tribal governments early in the planning process and shall endeavor to complete consultations prior to implementation of the proposed action. Early involvement means that a tribal government is given an opportunity to comment on a proposed action in time for the tribal government to provide meaningful comments that may affect the decision.

1.4.5 General Public

The Sikes Act requires that if MCLB Barstow, the USFWS, and the CDFW determine that substantial revisions to the MCLB Barstow INRMP are necessary, public comment shall be invited. NEPA analysis is required if substantial revisions to the INRMP are thought to be necessary and these revisions are expected to result in biophysical consequences materially different from those listed in the existing INRMP and analyzed in the previously approved INRMP implementation NEPA document. In that case, a new or supplemental NEPA analysis

must be performed and the public provided a reasonable opportunity to comment on the revised INRMP.

An Environmental Assessment (EA) for INRMP implementation was prepared concurrently with this Revised INRMP (see Appendix G). The NEPA process for that EA provided an opportunity for public review and comment. The Base considered all comments and made any necessary changes before approving the revised INRMP.

1.5 Integration with Other MCLB Barstow Plans

To ensure effective coordination with other Base directorates and tenants, any plans related to resources evaluated in this INRMP must be reviewed, and pertinent directives or actions incorporated into the INRMP. The following MCLB Barstow plans were reviewed for this INRMP:

- **Range Complex Management Plan (RCMP).** The 2013 RCMP identifies current and projected operations within MCLB Barstow and provides an investment strategy to meet training requirements. This INRMP is designed to be compatible with the goals, mission requirements, and future visions of the 2013 RCMP. A revised RCMP is currently being developed in conjunction with a Range and Training EA. New projected operations, mission requirements and training activities associated with the revised RCMP.
- **MCLB Barstow Master Plan.** The 2016 Master Plan was prepared to provide a coherent and economically feasible road map for the long-range physical development of MCLB Barstow. The management strategies to be implemented in this INRMP are intended to be compatible with the guidance and long-range planning in the 2016 Master Plan.
- **Integrated Wildland Fire Management Plan (WFMP).** The 2016 WFMP guides wildland fire management so appropriate measures are taken in fuel and wildfire management to enhance and maintain the Base's goals of military training and natural resources management. This INRMP is designed to be compatible with the guidance established in the 2016 WFMP.
- **Integrated Contingency Management Plan (ICMP).** The 2016 ICMP contains information concerning the Installation Restoration Program as discussed in this INRMP. This INRMP is designed to be compatible with the guidance established in the 2016 ICMP.
- **Integrated Pest Management Plan (IPMP).** The 2002 IPMP is a comprehensive, long-range document that captures all pest management and pesticide-related activities conducted on MCLB Barstow. The management strategies given in this INRMP are compatible with the 2002 IPMP.
- **Base Exterior Architecture Plan (BEAP).** The 2016 BEAP establishes specific design criteria for site planning, buildings, streets, parking, signs, site furnishings, landscaping, and other visual environment components (MCLB Barstow 2016). This INRMP is designed to be compatible with the criteria established in the 2016 BEAP.
- **Integrated Cultural Resources Management Plan (ICRMP).** The 2016 ICRMP is an internal compliance and management tool that incorporates the whole of the cultural

resources program with ongoing mission activities. This INRMP is designed to be compatible with the guidance established in the 2016 ICRMP.

1.6 Management Vision and Approach

The vision for this INRMP is to ensure the continued ability of MCLB Barstow to sustain and prepare for evolving mission requirements while conserving its natural resources and to do this by applying the principles of ecosystem management and adaptive management in an integrated approach.

Ecosystem management is the basis for the management of natural resources on land under USMC jurisdiction. An ecosystem can be defined as a dynamic, natural complex of living organisms interacting with each other and with their associated nonliving environment. Ecosystem management is defined by the MCO P5090.2A as:

> A goal-driven approach to managing natural and cultural resources that supports present and long term mission requirements; preserves ecosystem integrity; is at a scale compatible with natural processes; is cognizant of natural processes' time scales; recognizes social and economic viability within functioning ecosystems; is adaptable to complex, changing requirements; and is realized through effective partnerships among private, local, state, tribal, and federal interests. Ecosystem 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.

Adaptive management techniques are used to prepare or revise installation INRMPs. Adaptive management is defined in MCO P5090.2A as:

> …an approach to treat all management decisions as experiments to be tested. Rather than immediately prescribe a management decision, the manager working in an adaptive fashion tests possible solutions to problems using a scientific method, complete with variable controls and measures of success. This approach welcomes new ideas, new data, and revision of plans when better approaches are possible.

To be successful, INRMP development and implementation will involve adaptive management techniques. The planning process achieves long-term goals as defined by specific, midterm focus areas (objectives) with evaluation measures (metrics) and implemented through specific, short-term actions. The goals provide overall guidance and direction for the objectives, and the actions are then put into practice (tested) and analyzed for success (through established metrics). If the objectives are not met, projects can be extended or modified as necessary.

The goals, objectives, and policies of this INRMP provide the consistency and coordination needed among the various personnel at NAVFAC SW and MCLB Barstow at all levels of daily and annual decision making.

1.6.1 MCLB Barstow Natural Resource Management Goals

MCLB Barstow has identified three primary goals relating to natural resource management. Those goals, listed below, are compatible and consistent with USMC natural resources policy:

- **Goal 1:** Guarantee continued access for the military mission to MCLB Barstow's land, water, vegetation, and wildlife resources while preserving, protecting, and enhancing the natural ecosystem and biodiversity.
- **Goal 2:** Ensure that all uses of MCLB Barstow's land are compatible with the military mission and meet environmental compliance responsibilities.
- **Goal 3:** Provide the organizational capacity, support, and communication linkages necessary for effective strategic planning, daily administration of this INRMP, and management of the Base's natural resources.

These goals will help the Base implement its vision for environmental stewardship, which it will do to retain control and use of USMC land for mission needs.

1.6.2 Key Natural Resources Issues for This Revision

During early scoping for this INRMP revision, a wide range of past and present natural resource management issues were discussed and evaluated. Presented below are those natural resource issues determined to be key to the continued ability of MCLB Barstow to meet its goals of environmental stewardship and responsibility for the proper management of military land, and specifically addressed in this revised INRMP:

- Base planning strategies will continue to account for the presence of the desert tortoise (*Gopherus agassizii*), a federally listed threatened species and its designated critical habitat on MCLP Bartow, and ensure that individuals and habitat are adequately protected.
- Water resources management will continue to require a regional approach to secure adequate water quality and supplies for MCLB Barstow's current needs and long-term mission requirements.
- Migratory bird management strategies to protect and enhance ecosystems will continue to be implemented in compliance with the MBTA.
- The impacts of climate change and its impacts to natural resources will be begin to be monitored.

1.6.3 Military Mission and Public Access

The Sikes Act requires installations to provide public access for natural resource uses to the extent it is appropriate and consistent with installation security, the military mission, and sustainable natural resources management objectives (MCO P5090.2A). The CO of MCLB Barstow has determined that public access to the Base for recreational purposes is restricted due to the nature of the military mission, safety issues, and the presence of a federally listed species and its critical habitat. This includes recreational activities such as off-road vehicle (ORV) use and hunting.

1.6.4 INRMP Implementation

INRMP implementation requires a commitment of intent, time, and money. The funding of strategies and projects described in this INRMP are guided by the budget priorities assessed for environmental work on DoD installations. The USMC classifies projects according to output or performance level standards established by the DoD for installation support using a common framework of definitions, outputs, output performance metrics, and cost drivers for each installation support function. These Common Output Level Standards (COLS) provide a description of the capability associated with the particular installation support function. Guidance for the application of COLS is provided in DoDI 4001.01 with Change 1 (DoD 2011b).

The 2007 *Handbook for Preparing, Revising and Implementing Integrated Natural Resources Management Plans on Marine Corps Installations* (HQMC 2007) states that "implementation" anticipates the execution of all "must fund" projects and activities in accordance with specific time frames identified in the INRMP. "Must fund projects" and activities are those that are required to meet recurring natural and cultural resources conservation management requirements or current compliance needs. Not all projects listed in an INRMP are necessarily "must funds"; however, INRMPs should include all projects and actions that are proposed to enhance an installation's natural resources.

An INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for "must fund" projects and activities
- Ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the tasks required by the INRMP
- Coordinates annually with all cooperating offices
- Documents specific INRMP actions accomplished each year

The CO's signature on the final INRMP completes the INRMP revision process and constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with the time frames identified in the INRMP (MCO P5090.2A).

1.7 Review and Revision

The review process for the MCLB INRMP shall consist of an annual review, annual reporting, and a five-year review. Any of these review periods may result in no action, an update to the INRMP, or a revision of the INRMP.

1.7.1 Annual Review

Per DoD policy, the MCLB Barstow Environmental Division will review the INRMP annually in cooperation with the USFWS and CDFW. On an annual basis, MCLB Barstow will invite the USFWS, CDFW, and other interested internal and external stakeholders to review the previous year's INRMP implementation and discuss implementation of upcoming programs and projects. Invitations will be either by letter or email.

An Interim Environmental Compliance Evaluation (ECE) will also be performed by MCLB Barstow as part of the annual review.

The INRMP and its implementation will be reviewed annually for seven key focus areas (MCO P5090.2A), as follows:

1. INRMP implementation
2. Listed species and critical habitat
3. Partnership effectiveness
4. Fish and wildlife management and public use
5. Team adequacy for natural resources management
6. Ecosystem integrity
7. INRMP impact on the Installation's mission

These seven key focus areas, also referred to as conservation metrics, are required to be used in the DoN Natural Resources Metric Builder. Each focus area has three to seven criteria that have been established by natural resources managers and are used to help determine the status of the natural resources for a given functional area. This INRMP addresses and supports the requirements of those issues addressed in the DoN Natural Resources Metric Builder.

1.7.2 Annual Reporting

Per MCO P5090.2A, an ECE will be performed by Commandant of the Marine Corps (CMC), Facilities and Services Division, at MCLB Barstow every three years and will include a review of the INRMP among other environmental programs. Prior to 1 January of each calendar year, MCLB Barstow shall send the USFWS and the CDFW a written report of INRMP implementation actions performed during the preceding fiscal year. Also, MCLB Barstow shall submit its conservation metrics to the CMC for the previous fiscal year. The Secretary of the Navy and DoD will then report the date to Congress.

1.7.3 Five-Year Review

No less than every five years, the INRMP will be reviewed for operation and effect to determine if it is being implemented as required by the Sikes Act and is contributing to the management of natural resources at MCLB Barstow. The review will be conducted by representatives of the three cooperating parties: the CO responsible for the INRMP, the Regional Director of the USFWS, and the Director of the CDFW. Although these are the responsible parties, technical representatives generally conduct the review.

The review for operation and effect will either conclude that the INRMP is meeting the intent of the Sikes Act and can be updated and that implementation can therefore continue; or that it is not effective in meeting the intent of the Sikes Act and must be revised. The conclusion of the review will be documented in a jointly executed memorandum, meeting minutes, or in some other way that reflects mutual agreement. If only updates are needed, they will be done in a manner agreed to by all parties.

If a review of operation and effect concludes that an INRMP must be revised, there is no set time to complete the revision. The existing INRMP remains in effect until the revision is complete and the USFWS and CDFW concurrence on the revised INRMP is received. To ensure the concerns of MCLB Barstow, the USFWS, and the CDFW are adequately addressed and the plan meets the intent of the Sikes Act, any revisions of the INRMP will go through a detailed review process similar to the one used in the development of the initial INRMP.

MCO P5090.2A lists the following process as INRMP preparation or revision guidance:

- Identify stakeholders.
- Identify the military readiness mission and other land use requirements.
- Identify installation management requirements.
- Identify natural resources management objectives.
- Develop and evaluate natural resources management courses of action (with stakeholder participation).
- Select and implement the selected natural resources management course of action.
- Monitor and assess results.
- Review the installation INRMP annually and update it as needed to keep it current and relevant and to alleviate the need for extensive and costly periodic revisions.

2.0 HISTORIC, CURRENT, AND FUTURE LAND USE

2.1 MCLB Barstow Location and Regional Setting

MCLB Barstow is in western San Bernardino County, California, less than 6 miles east of the City of Barstow (Figures 2-1 and 2-2). MCLB property consists of 5,404.99 acres in three parcels: the Nebo Main Base (Nebo), Yermo Annex, and Rifle Range (Table 2-1).

Table 2-1. Real Estate Acreage Summary.

Properties	Acres
Nebo Main Base	1,286.12
Yermo Annex	1,680.57
Rifle Range	2,438.30
Total Real Estate Use by MCLB Barstow	**5,404.99**

Nebo and the Rifle Range are partially adjacent to one another, with Nebo located northwest of the Rifle Range. The Yermo Annex is approximately 5 miles east of Nebo (Figure 2-2). Interstate 40 passes housing and other portions of the Base; however, the interstate is fenced off on both the north and south boundaries of the Base. The Yermo Annex can be accessed by Interstate 40 from the south or Interstate 15 from the north, along the Daggett-Yermo Road. Historic Route 66 parallels Interstate 40, which runs through Nebo, south below the Yermo Annex, and along the northern boundary of the Rifle Range.

Three San Bernardino County communities are near MCLB Barstow: the city of Barstow, the largest city in the vicinity, and the towns of Yermo and Daggett. Most of the civilian work force and housing for both MCLB Barstow and Fort Irwin are within a 60-mile radius. The area has experienced expansion in previous decades. In 1970 the population of Barstow was 17,442 (Barstow Area Chamber of Commerce 2004). From 1980 to 1990, the population of Barstow increased by approximately 20 percent (Southern California Association of Governments [SCAG] 2012). Growth has slowed in recent years, with the population increasing by only about 2 percent in the last decade, from 2004 to 2014. The population was 23,498 in 2014 (U.S. Census 2014). Although in 2002 the population of San Bernardino County ranked fifth among the top 10 California counties in population increase, which took place mostly in and immediately west of Victorville, the City of Barstow's population declined by 1.6 percent (SCAG 2012). Future growth is contingent upon the City's ability to obtain additional water and on the region's market conditions.

Figure 2-1. MCLB Barstow Regional Map

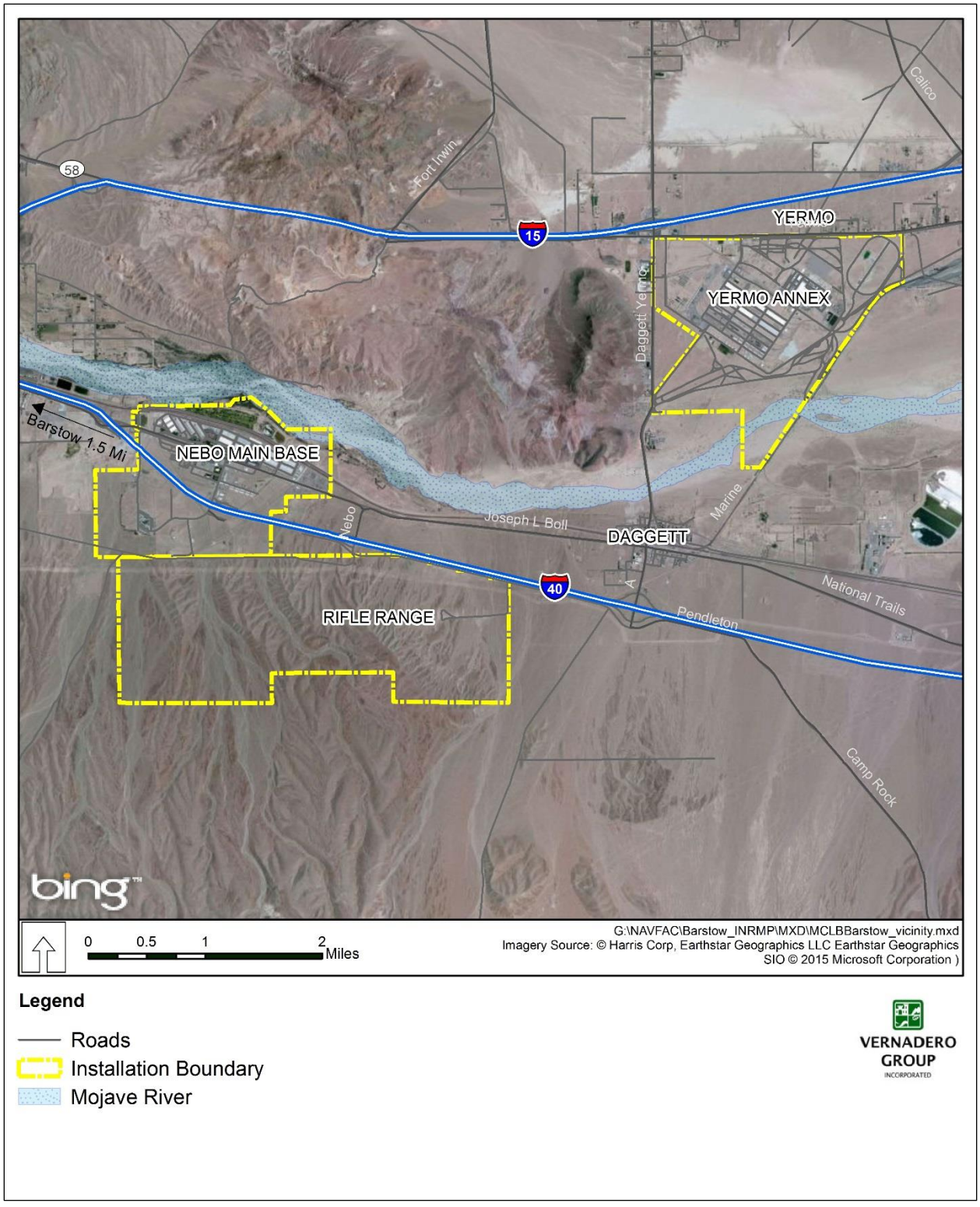

Figure 2-2. MCLB Barstow Vicinity Map

The towns of Yermo and Daggett are small communities with negligible expected growth. Yermo is northeast of the Yermo Annex and consists of a few residences and some commercial buildings. Daggett is the smallest of the nearby communities, situated at the junction of the Union Pacific and the BNSF Railway (BNSF) tracks. This community consists of a few residences beside Historic Route 66.

The emphasis of future development in west Mojave Desert communities is on increasing density and filling in open spaces and undeveloped areas. With this region being a focus for desert recreation, the preservation of its extensive natural resources will continue to be a priority of governing agencies and the local population.

The land adjacent to MCLB Barstow is general use land primarily administered by BLM. Other nearby uses include a quarry near Nebo, older commercial development along Historic Highway 66 west of Nebo, the Calico ghost and mining town, a California historic landmark to the north of Yermo Annex, and a county airport near the Yermo Annex.

2.2 Premilitary Land Use

2.2.1 Native American and Immigrant Trails

Early use of the land that is now part of MCLB Barstow centered on the Mojave River. Ancient trails through the Mojave Desert and along the Mojave River have a history of use through several centuries. Native Americans developed an immense trail system through southern California, including a trail along the Mojave River, which crosses Nebo and the Yermo Annex and probably predates the historic Ute, Mojave, Chemehuevi, and Paiute people.

European occupation of coastal southern California began in 1769 and sparked an interest in the vast, unknown territories of the West. As a result, traders, trappers, and other travelers and explorers made their way through the area. Immigrants used two well-established routes that passed through what is now MCLB Barstow land, the Old Spanish Trail, later known as the Mormon Trail (or the Salt Lake Route), and the old Mojave Indian Trail, converted in the 1850s to the old Government Road of Fort Mojave. The Old Spanish Trail/Mormon Trail extended southwest out of Nevada, crossing the southeast boundary of today's Fort Irwin, moving due south as it hugged the eastern border of the Calico Mountains. Eventually the trail crossed the Mojave River just a few miles east of Yermo to meet up with the old Mojave Indian Trail/Government Road, which ran along the south side of the river.

The Old Spanish Trail, which linked Santa Fe, New Mexico, to Los Angeles, California, was established in response to the Spanish authorities' desire to link new southern California settlements with their older colony in New Mexico. The trail served as a major trading route during European expansion into the West, crossing New Mexico, Colorado, Utah, Arizona, and southern Nevada before entering California. Between 1777 and 1829, a series of shortcuts were developed to bypass the longer, less direct routes that spanned the six states. In 1830, George C. Yount and William Wolfskill traveled the entire length of the route that came to be recognized as the Old Spanish Trail. As a major trading route for New Mexican traders, pack trains with as

many as 100 traders would set out from Santa Fe in annual caravans to exchange woolen goods for the horses and mules of southern California's missions and ranchos.

The Old Spanish Trail was regularly used from 1830 to 1848 by New Mexican traders and occasional travelers such as fur trappers, entrepreneurs, government agents, and settlers. In 1848 the Mormons developed the western portion of the trail, from Salt Lake City to Los Angeles, for wagon use. Wagons began to replace the traditional caravans and parties of travelers that formerly made up the majority of pack trail users. The Mormon Trail, as it came to be known, provided a route for wagon trains of American settlers moving west in the 1850s.

Following European arrival, Native Americans inhabiting the Mojave Desert used the route known as the Mojave Indian Trail for commercial expeditions. They also guided many travelers and explorers along this route, including a Franciscan priest, Francisco Garcés, who made the journey in 1776. Francisco Garcés' journal provides the first documented evidence of exploration through the Barstow area, detailing his search for an immigration route from southern Arizona to the Spanish missions in California and a trading route to link the missions in New Mexico.

In the 1860s, European-American pioneers settling along the Mojave River constructed way stations for stage lines, freighters, travelers, and miners. These stations were strategically located near the Mojave River at points where water was forced to the surface as a river or springs. Fish Ponds Station, on present-day Nebo, was one of these early establishments. Founded by Lafayette Meacham in 1865, Fish Ponds Station served as a stage stop for travelers of the old immigrant trails and remained active until about the turn of the century (Baltazar 1995). The flood of 1938 washed out many of the remaining structures erected along the Mojave River, including Fish Ponds Station.

From 1860 to 1871, a series of small forts were established along the Mormon Trail and the old Government Road to protect European-American travelers crossing the Mojave Desert, opening the desert to commercial development. One of these forts, Camp Cady, approximately 20 miles from Barstow, was used by an Army battalion to ward off Native American attacks. In 1868 a new route to southern California was established north of Blythe, California, reducing traffic along the Government Road (the former Mojave Indian Trail).

2.2.2 Railroads

The early trails were essentially rendered obsolete for commerce with the coming of the railroads in the 1880s. Underscoring the U.S. expansionist policies that arose in the mid-1840s, there was a push to develop rail lines that would span the continent from the Mississippi River to the Pacific Ocean. The first mainline to cross this area was built by the Southern Pacific Railroad in 1882 to 1883, as part of its Colorado Division from Mojave, California, to Needles, California. Tracks extended into Barstow (Waterman Junction) and Daggett (Calico Station) by 1882, linking up with the Atlantic and Pacific Railroad tracks at Needles in 1883.

An important component in the area's growth and land use was the introduction of rail lines that connected Los Angeles and other southern California towns to the commerce, mining, and

growing business ventures in the west Mojave Desert. This was accomplished in 1889 as the Atchison, Topeka, and Santa Fe Railway Company joined its National City tracks, which wound north through Cajon Pass, with the transcontinental line in Barstow. The introduction of rail lines in the region transformed commerce, mining, and other businesses and was a significant factor in the siting of the military base that is now MCLB Barstow.

2.2.3 Mining

Early prospectors of the region were establishing mining claims as early as the mid-1860s, before the railroad was built, but the cost and difficulty of mining coupled with a scarcity of water and food limited large mining ventures. It wasn't until the 1880s that silver mining became profitable, and the resulting Calico Mining District, sited in the Calico Mountains north of Barstow, began bringing hundreds of prospectors to the region. Up until this time, the area was inhabited by only a few prospectors, farmers, and ranchers. The boom in silver mining lasted until 1893, when the Sherman Silver Purchase Act was revoked and the financial panic of 1893 contributed to a decline in silver prices (Baltazar 1995). When silver lost its value, the focus shifted to the mineral wealth available from nonmetallic minerals, specifically borax.

2.2.4 Grazing

The Nebo Sheep Company was established more than a century ago by Mormon settlers. All three MCLB Barstow parcels may have been grazed by sheep at one time, but grazing was probably concentrated near the Mojave River. Water diversion canals in the Nebo parcel, perhaps dug to supply sheep ranching or mining east of the site (Gleason, pers. comm.1996), have collected water and fostered vegetation adapted to the waterlogged conditions.

2.2.5 History of MCLB Barstow

The USMC Depot of Supplies was established at Nebo on 28 December 1942, when the U.S. Navy turned it over to the USMC as a storage site for supplies and equipment needed for Fleet Marine Forces in the Pacific Theater during World War II (Figure 2-3). By 1945 the USMC Depot of Supplies had outgrown its facilities in the Nebo area, so 2,000 acres of land approximately 5 miles east of Nebo were annexed from the U.S. Army in October 1946, becoming known as the Yermo Annex. In 1954, the Commanding General, USMC Depot of Supplies, moved his flag. Commencing in 1958, MCLB Barstow was responsible for all USMC logistics west of the Mississippi River. Additionally, MCLB Barstow has historically supported, and currently supports, training range activities. The Rifle Range was acquired in three portions in 1955 to enable Marines to practice and improve their marksmanship skills.

In March 1961, the importance of the Installation increased dramatically with the establishment of the Depot Maintenance Activity. In November 1978, the Installation was redesignated with its present title of MCLB Barstow to emphasize its broad logistics support mission. In the early 1980s, MCLB Albany and Headquarters USMC worked aggressively to integrate logistics support for the Fleet Marine Forces and eliminate duplications. As a result, all operational logistics functions moved to Albany and, in January 1990, the Commanding General, MCLB Albany, was redesignated as Commander, MCLBs.

**Figure 2-3. Nebo as Seen from above in July 1943,
Built alongside Old Highway 66 and the Mojave River**

2.3 Current Land Use

MCLB Barstow's location makes it uniquely suited to serve its customer base in the DoD desert network of installations. Logistically, MCLB Barstow is an important military hub because it is situated at the intersection of major rail lines and highways. Its capacity to handle materials and large-vehicle repairs reinforces its usefulness to the nearby Marine Corps Air Ground Combat Center Twentynine Palms and Fort Irwin National Training Center. Figures 2-4 and 2-5 show MCLB Barstow's current land use, operations, and constraints.

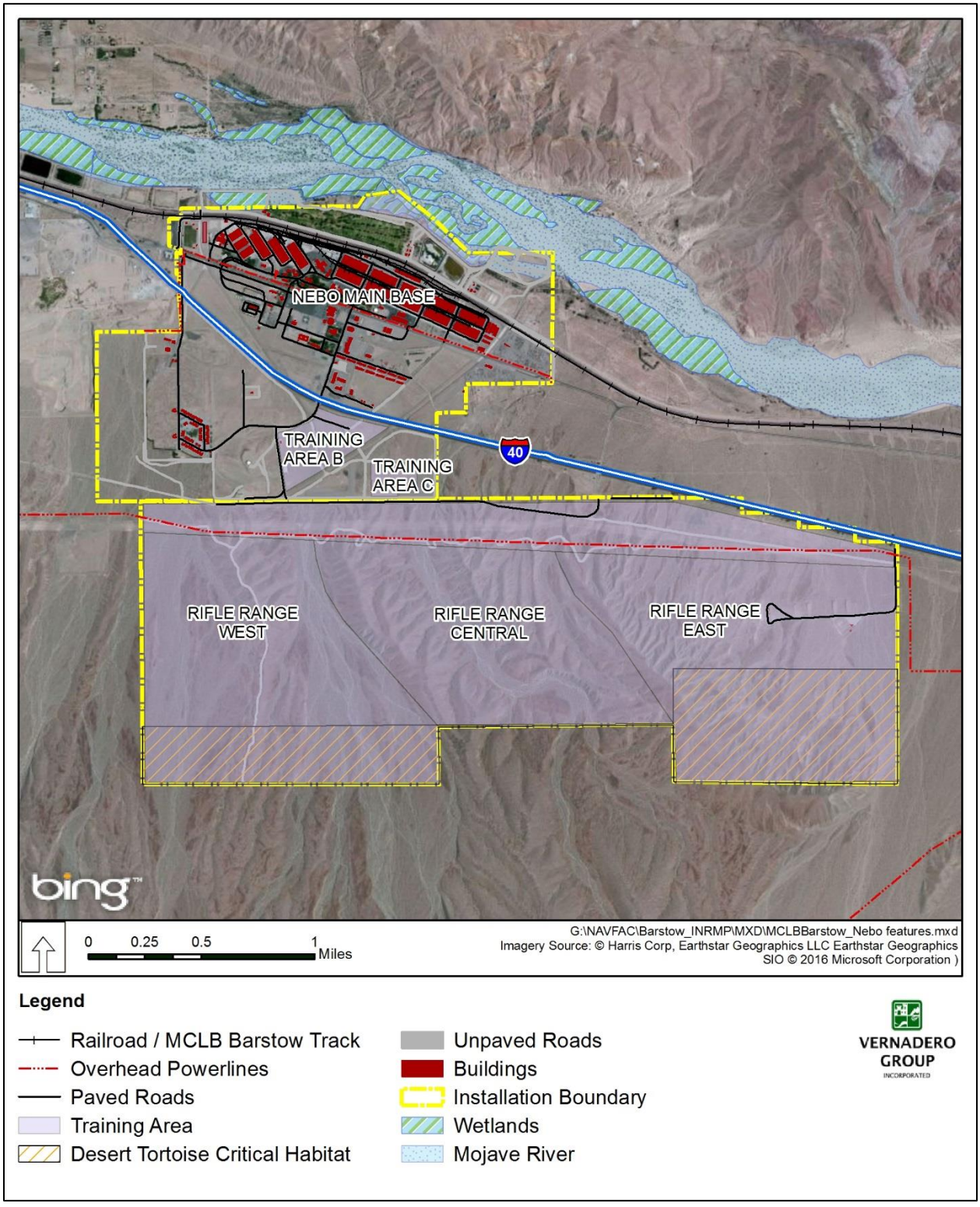

Figure 2-4. MCLB Barstow Nebo and Rifle Range Operations and Facilities

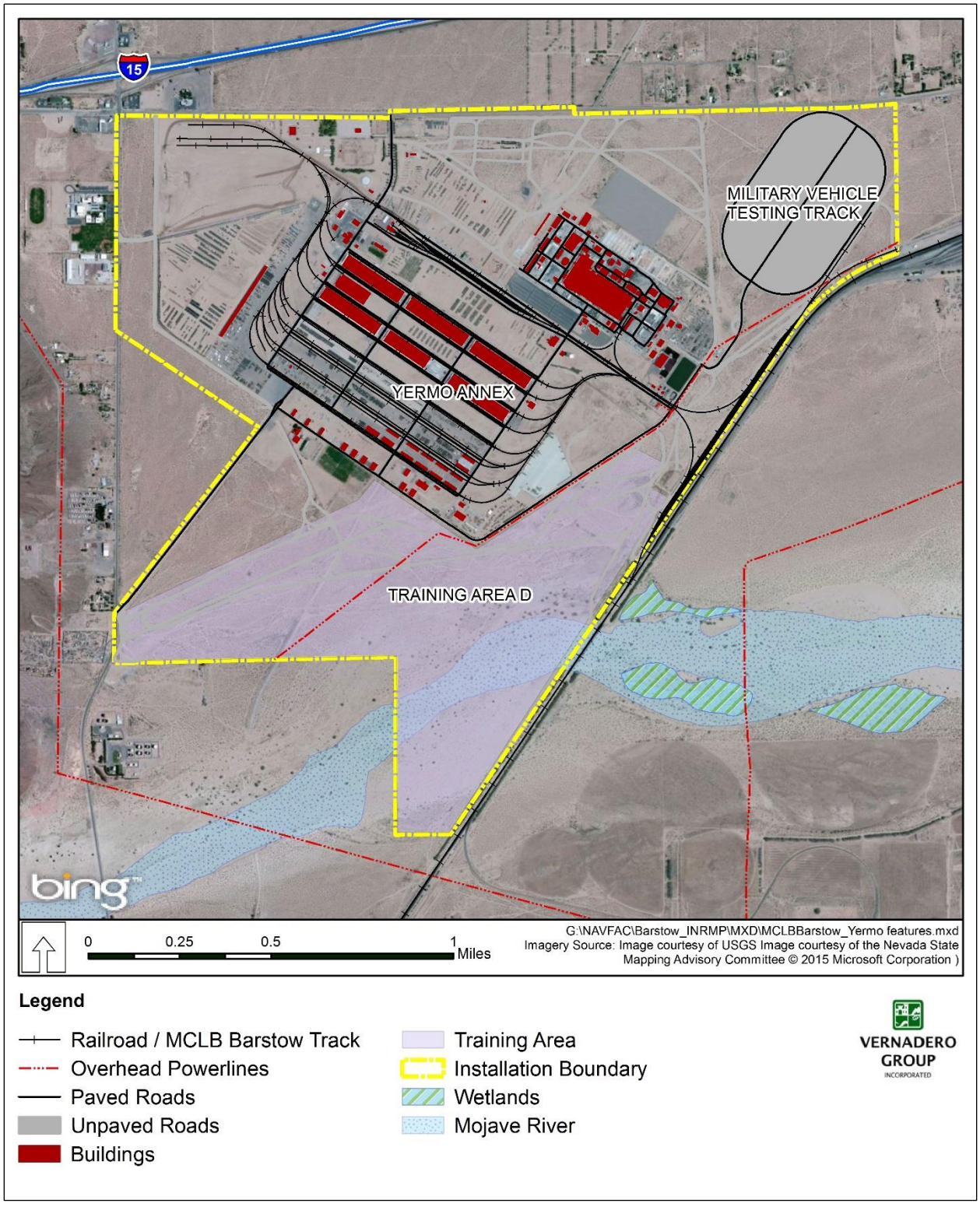

Figure 2-5. MCLB Barstow Yermo Annex Operations and Facilities

Desert conditions enhance MCLB Barstow's mission as a storage and warehousing facility. Low humidity and limited yearly rainfall significantly reduce mold, rust, and mildew damage to equipment. Most materials are stored outdoors, reducing the need for costly warehouses.

2.3.1 Logistics Operations

Nebo is used for storage, maintenance, and infrastructure support purposes such as administration, housing, and community facilities. Approximately 25 percent of Nebo is undeveloped open space. Of the BNSF line connecting Needles and Barstow, 1.8 miles run east to west just north of Nebo's main warehouse facilities, south of the Mojave River (Figure 2-4).

The Yermo Annex supports two primary functions: storage and repair. Most of the acreage on the Yermo Annex is used for warehouses and open storage facilities. The area also supports a major maintenance depot and an administration facility. Adjacent to the maintenance depot is a state-of-the-art military vehicle test track used in conjunction with the repair facilities. Approximately 2.2 miles of the Union Pacific Railroad run along the southeast boundary of the Yermo Annex, crossing the Mojave River (Figure 2-5). The Yermo Annex also has extensive rail facilities, consisting of approximately 24.5 track miles, to transport supplies.

The Rifle Range is dedicated to range activities, with rifle and pistol ranges to train Marines in marksmanship. Most of the Rifle Range is open space which serves as a range safety buffer zone. However, Rifle Range West includes a proposed Landing Helicopter Assault (LHA)/Landing Helicopter Dock (LHD) footprint, and Rifle Range East includes a proposed Landing Zone (LZ) 1 footprint. Two utility corridors run east to west along the north boundary of the Rifle Range (Figure 2-4).

Troop rotations through MCLB Barstow dramatically increase the number of personnel who require the use of Base facilities and services. The Army's National Training Center at Fort Irwin, 35 miles north of Barstow, is the only facility in the U.S. where Army and National Guard units have the space and topography for realistic desert battlefield training. It is not uncommon for the Army to move troop unit rotations through the Yermo Annex each year in support of its mission. Each unit arrives and is offloaded for training, and then is backloaded for transit back to its home base. The rail cars use nearly all sidings; vehicles are offloaded on the west end and are staged in convoys in the northwest corner of the Base. Additionally, USMC East Coast operational forces use Barstow's railhead an average of twice a year for similar movements of equipment to Barstow for subsequent deployments.

The conversion in 1980 of the Fort Irwin Military Reservation to a National Training Center for desert warfare had a significant impact on MCLB Barstow's activity levels. Increased rail traffic and bivouacking during U.S. Army troop rotations result in MCLB Barstow's peak periods of operation. Troop rotations are expected to continue at current levels. If Fort Irwin fulfills its expansion plans, the traffic volume would probably increase by one third.

2.3.2 Facilities

MCLB Barstow's annual facilities and operational contracts for Fiscal Year (FY) 2014 were valued at over $242 million. The FY 2014 payroll was $43 million for approximately 1,361 civilian jobs and 759 contract staff; with military troops, the total personnel positioned on MCLB Barstow reached 2,217. The combined economic impact to the local economy was more than $483 million (Garcia 2015). The Base supports a variety of land use functions, including the Rifle Range, administration, housing, technical training of Marines (which includes marksmanship and tactical combat training), community support, and utilities as well as supply, repair, and maintenance facilities. MCLB Barstow has 260 buildings, totaling 4,410,227 square feet. The land, buildings, and real property on MCLB Barstow are valued at more than $1.4 billion (Garcia 2015).

In addition to permanent Base functions, MCLB Barstow provides facility support for many tenant commands and visiting rotational units from other DoD installations. Tenant commands at MCLB Barstow include the following (USMC 2015):

- Air Clearance Authority
- Contracting and Purchasing Office
- Defense Commissary Agency
- Defense Logistics Agency (DLA) Distribution Barstow
- DLA Disposition Services
- DLA Document Services
- Fleet Support Division
- Marine Corps Logistics Command
- Marine Corps Systems Command
- Marine Depot Maintenance Command
- Movement Control Center National Training Center
- Naval Supply Systems Command Weapon Systems Support
- Office of General Counsel
- Officer in Charge Health Detachment
- Resident Officer in Charge of Construction
- Southwest Region Fleet Transportation
- U.S. Army Reserve Command
- U.S. Army Veterinary Services

2.3.3 Rail Facilities

Nebo contains approximately 7.5 track miles and the Yermo Annex approximately 24.5 track miles. The rail facilities are used to receive and ship supplies and equipment and to transport supplies internally. They are critical to the mission of the Base. The tracks are maintained by MCLB Barstow employees.

2.3.4 Water Supply

MCLB Barstow's potable water supply is pumped from production wells on the Base or purchased from the Golden State Water Company. Nebo obtains its drinking water through contract with Golden State Water Company, which extracts water from wells in the Barstow and Lenwood areas about 5 to 7 miles west of Nebo. Production wells at Nebo have been inactive since about 1975. The Yermo Annex's potable water derives from USMC-owned wells at the annex. Drinking water wells 5, 6, and 7 are currently in service there. Wells 5 and 6 are connected to a granular activated-carbon treatment system. Drinking water well 3 was removed from service, and the wellhead was demolished and closed in compliance with federal and state regulations. Drinking water well 4 was removed and demolished in August 2004. A drinking water well at Yermo Annex, well 7, was completed and permitted in November 2004; this well has perimeter security fencing. Potable water supplies for the Rifle Range are trucked in and stored for use.

With the local water basin in overdraft since the 1950s, the rapid urban growth in the desert has sparked concerns over the legal rights to the dwindling water supplies of the west Mojave Desert. In 1990, lower watershed users, including the City of Barstow and the Golden State Water Company, filed a complaint that asserted that cumulative water production upstream of Barstow had overdrafted the Mojave River Basin. The lawsuit resulted in a formal adjudication of the groundwater basins, requirements for reduced pumping throughout the watershed, and importation of water from California's aqueduct system. The Mojave Water Agency (MWA) has constructed pipelines to transport San Francisco Bay/Delta water from the aqueduct to recharge basins along the Mojave River floodplain. San Francisco Bay/Delta water is currently being discharged to recharge areas along the Mojave River near Hesperia and Barstow, and additional recharge basins are planned downstream (Maxwell 2000). The Mojave River Pipeline was completed in 2006, ultimately covering 76 miles and carrying 45,000 acre-feet of water a year (MWA 2014).

MCLB Barstow does not fall under the jurisdiction of the aforementioned ruling; however, this issue directly affects the Base, which relies exclusively on regional groundwater basins.

2.3.5 Roads and Fences

MCLB Barstow contains approximately 20 miles of paved and unpaved roads. Road and fence construction and maintenance are the responsibilities of the Public Works Office. There are perimeter fences on the Nebo and Rifle Range properties and around the maintenance facilities at the Yermo Annex.

2.3.6 Rifle Range and Range Safety Zone

The actual rifle range was initially a small portion (29 acres) of the 2,400-acre Rifle Range property. New, proposed uses at Range West include a high-intensity training area LHA/LHD site, water infiltration trenches and sediment detention basins, an earthen levee, and a new access road. Range East will include a stabilized LZ, new access roads, tactical refueling area, three bivouac areas, three new firing lines, and new buildings and structures within the existing

disturbance footprint. Routine maintenance of the facility includes grading access roads and parking lots, repairing firing berm erosion, and trimming vegetation between berms in the live-fire lanes. Grading activities are carried out semiannually unless additional maintenance is needed due to a severe storm. Because of the presence of the desert tortoise and its designated critical habitat on the Rifle Range (Figure 2-4), MCLB Barstow entered into consultation with the USFWS for operations and maintenance activities. Section 7 consultation has been completed, and the USFWS has issued Biological Opinions (BOs) for these activities (Appendix A).

2.3.7 Protected Habitats

Portions of MCLB Barstow receive additional regulatory protection because they contain a federally listed species or are jurisdictional wetlands or jurisdictional waters of the U.S. (JWoUS). Only one federally listed species, the desert tortoise, exists on MCLB Barstow. This federally threatened species was historically present on Nebo, but is currently only found on the Rifle Range. Of the existing tortoise habitat on the Base, approximately 540 acres have been formally designated as desert tortoise critical habitat by the USFWS and are part of the Ord-Rodman Desert Wildlife Management Area (DWMA). This critical habitat occurs on the south portion of the Rifle Range (Figure 2-4), which is currently the most remote and least used area of MCLB Barstow.

A wetlands delineation was conducted in November and December of 1997 (Tierra Data Inc. [TDI] 1998). The delineation estimated at the time that there were 265 acres of JWoUS and almost 1 acre of jurisdictional wetlands on the Base. The delineation further concluded that the desert washes on the Rifle Range that hydrologically connect to the Mojave River, which cuts across the boundaries of Nebo and the Yermo Annex, and were subject to JWoUS. In addition, the wetlands area north of the golf course, areas along the old canal, and portions of the percolation ponds are jurisdictional wetlands, also making them also subject to USACE regulation (TDI 1998) based upon laws and regulations in governance at the time.

2.3.8 Landscaping and Grounds Maintenance

Interspersed throughout the developed areas of the Base are pockets of landscaped grounds. These consist of lawns, shade trees, shrubs, windbreaks, and ornamental desert cacti. The developed portions of the Base generally lack natural vegetation and landscaping, and large portions of the Base show bare desert soil or are sparsely vegetated (MCLB Barstow 2016). The condition of the plants varies from excellent to poor. Some issues associated with the current groundskeeping are overpruning, incorrect planting techniques, inadequate irrigation, soil sterilant damage, and poor seasonal timing of planting (MCLB Barstow 2016).

Landscaping is challenging at MCLB Barstow due to the poor soil conditions, winds, and extreme temperatures, which are part of the desert environment. Irrigation is limited to the hours of least evaporation, generally overnight, and consists of water sprinkling. On summer days, more than half of the sprinkled water may not reach the ground. Base Order 11330.1, *Water Conservation,* and the Base Beautification Plan prohibit landscaping that wastes water. Instead,

plants whose water needs are most like native desert plants are used and they are arranged to make maximum use of scarce water resources.

The last formal review of MCLB Barstow's landscaping was in the 2016 BEAP. The BEAP recommended that a more consistent visual theme be developed for the Base's landscape design. This would improve the overall visual appearance of the Base and establish a coherent visual image that is more pleasing for residents and visitors. The suggested theme is described as "Mojave Desert." Landscaping is not just a "quality of life" issue. It is also important for controlling soil erosion and blowing dust, can reduce cooling costs for buildings, and can provide some habitat for wildlife.

2.3.9 Outdoor Recreation

In accordance with the Sikes Act, MCLB Barstow is obligated to provide outdoor recreation when it is compatible with the safety and security of the military mission and not inconsistent with the needs of fish and wildlife resources. Section 1.6.3 explains that public access is restricted on the Base for security reasons and to preserve critical habitat on the Rifle Range.

For the purposes of this INRMP, outdoor recreation is defined as active use of the Base's natural resources for recreation and physical exercise. MCLB Barstow provides outdoor recreational opportunities for its small military population and civilian personnel, including picnicking, walking, jogging, horseback riding, biking, playing tennis and golf, swimming, performing athletics, and wildlife watching. No hunting is permitted on MCLB Barstow.

2.4 Future Land Use at MCLB Barstow

2.4.1 Marine Air-Ground Task Force Training

MCLB Barstow is planning to enhance and update the operational capabilities of its existing training ranges and areas. To accommodate components of regional Marine Air-Ground Task Force training activities, MCLB Barstow proposes to create general aviation maneuver areas and to designate MV-22 rotary/tilt-rotor LZs and a simulated flight deck consisting of an LHA or LHD site. The project footprint of this proposed action would include portions of both the Yermo Annex and the Rifle Range (MCLB Barstow 2016).

The proposed action would consist of two LZs, with one on the Rifle Range, which will gain the LHA/LHD site, and the other on the Yermo Annex. The LZs would be constructed as rough-graded and stabilized 300-foot-by-300-foot areas. The LHA/LHD would be an 850-foot-by-150-foot area that would simulate the deck of a ship. The LHA/LHD site would have a 350-foot buffer to minimize disturbance from aircraft rotor wash (MCLB Barstow 2016).

Improvements to existing unimproved roads and the construction of new roads would be necessary to support the proposed LZs and LHA/LHD site. New roads would be 12 feet to 18 feet wide and rough graded. Biannual inspections and maintenance and as-needed emergency repairs are proposed for the project areas (MCLB Barstow 2016).

The project footprint of this proposed action does not overlap with the critical habitat of the desert tortoise, which is located along the south end of the Rifle Range (MCLB Barstow 2016).

2.5 Constraints and Opportunities

Constraints on MCLB Barstow are related to mission-focused needs; security on Nebo and the Yermo Annex, which restricts public access for outdoor recreation; and protection of critical habitat for the desert tortoise on the Rifle Range, which precludes some development and further mission-related use of that area.

Opportunities include further infill development of the disturbed areas of Nebo and the Yermo Annex. Possible development in the Rifle Range is the proposed development of the LZ and the LHA/LHD (Section 2.4.1).

2.5.1 Internal and External Encroachment

The City of Barstow is unlikely to encroach upon MCLB Barstow, as urban development is monitored to mitigate this. The USMC defines encroachment as:

> …any action planned or executed in the vicinity of a Marine Corps installation's normal area of operations which inhibits, curtails, or possesses the potential to impede Marine Corps interests. Further, encroachment is not limited to the immediate civilian community. Although physical development in conflict with military operations is the most often-cited source of encroachment, the actions of more removed entities, such as counties, States, and other Federal agencies which determine land use and occupancy, are equal potential sources" (MCO 11011.22A).

MCLB Barstow's mission is also unlikely to expand sufficiently for the Base to be constrained by internal limitations such as critical habitat (defined as a direct encroachment that can hinder training and maintenance) or requirements relating to other sensitive resources.

2.6 Land Use Planning

2.6.1 Regional Coordination

The protection and enhancement of the natural resources of MCLB Barstow will be achieved with an ecosystem management approach performed at a regional level, as entire ecosystems can be too expansive to consider at the Base level. At the present time, the operational needs of MCLB Barstow are not expected to necessitate the expansion of the Base. MCLB Barstow will continue to protect and enhance its own natural resources and, as required, will participate in regional ecosystem management partnerships.

2.6.2 Base Planning

Land use and natural resource management decisions will be evaluated so resources are protected against short-term, project-by-project impacts that could cumulatively result in

significant resource changes, thereby limiting the Base's flexibility in meeting military mission requirements. Additionally, decisions should be considered at appropriate biological scales and time frames so any conflicts between natural resource management and the military mission are removed. A "big picture" view of the current scenario, or of any existing or future problems, should be aligned with broader ecosystem management goals.

Careful consideration will be given to the siting of proposed actions, and potential impacts will be evaluated early in the planning process. As part of ongoing efforts to avoid and/or minimize impacts on special status species, sensitive habitat, and cultural or other relevant resources, consideration will first be given to use of lower-value management areas. This will assist planners in avoiding areas that support more sensitive resources. This will also enable planners to reduce the costs (in terms of funding, manpower, and time) involved in planning, obtaining regulatory approvals, and implementing proposed actions.

Another vital part of the Base-level planning context are BOs and Memoranda of Agreement (MOAs) or MOUs. These often modify environmental compliance responsibilities and could significantly influence the goals and projects proposed in the INRMP. The proposed construction of two new LZs and an LHA/LHD area require a new BO to be developed. Table 2-2 lists and summarizes MCLB Barstow's past and present BOs and agreements. Copies can be found in Appendix A.

Table 2-2. Record of Endangered Species Act Consultations and Memoranda of Agreement for MCLB Barstow Completed or in Progress

Date	Project/Document
12 August 1993	Routine operations and maintenance activities south of Interstate 40: Biological Opinion 1-8-93-F-1
15 December 1995	*Memorandum of Understanding to Foster the Ecosystem Approach between the Council on Environmental Quality, Department of Agriculture, Department of the Army, Department of Commerce, Department of Defense, Department of Energy, Department of Housing and Urban Development, Department of The Interior, Department of Justice, Department of Labor, Department of State, Department of Transportation, Environmental Protection Agency, and Office of Science and Technology Policy*
10 June 1997	New construction and updated maintenance activities on the Rifle Range, including five ground-disturbing activities: Biological Opinion1-8-97-F-20R
13 December 1988	Cooperative agreement between the Department of Defense and The Nature Conservancy
9 September 2003	Installation of perimeter fence at the Rifle Range: Biological Opinion 1-8-03-F-26
24 September 2003	Construction of a bullet trap at the Rifle Range, replacing an existing earthen berm: Amendment Letter to BO 1-8-97-F-20R
2 April 2004	*Memorandum of Understanding Concerning Agency Cooperation on the Preparation of the Raven Management Environmental Assessment among U.S. Fish and Wildlife Service, California-Nevada Operations Office, Bureau of Land Management California Desert District, National Park Service Mojave National Preserve, National Park Service Joshua Tree National Park, Animal and Plant Health Inspection Service, Wildlife Services, California State Office, Edwards Air Force Base, United States Army National Training Center Fort Irwin, Marine Air Ground Task Force Training Command Twentynine Palms, Marine Corps Logistics Base Barstow, Naval Air Weapons Station China Lake*
2017 TBD	2017 Range and Training: Biological Opinion #TBD

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3.0 EXISTING ENVIRONMENT

This chapter describes the physical and biotic environments at MCLB Barstow and their present conditions.

3.1 Physical Environment

3.1.1 Earth Resources

For the purpose of this discussion, earth resources include the regional geologic setting, topography, geology, and soils of MCLB Barstow.

Regional Geologic Setting

MCLB Barstow lies on the west plain of the Mojave Desert, which slopes gently eastward from the south end of the Sierra Nevada Mountains toward the Colorado River. The western Mojave Desert is a wedge-shaped basin with boundaries roughly defined as lying between two major California fault lines, the San Andreas to the south and Garlock to the north.

Considered part of the high desert, most of the west Mojave Desert lies at elevations ranging from 2,000 to 4,000 feet. The desert is arid, hot in the summer, and cool in the winter. Precipitation is primarily in the form of winter rain with higher elevations occasionally receiving snow. The Mojave Desert is transitional between the hotter, drier Colorado Desert to the south and the cooler Great Basin Desert to the north.

The Mojave Desert is an alluvial-filled basin with a rich geologic history. The landscape is characterized by low, isolated hills and mountain ranges separated by expanses of basins and valleys. Material eroding from the upper regions has contributed to the buildup of alluvial fans with bajadas at their bases. Dry washes are a common feature, winding down the slopes of the desert ranges into adjacent valleys and basins.

Topography

MCLB Barstow lies along the Mojave River in a large alluvial valley surrounded by low mountain ranges. The Mojave River Valley, extending east and west of MCLB Barstow, is bounded to the north and northwest by the Mitchell Range and Waterman Hills. The southern margin of the valley is provided by the east-west trending Newberry Mountains. The Calico Mountains to the north and east approach within a few miles of the Yermo Annex's northern border.

A distinct feature of the local landscape is Elephant Mountain, which is between the Nebo and Yermo Annex parcels. Elephant Mountain is the southern extension of the Mitchell Range, projecting out of the surrounding lowlands at a peak elevation of 2,674 feet.

The Nebo and the Yermo Annex properties are mostly level, exhibiting little variation in the local topography except for Nebo, where undulating hills lead south to Radio Hill. The Rifle Range displays the most diverse topography, consisting of moderate to steep, low hills separated by

ephemeral washes. Dry wash systems run north from Daggett Ridge, descending through the Rifle Range and parts of Nebo to reach the Mojave River.

Elevations of the MCLB Barstow properties range from a high of 2,650 feet in the Rifle Range to a midrange elevation of about 2,000 feet at Nebo, and a low of 1,940 feet at the Yermo Annex. The Mojave River flows down this gradient, serving as the boundary between Nebo and the Yermo Annex. This large river generally flows underground at MCLB Barstow.

Geology

The region surrounding MCLB Barstow is characterized by a geologic layering of sediment and rocks. The upper geologic layer of alluvial fan and stream channel deposits is most evident in the Mojave River and desert wash channels. The unconsolidated to semiconsolidated deposits of the valley are a result of millions of years of deposition from the Mojave River and surrounding mountain ranges. Next are a series of volcanic flows that grade into older sedimentary layers of shales and limestones, along with other volcanic rock. The oldest layer is a combination of a massive granitoid batholith and metamorphosed sedimentary units. Exposed bedrock in the area is generally sedimentary and volcanic in origin.

Three major fault assemblages surround MCLB Barstow: the Harper Lake-Camp Rock fault; Helendale, Lenwood, and Johnson Valley faults; and Emerson and Calico faults. The Harper Lake-Camp Rock fault series traverses Nebo and the Rifle Range and extends under the percolation ponds at Nebo.

The broader, less rugged mountain ranges in the region generally result from uplift along the northwest-trending fault zones. These ranges are primarily underlain by granitic rock. Mountain masses of volcanic origin, such as Elephant Mountain, are a combination of rhyolitic and dacite flows which form a more rugged terrain.

The most recent significant earthquake in the area was the Hector Mine earthquake, centered 47 miles east-southeast of Barstow on 16 October 1999 (USGS 2010). This quake measured 7.1 on the Richter scale but caused very little damage at MCLB Barstow or in the local community.

Soils

Low precipitation coupled with high evaporation substantially slows the soil-forming processes in the Mojave Desert. As a result, the more recently created soils are typically immature and low in organic material. Soils at Nebo and the Yermo Annex are generally of this younger type. Older soils cover most of the Rifle Range on the alluvial fans and hills.

Riverwash soils of the Mojave River floodplain consist of relatively unconsolidated, coarse sands and gravels that are typically moderately well drained. Water percolates through this medium easily. Alluvial deposits are very deep and provide excellent water storage. The nearly level surface deposits of the riverbed lie on the bedrock, confining water to the upper alluvial layer.

More finely textured soils found on low river terraces and recent alluvial fans include the Cajon, Villa, and Arizo soil units. These young soils consist of a mixture of sands, gravelly sands, and loamy sands that formed in Holocene alluvium, derived primarily from granitic parent material. They are very deep, somewhat excessively drained to excessively drained, and are characterized by low available water capacity, high permeability, and slow runoff.

Soils on old alluvial fans and terraces formed in alluvium are derived from mixed sources. On MCLB Barstow, these soil types include the Nebona-Cuddeback and Typic Haplargids-Yermo complexes. The soils of these complexes are generally older and more developed. They may support desert pavement of varnished gravel and cobbles on their surfaces.

The soil associations are summarized in Table 3-1 and shown in Figure 3-1.

Table 3-1. MCLB Barstow Soil Descriptions

Description	Soil Occurrence	Nebo (acres)	Yermo (acres)	RR (acres)
Arizo Gravelly Loamy Sand, 2%-9% Slopes	Arizo soils are found on alluvial fans, inset fans, fan aprons, fan skirts, stream terraces, and floodplains of intermittent streams and channels.	1,017	N/A	327
Cajon Sand, 0%-2% Slopes	Cajon soils have gradients of 0% to 15% and are on recent fans, fan skirts, fan aprons, inset fans, and river terraces at elevations of 200 to 4,300 feet.	155	1,395	N/A
Cajon Sand, 2%-9% Slopes	Cajon soils have gradients of 0% to 15% and are on recent fans, fan skirts, fan aprons, inset fans, and river terraces at elevations of 200 to 4,300 feet.	6	147	37
Cajon Gravelly Sand, 2%-15% Slopes	Cajon soils have gradients of 0% to 15% and are on recent fans, fan skirts, fan aprons, inset fans, and river terraces at elevations of 200 to 4,300 feet.	N/A	N/A	455
Nebona-Cuddeback Complex, 2%-9% Slopes	Nebona soils formed on old, gravelly, desert-pavement-covered terraces; are derived from nonmarine mixed alluvium; and have slopes of 2% to 9%. They can be found at elevation ranging from 2,200 to 3,000 feet.	76	N/A	914
Gravel Pit	Gravel pits are created intentionally by placing gravel into open pits.	0.1	NA	N/A
Riverwash	Riverwash soils form within channels have a 0% to 10% gradient and can be found at elevations from 650 to 4,000 feet.	20	176	N/A
Typic Haplargids – Yermo Complex, 8%-30% Slopes	Typic haplargid soils are found on hills, summits, and the toes and bases of slopes; have a 8% to 15% gradient; and can be found at elevations from 2,400 to 4,100 feet.	46	N/A	662
Villa Loamy Sand, Hummocky	Loamy soils are found on floodplains and alluvial fans and have a 0% to 2% slope. They are found at elevations from 1,700 to 2,800 feet.	13	N/A	N/A

RR – Rifle Range; **N/A** – not applicable

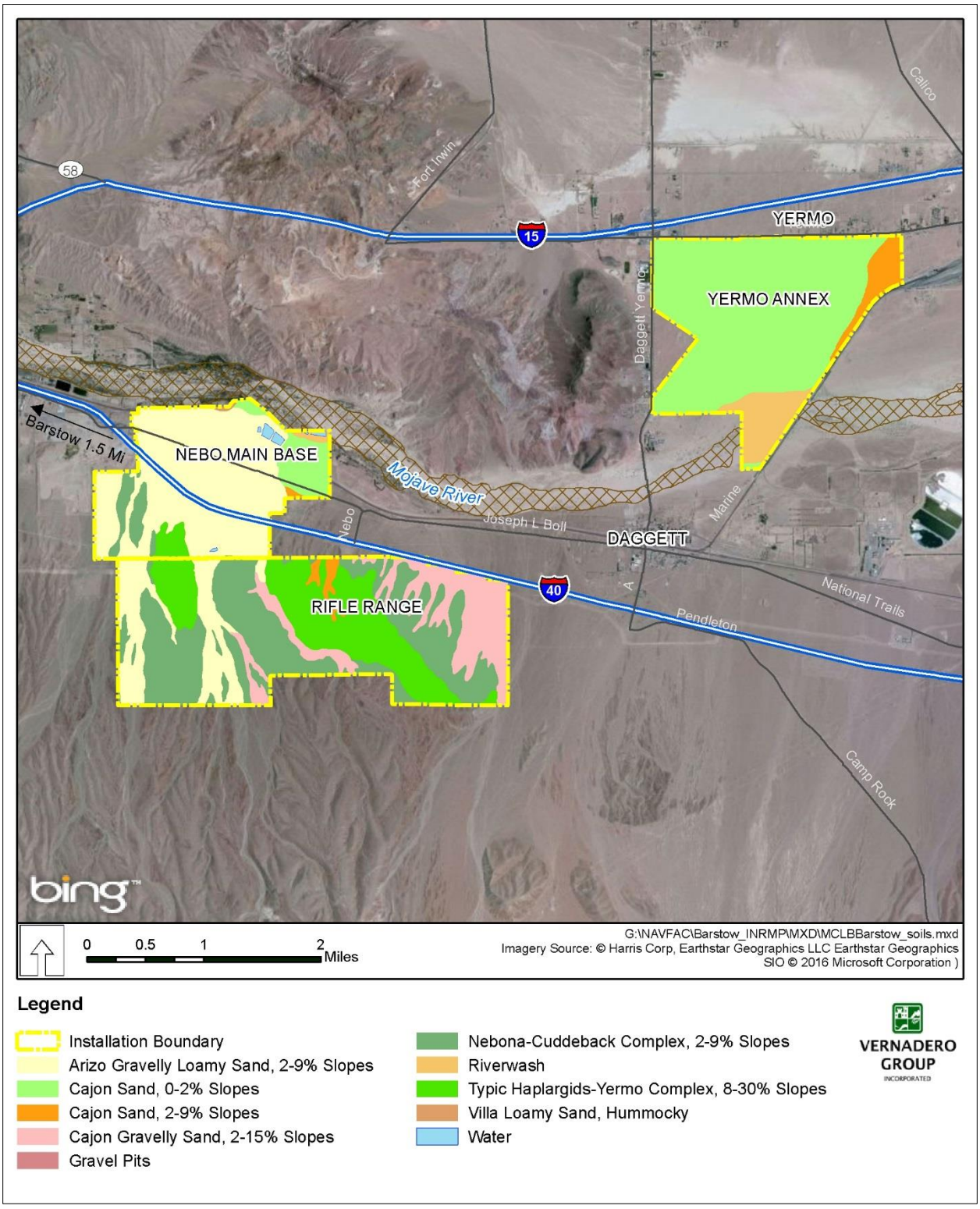

Figure 3-1. MCLB Barstow Soils

3.1.2 Climate

MCLB Barstow has an arid desert climate characterized by hot, dry summers, warm springs and autumns, and mild winters. Typical of a desert climate, the area is further distinguished by low yearly rainfall, high evaporation, and strong winds. Weather patterns are largely uniform except for differences in localized wind patterns.

MCLB Barstow experiences daily temperature fluctuations and seasonal and yearly variations. Daytime temperatures of at least 90° Fahrenheit (°F) occur most days from June through September, while winter temperatures average in the mid-40s and 50s. A record high of 116°F was registered in July 1972. The lowest temperature on record is 3°F in January 1963. Frosts are generally light and infrequent with an average of 58 days falling below freezing annually.

Annual precipitation records for Barstow indicate an average of 4.4 inches per year, with a minimum of 1.08 inches (1953 and 1994) and a maximum of 10.9 inches (1918). Most rain is received between November and March. Precipitation consists primarily of winter rains that fall predominantly as low-intensity, prolonged storms extending over large areas. Some precipitation is received as snow.

Summer rains are infrequent, occurring about three days each year, usually in the form of thunderstorms. The showers tend to be brief, intense, and localized. They quickly saturate the soil surface during the first few minutes, making the soil repel further water. This rapid runoff may result in flash floods or a high level of erosion and also prevent water from getting to the root zone to replenish plants. Periodically, these episodes of intense rainfall have resulted in flash floods in the Mojave River and the ephemeral washes that feed into the river on and near MCLB Barstow.

3.1.3 Water Resources

Water resources are defined as sources of water available for use by humans, flora, or fauna and include surface water, groundwater, near-shore waters, and wetlands. Surface water resources include stormwater, lakes, streams, rivers, and springs. Groundwater is defined as any source of water beneath the ground surface. Surface water and groundwater may be used for potable water, agricultural irrigation, industry, and recreation.

Water Resources Setting

MCLB Barstow lies within the Mojave River watershed, which extends over the entire west Mojave Desert. The Mojave River is the primary feature of the watershed, coursing over 120 miles from its headwaters in the San Bernardino Mountains to its terminus near Baker, California.

The Mojave River is an important water supply and the primary source of groundwater recharge of the subbasins of the Mojave watershed (Figure 3-2). As part of the lower Mojave watershed (the upper watershed lies north of MCLB Barstow), MCLB Barstow's groundwater is recharged from subsurface flows. Recharge fluctuations in local groundwater reserves are a result of

variations in precipitation both locally and within the entire Mojave River watershed. The configuration of the primary local faults have augmented groundwater storage capacities in and near the city of Barstow; recharge at Barstow is estimated at 9,000 acre-feet annually (Jacobs Engineering 1995).

Floodplain

The Mojave River zone is a broad, alluvial, dryland channel, usually supporting relatively unconfined water flows. Areas immediately adjacent to the Mojave River are considered by the California Division of Mines to be natural floodplains. This designation includes small portions of Nebo and the Yermo Annex. The river channel reaches nearly 0.5 mile at its widest point adjacent to MCLB Barstow, at the western end of the Tees and Trees Golf Course on Nebo.

The flood hazard at MCLB Barstow is insignificant as the 100-year floodplain crosses only a small portion of Nebo and does not reach the Yermo Annex or the Rifle Range. Potential flooding from the Mojave River is limited to an area along Nebo's northernmost boundary, extending approximately 1,200 feet onto the Base.

The areas subject to flooding include the golf course and percolation ponds, which can tolerate flooding with little damage. The raised embankment of the BNSF Railway tracks serves as a barrier between the river and other Nebo facilities. However, incidents of flooding have occurred along the Mojave River, making effective floodplain management important in preventing damage to Base facilities and ensuring the safety of its personnel. Heavy flows from the July 1993 Mojave River flood destroyed two monitoring wells in the bed of the river at the Yermo Annex and damaged six wells at Nebo (Jacobs Engineering 1995).

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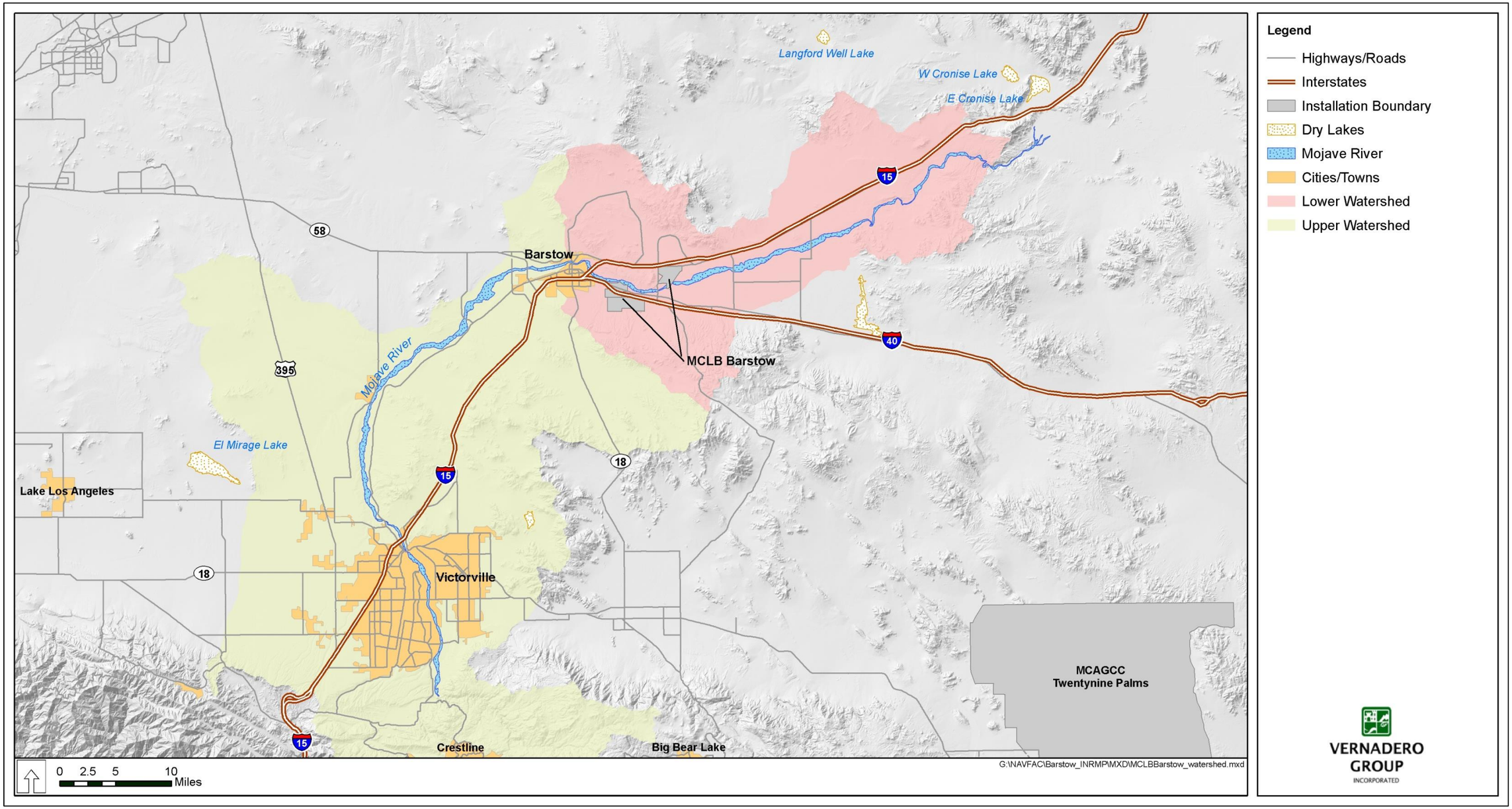

Figure 3-2. Mojave River Watershed

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Surface Water

The percolation ponds in Nebo along the Mojave River (Figure 3-3) attract a variety of resident and migratory birds. The open standing water serves as a resting place for water birds such as ducks, teals, shovelers, and coots. Two oxidation ponds and a series of effluent ponds provide an important, though artificial, habitat for wildlife that may also be utilizing nearby cottonwood-willow communities, desert wash thicket habitat, and the adjacent Tees and Trees Golf Course for perching, feeding, nesting, or breeding. The golf course contains a small, shallow, human-made pond, roughly 6 inches deep, that provides water and habitat for multiple species. It offers breeding habitat for western toads, foraging habitat for multiple bat species, and a source of drinking water for mule deer, coyotes, birds, and other species (TDI 2015).

Jurisdictional Waters of the United States

Jurisdictional Waters of the United States (JWoUS) can also be found on MCLB Barstow. Many of the washes on the Rifle Range (Figure 3-3) and one on Nebo have been previously mapped as JWoUS; all are outside the boundaries of the Mojave River. MCLB Barstow also harbors jurisdictional wetlands, which are a particular type of JWoUS. Jurisdictional wetlands must meet three requirements as defined by the USACE: prevalence of hydrophytic vegetation, presence of hydric soils, and wetland hydrology. These wetlands are found in Nebo along the southern edge of the Mojave River where the river's boundary crosses onto the Base. This habitat covers just 0.09 acre (Figure 3-3).

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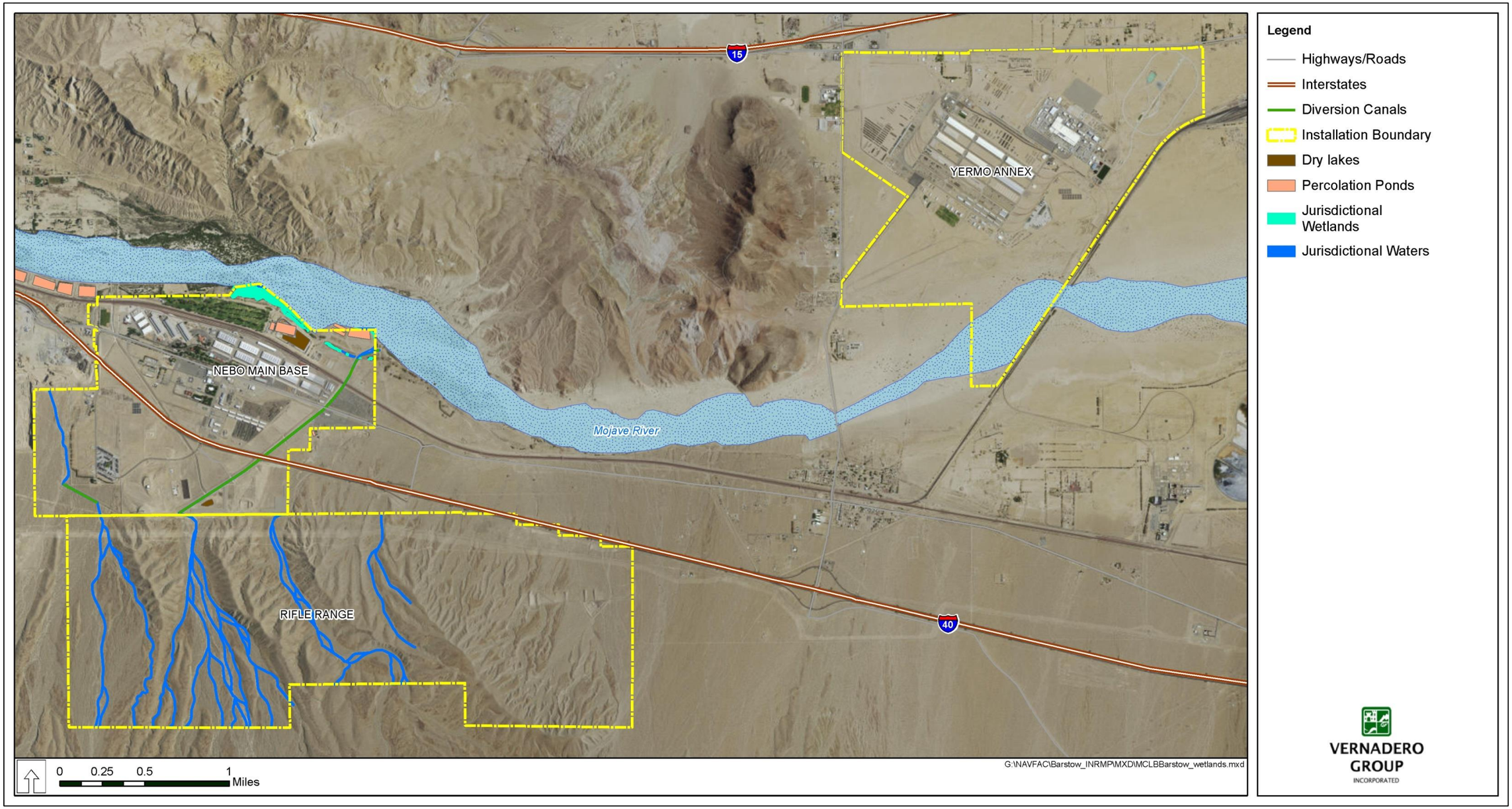

Figure 3-3. Surface Water on or Adjacent to MCLB Barstow

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Groundwater

Groundwater conditions at MCLB Barstow are monitored by an extensive network of shallow, intermediate, and deep monitoring wells installed during various ongoing environmental and engineering studies. Groundwater conditions at the Yermo Annex vary significantly from the conditions at Nebo in terms of depth, capacity, and quality. At Nebo, groundwater is encountered at much shallower depths and has water quality problems. Dissolved solids and nitrates associated with upstream wastewater discharges and dairy/agricultural use have eliminated underground wells as a source of water for domestic use at Nebo. The groundwater in the Yermo Annex is of higher quality than on Nebo, however, since the Harper Lake – Camp Rock earthquake fault separates the two water tables.

MCLB Barstow is within the Mojave Basin Area, an adjudicated groundwater basin. Water quality degradation has been noted in the surface water and groundwater throughout the Mojave Basin Area, as well as regionwide groundwater elevation declines in the Baja subarea of the basin where MCLB Barstow is located. The *Watermaster Annual Report for Water Year 2014-15* indicates water levels in the Baja subarea show continued declines, without significant recovery after storms, due to overpumping and limited recharge across the region (MWA 2014).

Groundwater at both Nebo and the Yermo Annex has been impacted by historical practices resulting in several contaminant plumes. The Department of the Navy's Environmental Restoration Program is currently managing and addressing the MCLB Barstow groundwater contamination through a combination of monitored natural attenuation and active remediation.

3.2 Air Quality

The U.S. Environmental Protection Agency (EPA) defines air quality in terms of concentrations of specific pollutants in the ambient air that may adversely affect the health and welfare of the general public. Air quality considers ambient (outdoor) air quality and emissions of air pollutants regulated by the Clean Air Act, as well as greenhouse gases, water vapor, carbon dioxide (CO_2), tropospheric ozone, nitrous oxide (N_2O), and methane (CH_4). Seven major pollutants of concern, called "criteria pollutants," are as follows:

- Carbon monoxide (CM)
- Sulfur dioxide (SO_2)
- Nitrogen dioxide (NO_2)
- Ozone (O_3)
- Suspended particulate matter less than or equal to 10 microns in diameter (PM_{10})
- Fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$)
- Lead (Pb)

The EPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a federal air quality standard are designated as nonattainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The

ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (for example, micrograms per cubic meter of air) or as a volume fraction (for example, parts per million by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CM, SO_2, Pb, and some particulates, are emitted directly into the atmosphere.

Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes; however, PM_{10} and $PM_{2.5}$ also can be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered “precursors” to secondary pollutants are those evaluated to control O_3 levels in the ambient air, such as reactive organic gases and oxides of nitrogen (NO_X).

Air quality at a given location can be described by the concentrations of pollutants in the atmosphere. Pollutants are defined as being of two general types: (1) criteria pollutants and (2) toxic compounds. Criteria pollutants must conform to national and/or state ambient air quality standards (MCLB Barstow Air Quality Management Plan 2015). The EPA established the NAAQS, while the California Air Resources Board established the state standards, termed the California Ambient Air Quality Standards (CAAQS). The NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except for annual standards, which may never be exceeded. The CAAQS represent maximum acceptable pollutant concentrations that are not to be equaled or exceeded. Areas that do not meet the air quality standard are designated as nonattainment areas.

MCLB Barstow lies within San Bernardino County, areas of which are considered to be nonattainment areas for PM_{10} and O_3 precursors (EPA 2015). The *de minimis* thresholds for San Bernardino County are 100 tons per year for PM_{10} and 25 tons per year for O_3 precursors, including NO_X and reactive organic gases. The California Air Resources Board is responsible for enforcing both the federal and state air pollution standards (EPA 2015).

MCLB Barstow experiences relatively strong winds throughout the year, a result of storm fronts moving in from the Pacific Coast. The resulting atmospheric convection causes the desert air to move rapidly from place to place. This mechanism is less effective during cooler winter months

when daily temperature ranges are less extreme. Winds are primarily from the west, particularly in the late spring and early summer.

Sand and dust churned into the air at these times cause air quality problems and are a nuisance that affects human activities. Sand and dust storms in the Mojave Desert are natural phenomena, necessary for sustaining endemic species that specialize in sand systems such as dunes, sand ramps along hillsides, and mesquite mounds. In the Mojave Desert there is a tendency for sand ramps to be on the western slopes of mountains. The origin of this sand is far west of MCLB Barstow land, and much of the sand ends up in Arizona east of the Colorado River (Zimbelman et al.1995).

3.3 Biotic Environment

Biotic environment in this INRMP refers to the vegetation, general wildlife, special status species, and invasive species at MCLB Barstow.

3.3.1 Vegetation

The best available data for vegetation at MCLB Barstow is from a botanical survey conducted in the spring of 1996 to inventory plant species and delineate plant communities on the Base (TDI 1996). The survey provided the first report on the Base's plant communities and their composition, cover, and distribution. Five plant communities were identified on MCLB Barstow: creosote bush scrub, desert wash scrub, cottonwood-willow, desert wash thicket, and desert pavement. Acreages for each community are presented in Table 3-2. Figure 3-4 shows the vegetation community boundaries for MCLB Barstow. The following series are described by Sawyer and Keeler-Wolf (1995), with Holland's (1986) equivalent of each series provided in parentheses: catclaw acacia series (Mojave wash scrub and Mojave desert wash scrub), creosote bush series (Mojave creosote bush scrub), creosote bush-white bursage series (Mojave creosote bush scrub), scalebroom series (Mojave desert wash scrub), and tamarisk series (tamarisk scrub).

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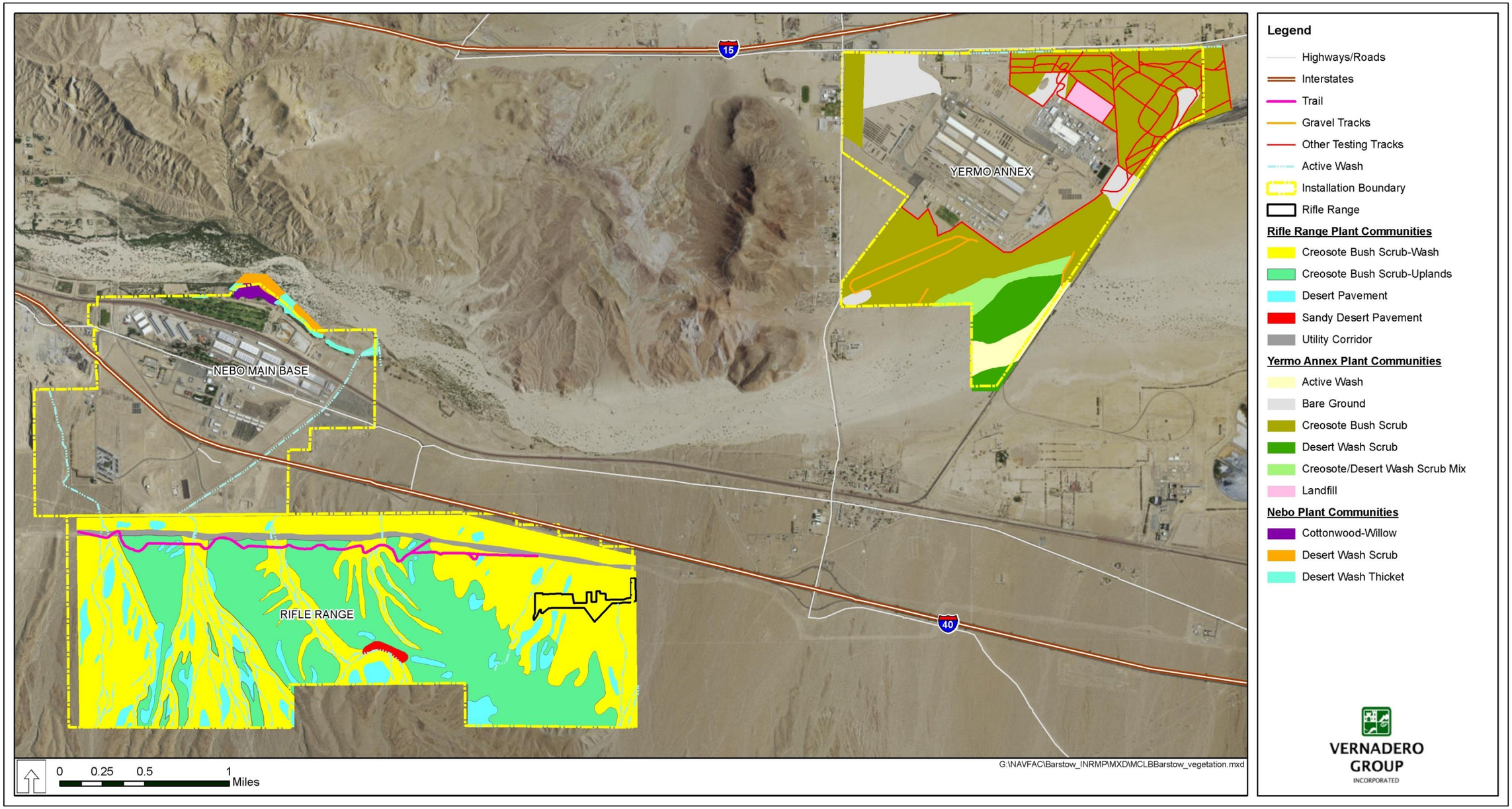

Figure 3-4. MCLB Barstow Vegetation (Source: TDI 1996, 2008, 2014)

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Table 3-2. MCLB Barstow Plant Communities, Total Acreage, and Acreage by Land Parcel

Plant Community	Acreage			
	Total	Nebo	Rifle Range	Yermo Annex
Creosote Bush Scrub	2,809	N/A	2,140	669
Desert Wash Scrub	107	N/A	11	96
Creosote/Desert Wash Scrub Mix	64	18	N/A	46
Cottonwood-Willow Desert Riparian	10	10	N/A	N/A
Desert Wash Thicket	18	18	N/A	N/A
Desert Pavement	185	N/A	185	N/A
Bare	124	N/A	N/A	124
Other (Active Wash, Landfill, Roads, Tracks, Rifle Range)	175	N/A	103	72
Acreage Covered by Study	**3,492**	**46**	**2,439**	**1,007**

Source: TDI 1996
N/A – not applicable

Creosote Bush Scrub

Creosote bush scrub on MCLB Barstow is dominated by creosote bush (*Larrea tridentata*), cheesebush (*Hymenoclea salsola*), and white bursage (*Ambrosia dumosa*). Species commonly associated with this habitat include brittlebush (*Encelia farinosa*), all-scale (*Atriplex polycarpa*), and California tea (*Ephedra californica*) with annuals such as buckwheat (*Eriogonum* spp.) and two invasive species, filaree (*Erodium cicutarium*), and Mediterranean grass (*Schismus barbatus*). Creosote bush scrub is found on the Yermo Annex and Rifle Range and makes up MCLB Barstow's largest plant community. The composition of species in this community varies by geographic location.

The Yermo Annex's creosote bush scrub community is dominated by creosote bush and white bursage intermixed with all-scale and California tea. Typical annuals include filaree, Mediterranean grass, and buckwheat (*E. trichopes*). Plants that distinguish the Yermo Annex's eastern side are small amounts of silver cholla (*Cylindropuntia echinocarpa*), buckwheat (*Eriogonum* spp.), and Indian rice grass (*Achnatherum hymenoides*).

The topography of the Rifle Range supports creosote bush scrub on two substrates, uplands and wash islands. Approximately 85 percent of the Rifle Range is covered by creosote bush scrub. This community is dominated by creosote bush mixed with these common species: Pima ratany (*Krameria erecta*), white bursage, desert dandelion (*Malacothrix glabrata*), devil's lettuce (*Amsinckia tessellata*), Mediterranean grass, filaree, pincushion (*Chaenactis* sp.), buckwheat, spotted langloisia (*Langloisia setosissima*), plantain (*Plantago ovata*), desert primrose (*Camissonia* spp.), chia (*Salvia columbariae*), and Mojave yucca (*Yucca schidigera*).

The Rifle Range is the only parcel to support a wide variety of cacti. The species of cacti found on the range include the many-headed barrel cactus (*Echinocactus polycephalus* var. *polycephalus*), hedgehog cactus (*Echinocereus engelmannii*), beavertail cactus (*Opuntia basilaris*), silver cholla (*Cylindropuntia echinocarpa*), pencil cholla (*Cylindropuntia ramosissima*) and, rarely, fishhook cactus (*Mammillaria tetrancistra*).

Bajadas, or conjoined alluvial fans, appear to have a more diverse species composition and more ground cover than either the wash or upland areas. They are characterized by the same general plant composition as upland and wash areas with the addition of cheesebush, spiny senna (*Senna armata*), sandpaper plant (*Petalonyx thurberi*), and pencil cholla.

Desert Wash Scrub

Desert wash scrub is the shrub community found in washes. It has a high conservation value due to its limited extent and the diverse plants and animals found in the community. There are two types of desert wash scrub on MCLB Barstow: *Tamarix–Lepidospartum–Chilopsis* and *Acacia–Psorothamnus–Chilopsis.* The Base also supports a transitional community, creosote/desert wash scrub mix, which has elements of both creosote bush scrub and desert wash scrub.

Desert Wash Scrub: *Tamarix –Lepidospartum–Chilopsis.* The *Tamarix–Lepidospartum–Chilopsis* desert wash scrub community is in the Mojave River portion of the Yermo Annex (Figure 3-4). It is sparsely populated and characterized by tamarisk (*Tamarix ramosissima*), scalebroom (*Lepidospartum squamatum*), and desert willow (*Chilopsis linearis*) with an understory of croton (*Croton californicus*), California tea, tiquilia (*Tiquilia plicata*), Russian thistle (*Salsola tragus*), wire lettuce (*Stephanomeria pauciflora*), Mediterranean grass, cryptantha (*Cryptantha* spp.), filaree, devil's lettuce (*Amsinckia tessellata*), desert primrose (*Camissonia* spp.), and panic grass (*Panicum urvilleanum*).

Desert Wash Scrub: *Acacia–Psorothamnus–Chilopsis*. The *Acacia–Psorothamnus–Chilopsis* community occurs in active washes on the Rifle Range, but not on its wash islands. Catclaw acacia (*Acacia greggii*), small-leaved Mojave indigo bush (*Psorothamnus arborescens* var. *minutifolius*), and desert willow are dominant. Other typical species of this habitat are sweet bush (*Bebbia juncea*), brittlebush, California tea, cheesebush, creosote bush, and Anderson thornbush (*Lycium andersonii*) with an understory of annuals dominated by Mediterranean grass together with foxtail chess (*Bromus madritensis* ssp. *rubens*), fiddleneck (*Amsinckia* spp.), filaree, buckwheat, and cryptantha.

Creosote/Desert Wash Scrub Mix. Creosote/desert wash scrub mix is a transitional community that occurs between creosote bush scrub and desert wash scrub, with neither community dominating. It occurs on more stable areas of the washes where upland species have a chance to become established. These transitional communities are found at the Yermo Annex and Nebo. A *Larrea–Tamarix* combination is also evident in the Yermo Annex.

Cottonwood-Willow Desert Riparian

The cottonwood-willow desert riparian community occurs in the Mojave River portion of Nebo. While it covers only a small area, MCLB Barstow's portion of the Mojave River constitutes about 1 percent of all the riparian habitat in the Mojave Desert. This community is considered sensitive and is a high priority for conservation. The community is distinguished by Fremont's cottonwood (*Populus fremontii*), narrow-leaved willow (*Salix exigua*), and arroyo willow (*S. lasiolepis*). As a result of its position along the Mojave River wash, it includes a large element of tamarisk. Other species in this riparian zone are mulefat (*Baccharis salicifolia*), Russian thistle, croton, heliotrope (*Heliotropium curassavicum*), Mediterranean grass, melilotus (*Melilotus alba*), and filaree.

Within this community there is a small pond of water created by levee embankments. The levee and adjacent ditch are possibly a result of the water diversion efforts of early sheep ranchers. The pond supports some unusual species such as escaped ornamentals and wetland species. Unique to the pond area are cattail (*Typha domingensis*), tule (*Scirpus acutus* var. *occidentalis*), athel (*Tamarix aphylla*), and Goodding's willow (*S. gooddingii*). Other species along the levee include rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *ceruminosus*), screwbean mesquite (*Prosopis pubescens*), all-scale, and four-wing saltbush (*A. canescens*). Some patches of beavertail were noted in Nebo on a slope adjoining the bank of the Mojave River.

Desert Wash Thicket

Desert wash thicket is a very dense plant community dominated by tamarisk and mule fat. It is found in the Mojave River area of Nebo. Understory plants include wire lettuce and croton.

Desert Pavement

Desert pavement is a veneer of gravel or larger stones that remains after the wind has blown upper layers of silt and sand away. The soil surface becomes armored with the pebbles left behind, then cemented with calcium carbonate residue from water evaporation. The disturbance caused by vehicular traffic can break through the pavement surface, which appears deceivingly strong, and start erosion channels. These surfaces are extremely hot because of their dark color, and few plants can tolerate living near them.

The desert pavement plant community owes its name to the substrate on which it grows. It is a sparse community, likely due in part to the characteristics of pavement that adversely influence plant growth (Cooke et al.1993). Desert pavement is dominated by creosote bush with other typical plants: white bursage, Mojave yucca, plantain, Mediterranean grass, filaree, foxtail chess, devil's lettuce, pincushion, chorizanthe (*Chorizanthe rigida*), and mirabilis (*Mirabilis bigelovii*). This community is only evident at the Rifle Range.

3.3.2 General Flora and Fauna

General flora and fauna are considered to be all species observed on MCLB Barstow that are not special status species (Section 3.3.3). A table showing the general flora and fauna species documented at MCLB Barstow is provided in Table A-1 in Appendix A.

3.3.3 Special Status Species

Special status species include federally threatened or endangered species protected by the ESA, as well as species protected by the California ESA. This definition also includes species that are considered species of special concern by the USFWS or California Department of Fish and Wildlife (CDFW) or are considered rare plants by the California Native Plant Society (CNPS).

Special status species have been reported to be found at MCLB Barstow according to previous INRMP iterations. In 2014-2015 a National Resources Inventory (NRI) was conducted to augment the information about the species found at MCLB Barstow. Special status species were observed during the 2014-2015 NRI; general biological resource surveys conducted by Leidos in 2014 in support of an EA (MCLB Barstow 2016); focused surveys, such as for the desert tortoise (Walde 2013; Vernadero 2016); and by incidental observations (Table 3-3). Figure 3-5 shows the special status species that have been recorded at MCLB Barstow.

Table 3-3. Special Status Species Observed on MCLB Barstow

Common Name Scientific Name	Habitat	Observed Range Location at MCLB Barstow
Reptiles		
Desert Tortoise (*Gopherus agassizii*)	Creosote bush, burrobush, Mojave yucca, blackbrush, Joshua tree, and galleta grass on flats, alluvial fans, bajadas, rocky terrain, and washes where soil is friable enough for tortoises to dig burrows. Can be found on rocky areas with slopes of up to 40%.	Rifle Range
Birds		
Brewer's Sparrow (*Spizella breweri*)	Sagebrush and scrub habitats. One of the few species that is mainly a sagebrush obligate. Can also be found in habitat dominated by creosote bush and saltbush.	Nebo, Rifle Range
Burrowing Owl (*Athene cunicularia hypugaea*)	Open, dry grasslands and desert habitats. Nests in burrows.	Rifle Range
Cooper's Hawk (*Accipiter cooperii*)	Woodlands and riparian areas. Nests and forages along riparian areas.	Nebo
Crissal Thrasher (*Toxostoma crissale*)	Dense, low, scrubby vegetation, such as desert and foothill scrub and riparian brush.	Nebo
Golden Eagle (*Aquila chrysaetos*)	Widespread in mountainous areas of the west Mojave Desert and open habitats, especially in mountains or hilly county. Nests on cliff faces or in large trees with nests frequently used for many years by the same breeding pair.	Rifle Range
Le Conte's Thrasher (*Toxostoma lecontei*)	Desert scrub, mesquite, tall riparian brush and, in transitional habitat, chaparral.	Rifle Range
Loggerhead Shrike (*Lanius ludovicianus*)	Found commonly in desert habitats: creosote scrub and desert washes.	Rifle Range, Yermo Annex
Lucy's Warbler (*Oreothlypis luciae*)	Mesquite woodlands along desert streams and washes, such as willows and cottonwoods.	Nebo
Northern Harrier (*Circus cyaneus*)	Often overwinters in desert and desert riparian habitats.	Yermo Annex
Nuttall's Woodpecker (*Picoides nuttallii*)	Woodlands along desert streams and washes, such as willows and cottonwoods.	Nebo
Olive-Sided Flycatcher (*Contopus cooperi*)	Most likely a migrant on the Base. Uses woodland habitat around the golf course as a stopover.	Nebo

Common Name Scientific Name	Habitat	Observed Range Location at MCLB Barstow
Short-Eared Owl (*Asio flammeaus*)	Most likely a migrant on the Base. Uses woodland habitat around the golf course as a stopover.	Rifle Range
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Riparian woodland typically with a canopy and an understory of shrubs or saplings. Young tamarisk thickets are not occupied anywhere.	Nebo
Swainson's Hawk (*Buteo swainsoni*)	Observed as a migrant through the Mojave Desert. May use riparian habitat as a stopover.	Rifle Range
Vermillion Flycatcher (*Pyrocephalus rubinus*)	Local breeder in the west Mojave Desert. Low-lying riparian areas with accessible water, such as park land or golf courses.	Nebo
Willow Flycatcher (*Empidonax traillii*)	Local breeder in the west Mojave Desert. Low-lying riparian areas with accessible water, such as park land or golf courses.	Nebo
Yellow-Breasted Chat (*Icteria virens*)	Brushy open country, including desert thickets. Usually nests in dense riparian thickets.	Nebo
Yellow Warbler (*Dendroica petechia*)	Cottonwoods and willows of riparian woodlands or forests with a dense understory.	Nebo
Mammals		
American Badger (*Taxidea taxus*)	Dry, open areas with little vegetation. Includes arid desert land and areas adjacent to riparian habitat where prey may be present.	Nebo
Desert Kit Fox (*Vulpes macrotis arsipus*)	Dry, open areas with little vegetation where burrows and prey are present.	Nebo, Rifle Rage, Yermo Annex
Pallid Bat (*Antrozous pallidus*)	Desert scrub habitat below 1,800 feet.	Nebo
Southern Grasshopper Mouse (*Onychomys torridus*)	Desert scrub and other desert habitats where burrows and prey are present.	Nebo
Plants		
Howe's Hedgehog Cactus (*Echinocereus engelmannii* var. *howei*)	Creosote bush scrub.	Nebo, Rifle Range
Threetooth Blazingstar (*Mentzelia tridentate*)	Creosote bush scrub.	Rifle Range

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Figure 3-5. Special Status Species Found at MCLB Barstow

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Agassiz Desert Tortoise (*Gopherus agassizii*)

On 4 August 1989, the USFWS published an emergency rule listing the Mojave Desert population of the Agassiz desert tortoise ("desert tortoise") as endangered (54 Federal Register [FR] 42270; Figure 3-6). On 2 April 1990, the USFWS determined the Mojave Desert population of the desert tortoise to be threatened (55 FR 12178). Reasons for the determination included significant population declines; loss of habitat from construction projects such as roads, housing, and energy development; and conversion of native habitat to agriculture. Livestock grazing and ORV activity have degraded additional habitat. Also cited as threatening the desert tortoise's continued existence were illegal collection by humans for pets or consumption; upper respiratory tract disease; predation on juvenile desert tortoises by common ravens, coyotes, and kit foxes; fire; and collisions with vehicles on paved and unpaved roads.

The Mojave Desert species (*G. morafkai*) primarily occurs in the bajadas, mountain foothills, and valleys of the Mojave and Colorado deserts west of the Colorado River. This species has been classified as distinct from *G. agassizii*. This species usually occurs below 4,000 feet in creosote bush and saltbush scrub habitats, tree yucca (Joshua tree and Mojave yucca) communities, and some ocotillo-creosote habitats (Stebbins 2003; Brennan and Holycross 2006). Creosote bush, white bursage, tree yucca, galleta grass, and blackbrush are indicator species for desert tortoise habitat (Brennan and Holycross 2006; Nussear et al. 2009). The desert tortoise occupies a wide variety of soil types and substrates that include sand dunes, rocky hillsides, and caliche caves in washes, sandy soils, and desert pavements. Tortoises must have suitable substrates and terrain for digging burrows (Stebbins 2003; Brennan and Holycross 2006). The availability of adequate forage resources consisting of native grasses, herbaceous perennials and annuals, and cacti are important for determining habitat suitability for the desert tortoise (Stebbins 2003; Brennan and Holycross 2006; Nussear et al. 2009).

On 8 February 1994, the USFWS designated approximately 6.44 million acres of critical habitat for the Mojave Desert population of the desert tortoise in portions of California (4.75 million acres), Nevada (1.22 million acres), Arizona (339,000 acres), and Utah (129,000 acres) (59 FR 5820-5846 and corrections in 59 FR 9032-9036). These designations became effective on 10 March 1994. A Recovery Plan for the desert tortoise was published in June 1994 (USFWS 1994). The Recovery Plan is the basis of and key strategy for the recovery and delisting of the desert tortoise. The Recovery Plan identified six recovery units and recommended the establishment of 14 DWMAs within the recovery units. Surveys in the DWMAs began in 1996. The 1994 Recovery Plan for the desert tortoise was updated in 2011 (USFWS 2011).

Current Management. The presence of the desert tortoise on MCLB Barstow was not formally realized until 1992. Afterward, approximately 260 acres of MCLB Barstow were surveyed for desert tortoises in 1992, covering 170 acres of the Rifle Range and about 90 acres within Nebo. Of the 30 desert tortoises identified during this survey, 26 were found at the Rifle Range. Most of the remaining portions of the Rifle Range have since been surveyed, except for a portion in the middle of the Range Safety Clear Zone. Surveyors conducted walking transects for tortoises each spring from 1994 to 1997 (Fisher personal communication 1996).

Figure 3-6. Agassiz Desert Tortoise (*Gopherus agassizii*)

The desert tortoises found inside the Nebo area were relocated to the Rifle Range, and desert-tortoise-proof fencing was constructed in 1994 along Nebo's perimeter fence in compliance with a 1993 BO (USFWS 1993). This was done to prevent tortoises from migrating back onto Nebo as contaminant cleanup projects were in the planning stage and the Nebo area is used to test military vehicles. The 1993 BO addressed operations and maintenance activities south of Interstate 40. Subsequent to the 1993 BO, a 1997 BO (USFWS 1997) was issued for new construction and updated maintenance activities on the Rifle Range. At that time, MCLB Barstow instituted an educational program about desert tortoises, briefing all Rifle Range users, newly assigned Base personnel, contractors, and visitors to the area.

Tortoise fencing was installed along the perimeter fence adjoining Nebo and the Rifle Range to protect tortoises from equipment operations at a test pond and during construction of landfill caps. Tortoise fencing was also attached to the perimeter fencing surrounding the capped landfills, protecting the tortoises from contamination. Additional fencing was installed on the Rifle Range to help deter ORV use on the range and to eliminate illegal dumping. Approximately 36,000 feet of four-strand barbed wire (not lower than 12 inches) were installed on three sides of the Rifle Range; chain-link fencing was installed on the north side.

The most recent desert tortoise surveys at MCLB Barstow took place in April 2016 (one season) and covered the entire the Rifle Range. During those surveys, 20 desert tortoises, 66 carcasses, 594 unoccupied burrows, and 19 occupied burrows were observed (Vernadero 2016).

The most recent focused desert tortoise surveys that included both the Rifle Range and Yermo Annex took place in 2012 to ascertain the species' status on the Base. At the Rifle Range, nine previously established research plots, previously surveyed in 2006, were resurveyed (Walde 2013). The resurveys at the Rifle Range were conducted in the spring and fall; 39 live tortoises were observed, 14 in the spring and 25 in the fall (Walde 2013). The Yermo Annex was surveyed using presence/absence survey transects across the entire parcel outside of the Old Test Track fence (Figure 3-7). Surveys at the Yermo Annex were only conducted in the spring. No live desert tortoise were found at the Yermo Annex during those surveys; only desert tortoise sign was observed. In total, 195 burrows and 223 carcasses were observed across the two seasons of surveys in 2012. Walde noted that those numbers represented a continuing decline in desert tortoise numbers at MCLB Barstow, dating back to 2002 and confirmed by the number of desert tortoises observed in surveys in 2006 and 2012 (Walde 2013).

Potential threats to the desert tortoise on MCLB Barstow property come mainly from operations and maintenance activities on the Rifle Range and Nebo. Maintenance on the Rifle Range primarily consists of grading the parking lot and access road semiannually and as needed after severe storms. Other maintenance includes using hand tools to repair eroded sections of the firing berms and to remove vegetation that impairs the view. Road grading within Nebo also takes place on a regular basis and as needed. Nebo's perimeter road is graded monthly or as needed after severe storms. Many of the other threats to tortoises are lessened due to limitations on public access and the relatively light use of the Rifle Range. The actual shooting range is a small portion (29 acres) of the Rifle Range parcel, which is greater than 2,400 acres and is used about 15 to 20 weeks a year by the Marines. The California Highway Patrol, BLM, San Bernardino Sheriff's Department, and military units from other installations have MOAs/MOUs to use the range.

In addition to performing routine maintenance, MCLB Barstow is in the process of increasing training activities on the Rifle Range and evaluating the effects those increases would have on the natural resources of the Base, particularly the desert tortoise. A BO is expected to be obtained in coordination with the USFWS to maintain compliance with the ESA. All conservation measures in that BO will be included in the final version of this INRMP.

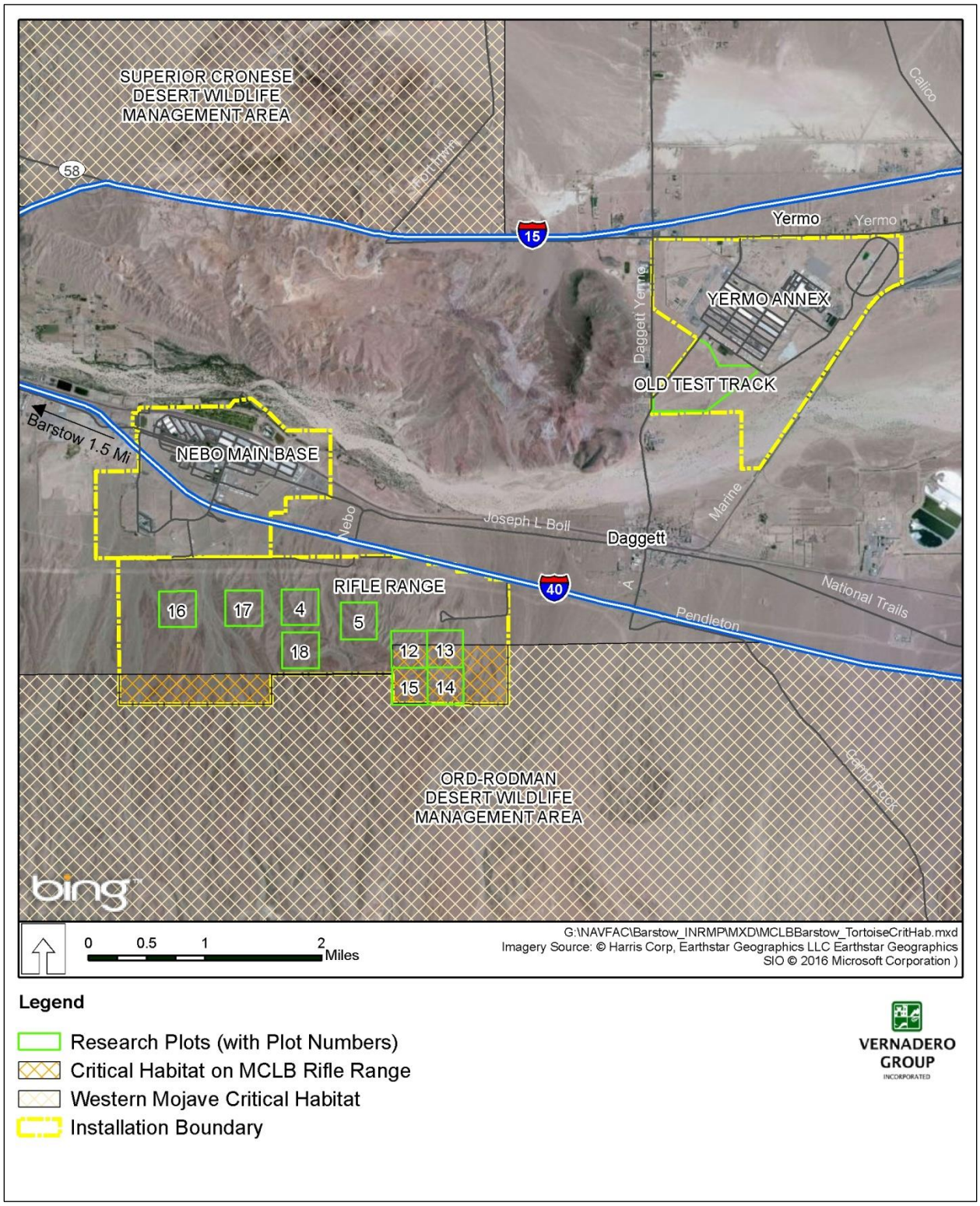

Figure 3-7. Desert Tortoise Critical Habitat and Research Plots (2016 Survey)

Brewer's Sparrow (*Spizella breweri*)

The Brewer's sparrow is a USFWS bird of conservation concern and is federally protected under the MBTA (Figure 3-8). Brewer's sparrows were detected at Nebo and the Rifle Range during avian surveys in 2014-2015 (TDI 2015).

Figure 3-8. Brewer's Sparrow (*Spizella breweri*)

Burrowing Owl (*Athene cunicularia*)

The burrowing owl is a California species of special concern and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-9). Burrowing owl individuals and sign were detected in five of the nine research plots on the Rifle Range during the 2012 spring/fall surveys and at the Old Test Track during 2012 spring surveys for desert tortoises (Walde 2013).

Figure 3-9. Burrowing Owl (*Athene cunicularia*)

Cooper's Hawk (*Accipiter cooperii*)

The Cooper's hawk is on the CDFW watch list and is federally protected under the MBTA (Figure 3-10). Cooper's hawks have been observed on Nebo during the surveys conducted by Lovio in 2005 and during the NRI in 2015 (Lovio 2005; TDI 2015). They are likely to forage throughout Nebo, particularly in riparian areas, where they may seek both cover and prey species. They are also likely to nest on Nebo near the Mojave River.

Figure 3-10. Cooper's Hawk (*Accipiter cooperii*)

Crissal Thrasher (*Toxostoma crissale*)

The crissal thrasher is a California species of concern and is federally protected under the MBTA (Figure 3-11). It was observed the spring of 2015 during avian surveys at Nebo (TDI 2015).

Figure 3-11. Crissal Thrasher (*Toxostoma crissale*)

Desert Kit Fox (*Vulpes macrotis arsipus*)

The desert kit fox is a California species of concern and is protected under Title 14 of the California Code of Regulations: §460 (Figure 3-12). It was observed the spring of 2015 during avian surveys on the Rifle Range (TDI 2015) and has been observed on previous natural resource surveys.

Figure 3-12. Desert Kit Fox (*Vulpes macrotis arsipus*)

Golden Eagle (*Aquila chrysaetos*)

The golden eagle is on the fully protected species in the state of California and is federally protected under the Bald and Golden Eagle Protection Act (BGEPA) and MBTA (Figure 3-13). It is also considered a sensitive species by BLM. Individuals that inhabit or nest in the surrounding areas may move downslope for the winter or upslope after the breeding season. Golden eagles inhabit a variety of habitats, including forests, canyons, shrubland, grassland, oak woodland, and arid deserts. Golden eagles were observed flying over MCLB Barstow during a vegetation survey in 2005 (Lovio 2006). No golden eagles have been observed nesting at MCLB Barstow.

Figure 3-13. Golden Eagle (*Aquila chrysaetos*)

Le Conte's Thrasher (*Toxostoma lecontei*)

Le Conte's thrasher is a California species of concern (applies only to the San Joaquin population) and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-14). Le Conte's thrashers were observed at the Rifle Range during avian surveys conducted in the summer of 2015 (TDI 2015).

Figure 3-14. Le Conte's Thrasher (*Toxostoma lecontei*)

Loggerhead Shrike (*Lanius ludovicianus*)

The loggerhead shrike is a California species of concern and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-15). The loggerhead shrike is a commonly encountered bird species at MCLB Barstow, having been detected there during the 2012 desert tortoise surveys (Walde 2013), the NRI in 2015 (TDI 2015), and the 2014 biological resource surveys, which involved observing nesting on the Rifle Range (MCLB Barstow 2016).

Figure 3-15. Loggerhead Shrike (*Lanius ludovicianus*)

Lucy's Warbler (*Oreothlypis luciae*)

Lucy's warbler is designated as a California species of concern and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-16). Individuals were observed during avian surveys in the summer of 2015 using areas around the golf course at Nebo (TDI 2015).

Figure 3-16. Lucy's Warbler (*Oreothlypis luciae*)

Northern Harrier (*Circus cyaneus*)

The northern harrier is a California species of concern and is federally protected under the MBTA (Figure 3-17). One northern harrier was observed flying over the Rifle Range during surveys conducted by Leidos during the summer of 2014 (MCLB Barstow 2016).

Figure 3-17. Northern Harrier (*Circus cyaneus*)

Nuttall's Woodpecker (*Picoides nuttallii*)

Nuttall's woodpecker is a USFWS bird of conservation concern and is federally protected under the MBTA (Figure 3-18). Nuttall's woodpeckers were heard during avian surveys in Nebo during the fall of 2014 (TDI 2015).

Figure 3-18. Nuttall's Woodpecker (*Picoides nuttallii*)

Olive-Sided Flycatcher (*Contopus cooperi*)

The olive-sided flycatcher is a California species of concern and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-19). Olive-sided flycatchers were observed during avian surveys on Nebo during the summer of 2014 (TDI 2015).

Figure 3-19. Olive-Sided Flycatcher (*Contopus cooperii*)

Short-Eared Owl (*Asio flammeaus*)

The short-eared owl is a California species of concern and is federally protected under the MBTA (Figure 3-20). One short-eared owl was observed at the Rifle Range during surveys in the summer of 2014 (MCLB Barstow 2016).

Figure 3-20. Short-Eared Owl (*Asio flammeaus*)

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher is a federally and California listed endangered subspecies and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-21). Summering southwestern willow flycatchers have been documented at only three sites in the Mojave Desert: Big Morongo Wildlife Preserve in 1981, along the Mojave River in 1990, and in 1994-1995 at Mojave Narrows Regional Park (BLM 2003). Surveys for the presence of this species were conducted in 2005 by Lovio and by TDI in 2014-2015. The 2005 surveys documented southwestern willow flycatchers at MCLB Barstow (Lovio 2005), but the 2014-2015 surveys did not locate the species (TDI 2015). Figure 3-21 shows the nearest locations of southwest willow flycatchers to the Base, along with sightings of its near relative, the willow flycatcher.

Figure 3-21. Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

Figure 3-22. Observations of Willow Flycatcher and Southwestern Willow Flycatcher at MCLB Barstow

Swainson's Hawk (*Buteo swainsoni*)

The Swainson's hawk is a California threatened species, a USFWS bird of conservation concern, and a BLM sensitive species (Figure 3-23). It is also federally protected under the MBTA. As a migrant, Swainson's hawks likely occur throughout the Mojave Desert during spring and fall migrations when they may forage but are not likely to nest. The migration pathway of the Swainson's hawks is not well characterized in this region, however. Swainson's hawks were observed flying over the Rifle Range during desert tortoise surveys in April 2016 (Vernadero 2016) and have been recorded by birders near the golf course in the eBird online checklist (eBird 2015).

Figure 3-23. Swainson's Hawk (*Buteo swainsoni*)

Vermillion Flycatcher (*Pyrocephalus rubinus*)

The vermillion flycatcher is a California species of concern and is federally protected under the MBTA (Figure 3-24). Vermillion flycatchers were documented on the Base during the 2005 vegetation surveys (TDI 2006) and the 2014-2015 NRI (TDI 2015).

Figure 3-24. Vermillion Flycatcher (*Pyrocephalus rubinus*)

Willow Flycatcher (*Empidonax traillii*)

The willow flycatcher is a California listed endangered species and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-25). Although no surveys have been performed for the willow flycatcher, Lovio and TDI conducted surveys for the southwestern willow flycatcher in 2005 and 2014-2015, respectively. The 2005 surveys documented southwestern willow flycatchers at MCLB Barstow but not willow flycatchers (Lovio 2005); by contrast, the 2014-2015 surveys confirmed the presence of willow flycatchers along the Mojave River, but did not find southwestern willow flycatchers (TDI 2015). Figure 3-21 shows the nearest locations of willow flycatchers to the Base.

Figure 3-25. Willow Flycatcher (*Empidonax traillii*)

Yellow-Breasted Chat (*Icteria virens*)

The yellow-breasted chat is a California species of concern (Figure 3-26). The species has been observed near the Mojave River in Nebo during avian surveys by Lovio in 2005 and TDI in 2014-2015 (Lovio 2005; TDI 2015).

Figure 3-26. Yellow-Breasted Chat (*Icteria virens*)

Yellow Warbler (*Setophaga petechial*)

The yellow warbler is a California species of concern and is federally protected under the MBTA (Figure 3-27). The yellow warbler was observed near the Mojave River in Nebo during Lovio's 2005 avian surveys (Lovio 2005).

Figure 3-27. Yellow Warbler (*Setophaga petechial*)

Pallid Bat (*Antrozous pallidus*)

The pallid bat is a California species of concern and a BLM sensitive species (Figure 3-28). Pallid bats were captured in mist nets in May 2015 and documented by Anabat™ bat detectors at Nebo in the summers of 2014 and 2015 (TDI 2015).

Figure 3-28. Pallid Bat (*Antrozous pallidus*) Captured in a Mist Net

Southern Grasshopper Mouse (*Onychomys torridus*)

The southern grasshopper mouse is a California species of concern (Figure 3-29). The mice were captured in pitfall traps and Sherman live traps in Nebo during surveys in the summers of 2014 and 2015 (TDI 2015).

Figure 3-29. Southern Grasshopper Mouse (*Onychomys torridus*)

American Badger (*Taxidea taxus*)

The American badger is a California species of special concern (Figure 3-30). In the 2005 INRMP, the American badger was stated to have been observed on MCLB Barstow (U.S. Navy 2005). No more recent occurrences of the species have been documented on the Base.

Figure 3-30. American Badger (*Taxidea taxus*)

Howe's Hedgehog Cactus (*Echinocereus engelmannii* var. *howei*)

Howe's hedgehog cactus is a BLM sensitive species. It is also a CNPS List 1B.1 plant, indicating that it is seriously threatened in California (Figure 3-31). The species was documented on the Rifle Range and Nebo during 2014-2015 rare plant surveys (TDI 2015).

Figure 3-31. Howe's Hedgehog Cactus (*Echinocereus engelmannii* var. *howei*)

Threetooth Blazingstar (*Mentzelia tridentate*)

Threetooth blazingstar is a BLM sensitive species. It is also a CNPS List 1B.3 plant, indicating that it is not very threatened in California (Figure 3-32). Two plants were documented on the Rifle Range during 2014-2015 rare plant surveys (TDI 2015).

Figure 3-32. Threetooth Blazingstar (*Mentzelia tridentate*)

3.3.4 Other Special Status Species

Certain other special status species are not known to occur on MCLB Barstow, are occasional visitors such as migratory birds, or if they are present, are unlikely to be affected by MCLB Barstow's activities. Information about these species is summarized in Table B-1 in Appendix B.

3.4 Invasive Species

Executive Order (EO) 13112 requires federal agencies to (1) identify actions that may affect invasive species; (2) use relevant programs to prevent introduction of invasive species; (3) detect, respond, and control such species; (4) monitor invasive species populations; (5) provide for the restoration of native species; (6) conduct research on invasive species; and (7) promote public education.

Once established, nonnative plant species often lead to changes in ecosystem processes (such as fire frequency, size, and intensity, or altered nutrient levels). Those changes tend to be self-maintaining and evolving, leading to functional and compositional ecosystem change (Brooks et al. 2003). In addition to competing with and displacing native species, these introduced species can hybridize with native species and alter conditions to promote the establishment and spread of other nonnative species. They also bring new pathogens and parasites (Warburton et al. 2002).

Several studies have pointed to various environmental and climatic variables as potential drivers in sustaining or increasing nonnative plant dominance in arid ecosystems (Shinneman and Baker 2009). Nonnative species often gain a foothold over native species because they can thrive under harsher conditions with fewer resources and are more prolific reproducers.

The collection of baseline information on invasive species allows Base managers to track the spread of known populations and identify new infestations so they can evaluate the effectiveness of management actions or treatments. Early detection of new invasive species or infestations enables managers to employ a rapid management response while the populations are still small and manageable.

3.4.1 Invasive and Nonnative Vegetation

The Mojave River area at the Yermo Annex has an abundance of invasive, weedy plants due to trains passing through the area dragging seeds and plant materials. Most of these potential invasive species are not especially noxious weeds. However, this site should be monitored regularly for infestation by weeds that could damage desert habitats and for areas where they might be economically controlled, if discovered early.

Invasive plant species were mapped during rare plants surveys conducted by TDI in the 2014 and 2015 seasons. Five species were documented as being heavy infestations at the Base (TDI 2015) as listed in Table 3-4.

Table 3-4. Invasive Plant Infestations at MCLB Barstow

Species		Cal-IPC Rating	Infestation Location
Common Name	Scientific Name		
Mediterranean Grass	*Schismus barbatus*	Limited	Nebo, Yermo Annex, Rifle Range
Perennial Pepperweed	*Lepidium latifolium*	High	Nebo
Saharan Mustard	*Brassica tournefortii*	High	Nebo, Yermo Annex, Rifle Range
Salt Cedar	*Tamarix ramosissima*	High	Nebo, Yermo Annex
Russian Thistle	*Salsola tragus*	Limited	Yermo Annex

Source: TDI 2015
CAL-IPC – California Invasive Plant Council

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4.0 MCLB BARSTOW NATURAL RESOURCES MANAGEMENT PROGRAM, OBJECTIVES, AND ACTION ITEMS

MCLB Barstow's natural resources management philosophy is to maintain processes and programs that prevent long-term damage or degradation of the range, allow the range to sustain current and future military training requirements, and achieve the conservation objectives of relevant regulatory requirements. MCLB Barstow's natural resources conservation and management program aims to:

- Meet the current and future military mission of MCLB Barstow.
- Avoid and minimize adverse effects on federally listed species and other significant natural resources through the implementation of programmatic instructions (published rules and guidelines for land users) and the evaluation of potential impacts of new activities and projects through the NEPA process.
- Improve native habitat maintenance, restoration, and enhancement activities through the implementation of Programmatic Conservation Plans, fire management, nonnative species control, erosion control, pollution prevention, etc.
- Inventory, monitor, and survey to understand and track the Base's species and habitats, and use those data to evaluate the status, quality, distribution, and trends of the resources and Management Plans.
- Maintain active and thoughtful compliance with the appropriate natural resources laws and regulations, agency guidance, relevant orders, and binding regulatory opinions and permits.
- Stay up to date about regional natural resources initiatives and trends, maintaining involvement in those that relate to the MCLB Barstow.
- Be aware of public opinion and interest groups and where they intersect with MCLB Barstow's interests.
- Maintain a professional and mutually productive relationship with the regulatory authorities that monitor and advise on MCLB Barstow.
- Achieve long-term desert tortoise management and conservation goals as defined in the draft 2017 MCLB Barstow BO (USFWS 2017).
- Maintain current natural resources data inventories that support mission planning and land use decision making on MCLB Barstow.
- Maintain open lines of communication with MCIWest and other DoD organizations in order to share information and experiences and coordinate actions on matters of mutual interest.
- Ensure natural resource management activities integrate cultural and other resource management programs and activities.

Natural resources management program objectives, metrics, and action items developed specifically for MCLB Barstow are discussed in this chapter. The discussion addresses existing or potential management issues as well as objectives of the program, metrics for evaluating the effectiveness of the program, and specific actions necessary to implement the program. This

program has been developed and prioritized to sustain the military's operational and support requirements, to achieve MCLB Barstow's overarching natural resources management goals, and incorporate the principles of ecosystem management, including adaptive strategies in all programs. Program areas include the following, listed by sections in this chapter:

4.1 INRMP Implementation
4.2 NEPA Review
4.3 Federal ESA Compliance
4.4 Threatened or Endangered Species and Critical Habitat
4.5 Critical Habitat
4.6 Other Special Status Species
4.7 Migratory Birds and Eagles
4.8 Soil Erosion Prevention and Control
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4.14 Bird/Animal Aircraft Strike Hazard Reduction Program
4.15 Wildland Fire Management
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4.20 Conservation Education and Awareness
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4.22 Cultural Resources
4.23 Construction
4.24 Landscaping and Grounds Maintenance
4.25 Environmental Permitting
4.26 Geographic Information Services Management
4.27 Law Enforcement Systems
4.28 Planned Projects and Implementation Schedule

In compliance with MCO P5090 2.A with changes 1-3, Chapter 3 (USMC 2013), this chapter provides performance-based objectives, metrics, and actions to ensure natural resource management programs are planned, funded, executed, periodically evaluated for efficacy, and adjusted as necessary to meet evolving military mission requirements, as well as natural and anthropogenic changes to MCLB Barstow's landscape.

The terminology used in this section is as follows:

- **Objectives:** Description of a desired future end-state or successful outcome that supports a MCLB Barstow INRMP goal or USMC/DoN policy or other relevant law or regulation
- **Metrics:** Description of a standard, quantity, or time frame for attaining the objective
- **Actions:** Description of a specific step, practice, or method for satisfying an objective

Natural resource management program objectives, metrics for success, and actions presented in this section were developed through meetings and discussions with MCLB Barstow, USFWS, CDFW, and BLM resource managers, monitoring experts, and other stakeholders. This INRMP stresses the importance of regional monitoring partnerships and protocol standardization for understanding landscape-scale ecosystem changes on MCLB Barstow and in the Mojave Desert.

Knowledge gaps relevant to the management of certain resources at MCLB Barstow identified during the planning process for this INRMP are summarized in Table 4-1.

Table 4-1. Knowledge Gaps Identified during the INRMP Planning Process

Resource	Incomplete or Unavailable Information/Data
Water Resources	Data is unavailable for wells within proximity of MCLB Barstow. Water may be utilized to supplement the wetland habitat within the Mojave River. Wetland delineation along the Mojave River has not been updated since 1998; up to date information would provide more accurate water resource management.
Climate and Air Resources	Data are available for the general region, but the data that would define the climatic and air quality variations on MCLB Barstow are not available.
Vegetation	Ecological characteristics for natural vegetative communities are potentially outdated, as vegetation mapping Basewide has not taken place since 1996.
General Flora and Fauna	Data are incomplete with regard to the occurrence, distribution, and overall health of certain wildlife species occurring at MCLB Barstow, including pollinators and invertebrates. The effects of nonnative species (*Tamarisk* spp., *Brassica tournefortii*, etc.) on native wildlife is not completely understood. The locations and characteristics of wildlife movement corridors within MCLB Barstow and from adjacent areas are not well documented.
Special Status Species	Data continue to be collected for special status species, but the occurrence and distribution of all species cannot be definitively known because some species are migratory. The movements and the longevity of individual desert tortoises on the Rifle Range are not well understood.
Wildfire Management	The extent to which invasive plants have spread across the base and created a wildfire risk is not well known.
Law Enforcement Management	Law enforcement actions are tracked, but there is no way to know the extent to which unpermitted access or unlawful activities are occurring. Similarly, while the extent and type of unauthorized activity can only be documented based on apprehensions, the magnitude, location, and resource damage effects can only be interpolated based on known data.

The natural resources management program on MCLB Barstow is driven by the need to maintain sufficient natural areas and varied vegetation to allow sound and realistic tactical training, as well as support sound ecological management. Range resource management programs must balance military mission requirements established under Title 10 United States Code (U.S.C.) with federal resource conservation laws such as the Sikes Act, ESA, and MBTA.

4.1 INRMP Implementation

Objective: Provide the organizational capacity, communications, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of the Base's land by the USMC.

Metric: Comply with environmental laws, stewardship of natural resources, and continued use of MCLB Barstow's land by the USMC.

Action 1: Ensure projects, objectives, actions and milestones (POAM) are conducted annually. Develop tasks, timelines, and cost estimates.

Action 2: Develop an Annual Phasing Plan for the POAM of this INRMP.

Action 3: Program funding for INRMP annual reviews, as-needed updates, and five-year revisions.

Action 4: Provide sufficient natural resource personnel and training to meet the needs of INRMP implementation.

4.2 NEPA Review

All major federal actions are subject to the NEPA review process and must consider the potential environmental impacts of the actions on natural resources as well as reasonable alternatives that would meet the action's purpose and need.

Objective: Provide timely, data-driven analysis of the potential impacts of federal actions on Base resources.

Metric: Consistently follow the NEPA planning process and applicable laws and regulations to evaluate potential impacts from an ecosystem management perspective, thereby mitigating risk or liability to the USMC.

Action 1: Perform Categorical Exclusion, EA, and/or EIS reviews to (1) identify the potential effects of the proposed action from a local and regional ecosystems management perspective; (2) identify less damaging alternatives; (3) identify other laws and regulations that may be applicable; (4) ensure that adequate mitigation is planned, if required; (5) assess the level of regulatory interface required; and (6) assess consistency with natural resource management goals, objectives, BOs, and conservation programs.

4.3 Federal ESA Compliance

The primary legislation regulating actions that may directly or indirectly impact federally listed species is the ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*). MCLB Barstow consults with the USFWS as needed to ensure that actions and activities at MCLB Barstow are not likely to jeopardize the continued existence of any endangered, threatened, or proposed species and comply with Sections 7 of the ESA. Pursuant to Section 7 of the ESA, federal agencies must consult with the USFWS if their action "may affect" a federally listed endangered or threatened species (50 Code of Federal Regulations [CFR] 402). Such consultations may be formal or informal. When required by Section 7 of the ESA, the Base prepares a Biological Assessment of the effects of a proposed action on listed species. The ESA prohibits the "take" of a threatened or endangered species. A take includes the direct killing, harming, or harassing of a species, or destruction of habitat that may be important for the species' survival or recovery.

The BOs require the re-initiation of formal consultation if: (1) the amount or extent of incidental take is reached, (2) new information reveals adverse effects on the desert tortoise due to an agency action that was not considered under the BO, (3) the agency action is subsequently modified in a manner that causes an effect onto a listed species or critical habitat that was not considered in the BO, or (4) a new species is listed or critical habitat designated that may be affected by the action (USFWS 1993; USFWS 1997; USFWS 2003; USFWS 2017).

Critical habitat for the desert tortoise has been designated on the Rifle Range as part of the Ord-Rodman Unit. Any action with the potential to affect this habitat will require consultation with the USFWS.

Objective: Comply with all consultation requirements to assure mission readiness and safeguard the Base's natural resources. Maintain viable populations of threatened or endangered species that exist on the MCLB Barstow and participate in regional efforts to facilitate the recovery of federally listed threatened or endangered species in the region.

Metric: Maintain compliance with applicable USFWS BOs and the ESA.

Action 1: Adhere to the conservation measures and relevant avoidance measures identified in all current USFWS BOs written for species on MCLB Barstow (see Appendix E for current BOs).

Action 2: Manage federally threatened or endangered species and their habitats for their conservation and to prevent jeopardy to the species and adverse modification of their critical habitat.

Action 3: Manage listed species and their habitats in a manner that minimizes impacts to both the mission and the species.

Action 4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally threatened or endangered species and maintain and update these data.

Action 5: Develop and maintain a robust geographic information system (GIS) database to document the spatial and temporal distribution of listed species and update it as survey data become available.

Action 6: Anticipate the need to consult with the USFWS under Section 7(a) of the ESA for any proposed actions on MCLB Barstow that may affect listed species.

4.4 Threatened and Endangered Species and Critical Habitat

Two threatened or endangered species have been found on MCLB Barstow, the Agassiz desert tortoise and the southwestern willow flycatcher.

On 4 August 1989, the USFWS published an emergency rule listing the Mojave Desert population of the Agassiz desert tortoise as endangered (54 FR 42270). On 2 April 1990, the USFWS determined the Mojave Desert population of the desert tortoise to be threatened (55 FR 12178). Desert tortoises have been formally recognized as found on MCLB Barstow since 1992. Surveys have been conducted periodically since then, with a higher intensity of surveys being conducted on the Rifle Range than at the Yermo Annex and Nebo. In 2006 and 2013, nine 500-meter-by-500-meter research plots were established in the Rifle Range and surveyed for desert tortoises. Since 2015, annual surveys have taken place in both the spring and the fall at these research plots. Starting in spring 2016, the entirety of the Rifle Range was surveyed for desert tortoises. These surveys will continue in the spring and the fall for the next two years.

The southwestern willow flycatcher is a federally and California listed endangered subspecies and a USFWS bird of conservation concern; it is also federally protected under the MBTA (Figure 3-20). Summering southwestern willow flycatchers have only been documented at three sites in the Mojave Desert: Big Morongo Wildlife Preserve in 1981, along the Mojave River in 1990, and in 1994-1995 at Mojave Narrows Regional Park (BLM 2003). Surveys for the presence of this species were conducted in 2005 by Lovio and by TDI in 2014-2015. The 2005 surveys documented a southwestern willow flycatcher at MCLB Barstow (Lovio 2006), but the 2014-2015 surveys did not locate the species (TDI 2015).

4.4.1 Desert Tortoise

Objective A: Maintain compliance with all applicable BOs for the desert tortoise on MCLB Barstow (see Appendix E).

Objective B: Improve and maintain existing populations of the desert tortoise and improve and maintain designated critical habitat on MCLB Barstow.

Action 1: Maintain a database that tracks locations of desert tortoises found on base to assist in planning activities and apply new information from current research to MCLB Barstow's management goals through adaptive management.

Action 2: Assist the USFWS with its range-wide monitoring program within the Ord-Rodman Critical Habitat Unit, which lies adjacent to the Rifle Range.

Action 3: Appoint a USFWS-approved desert tortoise management representative when specified by project requirements associated with proposed new range and training activities.

Action 4: Conduct clearance surveys following USFWS recommendations for the construction of LZs, LHA/LHD sites, access roads, bivouac areas, vehicle loading/refueling areas, and range maintenance and sustainment activities.

Action 5: Evaluate desert tortoise carcasses to attempt to determine the cause of death and track results in the database (see step 4.4-1). Evaluate all common raven's nests and frequently used roost or perch sites on MCLB Barstow to determine whether they are preying on desert tortoises; if desert tortoise carcasses are found, contact the USFWS or USDA Wildlife Services to address the issue.

Action 6: Maintain signage to indicate the presence of desert tortoises and outline appropriate activities in desert tortoise habitat.

Action 7: Restore degraded/disturbed tortoise habitat associated with proposed new range and training activities with native vegetation. Focus on exotic species management (see Section 4.11)

Action 8: Distribute relevant species information to interested parties (e.g., the BLM pamphlet that contains information on status, management, significance, and what citizens can do to help).

Action 9: Provide natural and cultural awareness training to all personnel who train or conduct activities on the range complex (see Section 4.20).

Action 10: Appropriately mark and delineate critical habitat adjacent to project footprints associated with proposed new range and training activities.

Action 11: Attend regional species and habitat conservation planning events held by organizations such as the Desert Tortoise Management Oversight Group, Desert Managers Group, and Desert Tortoise Council and participate, as appropriate, in regional conservation efforts for the desert tortoise with the USFWS and other partners.

4.4.2 Southwestern Willow Flycatcher

Objective A: Maintain habitat for the southwestern willow flycatcher on MCLB Barstow.

Objective B: Coordinate with other land owners and stakeholders within the Mojave River basin on regional species and habitat conservation planning.

Action 1: Conduct annual surveys for neotropical migratory birds (including southwestern willow flycatchers and least Bell's vireos).

Action 2: Conduct invasive species control in riparian habitat along the Mojave River.

Action 3: Conduct native riparian habitat enhancement along the Mojave River through the outplanting of native riparian species.

Action 4: Attend regional species and habitat conservation planning events for organizations such as the Desert Managers Group.

4.5 Critical Habitat

When a species is proposed for listing as endangered or threatened under the ESA, the USFWS considers whether there are areas of habitat that are essential to the species' conservation (i.e., recovery) and if those areas warrant designation as critical habitat. Currently, the desert tortoise is the only federally listed threatened or endangered species with designated critical habitat on the MCLB Barstow. The term "critical habitat" for a threatened or endangered species 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 in accordance with the provisions of Section 4 of the ESA, 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; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the Act, upon a determination by the Secretary that such areas are essential for conservation of the species.

The ESA was revised via the FY04 NDAA (Public Law 108-136) to recognize INRMP conservation measures and species benefits that could obviate the need for critical habitat designation on DoD land. The species benefit must be clearly identifiable in the document and should be referenced as a specific topic in the INRMP's table of contents. Additionally, the FY04 NDAA, Section 318, *Military Readiness and Conservation of Protected Species,* amended Section 4(a)(3) of the ESA (16 U.S.C. 1533(a)(3)) by adding the following at the end:

> (B)(i) The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the DoD, or designated for its use, that are subject to an INRMP prepared under Section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which Critical Habitat is proposed for designation. (ii) Nothing in this paragraph affects the requirement to consult under Section 7(a)(2) with respect to an agency action (as that term is defined in that section). (iii) Nothing in this paragraph affects the obligation of the DoD to comply with Section 9, including the prohibition preventing extinction and taking of endangered species and threatened species.

Section 4(b)(2) of the ESA of 1973 (16 U.S.C. 1533(b)(2)) was also amended by inserting a discussion of the impact on national security after the economic impact section. As noted above, critical habitat shall not be designated on an installation where the Secretary of Interior determines that the applicable INRMP provides a benefit to the species. In making its

assessment, on behalf of the Secretary of Interior, Region 1 of the USFWS developed the following guidance in 2001 to determine if a plan provides a benefit to the species:

- **The plan 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, 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 habitat fragmentation, maintaining or increasing populations, providing protection from catastrophic events, enhancing and restoring habitats, buffering protected areas, or testing and implementing new conservation strategies.

- **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 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.

- **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: (1) biological goals (broad guiding principles for the program) and objectives (measurable targets for achieving the goals); (2) quantifiable, scientifically valid parameters with verifiable objectives and standards to measure progress; (3) provisions for monitoring and, where appropriate, adaptive management; (4) 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; and (5) a duration sufficient to implement the plan and achieve the benefits of its goals and objectives.

This INRMP meets these three criteria for the desert tortoise; therefore, no additional critical habitat for the desert tortoise should be designated at MCLB Barstow.

<u>For Criterion 1: The Plan Provides a Conservation Benefit to the Species</u>

While MCLB Barstow developed its management programs and INRMP to focus on ecosystems on the MCLB Barstow, these plans were developed in coordination with the USFWS and finalized with the issuance of a BO for the desert tortoise under Section 7 of the ESA (Appendix E). Proposed management actions in the BO provide benefits not only to the desert tortoise but also to other species using the same ecosystem. These actions are fully incorporated in and provide the foundation of this INRMP. The objective of these actions is to increase the quantity and quality of habitat in these ecosystems that is available for use by the desert tortoise. Key aspects of these programs are the establishment of a management plan and annual surveys at MCLB Barstow.

For Criterion 2: The Plan Provides Certainty that the Management Plan Will Be Implemented

As noted in the USFWS Region 1 review procedures, all INRMPs meet this criterion through the statutory requirement of the Sikes Act. INRMP implementation is tracked and reported to the Headquarters Marine Corps (HQMC), USFWS, and CDFW annually. Implementation is also evaluated during triennial formal inspections (USMC ECE) and annual self-audits conducted by each installation.

This INRMP is implemented under the authority of the MCLB Barstow CO and has all approvals and concurrences required under the Sikes Act. MCLB Barstow has been assigned the responsibility for developing, programming, and implementing INRMP program requirements.

For Criterion 3: The Plan Provides Certainty That the Conservation Effort Will Be Effective

This INRMP proposes projects and protocols developed in coordination with the USFWS to allow for monitoring the habitat value of ecosystems range-wide. Monitoring and survey requirements are specifically identified and have been fully incorporated as priority actions in the INRMP and their required schedules have been noted. An annual report will be provided to the USFWS providing specific information on surveys, monitoring, activities in the ecosystem, and status of projects. Additionally, an annual report on all actions proposed in INRMPs (including monitoring actions) will be provided to the USFWS and CDFW. The results of these efforts will be incorporated into the INRMP so the results of management programs can be followed and effectiveness noted. This INRMP was established to provide long-term adaptive management of MCLB Barstow's ecosystems and to serve as the foundation of MCLB Barstow's Natural Resources Management Program.

4.6 Other Special Status Species

Other special status species such as state-listed or species of "special concern" may also inhabit the Base. The Navy encourages cooperation with state protection programs for special status species. MCLB Barstow will be prepared to implement appropriate strategies to protect special status species and their habitat when and if they are identified on the Base.

Objective A: Manage existing and potential habitat of special status species to support and maintain biological diversity and optimum wildlife population levels within areas of sensitive habitat while maintaining land use flexibility to fulfill present and future mission requirements.

Objective B: Avoid and minimize impacts to special status species.

Metric: Maintain special status species populations at or above current levels.

Action 1: Conduct baseline presence/absence surveys and periodic monitoring for special status species with the potential to occur on MCLB Barstow (Appendix B).

4.6.1 Special Status Plant Species Management

Objective: Provide for the recovery, enhancement, and protection of all special status plant species and their respective habitats as a proactive strategy to prevent future federal listings of those plants.

Metric: Understand the state and condition of special status plant species populations at MCLB Barstow.

Action 1: Conduct Basewide special status plant species surveys identified as BLM sensitive, CNPS, and FWS candidate every five years.

Action 2: Maintain an updated list of special status plant species with the potential to occur on MCLB Barstow and their sensitivity status.

Action 3: Maintain a cumulative map and record of surveys and findings for special status plant species.

4.7 Migratory Birds and Eagles

The MBTA of 1918 is the primary legislation in the U.S. established to conserve migratory birds. It implements the U.S.' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The MBTA prohibits taking, killing, or possessing migratory birds unless permitted by regulation. The species of birds protected by the MBTA appear in 50 CFR 10.13. On 2 December 2003, President George W. Bush signed the FY03 NDAA. The act provided that the Secretary of the Interior will exercise his/her authority under the MBTA to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense. An MOU outlining agency responsibilities between the DoD and the USFWS was signed on 31 July 2006 (USFWS 2006). Effective 30 March 2007, the USFWS published a rule authorizing the take of migratory birds in the course of military readiness activities provided such actions do not have a significant adverse effect on the population (72 FR 8931).

In addition to the MBTA, the BGEPA (16 U.S.C. 668) as amended in 1972 prohibits any form of possession or taking of bald or golden eagles (including any part, nest, or egg), unless allowed by permit. The BGEPA defines "take" as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. In September 2009, the USFWS announced a final rule on two new permit regulations that would allow for the take of eagles. The permits authorize limited, non-purposeful take of bald and golden eagles, which includes authorizing government agencies to disturb or otherwise take eagles in the course of conducting lawful activities, such as operating airports.

Objective: Maintain, restore, and enhance habitats on MCLB Barstow upon which resident and migratory populations of migratory birds and eagles depend, emphasizing those that may be affected by military activities, and in compliance with Executive Order 13186, the 2006 USFWS-DoD MOU, and 72 FR 8931.

Metric: Comply with all applicable laws and regulations for the protection of migratory birds and eagles, including the MBTA and the BGEPA.

Action 1: Avoid or minimize impacts to migratory birds and eagles and their habitats.

Action 2: During the breeding season, precede all vegetation removal associated with the increase in training and Rifle Range construction with a preconstruction survey conducted by a qualified wildlife biologist.

Action 3: Conduct preclearance surveys prior to the removal of trees or shrubs during the breeding season.

Action 4: Conduct periodic mortality surveys in the vicinity of the wind turbine and large solar arrays.

Action 5: Prepare educational materials regarding the Base's migratory birds and management practices. Include information on what personnel can do to help, species lists, and activities detrimental to the bird population.

Action 6: Collect and assess information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation.

Action 7: Participate in regional or national inventory and monitoring programs such as the Breeding Bird Survey, Breeding Biology Research and Monitoring Database (i.e., BBIRD), Christmas bird counts, bird atlas projects, and game bird surveys where practicable, feasible, and accessible, taking safety and security into consideration.

4.8 Soil Erosion Prevention and Control

DoDI 4715.03 requires the DoD to incorporate best management practices (BMPs) of the state where the installation resides regarding storm water runoff to minimize nonpoint sources of water pollution. The DoD is also required to prevent and control soil erosion and implement soil conservation measures in accordance with Chapter 3B of Title 16 U.S.C.

Objective A: Protect and restore soil productivity, watershed functioning, water quality, and wildlife habitat through effective implementation of BMPs to prevent and control soil erosion.

Objective B: Prevent degradation of Base facilities and equipment and protect the quality of life of personnel from the abrasive or otherwise destructive effects of wind and water erosion.

Metric: Implement measures for erosion prevention and control.

Action 1: Implement best management practices (BMPs) and soil erosion control measures, including those specified in BOs.

Action 2: Identify soil erosion hazards and prioritize restoration activities.

Action 3: Keep a record of the most effective BMPs for use in NEPA planning and mitigations. Maintain an updated BMP list.

Action 4: Pursue reasonable and cost-effective means to work with off-Base organizations, such as BLM and the County, through Letters of Agreement, MOUs, and contracts to control and prevent soil erosion.

Action 5: Monitor and manage the impacts of training and range maintenance activities on soil resources.

4.9 Water Resources

MCLB Barstow is located within the Mojave Desert and has limited water resources. As such, these water resources must be managed judiciously with the maintenance of water supply, rights, and quality being of the utmost importance.

DoDI 4715.03 requires DoD components to use a watershed-based approach to manage operations, activities, and land to avoid or minimize impacts to wetlands, groundwater, and surface waters on or adjacent to installations in accordance with the guidelines and goals established in the *Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management.* DoDI 4715.03 also requires DoD components to ensure no net loss of size, function, or value of wetlands and to preserve the natural and beneficial values of wetlands by carrying out activities in accordance with EO 11990 and the White House Office on Environmental Policy (WHOOEP 1993?).

EO 11988 regulates federal actions that may take place in the floodplain in order to reduce the risk of flood and minimize the impact of floods on human safety, health, welfare, and personal property. The USMC is charged with providing leadership in avoiding direct or indirect development of floodplains and in restoring and preserving the natural and beneficial values served by floodplains (MCO P5090.2A).

4.9.1 Water Supply

Objective: Ensure the adequate supply and reliable delivery of water to support domestic use, landscaping, environmental requirements, and natural resource sustainment.

Metric: Participate in cooperative watershed planning with federal, state, and local agencies to ensure that adequate water supplies are available to serve all the Base's needs, now and in the future.

Action 1: Cooperate with the Mojave Water Agency, San Bernardino County Flood Control District, and other agencies to consider long-term improvements and long-term maintenance within the Mojave River corridor that would capture storm water runoff, allowing percolation into the aquifer.

Action 2: Participate in cooperative watershed planning with federal, state, and local agencies.

Action 3: Promote activities and measures that facilitate the reclamation and reuse of wastewater.

Action 4: Meter water use to provide records of use and incentives for conservation.

Action 5: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural values while continuing federal water rights.

4.9.2 Water Rights

Objective: Ensure protection of water rights to continue the beneficial uses of water on MCLB Barstow.

Metric: Maintain current water rights at MCLB Barstow.

Action 1: Protect and maintain local surface water rights by scrutinizing proposed off-site actions in the upper Mojave River watershed that could adversely impact stream flow conditions.

Action 2: Protect and maintain local groundwater rights by evaluating water rights implications before drilling any new wells on the Base.

Action 3: Participate in a regional DoD strategy to protect access of military installations in the desert to a reliable and adequate supply of quality water in the context of increased population growth.

4.9.3 Water Quality

Objective: Protect the quality of MCLB Barstow's surface water for consumptive and landscape uses.

Metric: Comply with state guidelines to control NPS pollution, as required by the CWA.

Action 1: Prevent NPS pollution from on-site sources by providing an educational program for personnel to explain NPS concerns.

Action 2: Initiate BMPs to prevent or treat NPS pollution.

Action 3: Prevent the burying, dumping, draining, or otherwise disposing of any type of ammunition, explosive material, pyrotechnic, chemical ammunition, or any type of hazardous waste (including oil, fuel, and/or chemicals) onto the ground or into the water at MCLB Barstow.

Action 4: Support all agencies in eliminating all sources of pollution that may contaminate water quality in the Mojave River system.

Action 5: Cooperate and coordinate with all governmental agencies, including the Regional Water Quality Control Boards (RWQCBs), to apply measures to prevent surface and groundwater pollution.

Action 6: Prevent point-source pollution from on-site sources by investigating cross-connections and pretreatment solutions for phenols or boiler discharges coming from industrial sources.

Action 7: Require wastewater collection and treatment systems that are consistent with the protection of public health and water quality.

4.9.4 Floodplain Management

Objective: Protect MCLB Barstow personnel and resources in the floodplain from the damaging effects of floods.

Metric: Seek to reduce on-Base and off-Base causes of flood damage on MCLB Barstow.

Action 1: Accomplish protective measures to avoid or minimize the destructive effects of floods on personnel and resources.

Action 2: Challenge upstream development practices that may create injury to MCLB Barstow.

4.10 Vegetation

MCLB Barstow vegetation management practices aim to improve the overall look of the Base, enhance range and training areas by preserving natural wildlife habitat, and control and remove invasive and noxious species.

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 by:

- Acquiring, managing, and disposing of federal land and facilities
- Providing federally undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including water and related land resources planning, regulating, and licensing activities

Consistent with national and USMC policy (MCO P5090.2A), there will be “no net loss” of wetland habitat on MCLB Barstow, and impacts to wetlands are to be avoided wherever possible. The USMC will further strive to preserve and enhance the natural and beneficial values of wetlands while conducting its activities.

Any action significantly affecting wetlands requires an environmental review. If it is demonstrated that wetlands impacts are unavoidable, then mitigation is required. Loss of wetland function is mitigated through wetlands enhancement, restoration, or creation.

4.10.1 Vegetation Community Condition and Trend

Objective A: Monitor vegetation communities and trends at MCLB Barstow through mapping and GIS data development.

Metric: Maintain up-to-date vegetation mapping and GIS data

Action 1: Update vegetation mapping and GIS data.

Objective B: Maintain healthy vegetation communities

Metric: Achieve no net loss of healthy vegetation communities.

Action 2: Prevent unnecessary damage of or disturbance to native plant communities by implementing educational awareness and avoidance measures (Section 4.20).

4.10.2 Wetland Protection and Management

Objective: Protect and restore the natural and beneficial functions of the Base's riparian vegetation, wetlands, and waters of the U.S.

Metric: Monitor the condition of wetlands and the effectiveness of management approaches.

Action 1: Maintain an inventory of wetlands and monitor net changes annually.

Action 2: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural values while continuing federal water rights.

Action 3: Monitor wetland community plant species composition and relative cover, paying particular attention to exotics and invasion by noxious weeds.

Action 4: Ensure that activities in the jurisdictional wetlands and waters of the U.S. along the Mojave River are permitted through the USACE. This includes any movement or deposition of soil. Any action affecting the Mojave River requires an environmental review under NEPA.

4.11 Invasive and Nonnative Plant Species

EO 13112, issued in 1999, requires federal agencies to (1) identify actions that may affect invasive species; (2) use relevant programs to prevent the introduction of invasive species; (3) detect, respond, and control such species; (4) monitor invasive species populations; (5) provide for the restoration of native species; (6) conduct research on invasive species; and (7) promote public education. The collection of baseline information allows managers to track the spread of known populations and identify new infestations, allowing them to evaluate the effectiveness of the management actions and treatments. Early detection of new species or infestations enables managers to employ a rapid response by management working groups while the populations are still small and manageable.

Invasive species were mapped during the 2014-2015 NRI (TDI 2015). Those data represent the most current information as to the location of invasive and nonnative plant species on the Base. Management decisions should be informed by those data and associated report recommendations.

Objective: Eradicate or control the spread and introduction of noxious plant species, prioritizing those with the greatest potential to threaten sensitive species or degrade natural communities.

Metric: Abate Invasive and nonnative plant species.

Action 1: Remap invasive and nonnative species infestations every three to five years.

Action 2: Eradicate the giant reed (*Arundo donax*) along the river area in Nebo.

Action 3: Target salt cedar (*Tamarisk* spp.) for removal. Target giant reed and salt cedar for eradication as soon as feasible, and other weeds as prioritized in the guidelines of the Mojave Weed Management Area and the 2015 NRI.

Action 4: Work with others who are trying to find solutions to the spread of exotic annuals in the desert, which may affect the desert tortoise and create a wildland fuel hazard. Support the implementation of the Mojave Weed Control MOU.

Action 5: Educate Base personnel and contractors about the identification of noxious weeds, the importance of noxious weed control, and measures to minimize their spread. Develop a brochure.

Action 6: Ensure construction vehicles coming onto base are clean and free from excessive soil/mud that could carry unwanted seeds or other biological hitchhikers.

Action 7: Initiate an early detection and rapid response program.

4.12 Wildlife Protection and Management

Management of wildlife species on MCLB Barstow is primarily accomplished by managing the habitat on which wildlife depends. MCLB Barstow's natural resources personnel typically coordinate with the CDFW and USFWS to identify, prioritize, and implement habitat enhancement projects targeted for particular species or broad classifications of species (e.g., birds, reptiles, and invertebrates). Programs to manage wildlife habitat include invasive plant control, population density surveys (specifically for the desert tortoise), and fencing and protection of desert tortoise habitat on the Rifle Range.

An NRI was conducted in 2014 and 2015 to gain a better understanding of the baseline status of general wildlife species across the Base (TDI 2015). Those data should inform the management of all wildlife species and serve as the baseline to be updated as new data are acquired through the implementation of this INRMP.

Pollinators have become the focus of international attention due to their key role in the world's supply of food, fiber, and ecosystem biodiversity. The DoD has established partnerships, made a commitment to fund projects in this area, and has become a member of the Pollinator Partnership and the North American Pollinator Protection Campaign. Pollinators include a range of species from various animal groups including invertebrates (e.g., bees, butterflies, moths, beetles, flies), birds (e.g., hummingbirds), and mammals (e.g., bats). Some pollinators are in

significant decline across the country and around the world. Nearly 80 percent of the world's crops require pollination, and 30 percent of food consumed is the result of pollinator activity.

The following are specific concerns:

- Surveys for pollinator presence and abundance at MCLB Barstow are needed. Pollinators are important for maintenance of healthy native plant assemblages.
- Improper use of pesticides during landscape and facility maintenance can negatively impact plants and habitats that support pollinators.
- Invasive species (flora and fauna) threaten the 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.
- Landscaped areas at MCLB Barstow present an opportunity to support local pollinators through the use of native plant species.
- Plants in ecosystems of management interest at MCLB Barstow may depend on local pollinators.

No baseline survey has been conducted to identify pollinator species and the beneficial roles they play at MCLB Barstow in promoting healthy natural resources and habitats. Management of pollinator species is accomplished primarily through the protection and management of associated habitats.

There are opportunities to support pollinators in vegetation and habitat management throughout MCLB Barstow. The landscape in developed areas can be managed to benefit local pollinators. Restoration and coordination with post-construction and facility maintenance activities also present opportunities to benefit pollinator species. To ensure the success of management actions, is important to perform a baseline inventory of pollinators present at MCLB Barstow, as well as the plants and assemblages that support them. Such an effort could draw on Basewide surveys already conducted for birds and bats.

The role that pollinators play in sustaining sensitive species and rare plants at MCLB Barstow is also worth further investigation and may provide opportunities to coordinate and streamline research on both. Researching educational materials on pollinators and distributing information on the DoD's new Pollinator Partnership will assist managers in protecting pollinator species and help to educate MCLB Barstow personnel and residents as to their importance.

4.12.1 Habitat and Biodiversity Management

Objective: Enhance, restore, and protect the natural diversity and long-term viability of the ecological and evolutionary processes in all natural communities and wildlife habitats consistent with DoD ecosystem management policy.

Metric: Maintain habitat diversity on the Base.

Action 1: Define and map habitat values on the Base using ecosystem, landscape ecology, and multispecies concepts. Begin with habitat values for the desert tortoise.

Action 2: Create a Revegetation Plan. Restore all habitat impacted by construction associated with the increase in training and Rifle Range activities per the Revegetation Plan.

Action 3: Monitor habitat conditions and the effectiveness of management activities.

Action 4: Establish guzzlers (watering systems for wildlife) as appropriate in coordination with the CDFW. Avoid areas managed for desert tortoises due to safety concerns.

4.12.2 Wildlife Inventories

Objective: Evaluate the sustainable status of wildlife populations through the gathering of sufficient information to understand the diversity, abundance, and condition of wildlife on the Base.

Metric: Understand and support general wildlife populations on the Base.

Action 1: Update the 2015 NRI every five years as it pertains to general wildlife species. Update the presence, absence, and relative abundance of wildlife in all taxonomic groups, with focused surveys for sensitive species.

4.12.3 Pollinators

Objective: Maintain pollinator populations and their habitat when not in conflict with health and safety or the military mission.

Metric: Understand and support pollinator populations on the Base.

Action 1: Inventory and monitor pollinator populations. Establish the baseline conditions of pollinators and the plants that support them.

Action 2: Identify and develop landscapes that benefit pollinators.

Action 3: Develop BMPs that ensure that pollinators are not adversely impacted by Base activities.

4.12.4 Birds

Objective: Conserve viable populations of neotropical migratory birds and raptors that use the Base for stopover nesting, feeding, and resting.

Metric: Understand and support avian populations on the Base.

Action 1: Determine the status, health, and habitat use of neotropical migratory birds and raptors, emphasizing certain target or indicator species not currently considered to be sensitive species. In support of California Partners in Flight's (Cal-PIF's) riparian bird management

strategy, consider reproductive success and survival rates when monitoring populations, assessing habitat value, and developing conservation plans.

Action 2: Prioritize riparian sites for protection and restoration according to the means described in the Cal-PIF Riparian Bird Conservation Plan: current indicators of avian population health, proximity to existing high-quality sites, sites with intact adjacent uplands, sites with an intact natural hydrology or the potential to restore the natural processes of the system, and sites with surrounding land use that would not undermine restoration success.

Action 3: Enhance suitable urban habitats to encourage migratory stopovers.

Action 4: Monitor the use of stables on the Yermo Annex by birds (e.g., cowbirds) that depredate the nests of sensitive species especially, and provide management intervention if necessary.

Action 5: Limit disturbances during the breeding season. Promote understory and groundcover quality by postponing mowing until after the peak breeding season. If mowing must be done during the breeding season, maintain a low herbaceous layer of no more than 6 inches to discourage birds from nesting. Limit restoration activities and disturbances such as grazing, disking, and herbicide application to the nonbreeding season. When such actions are absolutely necessary during the breeding season, schedule the disturbances to minimize their impacts on nesting birds.

4.12.5 Mammals

Objective: Conserve viable mammal populations on the Base.

Metric: Understand and support mammal populations on the Base.

Action 1: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of mammal species on the Base.

Action 2: Discourage bat inhabitation of occupied buildings through appropriate and biologically acceptable measures. Encourage the relocation of bat colonies to alternative roosting sites.

4.12.6 Amphibians and Reptiles

Objective: Conserve viable amphibian and reptile populations on the Base.

Metric: Understand and support herpetological populations on the Base.

Action 1: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of herpetological species.

Action 2: Develop and implement a study of habitat use and the needs of herpetological species.

4.12.7 Invertebrates

Objective: Determine the abundance and diversity of invertebrate species on MCLB Barstow.

Metric: Understand and support invertebrate populations on the Base.

Action 1: Conduct repeatable Basewide surveys to develop a list of baseline for invertebrate diurnal and nocturnal species, focusing on insects, to determine their abundance and diversity.

4.12.8 Animal Damage Control, Feral Animal Removal, Pest Management

The laws regarding animal damage control fall under 14 CFR 251.5 and 671.6. Under the law, game species and fur-bearing mammals may be hunted and killed, or they may be trapped and released on the site. Removal or relocation of live animals requires a permit from the CDFW, which reserves the right to decide which species of special concern should be relocated.

Objective: Protect the Base, its inhabitants, and native species from risk or loss due to wild or feral animal predation or damage.

Metric: Perform feral species abatement.

Action 1: Conduct feral species abatement when necessary to protect native wildlife from domestic and feral animals.

Action 2: Conduct educational programs for residents on controlling pets and how to reduce practices that may attract coyotes or ravens to housing areas.

Action 3: Provide educational awareness materials to rotational units and Base personnel on how to employ proper waste management practices.

Action 4: Develop raven management procedures.

Action 5: Reduce the attraction of common ravens and other potential desert tortoise predators to the maximum extent possible. Monitor the progress and outcomes of the updated Desert Tortoise Recovery Plan and raven management strategies.

4.12.9 Insect and Disease Management

Objective: Protect Base personnel and visitors from harm by insect- and rodent-borne disease.

Metric: Perform pest species abatement.

Action 1: Establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that may adversely impact readiness or military operations by affecting the health of personnel or by damaging structures, material, or property.

4.13 Ecosystem Management

The DoD recognizes the value of ecosystem management and has established principles and guidelines for natural resource managers on military installations. Ecosystem management requires a shift from the management of single species or habitats to the management of multiple species and habitats. Regulatory requirements have historically fostered a greater emphasis on a species-by-species management approach. An important component of ecosystem management is adaptive management. Since knowledge of ecological systems and processes is inherently limited (due in part to changing conditions), MCLB Barstow must continuously reevaluate its resource management assumptions and practices as new information becomes available. Flexibility and adaptation in the face of uncertainty are critical (Benton et al. 2008).

Objective: Implement an ecosystem approach to promote the conservation of native species and habitats, ensure the sustainability and biological diversity of terrestrial ecosystems, and facilitate maximum support of the Base's military mission and infrastructure, while simultaneously ensuring compliance with applicable laws and regulations.

Metric: Acquire, develop, and maintain project and conservation information and GIS data relating to the physical environment to promote proactive ecosystem management.

Action 1: Continue to participate in partnerships that manage ecosystems across boundaries.

Action 2: Support research to gain the best available scientific information to guide natural resource and conservation decisions.

Action 3: Define and understand MCLB Barstow's regional relevance and responsibility towards regional conservation efforts.

4.14 Bird/Animal Aircraft Strike Hazard Reduction Program

DoD continually implements and improves aviation safety programs to provide the safest flying conditions possible. One of these programs is the Bird/Wildlife Aircraft Strike Hazard (BASH) prevention program. Throughout the military, air operations, aviation safety, and natural resources personnel work together to reduce the risk of bird and wildlife strikes through the Operational Risk Management process. Development and implementation of an effective BASH program requires constant interaction between air station's natural resources, aviation safety, and air operations communities as well as the pilots and air crews. Modifying habitats, scaring birds away from runways, and understanding the behavior and movements of birds in relation to the airfield environment and military training routes by pilots and air crews are all critical factors in reducing bird strikes.

Objective: Minimize bird/animal strikes from aircraft and ground vehicles on MCLB Barstow.

Metric: Monitor and report bird/animal strikes from aircraft and ground vehicles on MCLB Barstow.

Action 1: Create and implement a BASH program if necessary.

Action 2: Update this program as necessary and periodically evaluate possible improvements that might further reduce BASH incidents.

4.15 Wildland Fire Management

Wildland fires on MCLB Barstow are a risk to human lives, natural resources, military assets, and the military mission. Wildland fires contribute to soil erosion after the vegetative groundcover stabilizing the soil is removed. This loss of topsoil can lead to increased sedimentation and turbidity in surface water, the loss of soil moisture and nutrients, and in some cases, ground fires. Such fires leave the burned area vulnerable to the spread of exotic invasive plants, a major contributor to the loss of the native habitat on which native wildlife depends.

In accordance with DoDI 6055.06, MCO P5090.2A with changes 1-3 (HQMC 2013), and the Sikes Act, MCLB Barstow has prepared a Wildland Fire Management Plan (WFMP) to assess and address these and other important risks to natural resources and the Base's military mission.

DoDI 4715.03 21 requires all DoD components to manage fuel loads; provide adequate planning for prescribed burn programs; respond to wildfire in a manner that preserves health, safety, and air quality; protect facilities; and facilitate the health and maintenance of natural systems. This management is intended to reduce the potential for wildfires, function as an ecosystem-based management tool, integrate applicable state and local permit and reporting requirements, and be consistent with DoDI 6055.06 and the current Environmental Protection Agency Air Quality Policy on Wildland and Prescribed Fires.

Objective: Protect personnel, facilities, and natural and cultural resources from the impacts of wildland fires; ensure the perpetuation of native terrestrial habitats, fire-adapted plant communities, and rare species; and minimize the total cost of fire pre-suppression and suppression practices on land owned by the USMC.

Metric: Reduce the wildfire potential, protect military assets, and protect and enhance natural resources.

Action 1: Implement measures as described in the 2016 Wildland Fire Management Plan for MCLB Barstow (see Appendix F).

Action 2: Educate military personnel, employees, and the public about the scope and effect of wildland fire management, including fuels management, prevention, hazard/risk assessment, rehabilitation, and the role of fire in ecosystem management.

4.16 Climate Change

DoDI 4715.03 strengthens the rationale for resource management by stressing the importance of the relationship between ecosystem management and biodiversity conservation (DoD 2013).

The instruction outlined goals for installations to achieve, preserve, and enhance biodiversity, such as managing resources over sufficiently long periods to understand changing system dynamics, including addressing the effects associated with climate change (Benton et al. 2008).

DoD's 2014 *Climate Change Adaptation Roadmap* details how the effects of global climate change will impact the DoD's operations, how the DoD will adapt to and mitigate climate change threats, and how the DoD will coordinate with other entities currently addressing climate change. The report states: "Our first step in planning for these challenges is to identify the effects of climate change on the Department with tangible and specific metrics, using the best available science" (DoD 2014). Currently, baseline surveys are being conducted at more than 7,000 military installations and other facilities around the world to assess the effects of climate change and to integrate climate change considerations into military plans, operations, and training (DoD 2014).

The DoD guidance for addressing the effects of global climate change on natural resources and the military mission encourages installations to monitor historical regional trends and projections of future climate changes or sea-level rise and to develop installation-specific conservation strategies for adapting to global climate change.

Objective: Develop and implement conservation strategies for adapting to global climate change and to applicable laws and regulations.

Metric: Develop monitoring metrics and set targets to ensure management strategies meet the goals and objectives related to the effects of global climate change on natural resources as they relate to mission capability or capacity and to ecosystem management.

Action 1: Conduct an assessment of sustainability objectives and strategies relevant to natural resources in the context of climate change.

Action 2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.

Action 3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.

4.17 Leases

The USMC is authorized to outlease land when this is compatible with the military mission under 10 U.S.C. 2667. In addition, DoD and DoN policies allow the leasing of land to reduce maintenance costs. Often military land may be put to use for agricultural or grazing purposes and still be consistent with the military requirements of the installation. Lease agreements are required to contain a Soil and Water Conservation Plan, which dictates BMPs, or conservation measures for protecting the environment. The lessor may also be required to perform certain management activities or install improvements such as installing fencing or watering devices or implementing noxious weed control, on a cost reimbursable or cost-sharing basis. The plan

must include sound agricultural and pest management practices and be consistent with state and federal regulatory requirements and the overall goals of the Base.

In general, the small size of MCLB Barstow does not lend itself to the outleasing of land for agriculture or grazing. However, the potential does exist for the future leases.

Objective: Ensure the long-term viability, compatibility, and fair market value of all leases, in conjunction with the military mission and natural resource protection.

Metric: Set criteria for establishing, continuing, and monitoring the cost benefits and environmental compliance of lease agreements.

Action 1: Develop and implement a system to capture the full cost of supporting tenants. Provide oversight, inspection, and monitoring of outgrants for compliance with environmental protection laws.

4.18 Encroachment

Encroachment pressures along MCLB Barstow's borders are minor, though the increasing development and use of west Mojave Desert resources may affect the Base in the future. The City of Barstow and unincorporated San Bernardino County areas are concentrating future development plans within current boundaries by infilling open spaces. Most land developments are directed toward the city's western boundary, leaving MCLB Barstow east of the general pattern of development. Even with moderate expansion in outlying regions, urban and commercial developments are not expected to encroach on MCLB Barstow's boundaries in the foreseeable future.

For reasons of safety, security, and resource sensitivity, MCLB Barstow cannot allow extensive encroachment along its borders. Severe encroachment could constrain compatibility, safety, security, mission, or operational support requirements. Except for possible development of recreational uses near the firing range or testing areas, the mission and functions of MCLB Barstow do not conflict with the overall goals for the region.

Objective: Anticipate and protect against additional encroachment on resources available for fulfilling MCLB Barstow's mission and conserving environmental resources.

Metric: Minimize encroachment on MCLB Barstow property.

Action 1: Seek public recognition and support for excellent stewardship of the property.

Action 2: Identify through markers, fencing, or signage all of MCLB Barstow's boundaries with safety, security, or resource sensitivity concerns to prevent trespassing and other unlawful activities. Install appropriate signs to deter illegal trash dumping on the Rifle Range.

4.19 Outdoor Recreation

The Sikes Act requires installations to provide public access for natural resource uses to an extent that is appropriate and consistent with the military mission. In response, an MOU between the DOI and DoD was signed which requires all military installations to develop outdoor recreation plans where there are suitable resources for such a program and it is consistent with national security.

DoN policy is to permit access to outdoor recreation resources to the greatest degree possible, consistent with the installation's safety and security requirements and its available manpower and natural resources, and to support such activities without degradation or impairment of environmental qualities. If public use must be limited or regulated, the reasons and details of such limitations or regulation must be specified (i.e., limitation of the resource base, conflict with mission, security requirements, and safety requirements) (NAVFAC P-73).

Due to the presence of a federally threatened species on the Base, the restricted nature of the facilities, and safety and security issues, MCLB Barstow is unable to offer any significant outdoor recreation opportunities to the public. The Rifle Range is incapable of supporting any outdoor recreation activities because of safety requirements and the presence of the desert tortoise. Nebo Main Base and the Yermo Annex are mostly developed facilities, offering few opportunities for outdoor recreation. Both Nebo and the Yermo Annex's mission-intensive functions are additional constraints on outdoor recreation. Public access to Nebo or the Yermo Annex would conflict with security issues. This determination does not include urban recreational uses such as the golf course or interpretive and other educational activities.

Objective: Promote compatible and sustainable outdoor recreation opportunities that enhance the quality of life for MCLB Barstow personnel, while conserving natural resources and accomplishing the military mission.

Metric: Maintain or increase the access to outdoor recreation on the Base.

Action 1: Consider the installation of a trail for walking and fitness along the river.

Action 2: Develop a "viewing station" and interpretive panel for natural resource values or restoration and enhancement projects.

4.19.1 Off-Road Vehicle Use

Public land, including USMC land, is subject to pressure from individual and organized ORV interests for access. This form of recreational use frequently conflicts with military land use requirements, wise land management practices, environmental values, and recreation activities.

Under USMC policy, all land and water areas under USMC control are closed to off-road travel by ORVs except those areas specifically authorized by the Base CO. Even with approval, recreational ORV use on USMC land is only permitted in areas and on trails designated by Base Commanders.

Recreational off-road travel is prohibited on MCLB Barstow as its land is unsuitable for use by recreational ORVs. Nebo and the Yermo Annex are mostly developed areas with little potential for ORV use. The presence of the desert tortoise precludes the use of ORVs on the Rifle Range. However, some off-road travel is necessary for facilities maintenance and other military purposes. Consistent with official vehicle repair duties, military vehicles are being tested on a small portion of the Yermo Annex.

Objective: Ensure that off-road travel on MCLB is managed to protect natural resources, promote safety, and avoid conflicts with other property uses.

Metric: Ensure zero recreational use by ORV.

Action 1: Eliminate unauthorized ORV use.

4.20 Conservation Education and Awareness

The DoD's policy to encourage a conservation ethic by providing an understanding of the need to protect and conserve natural resources through good stewardship. USMC installations are to provide for sustained public access and use of natural resources for educational purposes when such access is compatible with mission activities and with other considerations such as security, safety, and resource sensitivity. MCLB Barstow is well suited to provide a forum for a variety of environmental and historical education programs and community involvement strategies.

Objective A: Build a strong conservation ethic and personal commitment to natural and cultural resource stewardship by personnel through the promotion of education and awareness of MCLB Barstow's unique environmental setting and history.

Objective B: Encourage community involvement in environmental education to support the conservation values of MCLB Barstow and convey them to individuals living on Base, visitors, neighbors, and outlying communities.

Metric: Improve conservation education and awareness throughout the MCLB Barstow community.

Action 1: Provide a clear, concise manual of environmental precautions and restrictions to be used by personnel. The manual should be reviewed annually.

Action 2: Support a natural resource orientation program for new personnel.

Action 3: Educate personnel about resources to support land management goals by way of classes, workshops, displays in communal areas, literature, and signs.

Action 4: Identify and evaluate suitable interpretive opportunities on MCLB Barstow, such as promoting the development of recreational, scenic, and historic trails for people with diverse interests and abilities.

4.21 Public Outreach

The USMC seeks to earn public confidence in its stewardship of the nation's natural heritage. An important objective of such programs is to gain proper public recognition of excellent stewardship.

The Base has a unique means of public outreach through the USMC Mounted Color Guard, which was formed in 1967 with its horses housed at the Yermo Annex. The unit rides wild mustangs of Palomino color adopted from BLM's Adopt a Horse and Burro Program. The mounts are gentled and trained by active-duty Marines who volunteer their time on evenings, weekends, and holidays. BLM honored this unit by portraying it on the first edition of its "Wild Horse" trading cards.

This is the only remaining mounted color guard in the USMC today, and it travels all over the western U.S. participating in parades, rodeos, and many other events and ceremonies.

Objective: Showcase MCLB Barstow's excellent stewardship of natural resources.

Metric: Maintain or increase outreach to the greater Barstow community.

Action 1: Submit materials for DoD and other environmental awards. Research potential awards, identify criteria, and develop a schedule for submission.

Action 2: Support Public Visitation Days by providing information, lectures, slideshows, and tours, if appropriate.

4.22 Cultural Resources

Long-term strategies include cultural resources surveys of areas that are not targeted for immediate use. Under Section 110 of the NHPA, federal land managers are directed to inventory cultural resources on land under their control even when no activity or undertaking is planned. Such investigations aid in long-term planning and also contribute to the archaeological context that is developed to evaluate resources. The 2016 ICRMP provides for this protection.

Concurrent with the NHPA, MCLB Barstow follows the guidelines of MCO P5090.2A with changes 1-3 (HQMC 2013) with respect to the management of cultural resources. That document dictates that installations consult with federally recognized Native American tribes with interests that may be affected by INRMP preparation or revision. The Base will comply with the consultation procedures found in Chapter 8 of the document. The focus of this INRMP is on conserving, inventorying, and monitoring natural resources. However, if any projects occur as a result of guidance from this INRMP that are determined to be undertakings under Section 106(d) of the NHPA, formal consultation will be initiated on a case-by-case basis. Tribes will have opportunities to review and comment both on this INRMP and on any case-by-case project.

Objective A: Maintain compliance with regulations established in the current Integrated Cultural Resource Management Plan (ICRMP).

Objective B: Accomplish mission-related activities with a minimum of delay and maximum flexibility while protecting the cultural heritage of the Base.

Metric: Identify and protect important archaeological and historic cultural resources.

Action 1: Evaluate potential impacts to cultural resources resulting from projects or activities that involve ground-disturbing activities

4.23 Construction

Objective: Minimize adverse effects from construction activities on natural resources to the maximum extent possible.

Metric: Minimize impacts of construction projects on natural resources.

Action 1: Evaluate and minimize potential impacts to natural resources resulting from construction projects by using the NEPA process (Section 4.2).

4.23.1 Maintenance

Objective: Protect wildlife habitat, special status species, soil productivity, watershed function and water quality from maintenance activities that may have a degrading effect or impact on the resource.

Metric: Minimize impacts of maintenance projects on natural resources.

Action 1: Develop the minimum network of roads needed to meet requirements for military readiness, safety and security, fire control, and environmental protection.

Action 2: Develop a 5- to 10-year Long-Term Maintenance Plan.

Action 3: Develop a list of appropriate mitigation practices for routine maintenance.

Action 4: Monitor resource conditions and the effectiveness of BMPs as mitigation.

Action 5: Develop contingency plans for emergency maintenance activities that may impact natural resources.

4.24 Landscaping and Grounds Maintenance

USMC policy requires environmentally and economically beneficial landscaping to be practiced on all USMC land. To the extent practical, MCLB Barstow must use regionally native plants for landscaping and other beneficial water conservation techniques (MCO P5090.2A). MCLB Barstow updated the (BEAP) in 2016. The BEAP's objective is to "improve the Base's public image, enhance morale, and foster a sense of pride and professionalism for Marine and civilian

development" (MCLB Barstow 2016). Landscaping and grounds maintenance follows the guidance of this document.

Objective A: Provide a sound basis for management and design of landscaping and grounds, particularly in consideration of their ability to enhance quality of life and foster a sense of community pride among those supporting and participating in activities at MCLB Barstow.

Objective B: Conserve water, protect water quality, reduce runoff and erosion, and decrease plant nutrient loss by reducing the demand for water in landscaped settings.

Metric: Maintain compliance with the 2016 BEAP.

Action 1: Conduct an irrigation system audit.

Action 2: Continue to reduce water wastage on lawns. Continue to limit the use of lawns where at all possible; use xeriscaping instead of lawns where at all possible.

Action 3: Reduce the use of water for landscaping while continuing to provide a high-quality living environment for Base personnel.

Action 4: For all landscaping projects use a palette of native plants that are suitable for the local climate, dry soils, and low level of maintenance funding found at the Base. Plant material should be used to resolve site problems as well as to improve the overall aesthetics of the site.

4.25 Environmental Permitting

The USACE's permitting authority under the CWA seeks to ensure that the environmental and cultural values of the nation's water resources and wetlands are protected, and work that may affect them is performed in the best interests of the public. Routine maintenance activities that may affect drainages fall under USACE authority from Section 404 of the CWA on nonagricultural land. Locations where roads cross drainages are most likely to require coverage by a permit. However, most MCLB activities are covered under a nationwide general permit, so no specific application for a permit is required. A set of 44 nationwide permits authorizes activities with minor impacts. General permits do not require an application, and most do not require notification of the USACE. If a landowner follows the terms and conditions of the general permit, then the activity is automatically authorized. A complete list of general permits can be found in 33 CFR 330. Restoration of structures or utilities to their original design falls under a nationwide general permit. Also covered are road crossings, maintenance of structures, and fills in head-water areas and isolated waters, but these activities must be evaluated on a site-specific basis to determine if the permit applies. General permit application processing times average about 16 days.

Objective: Comply with all environmental permitting requirements to assure mission readiness and safeguard the Base's natural resources.

Metric: Maintain compliance with the USACE's environmental permitting requirements.

Action 1: Comply with the CWA Section 404 permit and Section 401 state water quality certification if a project may affect a floodplain, wetland, or watercourse.

Action 2: Seek and obtain regional 404 permits (four months in advance) from the USACE, if needed.

Action 3: Obtain a five-year regional permit for all routine maintenance practices, if beneficial and needed.

4.26 Geographic Information Services Management

The mission of the MCLB Barstow's GIS program is to create, analyze, manage, and distribute authoritative, standardized geospatial information, products, and services to support military readiness and quality of life with an emphasis on natural and cultural resources.

As many of the training areas and locations of regulated natural resources are not demarcated in the field, GIS-based maps are the primary tool for implementing programmatic instructions and for integrating land use and natural resources management. This geospatial technology provides MCLB Barstow with potentially increased accuracy in communicating changes in land use and natural resources information. In addition, well-maintained and accessible GIS-based data also improve the likelihood of success for long-term planning.

Objective: Acquire, develop, and maintain data relating to natural resources on MCLB Barstow to improve the efficiency of natural resource management staff and contractors.

Metric: Maintain an up-to-date GIS database of natural resources to support training, improve natural resource management, and protect the environment in supporting the military mission.

Action 1: Continue the development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.

4.27 Law Enforcement Systems

The Commanding Officer of MCLB Barstow is responsible for land management, environmental compliance, security, training procedures, and safety at the Base. The authorities available to the Commander in meeting these responsibilities include the Sikes Act, 16 U.S.C. 670; Assimilative Crimes Act, 18 U.S.C. 13; Uniformed Code of Military Justice, 10 U.S.C. 807B; and other applicable laws and regulations.

U.S. Conservation Law Enforcement Officers and Military Police are the tools the Commanding Officer uses to enforce laws and regulations. Through enforcement and the education of both authorized range users and the public, law enforcement personnel reduce the degradation of training facilities and ranges; minimize the exploitation of plant and animal species; help to prevent the degradation of soil, water, and habitat resources; and protect cultural resources

while facilitating the sustained use of military land for readiness activities. Areas of particular concern include trespassing, removal of materials, property damage, and poaching.

Objective A: Provide law enforcement presence on the Base and within the Rifle Range.

Objective B: Protect natural and cultural resources from being exploited.

Objective C: Reduce illegal trespass and dumping.

Metric: Maintain a secure perimeter and provide adequate law enforcement personnel.

Action 1: Establish and maintain adequate control measures (e.g., signs, gates, fences) to provide for security, safety, and protection of natural resources.

4.28 Planned Projects and Implementation Schedule

In partnership with the USFWS and CDFW, MCLB Barstow has developed a list of actions planned for the next five years to implement this INRMP, including a time frame that outlines each project activity and how often it will occur (Appendix C). Actions are listed by program area and include priority classification, frequency, and regulatory requirements.

The USMC classifies projects according to output or performance level standards established by the DoD for installation support using a common framework of definitions, outputs, output performance metrics, and cost drivers for each installation support function. These Common Output Level Standards (COLS) describe the capability associated with each installation support function. Guidance for the application of COLS is provided in DoDI 4001.01 with change 1 (DoD 2013). Where appropriate, standards will be tiered to provide options for managing risk. It is the DoD's policy to develop COLS to include common definitions, performance standards, and performance metrics for all installation support functions to assist DoD components in apportioning and managing limited resources (DoD 2011b). COLS ratings are assigned to each planned project by MCLB Barstow in accordance with guidance provided by DoDI 4001.01 with change 1 and MCO P5090.2A with changes 1-3 (HQMC 2013).

4.28.1 COLS Level 1 – Low Risk (Full Program Health)

Program capability at COLS Level 1 provides minimal program and mission risks throughout the Future Years Defense Program (FYDP). It also includes full compliance with mandated requirements and policies, protection of human health and welfare of personnel, sustained strategic management and planning activities to meet future year requirements and improve or enhance capabilities program efficiencies or process improvements, and promotion of sustainability opportunities and conservation of environmental resources.

4.28.2 COLS Level 2 – Medium Risk (Moderate Program Health)

Program capability at COLS Level 2 provides moderate program and mission risks throughout the FYDP. It includes minimal strategic management and planning activities that place the USMC at risk of being unprepared for future environmental requirements and threats to the

USMC mission. This level funds only those policy requirements that are directly related to operational readiness and human health, leaving other BMPs unfunded. It does not include the ability to assess and implement program efficiencies or process improvements. Further, it does not address initiatives to promote sustainability opportunities and conservation of environmental resources.

4.28.3 COLS Level 3 – High Risk (Low Program Health)

Program capability at COLS Level 3 provides high program and mission risks throughout the FYDP. It does not fund policy requirements that have a direct impact on operational readiness and human health. This level does not fund all anticipated mandated emergent requirements based on historical execution, leaving full compliance subject to availability of discretionary funding through Current Year deficiencies. It includes only strategic management and planning activities that are directly tied to explicit mandated requirements by established deadlines, placing the USMC at risk of being unprepared for future environmental requirements and threats to the USMC mission. This level does not fund policy requirements, including those that are directly related to operational readiness, human health, and BMPs. It does not include the ability to assess and implement program efficiencies or process improvements. Further, it does not address initiatives to promote sustainability opportunities and conservation of environmental resources.

Implementation of this INRMP is subject to the availability of annual funding. The Installation requests project validation and funding through a variety of resources. The USMC and MCLB Barstow intend to implement the recommendations in this INRMP within the framework of regulatory compliance, national USMC mission obligations, antiterrorism and force protection limitations, and funding constraints. 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.C. 1341.

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5.2 Photograph Credits

Table 5.1. Photograph Credits

Photograph	Credit
Figure 3-6. Agassiz Desert Tortoise (*Gopherus agassizii*)	Vernadero Group Inc.
Figure 3-8. Brewer's Sparrow (*Spizella breweri*)	"Brewer's Sparrow" by Andy Reago and Chrissy McClarren, CC BY 2.0
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Figure 3-10. Cooper's Hawk (*Accipiter cooperii*)	USFWS National Digital Library
Figure 3-11. Crissal Thrasher (*Toxostoma crissale*)	Photograph courtesy of Alan Schmierer
Figure 3-12. Desert Kit Fox (*Vulpes macrotis macrotis*)	Photograph courtesy of Bureau of Land Management
Figure 3-13. Golden Eagle (*Aquila chrysaetos*)	USFWS National Digital Library
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Figure 3-17. Northern Harrier (*Circus cyaneus*)	Photograph courtesy of Alan Schmierer
Figure 3-18. Nuttall's Woodpecker (*Picoides nuttallii*)	Photograph courtesy of Alan Schmierer
Figure 3-19. Olive-Sided Flycatcher (*Contopus cooperii*)	Photograph courtesy of Alan Schmierer
Figure 3-20. Short-Eared Owl (*Asio flammeaus*)	"Wild Short Eared Owl" by Nigel, CC by 2.0
Figure 3-21. Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Photograph courtesy of Jim Rorabaugh, USFWS
Figure 3-23. Swainson's Hawk (*Buteo swainsoni*)	USFWS National Digital Library
Figure 3-24. Vermillion Flycatcher (*Pyrocephalus rubinus*)	"Vermillion Flycatcher" by James Diedrick, CC BY 2.0, taken on 23 March 2012
Figure 3-25. Willow Flycatcher (*Empidonax traillii*)	"Willow Flycatcher (*Empidonax traillii*)" by Dominic Sherony, CC BY-SA 2.0, taken 22 May 2006
Figure 3-26. Yellow-Breasted Chat (*Icteria virens*)	"Yellow-Breasted Chat" by HarmonyonPlanetEarth CC BY 2.0, taken 15 June 2015

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Figure 3-27. Yellow Warbler (*Setophaga petechial*)	"Yellow Warbler" by Nigel, CC BY 2.0, taken 21 May 2012
Figure 3-28. Pallid Bat (*Antrozous pallidus*) Captured in a Mist Net	**Tierra Data Inc. 2015.** Marine Corps Logistics Base Barstow, California Natural Resources Inventory 34 Report. Unpublished report submitted to Environmental, Marine Corps Logistics Base Barstow, California, and Naval Facilities Engineering Command Southwest, San Diego, California. September 2015.
Figure 3-29. Southern Grasshopper Mouse (*Onychomys torridus*)	**Tierra Data Inc. 2015.** Marine Corps Logistics Base Barstow, California Natural Resources Inventory 34 Report. Unpublished report submitted to Environmental, Marine Corps Logistics Base Barstow, California, and Naval Facilities Engineering Command Southwest, San Diego, 36 California. September 2015.
Figure 3-30. American Badger (*Taxidea taxus*)	"American Badger (*Taxidea taxus*)" by the California Department of Fish and Game CC BY 2.0
Figure 3-31. Howe's Hedgehog Cactus (*Echinocereus engelmannii* var. *howei*)	**Tierra Data Inc. 2015.** Marine Corps Logistics Base Barstow, California Natural Resources Inventory Report. Unpublished report submitted to Environmental, Marine Corps Logistics Base Barstow, California, and Naval Facilities Engineering Command Southwest, San Diego, California. September 2015.
Figure 3-32. Threetooth Blazingstar (*Mentzelia tridentate*)	**Tierra Data Inc. 2015.** Marine Corps Logistics Base Barstow, California Natural Resources Inventory Report. Unpublished report submitted to Environmental, Marine Corps Logistics Base Barstow, California and Naval Facilities Engineering Command Southwest, San Diego, 36 California. September 2015.

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Appendix A. General Flora and Fauna Found on MCLB Barstow

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Table A-1. General Flora and Fauna Found on MCLB Barstow

Scientific Name	Common Name	Reference
Invertebrates		
Anisoptera (suborder)	Dragonfly	MCLB Barstow 2016
Caelifer (suborder)	Grasshopper	MCLB Barstow 2016
Eurema nicippe	Sleepy sulphur	MCLB Barstow 2016
Formicidae (family)	Harvester ant	MCLB Barstow 2016
Pepsis sp.	Tarantula wasp	MCLB Barstow 2016, TDI 2015
Trimerotropis pallidipennis	Pallid-winged grasshopper	Navy 2005
Zerene eurydice	California dogface	TDI 2015
Amphibians		
Anaxyrus boreas	Western toad	TDI 2015
Pseudacris cadaverina	California treefrog	TDI 2015
Reptiles		
Aspidoscelis tigris	Great Basin whiptail	Navy 2005, MCLB Barstow 2016, TDI 2015,
Callisaurus draconoides	Zebra-tailed lizard	Navy 2005, MCLB Barstow 2016, TDI 2015
Coleonyx variegatus	Desert banded gecko	TDI 2015
Coluber flagellum piceus	Red racer	MCLB Barstow 2016, TDI 2015
Crotalus cerastes	Mohave Desert sidewinder	Navy 2005, MCLB Barstow 2016, TDI 2015
Crotalus mitchellii pyrrhus	Southwestern speckled rattlesnake	MCLB Barstow 2016
Crotalus scutulatus	Northern Mohave rattlesnake	Navy 2005, MCLB Barstow 2016, TDI 2015
Crotaphytus bicinctores[*]	Great Basin collared lizard	Navy 2005
Dipsosaurus dorsalis	Northern desert iguana	Navy 2005, MCLB Barstow 2016, TDI 2015
Gambelia wislizenii	Long-nosed leopard lizard	Navy 2005, MCLB Barstow 2016, TDI 2015
Hypsiglena chlorophaea deserticola	Northern desert nightsnake	TDI 2015
Phrynosoma platyrhinos calidiarum	Southern desert horned lizard	Navy 2005, MCLB Barstow 2016, TDI 2015
Phyllorhynchus decurtatus	Spotted leaf-nosed snake	TDI 2015
Pituophis catenifer desertiicola	Great Basin gophersnake	MCLB Barstow 2016, TDI 2015
Rhinocheilus lecontei	Long-nosed snake	TDI 2015
Salvadora hexalepis	Western patch-nosed snake	MCLB Barstow 2016
Sceloporus graciosus	Common sagebrush lizard	Navy 2005
Sceloporus magister	Desert spiny lizard	Navy 2005

Scientific Name	Common Name	Reference
Sceloporus uniformis	Yellow-backed spiny lizard	TDI 2015
Urosaurus graciosus	Western long-tailed brush lizard	TDI 2015
Uta stansburiana elegans	Western side-blotched lizard	Navy 2005, MCLB Barstow 2016, TDI 2015
Xantusia vigilis	Desert night lizard	TDI 2015
Birds		
Accipiter cooperii	Cooper's hawk	Navy 2005, Lovio 2006, TDI 2015
Actitis macularia	Spotted sandpiper	Lovio 2006, TDI 2015
Aechmophorus occidentalis	Western grebe	Navy 2005
Aeronautes saxitalis	White-throated swift	Navy 2005, Lovio 2006, TDI 2015
Agelaius phoenicius	Red-winged blackbird	TDI 2015
Agelaius tricolor	Tricolored blackbird	Lovio 2006
Amphispiza bilineata	Black-throated sparrow	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Anas acuta	Northern pintail	eBird 2015
Anas americana	American wigeon	Navy 2005, Lovio 2006, TDI 2015
Anas clypeata	Northern shoveler	Navy 2005, TDI 2015
Anas crecca	Green-winged teal	Navy 2005, TDI 2015
Anas cyanoptera	Cinnamon teal	Navy 2005, Lovio 2006
Anas discors	Blue-winged teal	Navy 2005
Anas platyrhynchos	Mallard	Navy 2005, Lovio 2006, TDI 2015
Anas strepera	Gadwall	Navy 2005, Lovio 2006
Aquila chrysaetos	Golden eagle	Navy 2005
Archilochus alexandri	Black-chinned hummingbird	Navy 2005, Lovio 2006, TDI 2015
Ardea herodius	Great blue heron	Navy 2005, Lovio 2006, TDI 2015
Artemisiospiza nevadensis	Sage sparrow	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Asio flammeaus	Short-eared owl	Lovio 2006, MCLB Barstow 2016
Asio otus	Long-eared owl	Lovio 2006
Athene cunicularia	Burrowing owl	Navy 2005
Auriparus minimus	Verdin	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Aythya affinis	Lesser scaup	Navy 2005, TDI 2015

Scientific Name	Common Name	Reference
Aythya collaris	Ring-necked duck	Lovio 2006
Bombycilla cedrorum	Cedar waxwing	TDI 2015
Branta canadensis	Canada goose	Navy 2005
Bubo virginianus	Great horned owl	Navy 2005, Lovio 2006, TDI 2015
Bucephala albeola	Bufflehead	Navy 2005, TDI 2015
Buteo albonotatus	Zone-tailed hawk	TDI 2015
Buteo jamaicensis	Red-tailed hawk	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Butorides striatus	Green heron	Lovio 2006
Calidris alpina	Dunlin	eBird 2015
Calidris mauri	Western sandpiper	Lovio 2006, TDI 2015
Calidris melanotos	Pectoral sandpiper	eBird 2015
Calidris minutilla	Least sandpiper	Navy 2005, Lovio 2006, TDI 2015
Callipepla californica	California quail	Navy 2005, Lovio 2006, TDI 2015
Callipepla gambelii	Gambel's quail	Navy 2005, TDI 2015
Calypte anna	Anna's hummingbird	Navy 2005, Lovio 2006, TDI 2015
Campylorhynchus brunneicapillus	Cactus wren	MCLB Barstow 2016, TDI 2015
Cardellina pusilla	Wilson's warbler	Lovio 2006, TDI 2015
Casmerodius albus	Great egret	Lovio 2006
Cathartes aura	Turkey vulture	Navy 2005, Lovio 2006, TDI 2015
Catharus guttatus	Hermit thrush	TDI 2015
Ceryle alcyon	Belted kingfisher	Navy 2005, Lovio 2006
Charadrius vociferus	Killdeer	Navy 2005, Lovio 2006, TDI 2015
Chondestes grammacus	Lark sparrow	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Chordeiles acutipennis	Lesser nighthawk	Lovio 2006, TDI 2015
Chordeiles minor	Common nighthawk	Navy 2005, MCLB Barstow 2016
Circus cyaneus	Northern harrier	MCLB Barstow 2016
Colaptes auratus	Northern flicker	Navy 2005, TDI 2015
Columba livia	Rock pigeon	Lovio 2006, MCLB Barstow 2016, TDI 2015
Contopus cooperi	Olive-sided flycatcher	TDI 2015

Scientific Name	Common Name	Reference
Contopus sordidulus	Western wood-pewee	Lovio 2006
Corvus brachyrhynchos	American crow	Lovio 2006, TDI 2015
Corvus corax	Common raven	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Egretta thula	Snowy egret	Lovio 2006
Empidonax difficilis	Pacific slope flycatcher	Lovio 2006, TDI 2015
Empidonax traillii	Willow flycatcher	Lovio 2006, TDI 2015
Eremophila alpestris	Horned lark	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Eremophila alpestris actia	California horned lark	TDI 2015
Euphagus cyanocephalus	Brewer's blackbird	Navy 2005, Lovio 2006, TDI 2015
Falco mexicanus	Prairie falcon	eBird 2015
Falco sparverius	American kestrel	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Fulica americana	American coot	Navy 2005, Lovio 2006, TDI 2015
Gallinago	Common snipe	Navy 2005
Geococcyx californianus	Greater roadrunner	Lovio 2006, TDI 2015
Geothlypis tolmiei	MacGillivray's warbler	MCLB Barstow 2016, TDI 2015
Geothlypis trichas	Common yellowthroat	Lovio 2006, TDI 2015
Haemorhous mexicanus	House finch	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Himantopus mexicana	Black-necked stilt	Navy 2005, Lovio 2006, TDI 2015
Hirundo rustica	Barn swallow	TDI 2015
Icteria virens	Yellow-breasted chat	Lovio 2006, TDI 2015
Icterus cucullatus	Hooded oriole	Lovio 2006, TDI 2015
Icterus galbula	Bullock’s oriole	Navy 2005, Lovio 2006, TDI 2015
Icterus parisorum	Scott's oriole	MCLB Barstow 2016
Junco hyemalis	Dark-eyed junco	Navy 2005, Lovio 2006, TDI 2015
Lanius ludovicianus	Loggerhead shrike	Lovio 2006, , MCLB Barstow 2016, TDI 2015
Laurs delawarensis	Ring-billed gull	eBird 2015
Limnodromus scolopaceus	Long-billed dowitcher	Navy 2005, Lovio 2006, TDI 2015
Limosa fedoa	Marbled godwit	TDI 2015
Melospiza melodia	Song sparrow	TDI 2015

Scientific Name	Common Name	Reference
Melozone crissalis	California towhee	TDI 2015
Melozone fusca	Canyon towhee	Navy 2005
Mimus polyglottos	Northern mockingbird	Navy 2005, Lovio 2006, TDI 2015
Molothrus ater	Brown-headed cowbird	Navy 2005, Lovio 2006
Myiarchus cinerascens	Ash-throated flycatcher	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Nycticorax	Black-crowned night-heron	Navy 2005
Oreoscoptes montanus	Sage thrasher	Navy 2005, Lovio 2006
Oreothlypis celata	Orange-crowned warbler	Navy 2005, Lovio 2006, TDI 2015
Oreothlypis luciae	Lucy's warbler	TDI 2015
Oreothlypis ruficapilla	Nashville warbler	TDI 2015
Oxyura jamaicensis	Ruddy duck	Navy 2005, Lovio 2006, TDI 2015
Pandion haliaetus	Osprey	TDI 2015
Parabuteo unicinctus	Harris' hawk	Navy 2005
Passer domesticus	House sparrow	Navy 2005, Lovio 2006, TDI 2015
Passerina amoena	Lazuli bunting	Navy 2005, Lovio 2006, TDI 2015
Passerina caerulea	Blue grosbeak	Navy 2005, Lovio 2006, TDI 2015
Petrochelidon pyrrhonota	Cliff swallow	TDI 2015
Phainopepla nitens	Phainopepla	Lovio 2006, TDI 2015
Phalacrocorax auritus	Double-crested cormorant	eBird 2015
Phalaenoptilus nuttallii	Common poorwill	Navy 2005
Phalaropus lobatus	Red-necked phalarope	TDI 2015
Phalaropus tricolor	Wilson's phalarope	Lovio 2006
Pheucticus melanocephalus	Black-headed grosbeak	Navy 2005, Lovio 2006, TDI 2015
Picoides nuttallii	Nuttall's woodpecker	TDI 2015
Picoides scalaris	Ladder-backed woodpecker	Navy 2005, Lovio 2006
Piranga flava	Hepatic tanager	TDI 2015
Piranga ludoviciana	Western tanager	Lovio 2006, MCLB Barstow 2016, TDI 2015
Plegadis chihi	White-faced Ibis	Lovio 2006, TDI 2015
Podiceps nigricollis	Eared grebe	Navy 2005, Lovio 2006, TDI 2015

Scientific Name	Common Name	Reference
Podilymbus podiceps	Pied-billed grebe	Navy 2005, Lovio 2006
Polioptila caerulea	Blue-gray gnatcatcher	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Polioptila melanura	Black-tailed gnatcatcher	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Porzana carolina	Sora	Lovio 2006
Pyrocephalus rubinus	Vermillion flycatcher	Navy 2005, TDI 2015
Quiscalus mexicanus	Great-tailed grackle	Lovio 2006, TDI 2015
Recurvirostra americana	American avocet	Navy 2005, Lovio 2006, TDI 2015
Regulus calendula	Ruby-crowned kinglet	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Salpinctes obsoletus	Rock wren	MCLB Barstow 2016, TDI 2015
Sayornis nigricans	Black phoebe	Navy 2005, Lovio 2006, TDI 2015
Sayornis saya	Say's phoebe	Lovio 2006, MCLB Barstow 2016, TDI 2015
Setophaga coronata	Yellow-rumped warbler	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Setophaga nigrescens	Black-throated gray warbler	TDI 2015
Setophaga petechia	Yellow warbler	Lovio 2006
Setophaga townsendi	Townsend's warbler	Lovio 2006, TDI 2015
Sialia currucoides	Mountain bluebird	TDI 2015
Sitta canadensis	Red-breasted nuthatch	Navy 2005, Lovio 2006
Sphyrapicus nuchalis	Red-naped sapsucker	eBird 2015
Sphyrapicus ruber	Red-breasted sapsucker	eBird 2015
Spinus psaltria	Lesser goldfinch	Navy 2005, Lovio 2006, TDI 2015
Spizella breweri	Brewer's sparrow	TDI 2015
Stelgidopteryx serripennis	Northern rough-winged swallow	Navy 2005, Lovio 2006, eBird 2015, MCLB Barstow 2016, TDI 2015
Streptopelia decaocto	Eurasian collared-dove	eBird 2015, TDI 2015
Streptopelia risoria	Ringed turtle-dove	Lovio 2006
Sturnella neglecta	Western meadowlark	Navy 2005, Lovio 2006, TDI 2015
Sturnus vulgaris	European starling	Navy 2005, Lovio 2006, TDI 2015
Tachycineta bicolor	Tree swallow	Navy 2005, TDI 2015
Thryomanes bewickii	Bewick's wren	TDI 2015

Scientific Name	Common Name	Reference
Toxostoma crissale	Crissal thrasher	TDI 2015
Toxostoma lecontei	Le Conte's thrasher	TDI 2015
Toxostoma redivivum	California thrasher	Lovio 2006, TDI 2015
Tringa flavipes	Lesser yellowlegs	Navy 2005, Lovio 2006
Tringa melanoleuca	Greater yellowlegs	Navy 2005, Lovio 2006, TDI 2015
Tringa semipalmatus	Willet	Navy 2005, TDI 2015
Troglodytes aedon	House wren	TDI 2015
Turdus migratorius	American robin	Lovio 2006, TDI 2015
Tyrannus verticalis	Western kingbird	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Tyto alba	Barn owl	Navy 2005
Vireo cassinii	Cassin's vireo	Lovio 2006
Vireo gilvus	Warbling vireo	Lovio 2006, TDI 2015
Zenaida asiatica	White-winged dove	Navy 2005, Lovio 2006, TDI 2015
Zenaida macroura	Mourning dove	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Zonotrichia atricapilla	Golden-crowned sparrow	Navy 2005
Zonotrichia leucophrys	White-crowned sparrow	Navy 2005, Lovio 2006, MCLB Barstow 2016, TDI 2015
Mammals		
Ammospermophilus leucurus	White-tailed antelope squirrel	Navy 2005, MCLB Barstow 2016, TDI 2015
Antrozous pallidus	Pallid bat	TDI 2015
Canis latrans	Coyote	TDI 2008, MCLB Barstow 2016, TDI 2015
Canis lupus familiaris	Domestic dog	MCLB Barstow 2016, TDI 2015
Chaetodipus penicillatus (previously *Perognathus penicillatus*)	Desert pocket mouse	Navy 2005, TDI 2015
Dipodomys merriami	Merriam's kangaroo rat	Navy 2005, MCLB Barstow 2016, TDI 2015
Dipodomys deserti	Desert kangaroo rat	TDI 2015
Dipodomys sp.	Kangaroo rat	TDI 2008
Felis rufus	Bobcat	Navy 2005, MCLB Barstow 2016
Equus caballus	Domestic horse	MCLB Barstow 2016
Lasiurus xanthinus	Mexican free-tailed bat	TDI 2015
Lepus californicus	Black-tailed jackrabbit	TDI 2008, MCLB Barstow 2016, TDI 2015

Scientific Name	Common Name	Reference
Myotis californicus	California myotis	TDI 2015
Myotis yumanensis	Yuma myotis	TDI 2015
Neotoma albigula	White-throated woodrat	Navy 2005, MCLB Barstow 2016
Neotoma lepida	Desert woodrat	TDI 2015
Notiosorex crawfordii	Desert shrew	TDI 2015
*Odocoileus hemionus**	Mule deer	TDI 2015
Onychomys torridus	Southern grasshopper mouse	Navy 2005, TDI 2015
Otospermophilus beecheyi	California ground squirrel	Navy 2005, MCLB Barstow 2016, TDI 2015
Parastrellus hesperus	Canyon bat	TDI 2015
Perognathus formosus	Long-tailed pocket mouse	Navy 2005
Peromyscus boylii	Brush mouse	Navy 2005
Peromyscus crinitus	Canyon mouse	Navy 2005, TDI 2015
Peromyscus eremicus	Cactus mouse	Navy 2005, TDI 2015
Perognathus longimembris	Little pocket mouse	TDI 2015
Peromyscus maniculatus	Deer mouse	Navy 2005, TDI 2015
Spermophilus sp.	Ground squirrel	TDI 2008
Sylvilagus auduonii	Desert cottontail	Navy 2005, MCLB Barstow 2016, TDI 2015
Tadarida brasiliensis	Mexican free-tailed bat	TDI 2015
Taxidea taxus	Badger	Navy 2005
Urocyon cinereoargenteus	Gray fox	Navy 2005
Vulpes macrotis arsipus	Desert it fox	TDI 2008, MCLB Barstow 2016, TDI 2015
Xerospermophilus tereticaudus	Round-tailed ground squirrel	TDI 2015
Plants		
Acacia constricta	White thorn acacia	TDI 2015
Acacia greggii	Catclaw acacia	TDI 2015
Acamptopappus sphaerocephalus var. *hirtellus*	Round headed goldenhead	Navy 2005, TDI 2015
Achnatherum hymenoides	Indian ricegrass	TDI 2015
Acmispon strigosus	Strigose lotus	TDI 2015
Adenophyllum cooperi	Cooper's dyssodia	Navy 2005, TDI 2015
Allionia incarnata var. *incarnata*	Trailing windmills	Navy 2005, TDI 2015
Allium sp.	Onion	TDI 2015
Amaranthus sp.	Amaranth	TDI 2015
Ambrosia acanthicarpa	Annual bursage	Navy 2005, TDI 2015

Scientific Name	Common Name	Reference
Ambrosia dumosa	Burro-weed	Navy 2005, TDI 2015
Amsinckia menziesii var. *intermedia*	Rancher's fireweed	Navy 2005, TDI 2015
Amsinckia tessellata var. *tessellata*	Devil's lettuce	Navy 2005, TDI 2015
Antirrhinum filipes	Twining snapdragon	TDI 2015
*Arundo donax**	Giant reed	Navy 2005, TDI 2015
Asclepias erosa	Desert milkweed	TDI 2015
Astragalus lentiginosus	Rattle pod	TDI 2015
Astragalus mohavensis (not confirmed – no flowers)	Mohave locoweed	TDI 2015
Astragalus sp.	Locoweed	TDI 2015
Atriplex canescens	Four-winged saltbush	Navy 2005, TDI 2015
Atriplex confertifolia	Shadscale	TDI 2015
Atriplex hymenelytra	Desert holly	, TDI 2015
Atriplex polycarpa	All-scale	Navy 2005, TDI 2015
Baccharis salicifolia	Mule fat	Navy 2005, TDI 2015
Baccharis salicina (=*emoryi*)	Emory baccharis	TDI 2015
Baileya pleniradiata	Woolly marigold	TDI 2015
Bebbia juncea var. *aspera*	Sweetbrush	Navy 2005, TDI 2015
*Brassica tournefortii**	Sahara mustard	TDI 2015
Brickellia incana	Woolly brickellia	Navy 2005, TDI 2015
*Bromus diandrus**	Ripgut grass	Navy 2005, TDI 2015
Bromus madritensis ssp. *rubens* (=*B. rubens*)*	Foxtail chess	Navy 2005, TDI 2015
*Bromus tectorum**	Cheat grass	Navy 2005, TDI 2015
*Caesalpinia gilliesii**	Bird of paradise	TDI 2015
Calycoseris parryi	Yellow tack-stem	TDI 2015
Camissonia brevipes ssp. *brevipes*	Desert primrose	TDI 2015
Camissonia campestris ssp. *campestris*	Mohave suncup	TDI 2015
Camissonia sp.	Suncup	TDI 2015
Caulanthus lasiophyllus	California mustard	TDI 2015
Chaenactis carphoclinia var. *carphoclinia*	Pebble pincushion	Navy 2005, TDI 2015
Chaenactis fremontii	Fremont's pincushion	Navy 2005, TDI 2015
Chaenactis macrantha	Mohave pincushion	TDI 2015
Chaenactis sp.	Pincushion	TDI 2015
Chaenactis stevioides	Desert pincushion	TDI 2015
Chaenactis xantiana	Xantus pincushion	TDI 2015

Scientific Name	Common Name	Reference
Chamaesyce albomarginata [=*Euphorbia a.*]	White-margined spurge	Navy 2005, TDI 2015
Chamaesyce ocellata (=*Euphorbia o.*)	Contura creek spurge	TDI 2015
Chamaesyce serpyllifolia	Thyme-leaved spurge	TDI 2015
Chilopsis linearis ssp. *arcuata*	Desert willow	, TDI 2015
Chorizanthe brevicornu var. *brevicornu*	Brittle chorizanthe	Navy 2005, TDI 2015
Chorizanthe rigida	Rigid chorizanthe	Navy 2005, TDI 2015
Chylismia (=*Camissonia*) *claviformis*	Clavate fruited primrose	TDI 2015
Cleomella obtusifolia	Mojave cleomella	TDI 2015
Coleogyne ramosissima	Blackbrush	TDI 2015
Conyza canadensis	Horseweed	Navy 2005
Coreopsis bigelovii	Bigelow coreopsis	TDI 2015
Croton californicus	Croton	Navy 2005, TDI 2015
Cryptantha angustifolia	Narrow-leaved cryptantha	Navy 2005, TDI 2015
Cryptantha circumscissa	Greeneocharis	Navy 2005, TDI 2015
Cryptantha maritima	Guadalupe cryptantha	TDI 2015
Cryptantha micrantha	Purple rooted forget me not	Navy 2005, TDI 2015
Cryptantha nevadensis var. *nevadensis*	Nevada cryptantha	TDI 2015
Cryptantha pterocarya	Wing-nut cryptantha	Navy 2005, TDI 2015
Cucurbita palmata	Coyote melon	Navy 2005, TDI 2015
*Cynodon dactylon**	Bermuda grass	Navy 2005, TDI 2015
Dalea mollissima	Silky dalea	TDI 2015
Dasyochloa pulchella	Low woollygrass	TDI 2015
Datura wrightii	Jimsonweed	TDI 2015
Delphinium parishii var. *parishii*	Parish larkspur	TDI 2015
Descurainia pinnata ssp. *glabra*	Western tansy mustard	Navy 2005, TDI 2015
*Descurainia sophia**	Eurasian tansy mustard	Navy 2005, TDI 2015
Dichelostemma capitatum	Blue dicks	TDI 2015
Distichlis spicata	Saltgrass	Navy 2005, TDI 2015
Echinocactus polycephalus var. *polycephalus*	Cotton top	Navy 2005, TDI 2015
Echinocereus engelmannii	Hedgehog cactus	Navy 2005, TDI 2015
Emmenanthe penduliflora	Whispering bells	TDI 2015
Encelia farinosa	Brittle-bush and incienso	TDI 2015
Ephedra californica	California tea	Navy 2005, TDI 2015
Ephedra nevadensis	Nevada tea	Navy 2005, TDI 2015
Eremalche exilis	White mallow	TDI 2015

Scientific Name	Common Name	Reference
Eremalche rotundifolia	Desert five-spot	Navy 2005, TDI 2015
Eremocarpus setigerus	Doveweed	TDI 2015
Eremothera (=*Camissonia*) *boothii* ssp. *condensate*)	Booth's east Mojave evening primrose	Navy 2005, TDI 2015
Eremothera (=*Camissonia*) *chamaeneroides*	Willow-herb primrose	Navy 2005, TDI 2015
Eremothera (=*Camissonia*) *refracta*	Narrow leaved primrose	TDI 2015
Eriastrum diffusum	Miniature woollystar	TDI 2015
Eriastrum eremicum ssp. *eremicum*	Desert woollystar	TDI 2015
Ericameria (=*Chrysothamnus*) *nauseosus* ssp. *ceruminosus*	Rubber rabbitbrush	Navy 2005, TDI 2015
Ericameria linearifolia	Linear leaved goldenbush	TDI 2015
Eriogonum brachyanthum	Short-flowered buckwheat	TDI 2015
Eriogonum deflexum var. *deflexum*	Flat-topped buckwheat	Navy 2005, TDI 2015
Eriogonum fasciculatum ssp. *polifolium*	Oblanceolate-leaved California buckwheat	Navy 2005, TDI 2015
Eriogonum gracillimum	Slender stemmed buckwheat	TDI 2015
Eriogonum inflatum var. *inflatum*	Desert trumpet	Navy 2005, TDI 2015
Eriogonum maculatum	Buckwheat	TDI 2015
Eriogonum mohavense	Western Mojave buckwheat	TDI 2015
Eriogonum nidularium	Whisk broom	TDI 2015
Eriogonum palmeranium	Palmer's buckwheat	TDI 2015
Eriogonum pusillum	Yellow turban	TDI 2015
Eriogonum reniforme	Kidney-leaved buckwheat	Navy 2005, TDI 2015
Eriogonum sp.	Buckwheat	TDI 2015
Eriogonum thomassii	Thomas' buckwheat	TDI 2015
Eriogonum thurberi	Thurber's buckwheat	TDI 2015
Eriogonum trichopes var. *trichopes*	Yellow trumpet	Navy 2005, TDI 2015
Erioneuron pulchellum	Fluff grass	Navy 2005
Eriophyllum wallacei	Wallace's wooly	Navy 2005, TDI 2015
*Erodium cicutarium**	Red-stemmed filaree	Navy 2005, TDI 2015
*Erodium moschatum**	White stemmed filaree	TDI 2015
Erodium texanum	Desert heron's-bill	TDI 2015
Eruca vesicaria ssp. *sativa**	Garden rocket	TDI 2015
Eschscholzia minutiflora	Pygmy poppy	Navy 2005, TDI 2015
Eucrypta micrantha	Small flowered eucrypta	TDI 2015
Geraea canescens	Desert sunflower	Navy 2005, TDI 2015
Gilia brecciarum ssp. *neglecta*	Nevada gilia	TDI 2015

Scientific Name	Common Name	Reference
Gilia cana ssp. *speciformis*	Showy gilia	TDI 2015
Gilia inconspicua	Shy gilia	TDI 2015
Gilia latiflora	Broad-leaved gilia	Navy 2005, TDI 2015
Gilia sp.	Gilia	TDI 2015
Gilia stellata	Star gilia	TDI 2015
Heliotropium curassavicum	Heliotrope	Navy 2005, TDI 2015
*Hordeum murinum**	Foxtail barley	TDI 2015
Hymenoclea salsola var. *salsola*	Cheesbush/burrobrush	Navy 2005, TDI 2015
Isomeris arborea	Bladderpod	Navy 2005
Krameria erecta	Pima rhatany	Navy 2005, TDI 2015
*Lactuca serriola**	Prickly lettuce	Navy 2005, TDI 2015
Langloisia setosissima ssp. *punctata*	Spotted langloisia	Navy 2005, TDI 2015
Larrea tridentata	Creosote bush	Navy 2005, TDI 2015
Lasthenia gracilis	Needle goldfields	TDI 2015
Lepidium fremontii var. *fremontii*	Fremont's peppergrass	Navy 2005, TDI 2015
Lepidium lasiocarpum ssp. *lasiocarpum*	Shaggyfruit pepperweed	TDI 2015
*Lepidium latifolium**	perennial pepperweed	TDI 2015
Lepidium nitidum var. *howelli*	Peppergrass	TDI 2015
Lepidospartum squamatum	Scale-broom	Navy 2005, TDI 2015
Loeseliastrum matthewsii	Desert calico	Navy 2005, TDI 2015
Lupinus arizonicus	Arizona lupine	Navy 2005, TDI 2015
Lupinus brevicaulis	Short stemmed blue lupine	TDI 2015
Lupinus shockleyi	Desert lupine	TDI 2015
Lupinus sp.	Lupine	TDI 2015
Lycium andersonii	Anderson's desertthorn	TDI 2015
Lycium cooperi	Cooper's box thorn	Navy 2005, TDI 2015
Lycium pallidum var. *oligospermam*	Rabbit thorn	TDI 2015
Malacothrix coulteri	Snake's head	TDI 2015
Malacothrix glabrata	Desert dandelion	Navy 2005, TDI 2015
Mammillaria tetrancistra	Fishhook cactus	Navy 2005, TDI 2015
*Medicago polymorpha**	California burclover	TDI 2015
Mentzelia albicaulis	White-stemmed mentzelia	Navy 2005, TDI 2015
Mentzelia eremophila	Pinyon blazingstar	TDI 2015
Mirabilis laevis	Desert wishbone bush	TDI 2015
Monoptilon bellioides	Mojave desert star	TDI 2015
*Nicotiana glauca**	Tree tobacco	Navy 2005
Oenothera deltoides ssp. *deltoides*	Devil's lantern	Navy 2005, TDI 2015

Scientific Name	Common Name	Reference
Oenothera primiveris ssp. *bufonis*	Large yellow desert primrose	TDI 2015
Opuntia basilaris var. *basilaris*	Beavertail cactus	Navy 2005, TDI 2015
Opuntia bigelovii	Teddy-bear cholla	Navy 2005, TDI 2015
Opuntia echinocarpa	Silver cholla	Navy 2005, TDI 2015
Opuntia ramosissima	Pencil cholla	Navy 2005, TDI 2015
Orobanche cooperi	Cooper's broom rape	TDI 2015
Oxytheca perfoliata	Roundleaf puncturebract	TDI 2015
Palafoxia arida var. *arida*	Spanish-needle	Navy 2005, TDI 2015
Panicum urvilleanum	Panicgrass	Navy 2005, TDI 2015
*Parkinsonia aculeate**	Mexican palo verde	TDI 2015
Pectocarya recurvata	Curvenut combseed	TDI 2015
Petalonyx thurberi var. *thurberi*	Common sandpaper plant	Navy 2005, TDI 2015
Phacelia crenulata var. *ambigua*	Notch-leaved phacelia	TDI 2015
Phacelia crenulata var. *crenulata*	Notch-leaved phacelia	TDI 2015
Phacelia distans	Lacy phacelia	TDI 2015
Phacelia sp.	Phacelia	TDI 2015
Phacelia tanacetifolia	Lacy scorpionweed	TDI 2015
Phacelia vallis-mortae var. *vallis-mortae*	Death Valley phacelia	TDI 2015
Phoradendron californicum	Desert mistletoe	Navy 2005, TDI 2015
Plagiobothrys jonesii	Jones' popcorn flower	TDI 2015
Plagiobothrys sp.	Popcorn flower	TDI 2015
Plantago ovata (=*P. insularis* var. *fastigiata*)	Island plantain	Navy 2005, TDI 2015
Pleuraphis rigida	Big galleta grass	TDI 2015
Pluchea sericea	Arrowweed	TDI 2015
Poa sp.	Bluegrass	TDI 2015
*Polypogon monspeliensis**	Annual beard grass	Navy 2005
Populus fremontii ssp. *fremontii*	Fremont cottonwood	Navy 2005, TDI 2015
Prenanthella exigua	Thorny skeleton plant	TDI 2015
Prosopis glandulosa var. *torreyana*	Honey mesquite	TDI 2015
Psorothamnus arborescens var. *minutifolius*	Small-leaved Mojave indigo bush	Navy 2005, TDI 2015
Rafinesquia neomexicana	Desert chicory	Navy 2005, TDI 2015
*Raphanus raphanistrum**	Jointed charlock	Navy 2005
Rumex hymenosepalus	Canaigre dock	TDI 2015
Salazaria mexicana	Bladder sage	TDI 2015
Salix exigua	Narrow-leaved willow	Navy 2005, TDI 2015

Scientific Name	Common Name	Reference
Salix gooddingii	Goodding's black willow	Navy 2005, TDI 2015
Salix lasiolepis	Arroyo willow	Navy 2005, TDI 2015
Salsola tragus (=*S. iberica*)*	Russian thistle, tumbleweed	Navy 2005, TDI 2015
Salvia columbariae	Chia	Navy 2005, TDI 2015
Sarcostemma cyanchoides ssp. *hartwegii*	Climbing milkweed	Navy 2005, TDI 2015
*Schismus barbatus**	Mediterranean grass	Navy 2005, TDI 2015
Schoenoplectus (=*Scirpus*) *acutus* var. *occidentalis*	Tule	Navy 2005, TDI 2015
Scirpus pungens	Common threesquare	Navy 2005
Senecio flaccidus var. *douglasii* (=*S. douglasii*)	Shrubby butterweed	Navy 2005, TDI 2015
Senecio flaccidus var. *monoensis*	Butterweed	TDI 2015
Senna armata (=*Cassia armata*)	Spiny senna	Navy 2005, TDI 2015
*Sisymbrium altissimum**	Tumbling mustard	TDI 2015
*Sisymbrium irio**	London rocket	TDI 2015
*Solanum elaeagnifolium**	Silverleafnettle	TDI 2015
*Sonchus asper**	Prickly sow-thistle	Navy 2005
Sphaeralcea ambigua var. *ambigua*	Apricot mallow	Navy 2005, TDI 2015
Stephanomeria pauciflora var. *pauciflora*	Wire-lettuce	Navy 2005, TDI 2015
Stillingia paucidentata	Mojave stillingia	TDI 2015
Stillingia spinulosa	Broad leaved stillingia	TDI 2015
Stylocline gnaphaloides	Everlasting nest straw	TDI 2015
Suaeda moquinii	Bush seepweed	Navy 2005, TDI 2015
*Tamarix aphylla**	Athel	Navy 2005, TDI 2015
*Tamarix ramosissima**	Tamarisk	Navy 2005, TDI 2015
Tetradymia stenolepis	Mojave cottonthorn	TDI 2015
Tiquilia plicata	Fanleaf crinklemat	TDI 2015
Tridens muticus	Slim tridens	TDI 2015
Typha domingensis	Southern cattail	Navy 2005, TDI 2015
Ulmus pumila	Siberian elm	Navy 2005, TDI 2015
Unidentified aster	Unidentified aster	TDI 2015
Unidentified forb	"Not medicago"	TDI 2015
Unidentified forb	Basal lvs only	TDI 2015
Xylorhiza tortifolia var. *tortifolia* (=*Machaeranthera t.*)	Mojave aster	Navy 2005, TDI 2015
Yucca schidigera	Mojave yucca	TDI 2015

TDI – Tierra Data Inc.
* Indicates a nonnative species.

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Appendix B. Sensitive Species with the Potential to Occur at MCLB Barstow

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Table B-1. Sensitive Species with the Potential to Occur at MCLB Barstow

Common Name Scientific Name	Habitat	Sensitivity Status	Status
Reptiles			
Western Pond Turtle (*Emys marmorata*)	Ponds and small lakes with abundant vegetation. Also in marshes, slow-moving streams, reservoirs, and occasionally brackish waters.	FSC, CSC	WMP
Mammals			
Mohave Ground Squirrel (*Spermophilus mohavensis*)	Open desert scrub, alkali desert scrub, Joshua trees, and grasslands of the Mojave Desert.	FSC/ST	WMP
Mojave River Vole (*Microtus californicus mohavensis*)	Restricted to moist areas in the Mojave River between Victorville and Helendale. Moist areas including meadows, freshwater marshes, irrigated pastures, ponds, and irrigation canals.	FSC, CSC, BLM sensitive	
Birds			
Least Bell's Vireo (*Vireo bellii pusillus*)	Riparian habitats. Breeds in willow riparian forest supporting a dense, shrubby understory of mulefat (*Baccharis salicifolius*) and other mesic species.	FE/SE	WMP, BCC
Yellow Warbler (*Dendroica petechia*)	Cottonwoods and willows of riparian woodlands or forests with dense understory.	CSC	WMP
Fish			
Mohave Tui Chub (*Gila bicolor mohavensis*)	Mojave River. This occurrence is the result of Mohave tui chub relocations within their native range and was planted in 1975. As of 1987, it was still there, but was not considered a secure occurrence.	FE, SE	
Plants			
Lane Mountain Milkvetch (*Astragalus jaegerianus*)	Joshua Tree woodland, Mojave Desert scrub/granitic, sandy, or gravelly.	FE, CNPS List 1B	
Crucifixion Thorn (*Castela emoryi*) (1)	Mojave Desert scrub.	CNPS List 2	
Mojave Spineflower (*Chorizanthe spinosa*) (5)	Chenopod scrub and Mojave Desert scrub.	CNPS List 4	
White-Bracted Spineflower (*Chorizanthe xanti* var. *leucotheca*) (5)	Pinyon and Juniper woodland, Mojave Desert scrub.	CNPS List 1B	
Clokey's Cryptantha (*Cryptantha clokeyi*) (1)	Mojave Desert scrub, sandy or gravelly soils.	CNPS List 1B	

Common Name Scientific Name	Habitat	Sensitivity Status	Status
Desert Cymopterus (*Cymopterus deserticola*) (5)	Joshua Tree woodland, Mojave Desert scrub/sandy soil.	CNPS List 1B	
Barstow Woolly Sunflower (*Eriophyllum mohavense*) (1)	Chenopod scrub, Mojave Desert scrub, playas.	CNPS List 1B	
Creamy Blazing Star (*Mentzelia tridentata*) (1)	Creosote-bush scrub (3).	CNPS List 1B	
Mojave Monkeyflower (*Mimulus mohavensis*) (1)	Joshua Tree woodland, Mojave Desert scrub/gravelly soil.	CNPS List 1B, BLM sensitive, USFWS species of concern	
White-Margined Beardtongue (*Penstemon albomarginatus*) (5)	Desert dune (stabilized), Mojave Desert scrub.	CNPS List 1B	
Parish's Phacelia (*Phacelia parishi*i) (1)	Clay or alkaline soils, dry lake margins (3).	CNPS List 1B	

FSC – USFWS species of concern; **CSC** – California species of concern; **WMP** – covered species under West Mojave Plan; **ST** – state listed threatened; BLM – Bureau of Land Management; **FE –** federally listed endangered; **SE** – state listed endangered; **BCC** – listed as a bird of conservation concern in need of additional conservation measures by USFWS, **CNPS** – California Native Plant Society; **List 1B** – rare or endangered in California and elsewhere; **List 2** – rare or endangered in California, more common elsewhere; **List 4** – plants of limited distribution; **USFWS** – U.S. Fish and Wildlife Service

Appendix C. MCLB Barstow Five-Year Action Plan: 2017-2021

FORMAT PAGE

Table C-1. MCLB Barstow Five-Year Action Plan: 2017-2021

Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
INRMP Implementation	4.1-1: Ensure POAM are conducted annually. Develop tasks, timelines, and cost estimates	17-21	3	Annual		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.1-2: Develop an Annual Phasing Plan for the POAM of this INRMP.	17-21	3	Annual		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.1-3: Program funding for INRMP annual reviews, as-needed updates, and five-year revisions.	17-21	3	Annual		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.1-4: Provide sufficient natural resource personnel and training to meet the needs of INRMP implementation.	17-21	3	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO P5090.2A, *Environmental Compliance and Protection Manual*

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
NEPA Review	4.2-1: Perform Categorical Exclusion, EA, and/or EIS reviews to (1) identify the potential effects of the proposed action from a local and regional ecosystems management perspective; (2) identify less damaging alternatives; (3) identify other laws and regulations that may be applicable; (4) ensure that adequate mitigation is planned, if required; (5) assess the level of regulatory interface required; and (6) assess consistency with natural resources management goals, objectives, BOs, and conservation programs.	17-21	3	Ongoing		NEPA (42 U.S.C 4321–4370h and 40 CFR 1500–1508); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO P5090.2A, *Environmental Compliance and Protection Manual*
Federal ESA Compliance	4.3-1: Adhere to the conservation measures and relevant avoidance measures identified in current USFWS BOs written for species on MCLB Barstow.	17-21	3	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; MCO P5090.2A, *Environmental Compliance and Protection Manual*; and USFWS BO 1993 (No. 1-8-93-F-16), 1997 (No. 1-8-97-F-20R) as amended 2003 (No. 1-8-97-F-20R), and 2017 (No. ?)
	4.3-2: Manage federally T&E species and their habitats for their conservation and to prevent jeopardy to the species and adverse modification of their critical habitat.	17-21	3	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; MCO P5090.2A, *Environmental Compliance and Protection Manual*; and USFWS BO 1993 (No. 1-8-93-F-16), 1997 (No. 1-8-97-F-20R) as amended 2003 (No. 1-8-97-F-20R), and 2017 (No. ?)

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
	4.3-3: Manage listed species and their habitats in a manner that minimizes impacts to both the mission and the species.	17-21	3	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; MCO P5090.2A, *Environmental Compliance and Protection Manual*; and USFWS BO 1993 (No. 1-8-93-F-16), 1997 (No. 1-8-97-F-20R) as amended 2003 (No. 1-8-97-F-20R), and 2017 (No. ?)
	4.3-4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally T&E species and maintain and update these data.	17-21	2	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.3-5: Develop and maintain a robust GIS database to document the spatial and temporal distribution of listed species and update it as survey data become available.	17-21	2	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO 11000.25, *Installation Geospatial Information and Services*
	4.3-6: Anticipate the need to consult with the USFWS under Section 7(a) of the ESA for any proposed actions on MCLB Barstow that may affect listed species.	17-21	2	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO P5090.2A, *Environmental Compliance and Protection Manual*

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
Threatened or Endangered Species and Critical Habitat	4.4-1: Maintain a database that tracks locations of desert tortoises found on base to assist in planning activities and apply new information from current research to MCLB Barstow's management goals through adaptive management.	17	3	Once		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-2: Assist the USFWS with its range-wide monitoring program within the Ord-Rodman Critical Habitat Unit, which lies adjacent to the Rifle Range.	17-21	3	Annual		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-3: Appoint a USFWS-approved desert tortoise management representative when specified by project requirements associated with proposed new range and training activities.	17-21	2	Varies		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-4: Conduct clearance surveys following USFWS recommendations for the construction of LZs, LHA/LHD sites, access roads, bivouac areas, vehicle loading/refueling areas, and range maintenance and sustainment associated with proposed new range and training activities.	17,18	3	Varies		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
	4.4-5: Evaluate desert tortoise carcasses to attempt to determine the cause of death and track results in the database (see step 4.4-1). Evaluate all common raven's nests and frequently used roost or perch sites on MCLB Barstow to determine whether they are preying on desert tortoises; if desert tortoise carcasses are found, contact the USFWS or USDA Wildlife Services to address the issue.	17-21	3	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-6: Maintain signage to indicate the presence of desert tortoises and outline appropriate activities in desert tortoise habitat associated with proposed new range and training activities.	17-21	3	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-7: Restore degraded/disturbed tortoise habitat with native vegetation associated with proposed new range and training activities.	17-21	3	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-8: Distribute relevant species information to interested parties (e.g., the BLM pamphlet that contains information on status, management, significance, and what citizens can do to help).	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
	4.4-9: Provide natural and cultural awareness training to all personnel who train or conduct activities on the range complex.	17-21	3	Ongoing		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-10: Appropriately mark and delineate critical habitat adjacent to project footprints associated with proposed new range and training activities.	17,18	3	Once		ESA of 1973, as amended (16 U.S.C. 1531, *et seq.*); and USFWS BO 2017 (No. ?)
	4.4-11: Attend regional species and habitat conservation planning events held by organizations such as the Desert Tortoise Management Oversight Group, Desert Managers Group, and Desert Tortoise Council and participate, as appropriate, in regional conservation efforts for the desert tortoise with the USFWS and other partners.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and MBTA of 1918 (16 U.S.C. 703-712)
	4.4-12: Conduct annual surveys for neotropical migratory birds (including southwestern willow flycatchers and least Bell's vireos).	17-21	2	Annual		MBTA of 1918 (16 U.S.C. 703-712)
	4.4-13: Conduct invasive species control in riparian habitat along the Mojave River.	17-21	2	Ongoing		MBTA of 1918 (16 U.S.C. 703-712); EO 13112, *Invasive Species*; and The Noxious Weed Act of 1974 (7 U.S.C. 2801)

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
	4.4-14: Conduct native riparian habitat enhancement along the Mojave River through the outplanting of native riparian species.	17-21	1	Varies		MBTA of 1918 (16 U.S.C. 703-712)
Critical Habitat	No actions.	None	None	None		None
Other Special Status Species	4.6-1: Conduct baseline presence/absence surveys and periodic monitoring for special status species with the potential to occur on MCLB Barstow.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and MBTA of 1918 (16 U.S.C. 703-712)
	4.6-2: Conduct Basewide special status plant species surveys identified as BLM sensitive, CNPS, FWS candidates every five years.	17-21	2	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.6-3: Maintain an updated list of special status plant species with the potential to occur on MCLB Barstow and their sensitivity status.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.6-4: Maintain a cumulative map and record of surveys and findings for special status plant species.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
Migratory Birds and Eagles	4.7-1: Avoid or minimize impacts to migratory birds and eagles and their habitats.	17-21	2	Ongoing		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*; and Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.7-2: During the breeding season, precede all vegetation removal associated with the increase in training and Rifle Range construction with a preconstruction survey conducted by a qualified wildlife biologist.	17-21	2	Varies		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*; and USFWS BO 2017 (No. ?)
	4.7-3: Conduct preclearance surveys prior to the removal of trees or shrubs during the breeding season.	17-21	2	Varies		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
	4.7-4: Conduct periodic mortality surveys in the vicinity of the wind turbine and large solar arrays.	17-21	2	Varies		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
	4.7-5: Prepare educational materials regarding the Base's migratory birds and management practices. Include information on what personnel can do to help, species lists, and activities detrimental to the bird population.	17-21	1	Varies		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)

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	4.7-6: Collect and assess information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation.	17-21	1	Varies		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
	4.7-7: Participate in regional or national inventory and monitoring programs such as the Breeding Bird Survey, Breeding Biology Research and Monitoring Database, Christmas bird counts, bird atlas projects, and game bird surveys where practicable, feasible, and accessible, taking safety and security into consideration.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and MCO P5090.2A, *Environmental Compliance and Protection Manual*
Soil Erosion Prevention and Control	4.8-1: Implement BMPs and soil erosion control measures.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program;* and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.8-2: Identify soil erosion hazards and prioritize restoration activities.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program;* and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.8-3: Keep a record of the most effective BMPs for use in NEPA planning and mitigations. Maintain an updated BMP list.	17-21	1	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program*

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Program Area	Action Step	Year	COLS Level	Frequency	Funding Source	Legal Driver and Comments
	4.8-4: Pursue reasonable and cost-effective means to work with off-Base organizations such as BLM and the County, through Letters of Agreement, MOUs, and contracts to control and prevent soil erosion.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.8-5: Monitor and manage the impacts of training and range maintenance activities on soil resources.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
Water Resources	4.9-1: Cooperate with the Mojave Water Agency, San Bernardino County Flood Control District, and other agencies to consider long-term improvements and long-term maintenance within the Mojave River corridor that would capture stormwater runoff, allowing percolation into the aquifer.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.9-2: Participate in cooperative watershed planning with federal, state, and local agencies.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.9-3: Promote activities and measures that facilitate the reclamation and reuse of wastewater.	17-21	2	Ongoing		EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*

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	4.9-4: Meter water use to provide records of use and incentives for conservation.	17-21	2	Ongoing		EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*
	4.9-5: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural values while continuing federal water rights.	17,18	1	Once		EO 11990, *Protection of Wetlands*
	4.9-6: Protect and maintain local surface water rights by scrutinizing proposed off-site actions in the upper Mojave River watershed that could adversely impact stream flow conditions.	17-21	2	Ongoing		Water Rights Law; and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.9-7: Protect and maintain local groundwater rights by evaluating water rights implications before drilling any new wells on the Base.	17-21	2	Ongoing		Water Rights Law; and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.9-8: Participate in a regional DoD strategy to protect access of military installations in the desert to a reliable and adequate supply of quality water in the context of increased population growth.	17,18	2	Once		EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*

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	4.9-9: Prevent NPS pollution from on-site sources by providing an educational program for personnel to explain NPS concerns.	17-21	2	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
	4.9-10: Initiate BMPs to prevent or treat NPS pollution.	17-21	2	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
	4.9-11: Prevent the burying, dumping, draining, or otherwise disposing of any type of ammunition, explosive material, pyrotechnic, chemical ammunition, or any type of hazardous waste (including oil, fuel, and/or chemicals) onto the ground or into the water at MCLB Barstow.	17-21	2	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
	4.9-12: Support all agencies in eliminating all sources of pollution that may contaminate water quality in the Mojave River system.	17-21	2	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
	4.9-13: Cooperate and coordinate with all governmental agencies, including the Regional Water Quality Control Boards, to apply measures to prevent surface and groundwater pollution.	17-21	2	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.); and DoD Instruction 4715.03, *Natural Resources Conservation Program*

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	4.9-14: Prevent point-source pollution from on-site sources by investigating cross-connections and pretreatment solutions for phenols or boiler discharges coming from industrial sources.	17-21	2	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
	4.9-15: Require wastewater collection and treatment systems that are consistent with the protection of public health and water quality.	17-21	2	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
	4.9-16: Accomplish protective measures to avoid or minimize the destructive effects of floods on Base personnel and resources.	17-21	2	Ongoing		EO 11988, *Flood Plain Management*
	4.9-17: Challenge upstream development practices that may create injury to MCLB Barstow.	17-21	2	Ongoing		EO 11988, *Flood Plain Management*
Vegetation	4.10-1: Update vegetation mapping and GIS data.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO 11000.25, *U.S. Army Installation Geospatial and Services*
	4.10-2: Prevent unnecessary damage of or disturbance to native plant communities through educational awareness and avoidance measures.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*

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	4.10-3: Maintain an inventory of wetlands and monitor changes annually.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; CWA of 1972 (33 U.S.C. Section 1251 *et seq*.); and EO 11990, *Protection of Wetlands*
	4.10-4: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural values while continuing federal water rights.	17,18	1	Once		EO 11990, *Protection of Wetlands*
	4.10-5: Monitor wetland community plant species composition and relative cover, paying particular attention to exotics and invasion by noxious weeds.	17-21	2	Ongoing		EO 11990, *Protection of Wetlands*; EO 13112, *Invasive Species*; and The Noxious Weed Act of 1974 (7 U.S.C. 2801)
	4.10-6: Ensure that activities in the jurisdictional wetlands and waters of the U.S. along the Mojave River are permitted through the USACE. This includes any movement or deposition of soil. Any action affecting the Mojave River requires an environmental review under NEPA.	17-21	3	Ongoing		EO 11990, *Protection of Wetlands*; EO 13112, *Invasive Species*; and DoD Instruction 4715.03, *Natural Resources Conservation Program*
Invasive and Nonnative Plant Species	4.11-1: Remap invasive and nonnative species infestations every three to five years.	17-21	2	Varies		EO 13112, *Invasive Species*; and The Noxious Weed Act of 1974 (7 U.S.C. 2801)

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	4.11-2: Eradicate the giant reed (*Arundo donax*) along the river area in Nebo.	17-21	2	Ongoing		EO 13112, *Invasive Species*; and The Noxious Weed Act of 1974 (7 U.S.C. 2801)
	4.11-3: Target salt cedar (*Tamarisk* spp.) for removal. Target giant reed and salt cedar for eradication as soon as feasible, and other weeds as prioritized in the guidelines of the Mojave Weed Management Area and the 2015 NRI.	17-21	2	Ongoing		EO 13112, *Invasive Species*; and The Noxious Weed Act of 1974 (7 U.S.C. 2801)
	4.11-4: Work with others who are trying to find solutions to the spread of exotic annuals in the desert, which may affect the desert tortoise and create a wildland fuel hazard. Support the implementation of the Mojave Weed Control MOU.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and EO13112, *Invasive Species*
	4.11-5: Educate Base personnel and contractors on the identification of noxious weeds, the importance of noxious weed control, and measures to minimize their spread. Develop a brochure.	17-21	1	Ongoing		EO 13112, *Invasive Species*; and The Noxious Weed Act of 1974 (7 U.S.C. 2801)

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	4.11-6: Ensure construction vehicles coming onto base are clean and free from excessive soil/mud that could carry unwanted seeds or other biological hitchhikers.	17-21	3	Varies		EO 13112, *Invasive Species*; The Noxious Weed Act of 1974 (7 U.S.C. 2801); and USFWS BO 2017 (No. ?)
	4.11-7: Initiate an early detection and rapid response program.	17,18	3	Once		EO 13112, *Invasive Species*; The Noxious Weed Act of 1974 (7 U.S.C. 2801); and USFWS BO 2017 (No. ?)
Wildlife Protection and Management	4.12-1: Define and map habitat values on the Base using ecosystem, landscape ecology, and multispecies concepts. Begin with habitat values for the desert tortoise.	17,18	2	Once		USFWS BO 2017 (No. ?)
	4.12-2: Create a Revegetation Plan. Restore all habitat impacted by construction associated with the increase in training and Rifle Range activities per the Revegetation Plan.	17,18	3	Once		USFWS BO 2017 (No. ?)
	4.12-3: Monitor habitat condition and the effectiveness of management activities.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); DoD Instruction 4715.03, *Natural Resources Conservation Program*; and USFWS BO 2017 (No. ?); and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.12-4: Establish guzzlers (watering systems for wildlife) as appropriate in coordination with the CDFW. Avoid areas managed for desert tortoises due to safety concerns.	18	2	Once		None

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	4.12-5: Update the 2015 NRI every five years as it pertains to general wildlife species. Update the presence, absence, and relative abundance of wildlife in all taxonomic groups, with focused surveys for sensitive species.	20,21	2	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-6: Inventory and monitor pollinator populations. Establish the baseline conditions of pollinators and the plants that support them.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-7: Identify and develop landscapes that benefit pollinators.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-8: Develop BMPs that ensure that pollinators are not adversely impacted by Base activities.	18,19	2	Once		DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-9: Determine the status, health, and habitat use of neotropical migratory birds and raptors, emphasizing certain target or indicator species not currently considered sensitive. In support of Cal-PIF's riparian bird management strategy, consider reproductive success and survival rates when monitoring populations, assessing habitat value, and developing conservation plans.	17-21	2	Ongoing		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*

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	4.12-10: Prioritize riparian sites for protection and restoration according to the means described in the Cal-PIF Riparian Bird Conservation Plan: current indicators of avian population health, proximity to existing high-quality sites, sites with intact adjacent uplands, sites with an intact natural hydrology or the potential to restore the natural processes of the system, and sites with surrounding land use that would not undermine restoration success.	17-21	2	Ongoing		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
	4.12-11: Enhance suitable urban habitats to encourage migratory stopovers.	17-21	2	Ongoing		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
	4.12-12: Monitor the use of stables on the Yermo Annex by birds (e.g., cowbirds) that depredate the nests of sensitive species especially, and provide management intervention if necessary.	17-21	2	Ongoing		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*

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	4.12-13: Limit disturbances during the breeding season. Promote understory and groundcover quality by postponing mowing until after the peak breeding season. If mowing must be done during the breeding season, maintain a low herbaceous layer of no more than 6 inches to discourage birds from nesting. Limit restoration activities and disturbances such as grazing, disking, and herbicide application to the nonbreeding season. When such actions are absolutely necessary during the breeding season, schedule the disturbances to minimize their impacts on nesting birds.	17-21	2	Ongoing		MBTA of 1918 (16 U.S.C. 703-712); BGEPA of 1940 (16 U.S.C. 668); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
	4.12-14: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of mammal species on the Base.	20,21	2	Varies		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-15: Discourage bat inhabitation of occupied buildings through appropriate and biologically acceptable measures. Encourage the relocation of bat colonies to alternative roosting sites.	17-21	2	Ongoing		None

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	4.12-16: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of herpetological species.	20,21	2	Varies		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-17: Develop and implement a study on the habitat use and the needs of herpetological species.	17,18	2	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-18: Conduct repeatable Basewide surveys to develop a baseline for invertebrate diurnal and nocturnal species list, focusing on insects, to determine their abundance and diversity.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.12-19: Conduct feral species abatement when necessary to protect native wildlife from domestic and feral animals.	17-21	2	Ongoing		EO 11987, *Exotic Organisms*
	4.12-20: Conduct educational programs for residents on controlling pets and how to reduce practices that may attract coyotes or ravens to housing areas.	17-21	1	Ongoing		EO 11987, *Exotic Organisms*
	4.12-21: Provide education awareness materials to rotational units and Base personnel on how to employ proper waste management practices.	17-21	1	Ongoing		EO 11987, *Exotic Organisms*

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	4.12-22: Develop raven management procedures.	17-21	2	Ongoing		EO 11987, *Exotic Organisms*
	4.12-23: Reduce the attraction of common ravens and other potential desert tortoise predators to the maximum extent possible. Monitor the progress and outcomes of the updated Desert Tortoise Recovery Plan for the west Mojave Desert and the raven management strategies.	17-21	2	Ongoing		EO 11987, *Exotic Organisms*; and USFWS BO 2017 (No. ?)
	4.12-24: Establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that may adversely impact readiness or military operations by affecting the health of personnel or by damaging structures, material, or property.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program*
Ecosystem Management	4.13-1: Continue to participate in partnerships that manage ecosystems across boundaries.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.13-2: Support research to gain the best available scientific information to guide natural resource and conservation decisions.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*

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	4.13-3: Define and understand MCLB Barstow's regional relevance and responsibility towards regional conservation efforts.	17-21	2	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
Bird/Animal Aircraft Strike Hazard Reduction Program	4.14-1: Create and implement a BASH program if necessary.	17-21	2	Once		DoD Bird/Wildlife Aircraft Strike Hazard (BASH) prevention program
	4.14-2: Update this program as necessary and periodically evaluate possible improvements that might further reduce BASH incidents.	17-21	2	Varies		DoD Bird/Wildlife Aircraft Strike Hazard (BASH) prevention program
Wildland Fire Management	4.15-1: Implement measures as described in the 2016 Wildland Fire Management Plan for MCLB Barstow.	17-21	3	Once		MCO P5090.2A, *Environmental Compliance and Protection Manual*; DoD Instruction 6055.6, *Fire and Emergency Services Program*; Federal Fire Policy (USDI/USDA 1995, revised in 2000); and the National Fire Plan
	4.15-2: Educate military personnel, employees, and the public about the scope and effect of wildland fire management, including fuels management, prevention, hazard/risk assessment, rehabilitation, and the role of fire in ecosystem management.	17-21	2	Ongoing		MCO P5090.2A, *Environmental Compliance and Protection Manual*; DoD Instruction 6055.6, *Fire and Emergency Services Program*; Federal Fire Policy (USDI/USDA 1995, revised in 2000); and the National Fire Plan

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Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies relevant to natural resources in the context of climate change.	17-21	2	Once		DoD Instruction 4715.03, *Natural Resources Conservation Program*; and DoD 2014, *Climate Change Adaptation Roadmap*
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.	17-21	2	Varies		DoD Instruction 4715.03, *Natural Resources Conservation Program*; and DoD 2014, *Climate Change Adaptation Roadmap*
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program*; and DoD 2014, *Climate Change Adaptation Roadmap*
Leases	4.17-1: Develop and implement a system to capture the full cost of supporting tenants. Provide oversight, inspection, and monitoring of outgrants for compliance with environmental protection laws.	17,18	1	Once		None

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Encroachment	4.18-1: Seek public recognition and support for excellent stewardship of the property.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.18-2: Identify through markers, fencing, or signage all of MCLB Barstow's boundaries with safety, security, or resource sensitivity concerns to prevent trespassing and other unlawful activities. Install appropriate signs to deter illegal trash dumping on the Rifle Range.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program*; and USFWS BO 2017 (No. ?)
Outdoor Recreation	4.19-1: Consider the installation of a trail for walking and fitness along the river.	17,18	1	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.19-2: Develop a "viewing station" and interpretive panel for natural resource values or restoration and enhancement projects.	17,18	1	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.19-3: Eliminate unauthorized off-road vehicle use.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
Conservation Education and Awareness	4.20-1: Provide a clear, concise manual of environmental precautions and restrictions to be used by personnel. The manual should be reviewed annually.	17-21	1	Annual		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*

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	4.20-2: Support a natural resource orientation program for new personnel.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.20-3: Educate personnel about resources to support land management goals by way of classes, workshops, displays in communal areas, literature, and signs.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.20-4: Identify and evaluate suitable interpretive opportunities on MCLB Barstow, such as promoting the development of recreational, scenic, and historic trails for people with diverse interests and abilities.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
Public Outreach	4.21-1: Submit materials for DoD and other environmental awards. Research potential awards, identify criteria, and develop a schedule for submission.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*
	4.21-2: Support Public Visitation Days by providing information, lectures, slideshows, and tours, if appropriate.	17-21	1	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*

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Cultural Resources	4.22-1: Evaluate potential impacts to cultural resources resulting from projects or activities that involve ground-disturbing activities.	17-21	3	Ongoing		NHPA of 1966 (16 U.S.C. 470); and ARPA of1979 (43 CFR 7)
Construction	4.23-1: Evaluate and minimize potential impacts to natural resources resulting from construction by using the NEPA process.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and MCO P5090.2A, *Environmental Compliance and Protection Manual*
	4.23-2: Develop the minimum network of roads needed to meet requirements for military readiness, safety and security, fire control, and environmental protection.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.23-3: Develop a 5- to 10-year Long-Term Maintenance Plan.	17,18	2	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.23-4: Develop a list of appropriate mitigation practices for routine maintenance.	17,18	2	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.23-5: Monitor resource conditions and the effectiveness of BMPs as mitigation.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)
	4.23-6: Develop contingency plans for emergency maintenance activities that may impact natural resources.	17,18	2	Once		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*)

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Landscaping and Grounds Maintenance	4.24-1: Conduct an irrigation system audit.	17,18	2	Once		BEAP 2016; EO 13148, *Greening the Government through Leadership in Environmental Management*; and EO 13123, *Greening the Government through Efficient Energy Management*
	4.24-2: Continue to reduce water wastage on lawns. Continue to limit the use of lawns where at all possible; use xeriscaping instead of lawns where at all possible.	17-21	2	Ongoing		BEAP 2016; EO 13148, *Greening the Government through Leadership in Environmental Management*; and EO 13123, *Greening the Government through Efficient Energy Management*
	4.24-3: Reduce use of water for landscaping while continuing to provide a high-quality living environment for Base personnel.	17-21	2	Ongoing		BEAP 2016; EO 13148, *Greening the Government through Leadership in Environmental Management*; and EO 13123, *Greening the Government through Efficient Energy Management*
	4.24-4: For all landscaping projects, use a palette of native plants that are suitable for the local climate, dry soils, and low level of maintenance funding found at the Base. Plant material should be used to resolve site problems as well as to improve the overall aesthetics of the site.	17-21	2	Ongoing		BEAP 2016; EO 13148, *Greening the Government through Leadership in Environmental Management*; and EO 13123, *Greening the Government through Efficient Energy Management*
Environmental Permitting	4.25-1: Comply with the CWA Section 404 permit and Section 401 state water quality certification if a project may affect a floodplain, wetland, or watercourse.	17-21	3	Ongoing		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.); and MCO P5090.2A, *Environmental Compliance and Protection Manual*

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	4.25-2: Seek and obtain regional 404 permits (four months in advance) from the USACE, if needed.	17-21	3	Varies		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
	4.25-3: Obtain a five-year regional permit for all routine maintenance practices, if beneficial and needed.	17-21	2	Once		CWA of 1972 (33 U.S.C. Section 1251 *et seq*.)
Geographic Information Services Management	4.26-1: Continue the development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.	17-21	2	Ongoing		DoD Instruction 4715.03, *Natural Resources Conservation Program*; and MCO 11000.25, *U.S. Army Installation Geospatial and Services*
Law Enforcement Systems	4.27-1: Establish and maintain adequate control measures (e.g., signs, gates, fences) to provide for security, safety, and protection of natural resources.	17-21	2	Ongoing		Sikes Act Improvement Act, as amended through 2003 (16 U.S.C. 670a, *et seq.*); and DoD Instruction 4715.03, *Natural Resources Conservation Program*

FY – Fiscal Year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **POAM** – Projects, Objectives, Actions and Milestones; **DoD** – Department of Defense; **MCO** – Marine Corps Order; **NEPA** – National Environmental Policy Act; **CFR** – Code of Federal Regulations; **EA** – Environmental Assessment; **EIS** – Environmental Impact Statement; **U.S.C.** – United States Code; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **MCLB** – Marine Corps Logistics Base; **No.** – Number; **T&E** – Threatened and Endangered; **GIS** – Geographic Information System; **LZ** – Landing Zone; **LHA** – Landing Helicopter Assault; **LHD** – Landing Helicopter Dock; **BLM** – Bureau of Land Management; **MBTA** – Migratory Bird Treaty Act; **EO** – Executive Order; **BGEPA** – Bald and Golden Eagle Protection Act; **BMP** – Best Management Practice; **MOU** – Memorandum of Understanding; **CWA** – Clean Water Act; **NPS** – Non-point Source; **USACE** – United States Army Corps of Engineers; **NRI** – National Resources Inventory; **CDFW** – California Department of Fish and Wildlife; **Cal-PIF** – California Partners in Flight; **BASH** – Bird/Animal Aircraft Strike Hazard; **NHPA** – National Historic Preservation Act; **ARPA** – Archaeological Resources Protection Act; **BEAP** – Base Exterior Architecture Plan. "USFWS BO 2017 (No. ?)" is in draft form and waiting for finalization.

Appendix D. Results of Annual Review

FORMAT PAGE

Appendix E. Biological Opinions for MCLB Barstow

FORMAT PAGE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
Ventura Field Office
2140 Eastman Avenue, Suite 100
Ventura, California 93003

August 12, 1993

Timothy A. Burr
Manager, Natural Resources Branch
Naval Facilities Engineering Command
Southwest Division
Department of the Navy
1220 Pacific Highway
San Diego, California 92132-5190

Subject: Biological Opinion for Operations and Maintenance of the Marine Corps Logistic Base, Barstow, San Bernardino County, California (CA-932.5, 1-8-93-F-16)

Dear Mr. Burr:

This biological opinion responds to your request for formal consultation with the Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated May 25, 1993, and received by us on May 27, 1993. At issue are impacts resulting from proposed operation and maintenance of the Marine Corps Logistic Base (MCLB), Barstow, San Bernardino County, California, which may affect the desert tortoise (Gopherus agassizii), a federally listed threatened species.

This biological opinion was prepared using information from the following sources: your May 25, 1993, request for consultation and accompanying documentation, informal consultation between our staffs, and our files.

Biological Opinion

It is the opinion of the Service that the proposed project is not likely to jeopardize the continued existence of the desert tortoise. Critical habitat has not been designated for the Mojave population of the desert tortoise in California; therefore, no critical habitat will be affected by the proposed action.

Description of the Proposed Action

Operations and maintenance at MCLB can be divided into activities occurring roughly north and south of Interstate 40 (Figure 1). North of Interstate 40 are mainly industrial facilities and residential areas of the Yermo Annex and portions of the Nebo Annex. Desert tortoises have not been recorded in these areas, therefore, the Navy's Southwest Division has determined activities north of Interstate 40 will not affect the desert tortoise (Bill Fisher, Southwest Division, personal communication, 1993).

This consultation addresses activities on MCLB south of Interstate 40. The Marine Corps Rifle Range, and a fenced portion of the Nebo Annex, including an amphibious vehicle test facility and residential, administrative, and industrial facilities, are located in this portion of MCLB. Proposed operations and maintenance activities include:

Rifle Range Operations

(1) Marine Corps requalification firing, including rifle and pistol firing, would be conducted one week per month. Firing would occur at the 200, 300, 500, and 600 yard positions on the rifle range. The M16-A2 and 5.56mm rifle, and the M1911-A1 and .45 caliber pistol would be used during qualification firing.

(2) California Highway Patrol Weapons training would be conducted on the 100 yard range about 4 days per month with .40 caliber pistols. Additional training would be conducted on a semi-annual basis with 5.56mm rifles and 4 times per year with 12 gauge shotguns.

(3) A civilian gun club would use the range every third Sunday of each month. Firing would occur on the 100 yard range with .22, .38, and .45 caliber pistols and .30 caliber and 5.56mm rifles. Use of pistols and rifles would not occur on the same day, but would be alternated monthly.

Rifle Range Maintenance

(1) Grading of the access road and parking lot of the rifle range would be accomplished semi-annually or on an as needed basis after severe storms. Only the existing road bed would be graded.

(2) The firing berms would be maintained as needed to repair eroded sections or trim vegetation that grows in the live fire lanes between the berms that interferes with qualification training. All such maintenance would be accomplished with hand tools.

(3) The existing wooden barrier on the west side of the 50-yard range would be replaced with an earthen berm. Material to construct the berm would be excavated from the Nebo or Yermo Annexes.

Nebo Annex Operations

(1) About 20 amphibious vehicles would be tested each month in a concrete-lined pond located inside the fenced Nebo Annex. During testing, vehicles would be driven in the pond and on the perimeter road which is located just inside the Nebo Annex perimeter fence.

(2) Security forces would patrol the Nebo perimeter road each day.

(3) A contaminants identification and disposal program would occur on about 400 acres within the fenced Nebo Annex. Affected lands would be excavated to remove contaminants, including heavy metals, aromatic hydrocarbons, sodium-filled valves, and other hazardous materials.

Nebo Annex Maintenance

(1) Grading of roads within the Nebo Annex would take place on a regular basis and as needed to maintain the roadways. The perimeter road would be graded monthly or as needed after storms.

(2) The fenced portion of the Nebo Annex (Figure 1) may require major ground-disturbing activities to effect cleanup of contaminants.

Southwest Division proposes the following measures to reduce the effects of these operations and maintenance activities on the desert tortoise:

(1) Two signs would be posted along the rifle range access road indicating that desert tortoises may be present and that the maximum speed is 20 miles per hour.

(2) Two signs would be posted at the rifle range parking lot warning all vehicle operators to check under vehicles for desert tortoises prior to moving any vehicle.

(3) Construction vehicles would observe speed limits not to exceed 20 miles per hour on roads to and from the rifle range. Before moving any vehicle, vehicle operators shall inspect under vehicles for desert tortoises.

(4) The Navy and/or Marine Corps will implement a worker/user education program concerning desert tortoises and these mitigation measures.

(5) No off-road vehicles would be permitted on the rifle range.

(6) Any action other than stated above that may affect the desert tortoise will be coordinated through Southwest Division wildlife biologists to minimize harm to the affected animals.

Effects of the Proposed Action on the Listed Species

Species Account

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered. In a final rule dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened. The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. The threatened Mojave population is found in California, Nevada, and north of the Colorado River in Arizona and southwestern Utah. In the California deserts, desert tortoises are most active during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and after infrequent summer monsoons. Desert tortoises spend the remainder of the year in burrows, escaping the extreme weather conditions of the desert.

The Service recently issued a draft recovery plan for the Mojave population of the desert tortoise (Brussard et al. 1993). This draft plan proposes the establishment of 14 Desert Wildlife Management Areas (DWMA) in six recovery units. Management in DWMAs would target the reduction or elimination of those factors which have caused declines in desert tortoise populations. The boundaries of proposed DWMAs are not precisely defined in the draft plan, but would be established by land management agencies in coordination with the Service, California Department of Fish and Game, and others. However, the proposed project is near the northern boundary of the Ord-Rodman DWMA and portions of the MCLB, particularly along its southern boundary, could be targeted for management actions to protect desert tortoises.

The Service is also preparing a proposed rule to designate critical habitat for the Mojave population of the desert tortoise. This proposed rule is scheduled to be published in the Federal Register in early September, 1993.

Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Turner et al. (1984), Weinstein et al. (1987), and Brussard et al. (1993).

Description of the Environment

The project site lies in the Mojave Desert of California just southeast of Barstow. The terrain on MCLB south of Interstate 40 slopes up into the foothills of the Ord Mountains and is bisected by a number of drainages, including Daggett Wash which traverses the southeast corner of MCLB. Vegetation is described as the creosote series of Mojave desertscrub by Turner (1982). This community type is open and characterized by relatively low perennial diversity. Dominant species include creosote (Larrea tridentata) and bursage (Ambrosia dumosa) (Turner 1982). Species diversity increases in the foothills of the Ord Mountains where drainages and rocky slopes create microhabitat sites for a variety of perennial shrubs.

About 260 acres at MCLB were surveyed for desert tortoises from April 27-30, 1992 (enclosure 2 of the letter initiating consultation). One hundred percent surveys, consisting of walking parallel transects every 30 feet, were conducted at the rifle range (170 acres), and Installation and Restoration sites A (29 acres), B (26 acres), and C (35 acres) (Figure 1). A total of 224 corrected sign, including 30 live desert tortoises, 130 cover sites, and 11 shells, was found during the surveys. All but 4 of the live animals were found at the rifle range.

These survey results document moderate to high densities of desert tortoises at MCLB south of Interstate 40, particularly at the rifle range. Installation and Restoration site C lies inside the fenced Nebo Annex and may be the only area within the fence which supports desert tortoises. One juvenile was found at this site and no more than six desert tortoises are thought to be present in the fenced area. No more than an estimated 200 acres within the fence is suitable desert tortoise habitat.

Lands on MCLB north of Interstate 40 are primarily in industrial or residential use. Little if any suitable habitat exists on MCLB north of Interstate 40 and no desert tortoises have been recorded there. Desert tortoises are infrequently observed north of Interstate 40 near Daggett and south of the Yermo Annex (Bill Fisher, pers. comm., 1993).

MCLB lies just north of or on the boundary of the proposed Ord-Rodman DWMA. Lands immediately south of MCLB are category 2 desert tortoise habitat which typically support medium to high

densities of desert tortoise, may be essential to maintenance of viable populations, and are managed for the benefit of the desert tortoise (Bureau of Land Management 1992). Estimated densities in the Ord-Rodman DWMA vary from 5 to 150 adult desert tortoises per square mile (Brussard et al. 1993).

Analysis of the Impacts

The proposed action consists mainly of operations and maintenance activities which would affect previously disturbed areas. The exception is the proposed contaminant disposal program in the fenced Nebo Annex. Of the estimated 400 acres to be disturbed by this activity, about 200 acres is marginal desert tortoise habitat. Southwest Division proposes to move all desert tortoises in the fenced area to the rifle range. An estimated 6 desert tortoises occur within the fence and would be affected by this action.

Although other activities occur on previously disturbed sites and would adversely affect little habitat, desert tortoises occur in and adjacent to these areas would be in danger of being crushed or injured by vehicles and equipment, could be collected by personnel or visitors to the area, and would be subject to accidental shooting on the rifle range. In addition, at least 8 desert tortoise cover sites occur in the berms of the rifle range. Maintenance of the berms could result in the destruction of these burrows and possibly result in mortality or injury of desert tortoises occupying those burrows.

Common ravens (Corvus corax) are efficient predators of desert tortoises (Campbell 1983, Miller 1932) and are attracted to refuse, water sources, and perching or nesting sites. Refuse generated by human activities, water (especially at the amphibious vehicle test facility), and perching or nesting sites such as signposts and powerlines may attract common ravens to the project site and increase predation of desert tortoises. Other predators, particularly the coyote (Canis latrans), are also attracted to refuse and water and could contribute to elevated predation rates.

The Service believes the impacts described above will not jeopardize the continued existence of the desert tortoise. We present this conclusion for the following reasons:

1. The proponent's project description includes features to minimize take of desert tortoises and mitigate the direct and indirect impacts of the proposed action.

2. Most activities proposed are ongoing activities occurring in previously disturbed areas.

3. The area which would be disturbed by the project is limited in size and impacts resulting from the project would not contribute to further fragmentation of desert tortoise populations.

Cumulative Effects

Cumulative effects are those impacts of future State and private actions that are reasonably certain to occur in the project area. Future Federal actions would be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project. Due to the extent of the lands in this area of the Mojave Desert administered by the Department of Defense and the Bureau of Land Management, most of the actions which are reasonably expected to occur within the vicinity of the project site would be subject to section 7 consultations. However, some lands near the project site, particularly to the north in and around Barstow, are privately owned and continued development of these non-Federal lands is anticipated.

The Service has contacted the Counties of San Bernardino, Kern, Riverside, Inyo, and Los Angeles (and the incorporated areas within the desert) regarding the listing of the desert tortoise and its implications for city and County-permitted activities. Many cities within the range of the desert tortoise in San Bernardino, Los Angeles, and Kern Counties have expressed interest in attempting to obtain a section 10(a)(1)(B) permit from the Service. Regional planning efforts, such as the West Mojave Coordinated Management Plan, could serve as model habitat conservation plans for local governments. Cumulative impacts of future State and private projects will be addressed in regional plans, such as this, and in the section 10(a)(1)(B) permit process.

Incidental Take

Section 9 of the Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with this incidental take statement. Reasonable and prudent measures, as well as terms and conditions in this biological opinion, are

nondiscretionary and must be undertaken by the agency or made a binding condition of any grant or permit, as appropriate.

This biological opinion anticipates the following forms of take:

1) Two desert tortoise per year in the form of direct mortality due to crushing by vehicles or as a result of other proposed activities.

2) Two desert tortoises in the form of direct mortality resulting from increased predator densities and elevated predation of desert tortoises induced by the project.

2) Ten desert tortoises through harassment associated with excavation of active burrows or movement of desert tortoises found above ground which must be moved out of harm's way.

This biological opinion does not authorize any form of take not incidental to those maintenance and operation activities at MCLB south of Interstate 40 described in the proposed action section of this biological opinion. If the incidental take authorized by this opinion is met, Southwest Division shall immediately notify the Service in writing. If the incidental take authorized by this opinion is exceeded, the activity resulting in the take shall cease and Southwest Division shall reinitiate formal consultation with the Service.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take authorized by this biological opinion:

1. Worker education programs, defined work and construction areas, and well-defined operational procedures shall be implemented.

2. Contaminant disposal at the fenced portion of the Nebo Annex shall be preceded by relocation all desert tortoises from within the fenced area. The Nebo Annex perimeter fence shall be equipped with desert tortoise-proof fencing prior to moving the desert tortoises.

3. Attraction of common ravens and other potential desert tortoise predators to the project area shall be reduced to the maximum extent possible.

Terms and Conditions

The following terms and conditions are established to implement the reasonable and prudent measures described above. Terms and

conditions 1 through 6 and 18 are taken from proponent's letter of initiation of consultation, but contain slight modifications or added detail.

(1) Two signs shall be posted along the rifle range access road indicating that desert tortoises are present and maximum speed limit is 20 miles per hour.

(2) Two signs shall be posted at the rifle range parking lot warning all vehicle operators to check under vehicles for desert tortoises prior to moving any vehicle.

(3) Construction vehicles shall observe speed limits not to exceed 20 miles per hour on access roads to the rifle range.

(4) The project proponent shall implement a worker/user education program concerning the desert tortoise and the stated mitigation measures. All personnel who implement actions authorized by this biological opinion shall be briefed on the status of the desert tortoise and protection measures designed to reduce potential impacts to this species. Personnel shall be advised that handling, harming, or harassing desert tortoises without specific authorization is a violation of the Act. Personnel shall also be advised of the penalties of up to a $25,000 and six months in prison for taking a listed species without a permit. Handouts summarizing this information shall be provided to all personnel implementing actions which may result in a take of desert tortoises.

(5) No off-road vehicles shall be permitted on the rifle range.

(6) Any action other than stated in terms and conditions 1 through 5 that may affect the desert tortoise shall be coordinated through Southwest Division wildlife biologists to minimize harm to the affected animals.

(7) Southwest shall designate a "field contact representative" (FCR) who will be responsible for overseeing compliance with these terms and conditions. The FCR shall have the authority to halt all construction, operation, and maintenance activities that are in violation of terms and conditions. The FCR shall have a copy of all terms and conditions.

(8) Only biologists authorized by the Service shall handle desert tortoises. The Service authorizes Michael Coffeen and Bill Fisher of Southwest Division to handle desert tortoises at MCLB. If others are needed to handle desert tortoises, Southwest Division shall submit the name(s) and qualifications of the

proposed authorized biologist(s) to the Service for review and approval.

(9) No more than 24 hours prior to construction of the soil berm at the 100 yard range of the rifle range, a qualified biologist (a biologist trained and experienced in desert tortoise survey techniques) shall survey all construction areas for desert tortoises. Any desert tortoises found which might be injured or killed by construction activities shall be moved by an authorized biologist (see term and condition 3 above for definition) pursuant to terms and conditions 14 and 15.

(10) Maintenance of the firing berms and trimming of vegetation on the berms and in the firing lanes between the berms shall be accomplished by personnel briefed on the status of the desert tortoise, pursuant to term and condition 4. Such personnel shall also be instructed on the identification of desert tortoise burrows by a qualified biologist. To the extent possible, maintenance activities shall avoid disturbance to desert tortoises and their burrows. If disturbance to burrows or desert tortoises is unavoidable, an authorized biologist(s) shall be on-site during such disturbance to ensure compliance with these terms and conditions.

(11) Southwest Division shall construct a desert tortoise-proof fence at the base of the existing Nebo Annex perimeter fence. The fence shall consist of 0.5-inch mesh hardware cloth fastened securely to the outside of the chain link fence. The hardware cloth shall extend 18 inches above the ground and 12 inches below the surface of the ground. Where burial of the hardware cloth is not possible, the lower 12 inches shall be folded outward and fastened to the ground so as to prevent desert tortoise entry. No contaminant disposal activities which may result in a take of desert tortoise shall occur prior to tortoise-proof fencing unless a biological monitor is on-site to insure such activity would not endanger desert tortoises.

(12) Following desert tortoise-proof fencing, an authorized biologist(s) shall survey the entire enclosed area and relocate any desert tortoises found above ground or excavated by hand from burrows pursuant to terms and conditions 14 and 15. All desert tortoise cover sites within the fence shall be examined for occupancy. Unoccupied cover sites and those from which desert tortoises are removed shall be collapsed to prevent further use. When fencing is complete, and the authorized biologist(s) has removed all desert tortoises from the fenced area, construction activities inside the fence may proceed without the presence of a biological monitor.

(13) No off-road vehicles shall be allowed on the rifle range. To the extent possible, vehicles shall be restricted to

existing roadways within MCLB south of Interstate 40, including the fenced Nebo Annex prior to construction of the desert tortoise-proof fence and relocation of desert tortoises within the fenced area.

(14) The boundaries of the 50-yard berm construction areas shall be clearly marked with flagging or stakes. All construction workers shall strictly limit their activities and vehicles to marked areas to eliminate adverse impacts to desert tortoises. All workers shall be instructed that their activities are restricted to marked areas.

(15) Construction areas shall be modified, if possible, to avoid direct impacts to desert tortoises and their burrows. If a desert tortoise or its burrow is found in an area to be disturbed by construction, the qualified or authorized biologist shall work with the construction supervisor to take steps as necessary, including minor relocation of project features, to avoid damaging a burrow or disturbing a desert tortoise. For burrows outside of the actual area of disturbance, the biologist shall consider the direction the burrow runs, and that burrows may be as long as 30 feet, in determining whether or not action is necessary to avoid take. Any hazards to desert tortoises that may be created, such as trenches, shall be monitored at least twice daily for desert tortoises which might become entrapped.

(16) If desert tortoises are found above ground or within burrows in areas to be disturbed by construction, operation, or maintenance activities, and it is not possible to avoid such disturbance, these desert tortoises shall be relocated by an authorized biologist a short distance away from the construction zone to habitat which will not be disturbed by further activities. All excavation of desert tortoise burrows shall be done by hand tools, either by or under the direction of a qualified biologist. If activities are short in duration, the authorized biologist may elect to hold the desert tortoise overnight pursuant to term and condition 17 and release the animal the next day at or near the point of capture after activities have been completed. If the relocation is not in the season of above-ground activity, the desert tortoise shall be moved on a seasonably warm day and placed at the mouth of a burrow of appropriate size. If the desert tortoise does not enter the burrow, or a burrow is not available, an artificial burrow shall be constructed and the desert tortoise placed within it. Artificial burrows shall be at least 6 feet in length and of the same diameter, depth, and orientation as the one in which the desert tortoise was found or as appropriate for the size of the subject desert tortoise. Wood or plastic materials may be used to strengthen the tunnel and/or chamber of the burrow. If the relocation occurs in the season of above-ground activity, the desert tortoise shall be placed in the mouth of a burrow of

appropriate size or in the shade of a large shrub. In coordination with the Service, the authorized biologist(s) shall be allowed some judgement and discretion to ensure that survival of the desert tortoise is likely.

(17) All relocated desert tortoises shall be marked for future identification. An identification number using the acrylic paint/epoxy covering technique shall be placed on the fourth left costal scute as described in Arizona Game and Fish Department et al. (1991). No notching is authorized. New latex gloves shall be used when handling each desert tortoise to avoid the transfer of infectious diseases between animals. Replacement of lost fluids with a syringe is not authorized. If a desert tortoise needs to be moved within three hours of nightfall, or when ambient temperatures are extremely low (i.e., less than 40 degrees Fahrenheit) or high (exceeds 90 degrees Fahrenheit), it shall be placed in a clean disposable cardboard box and held overnight in a cool location. The box shall be covered and kept in possession of a qualified biologist for release of each desert tortoise the next morning in the manner described in term and condition 16. Cardboard boxes used to hold desert tortoises shall be new, used once, and discarded. All materials which come into contact with desert tortoises shall be used only once and then properly discarded to minimize contact with the causative factor(s) for upper respiratory tract disease or other diseases.

(18) Prior to moving a vehicle, workers shall inspect for desert tortoises under the vehicle. If a desert tortoise is present, the authorized biologist shall carefully move the desert tortoise out of harm's way pursuant to terms and conditions 16 and 17. Alternatively, the authorized biologist shall direct the movement of the vehicle only when the desert tortoise would not be injured, or the desert tortoise shall be allowed to move out from under the vehicle on its own.

(19) All trash and food items shall be promptly contained within closed, raven-proof containers. The containers shall be regularly emptied and/or removed from the project site to reduce attractiveness of the area to ravens and other desert tortoise predators.

(20) An annual monitoring report shall be prepared and delivered to the Service's Ventura Field Office on or before January 15 of each year. The report shall briefly outline the effectiveness of the desert tortoise mitigation measures, the number of desert tortoises moved from construction sites, any mortality or injury to desert tortoises, and the actual acreage of desert tortoise habitat destroyed. The report shall make recommendations for modifying or refining these terms and conditions to enhance desert tortoise protection and reduce needless hardship on the Navy.

Disposition of Dead, Injured, or Sick Desert Tortoises

Upon locating dead, injured, or sick desert tortoises, initial notification must be made to the Service's Law Enforcement Office in Torrance, California at (310) 297 0062 within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. The notification shall be sent to the Service's Torrance office with a copy to the Ventura Field Office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. If possible, the remains of intact desert tortoises shall be placed with educational or research institutions holding appropriate State and Federal permits. If such institutions are not available or the shell has been damaged, the information noted above shall be obtained and the carcass left in place. Marking the carcass in a manner that would not be toxic to other wildlife to ensure that it would not be re-recorded in the future, should be considered.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution prior to disposition. Injured animals should be transported to a qualified veterinarian by an authorized desert tortoise biologist. Should any treated desert tortoises survive, the Service should be contacted regarding the final disposition of the animals.

Conservation Recommendations

In furtherance of the purposes of sections 2(c) and 7(a)(1) of the Act that mandate Federal agencies to utilize their authorities to carry out programs for the conservation of listed species, we recommend implementing the following actions:

1. Southwest Division should monitor the movements, survivorship, and condition of relocated desert tortoises to evaluate the effectiveness of the relocation. This information could be used to develop more successful relocation techniques.

2. Southwest Division and the Marine Corps should consider the development of a desert tortoise management plan for the southern boundary of the MCLB, particularly in T. 9 N., R. 1 W., sect. 26 and T. 9 N., R. 1 E., sect. 30. The plan would identify prohibitions and management actions necessary to maintain a viable population of desert tortoises on the southern boundary of the MCLB.

The Service requests notification of the implementation of any conservation recommendations so we can be kept informed of

actions that either minimize or avoid adverse effects, or that benefit listed species or their habitats.

Conclusion

This concludes formal consultation on operations and maintenance activities at the Marine Corps Logistics Base, San Bernardino County, California. Reinitiation of formal consultation is required if: 1) the amount or extent of incidental take is reached; 2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16). Any questions or comments should be directed to Jim Rorabaugh of the Ventura Field Office at (805) 644-1766.

Sincerely,

Raymond Brandt

Craig Faanes,
Acting Field Supervisor

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

June 10, 1997

Michael C. Stroud
Lead, Natural/Cultural Resources
Naval Facilities Engineering Command
Southwest Division
Department of the Navy
1220 Pacific Highway
San Diego, California 92132-5190

Subject: Biological Opinion for Maintenance and Upgrade of Firearms Ranges and Construction of a Desert Tortoise Fence on the Marine Corps Logistics Base, Barstow, San Bernardino County, California (1-8-97-F-20R)

Dear Mr. Stroud:

This biological opinion responds to the Navy's Southwest Division's request for an amendment to the existing Biological Opinion for Operations and Maintenance of the Marine Corps Logistics Base (MCLB), Barstow, San Bernardino County, California (1-8-93-F-16) pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). Your request was dated March 13, 1997 and received by us on March 15, 1997. At issue are impacts that improvements to the firearms ranges and installation of a desert tortoise fence around the MCLB housing area may have on the desert tortoise (Gopherus agassizii), a federally listed threatened species.

The Service reviewed the information contained in the amendment request and the subject biological opinion, met with Art Gleason of the MCLB staff and toured the project sites. Based on this information the Service determined that the proposed action is beyond the scope of an amendment to the existing biological opinion and that formal consultation on the proposed projects was necessary.

This biological opinion was prepared using information accompanying your March 13, 1997 request for amendment, informal consultation between Service and MCLB staff, a site visit, the previous programmatic biological opinion and information contained in our files.

Biological Opinion

It is the opinion of the Service that the proposed actions are not likely to jeopardize the continued existence of the desert tortoise. The proposed actions are not located within critical habitat of the desert tortoise. Therefore, critical habitat would not be affected by the proposed actions.

Description of the Proposed Action

The Navy's Southwest Division proposes to perform five different ground disturbing activities on MCLB.

1. Mine lead in range impact areas: This project would consist of removing the accumulated lead in the firing butts of the 100-yard pistol and rifle ranges. It would require the use of heavy earthmoving equipment to remove and sift the soil of the impact area, and to restore the butts to their original shape.

2. Level the bottom of the 100-yard range: To nearly double its usable width, this project would lower the southeast floor of the 100-yard range. Earth removed from the floor of this range would be used to restore the butts, as well as provide fill material for the following projects.

3. Raise the height of the safety berms on the sides of the pistol range: This project would make the currently sloping top of the two pistol range side berms level with the target butts to increase firing safety. Fill dirt would come from the lowering of the floor of the adjacent 100-yard range and would not require widening of the base of the berms.

4. Add a vehicle lane on the east side of the 200-, 300-, and 500-yard lines: This project would add a single lane along the backside of the rifle range to the center of the 200-, 300-, and 500-yard lines to permit access for a communications truck and the armorer's truck. These two vehicles currently block the Range Officer's view of the shooters to his left during firing, creating a safety hazard.

5. Construct a desert tortoise fence around the housing area: This project would extend the existing desert tortoise fence around the southern border of the Nebo facility to enclose the base housing area on the west end. It would tie to the existing fence on the Service Rock property boundary at the northwest corner of the Base. . condition of the already completed transfer of title of the land immediately west of Base Housing from the Bureau of Land Management to Service Rock, stipulates that Service Rock will c nstruct a dirt berm and windbreak on MCLB land to the west of housing before it extends its quar y southward. While the amendment request letter states that " A permanent tortoise fence would incl ude that windbreak", conversations with Art Gleason of MCLB indicate the statement is incorre t. The earthen berm would be constructed outside the tortoise fence.

The tortoise fence would be constructed using the existing chain link fence. A ditching machine would be used on the interior of the fence to dig a ditch about one foot away from the existing fence and 18 inches deep. Three foot wide, one half inch mesh hardware cloth would be angled from the ditch toward and attaching to the chain link fence. Approximately one foot of the hardware cloth would remain underground.

In the Navy Southwest Division's request for consultation, in addition to the permanent fencing noted above, it proposes to erect temporary fencing at the other project site and to use standard on-site measures for the protection and preservation of desert tortoises. The MCLB requested that the Service incorporate the appropriate measures from the Biological Opinion for Operations and Maintenance of the Marine corps logistics Base, Barstow, San Bernardino Counties, California (1-8-93-F-16, included as Appendix A).

Effects of the Proposed Action on the Listed Species

Species Account

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mojave desertscrub, and the lower Colorado River Valley subdivision of Sonoran desertscrub. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from two to eight inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Turner 1982, and Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Live desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986).

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend the remainder of the year in burrows, escaping the extreme conditions of the desert. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994).

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered. In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened. The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994.

Critical habitat is designated by the Service to identify the key biological and physical needs of the species and key areas for recovery, and focuses conservation actions on those areas. Critical habitat is composed of specific geographic areas that contain the biological and physical attributes that are essential to the species' conservation within those areas, such as space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats. These features are called the constituent elements of critical habitat.

The specific constituent elements of desert tortoise critical habitat are as follows: 1) sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality (59 FR 5820).

The recovery plan, which was published in June 1994, is the basis and key strategy for recovery and delisting of the desert tortoise (Service 1994). The plan divides the range of the desert tortoise into six distinct population segments or recovery units and recommends establishment of 14 Desert Wildlife Management Areas throughout the Recovery Units. Within each Desert Wildlife Management Area, the recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The design of Desert Wildlife Management Areas should follow accepted concepts of reserve design. As part of the actions needed to accomplish recovery, land management within all Desert Wildlife Management Areas should restrict human activities that negatively affect desert tortoises (Service 1994). The proposed project is located in the proposed Ord-Rodman Desert Wildlife Management Area, which is one of the four areas in the West Mojave Recovery Unit.

One hundred percent surveys have been conducted (1992 and continuing) in the general area of the proposed project. These surveys indicate that desert tortoises occur at moderate to high densities. Although no desert tortoises live in the pistol range berms, they use the rifle range area and may have active burrows on the 500-yard line. In addition, several tortoises enter the Base Housing area every year, and, although domestic animals are confined, the tortoises are still in danger from both traffic and children. During a site visit on April 8, 1997, one live tortoise and six to ten burrows were observed in the project area.

Analysis of Effects

Individual desert tortoises within the project area may be subject to injury or death as a result of crushing by construction vehicles or equipment in the project area or by straying of vehicles or equipment into desert tortoise habitat outside of the project area. Desert tortoises could become trapped in steep-sided excavations left as a result of work activity. Individual desert tortoises could be taken by predators, such as common ravens (*Corvus corax*) and coyotes (*Canis latrans*),

that can be attracted to the site by human activities. Uninformed workers could also collect or vandalize desert tortoises that they may encounter when in the project area. Noise generated at the construction sites could damage the ears of desert tortoises or it may cause them to leave the area. Desert tortoises that are moved as a result of the proposed activities could be at risk if their burrows were destroyed by project activities or if they void their bladders while being handled and are subsequently unable to extract sufficient moisture from food or drinking sources.

Prior to this consultation, MCLB has requested technical assistance from the Service to help reduce or eliminate the likelihood for take of desert tortoises during construction and maintenance actions. The mitigation measures MCLB proposes to implement during the proposed action are based upon this past technical assistance from the Service. To date, these mitigation measures have reduced project-related take on MCLB actions.

Less than two acres of habitat would be lost during the mining for lead and reconstruction of safety berms covered under this biological opinion. Once construction is completed it is likely that desert tortoises will use the protected sides of the target butts for burrow sites, thus the habitat loss would be largely temporary in nature.

The Service believes the effects described above are not likely to jeopardize the continued existence of the desert tortoise or adversely modify its critical habitat. We base this conclusion on the following facts:

1. The project description includes mitigation measures that will reduce the take of individual desert tortoises and minimize further degradation of their habitat. Following implementation of similar mitigation measures, past construction and maintenance actions proceeded without take of desert tortoises.

2. The area to be affected by the proposed action is already disturbed by past construction and maintenance work and other human activities.

3. The proposed action does not increase fragmentation of desert tortoise populations.

Cumulative Effects

Cumulative effects are those impacts of future State and private actions affecting endangered and threatened species that are reasonably certain to occur in the action area. Future Federal actions will be subject to the consultation requirements established in section 7 of the Endangered Species Act and therefore are not considered cumulative to the proposed action.

Most of the actions that are reasonably expected to occur within the vicinity of Highway 395 will be subject to section 7 consultations because much of the adjacent lands are public property administered by the Federal government.

The Service has contacted the counties of San Bernardino, Kern, Riverside, Inyo, and Los Angeles (and the incorporated areas within the desert) regarding the listing of the desert tortoise and its implications for city and county-permitted activities. Many cities within the range of the desert tortoise in San Bernardino, Los Angeles, and Kern counties have expressed interest in obtaining a section 10(a)(1)(B) incidental take permit from the Service. Regional planning efforts, such as the West Mojave Coordinated Management Plan, could serve as model habitat conservation plans for local governments. Cumulative impacts of future State and private projects will be addressed in regional plans, such as this, and in the section 10(a)(1)(B) incidental take permit process.

Incidental Take

Section 9 of the Endangered Species Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and 7(0)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this incidental take statement. The measures described below as reasonable and prudent measures and terms and conditions to reduce take are non-discretionary, and must be undertaken by the agency or made a binding condition of any grant or permit, as appropriate.

The Service anticipates the following form of take:

1. One (1) desert tortoise in the form of direct mortality through accidental death or injury during project activities.

2. Fifteen (15) desert tortoises in the form of harassment through moving desert tortoises from harm's way during rifle and pistol range maintenance and desert tortoise fence installation activities.

This biological opinion does not exempt from section 9 prohibitions any form of take that is not incidental to the MCLB's maintenance and construction work covered by this biological opinion.

If the incidental take authorized by this biological opinion is met, MCLB shall immediately notify the Service in writing. If the incidental take authorized by this biological opinion is exceeded, the MCLB shall immediately notify the construction crews to cease activities resulting in take and shall reinitiate formal consultation with the Service.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of the desert tortoise.

1. Worker education programs and well-defined operational procedures shall be implemented, with the cooperation of on-site qualified biologists, to avoid the take of desert tortoises and minimize loss of their habitat during construction activities.

2. Take of desert tortoises, through injury or death due to the straying of construction equipment beyond the project area, shall be reduced through establishment of clearly defined work areas.

3. Take of desert tortoises, through injury or death, found within the proposed project area shall be reduced through the removal of these animals to undisturbed areas adjacent to the construction site.

4. Attraction of common ravens and other potential desert tortoise predators to project areas shall be reduced to the maximum extent possible.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the MCLB is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above.

Except where modified as noted below, terms and conditions are excerpted directly from the terms and conditions section in biological opinion 1-8-93-F-16 (see Appendix A) and are hereby incorporated by reference.

Terms and conditions 3, 4, 5, 7, 8, 9 (modified to include all construction areas), 15, 18, and 20 implement reasonable and prudent measure 1;

Term and condition 14 is modified to read "The boundaries of all construction areas shall be clearly marked with flagging and stakes," and implements reasonable and prudent measure 2;

Terms and conditions 12, 16 and17 implement reasonable and prudent measure 3; and

Term and condition 19 implements reasonable and prudent measure 4

Disposition of Dead or Injured Desert Tortoises

Upon locating dead or injured desert tortoises, initial notification must be made in writing to the Service's Division of Law Enforcement in Torrance at (370 Amapola Avenue, Suite 114, Torrance, California 90501 310/328-1516) and by telephone and writing to the Ventura Fish and Wildlife Office in Ventura, California (2493 Portola Road, Suite B, Ventura, California 93003 805/ 644-1766) within three working days of its finding. The report shall include the date, time, location of the carcass, a photograph, cause of death, if known and any other pertinent information.

Care must be taken in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. MCLB shall endeavor to place the remains of intact desert tortoises with educational or research institutions holding the appropriate State and Federal permits per their instructions. If such institutions are not available or the shell has been damaged, the information noted above shall be obtained and the carcass left in place.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by MCLB through a biologist before implementation of the action. Injured animals should be transported to a qualified veterinarian. Should any treated desert tortoises survive, the Service should be contacted regarding the final disposition of the animals.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service offers the following conservation recommendations:

1. MCLB should monitor the survivorship of desert tortoises that are removed from work areas. This information would be used to develop more successful techniques for moving desert tortoises from harm's way and to more accurately assess take associated with this type of activity.

2. MCLB should consider having any desert tortoise accidentally killed by rifle and pistol range construction activities tested for heavy metals contamination.

The Service requests notification of the implementation of any conservation recommendations so we can be kept informed of actions that either minimize or avoid adverse effects, or that benefit listed species or their habitats.

Conclusion

This concludes formal consultation under section 7 of the Act for MCLB's proposal for rifle and pistol range construction and maintenance, and desert tortoise fence installation on MCLB in San Bernardino County, California. Re-initiation of formal consultation is required if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this biological opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16). Any questions or comments should be directed to Doug Laye of the Services Barstow Sub-Office at (760) 255-8844.

Sincerely,

Diane K. Noda
Field Supervisor

Enclosure:

Appendix A - Biological Opinion for Operations and Maintenance of the Marine Corps Logistics Base (MCLB), Barstow, San Bernardino Counties, California (1-8-93-F-16).

REFERENCES

Burge, B.L. 1978. Physical characteristics and patterns of utilization of cover sites by *Gopherus agassizii* in southern Nevada. Proc. 1978 Symp., The Desert Tortoise Council. pp. 80-111.

Burge, B.L., and W.G. Bradley. 1976. Population density, structure and feeding habits of the desert tortoise, *Gopherus agassizii*, in a low desert study area in southern Nevada. Proc. 1976 Symp., The Desert Tortoise Council. pp. 51-74.

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Hovik, D.C., and D.B. Hardenbrook. 1989. Summer and fall activity and movements of desert tortoises in Pahrump Valley, Nevada. Abstract of paper presented at Fourteenth Annual Meeting and Symposium of the Desert Tortoise Council.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (*Gopherus agassizii*) in California. In: R.B. Bury (ed.). North American Tortoises: Conservation and Ecology. U.S. Fish and Wildlife Service, Wildlife Research Report 12, Washington, D.C.

Schamberger, M., and F.B. Turner. 1986. The application of habitat modeling to the desert tortoise (Gopherus agassizii). Herpetologica 42(1):134-138.

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Turner, F.B., and D.E. Brown. 1982. Sonoran desertscrub. In: D.E. Brown (editor). Biotic communities of the American Southwest - United States and Mexico. Desert Plants 4(1-4):181-222.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

In Reply Refer To: 815.881.1128

September 24, 2003

Mr. J. L. Stormo
Environmental Division
Installation and Logistics Department
United States Marine Corps
Marine Corps Logistics Base
Barstow, California 92311

Subject: Request for Amendment to Biological Opinion 1-8-97-F-20R for Activities Associated with Operations and Maintenance of the Rifle Range at the Marine Corps Logistics Base, Barstow, San Bernardino County, California

Dear Mr. Stormo:

This letter constitutes an amendment to the June 10, 1997, Biological Opinion for Maintenance and Upgrade of Firearms Ranges and Construction of a Desert Tortoise Fence on the Marine Corps Logistics Base, Barstow, San Bernardino County, California (1-8-97-F-20R). At issue are the effects of the proposed improvements to the firearms range on the desert tortoise *(Gopherus agassizii)*, a federally threatened species. The Fish and Wildlife Service (Service) received your written request dated July 22, 2003, to amend the action addressed in the above mentioned biological opinion. This amendment adds the construction of a bullet trap at the pistol range which replaces an existing earthen berm. The bullet trap is a containment box for the spent ammunition. (See enclosed figures.) The trap drops the spent ammunition to the bottom of the trap for easy collection of the lead ammunition. This trap will eliminate the possibility of lead contamination of the environment at and near the pistol range. Approximately 2000 cubic yards of the berm is currently contaminated with lead from spent ammunition from previous use of the pistol range.

The proposed action is expected to disturb less than one acre of Mojave desert scrub habitat. This area supports a moderate density of 68 desert tortoises per square mile. The measures to minimize adverse affects to desert tortoises that have been applied under the existing biological opinion have been successful. The existing Incidental Take Statement authorizes two (2) desert tortoises in the form of direct mortality through accidental death or injury during project activities annually and fifteen (15) desert tortoises in the form of harassment. The Marines have taken only four (4) desert tortoises in 12 years.

The nature of the proposed amendment is similar in scope to the activities previously addressed in the biological opinion, and it includes all minimization measures identified in the original

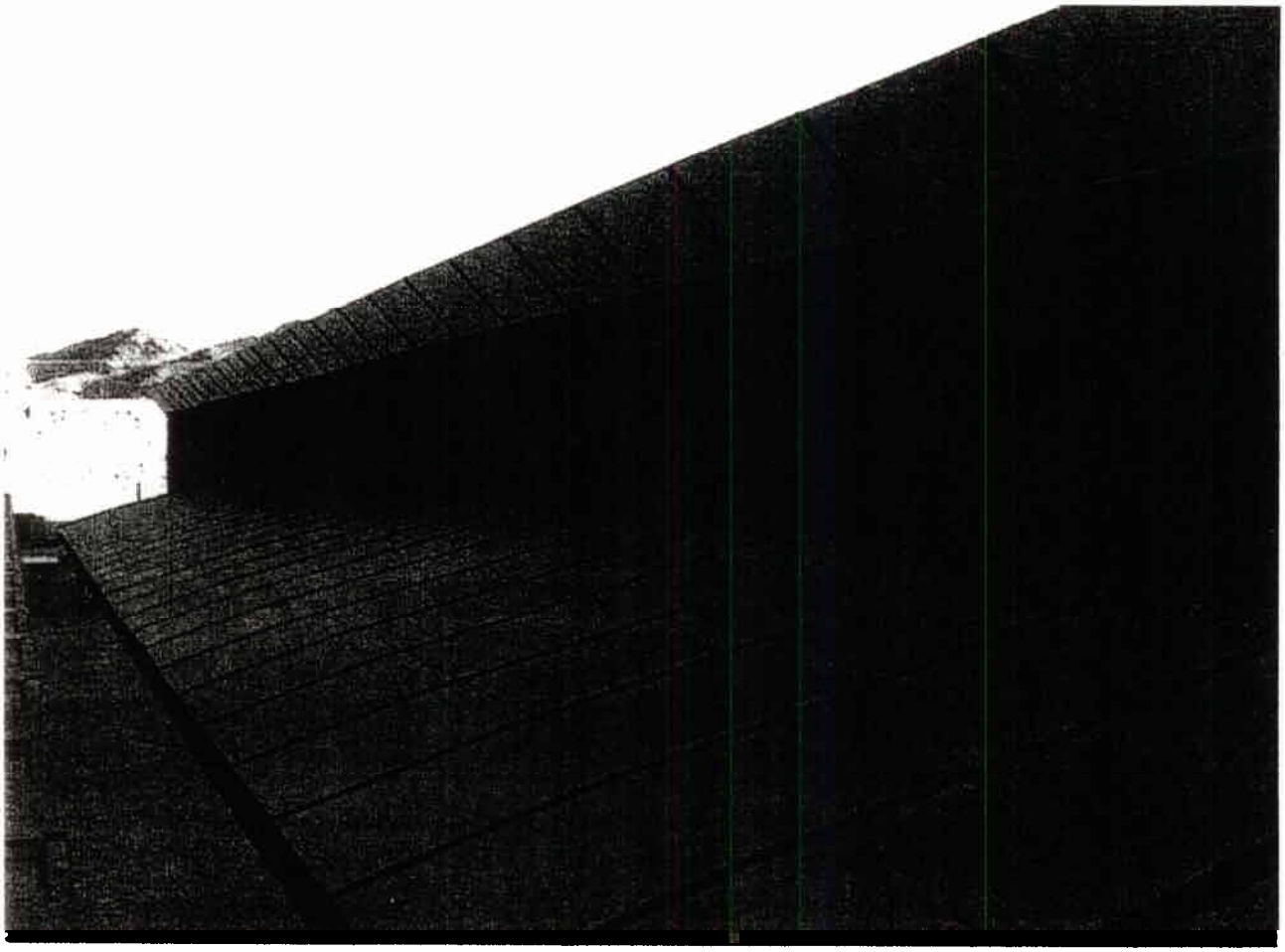
proposed action and the terms and conditions of the biological opinion. We anticipate that one desert tortoise will need to be moved from the construction zone based on conversations with your staff. Because this falls within the incidental take level evaluated in the biological opinion, the incidental take associated with this project would not modify our conclusion in the biological opinion nor modify the existing baseline for the desert tortoise in the area. Should more than one desert tortoise be found in the required pre-construction surveys, construction activities shall not begin until the Service has made a determination whether the number of desert tortoises actually found in the project area would modify our conclusions and necessitate re-initiation of consultation. We would appreciate receiving a written report on the results of your preconstruction clearance surveys.

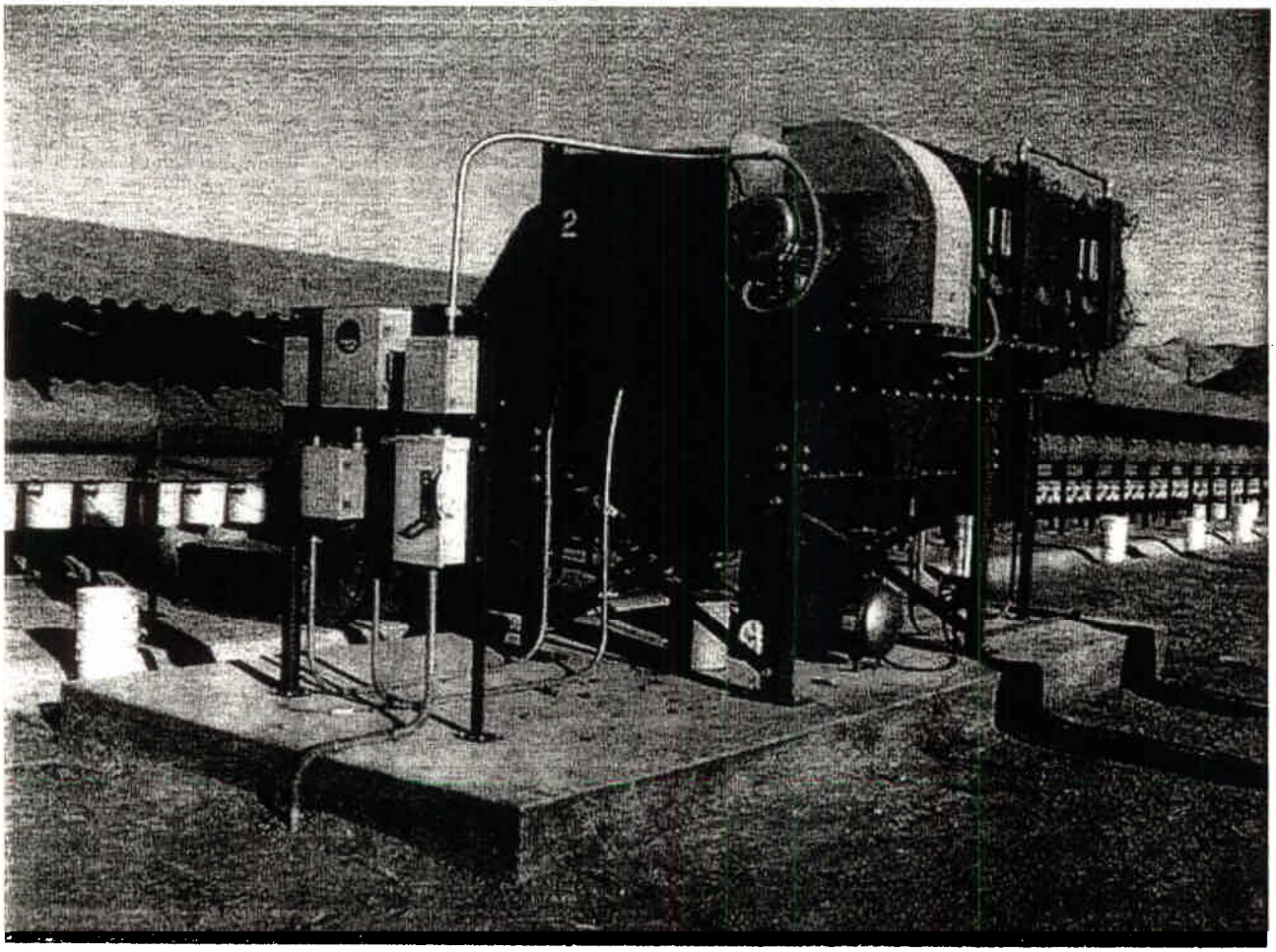
If you have any questions regarding this amendment, please contact Tim Thomas of my staff at (760) 255-8890.

Sincerely,

Carl T. Benz
Assistant Field Supervisor
South Coast/Deserts

Enclosures (2)

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

In Reply Refer To: PAS# 437.466.564

September 9, 2003

Michael Stroud
Department of the Navy
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5190

Subject: Biological Opinion for the Proposed Rifle Range Perimeter Fence at Marine Corps Logistics Base, Barstow, California (1-8-03-F-26)

Dear Mr Stroud:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion on the proposed installation of a rifle range perimeter fence at the Marine Corps Logistics Base (MCLB), Barstow, California and its effects on the federally threatened desert tortoise (*Gopherus agassizii*) and its designated critical habitat. This document was prepared in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). Your request for reinitiation of the biological opinions 1-8-93-F-16 and 1-8-97-F-20R was received on February 11, 2003.

After discussions with your staff, we received your June 27, 2003, letter to request that this action be covered under a separate biological opinion rather than a reinitiation. This biological opinion is based on information which accompanied your request for consultation and information in our files. A complete administrative record of this consultation is on file at the Ventura Fish and Wildlife Office.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The MCLB Barstow is located in western San Bernardino County, California, approximately 5 miles (8 kilometers [km]) east of the City of Barstow. Base property encompasses approximately 6,165 acres (2,495 hectares [ha]) and is divided into three separate areas: the Nebo area (1,868 acres [756 ha]), the Yermo Annex (1,859 acres [752 ha]), and the Rifle Range Area (2,438 acres [987 ha]) (See Figure 1-2). The Nebo and Rifle Range Area are adjacent to each other, while the Yermo Annex is situated approximately 3 miles (4.8 km) east of the Nebo Area. The Rifle

Range Area is bordered by Bureau of Land Management (Bureau) lands to the south, west, and east, and by the Nebo Area and the Interstate 40 transportation corridor to the north. A portion of the proposed action occurs on Bureau managed lands and MCLB has coordinated with the Bureau's Barstow office. The proposed action occurs in the designated Ord-Rodman desert tortoise critical habitat unit.

The purpose of the proposed action is to establish a physical barrier around the perimeter of the restricted Rifle Range Area property to impede and discourage unauthorized public access to the range, to help ensure public safety when the range is in operation, and to provide added security for personnel, equipment, and other military assets.

CONSTRUCTION AND MAINTENANCE ACTIVITIES

The proposed action involves the installation and maintenance of approximately 42,760 feet (ft) (13,033 meters [m])of new fencing around the perimeter of the 2,438-acre (987-ha) Rifle Range Area property (See Figure 2-1). The project design includes both chain link security fencing and 4-strand barbed-wire fencing. The chain link fencing would be installed along approximately 7,600 ft (2,316 m) of the property line fronting Pendleton Road in the northeast part of the Rifle Range Area. This part of the property boundary is easily accessible from existing roadways and is therefore most vulnerable to trespassing. The remaining property line (approximately 35,160 ft [10,717 m]) is not immediately accessible from any existing roads and would be fenced using 4-strand barbed-wire. In total, approximately 8 miles (13 km) of fencing would be installed. The bottom of the chain link fence would be flush with the ground, whereas the bottom strand of the barbed-wire fence would be 12 inches (30 centimeters) above the ground to allow the movement of desert tortoises.

Installation of chain link fencing would require the excavation of postholes at 10-ft intervals and the pouring of approximately 3 cubic ft (0.18 cubic meters) of concrete to set each post. Barbed-wire fencing permits greater flexibility in the placement of fence posts and postholes, and concrete would be required only at corner post locations and pull post locations (which are placed at variable intervals no greater than 660 ft [200 m]). Such locations would also require the pouring of concrete to set two braces for each post. A pull post requires the greatest strength and stability because it must bear the pressure of pulling the wire strands during installation and holding them taught over time. Alternatively, the intervening line posts serve only to maintain the desired separation between strands of barbed wire and are not required to initiate or maintain the tautness of the wire strands. These latter types of posts are metal stakes that would be driven 2.5 ft (0.8 m) into the ground but would not require soil excavation or the use of concrete.

The proposed action would also provide controlled access to the Rifle Range Area via the installation of five security gates at selected locations along the northern boundary of the property. Each of the 20-ft (6.1-m) wide gates would be constructed using chain-link material, with 3 strands of barbed-wire along the top. In all situations where a security gate would be joined directly to a section of 4-strand barbed-wire fencing, a 10-ft (3-m) section of chain link fence would be substituted for the barbed wire fence to provide greater stability and a stronger

transition between the fence and the gate. Each gate would be able to swing either direction up to 90 degrees perpendicular to the fence, so ground clearance would be limited to the area within existing trails or roads as they pass through each gate. In addition, a small amount of ground clearance along the immediate fence line may be required during fence installation. Signs would be posted at intervals of no more than 200 ft (61 m) along the entire fence line and on all gates to serve as a deterrent to unauthorized personnel.

Maintenance activities would be similar to those used to construct the fence. The areas of disturbance would be approximately 20 feet wide inside the fence and 10 feet wide outside the fence.

MEASURES TO PROTECT DESERT TORTOISES

The Navy would implement the following measures at the MCLB, Barstow, to minimize or avoid impacts to the desert tortoise and its critical habitat.

1. An authorized biologist would be required to be on site for the entire project. The authorized biologist must be qualified and experienced, and be authorized by the Service to handle desert tortoises. The authorized biologist would walk in front of the lead vehicle to locate desert tortoise and burrows and behind vehicles when they are backing up or turning around.

2. If a desert tortoise wanders into an active work area, work would cease temporarily. Work would resume once the desert tortoise was moved out of harm's way by the authorized biologist. The desert tortoise would be moved the minimum distance necessary to ensure its safety.

3. The fence contractor would limit travel and access within a corridor along the proposed fence line that encompasses 10 ft (3 m) external to the fence line (on Bureau lands) and 20 ft (6 m) inside. Vegetation removal and disturbance along this 30 ft (9 m) wide corridor (32.3 acres [13.1 ha]) would be minimized; no widespread clearing of vegetation would occur. The exact amount of vegetation removal would be dictated by the location of vegetation in relation to the desired placement of fence posts and vehicle or personnel access points, but vegetation removal and habitat disturbance would be avoided to the maximum extent practicable within and immediately adjacent to the actual fence construction area, access roads, and construction staging areas.

4. Operators of vehicles associated with this project would observe speed limits not to exceed 20 miles per hour (32 km per hour) on unpaved roads to and from the Rifle Range Area.

5. The fence contractor would avoid placing fence posts within any existing ephemeral drainage channels so flows would not be impeded, and no discharge of material or fill into waters of the U.S. would occur.

6. All vehicle operators would inspect under vehicles for desert tortoise prior to movement of any vehicle.

7. A maximum of three work staging areas would be allowed in the vicinity of the project. One staging area would be allowed in the existing parking area at the Rifle Range, which is outside the buffer zone of the proposed fence line, and up to two more could be placed in areas recently disturbed by a pipeline project in the existing utility corridor. To the maximum extent practicable, all vegetation in the immediate vicinity of any construction or maintenance area, access road, or staging area would be avoided and remain unharmed. Staging areas would be inspected for desert tortoises and burrows and approved by the authorized biologist. Prior to use, the staging areas would be fenced with a Service-approved desert tortoise barrier. The desert tortoise barrier will consist of 0.5 inch (1.3 cm) mesh hardware cloth fastened to stakes. The hardware cloth will extend 18 inches (46 cm) above the ground and 12 inches (30 cm) below the surface of the ground. Where burial of the hardware cloth is not possible, the lower 12 inches (30 cm) will be folded outward and fastened to the ground so as to prevent desert tortoise entry.

8. The fence contractor would be required to remove all material, equipment, and other debris (including trash) within the construction area in a systematic method and dispose of items in an approved manner.

9. The fence contractor would ensure that for all barbed-wire fence installation, a proper clearance of 12 inches (30 cm) exists between the bottom of the barbed wire and the ground to allow movement of desert tortoises.

10. The fence contractor would be required to submit a written report concerning the desert tortoise that details well-defined operational procedures and worker-education briefings. The written procedures would also include steps to be taken for desert tortoise pre-clearance surveys, monitoring during construction, and the course of action to be taken should a burrow or a desert tortoise be encountered during construction. The following guidelines would be utilized in forming the procedures: (1) Guidelines for Handling Desert Tortoises During Construction Projects - July 1994 (revised July 1999) - Prepared by the Desert Tortoise Council, and (2) Procedures for Endangered Species Compliance for the Mojave Desert Tortoise - November 1990 - Service Regions 1, 2, and 6. The worker-education briefing would include but not be limited to the following:

- Personnel would be advised that handling, harming, or harassing a desert tortoise without specific authorization is a violation of the Act. Personnel would also be advised of the penalties of up to $25,000 and 6 months in prison for unauthorized handling a listed species.
- No pets or firearms would be allowed in the work area or on any Federal Government Property.

- All organic and inorganic litter and garbage (including cigarette butts) would be disposed of properly in covered, raven-proof containers. The fence contractor would dispose of all trash and debris off the job site daily.
- Any desert tortoises encountered would be reported immediately to the construction supervisor and authorized biologist.
- Wildfire prevention measures would be implemented, including restricting smoking to areas clear of vegetation, not lighting fires of any kind, equipping vehicles with spark arresters and fire extinguishers, and compliance with all requirements of the Wildfire Protection Plan.
- Vegetation would be preserved by minimizing clearing and avoiding any vegetation that has been flagged.
- Noxious weeds would be controlled by cleaning all equipment and vehicles at designated locations and by inspecting all vehicles to ensure absence of loose soil and plant debris before leaving the area.
- Limitations on refueling vehicles would be implemented, as would other requirements for safe handling and disposal of hazardous wastes.

STATUS OF THE SPECIES

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote (*Larrea tridentata*), shadscale (*Atriplex confertifolia*), and Joshua tree (*Yucca brevifolia*) series of Mojave desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from 2 to 8 inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner 1982, Turner and Brown 1982, Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986).

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall and winter months and occasionally after summer rain storms. Desert tortoises spend much of the year in burrows, escaping the extreme conditions of the desert. A desert tortoise typically will spend 95 percent of its time underground (Phil Medica pers. comm.). Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein *et al.* (1987), and Service (1994).

Adult desert tortoises use several burrows during their active season. In Nevada, adults used 12 to 25 shelter sites (burrows, pallets, etc.) per year (Burge 1978). Several burrows may be used over the span of a few days or a tortoise may return to the same burrow each night (Bury and Marlow 1973; Coombs 1974; Grant 1936a). Desert tortoises depend on their burrows to escape the extreme effects of temperature and humidity (Brattstrom 1965; McGinnis and Voigt 1971; Voigt 1971). The temperature inside a summer burrow will range from 19 to 37.8 degree centigrade although outside temperature will be much warmer. The humidity in a burrow is relatively high and constant, creating an environmental buffer against dessication in the desert. Tortoises have also been observed to emerge from their burrows on warm days during the winter months (Woodbury and Hardy 1948b; Coombs 1977c).

Food resources for desert tortoises are dependent on the availability and nutritional quality of annual and herbivorous perennial vegetation, which is greatly influenced by climatic factors, such as the timing and amount of rainfall, temperature, and wind (Avery 1998). In the Mojave Desert, these climatic factors are typically highly variable both seasonally and annually; this variability can limit the desert tortoise's food resources.

Desert tortoises will eat many species of plants. However, at any time, most of their diet consists of a few species (Avery 1998). Additionally, their diet changes during the course of a season and over several seasons (Avery 1998). Possible reasons for desert tortoises to alter their diet include changes in nutrient concentrations in plant species, the availability of plants, and the nutrient requirements of individual animals (Avery 1998). In Avery's (1998) study in the Ivanpah Valley in the east Mojave Desert, desert tortoises consumed primarily green annual plants in spring; cacti and herbaceous perennials were eaten once the annuals began to disappear. Medica *et al.* (1982 in Avery 1998) found that desert tortoises ate increased amounts of green perennial grass when annuals were sparse or unavailable; Avery (1998) found that desert tortoises rarely ate perennial grasses.

Desert tortoises can produce from one to three clutches of eggs per year. On rare occasions, clutches can contain up to15 eggs; most clutches contain three to seven eggs. Multi-decade studies of the Blanding's turtle (*Emydoidea blandingii*), which, like the desert tortoise, is long-lived and matures late, indicate that approximately 70 percent of the young animals must survive each year until they reach adult size to maintain a stable population; after this time, annual adult survivorship exceeds 90 percent (Congdon *et al.* 1993). Hatchling desert tortoises or neonates may have a mortality as high as 90 percent during their first year (Dave Morafka pers. comm.). Research has indicated that 50 to 60 percent of juvenile and immature desert tortoises typically survive from year to year (Congdon *et al.* 1993). In other words, 50 percent are lost each year. We do not have sufficient information on the demography of the desert tortoise to determine whether this rate is sufficient to maintain viable populations.

Desert tortoises typically hatch from June through September (Berry 1975). These neonate tortoises are the size of a silver dollar and do not have an ossified shell. At the time of hatching, the desert tortoise has a substantial yolk sac; the yolk can sustain them through the fall and winter

months until forage is available in the late winter or early spring. However, neonates will eat if food is available to them at the time of hatching. When food is available, neonates can reduce their reliance on the yolk sac in the first year to conserve this source of nutrition. Neonate desert tortoises use abandoned rodent burrows for daily and winter shelters, which are often shallowly excavated and run parallel to the surface of the ground.

Neonate desert tortoises emerge from their winter burrows as early as late January to take advantage of freshly germinating annual plants; if appropriate temperatures and rainfall are present, some plants will continue to germinate later in the spring. Freshly germinating plants and plant species that remain small throughout their phenological development are important to neonate desert tortoises because their small size prohibits access to taller plants. As herbaceous plants grow taller during the spring, some species become inaccessible to small desert tortoises.

Neonate and juvenile desert tortoises require approximately 12 to 16 percent protein content in their diet for proper growth. Desert tortoises, both juveniles and adults, seem to selectively forage for particular species of plants with favorable ratios of water, nitrogen (protein), and potassium. Oftedal has developed the potassium excretion potential (PEP) model (Oftedal 2001), which predicts that, at favorable ratios, the water and nitrogen allow desert tortoises to excrete high concentrations of potentially toxic potassium, which is abundant in many desert plants. Oftedal (2001) also reports that variation in rainfall and temperature causes the PEP index to change annually and during the course of a plant's growing season. Therefore, the changing nutritive quality of plants, combined with their increasing size, further limits the forage available to small desert tortoises to provide for their survival and growth.

The ecological requirements and behavior of neonate, immature, and juvenile desert tortoises are substantially different from those of subadults and adults. Smaller desert tortoises use abandoned rodent burrows, which are typically more fragile than the larger ones constructed by adult tortoises. They are active earlier and later in the season. Small desert tortoises rely on smaller annual plants with greater protein content to be able to gain access to food and to grow. Maintaining favorable habitat conditions for forage and other life requisites for small desert tortoises is crucial for the continued viability of the species.

Limited information is available on the movements and home range of the desert tortoise throughout its lifetime. In general, the home range of a desert tortoise varies by the age and sex of the animal and the availability of forage (Berry 1973). Adult tortoises have larger home ranges than younger animals and males tend to have larger home ranges than females. In years of higher than average precipitation, tortoises have larger home ranges than during dry years. An annual home range has been documented at 42 hectares while a multi-year home range would be larger (Esque, T.C., *et al.* 1990). Tracy has reported tortoises moving more than one linear mile in a year (C. Richard Tracy pers. comm.).

Several studies have been conducted on relocating desert tortoises. Results have shown that relocations that occur in the spring are more successful than those that occur in the fall or winter. Relocations in the summer had the greatest rate of failure (Phil Medica pers. comm.).

The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California. On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 *Federal Register* 32326). In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 *Federal Register* 12178). The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994 (59 *Federal Register* 5820).

Critical habitat is designated by the Service to identify the key biological and physical needs of the species and key areas for recovery, and focuses conservation actions on those areas. Critical habitat is composed of specific geographic areas that contain the biological and physical attributes that are essential to the species' conservation within those areas, such as space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats. These features are called the constituent elements of critical habitat. The specific constituent elements of desert tortoise critical habitat are: sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

The recovery plan for the desert tortoise is the basis and key strategy for recovery and delisting of the desert tortoise. The plan divides the range of the desert tortoise into six distinct population segments or recovery units and recommends the establishment of 14 desert wildlife management areas throughout the recovery units. Within each desert wildlife management area, the recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The design of desert wildlife management areas should follow accepted concepts of reserve design. As part of the actions needed to accomplish recovery, land management within all desert wildlife management areas should restrict human activities that negatively affect desert tortoises (Service 1994).

Four recovery units identified in the recovery plan are located in California. Eight critical habitat units are also located in California. The primary constituent elements as described in the designation of critical habitat for the desert tortoise are: sufficient space to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; and sufficient vegetation for shelter from temperature extremes and predators.

The desert tortoise was listed in response to loss of individual desert tortoises (population declines) and degradation of habitat caused by numerous human activities including

urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The Service also noted the following activities directly cause the death of individual desert tortoises: increased predation by common ravens, collisions with vehicles on paved and unpaved roads, and diseases.

Populations of the desert tortoise have continued to decline since it was listed in 1989. Most notably, declines have been documented in previously stable or increasing study plots in the Fenner, Ward, and Chemehuevi Valleys since 1994 when the recovery plan was published (Berry 1999, Berry 2000, Berry *et al.* 2001). Documented declines have been reported to be as much as 84 percent in Chemehuevi Valley (Berry 1999) and 95 percent in Goffs (Berry 2000). Recent declines have been attributed to multiple factors, including: crushing by vehicles along paved and dirt roads, predation by common ravens, trampling by livestock, attacks and predation by feral dogs, collecting, upper respiratory tract disease, shell and metabolic diseases, elevated levels of toxicants, and habitat degradation and alteration from many sources (Lovich and Bainbridge 1999, Berry *in litt.* 2001, Boarman 2002).

ENVIRONMENTAL BASELINE

The proposed action involves the installation and maintenance of approximately 42,760 ft (10,033 m) of new fencing in a 30-ft (9 m) wide corridor around the perimeter of the Rifle Range Area. The proposed project area is largely an undisturbed creosote bush scrub and desert pavement (31.1 acres (12.6 ha), and a small amount (1.3 acres [0.5 ha]) of existing disturbance (roads, trails, and utility corridor).

Based on the 20-ft (6-m) wide access area on the inside of the proposed perimeter fence line plus a 10-ft (3-m) wide access area on the outside the proposed fence line, approximately 32.3 acres (13.1 ha) of habitat will be potentially affected by proposed perimeter fencing construction activities. This area also includes approximately 14.7 acres (5.9 ha) of the 253,200 acre (102,466 ha) Ord-Rodman desert tortoise critical habitat unit that will be affected.

The rifle range has an east-west ridge of low topography and the fence line will be placed in the lowlands surrounding the ridge. Creosote bush scrub is the dominant plant community, comprising approximately 88 percent of the Rifle Range Area and 87 percent of the proposed project lands. Plant species found in this habitat type include creosote bush (*Larrea tridentata*), cheesebush (*Ambrosia salsola*), white bursage (*A. dumosa*), desert dandelion (*Malacothrix glabrata*), buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), chia (*Salvia columbariae*), brittle brush (*Encelia farinosa*), allscale (*Atriplex polycarpa*), California tea (*Ephedra californica*), and Mojave yucca (*Yucca schidigera*). Numerous cactus species occur, including many-headed barrel cactus (*Echinocactus polycephalus*), hedgehog cactus (*Echinocereus engelmannii*), beavertail cactus (*Opuntia basilaris*), and several chollas (*Opuntia* spp.).

Desert pavement habitat comprises approximately 8 percent of the Rifle Range Area and 9 percent of the proposed project area. Desert pavement is composed of gravel and larger stones

that remain after strong winds have blown the upper layers of sand and silt front an area. Disturbance by vehicles traveling on desert pavement can break through the deceivingly strong surface and cause subsequent erosion. The desert pavement plant community is sparsely covered by creosote bush, white bursage, Mojave yucca, plantain (*Plantago ovata*) and Mediterranean grass (*Schismus barbatus*).

The biological assessment included data for desert tortoise densities as reported by Gardner and Brodie (2000) as 27.1 animals per square kilometer (68 per square mile).

EFFECTS OF THE ACTION

The construction and maintenance of the perimeter fence could expose desert tortoises for a brief period to a high level of human activity along the boundary of the Rifle Range Area. Operation of equipment and vehicles could potentially result in injury or mortality of desert tortoises that occupy or walk into the construction or maintenance area. Desert tortoises can potentially seek shelter in the shade of vehicles and equipment and be crushed when the vehicles or equipment are subsequently moved. The burrows of desert tortoises in and near the construction or maintenance area could potentially collapse and trap individuals as a result of the weight or vibrations from heavy construction equipment. The loss of burrows that are unoccupied at the time of their destruction could potentially adversely affect desert tortoises as they would no longer be available to escape the extreme temperatures, humidity, and predators of the Mojave Desert. Desert tortoises know the locations of their burrows. Thus, if a burrow is destroyed and a desert tortoise needs that burrow to escape extreme temperatures or a predator, the tortoise may not survive. Dogs brought to the work site could potentially disturb, tip over, injure, or kill desert tortoises. Unauthorized handling and other human physical contact could potentially transmit disease to the desert tortoises. In addition to disease, unnecessary handling of the tortoise may cause it to void its bladder making it more susceptible to dehydration in the arid desert environment.

Desert tortoises removed from their burrows in the summer are exposed to high temperatures. If a tortoise is unable to locate its burrow before its body temperature rises above 42 degrees Celsius, it will die of hyperthermia. They are also vulnerable to predation from coyotes (*Canis latrans*), feral dogs, common ravens (*Corvus corax*), and other predators.

Improper disposal of trash and garbage may attract the common raven, coyotes and other predators to the work site. Common ravens prey on juvenile tortoises whose shells have not yet hardened.

Most of the 42,760 ft (10,033 m) long route will cross desert tortoise habitat including 21,344 ft (6,505 m), or 14.7 acres (5.9 ha) of designated desert tortoise critical habitat. Most constituent elements are found on the project site: sufficient space to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and

overwintering; burrows and other shelter sites; and sufficient vegetation for shelter from temperature extremes and predators. Vegetation removal and disturbance along the corridor would be minimized; no widespread clearing of vegetation would occur. Ground disturbance would be limited to crushing vegetation and movement of heavy equipment within the approximately 30-foot wide corridor. Some species of crushed shrubs and perennial grasses should sprout from their crowns and recover to their pre-disturbance size in a fairly short period of time. Surface disturbance would result in conditions favorable for the germination and establishment of nonnative weedy annual plants. The nonnative plants provide minimal forage value for the desert tortoise and increase the probability of fire. These plants would replace the native annual species which are used as forage by desert tortoises, reducing the availability of high quality nutritional plants in the project area to desert tortoises. The native vegetation in the Mojave Desert is not adapted to fire. The introduction and spread of nonnative annual plants, particularly red brome and split grass, provide fuel for fires because they are common to a disturbed area, grow in dense mats, and fill the intershrub spaces (Brown and Minnich 1986, Brooks 1999). This fuel source carries fire from shrub to shrub, destroying the dominant shrub type and converting the plant community to one dominated by non-native annual plants. Until areas that are disturbed by construction have recovered, desert tortoises are unlikely to find the same food resources that are available in undisturbed areas.

Suitable substrates that can be used by desert tortoises for burrowing and nesting would likely remain throughout most of the corridor, unless the movement of vehicles and equipment compacts the soils to such a degree that digging would be impaired. The actual time it would take for these substrates to become usable again would depend on the amount of rainfall and other weather patterns in the years after construction.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any non-federal action in the action area that is reasonably certain to occur.

CONCLUSION

After reviewing the current status of the desert tortoise, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the installation and maintenance of a perimeter fence around the MCLB Rifle Range Area is not likely to jeopardize the continued existence of the desert tortoise or to adversely modify its critical habitat. We have reached this conclusion for the following reasons:

- The Navy has included measures as part of the proposed action to minimize injury or mortality to desert tortoises.

- The area to be directly affected constitutes a small portion (5.8×10^{-3} percent) of the desert tortoise's critical habitat and habitat in the recovery unit.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(a)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the Navy, its contractors and permittees, for the exemption in section 7(a)(2) to apply. The Navy has a continuing duty to regulate the activity covered by this incidental take statement. If the Navy fails to assume and implement the terms and conditions, the protective coverage of section 7(a)(2) may lapse. To monitor the impact of incidental take, the Navy must report the progress of the action and its effect on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

We anticipate that incidental take of desert tortoises is likely to occur as a result of installing a perimeter fence through the Ord-Rodman critical habitat. Incidental take of desert tortoises would occur primarily in the form of injury or death from heavy equipment operations, from collisions with vehicles being used for transport of crews and materials, and from relocation of desert tortoises, by authorized biologists, occurring in the project area. Given that the densities of desert tortoises along part of the route and at nearby areas has been estimated at 68 per square mile (27.1 per square kilometer) (Gardner and Brodie 2000), we anticipate that up to five desert tortoises will be taken as a result of being moved from harm's way and that one desert tortoise will be taken from mortality or injury.

If a desert tortoise is killed or injured during the installation of the perimeter fence, the Navy and the Service shall immediately review the circumstances of the incident to determine if additional protective measures are required. Please refer to section on Disposition of Dead or Injured Animals for further information. Construction or maintenance activities may proceed during the period of review, provided that the conservation measures proposed by the Navy and the terms and conditions of this biological opinion have been and continue to be fully implemented.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the desert tortoise:

1. The Navy shall implement well-defined operational procedures to reduce injury and mortality of desert tortoises during construction and maintenance activities.

2. The Navy shall ensure that desert tortoises are only handled according to accepted protocols and by persons authorized by the Service.

The Service's evaluation of the effects of the proposed actions includes consideration of the measures developed by the Navy, and repeated in the Description of the Proposed Action portion of this biological opinion, to minimize the adverse effects of ongoing actions to the desert tortoise. Any subsequent changes in the minimization measures proposed for the desert tortoise may constitute a modification of the proposed action and may warrant re-initiation of formal consultation, as specified at 50 CFR 402.16. These reasonable and prudent measures are intended to clarify or supplement the protective measures that were proposed by the Navy as part of the proposed action.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Navy must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

For the purposes of this biological opinion, a desert tortoise monitor is an individual who can demonstrate, through training and field experience, that he or she can detect the presence of desert tortoises through observations of animals, sign, scat, and burrows. A desert tortoise monitor shall also have the ability and skill to monitor projects for compliance as described in the Description of the Proposed Action and the terms and conditions of this biological opinion. An authorized biologist is a biologist who is approved by the Service and can demonstrate that he or she has substantial field experience and training to handle and relocate desert tortoises, reconstruct burrows, and relocate eggs; an authorized biologist can also demonstrate that he or she possesses the skills described for a desert tortoise monitor.

A concurrent request to designate Mr. Peter Woodman as an authorized biologist accompanied the request for consultation. Based on information in our files, we have determined that Mr Woodman is fully qualified to survey for and handle desert tortoises. Therefore, the Service authorizes Mr. Woodman to handle desert tortoise, if needed, to accomplish the proposed project under this biological opinion. Please see Terms and Conditions 2.a-d below.

1. The following terms and conditions implement reasonable and prudent measure 1:

   a. Prior to the initiation of construction or maintenance of the rifle range fence and desert tortoise-proof fences, personnel (including surveyors, construction engineers, employees, contractors, contractors' employees, supervisors, inspectors, subcontractors, delivery personnel, and all visitors operating a vehicle or equipment in the project area) must complete a desert tortoise education program. This program will contain information concerning the biology and distribution of the desert tortoise, its legal status and occurrence in the project area, the definition of "take" and associated penalties, the measures designed to minimize the effects of construction activities, the means by which employees can help facilitate this process, and reporting procedures to be implemented in case a desert tortoise is encountered.

   b. Trash and food items must be disposed of promptly in predator-proof containers with re-sealable lids. Trash containers must be removed at least once per week.

   c. Any time a vehicle or equipment is parked in desert tortoise habitat, the operator must inspect the ground around and underneath the vehicle or equipment for desert tortoises prior to moving the vehicle or equipment. If a desert tortoise is observed beneath the vehicle or equipment, an authorized biologist must be contacted. If possible, the desert tortoise will be left to move on its own. Otherwise, the desert tortoise will be removed and relocated by the authorized biologist in accordance with the handling provisions of this biological opinion.

   d. All occupied desert tortoise burrows will be avoided by locating fence posts and gate posts away from the burrows for the rifle range fence. All occupied desert tortoise burrows will be avoided by locating the fence away from burrows for the desert tortoise-proof fence.

   e. All excavations will be inspected daily for desert tortoises prior to filling.

2. The following terms and conditions implement reasonable and prudent measure 2:

   a. Only biologists authorized by the Service will handle desert tortoises. The Navy will submit the credentials of all proposed authorized biologists to the Service for our review and approval at least 30 days prior to the initiation of any activity within desert tortoise habitat.

   b. Desert tortoises will be moved only by an authorized biologist and solely for the purpose of moving the animals out of harm's way. Desert tortoises will be moved the minimum distance to ensure their safety. Desert tortoises will be monitored to ensure that they do not re-enter the work area during the fence construction or maintenance activities.

c. All handling of desert tortoises and their eggs and excavation of burrows must be conducted by an authorized biologist in accordance with recommended protocol (Desert Tortoise Council 1999).

d. All desert tortoises observed by project workers within or immediately adjacent to the zone of possible disturbance where they may be harmed must be reported immediately to an authorized biologist. The authorized biologist will move the desert tortoise off-site into adjacent undisturbed desert tortoise habitat if it is in imminent danger. Desert tortoises will be handled only when necessary, and in accordance with guidelines provided in this biological opinion. See 2.c. above.

REPORTING REQUIREMENTS

The authorized biologist must maintain a record of each observation of a desert tortoise. The information gathered shall include the following: (1) date and time of observation; (2) whether the desert tortoise was handled and whether it voided its bladder; (3) general health of the desert tortoise; (4) size and sex of the animal; (5) and the location from and to which the desert tortoise was moved (recorded in UTM coordinates).

The Navy will provide a report to the Service no later than 90 days following the completion of construction activity. The report will document the numbers and location desert tortoises encountered, injured, killed, and handled, total acreage of habitat that was disturbed, effectiveness of the terms and conditions of this biological opinion, and recommendations for future measures that allow for better protection or more workable implementation. We encourage the Navy to submit recommendations regarding modification of the above terms and conditions or additional measures that would improve or maintain protection for the desert tortoise while simplifying compliance with the Act.

DISPOSITION OF DEAD OR INJURED ANIMALS

Upon locating a dead or injured desert tortoise, initial notification must be made in writing within three working days of finding the desert tortoise to the Service's Division of Law Enforcement (370 Amapola Avenue, Suite 114, Torrance, California 90501) and in writing to the Ventura Fish and Wildlife Office (2493 Portola Road, Suite B, Ventura, California 93003); the Ventura Fish and Wildlife Office shall also be notified immediately by telephone (805-644-1766) or electronic mail. The report shall include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Care must be taken in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. Injured animals shall be transported to an authorized veterinarian at the expense of the project proponent. Should any treated desert tortoises survive, the Service should be contacted regarding the final disposition of the animals.

The remains of intact desert tortoises shall be placed with educational or research institutions holding the appropriate State or Federal permits per their instructions. If such institutions are not available or the shell has been damaged, the information noted above shall be obtained and the carcass left in place. Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by the authorized biologist before implementation of the action.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

To compensate for habitat degraded or destroyed by installation and maintenance of the perimeter fence, we suggest that the Navy purchase lands off-site and transfer the lands to a conservation organization that will manage these lands for the conservation and recovery of the desert tortoise.

We recommend that the Navy restore annual endemic plants and monitor the recovery of annual and perennial plant communities in areas disturbed by installation of the perimeter fence. The route should be inspected for any infestations of non-native invasive plant species, such as the Sahara mustard (*Brassica tournefordii*) and Russian thistle (*Salsola tragus*). If individuals of these species are detected, they should be eradicated. Adverse effects to desert tortoises should be avoided during the eradication efforts. We request that you notify us if Sahara mustard or Russian thistle are found and inform us whether eradication efforts were implemented and their effectiveness. We also encourage the Navy to control the establishment of invasive non-native species in addition to those specifically mentioned above.

REINITIATION NOTICE

This concludes formal consultation on the Navy's proposed perimeter fence installation outlined in the request for formal consultation. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency's action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Tim Thomas of my staff at (760) 255-8890.

Sincerely,

Carl T. Benz
Assistant Field Supervisor
South Coast/Desert Divisions

Enclosures

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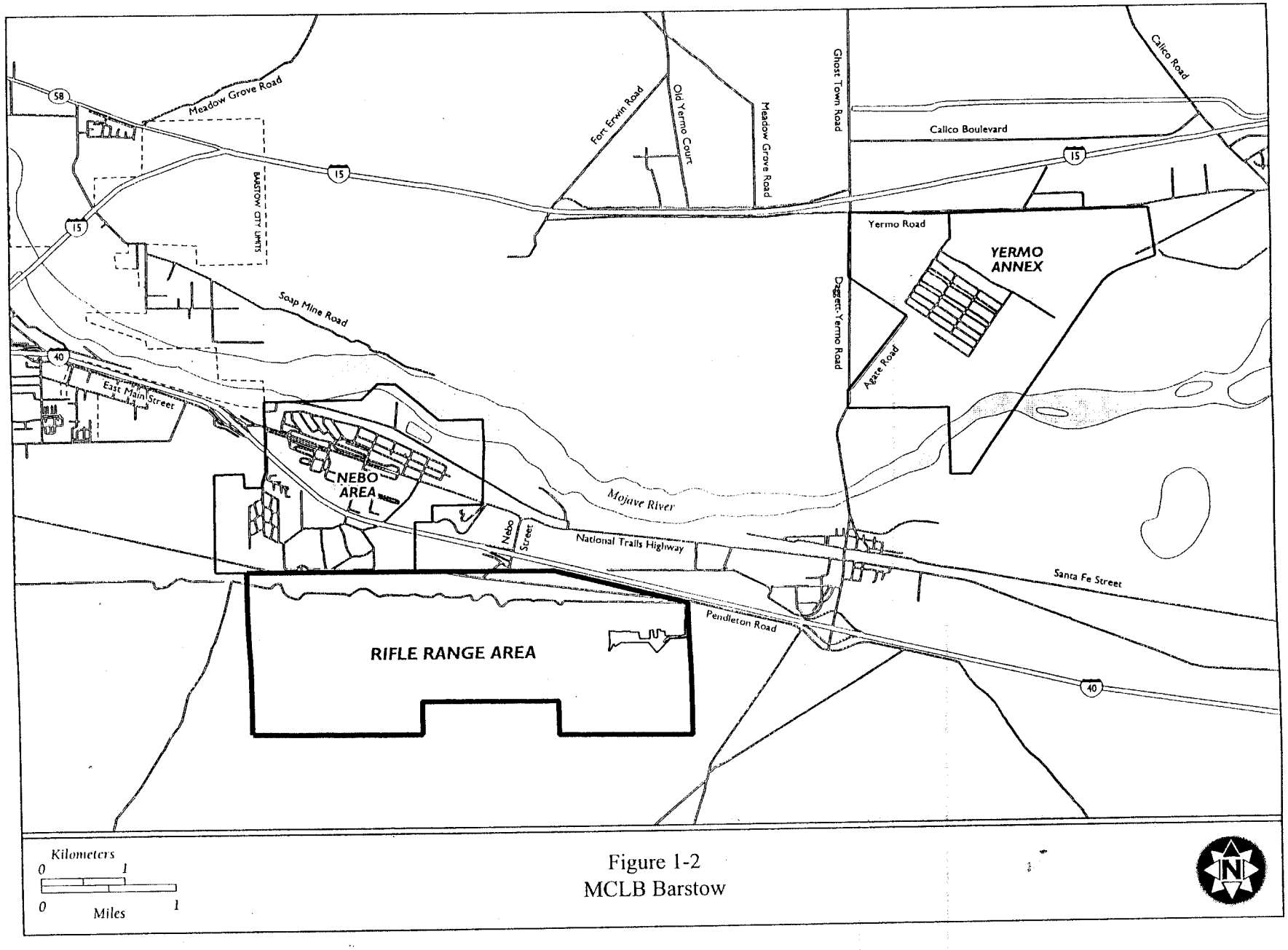


Figure 1-2
MCLB Barstow

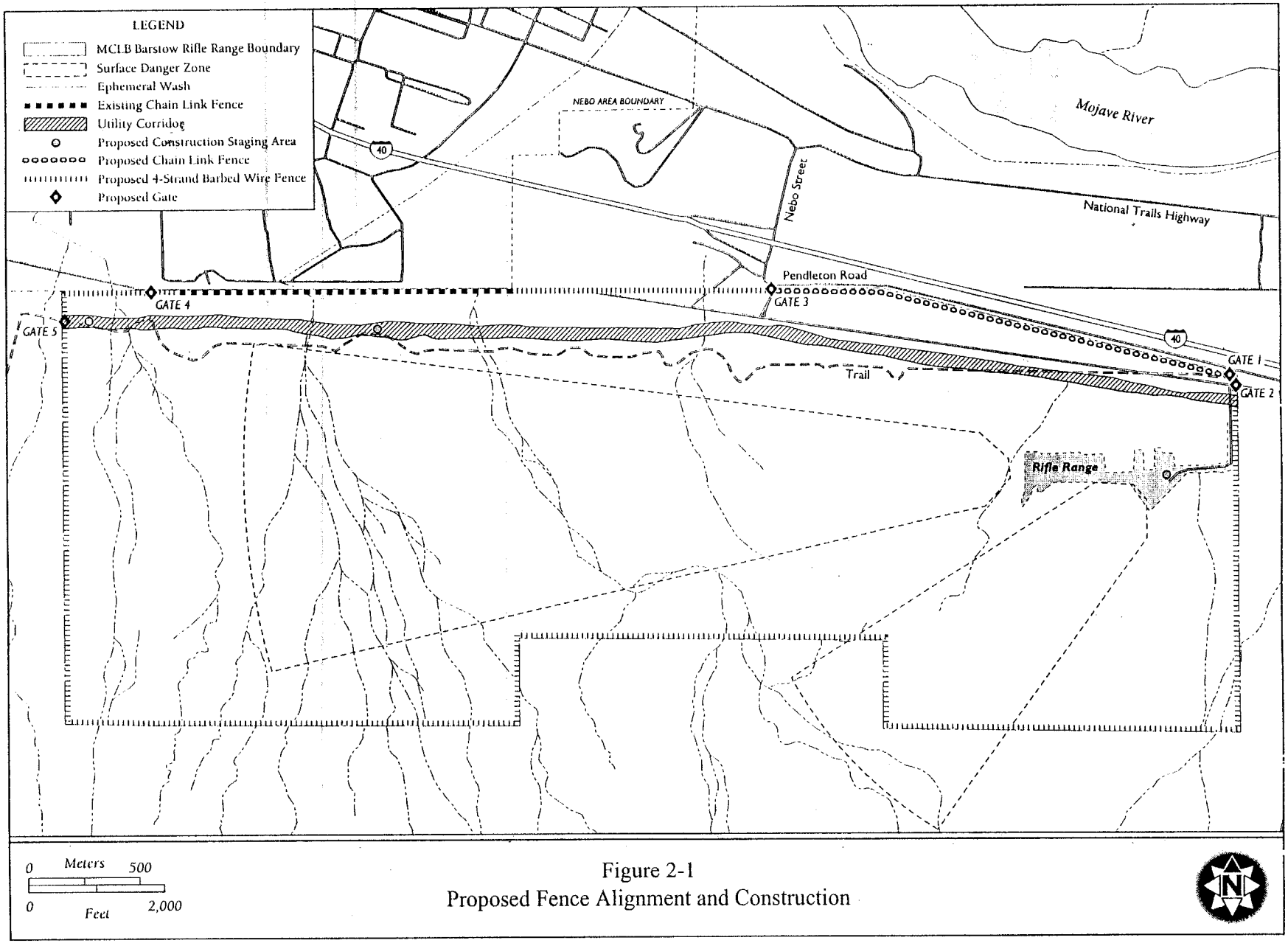


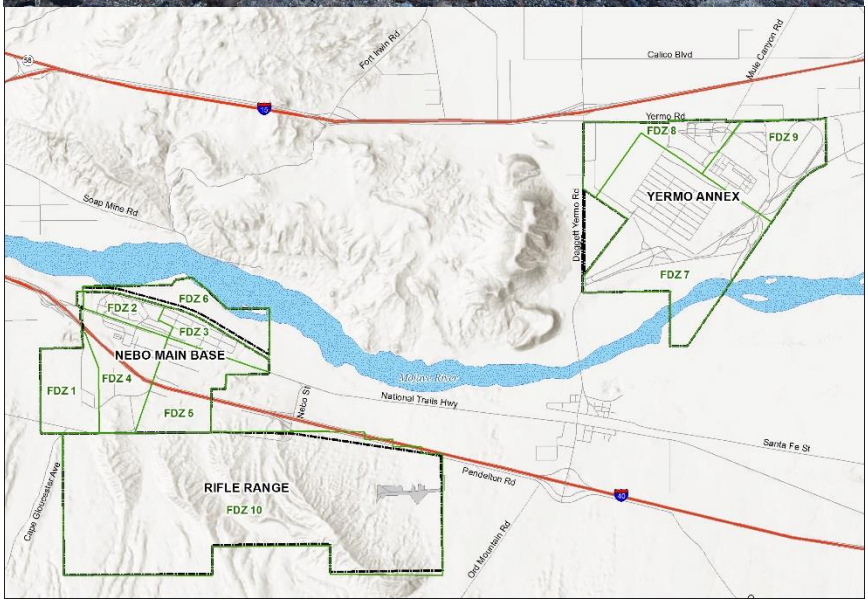
Figure 2-1
Proposed Fence Alignment and Construction

Appendix F. Wildland Fire Management Plan

FORMAT PAGE

FINAL WILDLAND FIRE MANAGEMENT PLAN

MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA



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Barstow, California

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December 2016

FORMAT PAGE

EXECUTIVE SUMMARY

The purpose of the Marine Corps Logistics Base (MCLB) Barstow Wildland Fire Management Plan (WFMP) is to protect personnel, facilities, and natural and cultural resources from the impacts of wildland fire and ensure the perpetuation of native terrestrial habitats and rare species. It integrates applicable regulatory requirements with ecosystem management strategies. This WFMP directly supports the Installation's military mission and is consistent with its fire management directives. The development of this WFMP is directed by Marine Corps Order (MCO) 5090.2A.

The MCLB Barstow Wildland Fire Management Program's objectives are derived from MCLB Barstow's Fire Department Strategic Plan and the Revised 2016 MCLB Barstow Integrated Natural Resource Management Plan. While the missions of the Fire and Emergency Services (F&ES) Division and the Environmental Division differ, with respect to wildland fire management, their goals and objectives are similar. The mission of the F&ES Division is to provide highly capable all-hazard emergency response to protect the lives and property of MCLB Barstow and its community. The Environmental Division's mission is to promote sustainable practices, reduce the impact of Installation operations on the natural environment, and enhance the quality of life of Installation residents and employees.

The combined goals and objectives of this WFMP are outlined below.

Objectives

- **Objective 1.** Protect personnel, facilities, and environmental and cultural resources from the impacts of wildland fire.
- **Objective 2.** Sustain facilities, infrastructure, and vegetation cover conditions that facilitate military training so training activities may proceed without interruption, delay, or impairment of the quality of that training.
- **Objective 3.** Minimize the adverse effects of wildland fire by determining the most appropriate treatment and maintenance methods to ensure ecosystem sustainability and health.
- **Objective 4.** Maintain a beneficial WFMP that provides guidance to F&ES Division and Environmental Division personnel.
- **Objective 5.** Maintain wildfire preparedness.
- **Objective 6.** Ensure the perpetuation of natural communities and rare species.
- **Objective 7.** Minimize the total cost of fire presuppression and suppression practices on lands owned by the Marine Corps.

Goals

- **Goal 1.** Protect human life in the event of a fire.
- **Goal 2.** Protect military values and assets and have no net loss of training grounds.
- **Goal 3.** Protect at-risk natural and cultural resources values.

- **Goal 4.** Maintain adequate resources, training, and partnerships to respond to wildfire emergencies.
- **Goal 5.** Maintain awareness of the locations of sensitive resources and the most appropriate treatment and maintenance methods to mitigate negative impacts to these resources.
- **Goal 6.** Improve interagency fire protection coordination and management.
- **Goal 7.** Identify wildland fire access roads and maintain them in a drivable condition.
- **Goal 8.** Identify wildland fire control points, such as roads, drainages, and ridges.
- **Goal 9.** Identify likely fire ignition points.
- **Goal 10:** Educate employees and the public about the scope and effect of wildland fire management, including fuels management, prevention, hazard/risk assessment, rehabilitation, and the role of fire in ecosystem management.

The Department of Defense, Department of the Navy, Marine Corps, and MCLB Barstow have provided standards for wildland fire management through the issuance of instructions. Additionally, the policies for wildland fire management span both F&ES and natural resources management. The policy of the Marine Corps is to act responsibly in the public interest to restore, improve, preserve, and properly use natural resources. Concern for the inherent values of natural resources in all Marine Corps plans, actions, and programs will be conscious and active. Land use practices and decisions must coincide with the military mission, rely on scientifically sound conservation procedures and techniques, and employ scientific methods and an interdisciplinary approach.

This WFMP provides planning and operational guidance for the Base's Wildland Fire Management Program. This plan is reviewed by MCLB Barstow's Environmental Division and Fire Department annually when updates and revisions are made to reflect new policies and procedures.

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	Degree(s) Fahrenheit
ac	Acre(s)
amsl	Above Mean Sea Level
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
Cal-IPC	California Invasive Plant Council
CNPS	California Native Plant Society
CO	Commanding Officer/Installation Commander
DoD	Department of Defense
DODI	Department of Defense Instruction
EMS	Emergency Medical Services
F&ES	Fire and Emergency Services
FDZ	Fire Demand Zone
FR	Federal Register
FRCC	Fire Regime Condition Class
ft	Foot (Feet)
HSPD-5	Homeland Security Presidential Directive 5
ICRMP	Integrated Cultural Resources Management Plan
ICS	Incident Command System
INRMP	Integrated Natural Resources Management Plan
MBTA	Migratory Bird Treaty Act
MCLB	Marine Corps Logistics Base
MCO	Marine Corps Order
MDAQMD	Mojave Desert Air Quality Management District
mph	Mile(s) per Hour
NAVFAC	Naval Facilities Engineering Command

Nebo	Nebo Main Base
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System
NFES	National Fire Education System
NFIRS	National Fire Incident Reporting System
NFP	National Fire Plan
NFPA	National Fire Protection Association
NICC	National Interagency Coordination Center
NIFC	National Interagency Fire Center
NIMS	National Incident Management System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NUS	Normal Unit Strength
NWCG	National Wildland Coordinating Group
NWS	National Weather Service
O_3	Ozone
OSCC	Southern California Geographic Area Coordination Center
OSHA	Occupational Safety and Health Administration
PM_{10}	Suspended Particulate Matter Less Than or Equal to 10 Microns in Diameter
PMS	Publication Management System
PPE	Personal Protective Equipment
RCMP	Range Complex Management Plan
RTA	Range and Training Area
SHPO	State Historic Preservation Officer
THPO	Tribal Historic Preservation Officer
UFC	Unified Facilities Criteria
U.S.	United States

USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WFDSS	Wildland Fire Decision Support System
WFMP	Wildland Fire Management Plan

1.0 INTRODUCTION

1.1 Purpose

The purpose of the Marine Corps Logistics Base (MCLB) Barstow Wildland Fire Management Plan (WFMP) is to protect personnel, facilities, and natural and cultural resources from the impacts of wildland fire and ensure the perpetuation of native terrestrial habitats and rare species. It integrates applicable regulatory requirements with ecosystem management strategies. This WFMP directly supports the Installation's military mission and is consistent with its fire management directives. The development of this WFMP is directed by Marine Corps Order (MCO) 5090.2A. For further policy, refer to Section 2.1.

1.2 Project Location

MCLB Barstow is located in the Mojave Desert in San Bernardino County in south-central California, less than 6 miles east of the city of Barstow (Figure 1-1). MCLB Barstow's property consists of three parcels covering 5,405 acres (ac): Nebo Main Base (Nebo),1,286 ac; the Yermo Annex, 1,681 ac; and the Rifle Range, 2,438 ac. Nebo primarily supports Base headquarters, administration, storage, recreational facilities, shopping, and housing, whereas the Yermo Annex supports storage and an industrial complex and the Rifle Range supports marksmanship and requalification on its three small-arms ranges.

Nebo and the Rifle Range are partially adjacent to one another, with Nebo located northwest of the Rifle Range (Figure 1-2). The Yermo Annex is approximately 5 miles east of Nebo (Figure 1-3). Interstate 40 passes through housing and other portions of Nebo; however, the Base is fenced on both its northern and southern boundaries. The Yermo Annex can be accessed from Interstate 40 to the south or from Interstate 15 to the north, along Daggett-Yermo Road. Historic Route 66, which parallels Interstate 40, extends through Nebo and passes along the northern boundary of the Rifle Range. The dry bed of the Mojave River forms the northern boundary of Nebo and runs south of and passes through a portion of the Yermo Annex.

Adjacent open lands are primarily administered by the Bureau of Land Management (BLM) and are used as an open-space reserve. Other nearby uses include a quarry near Nebo, older commercial development along Highway 66 west of Nebo, and a county airport near the Yermo Annex. Property ownership of lands surrounding MCLB Barstow is shown in Figures 1-2 and 1-3.

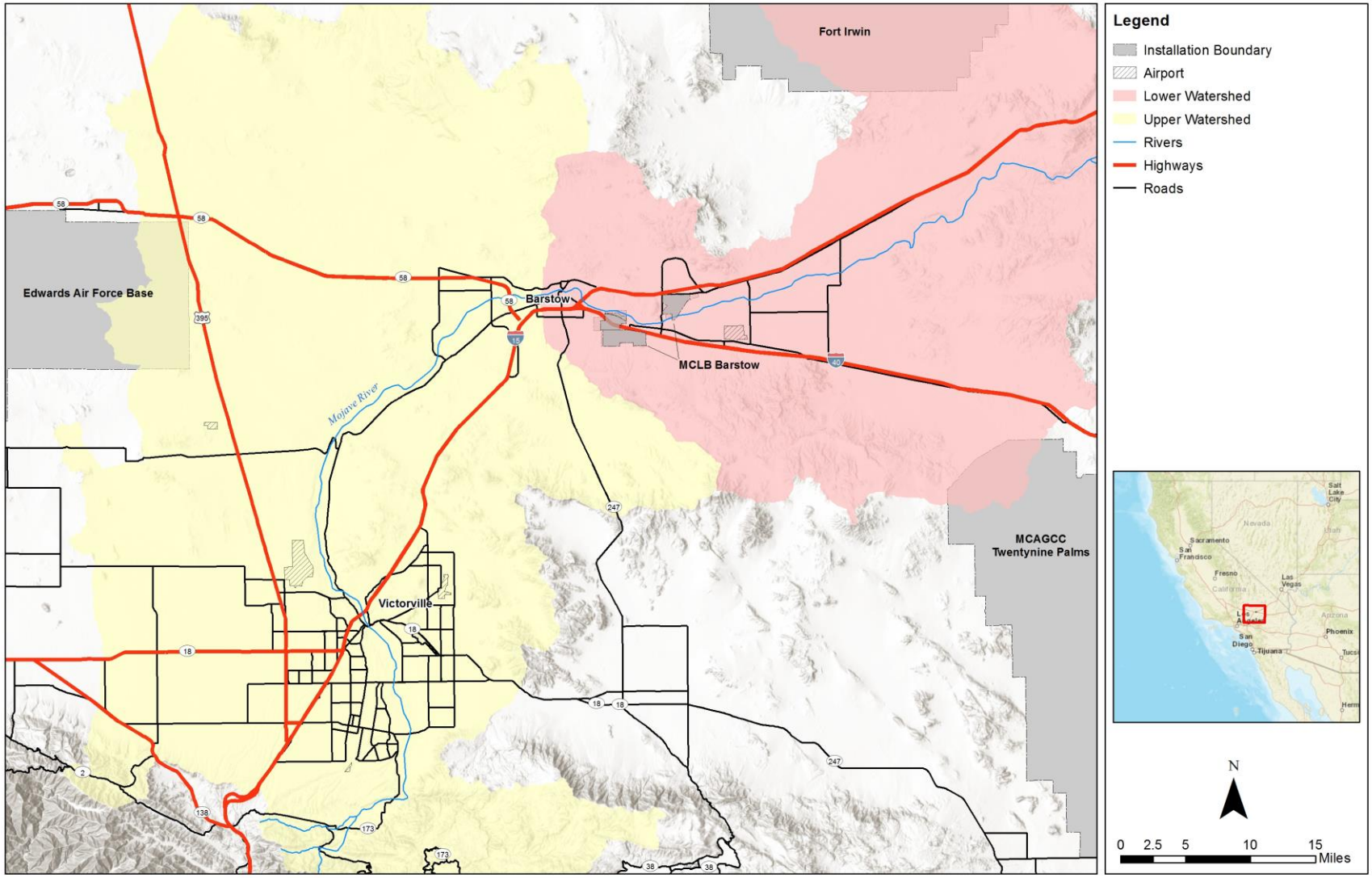

Figure 1-1. Regional Vicinity Map

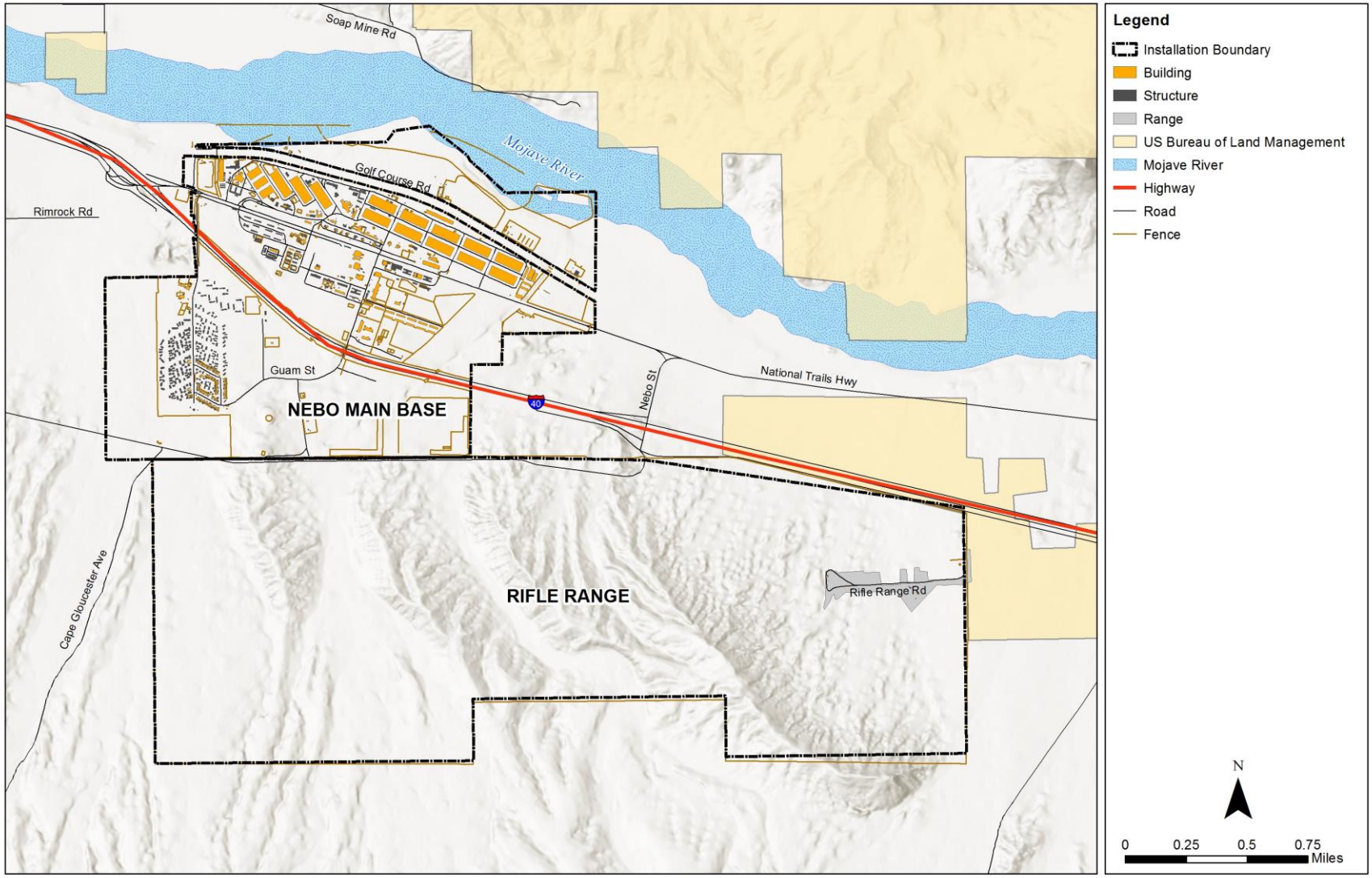

Figure 1-2. Project Vicinity – Nebo and Rifle Range

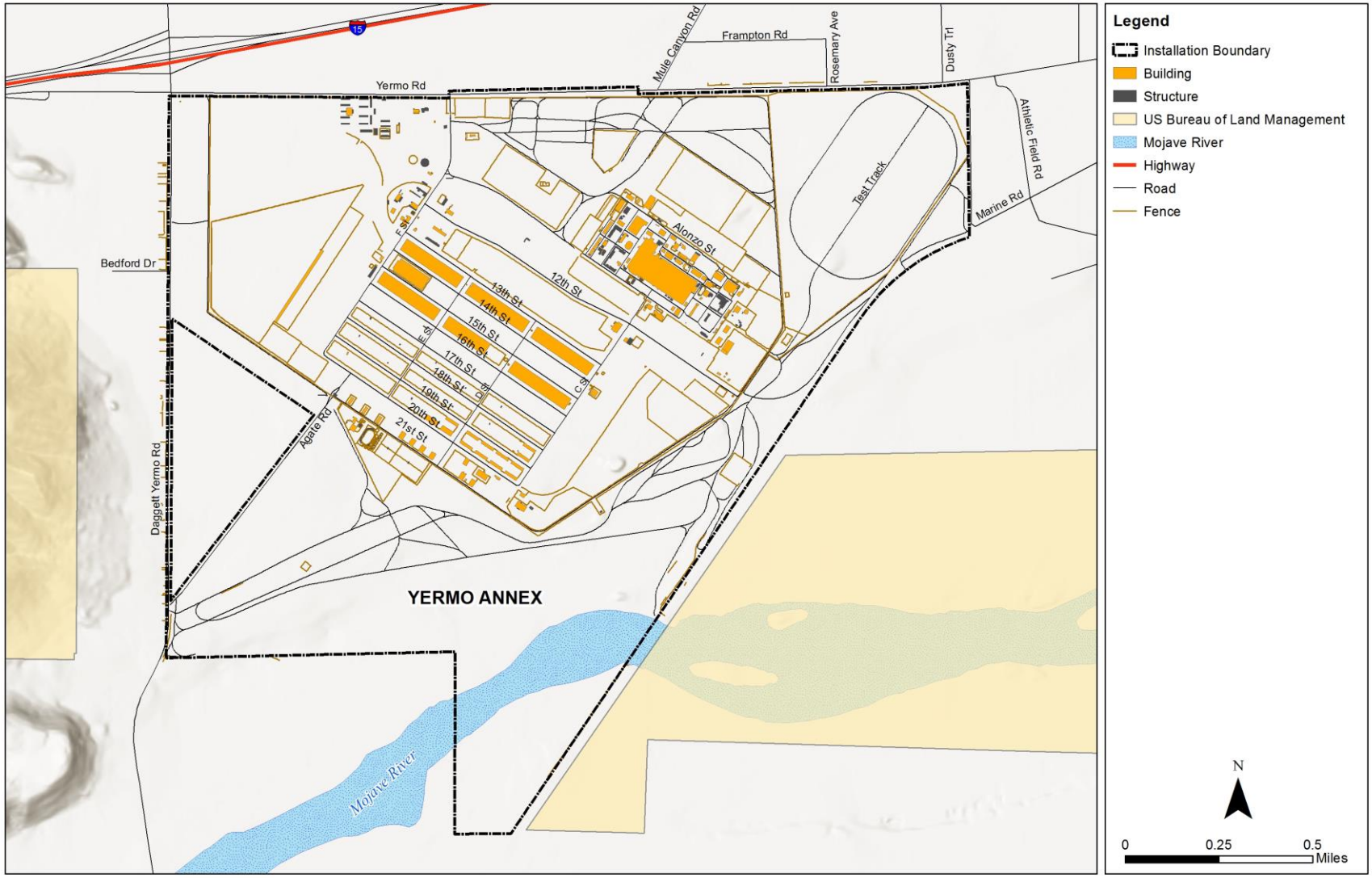

Figure 1-3. Project Vicinity – Yermo Annex

1.3 Marine Corps Logistics Base Barstow Mission

As one of two logistics bases operated by the United States (U.S.) Marine Corps, MCLB Barstow serves an important role as a primary West Coast Marine Corps Logistics and Maintenance Center. Its mission is twofold: (1) to procure, maintain, store, and distribute supplies and equipment as needed and (2) to repair and rebuild Marine Corps and other Department of Defense (DoD) equipment. MCLB Barstow furnishes supplies for Marine Corps facilities worldwide and is a direct support provider for all installations. Secondarily, MCLB Barstow is responsible for the technical training of Marines, developing and maintaining their skills and job efficiency.

1.4 Wildland Fire Management Plan Overview

The WFMP is a tool that describes in detail the structure of a Fire Management Program and the activities and methods that will be used by the Fire and Emergency Services (F&ES) and Natural Resources managers at MCLB Barstow to achieve safety, resource protection, and land management objectives. This WFMP will help guide wildland fire management so appropriate measures are taken in the management of natural fuels and wildland fire to support the Installation's goals. It identifies the linkages between higher-level planning documents, legislation and policies, and the actions described in this plan; describes the fire management unit characteristics covered by the WFMP; documents the procedures used in the area covered by the WFMP to implement the Wildland Fire Management Program; and documents the processes for determining whether the WFMP is being implemented as planned and fire-related goals and objectives are being achieved.

The Fire Management Program for MCLB Barstow is driven by the Installation's mission, land ownership patterns, and natural resources and significant habitats. Safety is the primary consideration when selecting a wildland fire management strategy. The development of Safety Plans and standards are essential to the overall success of the mission at MCLB Barstow. This WFMP establishes a protection strategy for onsite staff, trainees, contractors, and civilians, as well as others who could possibly be impacted by wildland fires at the Installation.

FORMAT PAGE

2.0 POLICY, LAND MANAGEMENT PLANNING, AND PARTNERSHIPS

Depending on property ownership, different safety and operations requirements must be met in the planning and implementation of prescribed fire and wildfire management. The DoD, Department of the Navy, Marine Corps, and MCLB Barstow have provided standards for wildland fire management through the issuance of instructions. Additionally, the policies for wildland fire management span both F&ES and natural resources management. The policy of the Marine Corps is to act responsibly in the public interest to restore, improve, preserve, and properly use natural resources. Concern for the inherent values of natural resources in all Marine Corps plans, actions, and programs will be conscious and active. Land use practices and decisions must coincide with the military mission, rely on scientifically sound conservation procedures and techniques, and employ scientific methods and an interdisciplinary approach.

2.1 Fire Policy

2.1.1 Department of Defense

DODI Instruction 6055.06 (December 2006) – DoD F&ES Program

DoD Instruction (DODI) 6055.06 cancelled DODI 6055.6 (October 2000). It updated policy and criteria for the allocation, assignment, operation, and administration of the DoD F&ES Program, established a DoD F&ES Working Group, and authorized publications such as guides, handbooks, and manuals to provide specific information on the DoD F&ES Program. These publications included DODI 6055.06-M and the DoD Emergency Medical Services (EMS) Program; DoD F&ES Fitness and Wellness Program; Firefighter Chemical, Biological, Radiological, Nuclear, or High-Yield Explosive, and Weapons of Mass Destruction; DoD F&ES Standards of Response Coverage; and DoD Wildland Fire Management Program.

Although DODI 6055.06 requires that numerous qualifications be met to manage wildland fires, Section 6.16 of the DODI describes the risk management procedures by which an installation may deviate from minimum requirements. A long-term deviation from the instruction may be requested by following instructions provided in Section 6.16.3 of DODI 6055.06.

Federal fire policy was adopted by the DoD Wildland Fire Policy Working Group in 1996 and implemented as DoD fire policy through DODI 6055.6 (DoD F&ES Program 2000). DODI 6055.6 requires that fire department and natural resources preparedness and response to wildland fires be in accordance with the Federal Wildland Fire Management Policy and Program Review of 1995 (January 2001; U.S. Department of the Interior and U.S. Department of Agriculture 2001), and provides other policy and criteria for the allocation, assignment, operation, and administration of the DoD F&ES and EMS programs. DODI 6055.6 states:

E2.5.9. Wildland Fire Preparation and Response. Fire department and natural resources preparedness and response to wildland fires shall be in accordance with the Federal Wildland Fire Management Policy and Program Review of 1995 and the Interagency Fire Management Agreement (reference (l)), except as covered under DoD Directive 3025.15 (reference (m)). The Department of Defense shall establish and maintain voting membership in the National Wildfire Coordinating Group to facilitate the development of policy, standards and training with the Federal wildland agencies. The Department of Defense shall establish and maintain a fire protection specialist position at the National Interagency Fire Center to represent DoD wildland fire requirements, coordinate the use of military assets through the Director of Military Support, and manage the wildland fire qualification system for the Department of Defense.

E3.8. WILDLAND FIRE RESPONSE

Plan for and respond to wildland fires on installations using 2001 Federal Wildland Fire Management Policy, established standards, local conditions' risk considerations, and the following:

E3.8.1. For installations with burnable acreage or bordered by burnable acreage, prepare an Installation Wildland Fire Management Plan that identifies:

E3.8.1.1. All wildland fire management strategies including military training availability, ecosystem sustainability, and protection of F&ES personnel and the public.

E3.8.1.2. Wildland fire preparedness, preplanned dispatch for both initial and extended attack, and prescribed fire and prevention per NFPA (National Fire Protection Association) Standard 1710. If required, the minimum level of service for wildfire suppression shall consist of a direct wildland attack capability within 10 minutes of arrival of the initial wildland fire company at the fire scene.

E3.8.2. Train all personnel involved in wildland fire management activities to the appropriate Publication Management System (PMS) 310-1 or NFPA Standard 1051 position, and all personnel shall be outfitted with protective clothing and equipment per NFPA 1977.

<u>DoDI 6055.06-M (February 2006) as Amended, (September 2010) DoD F&ES Certification Program Manual</u>

The DODI 6055.06-M manual was issued under the authority of DODI 6055.6, *DoD Fire and Emergency Services Program,* 10 October 2000. It was revised in September 2010 to incorporate changes to DODI 6055.6, 21 December 2006. It established uniform professional qualification standards, standardized training, and certification procedures for all DoD F&ES personnel. It is recommended that DoD agencies prepare and respond to wildfires in

accordance with “the standards promulgated by the Department of Labor-Occupational Safety and Health Administration (OSHA), National Fire Protection Association (NFPA), the National Fire Code, Unified Facilities Criteria (UFC) 3-600-01, and other fire safety criteria published by the Department of Defense.”

MCO 5090.2A – Environmental Compliance and Protection Manual

MCO 5090.2A requires that Marine Corps installations that, due to mission requirements and vegetative types, are prone to wildfire will include Fire Management Plans in their Integrated Natural Resources Management Plans (INRMPs), as amended. MCO 5090.2A further states that responsibility for good stewardship of natural resources will be an important and identifiable function of all echelons of Command management. Procedures must be established at each installation to ensure that Marine Corps decision makers are kept informed of the conditions of natural resources, the objectives of Natural Resources Management Plans, and potential or actual conflicts between Marine Corps actions and policies and procedures. Stewardship will be recognized as a high-priority requirement in retaining control and use of Marine Corps lands for mission needs.

MCO P5090.2A was enacted in January 2008 in response to the DODIs listed above and requires that installations with, or bordered by, burnable acreage develop a WFMP consistent with the INRMP and ICRMP. The MCO authorizes the Installation Commander (CO) to define the roles and responsibilities for the WFMP and program resources, designate an installation Wildland Fire Program Manager, and approve the installation’s WFMP and the deployment of Marine Corps civilian firefighters to any off-installation incident. The designated Wildland Fire Program Manager is responsible for the development of the WFMP in addition to reviewing and approving Burn Plans for consistency with the INRMP and other applicable operating instructions.

MCO P11000.11 (June 2010) – Marine Corps Fire Protection and Emergency Services Procedural Manual

This order provides policy to protect Marine Corps personnel and the public from loss of life, injury, and illness due to fires and other emergencies as a result of installation activities, aircraft operations, disasters, or terrorist incidents. This order also encourages measures to prevent or minimize damage to Marine Corps property and the environment.

Base Order P11320.5H – MCLB Fire Regulations

Base Order P11320.5H provides instructions and guidance concerning fire prevention and fire protection procedures at the Installation. The Base Order references the following: MCO 1000.11, MCO 10330.2D, 42 United States Code, DODI 6055.6, DoD Directive 3025.1, UFC 3-600-1 (NOTAL), Base Order 11101.20B, and National Fire Codes (NOTAL).

Marine Corps Base Order 3570.1 – MCLB Barstow Regulations for Ranges and Training Areas and Airspace (Range Regulations)

Marine Corps Base Order 3570.1 provides instructions and guidance for personnel operating within MCLB Barstow's Range and Training Areas (RTAs) to ensure that they will operate in a safe manner, preserving life, equipment, and natural resources. The MCLB Barstow RTAs will be managed in a way that maximizes safe, effective training opportunities for MCLB Barstow's diverse customer base.

MCLB Fire Department

MCLB-Barstow F&ES Strategic Plan. As identified in the MCLB Barstow F&ES Strategic Plan (Appendix A), the mission and principle of the MCLB Barstow Fire Department is to "provide highly capable all hazard emergency response in order to protect the lives and property of MCLB Barstow and its community."

To support that mission, the F&ES Strategic Plan has prioritized three key organizational principles:

1. Support a safe work environment concentrating firefighters' efforts on safety in everything they do.
2. Establish and maintain the highest quality F&ES Program.
3. Promote high professional standards.

MCLB-Barstow F&ES Standard Operating Guidelines. Standard operating guidelines (Appendix B) are used by all personnel assigned or attached to the MCLB Fire Department. These standard operating guidelines provide basic information needed to conduct safe and efficient emergency operations. All personnel are expected to conduct themselves in accordance with these guidelines.

Environmental Office

MCO P5090.2A, *Environmental Protection and Compliance Manual*, provides guidance on environmental management on USMC installations and incorporates all federal laws and regulations as well as Marine Corps-specific policies. MCLB Barstow's Environmental Division office serves as the onsite point of contact for all environmental-related activities, including the planning, organizing, administering, implementing, and management of environmental programs at the training center. Projects proposed in this WFMP are reviewed and executed by MCLB Barstow's Environmental Director and Natural Resources Manager, as chosen by the CO.

Naval Facilities Engineering Command Southwest

Naval Facilities Engineering Command (NAVFAC) Southwest provides technical and contracting support for the planning, engineering/design, construction, real estate (including acquisition and disposal of), and environmental services in Arizona, California, Colorado, Nevada, New Mexico, and Utah. The Command also provides public works services like transportation, maintenance, utilities/energy delivery, facilities management, and base/training

center operations to support other federal agencies in California plus other Navy and Marine Corps installations within its geographic area of responsibility.

NAVFAC Southwest helps to enforce Navy and Marine Corps policy to ensure compliance with natural resources laws and regulations and stewardship of lands. It also provides the technical capability 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 authority. NAVFAC Southwest's Central Integrated Product Team is the principal unit involved with land use planning and implementation support. It ensures that MCLB Barstow conforms to all appropriate federal and state environmental laws and regulations.

2.1.2 Federal Wildland Fire Policy

Federal Wildland Fire Management Policy and Program Review

The 1995 Federal Wildland Fire Policy established principles and policies to provide a common approach to wildland fire by federal partner agencies. The Interagency Federal Wildland Fire Policy Review Working Group, at the direction of the Secretaries of the Interior and Agriculture, reviewed the 1995 Federal Wildland Fire Management Policy and Program Review and its implementation, resulting in the development of the review and update of the 1995 Federal Wildland Fire Management Policy (January 2001). The working group found that the policy was generally sound and continued to provide a solid foundation for wildland fire management activities and for natural resources management activities of the federal government. The review and update of the 1995 Federal Wildland Fire Management Policy (January 2001) consists of guiding principles and discrete policies. As a whole these principles and policy statements guide the philosophy, direction, and implementation of fire management planning, activities, and projects on federal lands.

Implementation Guidance

The Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy (June 2003) was developed and approved under the authority of the Wildland Fire Leadership Council to set forth direction for consistent implementation of the federal fire policy. In 2008, the National Wildfire Coordinating Group (NWCG) modified this guidance and tested the new guidelines. The NWCG affirmed the soundness of the review and update of the 1995 Federal Wildland Fire Management Policy (January 2001), validated the modification of Federal Wildland Fire Policy guidance, replaced the existing analysis and decision processes with the Wildland Fire Decision Support System (WFDSS), and replaced the *Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy* (June 2003) with *Guidance for Implementation of Federal Wildland Fire Management Policy* (February 2009). This updated guidance consolidates and clarifies changes that have occurred since the 2003 strategy document was issued and provides revised direction for consistent implementation of the review and update of the 1995 Federal Wildland Fire Management Policy (January 2001).

Wildland Fire Use Implementation Procedures Reference Guide

The *Wildland Fire Use Implementation Procedures Reference Guide* (May 2005) provides direction, guidance, and assistance in implementing the Federal Wildland Fire Management Policy, specifically associated with the planning and implementation of wildland fire use, for the National Park Service (NPS), U.S. Forest Service (USFS), Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (USFWS), and BLM. Managing wildland fires for resource benefit (wildland fire use) is an option available to federal agencies that have an approved Land Use Plan and Fire Management Plan that allow for wildland fire use. The DoD was not involved in the production of the 2005 *Wildland Fire Use Implementation Procedures Reference Guide*, but it is the most recent document available that provides guidance in implementing the 2001 Federal Wildland Fire Management Policy for wildland fire use. The document addresses safety, response to wildland fire, use of wildland fire (i.e., prescribed fire), fire science, interagency cooperation, and communication and education. The guide provides detailed steps for creating a Wildland Fire Implementation Plan specific to management of individual fires or prescribed fires.

2.1.3 National Fire Protection Association

The NFPA is an international, nonprofit organization whose mission is to reduce the burden of fire and other hazards to quality of life by developing and advocating consensus codes and standards, performing research, and providing training and education. The codes and standards developed by NFPA are internationally recognized and adopted because they were developed using an open, consensus-based process. NFPA documents listed and described below can be ordered through the NFPA website at http://www.nfpa.org.

- NFPA 1051 – *Standard for Wildland Fire Fighter Personnel Professional Qualifications*
- NFPA 1141 – *Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas*
- NFPA 1143 – *Standard for Wildland Fire Management*
- NFPA 1144 – *Standard for Reducing Structure Ignition Hazards from Wildland Fire*
- *NFPA 1561 – Standard on Emergency Services Incident Management System and Command Safety*
- *NFPA 1582 – Standard on Comprehensive Occupational Medical Program for Fire Departments*
- NFPA 1710 – *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*
- NFPA 1984 – *Standard on Respirators for Wildland Fire Fighting Operation*
- NFPA 1906 – *Standard for Wildland Fire Apparatus*
- NFPA 1977 – *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*

2.1.4 National Fire Plan

The National Fire Plan (NFP) is not a specific document but a broad statement of federal policy developed from several documents. The NFP requires a range of wildland fire management activities on and near federal lands. The five key points of the NFP are as follows:

1. Maintain a cost-effective level of preparedness in firefighting and prevention.
2. Invest in projects to reduce fire risk with focused effort in wildland urban interface areas.
3. Work with communities to reduce the risks of catastrophic fire.
4. Rehabilitate fire-damaged wildland and restore high-risk ecosystems.
5. Establish and maintain a high level of accountability, including oversight reviews, progress tracking, cost analysis, and performance monitoring.

2.1.5 10-Year Comprehensive Strategy and National Cohesive Strategy

The 2001 document *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-Year Comprehensive Strategy* further develops the five key points originally outlined in the NFP. In this document, known by the short title of *10-Year Comprehensive Strategy*, four objectives are identified:

1. Improve prevention and suppression.
2. Reduce hazardous fuels.
3. Restore fire-adapted ecosystems.
4. Promote community assistance.

A National Cohesive Wildland Fire Management Strategy (Forests and Rangelands 2014) was developed to address wildfire as a complex land management and societal issue. The strategy identifies three primary factors presenting the greatest challenges and the greatest opportunities for making a positive difference in addressing the wildland fire problems. The primary factors identified are restoring and maintaining resilient landscapes, creating fire-adapted communities, and responding to wildfires. The cohesive strategy is built on the foundation of other efforts, such as the 10-Year Comprehensive Strategy and the NFP, to establish direction for wildland fire management using a phased approach.

2.1.6 National Incident Management System

Homeland Security Presidential Directive 5 (HSPD-5) National Incident Management System (NIMS) enacted on 28 February 2003 was created to “enhance the ability of the U.S. to manage domestic incidents by establishing a single, comprehensive national incident management system” (White House 2003). HSPD-5 directs the Department of Homeland Security to develop and administer NIMS and further requires all federal departments and agencies to adopt NIMS and use it in their individual Incident Management Plans.

NIMS components and resources can be accessed through the Federal Emergency Management Agency website at *http://www.fema.gov/national-incident-management-system*

NIMS incorporates "best practices from all levels of existing Response Plans. It is not an operational Incident Management Plan but a set of doctrine, concepts, principles, terminology, and organizational processes that are meant to enable effective collaboration between federal, state, and tribal agencies as well as the private sector and non-governmental organizations" (Federal Emergency Management Agency 2008).

2.1.7 Sikes Act Improvement Act of 1997 as Amended

The Sikes Act Improvement Act of 1997 as amended requires military installations in the U.S. to prepare and implement INRMPs that provide for the following management activities, to the extent that such activities are consistent with the use of the installation for military preparedness:

- The conservation and rehabilitation of natural resources on military installations.
- The sustainable multipurpose use of the resources, to include hunting, fishing, trapping, and nonconsumptive uses.
- Public access to the installation, subject to safety requirements and military security.

In accordance with Sikes Act Improvement Act of 1997 as amended, prescribed fire can effectively and efficiently accomplish objectives for wildlife management, land management, forest management, and wildlife-oriented recreation.

2.1.8 National Wildfire Coordinating Group

The NWCG attempts to improve the coordination and integration of federal, state, and tribal Wildland Fire Programs while recognizing individual agency missions and also serving as an information source and discussion forum for short- and long-term wildland fire management issues (NWCG 2008). The NWCG mission is to provide national leadership to develop, maintain, and communicate interagency standards, guidelines, qualifications, training, and other capabilities that enable interoperable operations among federal and nonfederal entities.

Although NWCG standards are interagency by design, the decision to adopt and utilize them is made independently by the individual member entities and communicated through their respective directives systems. NWCG is made up of the USFS, BLM, NPS, BIA, and USFWS and of nonfederal agencies (i.e., National Association of State Foresters, Intertribal Timber Council, and International Association of Fire Chiefs). The NWCG's strategic priorities are as follows:

- Develop, distribute, and support wildland fire operations standards for adoption and use by the NWCG member entities.
- Establish and maintain a comprehensive training curriculum in support of the standards.
- Develop standards with the intent of universal adoption and minimal agency-specific variation but recognizing the autonomy of the NWCG member entities.
- Support the National Cohesive Wildland Fire Management Strategy goals: to restore and maintain resilient landscapes, create fire adapted communities, and respond to wildfires safely and effectively.

- Ensure that all NWCG activities contribute to safe, effective, and coordinated national interagency wildland fire operations.

Current and historic NWCG documents are maintained in a PMS online at http://www.nwcg.gov/publications. The NWCG documents are assigned unique identifying numbers following the PMS heading. Additionally, documents may also be assigned a National Fire Education System (NFES) number. Although the PMS and NFES numbers may be different, they correspond to the same document and both numbers are listed on recent NWCG publications. Publications can be searched by either the PMS or NFES number at the NWCG publications website listed above.

PMS 210/NFES 002943 – Wildland Fire Incident Management Field Guide

The *Wildland Fire Incident Management Field Guide* is the standard NWCG incident management reference guide. It is a revision of what used to be called the *Fireline Handbook*, PMS 410-1. This guide has been renamed because, over time, the original purpose of the *Fireline Handbook* had been replaced by the *Incident Response Pocket Guide*, PMS 461. The *Wildland Fire Incident Management Field Guide* states, references, or supplements wildland fire incident management and operational standards established by the NWCG.

PMS 304-2/NFES 1596 – Fitness and Work Capacity

PMS 304-2 provides guidance for individuals to maintain work capacity. It discusses factors relevant to work capacity, including physical fitness, physiology, nutrition, training, and exercise.

PMS 307/NFES 1109 – Work Capacity Test Administrator's Guide

PMS 307 provides guidance for administrators of the work capacity test, including forms, suggested participant pretest training, and medical screening.

PMS 310-1/NFES 1414 – National Incident Management System: Wildland Fire Qualification System Guide

The main objective of PMS 310-1 is to establish minimum requirements for, and allow cooperating agencies to agree upon, training, experience, physical fitness level, and currency of qualifications for interagency national wildfire mobilization and establish minimum qualifications for personnel on moderate or higher-complexity prescribed fires.

Federal Wildland Fire Qualifications Supplement

When criteria for inclusion in the PMS 310-1 are not met for a position, wildland fire agencies have the option to establish agency-specific positions and standards for those positions based on unique missions and needs. Agencies that utilize positions not contained in the PMS 310-1, broadly referred to as Technical Specialists, typically establish minimum standards for these positions in agency-specific manuals or guides. The *Federal Wildland Fire Qualifications Supplement* was published in 2016. It includes federal-agency-sponsored positions that are not included in PMS 310-1 and which are frequently used for wildland fire incidents.

PMS 461/NFES 002943 – Incident Response Pocket Guide

The *Incident Response Pocket Guide* is the "wildland fire job aid and training reference for operational personnel from Firefighter Type 2 through Division Supervisor and Initial Attack/Extended Attack Incident Commander" and is primarily an initial responder's tool (NWCG 2004).

2.1.9 National Interagency Fire Center

The National Interagency Fire Center (NIFC), located in Boise, Idaho, is the nation's support center for wildland firefighting. The NIFC's mission is to serve as a focal point for coordinating the national mobilization of resources for wildland fire and other incidents throughout the U.S. The NIFC website, https://www.nifc.gov/index.html, serves as a clearinghouse for wildland fire information, providing intelligence on equipment and supplies, policies, training, and predictive services. The website also provides information about products designed for the use of the internal wildland fire community for wildland fire and incident management decision making. Additionally, the National Interagency Coordination Center (NICC) operates from the NIFC to coordinate the national mobilization of resources for wildland fire and other incidents throughout the U.S.

The National Interagency Fire Center Red Book (January 2016)

The Fire and Aviation Directors of the BLM, USFS, USFWS, and NPS have directed the Federal Fire and Aviation Task Group, NIFC, to annually revise, publish, and distribute the federal Interagency Standards for Fire and Fire Aviation Operations, and issue errata to the document. The document addresses specific action items that are contained in the *Guidance for Implementation of Federal Wildland Fire Management Policy* (13 February 2009). It provides Fire and Fire Aviation Program management direction to the interagency partners by stating, referencing, or supporting policy. Each agency treats the manual as either supplemental policy or guidance while complying with interagency and agency-specific health, safety, and fire management policy documents.

National Interagency Coordination Center

The NICC is the focal point for coordinating the mobilization of resources for wildland fire and other incidents throughout the U.S. The NICC also provides intelligence- and predictive-services-related products designed to be used by the internal wildland fire community for wildland fire and incident management decision making. The NICC website has five primary components: incident information, predictive services, logistics/dispatch, administrative, and links to related area and national websites.

Geographic Area Coordination Centers

The U.S. has 10 Geographic Area Coordination Centers. MCLB Barstow is in the operating area of the Southern California Geographic Area Coordination Center (OSCC). The OSCC provides logistical support and intelligence for wildfires in southern California. It is the focal point for

coordinating the mobilization of resources for wildland fire and other incidents throughout the geographic area. The center also provides logistical support for nonfire disasters, including hurricanes, earthquakes, and floods. The OSCC website has five primary components: incident information, predictive services, logistics/dispatch, administrative, and links to related area and national websites.

2.2 Land/Resource Management Planning

The development of this WFMP is guided by more specific management direction found in the following documents:

- **INRMP.** This five-year plan establishes a framework for natural resources management on MCLB Barstow and provides direction to ensure that natural resources conservation measures and military operations are integrated and consistent with stewardship and legal requirements. A revised INRMP is in development concurrently with this WFMP.
- **Range Complex Management Plan (RCMP).** The RCMP identifies current and projected operations within MCLB Barstow and provides an investment strategy to meet training requirements. A new RCMP is being developed in conjunction with a Range and Training Environmental Assessment.
- **MCLB Barstow Master Plan.** A Master Plan provides a coherent and economically feasible road map for the long-range physical development of MCLB Barstow. The latest master plan, prepared in 2016, is currently under revision.
- **Integrated Contingency Plan.** The Integrated Contingency Plan, or “One Plan”, is one functional plan that consolidates multiple emergency response plans for releases of oil and nonradiological hazardous substances. The plan contains information concerning the Installation Restoration Program.
- **Integrated Pest Management Plan.** The Integrated Pest Management Plan is a comprehensive, long-range document that captures all pest management and pesticide-related activities conducted on MCLB Barstow.
- **Base Exterior Architecture Plan.** The 2016 Base Exterior Architecture Plan establishes specific design criteria for site planning, buildings, streets, parking, signs, site furnishings, landscaping, and other visual environment components.
- **ICRMP.** An ICRMP is an internal compliance and management tool that incorporates the whole of cultural resources with ongoing mission activities. This five-year plan establishes a framework for cultural resources management on MCLB Barstow.

Other documents that relate to the management of regional resources in the vicinity of MCLB Barstow are listed below:

- **California Desert Conservation Plan, as amended.** This plan provides guidance relative to the use of the public lands and resources of the California Desert Conservation Area (on BLM land), including economic, educational, scientific, and recreational uses, in a manner that enhances wherever possible and does not diminish the environmental, cultural, and aesthetic values of the desert and its productivity.

- **1994 Desert Tortoise Recovery Plan (Revised Recovery Plan 2011).** This is a USFWS Advisory Plan that outlines the process of protecting habitat to achieve survival of the desert tortoise. It identifies six areas (Recovery Units) where the tortoise population could be managed to achieve recovery; human activities are considered to be incompatible with recovery and recommended to be prohibited. The plan also describes recovery objectives that would lead to delisting of the tortoise. The 2011 Revised Recovery Plan identifies specific wildland firefighting tactics to be used in critical desert tortoise habitat.
- **West Mojave Plan Draft Environmental Impact Report/Environmental Impact Statement (BLM 2003; Record of Decision 2006; amends the California Desert Conservation Plan).** This document establishes a regional biological strategy to conserve over 100 plant and animal species and their habitats to prevent future listing. It also provides for an efficient, equitable, and cost-effective process for complying with threatened and endangered species law.

2.3 Potential Sensitive Resources

The Environmental Division of MCLB Barstow is tasked with ensuring that the natural and cultural resources present at MCLB Barstow are sustainable and preserved. The Base complies with applicable laws and regulations while supporting its military mission. The protection and enhancement of training lands and open-space areas are critical to implementing the WFMP.

2.3.1 Natural Resources

The Endangered Species Act, Clean Water Act, and Migratory Bird Treaty Act (MBTA) all require military installations to protect certain biological resources; however, the Sikes Act Improvement Act of 1997 as amended requires installations to use INRMPs as defined plans to protect sensitive natural resources. MCO P5090.2A, *Environmental Compliance and Protection Manual*, requires that all Marine Corps installations having water and land suitable for the conservation and management of natural resources prepare and implement a comprehensive INRMP that includes all elements of natural resources management applicable to the installation. MCLB Barstow contains significant natural resources, including a federally listed species, designated critical habitat, and waters of the U.S. that necessitate management and legal consideration. DODI 4715.03, *Natural Resources Conservation Program*, "provides procedures for DoD components and installations for developing, implementing, and evaluating effective natural resources management programs."

A natural resources inventory was conducted in 2014 and 2015 to provide data for the update to the INRMP for MCLB Barstow (Tierra Data Inc. 2015). The survey identified 22 plant and wildlife species confirmed at the Installation that are listed as sensitive by one or more agencies or professional organizations. The species identified were 2 plant species, 1 reptile species, 16 avian species, and 3 mammal species.

2.3.2 Cultural Resources

An ICRMP is an internal compliance and management tool that incorporates the whole of the Cultural Resources Program with ongoing mission activities. ICRMPs are required by DODI 4715.16, *Cultural Resources Program,* and MCO P5090.2A, Chapter 8, *Cultural Resources Management.* DODI 4715.16 states that "all installations with cultural resources will complete and update ICRMPs as per this policy. In addition, all ICRMPs will be current and implemented, in consultation and partnership with SHPO [State Historic Preservation Officers], THPO [Tribal Historic Preservation Officers] and other appropriate consulting parties." In total, 68 archaeological resources have been recorded within the boundaries of MCLB Barstow, consisting of 39 sites and 29 isolates (MCLB Barstow 2011).

2.4 Partnerships

This WFMP was developed by the MCLB Barstow Working Group for the INRMP's WFMP update. Cooperating entities included the MCLB Barstow's Environmental Division and F&ES, NAVFAC Southwest, Vernadero Group Inc., and Versar Inc. Other internal stakeholders included the Headquarters Marine Corps, Marine Corps Installations West, the MCLB Barstow CO, MCLB Barstow Strategic Planning, MCLB Barstow Communications, and MCLB Barstow Public Works.

The following external stakeholders were consulted during planning and/or review of the WFMP:

- BLM
- California Department of Fish and Wildlife
- Desert Management Working Group
- Lahonton Regional Water District
- Mojave Water Agency
- USFWS
- USFS

FORMAT PAGE

3.0 FIRE MANAGEMENT UNIT CHARACTERISTICS

3.1 Area-wide Management Considerations

3.1.1 Goals and Objectives

The MCLB Barstow Fire Management Program's objectives are derived from MCLB Barstow's Fire Department Strategic Plan (MCLB Barstow 2016) and the Revised 2016 MCLB Barstow INRMP. While the missions of the F&ES Division and the Environmental Division differ, with respect to wildland fire management, their goals and objectives are similar. The mission of the F&ES Division is to provide highly capable all-hazard emergency response to protect the lives and property of MCLB Barstow and its community (MCLB Barstow 2016). The Environmental Division's mission is to promote sustainable practices, reduce the impact of Installation operations on the natural environment, and enhance the quality of life of Installation residents and employees. The combined goals and objectives of this WFMP are outlined below.

Objectives

- **Objective 1.** Protect personnel, facilities, and environmental and cultural resources from the impacts of wildland fire.
- **Objective 2.** Sustain facilities, infrastructure, and vegetation cover conditions that facilitate military training so training activities may proceed without interruption, delay, or impairment of the quality of that training.
- **Objective 3.** Minimize the adverse effects of wildland fire by determining the most appropriate treatment and maintenance methods to ensure ecosystem sustainability and health.
- **Objective 4.** Maintain a beneficial WFMP that provides guidance to F&ES Division and Environmental Division personnel.
- **Objective 5.** Maintain wildfire preparedness.
- **Objective 6.** Ensure the perpetuation of natural communities and rare species.
- **Objective 7.** Minimize the total cost of fire presuppression and suppression practices on lands owned by the Marine Corps.

Goals

- **Goal 1.** Protect human life in the event of a fire.
- **Goal 2.** Protect military values and assets and have no net loss of training grounds.
- **Goal 3.** Protect at-risk natural and cultural resources values.
- **Goal 4.** Maintain adequate resources, training, and partnerships to respond to wildfire emergencies.
- **Goal 5.** Maintain awareness of the locations of sensitive resources and the most appropriate treatment and maintenance methods to mitigate negative impacts to these resources.
- **Goal 6.** Improve interagency fire protection coordination and management.
- **Goal 7.** Identify wildland fire access roads and maintain them in a drivable condition.

- **Goal 8.** Identify wildland fire control points, such as roads, drainages, and ridges.
- **Goal 9.** Identify likely fire ignition points.
- **Goal 10:** Educate employees and the public about the scope and effect of wildland fire management, including fuels management, prevention, hazard/risk assessment, rehabilitation, and the role of fire in ecosystem management.

3.1.2 Physical and Biological Setting

General Location

MCLB Barstow is located in the Mojave River Valley basin on the western plain of the Mojave Desert, which slopes gently eastward from the southern end of the Sierra Nevada Mountains in central California toward the Colorado River. Considered part of the high desert in south-central California, most of the western Mojave Desert lies at elevations ranging from 2,000 to 4,000 feet (ft). The Mojave Desert is transitional between the hotter, drier Colorado Desert to the south and the cooler Great Basin Desert to the north.

Physiography

MCLB Barstow is characterized by low ridges and terraces that slope downward to an alluvial valley that generally trends west to east. Nebo and the Yermo Annex are relatively flat, with few topographic features and are generally less than 2,000 ft above mean sea level (amsl) (Figure 3-1). The Rifle Range varies between 2,100 and 2,650 ft amsl and contains plateaus and ephemeral washes that drain north toward the Mojave River (Figure 3-1). Elephant Mountain, located between Nebo and the Yermo Annex, is the highest peak in the area, reaching 2,674 ft amsl.

The region's complex geologic systems consist of sandstone, shale, and gravel deposits. Volcanic rock and granite are also present. The soil of MCLB Barstow and the surrounding area consists of alluvial deposits of unconsolidated to partially consolidated sandy sediments.

Hydrology

The region's main hydrologic resource is the Mojave River (Figure 3-1). Water rarely flows aboveground in the river, but it does flow underground. The river flows underneath MCLB Barstow, less than a mile north of the Rifle Range, and parallels Nebo's northern boundary. This portion of the riverbed is usually dry except during some periods of the rainy season.

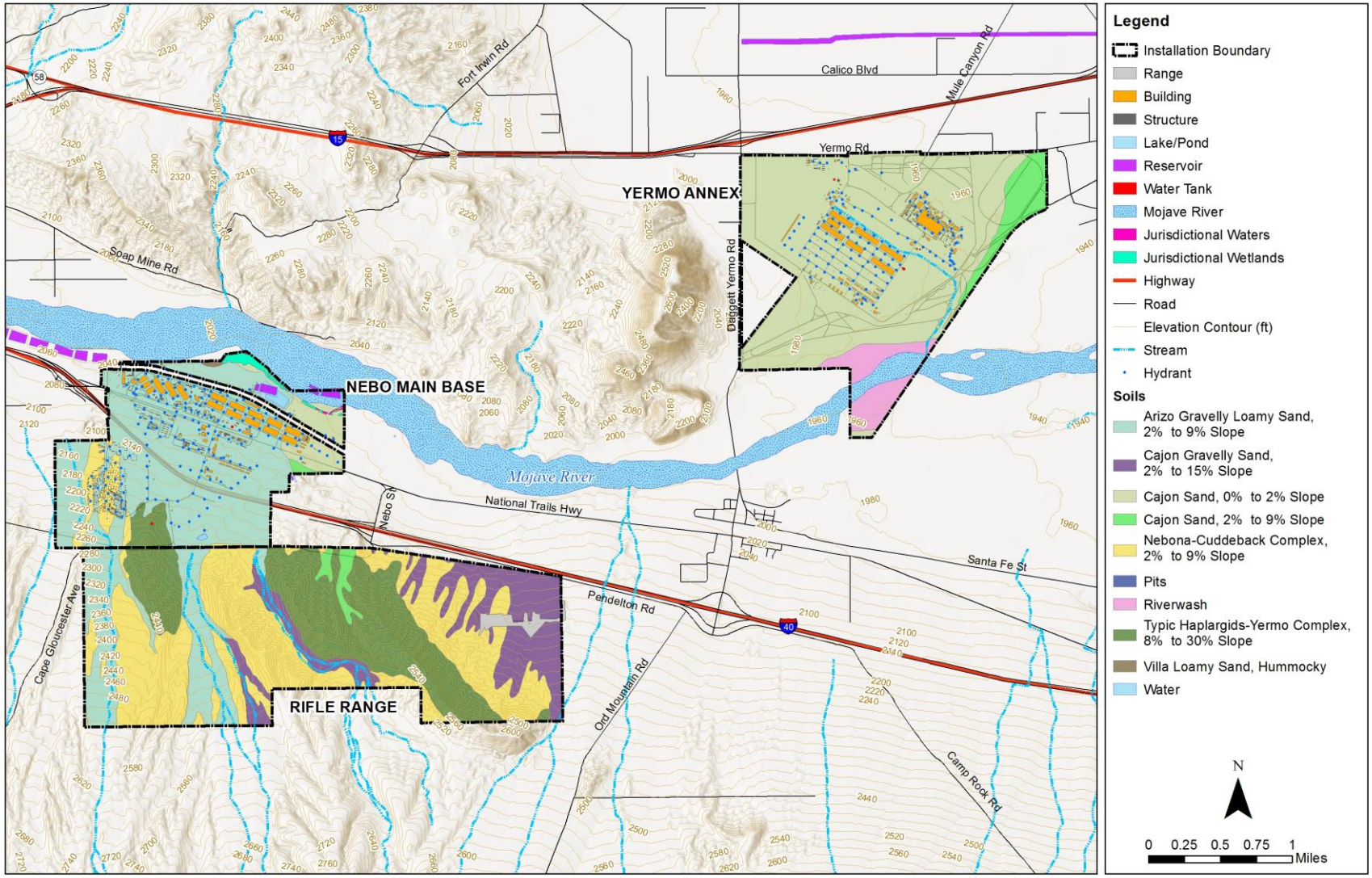

Figure 3-1. Physiographic and Hydrologic Features

Potable water at Nebo is provided by the Southern California Water Company. Water is delivered by supply lines from the city of Barstow and stored in two onsite reservoirs. One reservoir is located just north of Joseph Boll Avenue by Building Q13, while the second reservoir is located south of Interstate 40 near family housing. Both reservoirs store approximately 2 million gallons of water.

Potable water for the Yermo Annex is supplied by a well system owned by MCLB Barstow. Three wells are currently used for the water supply. The Yermo Annex's well system water is treated and stored in reservoirs throughout the Base. The treated water is pumped via booster pumps to an elevated storage tank that provides additional pressure to the system.

Climate

MCLB Barstow is in the north-central Mojave Desert and has an arid climate characterized by hot, dry summers with warm springs and autumns and mild winters. The average annual rainfall is less than 4.4 inches with an annual minimum of 1.08 inches and an annual maximum of 10.9 inches. Rainfall occurs mainly in the winter between November and March, though torrential thunderstorms can occur during the summer. High-intensity storms can produce damaging winds and flash flooding. Humidity levels average less than 40 percent in the summer. Winds primarily originate from the west at monthly average speeds approaching 8 to 9 miles per hour (mph); gusts exceeding 40 to 50 mph are not uncommon.

MCLB Barstow experiences daily temperature fluctuations, resulting in hot days and cool nights. The average high temperature is between 60 and 70 degrees Fahrenheit (°F) in the winter months and more than 100°F in the summer months. Winter temperatures average in the mid-40s and 50s, while daytime temperatures of at least 90°F occur most days from June through September. Winter temperatures can drop below freezing at night. Snowfall is rare in the area but can occur in December and January.

MCLB Barstow experiences relatively strong winds throughout the year, a result of storm fronts moving in from the Pacific Coast. The resulting atmospheric convection causes the desert air to move rapidly from place to place. This mechanism is less effective during cooler winter months when daily temperature ranges are less extreme. Winds are primarily from the west, particularly in the late spring and early summer.

Air Quality

The California Air Resources Board is responsible for enforcing both the federal and state air pollution standards. MCLB Barstow is within the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD), which oversees the development and implementation of local Attainment Plans.

Air quality in the vicinity of MCLB Barstow is generally good. On occasion, it has not met national ambient quality standards due to locally generated and/or transported pollutants from the Los Angeles Basin. MDAQMD is in nonattainment for PM_{10} (suspended particulate matter less than or equal to 10 microns in diameter) and O_3 (ozone) due to pollutants transported from the San

Joaquin Valley and the Los Angeles air basins. The *de minimis* thresholds for San Bernardino County are 100 tons per year for PM_{10} and 25 tons per year for O_3 precursors, including nitrogen oxides and reactive organic gases.

Natural Communities

A botanical survey conducted in 1996 inventoried plant species and communities at MCLB Barstow. The vegetation surveys identified five plant communities on MCLB Barstow: creosote bush scrub, desert wash scrub, cottonwood-willow, desert wash thicket, and desert pavement (Tierra Data Systems 1996). The following community descriptions are provided by the INRMP based on the vegetation survey (Tierra Data Systems 1996) and descriptions based on equivalent series described by Sawyer and Keeler-Wolf (1995) and Holland (1986). Natural community boundaries are shown in Figure 3-2.

Creosote Bush Scrub. Creosote bush scrub is found on the Yermo Annex and the Rifle Range, making up MCLB's largest plant community (Figure 3-2). The composition of species in this community varies by geographic location; however, it is typically dominated by creosote bush, white bursage (*Ambrosia dumosa*), and cheesebush or burrowbrush (*Hymenoclea salsola*). Species commonly associated with this habitat include brittlebush (*Encelia farinosa*), all-scale (*Atriplex polycarpa*), and California tea (*Ephedra californica*), with annuals such as buckwheat (*Eriogonum* spp.), and the invasive species filaree (*Erodium cicutarium*) and Mediterranean grass (*Schismus barbatus*).

Historically, most fires in the desert have been infrequent and of low severity because production of annual and perennial herbs seldom provide a fuel load capable of sustaining fire. Although the resinous foliage of creosote bush is very flammable, the creosote bush-white bursage community was "essentially nonflammable" because the shrubs are too sparse to carry fire (Marshall 1995); however, the frequency and extent have increased significantly as alien annual grasses and human ignition sources have become more common (Brooks and Minnich 2006).

Creosote bush and white bursage are top-killed by fire and are poorly adapted to fire because of their limited sprouting ability, though they can survive some fires that burn patchily or are of low severity (Marshall 1994, 1995). Seedling establishment can also be increased by fire (Marshall 1995). Cheesebush is often top-killed by fire, but it is able to recover quickly by offsite seeds and sprouting (Tesky 1993).

Desert Wash Scrub. Desert wash scrub is the shrub community found in washes. It has high conservation value due to its limited extent and its diverse plants and animals. MCLB Barstow has two types of desert wash scrub: *Tamarix–Lepidospartum–Chilopsis* and *Acacia–Psorothamnus–Chilopsis*. In addition, a transitional community, creosote/desert wash scrub mix, has elements of both Desert wash scrub and creosote bush scrub.

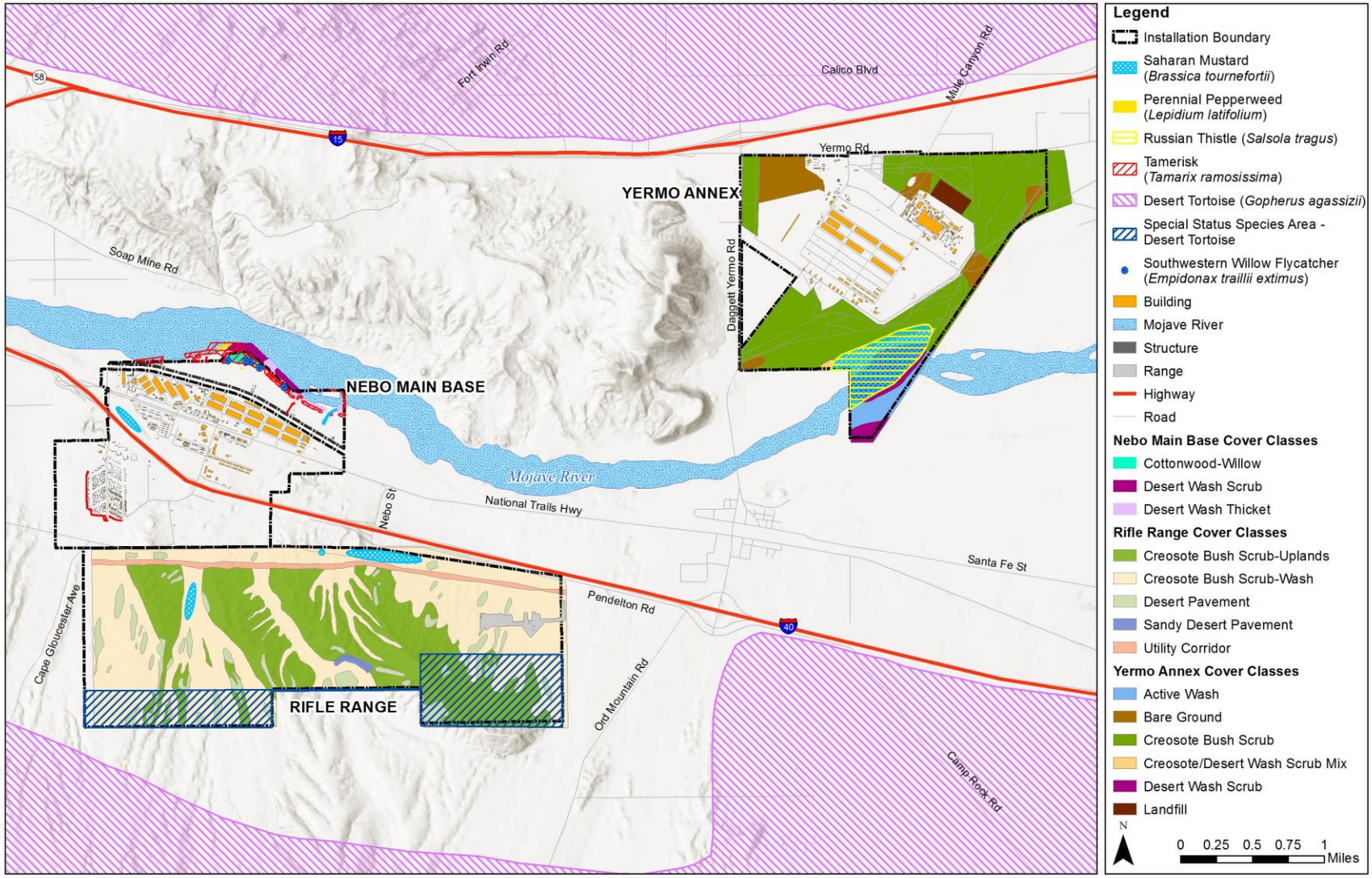

Figure 3-2. Vegetation Communities, Special Status Species, and Invasive Plant Locations

The *Tamarix–Lepidospartum–Chilopsis* desert wash scrub is located in the Yermo Annex along the Mojave River. It is sparsely populated and characterized by tamarisk (*Tamarix ramosissima*), scalebroom (*Lepidospartum squamatum*), and desert willow (*Chilopsis linearis*) with an understory of croton (*Croton californicus*), California tea, tiquilia (*Tiquilia plicata*), Russian thistle (*Salsola tragus*), wire lettuce (*Stephanomeria pauciflora*), Mediterranean grass, cryptantha (*Cryptantha* spp.), filaree, devil's lettuce (*Amsinckia tessellata*), desert primrose (*Camissonia* spp.) and panic grass (*Panicum urvilleanum*).

The *Acacia–Psorothamnus–Chilopsis* desert wash scrub community occurs at the Rifle Range along active washes but not on the wash islands. Catclaw acacia (*Acacia greggii*), small-leaved Mojave indigo bush (*Psorothamnus arborescens* var. *minutifolius*), and desert willow are dominant. Other typical species of this habitat are sweet bush (*Bebbia juncea*), brittlebush, California tea, cheesebush, creosote bush, and Anderson thornbush (*Lycium andersonii*) with an understory of annuals dominated by Mediterranean grass together with foxtail chess (*Bromus madritensis* ssp. *rubens*), fiddleneck (*Amsinckia* spp.), filaree, buckwheat, and cryptantha.

Creosote/Desert Wash Scrub Mix which is a transitional community occurring between Creosote Bush Scrub and Desert Wash Scrub, with neither community dominating. It occurs on more stabilized areas of the washes where upland species have a chance to become established.

Due the location of these communities, they are rarely burned and do not experience wildland fire except in years of drought. Most of the dominant shrubs in this community will sprout from the roots after being burned. Tamarisk is very fire adaptive and will resist burning due to its high salt content, which makes tamarisk a great fire-shelter belt (Simpfendorfer 1989). Although rarely burned, dessert willow would be top-killed by fire but has a high post-fire sprouting rate (Tratz 1978).

Cottonwood-Willow. The cottonwood-willow desert riparian community occurs in the Mojave River portion of Nebo. While it covers only a small area, MCLB Barstow's portion of the Mojave River constitutes about 1 percent of all the riparian habitat in the Mojave Desert. This community is considered sensitive and is a high priority for conservation. This community is distinguished by Fremont's cottonwood (*Populus fremontii*), narrow-leaved willow (*Salix exigua*), and arroyo willow (*S. lasiolepis*). As a result of its position along the Mojave River wash, this community includes a large element of tamarisk. Other species in this riparian zone are mulefat (*Baccharis salicifolia*), Russian thistle, croton, heliotrope (*Heliotropium curassavicum*), Mediterranean grass, melilotus (*Melilotus alba*), and filaree.

Due to the riparian nature of this community, fire presence is low and usually not severe. Most of its constituent species can be top-killed if fire is moderate but will sprout from the roots. Though cottonwoods are not fire dependent, burning may help with seedling regeneration due to thinning of overstory and surrounding vegetation (Stromburg 1993). Both of the dominant willow species will sprout from root crowns after fire (Mount et al. 1996).

Desert Wash Thicket. Desert wash thicket is a very dense plant community dominated by tamarisk and mulefat. It is found in the Mojave River area of Nebo. Understory plants include wire lettuce and croton.

Desert Pavement. This community is only evident at the Rifle Range. Desert pavement is dominated by creosote bush with other typical plants: white bursage, Mojave yucca, plantain, Mediterranean grass, filaree, foxtail chess, devil's lettuce, pincushion, chorizanthe (*Chorizanthe rigida*), and mirabilis (*Mirabilis bigelovii*).

Due to the sparse vegetation in this area, it is hard for fire to ignite or affect this community.

Rare Plant Species. Threatened and endangered species surveys conducted in 2014-2015 confirmed the occurrence of one sensitive plant species, threetooth blazingstar (also known as creamy blazingstar) (*Mentzelia tridentata*), and one potentially sensitive species, Howe's hedgehog cactus (*Echinocereus engelmannii* var. *howei*), at MCLB Barstow (Tierra Data Inc. 2015). The species identified during the survey are detailed in Table 3-1.

Threetooth blazingstar is an annual herb that is endemic to California and listed by the California Native Plant Society (CNPS) as 1B.3 (rare, threatened, or endangered in California, though not very endangered). This species is not listed as threatened or endangered by the state or federal government (CNPS 2016). This species was found in one location at the Rifle Range and consisted of two individual plants. Most of Rifle Range is considered potential habitat for this species. No information was found regarding the effects of fire on threetooth blazing star.

Howe's hedgehog cactus is listed by the CNPS as 1B.1 (very endangered in California); however, the identification of hedgehog cactus to the variety that is considered rare was not possible because of unclear species classification and limited scientific descriptions in the literature. Potentially sensitive hedgehog cactus individuals were found throughout the Rifle Range and the undeveloped portions of Nebo. No information was found regarding the effects of fire on Howes's hedgehog cactus.

Rare Animal Species. The Natural Resources Inventory conducted in 2014 and 2015 identified 20 wildlife species that are listed as sensitive by one or more agencies or professional organizations (Tierra Data Inc. 2015). The species identified were 1 reptile species, 16 avian species, and 3 mammal species. The reptile was the Mojave Desert population of the Agassiz desert tortoise, which is state and federally listed as threatened. One of the bird species, the willow flycatcher, is state listed as endangered. The remaining animal species are considered to be special conservation status, special concern, or watch list species by the USFWS or California Fish and Wildlife.

Table 3-1. Sensitive Species Known to Occur on MCLB Barstow

Common Name Scientific Name	Habitat	Observed Range Location at Marine Corps Logistics Base Barstow
Reptiles		
Desert Tortoise (*Gopherus agassizii*)	Creosote bush, burrobush, Mojave yucca, blackbrush, Joshua tree, and galleta grass on flats, alluvial fans, bajadas, rocky terrain, and washes where soil is friable enough for tortoise to dig burrows. Can be found on rocky areas with slopes of up to 40%.	Rifle Range
Birds		
Brewer's Sparrow (*Spizella breweri*)	Sagebrush and scrub habitats. One of the few species that is mainly a sagebrush obligate. Can also be found in habitat dominated by creosote bush and saltbush.	Nebo, Rifle Range
Burrowing Owl (*Athene cunicularia hypugaea*)	Open, dry grasslands and desert habitats. Nests in burrows.	Rifle Range
Cooper's Hawk (*Accipiter cooperii*)	Woodlands and riparian areas. Nests and forages along riparian areas.	Nebo
Crissal Thrasher (*Toxostoma crissale*)	Dense, low, scrubby vegetation such as desert and foothill scrub and riparian brush.	Nebo
Golden Eagle (*Aquila chrysaetos*)	Widespread in the mountainous and hilly areas of the western Mojave Desert and in open habitats. Nests on cliff faces or in large trees, with nests frequently used for many years by the same breeding pair.	Rifle Range
Le Conte's Thrasher (*Toxostoma lecontei*)	Desert scrub, mesquite, tall riparian brush and, in transitional habitat, chaparral.	Rifle Range
Loggerhead Shrike (*Lanius ludovicianus)*	Found commonly in desert habitats: creosote scrub and desert washes.	Rifle Range, Yermo Annex
Lucy's Warbler (*Oreothlypis luciae*)	Mesquite woodlands along desert streams and washes, such as willows and cottonwoods.	Nebo
Northern Harrier (*Circus cyaneus*)	Often overwinters in desert and desert riparian habitats.	Yermo Annex
Nuttall's Woodpecker (*Picoides nuttallii*)	Woodlands along desert streams and washes, such as willows and cottonwoods.	Nebo
Olive-Sided Flycatcher (*Contopus cooperi*)	Most likely a migrant on the Installation. Uses woodland habitat around the Tees and Trees Golf Course as a stopover.	Nebo
Short-Eared Owl (*Asio flammeaus*)	Most likely a migrant on the Installation. Uses woodland habitat around the golf course as a stopover.	Rifle Range

Common Name Scientific Name	Habitat	Observed Range Location at Marine Corps Logistics Base Barstow
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Riparian woodland typically with a canopy and an understory of shrubs or saplings. Young tamarisk thickets are not occupied anywhere.	Nebo
Swainson's Hawk (Buteo swainsoni)	Observed as a migrant through the Mojave Desert; may use riparian habitat as a stopover.	Rifle Range
Vermillion Flycatcher (*Pyrocephalus rubinus*)	Local breeder in the western Mojave Desert. Low-lying riparian areas with accessible water, such as park land or golf courses.	Nebo
Willow Flycatcher (Empidonax traillii)	Local breeder in the western Mojave Desert. Low-lying riparian areas with accessible water, such as park land or golf courses.	Nebo
Yellow-Breasted Chat (*Icteria virens*)	Brushy open country, including desert thickets. Usually nests in dense riparian thickets.	Nebo
Yellow Warbler (*Dendroica petechia*)	Cottonwoods and willows of riparian woodlands or forests with a dense understory.	Nebo
Mammals		
American Badger (*Taxidea taxus*)	Dry, open areas with little vegetation. Includes arid desert lands and areas adjacent to riparian habitat where prey may be present.	Nebo
Pallid Bat (*Antrozous pallidus*)	Desert scrub habitat below 1,800 feet.	Nebo
Southern Grasshopper Mouse (*Onychomys torridus*)	Desert scrub and other desert habitats where burrows and prey are present.	Nebo
Plants		
Howe's Hedgehog Cactus (*Echinocereus engelmannii* var. *howei*)	Creosote bush scrub.	Nebo, Rifle Range
Threetooth Blazingstar (*Mentzelia tridentate*)	Creosote bush scrub.	Rifle Range

In 1990 the USFWS listed the desert tortoise as threatened; it is also state listed as threatened. Reasons for the determination included significant population declines; loss of habitat from construction projects such as roads, housing, and energy development; and conversion of native habitat to agriculture. Livestock grazing and off-road vehicle activity have degraded additional habitat. Also cited as threatening the desert tortoise's continued existence were illegal collection by humans for pets or consumption; upper respiratory tract disease; predation on juvenile desert tortoises by common ravens, coyotes, and kit foxes; fire; and collisions with vehicles on paved and unpaved roads. Potential threats to the desert tortoise on MCLB Barstow property come mainly from operations and maintenance activities on the Rifle Range and Nebo.

Maintenance on the Rifle Range primarily consists of grading the parking lot and access road semiannually and as needed after severe storms.

In 1994 the USFWS designated approximately 6.44 million ac of critical habitat for the Mojave Desert population of the desert tortoise in portions of California (4.75 million ac), Nevada (1.22 million ac), Arizona (339,000 ac), and Utah (129,000 ac) (59 Federal Register [FR] 5820-5846 and corrections in 59 FR 9032-9036). Portions of this critical habitat occur in the Rifle Range (see Figure 3-2). The habitat suitability for desert tortoise is considered high within open-space areas such as Fire Demand Zones (FDZs) 1, 6, and 10. Tortoise fences were constructed along the perimeter fence adjoining Nebo and the Rifle Range to protect tortoises from equipment operations at a test pond and during construction of landfill caps. Tortoise fencing was also attached to the perimeter fencing surrounding the capped landfills, protecting the tortoises from contamination.

The Environmental Division should be consulted prior to planned fuels treatments, including vegetation removal, grubbing, grading, stockpiling, or other prefire suppression activities, to ensure that activities are consistent with accepted conservation measures.

MCLB Barstow is in the process of increasing training activities on the Rifle Range and evaluating the effects those increases would have on the natural resources of the Installation, particularly the desert tortoise. A Biological Opinion is expected to be obtained in coordination with the USFWS to maintain compliance with the Endangered Species Act. All conservation measures in that Biological Opinion will be included in the final version of the 2016 Revised INRMP.

Birds covered under the MBTA, and under similar provisions of the California Fish and Game code, could use foraging and nesting areas within FDZs 1, 6, 7, and 10. Consistent with the prescriptions against “take” under the MBTA, if any presuppression or prescribed burn activities are to be initiated within the nesting period of migratory birds, which is expected to be February 1 through August 31, a preproject survey of active nests for migratory birds must be conducted. If nests are identified, a qualified biologist needs to determine a no-impact buffer. It would likely be a minimum of 100 ft for passerine species and 300 ft for raptors. A qualified biologist would monitor the nest, and if it is confirmed as not active, project implementation could resume as long as no other nests are within the buffer.

Invasive Plant Species and Noxious Weeds

Invasive plants species and noxious weeds can indirectly negatively impact the natural resources on MCLB Barstow. After a wildland fire, invasive plants and weeds, which tend to be opportunistic and disturbance-adapted, can outcompete native species during the habitat’s restorative phase. Proactive measures such as mowing, burning, and applying pesticide can eliminate and/or reduce the presence of weeds and invasive plants; these measures can also reduce fuels that could increase the risk of wildland fires. Desert plant community dynamics are often altered by the introduction of nonnative annual forbs and grasses. Fire regimes, in particular, can be altered by the increase in biomass resulting from dense infestations of such

species. The altered fire regime would have the potential to increase the frequency and intensity of wildfires, especially during the periods of prolific weed growth associated with high precipitation followed by a hot, dry season (MCLB Barstow 2016).

The California Invasive Plant Council (Cal-IPC) tracks the distribution of many invasive plant species that threaten wildlands, and it maintains a rating system to describe the degree of each species' invasiveness. As part of the 2014-2015 Natural Resources Inventory at MCLB Barstow, all occurrences of Cal-IPC weed species were mapped, and the distribution and abundance of the species were documented within the survey area (Figure 3-2). Five Cal-IPC noxious weed species are abundant and widespread at the Installation (Table 3-2). One additional species was identified in the previous INRMP as significant to promoting wildland fire in desert environments.

Of the six invasive plant species identified, three have a "high" rating and the other three are rated as "limited" by Cal-IPC. Species rated as "high" have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Most are widely distributed. Those rated as "limited" are invasive, but their ecological impacts are generally considered minor on a statewide level. Their ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic (Cal-IPC 2016).

Table 3-2. Invasive Plant Species that Are Abundant and Widespread at MCLB Barstow

Scientific Name	Common Name	California Invasive Plant Council Rating*	Infestation Location
Brassica tournefortii	Saharan mustard	High	Nebo, Yermo Annex, Rifle Range
Lepidium latifolium	Perennial pepperweed	High	Nebo
Salsola tragus	Russian thistle	Limited	Yermo Annex
Schismus barbatus	Mediterranean grass	Limited	Nebo, Yermo Annex, Rifle Range
Tamarix ramosissima	Saltcedar	High	Nebo, Yermo Annex
Erodium cicutarium	Redstemmed filaree	Limited	Nebo, Yermo Annex, Rifle Range

Saharan Mustard (*Brassica tournefortii*). Saharan mustard was observed on all portions of the Installation, though most of the occurrences were fairly localized with individual populations in the high 100s. At the Rifle Range, Saharan mustard was typically found near creosote shrubs toward the end of washes in broader flats and was not found within the upper reaches of water patterns in the hills. At Nebo, Saharan mustard was located within the rock lined drainage northeast of the sanitation ponds. Saharan mustard at the Yermo Annex was found sporadically throughout the dune habitat (Tierra Data Systems 1996).

Saharan mustard is a winter annual found in deserts, desert dunes, and coastal scrub throughout the southwestern region of California, including the Mojave Desert. This species readily invades newly burned areas and is known to increase fire frequency and fuel load.

Because native shrub species are not adapted to recurrent fires, increased fire frequency can cause scrub habitats to convert to grasslands. The high biomass of Saharan mustard, along with frequent fires, may deplete soils of important nutrients, making native habitat recovery more difficult (Cal-IPC 2016).

Perennial Pepperweed (*Lepidium latifolium*). Perennial pepperweed was observed only on Nebo and is currently localized; however, the occurrence is within the watershed of the Mojave River to the north. The population of perennial pepperweed at the Installation was estimated to be in the hundreds.

Perennial pepperweed is invasive, primarily in riparian areas and wetlands, and may invade adjacent areas once established. Perennial pepperweed grows very aggressively, forming dense colonies that exclude native species. It reproduces both by seed and vegetatively from its roots and small root fragments. Seeds and root fragments are spread easily by flooding and soil movement, and seeds stick to tires, shoes, and animals, making continued dispersion difficult to avoid. Perennial pepperweed is a state listed noxious weed in California and many other western states. Perennial pepperweed's tall stature, dense growth pattern, and accumulations of semiwoody stems may increase fuel loads and fire frequency in infested habitats.

Russian Thistle (*Salsola tragus*). Russian thistle is a large, bushy summer annual. It is a disturbance-response species, taking hold along roadsides, on abandoned agricultural fields, and in cleared areas and wastelands. As Russian thistle matures, it forms large, spherical bushlike structures that are often uprooted by wind when dry. These windblown spheres “tumble” across the desert dispersing seeds as they roll. Russian thistle is also a fire hazard, primarily because it increases fuel loads but, secondly, because burning plants can spread fire while tumbling (Cal-IPC 2016).

Mediterranean Grass (*Schismus arabicus* and *S. barbatus*). This annual grass is found throughout the Installation, ranging from dense mats to individual plants that are found only sporadically. This species contributes to increased fire frequency in the desert, which can result in shrub habitat converting to grassland. It does this by carrying fires between shrubs, acting as an unnatural fine fuel source connecting normally isolated shrubs (Cal-IPC 2016).

Tamarisk (*Tamarix ramosissima*). Tamarisk is a shrub or a tree, prevalent at the Installation in the Mojave River and at the Yermo Annex. Tamarisk is rated “high” by the Cal-IPC for invasive establishment within locations of high disturbance. Its establishment is based on disturbances associated with geomorphology, groundwater, soil chemistry, fire frequency, plant community composition, and outcompetition of native plants, reducing diversity.

Tamarisk is a fast resprouter that can quickly form dense monoculture stands that can dominate an entire riparian community (Cal-IPC 2016). Tamarisk leaves are not highly flammable due to high moisture content, even though they contain volatile oils. Tamarisk flammability increases with the buildup of dead and senescent woody material within the plant, and dense stands of tamarisk can be highly flammable (Busch 1995).

Red-Stemmed Filaree (*Erodium cicutarium*). Filaree is a common weed growing in a variety of desert habitats. It is so ubiquitous in the modern desert landscape that the plant must be considered permanently naturalized. The prostrate stems of red-stemmed filaree aid in spreading ground fire. Dead plants contribute to fuel loads.

Cultural Resources

Cultural resources consist of districts, buildings, sites, structures, areas of traditional use, or objects with historical, architectural, archaeological, cultural, or scientific importance. They include archaeological resources (both prehistoric and historic), historic architectural resources (physical properties, structures, or built items), and traditional cultural resources (those important to living Native Americans for religious, spiritual, ancestral, or traditional reasons) (MCLB Barstow 2016). In total, 68 archaeological resources have been recorded within the boundaries of MCLB Barstow, consisting of 39 sites and 29 isolates (MCLB Barstow 2011; Figure 3-3). Of these, one site (CA-SBR-2910H) has been determined to be eligible for inclusion in the National Register of Historic Places. One additional site (CA-SBR-73) has been designated as a California point of historical interest, and another site (CA-SBR-3033/H) has been designated a California historical landmark. Of the buildings and structures in the built environment at MCLB Barstow, 246 properties were built more than 50 years ago. The remaining were constructed after 1989. No buildings have been found to be eligible for inclusion in the National Register of Historic Places (MCLB Barstow 2011).

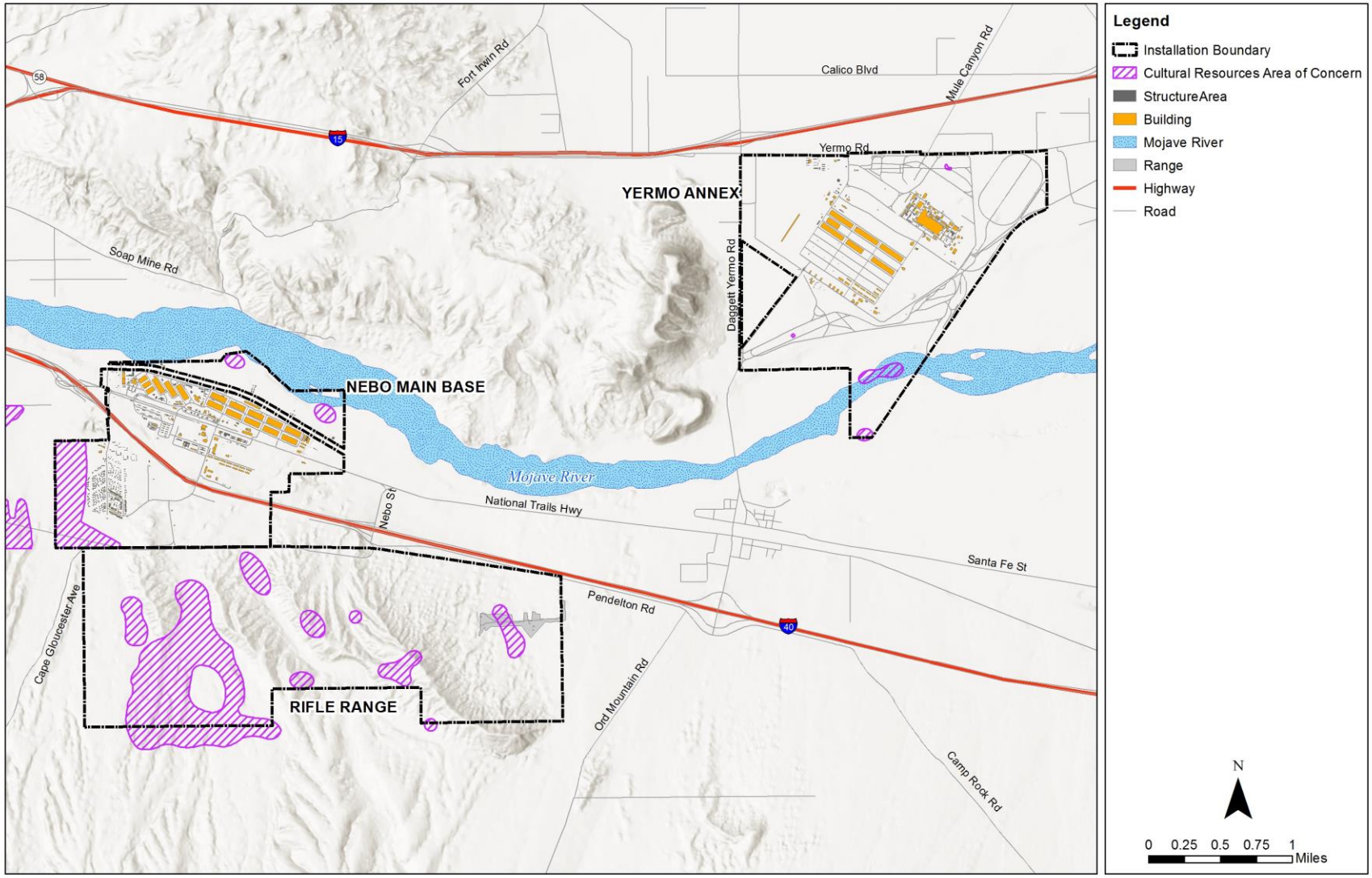

Figure 3-3. Cultural Resources Area of Concern

3.2 FDZ-Specific Descriptions

The MCLB Barstow F&ES Division has identified 10 FDZs at MCLB Barstow (Figure 3-4). For the purposes of this WFMP, these preexisting FDZs will be used as the Fire Management Units that are commonly identified in interagency fire management planning.

The MCLB Barstow F&ES Division develops an annual fire risk assessment (Appendix C) for the Installation. Each FDZ is analyzed for the kind of potential fire that may result in an ignition source or cause damage to improvements or the environment. Potential fires analyzed include fires to railroads, structures, wildlands, munitions, waste/dumpsters, vehicles, and petroleum/oil/lubricants. Each kind of fire was given a low, moderate, or high rating as to the consequence, probability, and degree of risk it has within the individual zones. Probability is defined as the potential of an event occurring; consequence indicates the results of an event. Both factors are considered when determining the degree of risk. The 2016 risk assessment identifies three FDZs with moderate probability of wildland fire: FDZs 1, 6, and 10. Of these, only one, FDZ 1, is considered a moderate risk, due to its proximity to base housing. The remaining FDZs have low risk for wildland fire.

FDZs identified as having wildland fire concerns were evaluated for their fire regime condition class (FRCC). FRCC is an interagency standardized tool for determining the degree of departure from reference condition vegetation, fuels, and disturbance regimes (BIA et al. 2008). FRCC 1 represents ecosystems with low departure from a defined reference period; that is, landscapes are still within the natural or historical range of variability. FRCC 2 designates ecosystems with moderate departure, and FRCC 3 designates ecosystems with high departure from reference conditions. The greater the departure from historic conditions, the greater the risk of wildfire. During recent years, large fires in southern California have occurred in FRCC 3 areas, resulting in extreme fire behavior and loss of life and property (BIA et al. 2008).

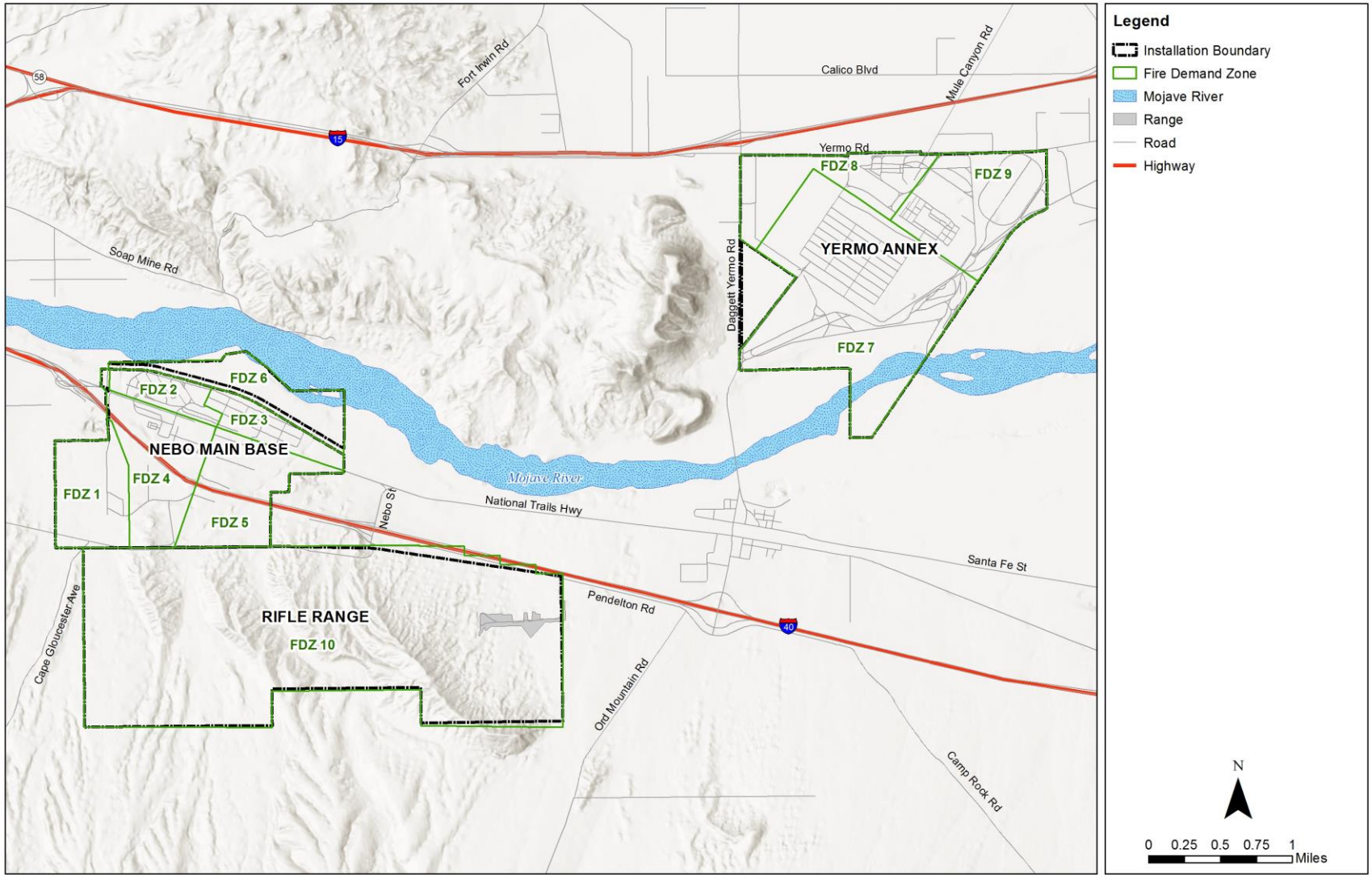

Figure 3-4. FDZs that Serve as Fire Management Units

3.2.1 FDZ 1 – Base Housing

Characteristics

FDZ 1 Location. FDZ 1 is in the westernmost portion of Nebo (Area B), south of Interstate 40 and north of and adjacent to FDZ 10 (Figure 3-5).

FDZ 1 Topography. FDZ 1 is a gently sloping desert wash with a moderately sloping hillside dissected by ephemeral washes. The major topographical feature is a dry streambed running from the Rifle Range toward the Mojave River to the north. Elevations range from 2,140 ft to approximately 2,180 ft. Its aspect is north facing.

Resource Use. The major resource uses are for Base housing and a cultural and natural resources restricted area.

Soils. Soils within FDZ 1 are characterized by sandy arroyos and washes. The Natural Resources Conservation Service (NRCS) soil associations for the northern section of FDZ 1 are Arizo gravelly loamy sand, 2 to 9 percent slopes, and Nebona-Cuddeback complex, 2 to 9 percent slopes (NRCS 2008).

Hydrology and Water Quality. The hydrological conditions of FDZ 1 include drainage convergences from ephemeral washes and arroyos. The primary sources of hydrology are precipitation events during the fall through spring seasons. Occasional monsoons may occur during the summer months.

Cultural Values. A large portion of FDZ 1 is designated as a cultural restricted area.

Invasive Species and Weed Issues. Tamarisk is present as a shelter belt between the natural area and the housing area within FDZ 1. Tamarisk is rated “high” by the Cal-IPC for invasive species establishment within locations of high disturbance. Its establishment is based on disturbances associated with geomorphology, groundwater, soil chemistry, fire frequency, plant community composition, and outcompetition of native plants, reducing diversity.

Sensitive, Threatened, and Endangered Species and Habitat. Sensitive species with potential to occur or that are known to occur at Nebo include the desert tortoise, the American badger, and several special status bird species that may be found foraging, nesting, or resting in the habitats within FDZ 1. However, no specific locations of sensitive species or habitat designations have been identified within FDZ 1.

Fire Occurrence and History. Wildland fire has not been recorded in FDZ 1.

Likely Ignition Source. Ignition sources include off-road vehicles and sources from Base housing.

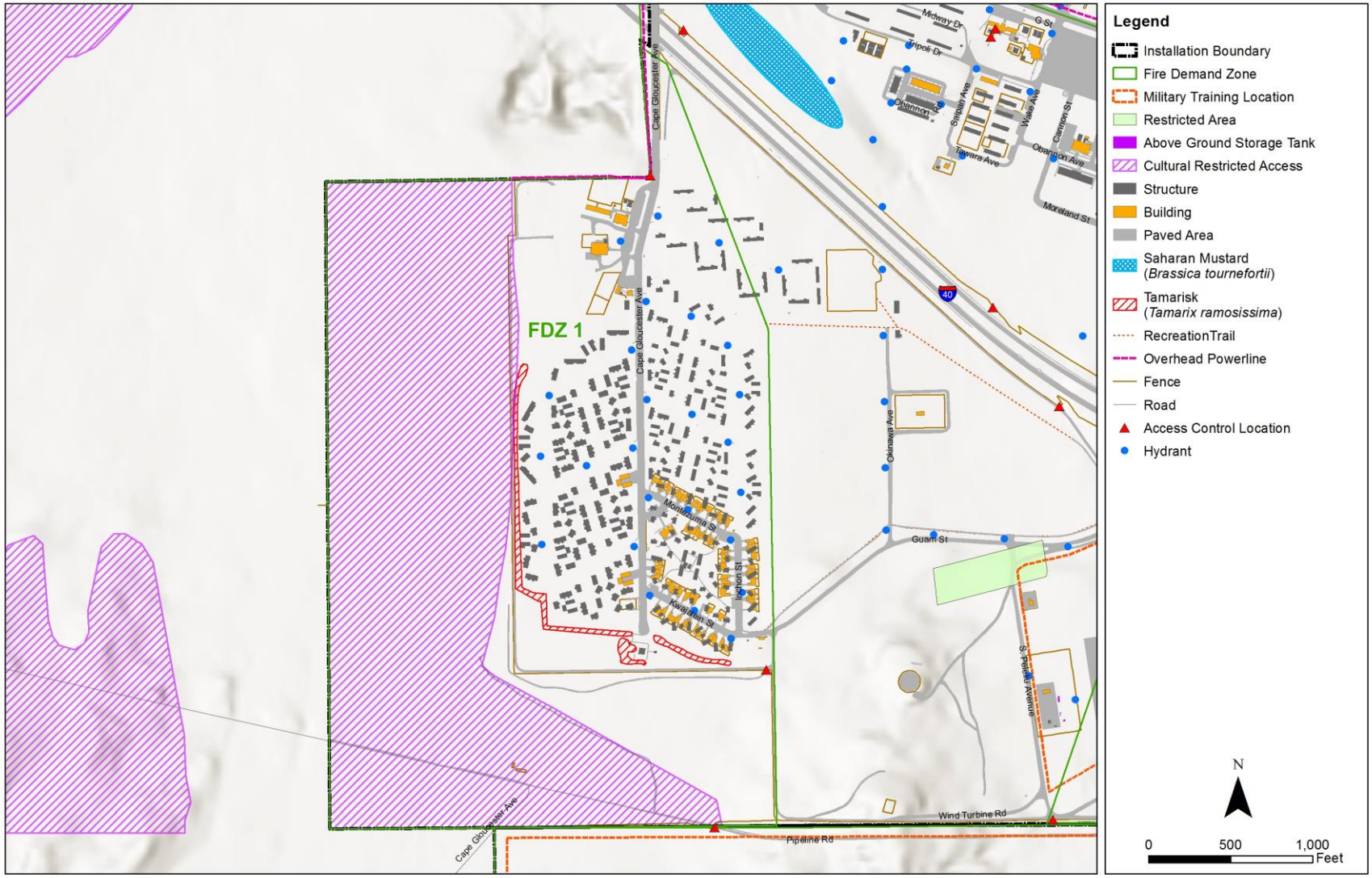

Figure 3-5. FDZ 1 and Associated Features

Fire Regime and FRCC. FDZ 1 is classified as FRCC 1. This fire regime is characterized by relatively small, patchy, low-severity surface fires and a truncated, long fire return interval. The row of tamarisk has the potential for a frequent, high-intensity, crown-fire regime. This situation could reach FRCC 3, as it is far removed from the historic fire return/intensity conditions.

Fire Models, Fire Behavior, Fire Weather, and Climate-Related Impacts. Except for years of high rainfall, the fuel model in FDZ 1, SH1, consists of low-load, dry-climate shrub. This model rarely contains enough fuel volume or continuity to support fire spread. If a fire carries through the vegetation, the rate of spread is no more than three chains (200 ft) per hour, and the flame lengths are less than 1 ft.

In the event of a high-rainfall year or a series of high-rainfall years that produce a sufficient grass/fine fuel load to carry a fire front, the fuel model would be GR1, consisting of short, sparse, dry-climate grass. The rate of spread could be approximately 20 chains (1,300 ft) per hour, with flame lengths of 2 to 3 ft.

The fuel model for tamarisk is SH5, described as high-load, dry-climate shrub. Although the rate of spread is highly dependent on mid-flame wind speed, it is possible for fires to spread more than 60 chains (4,000 ft) per hour with a 10 mph wind. Flame lengths could exceed 10 ft. The risk of escape would be low due to the limited linear extent of this fuel type in FDZ 1.

Values at Risk. In FDZ 1 the values at risk are Base housing facilities, recreational facilities, residences, power and gas utility lines, and cultural resources.

Management Guidance

Suppression strategies are as follows:

- Provide for firefighter and public safety.
- Suppress 100 percent of all unplanned wildland fires, regardless of ignition source, to the smallest size possible but no more than 10 ac, protecting all values at risk in a prioritized manner.
- Ensure that wildland fires will not leave federal reservation lands and enter private lands.
- Assign a Resource Advisor to all wildland fires. The Resource Advisor consults with the Ecosystem Management Staff at MCLB Barstow and obtains appropriate information (including maps and detailed descriptions) on the location of resource values potentially at risk from suppression or post-suppression actions.
- Have Resource Advisors meet annually with fire crews to discuss resource concerns and values in the Mojave Desert ecosystem.
- Use an aggressive, direct attack wherever possible (see *Safety Issues and Protection of Resources* below).
- Use a mix of the following suppression methods:
    - Aerial attack
    - Hand tools to create fire breaks
    - Foam or fire retardant

- Be aware that off-road attack methods with engines and surface-disturbing equipment such as bulldozers are restricted due to cultural resources. In addition, loose, sandy soil may not permit off-road attack methods.

Safety Issues and Protection of Resources

Safety is the primary consideration when selecting a wildland fire management strategy. The development of Safety Plans and standards is essential to the overall success of the mission at MCLB Barstow. This WFMP establishes a protection strategy for (1) onsite staff, trainees, contractors, civilians, and others who could possibly be impacted by natural fires and (2) for Marine Corps activities adjacent to the Installation. Safety issues commonly encountered include the following:

- Establishment of safety zones and escape routes
- Loose, sandy soil that can make off-road vehicle travel difficult
- Rattlesnakes and scorpions

3.2.2 FDZ 6 – Riparian

Characteristics

FDZ 6 Location. FDZ 6 is in the northernmost portion of Nebo (Area B). It is south of the Mojave River and north of the golf course and sewage ponds (Figure 3-6). It extends the full length of Nebo from east to west.

FDZ 6 Topography. FDZ 6 is characterized as flat, desert ephemeral, river-bottom terrain. The major topographical feature is the Mojave River, which is dry except after storms.

Resource Use. Wildlife habitat, wetlands, and floodplain are the major resource uses.

Soils. The soils within the riverbed portion of FDZ 6 consist of riverwash, characterized by coarse sand and gravelly intrusions. As the riverbed soils transition onto the riverbank and the 100-year floodplain, the soils become like loamy sediment. The NRCS soil associations for the northern section of FDZ 6 are Arizo gravely, loamy sand, 2 to 9 percent slopes; Cajon sand, 0 to 2 percent slopes; Villa loamy sand (hummocky); and riverwash (NRCS 2008).

Hydrology and Water Quality. Hydrological conditions for the riparian and wetland areas in FDZ 6 are primarily derived from the Mojave River. During precipitation events and surface flows, the Mojave River is an ephemeral waterway. Precipitation events occur mainly during the fall through spring seasons. Occasional monsoons may occur during summer months within this region. The Mojave River is also considered a subfluvial waterway, in that headwaters flow from the San Bernardino Mountains, percolate underground, and then percolate upward along selective reaches of the river towards its terminus at Soda Lake.

Cultural Values. Cultural locations within FDZ 6 include potentially historic water well locations.

Invasive Species and Weed Issues. Within FDZ 6, approximately 18 ac of riparian corridor vegetation associated with the Mojave River and floodplain are susceptible to fire as a result of high concentrations of invading tamarisk. Tamarisk is the dominant shrub/tree species within the Mojave River and 100-year floodplain of FDZ 6. Tamarisk is rated "high" by the Cal-IPC for invasive establishment within locations of high disturbance. Its establishment is based on disturbances associated with geomorphology, groundwater, soil chemistry, fire frequency, plant community composition, and outcompetition of native plants, reducing diversity.

Sensitive, Threatened, and Endangered Species and Habitat. Sensitive species that have been identified was having potential to occur at Nebo include the desert tortoise, American badger, and several special status bird species that may be found foraging, nesting, or resting in the habitats within FDZ 6 (Table 3-1). The southwestern willow flycatcher inhabits riparian areas in FDZ 6. Removal of the tamarisk in FDZ 6 Nebo should only be performed as part of a Restoration Plan for the habitat. Based on the physical conditions of FDZ 6, the desert tortoise is not likely to be found here; however, the potential exists for the species to be present.

Fire Occurrence and History. Wildland fire has not been recorded in FDZ 6.

Likely Ignition Source. Potential ignition sources include off-road vehicles and transients.

Fire Regime and FRCC. The invasion of tamarisk has created the potential for a frequent, high-intensity, crown-fire regime. This situation could reach FRCC 3, as it is far removed from the historic fire return/intensity conditions. Historic riparian species such as cottonwood (*Populus fremontii*) and willow (*Salix* sp.) would produce an infrequent, low- to moderate-intensity, surface-fire regime.

Fire Models, Fire Behavior, Fire Weather, and Climate-Related Impacts. The fuel model for tamarisk is SH5, described as high-load, dry-climate shrub. Although the rate of spread is highly dependent on mid-flame wind speed, it is possible for fires to spread more than 60 chains (4,000 ft) per hour with a 10 mph wind. Flame lengths could exceed 10 ft.

Values at Risk. Golf course facilities, wetlands, a sewage treatment plant, residences, and business structures are values at risk in Nebo.

Management Guidance

Suppression strategies are as follows:

- Provide for firefighter and public safety.
- Suppress 100 percent of all unplanned wildland fires, regardless of ignition source, to the smallest size possible but no more than 10 ac, protecting all values at risk in a prioritized manner.
- Ensure that wildland fires will not leave the federal reservation lands and enter private lands.

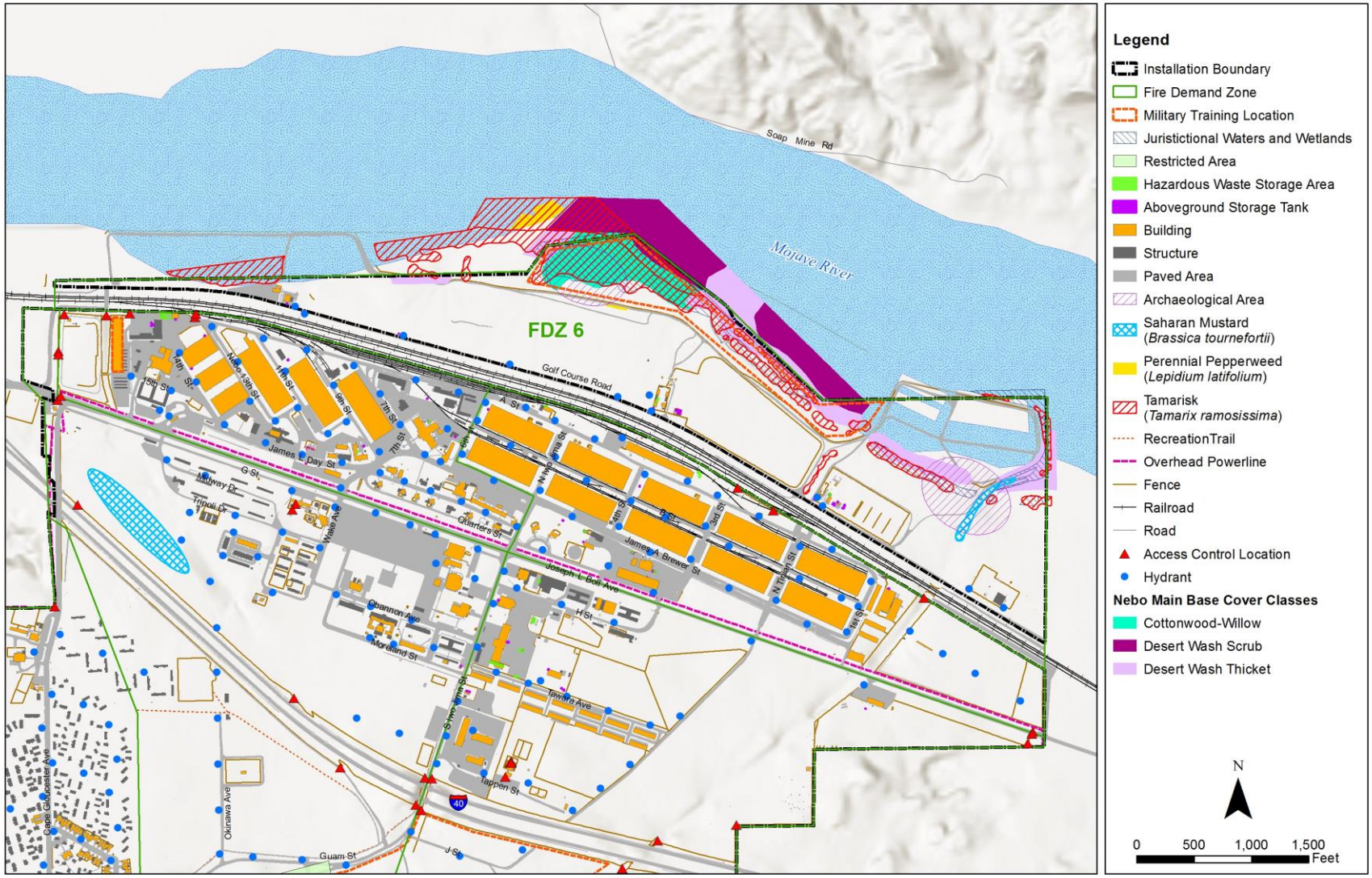

Figure 3-6. FDZ 6 and Associated Features

- Assign a Resource Advisor to all wildland fires. The Resource Advisor consults with the Ecosystem Management Staff at MCLB Barstow and obtains appropriate information (including maps and detailed descriptions) on the location of resource values potentially at risk from suppression or post-suppression actions.
- Have Resource Advisors meet annually with fire crews to discuss resource concerns and values in the Mojave Desert ecosystem.
- Use an aggressive, direct attack wherever possible (see *Safety Issues and Protection of Resources* below).
- Use a mix of the following suppression methods:
  - Aerial attack
  - Hand tools to create fire breaks
  - Foam or fire retardant
- Use off-road attack methods with engines and surface-disturbing equipment such as bulldozers if feasible in FDZ 6. Note that loose, sandy soil will not permit off-road attack methods.

Safety Issues and Protection of Resources

Safety is the primary consideration when selecting a wildland fire management strategy. The development of Safety Plans and standards is essential to the overall success of the mission at MCLB Barstow. This WFMP establishes a protection strategy for (1) onsite staff, trainees, contractors, civilians, and others who could possibly be impacted by natural fires and (2) Marine Corps activities adjacent to the Installation. Safety issues commonly encountered include the following:

- Evacuation of personnel north of A Street from the golf course and sewage treatment plant area.
- Protection of the structures north of A Street.
- Limited fire suppression vehicle access north of A Street. Type 3 or larger engines can only access this area from the east. With a prevailing west wind, an easterly approach would place engines at the head of the fire, with only one way in and one way out.
- Establishment of safety zones and escape routes.
- Difficult off-road vehicle travel due to loose, sandy soil.
- Rattlesnakes and scorpions.

3.2.3 FDZ 10 – Rifle Range

Characteristics

FDZ 10 Location. FDZ 10 is includes all of the Rifle Range parcel. It is adjacent to and directly south of Nebo and Interstate 40 (Figure 3-7). It is bounded by unnamed washes, ridges, and midslope topography on its south, east, and west sides.

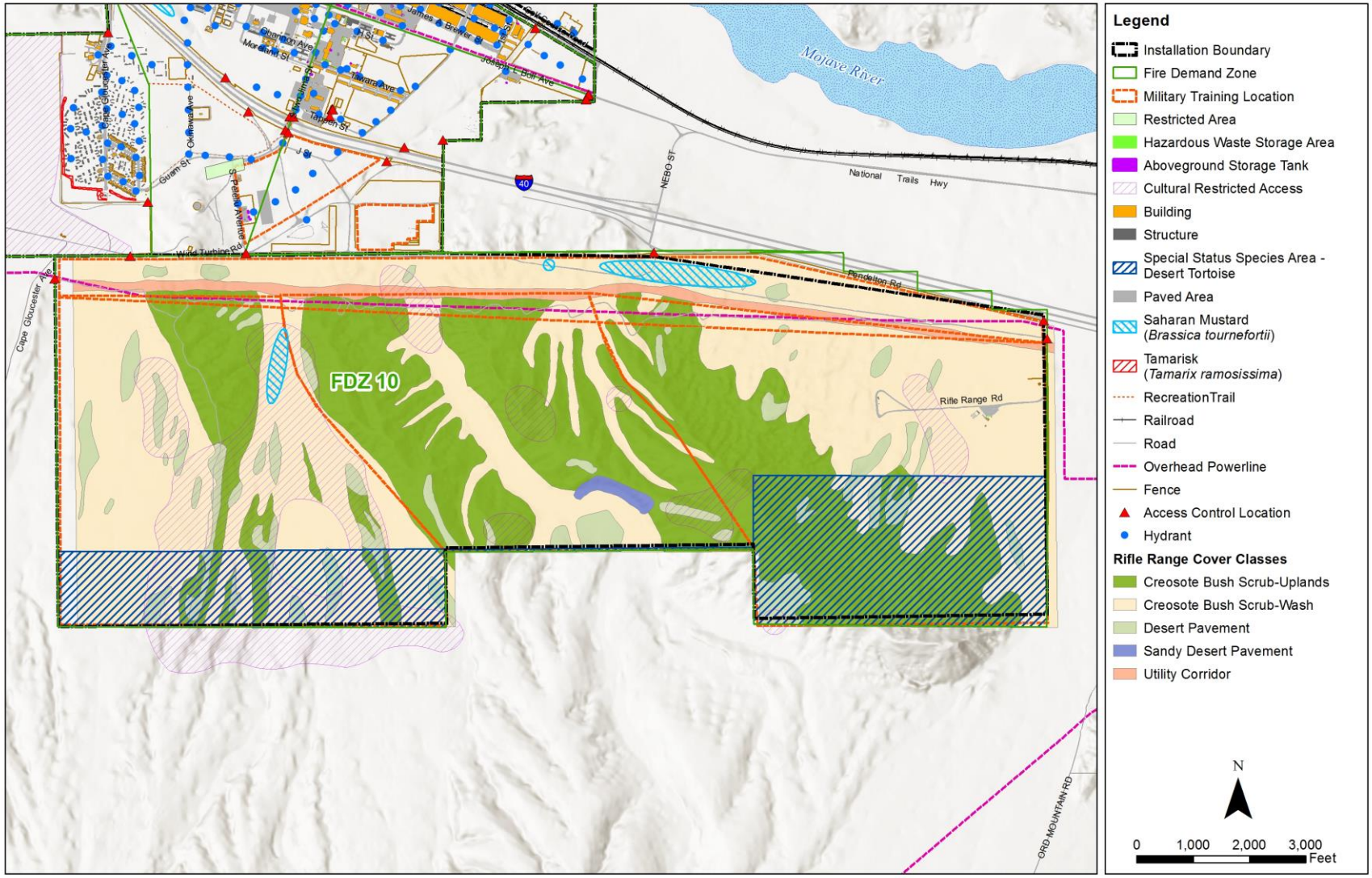

Figure 3-7. FDZ 10 and Associated Features

FDZ 10 Topography. FDZ 10 is characterized by moderate to steep, generally rolling, low hills dissected by ephemeral washes. Numerous dry washes run north, descending through the Rifle Range and eventually reaching the Mojave River. Elevations range from 2,000 ft to approximately 2,650 ft. FDZ 10's aspect is generally north facing, but this has little effect on vegetation.

Resource Use. The Rifle Range is dedicated to range activities and includes rifle and pistol ranges to train Marines in marksmanship. The majority of the Rifle Range consists of open space, serving as a range safety buffer zone. Two utility corridors run east-west along the northern boundary of the Rifle Range. Portions of the Rifle Range are within the Ord-Rodman Critical Desert Tortoise Habitat Area.

Soils. The soils within FDZ 10 runs from gravelly slopes and foothills to sandy arroyos and washes. The NRCS soil associations for the northern section of FDZ 10 are Arizo gravelly loamy sand, 2 to 9 percent slopes; Cajon sand, 2 to 9 percent slopes; Cajon gravelly sand, 2 to 15 percent slopes; Nebona-Cuddeback complex, 2 to 9 percent slopes; and Typic Haplargids-Yermo complex, 8 to 30 percent slopes (NRCS 2008).

Hydrology and Water Quality. The hydrological conditions of FDZ 10 include drainage convergences from ephemeral washes and arroyos. The primary sources of hydrology are precipitation events during the fall through spring seasons. Occasional monsoons may occur during summer months within this region.

Cultural Values. The Rifle Range has widely dispersed lithic scatter, which has been surveyed and found to be ineligible for listing on the NRHP.

Invasive Species and Weed Issues. The potential fuel component of greatest concern in FDZ 10 is nonnative annual grass, such as red brome (*B. madritensis rubens*), cheat grass (*B. tectorum*), and Mediterranean grass, which appear during years of high rainfall. Saharan mustard is also present in many parts of FDZ 10. Although populations of these nonnative annual plants and their resultant fine-fuel loadings wax and wane with annual and multidecadal fluctuations in rainfall, to date they have not appeared in sufficient volume to change fire behavior and the fire regime.

Sensitive Species, Threatened, and Endangered Species and Habitat. Sensitive species that have been identified as having potential to occur or are known to occur at the Rifle Range include the desert tortoise, Howe's hedgehog cactus, threetooth blazingstar, and several special status bird species that may be found foraging, nesting, or resting in the habitats within FDZ 10 (Table 3-1). A portion of FDZ 10 has been formally designated as desert tortoise critical habitat by the USFWS and is part of the Ord-Rodman Desert Wildlife Management Area.

Fire Occurrence and History. Wildland fire has not been recorded in FDZ 10.

Likely Ignition Source. Ignition sources include Interstate 40, off-road vehicles, generators, and ammunition/ordnance.

Fire Regime and FRCC. FDZ 10 is classified as FRCC 1. This fire regime is characterized by relatively small, patchy, low-severity surface fires and a truncated, long fire return interval.

Fuel Models, Fire Behavior, Fire Weather, and Climate-Related Impacts. Except for years of high rainfall, the fuel model in FDZ 10 is low load, dry climate shrub (SH1). This model rarely contains enough fuel volume or continuity to support fire spread. If a fire carries through the vegetation, the rate of spread is no more than three chains (200 ft) per hour and the flame lengths are less than 1 ft.

In the event of a high rainfall year or a series of high rainfall years that produce a sufficient grass/fine fuel load to carry a fire front, the fuel model would be GR1, short, sparse, dry-climate grass. The rate of spread could be approximately 20 chains (1,300 ft) per hour, with flame lengths of 2 to 3 ft.

Values at Risk. Several utility lines run through or near this FDZ. In addition, sensitive species, desert tortoise habitat, and cultural resources are also within FDZ 10. Military equipment and personnel may also be at risk if a wildfire occurs during military operations.

Management Guidance

Suppression strategies are as follows:

- Provide for firefighter and public safety.
- Suppress 100 percent of all unplanned wildland fires, regardless of ignition source, to the smallest size possible but no more than 10 ac, protecting all values at risk in a prioritized manner.
- Ensure that wildland fires will not leave the federal reservation lands and enter private lands.
- Assign a Resource Advisor to all wildland fires. The Resource Advisor consults with the Ecosystem Management Staff at MCLB Barstow and obtains appropriate information (including maps and detailed descriptions) on the location of resource values potentially at risk from suppression or post-suppression actions.
- Have Resource Advisors meet annually with fire crews to discuss resource concerns and values in the Mojave Desert ecosystem.
- Use an aggressive, direct attack wherever possible (see *Safety Issues and Protection of Resources* below).
- Use a mix of the following suppression methods:
  - Aerial attack
  - Hand tools to create fire breaks
  - Foam or fire retardant.
- Minimize the use off-road attack methods with engines and surface-disturbing equipment such as bulldozers in FDZ 10. Note that loose, sandy soil will not permit off-road attack methods.
- Discourage backfires and burning of unburned vegetation fingers and islands.

Safety Issues and Protection of Resources

Safety is the primary consideration when selecting a wildland fire management strategy. The development of Safety Plans and standards is essential to the overall success of the mission at MCLB Barstow. This WFMP establishes a protection strategy for (1) onsite staff, trainees, contractors, civilians, and others who could possibly be impacted by Natural fires and (2) Marine Corps activities adjacent to the installation. Safety issues commonly encountered include the following:

- Power and gas lines and other utilities
- The power-generating windmill north of the power lines
- Unexploded ordnance, mostly small arms
- Establishment of safety zones and escape routes
- Difficult off-road vehicle travel due to loose, sandy soil
- Rattlesnakes and scorpions

4.0 WILDLAND FIRE OPERATIONAL GUIDANCE

4.1 Management of Unplanned Ignitions

4.1.1 Preparedness

Preparedness is the process of planning and implementing activities prior to wildland fire ignition and is the foundation for an effective Wildland Fire Management Program at MCLB Barstow. Thorough planning enables managers to effectively meet a variety of wildland fire management objectives. The preparedness planning process includes routine actions completed prior to each fire season as well as supplemental actions conducted in response to changing fire danger. Fireline construction and maintenance are examples of routine preparedness actions; as fire danger increases, the level of effort must also increase and supplemental actions may need to be taken.

At a minimum, MCLB Barstow will accomplish the following preparedness actions:

- Incorporate preparedness considerations into the WFMP.
- Maintain fully qualified personnel commensurate with NFPA 1051 or PMS 310-1.
- Maintain a cache of supplies, materials, and equipment sufficient to meet normal unit strength (NUS) requirements.
- Operate fire-related data processing systems to enter, archive, retrieve, and interpret information for wildland fire management planning and operations. Maintain record systems, weather data, maps, and other related information.
- Prepare annual preseason wildfire risk analysis.
- Provide a dispatch system for fire management resources on the installation.
- Maintain detection and initial attack capabilities.
- Review agreements to coordinate interagency operations and update them as necessary.

<u>Fire Season Readiness Evaluation</u>

The F&ES Division should conduct an annual preseason fire readiness inspection for MCLB Barstow. Fire readiness inspections will determine whether or not current training levels, equipment inventories, and organizational structure meet the standards described in this WFMP and applicable guidelines and policies. Several interagency preparedness review checklists have been developed and are available at http://www.nifc.gov/policies/pol_ref_intgncy_prepcheck.html.

<u>Preseason Wildfire Risk Assessment</u>

Preseason risk analysis provides the basis for wildland fire management actions such as prepositioning of critical resources, requesting additional funding, and modifying applicable cooperative agreements to meet anticipated needs. A preseason wildfire risk analysis checklist for MCLB Barstow is provided below. This and any other applicable information will be used to predict the severity and duration of the wildfire season at MCLB Barstow.

- Check current and predicted weather, especially:
  - Precipitation levels
  - Drought indices
- Compare current and predicted weather with historical information.
- Check fuel info, such as:
  - Predicted wildfire behavior
  - Areas of increased invasive plant coverage or density
  - Fuel moisture content
  - Compare fuels info with historical information

Key indicator values are compared with average values and with levels of significant wildfire years to determine the wildfire potential for the current year. Many different indicators can be used to develop a preseason risk analysis, including precipitation levels, drought indices, fires to date, and the regional fire preparedness level. (Current regional drought levels and further drought monitoring information are located at http://www.predictiveservices.nifc.gov/predictive.htm.) If the analysis suggests that an abnormally severe fire season might be indicated, local and regional resources should be notified of the potential need for additional resources.

MCLB Barstow's annual F&ES risk assessment is provided in Appendix C.

Training and Qualifications

Training. The Training Program, qualification, and certification process are the foundations of the Safety Program. Unless a waiver is granted by the Installation's CO, all fire operations personnel involved in wildland fire activities, including both wildfire and prescribed fire, shall meet the current wildland fire qualification standards for command and general staff positions commensurate with NFPA 1051 or PMS 310-1. In accordance with MCO P11000.11, Marine Corps Fire Protection and Emergency Services Procedural Manual, F&ES will ensure sufficient emergency response personnel are trained for their expected level of involvement in the wildland fire mission. At minimum, F&ES wildland fire fighters will be trained to NFPA Standard 1051 Firefighter 1, NWCG Standard Firefighter Type 2, or equivalent level training.

NFPA 1051 covers the special skills required by structural fire departments for wildland fire incidents and will serve as the minimum training conducted by MCLB Barstow's F&ES. PMS 310-1 is a guide to a performance-based National Interagency Incident Management System Wildland Fire Qualification System, developed by the NWCG, that establishes minimum requirements for, and allows cooperating agencies to agree upon, training, experience, physical fitness level, and currency of qualifications for interagency national wildfire mobilization and establish minimum qualifications for personnel on moderate or higher-complexity prescribed fires. While any organization or agency providing resources to fill national interagency requests for incidents or multi-agency prescribed fires of moderate or higher complexity will be expected to meet the minimum NWCG requirements described in PMS 310-1, the NWCG recognizes the ability of cooperating agencies at the local level to jointly define and accept each other's qualifications for initial attack, extended attack, and large fire operations. MCLB Barstow's F&ES is not a national interagency partner and would not be expected to fill national interagency

requests or encounter moderate or higher complexity wildland fires at the Base. Therefore, the MCLB Barstow F&ES training needs do not warrant the additional training costs and time necessary to meet the NWCG requirements. If it is determined that MCLB Barstow F&ES expected to fill national interagency requests or encounter moderate or higher complexity wildland fires, then MCLB Barstow F&ES may use the Qualification Crosswalk for Structural Firefighters.

Qualification Crosswalk for Structural Firefighters. An exception for required training as presented in PMS 310-1 is for structural firefighters who use the skills crosswalk (Table 4-1). The skills crosswalk was developed by analyzing and comparing NFPA structural firefighting standards with NWCG wildland firefighting position task books. The crosswalk identifies wildland skills and knowledge not incorporated within standard structural firefighting training, and it considers a structural firefighter's existing fire suppression knowledge and skills; hence, a structural firefighter can be trained with reduced classroom hours, curriculum redundancies, and training hours. Four specific NWCG positions are incorporated into the skills crosswalk, each paired with a counterpart structural position. The skills crosswalk is explained in PMS 310-1. A training overview for the skills crosswalk produced by the U.S. Fire Administration is included in Appendix D.

Table 4-1. NWCG and Structural Fire Paired Skills Crosswalk Counterpart Positions

Structural Fire Counterpart Position	Entering Qualifications	National Wildfire Coordination Group Position
Nonsupervisory Structural Firefighter, Basic	Meets NFPA Standard 1001 for Firefighter 1 or equivalency	Firefighter Type 2
Nonsupervisory Structural Firefighter, Advanced	Meets NFPA Standard 1001 for Firefighter 2 or equivalency	Firefighter Type 1
Driver/Operator/Engineer or Company Officer	Meets NFPA Standard 1021 for fire officer or equivalency	Engine Boss, Single Resource
Experienced Lieutenants, Captains, Chief Officers	Meets NFPA Standard 1021 for fire officer or equivalency	Strike Team Leader

Source: PMS 310-1
NFPA – National Fire Protection Association

Physical Qualifications and Standards. Measurable and objective medical and fitness evaluations are used to establish fitness standards for MCLB Barstow personnel. All personnel involved in wildland fire activities must meet medical examination and physical fitness requirements commensurate with NFPA 1582 and DODI 6055.05M, *Occupational Medical Examinations and Surveillance Manual*.

Supplies, Materials, and Equipment

A certain level of inventory must be maintained to be prepared for an initial attack. Ongoing wildfires require a much higher inventory of equipment and supplies. Some materials are expendable and must be replaced when used. Other materials, primarily suppression equipment, may cost hundreds of thousands of dollars and are used for several years or even

decades. This section defines the level at which MCLB Barstow should be equipped for various suppression and prescribed fire operations.

Equipment. MCLB Barstow must maintain a cache of wildland firefighting tools and personal protective equipment (PPE) adequate to support all of the Installation's initial attacks. The number, type, and distribution of materials in the cache are dictated by the staffing, suppression strategy, fuels, and wildland fire history of the Installation. Cache equipment, other than the Installation's common-use property, is considered to be the Installation's NUS.

NUS is a recommended base level of all items required to support initial attack operations on wildland fires; it is not meant for support of wildfires exceeding the initial attack. NUS will include PPE and safety items required for prescribed fire assignments and requirements; a list can be found in Appendix M of the 2015 NIFC Red Book. Equipment and supplies needed to perform extended attack activities, or to equip personnel ordered to support extended attack activities, will be supplied by other sources.

Items used during an initial attack on wildfires and prescribed fires will be replaced or repaired by the appropriate funding source. NUS supplies are normally ordered through the General Services Administration, although other sources may be used directly from the manufacturers.

All NUS items will be maintained in such a way that they will not be used for routine natural resource management operations. If, in an emergency, NUS items must be used for nonfire operations, the items will be replaced immediately, funded by the benefiting activity. Items used in an emergency during extended suppression operations must be replaced immediately.

All wildland firefighting equipment and supplies will be kept in a constant state of readiness for fire suppression and prescribed fire activities. It is the responsibility of MCLB Barstow's Wildland Fire Program Manager to ensure that an appropriate supply of wildland fire equipment is stocked, accounted for, and maintained as necessary. Quantities of the supplies/equipment are determined by the number of personnel estimated for the initial attack, with an allowance for reserves. The MCLB Barstow wildland fire cache will be annually inventoried and inspected in order to ensure the equipment is available and in working order. Records of the annual inventory and inspection should include the date, inspector's name and signature, and a note of any issues, concerns, equipment needs, etc. These records will be maintained in the Wildland Fire Management Program records.

PPE. It is mandatory that all personnel involved in direct wildland fire management activities be outfitted with protective clothing and equipment that meets NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting* (MCO P5090.2A), and the 2015 NIFC Red Book. All fire personnel must be equipped with the proper PPE necessary for wildland fire management activities. Knowledge of the proper selection, use, and care of the various tools and equipment used in wildland fire management as well as the capabilities and limitations of PPE is the responsibility of every individual. Fire personnel will ensure that proper PPE is worn when those personnel are actively engaged in wildland fire management activities.

MCLB Barstow's Wildland Fire Management Program will maintain a minimum level of PPE at the Installation's fire cache to outfit all personnel assigned to fire management duties. Required PPE is described in detail in Chapter 7 of the 2015 NIFC Red Book and NFPA 1977. The required PPE for wildland fire positions at MCLB Barstow is listed below.

- Eight-inch-high, lace-type exterior leather work boots with nonslip, Vibram-type, melt-resistant soles (The 8-inch height requirement is measured from the bottom of the heel to the top of the boot.)
- Fire shelter
- Hard hat with chin strap
- Goggles/safety glasses
- Earplugs/hearing protection
- Pants, shirts, or coveralls that meet or exceed the NFPA 1977 and 2015 NIFC Red Book standards
- Leather gloves
- Additional PPE as identified by local conditions, material safety data sheets, or job hazard analyses

In addition to the required PPE above, the following supplies are an essential part of the wildland fire personnel's line gear:

- Fireline pack
- Canteen (2 quarts minimum)
- Extra set of earplugs
- First-aid kit
- File
- One meal, ready-to-eat
- Headlamp with batteries
- Flagging
- *Incident Response Pocket Guide*

Cooperative and Mutual Aid Agreements

As outlined in MCO P5090.2A, installations are encouraged to develop regional partnerships for wildland fire management support by means of reciprocal agreements with federal, state, local, and private entities to share human, logistical, and operational resources. Emergency assistance and mutual aid agreements will conform to the guidelines stated in DODI 6055.06P and MCO P11000.11B. MCLB Barstow currently has six mutual aid, automatic aid, and training agreements in place with the following:

- Barstow Fire Protection District
- Dagget Fire Protection District
- Fort Irwin and the National Training Center

- Newberry Springs Community Service District
- San Bernardino County Fire Protection District
- Yermo Calico Fire Protection District

MCLB Barstow currently has one Joint Memorandum of Understanding for mutual aid EMS in place with the Inland Counties Emergency Medical Agency and Desert Ambulance.

Additionally, MCLB has access to additional mutual aid via the California Disaster and Civil Defense master mutual aid agreement and the California Fire Service and Rescue Emergency Mutual Aid Plan.

Fire Weather Forecasting and Monitoring

Predictive services including fire danger ratings and weather information may be obtained on the OSCC website. Additional fire weather information for MCLB Barstow can be obtained on the National Weather Service (NWS) website or through coordination with the NWS Forecast office in Reno, Nevada. NWS fire weather observation stations provide the specialized weather observations necessary for fire weather forecasts, wildfire control and suppression efforts, and various other land management operations. Weather stations near MCLB Barstow include those at Daggett, the Barstow-Daggett Airport, the Opal Mountain, and the Mojave River Sink.

Fire Readiness Plan

Fire readiness planning establishes installation restrictions and preparation commensurate with wild fire danger by establishing wildland fire danger ratings. Range Control publishes the Fire Readiness Plan message to remind all units of their responsibilities during the fire season. Fire readiness planning establishes the fire danger ratings as follows:

- **Fire Readiness Plan 1.** Fire danger is low. No restrictions on authorized ranges or training areas. Normal safety precautions will be followed.
- **Fire Readiness Plan 2.** Occasional fire activity. No restrictions on authorized ranges or training areas. Normal safety precautions will be followed.
- **Fire Readiness Plan 3.** Fire danger is moderate. The use of certain ranges and training areas may be curtailed at the discretion of the CO, Normal safety precautions will be followed. Caution will be exercised in the use of all explosives and smoke.
- **Fire Readiness Plan 4.** Fire season. The use of certain ranges and training areas may be curtailed at the discretion of the CO.
- **Fire Readiness Plan 5.** Fire danger is high or severe. Explosives, smoke, and incendiary ammunition will be restricted to firing ranges. These areas will be fireproofed and supervised. The use of generators will be restricted to areas that have been fireproofed to mineral soil for a 50 ft diameter around each generator.
- **Fire Readiness Plan 6.** Fire danger is critical. All military training and other activities likely to start wildland fires, such as smoking, will be suspended in FDZs with moderate or high probability of wildland fire.

- **Fire Readiness Plan 7.** Fire danger is extreme. All training will cease and troops will come out of the field. Request to train during Readiness Plan 7 will be submitted to the CO via Range Control.

Blowup Alert. An alert to units that conditions could quickly elevate from Level 4 to Level 7 or higher. The use of any significant ignition sources will be prohibited.

Resource Advisor

According to the Resource Advisor's *Guide for Wildland Fire,* PMS 313, a Resource Advisor is responsible for the identification and evaluation of fire on natural and cultural resources as well as its impacts and benefits. The Resource Advisor is generally a person from the local organization. The Environmental Division at MCLB Barstow would provide the natural and cultural resources Resource Advisor. The Resource Advisor will anticipate impacts due to suppression and prescribed fire, communicate within the organization and with the Incident Command and Incident Management Team, plan and monitor mitigation efforts, and provide input on restoration initiatives and plans.

The Resource Advisor is responsible for providing information, analysis, and advice to fire managers that includes the following areas of concern for fire suppression or prescribed fire actions:

- Land ownership
- Hazardous materials
- Fuel breaks (locations and specifications)
- Water sources and ownership
- Critical watersheds
- Critical wildlife habitat
- Noxious weeds
- Special status species (threatened, endangered, proposed, and sensitive)
- Fisheries
- Poisonous plants and animals
- Prehistoric and historic archeological sites, historic trails, and paleontological sites
- Historic structures, features, cultural landscapes, and traditional cultural properties
- Riparian areas
- Military issues
- Utility rights-of-way (power, communication sites)
- Permanent and temporary structures
- Recreational management areas
- Special management areas

The Resource Advisor provides analysis, planning, and strategy for the development of Wildland Fire Implementation Plans, wildland fire situation analyses, strategic meetings, team transition, and Incident Action Plans. The Resource Advisor also provides input on daily

meetings and briefings, presents priorities and issues of concern, monitors post-suppression rehabilitation, records fire damage, and maintains resource documentation.

4.1.2 Incident Management

Preplanned Dispatch

DODI 6055.06 requires installations to follow wildland fire preparedness, preplanned dispatch, and prescribed fire and prevention standards as determined by NFPA 1710. The MCLB Dispatch Center's operations guide establishes uniform guidance pertaining to the operation of the 911 Emergency Dispatch Center and the information to be maintained by the emergency dispatchers (Appendix E).

Section 5.7 of NFPA 1710 discusses the requirements and recommendations of fire companies that provide wildland fire suppression services. Fire companies must possess all levels of capability, including the personnel, equipment, and resources to deploy to wildfire suppression operations. MCLB Barstow's F&ES standards of cover, provided in Appendix F, identify expected response times.

Additional resources may be ordered through the San Bernardino County Communications Center or the California Department of Forestry and Fire Protection's San Bernardino Communication Center.

Wildfire Suppression

A wildfire is defined as a free-burning and unwanted wildland fire requiring a suppression action. Wildfire suppression actions may take several forms. MCLB Barstow has a history of low wildfire occurrence. Natural vegetation on the Base is similar to many other low-elevation shrubland zones of the Mojave Desert in that it is sparse and discontinuous and lacks a surface fuel bed that promotes fire growth. Heavy rainfall in the Mojave Desert during the growing season periodically produces an unnatural cover of invasive nonnative annual grasses (*Bromus* sp. and *Schismus* sp.), which serves as a carrier of fire in disturbed upland areas. Fuel loads in riparian drainages is also increased due to the presence of the invasive tamarisk. Under this situation, fires start and burn through the desert ecosystem, which normally has a very low fire occurrence/frequency and has a very low tolerance of fire. Of particular concern during these events is the loss of desert tortoise habitat (USFS 1995; USFWS 2008).

To demonstrate the potential behavior of a wildland fire burning on MCLB Barstow lands and to give an idea of the potential management complexity the fire may produce, a brief fire behavior analysis was modeled using the FireFamily Plus weather model and the BEHAVE Plus fire behavior model.

This analysis assumes that a heavy rainfall season occurred and produced enough fine surface fuels to support fire growth in fuel model GR1 (short, sparse, dry-climate grass, natural or heavy grazing, low predicted rate of fire spread and low flame length). SH1 may be present (low, dry-climate shrub fuel load, fuel bed depth about 1 ft, some grass, very low spread rates, very low

flame length). SH5 may also be present (heavy, dry-climate shrub load, depth 4 to 6 ft, very high spread rate, very high flame length). These fuel models were analyzed using identical parameters. This analysis is not intended to be a worst-case scenario.

Using the FireFamily Plus program, fire weather records from the two closest National Fire Danger Rating System (NFDRS) weather stations (Opal Mountain and Mojave River Sink) were used to determine the 90th percentile fire weather day. The SURFACE and CONTAIN modules of BEHAVE Plus were used to predict the fire's potential rate of spread and the possible suppression forces needed to contain the fire (see Appendix G for weather data and BEHAVE outputs). Fuel models GR1, SH1, and SH5 were used, respectively representing sparse, dry grassland; thickets of low shrubs; and dense stands or clusters of tamarisk.

The results of this analysis show that a fire starting and spreading past the point of origin on a 90th percentile day in GR1 fuels could be contained within an hour at roughly 13.5 ac, which exceeds the 10 ac threshold. The SH1 and SH5 model results illustrate an escaped fire situation. Due to the isolated distributions of the fuels, the spread would be limited to the extent of the fuel source, except in the cases where additional fuels were in close proximity and subject to ignition from the flaming front or within spotting distance.

The model identifies that containment of a GR1 fire would require four wildland fire engines with three-person effective crews capable of conducting an initial attack generally between 0.2 and 0.4 hours from ignition. According to the model results, the same resources able to contain the GR1 type fire would not be able to respond in time to contain a fire in an SH1 or SH5 environment. The GR1 response, which represents over 90 percent of potential wildland fires, would meet the policy strategy for wildland fire management in the MCLB Barstow INRMP, Section II.C, which states that 100 percent of all unplanned wildland fires, regardless of ignition source, should be suppressed to the smallest size possible but no more than 10 ac, protecting all values at risk in a prioritized manner. Further, if maintaining isolated pockets is the management strategy and the pockets are under 10 ac, then all but two stands would be under 10 ac. One stand is 15 ac of mixed vegetation and the other is 10 ac with discontinuous distribution.

Management options that would mitigate the increasing response time, would include increasing response equipment, and conducting prefire incident fuel treatments to reduce or eliminate dangerous fuel loads within SH5 areas, safely reducing the need to suppress dangerous fires.

The model has specific limitations that may result in overestimated results. The analysis does not take into account the overall extent and distribution of the fuel models or breaks between them and likely overestimates the extent and rate of spread for the specific conditions found at MCLB Barstow.

Chapter 11 of the *Interagency Standards for Fire and Fire Aviation Operations* (the Red Book) (NWCG 2016) was used to ascertain the complexity and management levels for this potential wildland fire. This fire would be best managed by a Type 4 Incident Commander. The

characteristics of a Type 4 incident are given below, and the characteristics of a Type 5 incident follow for comparison.

Characteristics of a Type 4 Incident. A Type 4 incident has the following attributes:

- An ad hoc organization is managed by a Type 4 Incident Commander.
- Primarily local resources are used.
- Incident Command System (ICS) command and general staff positions are not activated.
- Resources vary from single resource to multiple resource task forces or strike teams.
- The incident is usually limited to one operational period in the control phase. Mopping up may extend into multiple operational periods.
- A written incident Action Plan is not required. A documented operational briefing will be completed for all incoming resources. Refer to the *Incident Response Pocket Guide* (NWCG 2004) for a briefing checklist.

It should be noted that a Type 4 incident may require additional coordination and support. Depending on the incident situation, the following may be needed: additional support dispatchers, aviation facilities and support, logistical support (food, vehicle repair, sleeping arrangements, etc. for off-base resources), traffic control, law enforcement (evacuations), financial support for collecting costs, and procurement.

- **Qualifications:** To achieve the staffing level to manage a Type 4 wildland fire incident, MCLB Barstow fire staff need to have the following minimum ICS qualifications:
  - During fire season, one Type 4 Incident Commander per shift.
- **Training**: Per NWCG PMS3101.
- **Engine Boss, Single Resource**
  - S-231 Engine Boss, Single Resource
  - S-290 Intermediate Fire Behavior
  - S-270 Basic Air Operations
  - S-234 Ignition Operations
  - L-280 Followership to Leadership
- **Incident Commander Type 4**
  - S-200 Initial Attack Incident Commander
  - S-234 Ignition Operations
  - S-215 Fire Operations in the Wildland/Urban Interface
- **Enhancing Staff and Wildland Fire Suppression Equipment Capability:** The objective is to:
  - Institutionalize leadership and state-of-the-art capability in wildland fire management in support of this plan's goal.
  - Bring wildland firefighting resources to a par with other wildland fire organizations by accomplishing the following:
    - Maintain a wildland fire mutual aid agreement with Fort Irwin to provide two Type 3 wildland fire engines.

- Develop and maintain wildland fire mutual aid agreements with BLM, the Barstow Fire Protection District, the San Bernardino County Fire Department, etc.
- Develop aerial support suppression agreements.
- Create a climatological monitoring system that assesses annual fine fuel buildup.
- Develop a fire road access annual Maintenance Plan.
- Identify wildland fire control points, such as roads, drainages, and ridges.
- Develop a plan for early detection and eradication of new nonnative species, especially those that pose significant fire threats.

Characteristics of a Type 5 Incident. The attributes of a Type 5 incident are as follows:

- An ad hoc organization is managed by a Type 5 Incident Commander.
- Primarily local resources are used.
- ICS and general staff positions are not activated.
- Resources vary from two to six firefighters.
- The incident is generally contained within the first burning period and often within a few hours after resources arrive on the scene.
- Additional firefighting resources or logistical support are not usually required.
- A system of recordkeeping should be established to include mapping of all wildland fires regardless of size, the number of wildfire responses, the number of wildland fire responses requiring mutual aid, and the number of mutual aid responses/requests to other agencies.

WFDSS Information

A WFDSS is a decision analysis process designed to outline the most appropriate suppression strategy in a systematic way. The WFDSS is not necessarily a software program or computer model; a paper document covering each item is adequate. Reasonable suppression alternatives are identified, analyzed, and evaluated for consistency with the expected probability of success and consequences of failure. MCLB Barstow's Wildland Fire Program Manager approves the WFDSS and any revisions. Evaluation criteria include anticipated suppression costs, resource impacts, and environmental, social, and political considerations. The preferred alternative will be the suppression strategy employed. If the preferred strategy fails, a new WFDSS must be developed. WFDSS element descriptions are provided in Appendix N of the 2015 NIFC Red Book.

Extraordinary Fire Situations

Wildfire behavior instances may occur that exceed the ability of MCLB Barstow to achieve management objectives. Although these incidents may occur infrequently, the conditions resulting from extreme resistance to control must be addressed in wildland fire management planning. Under these extraordinary circumstances, a variety of situations may arise, including unacceptable threats to firefighter safety, substantial acreage burned, uncontrollable losses of

improvements, consistent failure to meet suppression objectives, and overwhelming installation or outside involvement. In such situations, Incident Commanders must shift their focus from perimeter control to an interim strategy for protecting life and designated resources on and off the Installation, while providing for the safety of firefighting resources until conditions are more favorable for suppression.

Public Safety

Public and firefighter safety is of primary concern during all wildland fire management operations. The following sections address various issues as they relate to public safety.

Fire. Prevention of injury to the public by fire is the responsibility of Wildland Fire Managers during prescribed fire and wildfire suppression operations. Careful planning of prescribed fires minimizes the risk of escapes that may endanger the public. Additionally, during the formulation of the Prescribed Burn Plan (including contingency planning) and wildfire events, the location of all training operations near the burn area are determined. Once determined, the Installation coordinates with the partner agencies and the CO to limit access to impacted areas and plan detour routes around problem areas.

Smoke. Smoke across highways is one of the most common problems associated with wildland fires. To mitigate this potential safety issue, transport winds are selected to carry smoke away from highways and all other sensitive areas during prescribed burning operations. This factor cannot be controlled in the event of a wildfire; however, when smoke impacts highways, risks can be mitigated with signs, lookouts, and public service notices.

Management actions such as hazard reduction burning and burnouts may minimize smoke management problems during wildfires. Hazard reduction burning in areas prone to wildfires will reduce fuel loading, resulting in less smoke. Burnouts may be undertaken so the smoke resulting from suppression actions does not add to the smoke from wildfires.

If sensitive or developed areas are impacted by smoke from either prescribed burns or wildfires, appropriate actions are taken. These actions may include posting a patrol along impacted roads, notifying the Range Control office to halt training in an affected area, or evacuating Installation personnel and residents from the affected area. All such actions must be coordinated with the appropriate Installation division, including the USFS, CO, MCLB Barstow F&ES Division, and other emergency services.

Incident Management Team Transition

Once an incident has exceeded MCLB Barstow's initial attack forces, then a plan to transition to the next higher Incident Command Team will be initiated.

Aviation Support

The use of aircraft can be very helpful in accomplishing both wildfire and prescribed burn suppression activities. Fixed and rotary wing aircraft may be used to accomplish wildland fire and natural resource management tasks throughout the year.

Air-space restrictions exist over most of MCLB Barstow. Permission to enter this restricted area must be obtained from the Base by all non-DoD aircraft whenever wildland fire flight operations occur at MCLB Barstow. During any wildfire or prescribed burn that involves aircraft, MCLB Barstow Air Operations will manage air operations, safety, and emergency protocols.

Personnel Work/Rest Guidelines

Personnel work/rest guidelines assure safe and productive fire suppression activities by providing for rest, overhead, and support personnel on large, complex, or extended wildfires. Compliance with work/rest guidelines is a basic responsibility of all supervisory wildland fire management personnel and is described fully in Chapter 7 of the 2015 NIFC Red Book and Chapter 10, Section 12.7, of the PMS 902 I*nteragency Incident Business Management Handbook.* As stated in these documents, a work/rest ratio of 2:1 should be met on all fire incidents; appropriate justification and documentation should be included in the incident records if this condition is not met.

4.1.3 Records and Reports

Permanent installation records will be kept to facilitate effective and defensible wildland fire management and planning. The records described below will be held as permanent resource management records and kept on file in the installation Wildland Fire Management Program office.

Incident Qualification and Certification System Information

MCO P5090.2A specifies that current training and qualification records will be maintained for all personnel involved in wildland fire management activities. These records will be maintained in the Wildland Fire Management Program office and managed by the Wildland Fire Program Manager. Training and qualification records include Incident Qualification Classification System records, position task books, medical examination records, and physical fitness test records. Training records are currently tracked and maintained at www.emergencyreporting.com.

Situation Reports

Situation reports contain current information about fire danger, fire status, and resource availability. Situation reports are submitted as situations change throughout the wildfire season. Outside OF the official wildfire season, situation reports are to be completed when an ignition source is present and THE fire danger is very high or extreme, or whenever a wildfire has occurred or is in progress. An ICS-209 is required for any fire under a full suppression management strategy that exceeds 100 ac in timber (fuel models 8 through 13), 300 ac in grass and brush (fuel models 1 through 7), or has a Type 1 or 2 incident.

Fire Weather Records

All weather information for fire management activities are kept in the permanent Installation records. At a minimum, days of burn fire weather forecasts for the area to be burned must be

maintained with the Prescribed Burn Plan. For prescribed fires, fire weather information is kept with all other fire records.

Fire weather information supplied by NWS may include any or all of the following:

- **Fire Weather Planning Forecast.** This forecast is used mainly for presuppression and management planning information and to determine general weather trends that may affect burning conditions and thus fire behavior.
- **Site-Specific Wildland Fire Forecast (Spot Forecast).** Spot forecasts are used to determine site-specific weather conditions and guide wildland fire suppression or prescribed fire planning and management activities. Spot weather observation and forecast request instructions and notes are given in Appendix E of the 2015 NIFC Red Book.
- **NFDRS Forecast.** These forecasts are issued from predetermined sites where NFDRS information is received.
- **Fire Weather Watch.** This notice is issued 12 to 48 hours in advance of critical weather conditions that may lead to a red flag event (weather conditions that could lead to extensive wildfire occurrence or extreme fire behavior).
- **Red Flag Warning.** This notice is issued when a red flag event is imminent or occurring.
- **Fire Danger Statements and Blow-Up Alerts.** These notices are requested by the land management agency and only issued by approval in instances where the fire danger or occurrence is high and weather conditions are extreme.

National Fire Incident Reporting System

The U.S. Fire Administration, in conjunction with the National Fire Information Council, developed the National Fire Incident Reporting System (NFIRS) to provide a standard national reporting system to be used by state fire departments to report fires and other incidents to which they respond and to maintain records of these incidents in a uniform manner (NFPA 1143). The NFIRS is a computer-based program that collects fire reports and analyzes the national collective database. Fire reporting provides a basis for fire preparedness, support for funding requests, and aid in organizational development (NFPA 1143). The basic form, NFIRS-1, provides basic information about the incident. The wildland fire form, NFIRS-8, focuses on wildland fire and provides in-depth information about the incident. (For more information see the U.S. Fire Administration's website at https://www.nfirs.fema.gov/system/guidelines.shtm).

Incident Status Summary (ICS-209)

The incident status summary (ICS-209) conforms to NIMS policy. The ICS-209 is used to report large wildland fires and other significant events on lands under federal protection or federal ownership, and it is submitted to the Geographic Area Coordination Center. MCLB Barstow is in the OSCC. If the characteristics of a wildland fire on MCLB Barstow qualify as an incident for submittal according to NIFC's *National Interagency Mobilization Guide,* an ICS-209 form IS completed and submitted. Wildland fires are reported based on (1) acres burned (more than 100 ac in timber and/or more than 300 ac in grass/brush fuels), (2) if a Type 1 or 2 Incident

Management Team or national resources are assigned, significant events having occurred or forecasted to occur, incident strategy (full suppression, point/zone protection, confine and monitor), and time since detection. See the *National Mobilization Guide*, produced annually by the NICC, for more information.

Other Records

All records, maps, and other information relating to wildland fire management are kept in permanent Installation records to assist in future fire planning. Such records may include annual narrative reports, historic records of the Installation, photographs showing vegetative cover, cover type maps, monthly reports, and other pertinent maps and files that may represent the only documentation of fire occurrence or fire behavior on the Installation.

4.1.4 Emergency Stabilization

Burned areas may present situations that require special efforts to prevent further catastrophic damage after the fire. Burned Area Emergency Response is a process used to evaluate burned areas to determine if loss of vegetation increases the risk of soil erosion, increased runoff that may increase and cause flash flooding, and/or puts endangered species and community water supplies at risk. This response is not intended to replace resources lost in the fire but to mitigate damage that may occur while the burned area is vulnerable to damage.

Emergency Stabilization Strategies

The following are emergency stabilization strategies:

- Determine if an emergency condition exists after the fire.
- Stabilize and prevent unacceptable degradation of natural and cultural resources.
- Minimize threats to life and property resulting from the effects of a fire.
- Make physical improvements necessary to prevent degradation of land, natural resources, and other values at risk.
- Take action within six months following the containment of a wildland fire.
- Monitor the implementation and effectiveness of emergency treatments.

4.2 Burned Area Rehabilitation

Post-fire rehabilitation will be considered on a case-by-case basis depending on the location of the fire and resources/values to be protected. Site-specific projects will meet objectives as identified in MCLB Barstow's Base Master Plan and the INRMP.

Fire damages resulting from wildland fires take two forms: suppression damages and resource damages. Suppression damage is the result of suppression operations. Resource damage is a result of the fire itself damaging the natural resource. These damages are described below.

- Suppression repair involves short-term actions to stabilize a burned area and mitigate suppression damage.

  - Repairing damage from suppression operations is generally the responsibility of the Installation's Environmental Department in coordination with the MCLB fire department.
- Resource damage restoration or rehabilitation involves long-term or post-incident actions.
  - Post-incident rehabilitation actions must be specified in a Rehabilitation Plan. Preparation and implementation of the plan is the responsibility of the Environmental Department.
  - Post-fire rehabilitation and/or restoration needs should be considered for each fire and plans should be prepared for fires requiring complex rehabilitation and restoration efforts.

Rehabilitation Strategies

Rehabilitation strategies are as follows:

- Specify the treatments required to implement post-fire rehabilitation policies.
- Repair or improve fire-damaged lands unlikely to recover naturally to management-approved conditions.
- Repair minor facilities damaged by fire.
- Consult with the staff archaeologist, botanist, wildlife biologist, and other staff specialists to evaluate fire and suppression operations effects and to determine if additional restoration is necessary.
- Take action within three years of containment of a wildland fire.

Rehabilitation

National Environmental Policy Act (NEPA) Documentation Needed for Fire Management Activities, Categorical Exclusions (FR 68, No. 108, 5 June 2003). This documentation states, "Activities carried out under the rehabilitation category will take place only after a wildfire. These activities cannot use herbicides or pesticides, nor include the construction of new permanent roads or other infra-structure, and they must be completed within three years following a wildfire. Activities carried out under the rehabilitation categorical exclusion will not exceed 4,200 ac."

The following are rehabilitation efforts:

  - Use agency resource specialists to provide guidance during fire rehabilitation efforts.
  - Inspect equipment and stabilization material, such as straw, to confirm its weed-free status.
  - Use hand tools for rehabilitation activities whenever feasible.
  - Rehabilitate all firelines to natural conditions. Long-term rehabilitation may include repairs to structures (e.g., signs, windmills), the construction of temporary fences to exclude people and livestock from burned areas, and installation of signage.

4.3 Management of Planned Fuels Treatments

The potential hazard of any given site depends on a number of factors, such as the amount and type of living and dead vegetation on the site, the exposure of the site to wind and other factors involving weather and topography, and the presence of natural barriers to fire spread. Planned management activities primarily impact wildfire hazards by influencing the quantity, structure, and arrangement of fuels.

Treatments to reduce wildland fuels are needed to protect people and property and to prevent the loss of military training opportunities that would result from a large fire. Fuel treatments to protect occupied structures and high-value facilities will improve fire resistance and survivability of buildings, utilities, and other infrastructure. Fuels treatments can be in the form of prescribed fire or nonfire methods, including chemical, mechanical, and biological controls. Nonfire fuel reduction actions are especially useful in areas where prescribed fire is not desired, feasible, or effective.

4.3.1 Prescribed Fire

The naturally occurring ecosystems on the Base are generally not fire dependent, and prescribed fire is not needed to maintain ecosystem integrity; therefore, prescribed fire strategies have not been developed for use at MCLB Barstow at this time. The following guidance is outlined to provide decision support if prescribed fire is considered in the future.

Prescribed fire is an intentionally set fire that burns under specified conditions that allow the fire to be confined to a predetermined area and produces the behavior and characteristics required to attain planned treatment and resource management objectives (NFES 2394). Prescribed fires may be used in conjunction with nonfire (mechanical/manual) hazardous fuel reduction to reduce accumulated fuels on the Installation. Although the use of fire to obtain management objectives has some risks, those risks may be minimized by the implementation of certain requirements. In order to reduce the potential for unintended circumstances, extensive planning, coordination, and risk management should be completed prior to the ignition of any prescribed burn. Requirements for effective management of prescribed fire include measurable objectives, qualified personnel, quantified ranges of conditions under which burns will be conducted, a description of actions that will be taken if these conditions are exceeded, a monitoring and documentation process, and a review and approval process. See PMS 484 for planning and implementation procedures.

Prescribed burns are intended to simulate natural fire regimes and accomplish wildland fire and natural resource management objectives. These objectives may include:

- Reducing hazardous fuels
- Restoring habitat
- Promoting biological diversity
    - Enhancing wildlife and plant species and populations
    - Preserving endangered species
- Managing vegetation

- Preparing sites for seeding or planting restoration
- Reducing hardwood brush
- Removing dead vegetation or thatch following chemical or mechanical treatment

Natural Resources Managers must conduct appropriate planning before implementing prescribed burning. Any action significantly affecting wetlands, such as those within the Mojave River in FDZ 6, would require an environmental review. An interdisciplinary approach and the NEPA planning process would be used to determine the best site-specific prescribed fire methods to employ to accomplish the identified goals and objectives while mitigating negative effects.

A site-specific Prescribed Burn Plan and go/no-go checklist would be completed prior to starting any fire on the ground. Fire behavior and monitoring actions would be accomplished during and following prescribed fire activities. The MCLB Barstow Prescribed Burn Plan involves a thorough review of objectives and any special precautions that must be observed. Parts of the plan are completed on the day of the burn after weather forecasts are received, burning conditions are determined, and available resources are established. As applicable, a designated Line Officer who is not part of the Burning Team double-checks the Burn Plan and the go/no-go checklist with the burn boss to ensure there are no oversights and then signs the plan before firing begins.

This WFMP must be revised to identify the required components for site-specific Burn Plans. At a minimum, MCLB Barstow's Prescribed Burn Plan should include the following elements as outlined in MCO P5090.2A:

- Burn objectives
- Acceptable weather and fuel moisture parameters
- Required personnel and equipment resources
- Burn area map
- Smoke Management Plan
- Safety considerations
- Preburn authorization/notification checklist
- Coordination to consider mission, wildlife, endangered species, cultural resources, and noxious weed effects
- Alternative plan to cover the plan of action if wind or weather conditions change
- Plan for analysis of burn success and identification of lessons learned

In addition to the Prescribed Burn Plan, the following information should also be part of the planning process and maintained in the prescribed burn records in MCLB Barstow's Wildland Fire Management office:

- **Contingency Plan.** This plan lists actions to be taken if the prescribed fire should escape and be declared a wildfire. The Contingency Plan also sets overburn limits in certain areas where the prescribed fire might be allowed to burn outside the boundaries of the burn unit. Examples are where the boundaries of a burn unit join a wetland and a

maximum manageable area has been established. Generally, no break separates the units because the fire is expected to spread a short distance into the wetland before available fuels are exhausted.

- **Site Preparation.** This includes any preparation of control lines that is required to safely and effectively handle the prescribed fire. Fireproofing facilities and resources may also be undertaken. Site preparation may take place early in the burning season whereas activities may be completed as part of the preburn preparation.
- **Equipment Preparedness.** This is essential for the effective and efficient operation of any Wildland Fire Management Program. Equipment should be maintained in a fire-ready condition during the prescribed wildfire season. A final check of equipment may be included as part of the Prescribed Burn Plan.
- **Fire Behavior Evaluation.** This evaluation should be completed and compared with desired fire behavior. Fuels, topography, and predicted weather data should be used to predict fire behavior within the prescribed burn unit. If desired results are not predicted, the prescribed fire should be reassessed and possibly canceled. The fire behavior evaluation and supporting data should be maintained as part of the Prescribed Burn Plan.
- **Smoke Management Assessment.** This assessment is undertaken to determine smoke trajectory and potential target areas within the trajectory. If a critical area lies within the smoke trajectory, a further smoke analysis (fuel loading, acres burned, fire to target distance, mitigation, etc.) should be conducted to determine if the burn may be safely conducted. The Prescribed Burn Plan will also contain emergency actions to be undertaken if smoke becomes an unexpected problem. The Mojave Desert Air Quality Management District should be notified due to air quality constraints and smoke management issues.
- **Notification and Coordination.** This is an essential part of prescribed fire planning. Training Center coordination will, at a minimum, include the F&ES Division, CO, and BLM. Through cooperative agreements, additional resources may be available to either assist in completing the prescribed burn or suppressing the fire should it escape. These agencies may be notified of proposed and accomplished prescribed fires; they use this information to determine the quantity of resources needed to be committed to prescribed fires and the resources available, in case of escape.

Prescribed fire operations at MCLB Barstow require adherence to interagency guidelines and standards as outlined in PMS 310-1 or NFPA 1051 and PMS 420-2. The 2014 *Interagency Prescribed Fire Planning and Implementation Procedures Guide* may be used as an additional information resource. As a minimum requirement at MCLB Barstow, all prescribed burn bosses must be either qualified as or under the supervision of a Prescribed Fire Burn Boss Type 2 to conduct prescribed burns. Burning units involving low-risk or low-complexity burns should be clearly identified so that less qualified or less experienced personnel can be used. Low-complexity prescribed burns may include miscellaneous small burns such as wildlife openings, isolated fuel islands, and brush piles.

If prescribed fires are used at MCLB Barstow, NWCG standards for interagency prescribed fire operations must be followed. Some Installation prescribed fire operations may be defined as "low complexity" in nature. To be categorized as low complexity, the prescribed fire operation must have the following characteristics:

- Low risk of escape
- No negative impacts if minor escapes occur
- A low to moderate burning condition
- No multiple fuel complexes or fuels that exhibit extreme fire behavior characteristics
- Simple burn objectives

4.3.2 Nonfire Fuels Treatment

Nonfire fuel reduction actions are undertaken to reduce the wildfire hazard of an area. These types of treatments are especially useful in areas where prescribed fire is not feasible and in smoke-sensitive areas. The potential hazard of any given site depends on a number of factors, such as the amount and type of living and dead vegetation on the site, the exposure of the site to wind and other factors involving weather and topography, and the presence of natural barriers to fire spread. Fuels management activities primarily impact wildfire hazards by influencing the quantity, structure, and arrangement of fuels.

Nonfire fuels treatments may be used independently or in combination with other treatment methods to accomplish management goals and objectives. A variety of methods can be used to accomplish nonfire fuel reduction. These methods fall in one of three categories, chemical, manual or mechanical, or biological.

Chemical

A chemical fuel treatment is the application of chemical agents to kill or restrict the growth of existing vegetation (BLM 2015). A wide variety of chemicals can affect vegetation in different ways, including killing the entire plant or just the exposed parts, restricting pre- or post-emergent growth, or defoliating. Chemical treatment is predominantly used to reduce the distribution of nonnative, invasive, and/or exotic species by applying herbicides to a treatment area. Many of these species are invigorated by fire. Chemical treatment can be used alone or in conjunction with other fuel treatments. Typically, several treatment cycles are necessary to deplete the seed bank and to kill and remove dead vegetation, which facilitates retreatment. Planting desired vegetation species may also follow treatments to prevent the area from reverting to its previous condition.

Manual or Mechanical

Manual or mechanical fuel treatments are viable methods of reducing fuel loading where the use of prescribed burns or wildfire is not an option due to safety risks and negative environmental impacts. The removal of continuous fuels and the density of fuels is essential to reducing fire risk and can be achieved through manual treatment. These types of treatments are limited by species effectiveness, logistical feasibility, and monetary constraints. Manual methods

are most often used near or surrounding communities or in environmentally sensitive areas, which are more sensitive to the effects of fire and smoke. Manual fuels reduction strategies include the following:

- Hand cutting and removing materials to a disposal site
- Mowing with a lawn mower, brush hog, or hydro-ax to reduce vegetation
- Lopping parts of trees or shrubs (i.e., low-hanging branches that are considered ladder fuels)
- Thinning to reduce the density of trees or shrubs within an area to eliminate continuous fuel sources
- Chipping dead, woody vegetation and distributing or removing it
- Removing the biomass resulting from treated fuel sources to a location away from the area being treated

Manual reduction of fuels is an effective means of reducing the potential for passive crown fires by the removal of surface and ladder fuels (Stephens et al. 2012). In comparison to prescribed burning, the effectiveness of fuel reduction through manual means is somewhat less effective due to the biomass that remains after a treatment unless the dead material is removed from the site. Special consideration must be made to limit the impacts to soils, wildlife, and vegetation communities due to the aggressive practices used to reduce fuels. Heavy equipment traffic, pedestrian traffic, selective species removal, and chemical introduction have the ability to potentially create a significant negative impact.

Biological

Biological fuel treatments use living organism to selectively suppress, inhibit, or remove herbaceous and woody vegetation (BLM 2015). Biological treatments rely on the consumption of plants by animals to reduce the amount of fuel in a given location. Plant-eating organisms include insects as well as grazing animals such as cows, goats, and sheep.

4.4 Prevention and Education

4.4.1 Fire Investigation

See Appendix H for MCLB Barstow's Fire Investigation Plan. Fire investigations provide the information needed to reduce the potential for future ignitions and to help educate Base personnel and visitors about the risks of wildfire and opportunities to minimize the risk of ignition.

4.4.2 Fire Prevention

Fire prevention and education programs are coordinated through MCLB Barstow's Fire Department.

4.4.3 Defense Zones and Roadsides

In the context of fire control, defensible space (“Defense Zones”) is the natural and landscaped area around a structure that has been maintained and designed to reduce fire danger. This defensible space reduces the risk that fire will spread from the surroundings to the structure and provides firefighters with access and a safer area to defend the structure.

The first 30 ft is the Defensible Space Zone (or Zone A) of a defensible space around a structure. It is where vegetation is kept to a minimum combustible mass. A guideline used in this zone is "low, lean, and green." The second distance, of 30 to 100 ft, is the Reduced Fuel Zone (or Zone B) of a defensible space around a structure. In this area, fuel/vegetation is typically separated vertically and horizontally depending on the vegetation type. Each defense zone classification has its own requirements for treatments near structures or facilities.

Stakeholders at MCLB Barstow will collaborate with MCLB Barstow’s Facilities Director to determine which structures are occupied, potentially occupied, or high-value facilities. Vegetation treatment for defensible space around those structures will be based on site-specific conditions, and the final vegetation treatment will be coordinated with MCLB Barstow Public Works before any action is taken. The list below represents future vegetation management strategies, including roadside vegetation treatment. Some of these measures will be implemented only after NEPA analysis and determination and Section 7 consultation with the USFWS.

The following are the requirements for Defense Zones A and B:

- Reduce continuous ground fuels by removing dead or dry biomass and leaving “wildlife” logs; consult with the Natural Resources Manager before work commences.
- Perform weed control annually to prevent the accumulation of thatch.
- Create vegetation “islands” (i.e., irregularly grouped plants) by creating horizontal and vertical spacing between plants to interrupt continuous ground fuels. Leave the root structure intact. Do not completely remove all vegetation and leave the ground bare.
- Have the revegetation plant palette approved by the Natural Resources Manager where revegetation efforts are required. The palette should consist of native plants that have a low probability of contributing to fuel hazards (e.g., through providing fuel ladders) while supporting habitat for federally listed plants and animals and blending with adjacent native vegetation communities.
- Use nest clearance surveys for all vegetation treatments during bird breeding season (15 February through 15 September) to comply with the MBTA.
- Do not use native vegetation (fuel) treatments in riparian areas.
- Be aware that, where necessary to stabilize the soil and prevent erosion, grass and other vegetation need not be removed. Other measures can be considered to reduce fuel continuity (e.g., trimming and/or creating islands of vegetation).
- On a case-by-case basis, trim shrubs up away from the ground to create space between them and any nearby trees so flames cannot spread as easily from one tree to the other.

- Perform year-round maintenance, inspection, and enforcement of all fuel modification zones (defensible zones) and fuel treatments.

Defensible Space Zone A (0 to 30 ft) requirements are as follows:

- Remove all dead wood from trees adjacent to or overhanging a building.
- Remove limbs from the bottom third of the tree to a maximum of 6 ft above the ground in order to reduce the risk of a vertical fire ladder where continuous ground fuels are adjacent to the tree, Remove all limbs within 10 ft radius of the chimney stack opening.
- Remove leaves, needles, and other dead vegetative growth from all roofs and gutters and under trees.
- Situate firewood, propane tanks, and combustible material a minimum of 30 ft from all structures.
- Construct future structures (e.g., windbreaks, decks, and storage sheds) with uncombustible materials. Wood fencing should not be used.
- Use existing noninflammable paved parking/storage lots, patios, driveways, walkways, boulders, rocks, and gravel to break up fuel continuity.

Reduced Fuel Zone B (30 to100 ft) requirements are the following:

- If it is determined that the 30 ft defensible zone is not sufficient to provide reasonable protection, fuels can be thinned under the direction of the Natural Resources Manager or MCLB Fire Chief. If the total percentage of the vegetation canopy within 100 ft of buildings is greater than 70 percent, trees and shrubs can be trimmed into islands (i.e., irregularly in a grouped fashion) so the total percentage of canopy cover of the area is reduced to 50 to 70 percent.

4.5 Funding Sources

MCO P5090.2A identifies the appropriate sources of funding for wildland fire activities, which are outlined below:

- Costs associated with developing and drafting or amending this WFMP will be funded by the Operation and Maintenance, Marine Corps account.
- Wildland fire management activities that are conducted for the purpose of compliance with environmental laws and regulations will be supported by conservation funds.
- Wildfire suppression, prescribed burning, and other wildland fire management activities to support training, range use, munitions testing and evaluation, or other mission activities will be supported by the responsible activity through direct funding or reimbursement.
- Funding for wildfire prevention and fuels management for hazard reduction is an Installation operations and maintenance responsibility.

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5.0 MONITORING AND EVALUATION

5.1 Fire Management Plan Revision

This WFMP is reviewed by MCLB Barstow's Environmental Division and Fire Department annually when updates and revisions are made to reflect new policies and procedures. The documents referenced in the WFMP and its appendices are updated annually.

5.2 Post-Fire Monitoring

The purpose of post-fire monitoring is to determine fire trends, wildland response to fires, and the effectiveness of fire management strategies. The Environmental Division is responsible for post-fire monitoring.

MCLB Barstow will maintain a photographic record of fire occurrence and post-fire effects on its lands for every wildland fire that is 10 ac or larger.

The following documentation will be completed:

- Photographs of the fire
- Photographs of the start of any transects for monitoring plant or soil cover
- Photographs from 5 and 10 years post-burn from the same photographic point
- Data associated with wildfires, such as fire weather, ignition source, date and time, area burned, etc.
- An annually updated fire history and fire map
- Copies of wildfire reports

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6.0 REFERENCES

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Appendix A. MCLB Barstow Fire and Emergency Services Strategic Plan

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MARINE CORPS LOGISTICS BASE

BARSTOW

FIRE & EMERGENCY SERVICES

STRATEGIC PLAN

2016 - 2020

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EXECUTIVE SUMMARY

The Marine Corps Logistics Base Barstow Fire Department is charged with protecting life and property within the boundaries of the installation. Effective community planning by the Installations and Logistics section must be conducted to create safe and healthy work conditions on the installation. The need for significant improvements in engineering features to provide a safer environment for our community cannot be overstated. New developments in building design and construction, coupled with new technology and equipment will assist our department as we constantly evaluate our methods of delivering emergency services to the community.

A strategic plan developed by the MCLB Barstow Fire Department provides a foundation to meet that challenge. This plan establishes priorities, identifies goals and develops fiscal options for emergency services through the next five years. It is a living document that will be constantly evaluated, re-examined, and updated as needed. The department is prepared and postured for these challenges and opportunities. This document is intended to be used as a planning tool to ensure that our department will provide current and future effective emergency services in a fiscally sound manner**.**

The 2016-2020 MCLB Barstow Fire Department Strategic Plan represents the efforts of many people in evaluating our department and its mission, anticipating the future in terms of community needs and resources required to meet those needs, and in formulating a plan to provide comprehensive cost-effective services to our customers - the citizens of MCLB Barstow Logistics Base. This strategic plan will serve to inform the members of our department of the preparation for the future, while at the same time serving as a foundation document for informing the base leadership, our community and for addressing fiscal planning. It incorporates the goals and objectives that this department believes are necessary to meet the future service demands of the community. Performance measures are utilized to evaluate the effectiveness of the department's efforts. In order to ensure that a contemporary strategy is used in the future, the strategic plan will be evaluated and revised on an annual basis.

COMMMUNITY PROFILE

POPULATION

MCLB Barstow averages more than 2,220 active duty and civilian personnel. The makeup is approximately 100 active duty, 760 contractors, and 1,360 civilians. About 30,000 military retirees are permanent residents in the high desert communities around Barstow. The NTC Army Aviation Pilots with their families are part of our base community and they reside in MCLB Barstow Housing

LAND AND REAL ESTATE CHARACTERISTICS

The base is comprised of three principal sites: Nebo, which encompasses 1,879 acres and functions as base headquarters and is the main facility for administration, storage, recreational activities, shopping, and housing functions. Yermo Annex encompasses 1,859 acres and is primarily a storage and industrial complex and, the third site, 2,438 acres, serves as our rifle and pistol ranges

MCLB Barstow borders the Cities of Barstow, Daggett, Yermo and the County of San Bernardino. Interstate 15 passes just to the north of the base. This highway is a critical thoroughfare in Southern California. I-40 is another major artery of the Southern area of the base and runs through our Fire District#1, Fire Demand Zone 4. Off-base assistance is available for our community but response times vary from 10-15 minutes for the local department. Off-base departments may request assistance with automobile accidents, confined space, high/low angle rescue, hazardous materials, aircraft accidents, water rescue, EMS, rail accidents, POL fires/spills, and any other incidents beyond their capability.

ECONOMIC IMPACT:

MCLB Barstow's annual facilities and operational contracts in fiscal year 2015 was over $242 million. The FY15 payroll was $43 million with approximately 1,361 civilian jobs and 759 contract staff, with military the total personnel positioned on MCLB Barstow is 2,217. Combined economic impact for the local economy was more than $483 million.

BASE FACILITIES:

MCLB Barstow has 260 buildings, totaling 4,410,227 square feet, 5,406 acres. There are 74 housing units on base for officer and enlisted personnel and their families. There are three military bachelors enlisted quarters (BEQ), with 41 bed spaces, for un-accompanied noncommissioned officers and service members. Additional military barracks were built in the winter of 2010 for 56 bed spaces which replaced the above 41 bed spaces. Yermo annex has two Army barracks that are capable of housing 100 personnel. The land, buildings and real property on MCLB Barstow are valued at $1,419,400,000.

HISTORY

The Marine Corps Logistics Base, presently the second largest employer in the Barstow area, was established as the Marine Corps Depot of Supplies at its present location on December 28, 1942, when the United States Navy turned it over to the Marine Corps as a storage site for supplies and equipment needed for Fleet Marine Forces in the Pacific theater during World War II. By the end of World War II, the base had outgrown its facilities and as a result, 2,000 acres of land, approximately seven miles east of the Nebo Main Base were annexed from the United States Army in October 1946. In 1954, the Commanding General, Marine Corps Depot of Supplies, moved his flag from San Francisco to Barstow and since then the base has grown in stature, strength and size. In March 1961 the importance of MCLB Barstow increased dramatically with the establishment of the Depot Maintenance Activity. In November 1978, the Base was re-designated to its present title of Marine Corps Logistics Base to emphasize its broad logistics support mission. In the early 1980's, MCLB Albany and Headquarters Marine Corps worked aggressively to integrate logistics support for the Fleet Marine Forces and eliminate duplications. As a result, all operational logistics functions moved to Albany and in January 1990, the Commanding General, Marine Corps Logistics Base, Albany, was re-designated Commander Marine Corps Logistics Bases.

The Marine Corps Logistics Bases is comprised of three major components- MCLB, Albany, Georgia; MCLB, Barstow, California; and Blount Island Command, Jacksonville, Florida. Generally speaking, MCLB, Albany furnishes supplies for Marine Corps forces east of the Mississippi and to forces which are part of the Atlantic Fleet. We at Barstow support Marine forces west of the Mississippi, the Far East and Asia, while Blount Island Command provides logistical support for the Marine Corps' Maritime Pre-Positioning Ships and the Norway Geo-Pre-Propositioning programs.

COMMUNITY RISKS

Although our Department is a full service emergency response department, a recent risk analysis has shown the predominant risk at MCLB to be the low and moderate categories. The Emphasis will be focused on the leading causes of fires which include careless maintenance, cooking, electrical, flammable liquids and vehicle fires. In the fire categories, the predominant risk is the maintenance center, which is considered the only high risk facility, due to the several entities within the complex. Also to take into consideration is military family housing structures. Existing housing facilities are Type V wood frame construction and pose a challenge to the department since most units are multifamily dwellings. There have been no housing fires since 2003. The leading cause of fires in family housing occupancies is careless cooking. The majority of the fires on MCLB Barstow are contained to the room of origin.

Our department also provides services to the City of Barstow through a mutual aid agreement. The severe risks in Barstow include the industrial occupancies along the southern border of MCLB Barstow and the railroad complex outside our installation.

FIRE DEPARTMENT PROFILE

VISION AND MISSION

The mission of the MCLB Fire & Emergency Services is to provide highly capable all hazard emergency response in order to protect the lives and property of MCLB Barstow and its community.

To support our Mission, the vision of our department has prioritized eight Core Ethic Values:

1. ***People*** *– We value keeping our people safe and well trained.*

2. ***Leadership*** *– We value leading by example.*

3. ***Teamwork*** *– We value working together.*

4. ***Integrity*** *– We value the utmost integrity in everything we do.*

5. ***Diversity*** *– We value equality and fairness and we consider the needs of our staff and line personnel and the community we serve.*

6. ***Communication*** *– We value open and honest communication with our staff and with all of our stakeholders.*

7. ***Partnership*** *– We value working in partnership.*

8. ***Pursuit of Excellence*** *– We value continuous improvement at all levels of our organization.*

DEPARTMENT PROFILE

The department operates a fleet of 16 firefighting vehicles and 2 support trailers comprised of 2 command vehicles, Training Officer vehicle, EMS Officer vehicle, 3 Inspector vehicles one of them being a heavy duty tow vehicles, 3 engine companies, 1 aerial apparatus, 1 medium rescue truck, 2 ALS Ambulance's, 1 hazardous materials response unit, 1 Reserve Engine, 1 air trailer, and 1 CBRNE response trailer. The department is staffed 24 hours per day, seven days each week with a minimum of 20 firefighters on duty. The department employs 66 civilian employees. The Department's annual operating and maintenance budget is approximately $305,000.00. This includes re-reimbursable funds from housing and the Maintenance Center. The total of the reimbursable component of our budget is approximately $120,000.00. Specialized funding (Central Managed Programs (CMP)) from HQMC, for training and specialized programs is provided as well. P-1 funding is a centralized funding controlled program through HQMC.

Projections for future growth do not show an increase in size of the community. A portion of our housing area was demolished in 2007 and was reduced by approximately 35%. The mission at MCLB Barstow is not expected to change and the rest of the installation will remain relatively constant for the foreseeable future.

SERVICES WE PROVIDE

Positive Incident Management	Natural Disaster Recovery
Structural Firefighting	Proactive Fire Prevention
Structural Rescue Operations	Fire Extinguisher Maintenance
Wildland Firefighting	POL Firefighting
Control/Mitigate POL Spills	Waste/Dumpster Firefighting
Hazardous Materials Releases	Vehicle Firefighting
Emergency Medical Services	Emergency Communications
Weapons of Mass Destruction	Firefighter Safety & Health
Confined Space Rescue	Preventive Vehicle Maintenance
Water Rescue	Active Firefighter Training
Technical Rescue Operations	Firefighter Physical Fitness
High Angle Rescue	Administrative Support
Automobile Extrication	Global Logistics Support

GOALS AND OBJECTIVES

1. Limit fire-ground/work related injuries.
2. Limit fire-related fatalities and injuries within our community.
3. Ensure both fire stations meet the distribution and concentration requirement.
4. Ensure all apparatus have the minimum number of personnel assigned to accomplish critical tasks outlined in the SOC.
5. Ensure response equipment meets the deployment objective for each type and magnitude of fire emergency incidents.
6. Conduct a critical task analysis of each category to determine the effective ERF.
7. Provide timely emergency medical and rescue services.
8. Ensure all apparatus inspected be certified personnel.
9. Ensure all MCLBB apparatus remain in a ready state and the replacement of the emergency vehicles remain within the established life cycle.
10. Increase the overall physical condition of our responders.
11. Outfit each fire station with modernized workout equipment.
12. Ensure Hazardous Material Unit obtains necessary tools/equipment for an effective response.
13. Obtain all necessary tools and equipment to meet the CALEMA Medium Rescue Standard.
14. Increase the number of trained Rescue Technician.
15. Obtain funding to upgrade our training facility.
16. Ensure appropriate training material is provided.
17. Publish the 2106 annual training plan.
18. Ensure all new and existing employees receive necessary training.
19. Ensure that F&ES meets required training and equipment standards for wildland.
20. Minimize Post Traumatic Stress & Reduce the impact to responding personnel following a traumatic event.
21. Maintain emergency radio communication.
22. Ensure personnel are properly licensed.
23. Transition additional F&ES equipment and personnel to Bldg. 322.
24. Obtain a tool & equipment maintenance contract.
25. Ensure PPE inventory is compliant and adequate.
26. Ensure personnel obtain and maintain required EMS Certifications.
27. Ensure the AED program at MCLB Barstow is updated and maintained.
28. Increase the public education program to target specific risks and risk audiences as identified through incident, demographic, and program data analysis.

WHERE THE DEPARTMENT WANTS TO BE

This Strategic Plan contains the goals and objectives our department feels is necessary to maintain the high level of service expected by our community and base leadership.

Goal 1: Limit fire-ground/work related injuries.

Performance Measures:

1. *Perform an annual review of the Risk Management Plan in January of 2016 with the purpose of identifying, implementing and validating risk control measures.*
2. *Thoroughly investigate and track all near-misses and mishaps. Identify and implement control measures whenever possible.*
3. *Reduce Total Case Incidence rates in accordance with the Base Safety Office 2016 Installation Safety Goals.*

Goal 2: Limit fire-related fatalities and injuries within our community.

Performance Measures:

1. *Ensure the established Department Response Objectives are met 90% of the time (ART & Full Response).*
2. *Evaluate minimum standards for responder readiness through training and crew performance evaluations throughout 2016.*
3. *Ensure Alarm and Sprinkler Testing is conducted in accordance with NFPA Requirements. Monitor compliance on a monthly basis.*

Goal 3: Ensure both fire stations meet the distribution and concentration requirements outlined in the Standards of Cover.

Performance Measure:

1. *Track all responses per fire demand zones on a monthly basis to validate our department standards of coverage.*
2. *Reduce structural response time benchmark to 6 minutes for the ART 90% of the time for 2016.*

Goal 4: Ensure all apparatus have the minimum number of personnel assigned to accomplish the critical tasks outlined in the Standards of Cover.

Performance Measures:

1. *Ensure staffing remains at 20 personnel daily for 2016.*
2. *Ensure both Ambulances are staffed daily with a minimum of one Paramedic and one EMT.*
3. *Increase the number of Paramedics with the organization from 10 to 12. Once Paramedic staffing is increased; ensure each station is staffed with an ALS Engine and an ALS Ambulance daily.*

Goal 5: Ensure response equipment meets deployment objectives for each type and magnitude of fire emergency incidents.

Performance Measure:

1. *Obtain necessary funds to replace obsolete SCBAs and replace with Scott Air packs.*
2. *Utilize the organization OPR programs to identify and procure necessary response equipment throughout FY16.*

Goal 6: Conduct a critical task analysis of each risk category and/or fire incidents to determine the effective response force (ERF).

Performance Measures:

1. *Review response procedures for all high risk facilities and supplement critical tasking through automatic mutual aid.*

Goal 7: Provide timely emergency medical and rescue services.

Performance Measures:

1. *Provide the full response of emergency medical service within 7 minutes for 90% of all calls requiring emergency medical assistance.*
2. *Provide advance life support service within 6 minutes for 90% of all calls requiring all medical aids. With a minimum of two Paramedics and two Emergency Medical Technicians per NFPA 1710.*

Goal 8: Ensure all apparatus inspected and tested by certified personnel.

Performance Measures:

1. *Assist GME personnel in becoming certified as Automotive Service Excellence (ASE) mechanics and Emergency Vehicle Technicians (EVT) by the end of FY16. (NFPA 1911 4.3.1.1 any person performing diagnostic checks, inspections, or maintenance of the fire apparatus shall meet the qualifications of NFPA 1071, Standard for Emergency Vehicle Technician (EVT's)Professional Qualification.)*
2. *Ensure all apparatus pass the annual pump test.*
3. *File and document all 2016 inspection and testing records in Emergency Reporting.*

Goal 9: Ensure all MCLB apparatus remain in a ready state and the replacement of emergency vehicles remain within the established life cycle.

Performance Measures:

1. *Ensure the 2016 ambulance is placed in service within 14 days of its arrival.*
2. *Equipment and apparatus replacement plans are captured and make it part of our continual planning process i.e. spreadsheet in 2016.*

Goal 10: Increase the overall physical condition of our responders through a NFPA 1583 Compliant Wellness Program.

Performance Measures:

1. *Certify the Physical Fitness OPR's as Peer Fitness Trainers during 2016.*
2. *Comply with the standards and guidelines of NFPA 1583 and MCO P1700.29.*
3. *Update MI-2.3 Physical Fitness Policy in 2016.*
4. *Conduct base line physical fitness assessments during 2016.*
5. *Ensure time is allotted during the duty day for Physical fitness.*

Goal 11: Outfit each Fire Station with modernized workout equipment under the guidance of the MCO Satellite Facility.

Performance Measures:

1. *Outfit both stations with proper equipment to support the physical fitness needs of fire personnel.*
2. *Obtain necessary budget approval each quarter for needed physical fitness equipment.*

Goal 12: Ensure Hazmat 401 obtains all necessary tools & equipment for an effective Hazardous Materials Response.

Performance Measures:

1. *Train all personnel on the check out and operational use of Hazmat 401.*
2. *Complete a full inventory of the vehicle and establish an equipment replacement cycle.*
3. *Obtain all equipment necessary to meet the Firescope requirements of a Type I Hazardous Materials Response Unit by the end of 2016.*

Goal 13: Obtain all necessary tools and equipment to meet the CALEMA Medium Rescue Standard.

Performance Measures:

1. *Align the Rescue Equipment list to match the CALEMA Medium Rescue Requirements.*
2. *Procure necessary rescue equipment in order to meet the CALEMA Requirements.*

Goal 14: Increase the number trained Rescue Technicians at MCLB Barstow F&ES.

Performance Measures:

1. *Contract Alabama Fire College to conduct on site Rope Tech 1 & 2 training within 2016.*
1. *Utilize the DoD CDC program to obtain Confined Space Rescue 1 & 2 for a minimum of 10 personnel in 2016.*

Goal 15: Obtain funding to upgrade our training facility which incorporates new and future mission requirements.

Performance Measure:

1. Procure an ARFF (MV-22) live fire training prop.
2. Continue to work with Public Works on the upgrade and repair of Bldg. 371.

Goal 16: Ensure appropriate training material is provided to all members.

Performance Measures:

1. *Maintain a reference library with up to date edition of required textbooks.*
2. *Conduct quarterly inventories of publications and reorder items as necessary.*
3. *Issue each member with the required text when enrolled in a certification course.*
4. *Issue all new employees a current edition of the IFSTA Essentials.*

Goal 17: Publish the 2016 annual training plan.

Performance Measures:

1. *Ensure templates are created in Emergency Reporting for each month's required training.*
2. *Evaluate training compliance on a monthly basis and review results with appropriate supervisor.*

Goal 18: Ensure all new and existing employees receive necessary training.

Performance Measures:

1. *Ensure all fire department personnel are familiar to the risks surrounding the base and are trained to respond to that risk.*
2. *Ensure a minimum of 80% of personnel are trained to the Hazardous Materials Technician level by end of FY16.*
3. *Develop electronic tracking of orientation training by the end of 2016.*

Goal 19: Ensure that MCLB F&ES meets required training and equipment standards for Wildland firefighting.

Performance Measures:

1. *Require all personnel obtain and maintain DoD Wildland Firefighter I by end of 2016.*
2. *Develop and implement Wildland Crew Proficiency Evaluations by end of 2016.*
3. *Maintain a NFPA Compliant Wildland PPE inventory for all employees.*

Goal 20: Minimize Post Traumatic Stress & Reduce the impact to responding personnel following a traumatic event.

Performance Measures:

1. *Update the CISM Management Instruction for accuracy and guidance.*
2. *Provide pre-incident stress management for the trauma service provider training.*
3. *Following all critical incidents perform a peer assessment and determine the need for further professional CISM assistance.*
4. *Allocate funds to cover the cost of San Bernardino Professional CISM team.*

Goal 21: Maintain emergency radio communications.

Performance Measures:

1. *Obtain mobile radios from MCPD for a temporary interoperability communication solution.*
2. *Review and update the department radio communication plan during 2016.*
3. *Repair existing radio communication equipment as needed.*

Goal 22: Ensure all personnel are properly licensed.

Performance Measures:

1. *Ensure 100% of required personnel obtain and maintain EVOC certification.*
2. *Ensure 100% of personnel involved in a vehicle mishap receive an EVOC refresher.*
3. *Ensure all required personnel have a properly endorsed state driver's license as well as a Government Driver's License (OF-346).*

Goal 23: Transition additional F&ES equipment and personnel to Bldg. 322.

Performance Measures:

1. *Centralize all of the equipment and supplies into Bldg. 322 by the end of FY16.*
2. *Obtain approval for F&ES personnel to begin the occupation of Bldg. 322.*
3. *Work with Installation personnel to repair and modify structure to accommodate Fire & Emergency Services personnel.*

Goal 24: Obtain a tools & equipment maintenance contract.

Performance Measures:

1. *Create an individual maintenance record for each piece of powered equipment by the end 2016.*
2. *Ensure all powered equipment is serviced annually to ensure serviceability and reliability.*

Goal 25: Ensure PPE inventory is compliant and adequate to meet the needs of MCLB Barstow F&ES.

Performance Measures:

1. *Ensure all assigned personnel have two sets of Structural Firefighting PPE.*
2. *Ensure PPE is inspected and tested in accordance with NFPA Requirements.*
3. *Ensure PPE Storage is inventoried and minimum levels maintained.*

Goal 26: Ensure personnel obtain and maintain required EMS Certifications.
Performance Measures:

1. *Maintain ICEMA CE Provider number.*
2. *Ensure personnel receive sufficient continuing education units to maintain required EMS Certifications.*

Goal 27: Ensure the AED program at MCLB Barstow is updated and maintained.
Performance Measures

1. *Upgrade the software on all AED's aboard both installation in 2016.*
2. *Ensure base personnel are trained to operate the AED's in each location by the end of the 2016.*
3. *Offer CPR training to Installation Personnel throughout 2016.*

Goal 28: Increase the public education program to target specific risks and risk audiences as identified through incident, demographic, and program data analysis.
Performance Measures:

1. *Expand the public education program to include other non-fire related topics (e.g., stroke, heart attack, drowning, etc.) in 2016.*

EVALUATION OF EXISTING INTERAGENCY AGREEMENTS

DoDi 6055.06, DoD Fire and Emergency Services Program, authorized Commanding Officers of DoD installations to enter into mutual aid agreements. If practical, a portion of the required F&ES for a DoD installation may be provided for under a mutual aid agreement. Mutual aid is specifically authorized by sections 5121-5206 of 42 U.S.C. (Reference (ai) and permits routine assistance to and from local jurisdictions as defined in a mutual aid agreement. Fire chiefs, through the installation commander, may also provide aid under the Immediate Response Authority per Reference.

Majority of MCLB Barstow Fire & Emergency Services Mutual Aid Agreements were updated in Calendar year 2013 (CY13) and is on track to be reviewed/updated in CY16 to be in compliance with the DoDi Standard. All MCLB Barstow Fire & Emergency Services Mutual Aid Agreements are reviewed annually with the corresponding fire districts. Presently our organization has agreements for the following Agencies:

1. San Bernardino County Fire Department
2. Barstow Fire protection District
3. Daggett Fire Department
4. Yermo Fire Department
5. Ft. Irwin Fire and Emergency Services
6. Newberry Springs Fire Department
7. Desert Ambulance
8. Inland County Emergency Medical Authority

Our department responded to a total of 917 mutual aid calls in 2014. Analysis clearly shows we provide assistance more than we receive assistance. This is common throughout the Department of Defense as our staffing standard is mandatory and our Prevention efforts make a difference. The majority of our counterparts are paid call/professional and volunteer departments. Approximately $92,000 in labor costs has been associated with providing local mutual aid assistance in 2014. Effective risk management by the department management staff to ensure base coverage stays within requirements have allowed the surrounding fire districts to benefit from these agreements. Benefits for our organization providing mutual aid assistance varies from staying proficient in firefighting methods and emergency medical care, interagency training events and interoperability to name a few. Our largest number of mutual aid calls provided is within the County of San Bernardino. The preponderance of the mutual aid calls are for EMS services and motor vehicle accidents.

Appendix B. MCLB Barstow Fire and Emergency Services Standard Operating Guidelines

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Appendix C. Fire Risk Assessment

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MARINE CORPS LOGISTICS BASE

BARSTOW

FIRE AND EMERGENCY SERVICES

RISK ASSESSMENT

2016

Marine Corps Logistics Base Barstow Fire & Emergency Services

The mission of the MCLB Fire & Emergency Services is to provide highly capable all hazard emergency response in order to protect the lives and property of MCLB Barstow and its community.

To support our Mission, the vision of our department has prioritized eight Core Ethic Values:

1. ***People*** *– We value keeping our people safe and well trained.*

2. ***Leadership*** *– We value leading by example.*

3. ***Teamwork*** *– We value working together.*

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7. ***Partnership*** *– We value working in partnership.*

8. ***Pursuit of Excellence*** *– We value continuous improvement at all levels of our organization.*

Our department responds to almost 1,000 incidents each year, providing a level of service that exceeds Department of Defense Standards. Our department has conducted a risk assessment to ensure an effective and focused response to the most likely incidents on our installation. We considered probability and consequence during our assessment as indicated in our Management Instructions. We developed the requirements for the services we provide based on the risk of each type of incident.

The services we provide the community are divided into fire and non-fire risks and are as follows:

Fire Risk
- Structural
- Vehicle
- Waste/Dumpster

Non-Fire Risk
- Hazardous Materials Releases
- Emergency Medical Services
- Confined Space Rescue
- Vehicle Extrication
- Swift Water Rescue

Non-Fire Risk (Cont.)
Railroad Emergency

We have evaluated the call volume, type of calls, and incident potential for each service we provide to the installation. This risk assessment provides the data necessary to make effective decisions that affect limited resources. Our department will target high risk elements to ensure our resources are utilized in the most efficient manner. The probability and consequence is identified below and listed by Fire Demand Zones. The probability is broken down and is based on the actual emergency and the potential of incidents occurring by call type to that FDZ. The consequences are based on several factors to include life, property value, and what is detrimental to the mission.

Probability & Consequence Matrix

High Probability Low Consequence *Moderate Risk*	**High Probability High Consequence** *High Risk*
Low Probability Low Consequence *Low Isolated Risk*	**Low Probability High Consequence** *High/Special Risk*

Fire Risk

The probability and consequence of fire risk as indicated for each fire demand zone has been identified for the Marine Corps Logistics Base Barstow during our risk analysis. Probability is the potential of an event occurring while consequence indicates the results of an event. Both factors are considered when determining the degree of risk.

FDZ 1	Consequence	Probability	Degree of Risk
Structural Firefighting	High	Low	High/Special
Wildland Firefighting	Low	Moderate	Moderate
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Low	Low	Low

FDZ 2	Consequence	Probability	Degree of Risk
Structural Firefighting	High	Low	High/Special
Wildland Firefighting	Low	Low	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Low	Low	Low

FDZ 3	Consequence	Probability	Degree of Risk
Structural Firefighting	Moderate	Low	Moderate
Wildland Firefighting	Low	Low	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Low	Low	Low

FDZ 4	Consequence	Probability	Degree of Risk
Structural Firefighting	High	Low	High/Special
Wildland Firefighting	Low	low	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Low	Moderate	Moderate

FDZ 5	Consequence	Probability	Degree of Risk
Structural Firefighting	Moderate	Low	Moderate
Wildland Firefighting	Low	Low	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Low	Moderate	Moderate

FDZ 6	Consequence	Probability	Degree of Risk
Structural Firefighting	Low	Low	Low
Wildland Firefighting	Low	Moderate	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Low	Low	Low

FDZ 7	Consequence	Probability	Degree of Risk
Structural Firefighting	Moderate	Low	Moderate
Wildland Firefighting	Low	Low	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Low	Low	Low

FDZ 8	Consequence	Probability	Degree of Risk
Structural Firefighting	Moderate	Low	Moderate
Wildland Firefighting	Low	Low	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Moderate	Low	Moderate

FDZ 9	Consequence	Probability	Degree of Risk
Structural Firefighting	High	Low	High/Special
Wildland Firefighting	Low	Low	Low
Waste/Dumpster Firefighting	Low	Low	Low
Vehicle Firefighting	Moderate	Low	Moderate

FDZ 10	Consequence	Probability	Degree of Risk
Structural Firefighting	Low	Low	Low
Wildland Firefighting	Low	Moderate	Low
Waste/Dumpster Firefighting	N/A	N/A	N/A
Vehicle Firefighting	Low	Low	Low

Non-Fire Risk

The probability and consequence of each non-fire risk indicated for each fire demand zone has been identified for the Barstow's fire service districts during our risk analysis. Our analysis is shown below. Probability is the potential of an event occurring while consequence indicates the results of an event. Both factors are considered when determining the degree of risk.

FDZ 1	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	Moderate	Low	Moderate
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Low	Low
Swift Water Rescue	N/A	N/A	N/A
Railroad Emergency	N/A	N/A	N/A

FDZ 2	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	High	Low	High/Special
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Low	Low
Swift Water Rescue	Low	Low	Low
Railroad Emergency	High	Low	High/Special

FDZ 3	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	High	Low	High/Special
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Low	Low
Swift Water Rescue	Low	Low	Low
Railroad Emergency	High	Low	High/Special

FDZ 4	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	High	Low	High/Special
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Moderate	Moderate
Swift Water Rescue	Low	Low	Low
Railroad Emergency	N/A	N/A	N/A

FDZ 5	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	Low	Low	Low
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Moderate	Moderate
Swift Water Rescue	Low	Low	Low
Railroad Emergency	N/A	N/A	N/A

FDZ 6	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	High	Low	High/Special
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Low	Low
Swift Water Rescue	Low	Moderate	Moderate
Railroad Emergency	High	Low	High/Special

FDZ 7	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	Moderate	Moderate	Moderate
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Low	Low
Swift Water Rescue	N/A	N/A	N/A
Railroad Emergency	Low	Low	Low

FDZ 8	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	Moderate	Low	Moderate
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Moderate	Moderate
Swift Water Rescue	N/A	N/A	N/A
Railroad Emergency	Low	Low	Low

FDZ 9	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	High	Low	High/Special
Emergency Medical Services	Low	High	Moderate
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Moderate	Moderate
Swift Water Rescue	N/A	N/A	N/A
Railroad Emergency	Moderate	Low	Moderate

FDZ 10	Consequence	Probability	Degree of Risk
Hazardous Materials Releases	Low	Low	Low
Emergency Medical Services	Low	Low	Low
Confined Space Rescue	Low	Low	Low
Vehicle Extrication	Low	Moderate	Moderate
Swift Water Rescue	N/A	N/A	N/A

Railroad Emergency	N/A	N/A	N/A

In addition to identifying the degree of risk by planning zone, we have assessed each service we provide to determine high risk elements facing our department.

Structural

Our department responded to 55 structural emergency responses aboard the two bases and 51 mutual aid structural responses in 2015. We use several methods to determine the degree of risk a structure poses to our community. We use Emergency Reporting Software with an imbedded Vision risk assessment as an objective tool to measure structural risk. The main component of risk for structural firefighting is an OVAP score of more than 35. The single facility we have identified as high risk is:

Bldg 573	Maintenance Facility	530,631 sq ft

We have also identified a target hazard in each fire demand zone to determine the most demanding requirements. Those facilities are as follows:

Fire Demand Zone 1			
3012 A-B	Base Housing	4538 sq ft	1125 gpm / 90 min
Fire Demand Zone 2			
Bldg 2	Storage	124,715 sq ft	2253 gpm / 90 min
Fire Demand Zone 3			
Bldg 12	Storage	121,715 sq ft	2399 gpm / 90 min
Fire Demand Zone 4			
Bldg 364	Commissary	17,253 sq ft	2250 gpm / 120 min
Fire Demand Zone 5			
Bldg 322	Maintenance Shop	21,459 sq ft	1500 gpm / 120 min
Fire Demand Zone 6			
Bldg T-100	Golf Course	2,880 sq ft	1500 gpm / 120 min
Fire Demand Zone 7			
Bldg 405	Storage	174,258 sq ft	2250 gpm / 120 min
Fire Demand Zone 8			
Bldg 487	Maintenance	1,500 sq ft	1500 gpm / 90 min
Fire Demand Zone 9			
Bldg 573	Maintenance	530,631 sq ft	3000 gpm / 150 min
Fire Demand Zone 10			
Bldg 249	Rifle Range	784 sq ft	750 gpm / 60 min

Vehicle Fire
Our department responded to 2 vehicle fires responses aboard the two bases and 24 mutual aid vehicle fire responses in 2015. Most vehicle fires occur on the interstate and pose a significant risk to firefighters. While we have not experienced a fire ground injury during a vehicle fire, the risk remains high. We have evaluated call volume and potential risk for vehicle fires and have determined the high risk areas for vehicle fires are:

Iwo Jima at I-40
Gates

Emergency Medical Service (EMS)
Our department responded to 75 EMS emergency responses aboard the two bases and 522 EMS mutual aid responses in 2015, most responses within our districts were focused on high volume areas. Based on call volume and incident potential, we have identified these areas and high risk for EMS events:

Bldg 573, Maintenance
Bldg 149, Occupational health

Hazardous Materials Releases
The hazardous materials risk involves some unknown elements within our jurisdiction specifically Interstate 40 which has a 7 mile stretch that runs through Marine Corps Logistics Base Barstow, and involves the potential of any type of legally transported hazardous material. The other major threat of hazardous materials release is through the transportation by rail. We have two major hubs within close proximity of our district, and the rail runs through are installation approximately a train every hour. Based on these risks in addition to hazardous materials used to support the mission, we have identified these high risk hazardous materials locations on the Barstow:

Bldg 573, Maintenance Facility
Rail
Interstate 40

Confined Space Rescue
There are several areas that we consider high risk to confined space rescues with a high number of entries. Based on the volume of entries into hazardous areas, we have identified several areas as high risk:

Bldg 573, Maintenance Facility

Swift Water Rescue
While this area is predominantly arid, there are times each year that presents a swift water rescue hazard. Flash flooding is a problem during severe storms but all of the recent responses have occurred outside the installation, with the exception of two rescues adjacent to FDZ 6.

Rail Incidents
The risk on the Barstow for a rail incident is low. While we do have approximately 20 trains per day transiting Barstow, the speed restrictions and relatively straight track layout reduce the risk of an incident on the 7 miles of rail on our installation. The two main

risks from the rail on the Barstow are an incident involving hazardous cargo and a heavy rescue event at a vehicle crossing. We have identified high risk elements for rail:

Hazardous materials release
Derailment
Vehicle accident at Yermo railroad crossing

Review

Our department will continue to target high risk elements when developing incident action plans, training evolutions, and facility assessments. We will also continue to assess risk annually and as conditions change to ensure our department is focused on the areas with the most risk to ensure we are able to effectively mitigate all emergency responses on the installation.

Appendix D. Skills Crosswalk

FORMAT PAGE

Skills Crosswalk

Wildland Training for Structural Firefighters

Overview

Skills Crosswalk (*Crosswalk*) identifies critical wildland firefighting skills that structural firefighters need to be safe and effective in either of two situations: when making an initial attack on a wildland fire in their jurisdiction, or when working with state and federal wildland firefighter agencies.

The *Crosswalk* was developed by analyzing and comparing National Fire Protection Association (NFPA) structural firefighting standards with National Wildland Coordinating Group (NWCG) wildland firefighting Position Task Books. The resulting Crosswalk identifies wildland skills and knowledge not incorporated within standard structural firefighting training. By incorporating a structural firefighter's existing fire suppression knowledge and skills, use of *Crosswalk* reduces required classroom hours, minimizes curriculum redundancies, and makes efficient use of limited training hours.

Coursework, practical demonstration of skills using NWCG Task Books (or other appropriate means), and the use of materials in resource kits assembled for each position have been incorporated into the *Crosswalk*.

Purpose of the *Skills Crosswalk*

In every area of the nation, rural development is expanding into wildland areas. Since the 1980's the rural population has more than doubled, with 140 million people now living in rural areas.[1] As a result, rural and volunteer firefighters increasingly manage fire in the Wildland Urban Interface (WUI). The *Crosswalk* provides a performance-based methodology and a learning resource guide for qualified structural firefighters to develop wildland firefighting knowledge and skills in a focused and time-efficient format. Structural firefighters with wildland skills work more safely and effectively on initial and extended attack operations. Cooperative firefighting efforts with neighboring jurisdictions and with federal wildland firefighters are enhanced.

The *Crosswalk* provides a standardized resource to guide local agencies in the development of training programs structured to meet needs of structural fire department personnel. By implementing the *Crosswalk*, wildland fire protection capacity and capability will be increased throughout the nation.

[1] US Census bureau statistics from 2006 report on migration from urban to rural America, **www.census.gov/** Population living in WUI 1960's 25,000,000; 1970's 47,000,000; 1980's 60,000,000; 1990's 97,000,000; 2000's 140,000,000.

FEMA

NWCG Positions Used for the *Skills Crosswalk*

Four specific NWCG positions are incorporated in *Crosswalk*, each paired with a counterpart structural position, as shown below:

Structural Fire Counterpart Position	Entering Qualifications	NWCG Position
Non-Supervisory Structural Firefighter, Basic	Meets NFPA 1001 for Firefighter 1, or equivalency	Firefighter 2 (FF2)*
Non-Supervisory Structural Firefighter, Advanced	Meets NFPA 1001 for Firefighter 2, or equivalency	Firefighter 1 (FF1)*
Driver/Operator/Engineer or Company Officer	Meets NFPA 1021 for Fire Officer 1, or equivalency	Single-Engine Resource Boss (ENGB)
Experienced lieutenants, captains, chief officers	Meets NFPA 1021 s for Fire Officer, or equivalency	Strike Team Leader (STEN)

*NWCG firefighter position designations 1 and 2 are opposite of NFPA designation (Firefighter 1=advanced)

Using *Skills Crosswalk*

Authority Having Jurisdiction

The designated "Authority Having Jurisdiction" (AHJ) plays a primary role in the use and administration of the *Crosswalk*. The AHJ is defined by NFPA as an organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installation, or a procedure. State and/or local law designate the AHJ for wildland fire protection within a given jurisdiction. Fire department chiefs, state fire marshals, state foresters, training officers, and other qualified fire protection officials are typically designated as the AHJ. The AHJ determines firefighter eligibility for *Crosswalk* use.

Training Organizations

State fire training authorities, state, county or city municipalities, rural fire districts, individual fire departments, or other agencies and organizations responsible for local firefighter training and/or certification may use the *Crosswalk. Crosswalk* can serve as an avenue of equivalency with NWCG standards. It may also be used to guide local firefighters in the development of wildland firefighting skills.

Instructor Qualifications

Qualifications for instructors to teach the NWCG curriculum are described in the Field Manager's Course Guide, Publication 901-1. Certification of instructor qualifications is the responsibility of the employing agency. All instructors should have training in how to be an instructor and be experienced in the content that they are teaching. For more information consult the Field Manager's Course Guide found on the NWCG Web site at http://www.nwcg.gov/pms/training/training.htm

Structural Firefighters

Crosswalk can be used as an NWCG equivalency and certification tool by structural firefighters and fire officers who meet the qualifications of firefighters as specified by NFPA 1001 and NFPA 1021, respectively, or the training standard determined as equivalent by the AHJ.

Skills Crosswalk Contents

For each position level, *Crosswalk* has three components:

1) Knowledge and skills
2) Performance evaluation and documentation
3) Resource kits

Knowledge and Skills

The *Crosswalk* identifies the specific knowledge and skills identified as gaps for structural firefighters. It indicates the corresponding NWCG class or lesson component, the lesson style (e.g. web-based or classroom presentation) and the length of the exercise. The *Crosswalk* will be posted on the USFA Website with links to NWCG resources. Portions of the curriculum are available in modular self-study formats, such as Web-based interactive lessons, CD-ROM, or written material. Demonstrations and field exercises are sometimes required to complement the curriculum. Ideally, training officials should use the NWCG lesson components within the context of their own training development.

Performance Evaluation and Documentation

The NWCG Position Task Books for each position level are the recommended tool to evaluate successful performance and they serve as documentation of required tasks, behavior and knowledge. Alternative types of training and experience documentation are acceptable, but must be equivalent in content to the position task book used for the position.

Resource Kits

Crosswalk Resource Kits containing materials integral to the successful suppression and management of wildland fires are included in the *Crosswalk*.

The *Skills Crosswalk* and NWCG Position Certification

Upon completion of the required academic and performance tasks, the AHJ reviews the candidate's C*rosswalk* documentation. Taking into account the candidate's skills, abilities, experience, aptitudes, and overall fit for the position, the AHJ may certify the individual as qualified for the NWCG position at once, or may require additional study and/or practical training for certification.

Position certifications of firefighters and company officers completing the *Crosswalk* process are accepted by NWCG member organizations as fully equivalent to standard NWCG certifications.

Roles, Responsibility, and Accountability

The NWCG and the US Fire Administration expect that fire protection organizations assuming wildland duties do so with safety as their first priority. The *Crosswalk* was developed to improve safety and operational effectiveness in wildland fire suppression activities. The process allows for a performance-based approach to qualifications by acknowledging the existing skills of qualified structural personnel. Successful implementation of *Crosswalk*—and its credibility as a system of certification and equivalency

for the structural fire service—depends on the professionalism and accountability of its users. As such, participants in the *Crosswalk* process have distinct roles and responsibilities to protect *Crosswalk* integrity.

The AHJ is responsible for:

- Ensuring and certifying that a firefighter has satisfied *Crosswalk* requirements according to guidelines.
- Conducting rigorous and appropriate testing and assessments that demonstrate the firefighter's knowledge and ability to safely and effectively perform required skills through on-the-job performance, simulations, drills and exercises, or a combination of like situations.
- Completing a thorough evaluation of the firefighter's overall suitability for wildland firefighting position certifications attained through the *Crosswalk* process. The AHJ assumes considerable professional responsibility in this determination.
- Issuing qualifications cards or other documentation of qualification, as locally appropriate or legally required.
- Maintaining documentation supporting certifications for all personnel using *Crosswalk*.

The firefighter is responsible for:

- Honest assessment of his or her own abilities, aptitudes, and overall suitability for assuming wildland firefighting positions.
- Completion of all *Crosswalk* academic and practical lesson components.
- Consistent review of learning materials and completion of appropriate refresher sessions and exercises.

Benefits of the *Skills Crosswalk*

Qualified structural firefighters already possess basic knowledge and competencies, and the *Crosswalk* focuses study and practical learning exercises on only critical wildland fire suppression concepts that are not addressed in structural training curriculum. Redundancies between wildland and structural fire suppression training programs are then significantly reduced. Completion of the standard NWCG curriculum requires about 233.5 classroom hours to complete coursework required for Strike Team Leader. *Crosswalk* enables a qualified company officer (NFPA Standard 1021 or equivalent) to complete focused coursework in 94 hours.

The table below portrays training hours savings realized with use of the *Crosswalk* for the equivalent structural firefighter position.

NWCG Positions	NWCG Curriculum Hours	Structural Equivalent Positions	*Skills Crosswalk* Hours
Firefighter 2 (FF2)	67.5	Non-Supervisory Structural Firefighter, Basic	21
Firefighter 1 (FF1)	54	Non-Supervisory Structural Firefighter, Advanced	17.5
Single-Engine Resource Boss (ENGB)	88	Driver/Operator/Engineer or Company Officer	44
Strike Team Leader (STEN)	24	Experienced lieutenants, captains, chief officers	12.25
Total	233.5	Total	94.75

Background

In June 2003, the National Association of State Foresters issued a report to the United States Congress titled "The Changing Role and Needs of Local, Rural and Volunteer Fire Departments in the Wildland-Urban Interface." The report described the expansion of wildland fire responsibilities of America's structural fire service, in particular the predominantly rural and volunteer organizations serving communities near the wildland-urban interface. Several important training-related recommendations were offered to boost safety and capacity in wildland fire suppression operations undertaken by these departments.

NWCG member organizations (Department of Interior Bureaus, United States Forest Service, United States Fire Administration, the Intertribal Timber Council, and the National Association of State Foresters) coordinated with subject matter experts from the North American State Fire Training Directors, the International Association of Fire Chiefs and the National Fire Protection Association. As a result of this effort, training programs and policies were developed to create a training and qualifications reciprocity system. The *Crosswalk* is among these projects.

After construction of the *Crosswalk* methodology, structural and wildland fire personnel from Arizona, Arkansas, Florida, Montana, New Jersey, Oregon, Pennsylvania, Texas and New Jersey tested and validated the system. "Skills gaps" were then developed for each position. The International Association of Fire Chiefs (IAFC) refined the *Crosswalk* through trial applications with personnel. The *Crosswalk* is a dynamic document. Modifications to the process will likely result as user input is incorporated into the *Crosswalk* structure and procedures

For Additional Information

The *Skills Crosswalk* can be found at:
http://www.usfa.fema.gov/fireservice/firefighter_health_safety/safety/training/

Contact for questions:

Phyllis Krietz, USFA Representative, 301-447-1224

Skills Crosswalk

Wildland Training for Structural Firefighters

The levels of training have been defined as:

- **Non-supervisory Structural Firefighter: Basic**
- **Non-supervisory Structural Firefighter: Advanced**
- **Company Officer**
- **Strike Team/Task Force Leader**

Required for equivalency:

Non-supervisory Structural Firefighter: Basic

- Academic knowledge as listed in the Skills Crosswalk
- **Performance Component:** Completion of Field Exercise for NWCG Firefighter 2 (FF2)
- List of Personal Protective Equipment
- Resources Kit

Non-supervisory Structural Firefighter: Advanced

- ***Prerequisite:*** *Field exercise for "Non-supervisory Structural Firefighter: Basic"*
- Academic knowledge as listed in the Skills Crosswalk
- **Performance Component:** Completion of NWCG Position Task Book for Firefighter 1 (FF1)
- Resources Kit

Company Officer

- ***Prerequisite:*** *Completion of NWCG Position Task Book for Firefighter 1*
- Academic knowledge as listed in the Skills Crosswalk
- **Performance Component:** Completion of NWCG Position Task Book for Single-Engine Resource Boss (ENGB)
- Resources Kit

Strike Team/Task Force Leader

- ***Prerequisite:*** *Completion of NWCG Position Task Book for Single-Engine Resource Boss (ENGB)*
- Academic knowledge as listed in the Skills Crosswalk
- **Performance Component:** Completion of NWCG Position Task Book for Strike Team/Task Force Leader (STEN)
- Resources Kit

Non-supervisory Structural Firefighters: BASIC

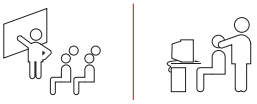
A non-supervisory structual firefighter requires both academic knowledge and skill performance. The table below lists the skills required and where the skills are taught in the NWCG curriculum. Also listed is the Field Exercise required at the basic level to prove skill attainment.

Performance Component
Completion of Field Exercise in NWCG Firefighter 2 (FF2) training.

Wildland Skills	NWCG Resources		
	Where to Find It	Lesson Style	Length (in hours)
Basics			
Wildland fire behavior • Identify principle environmental factors affecting fire behavior. • Explain how fuel size affects fire behavior. • Explain how the arrangement of fuels affects fire behavior. • Describe how wind affects fire spread. • Give weather factors which affect fuel moisture. • Describe how topography affects fire spread. • Describe how building construction and arrangement affect fire spread.	S-190[1]	CD-ROM/Web-based OR Classroom	6-8 Hours
Fireline Construction			
Follow established procedures in securing the fireline. • when working around fireline equipment. • Identify hazards and safety procedures when working around fireline machinery. Black lining Coordinated fire crew methods: leap frog and bump up	S-130[2] Unit 9 Suppression	Classroom	1.5 Hours
Suppression and Mopup			
Systematic procedures for locating and suppressing fire	S-130 Unit 11 Mopup and Securing the Fireline	Classroom/video	2 Hours
Firing devices: preparation and use	S-130 Unit 7 Firing Devices	Hands-on demo	1 Hour

[1] *Introduction to Wildland Fire Behavior*
[2] *Firefighter Training*
[3] *Water Use and Pumps*

Non-supervisory Structural Firefighters: BASIC (cont.)

Wildland Skills	NWCG Resources		
	Where to Find It 	Lesson Style 	Length (in hours) 
Wildland hoses: Hose pack construction, fittings, progressive hose lay and deployment	S-211[3] Unit 2, Lesson A Fittings and Hose Unit 2 Lesson D Hose lays	Classroom	Lesson A 1 Hour Lesson D 45 Minutes
Safety			
List life threatening situations in wildland fires.	S-130 Unit 4A Watch out situations and Fire Orders	Classroom/demo/ video	2-2.5 Hours
Follow established procedures in securing the fireline. Follow established procedures when working around fireline equpment. Identify hazards and safety procedures when working around fireline machinery.	S-130 Unit 4B LCES	Classroom/video	1 hour
Fire shelter use	S-130 Unit 4C Fire Shelter	Classroom/video	2 Hours
Identify situations which warrant immediate action and/or reporting	S-130 Unit 4D Potential Hazards and Human Factors on the Fireline	Classroom/video	3 Hours
Safely transport personnel and equipment, appropriate to locality, commercial and small fixed wing aircraft required Safety procedures around engine, dozers and tractor plows Safety procedures for retardant/water drops	S-130 Unit 5 Transportation Safety	Classroom	0.5 Hours
		Estimated Total Training Time:	**21 Hours**

Personal Protective Equipment (PPE)

Required
Meets the requirement of NFPA 1977 Standard On Protective Clothing And Equipment For Wildland Firefighting, 2005 edition; and a fire shelter approved by the AHJ.

Recommended
A backpack for personal equipment and at least 2 quarts of drinking water.

Resources Kit

- Incident Response Pocket Guide (IRPG) (PMS 461)
- Fireline Handbook (PMS 410-1)
- Fuels, Fire Behavior, and Tactics by geographic areas of the US.
- Local specific materials.

Non-supervisory Structural Firefighters: ADVANCED

A non-supervisory advanced structual firefighter requires both academic knowledge and skill performance. The table below lists the skills required and where the skills are taught in the NWCG curriculum. Also listed is the Position Task Book required at this level to prove skill attainment.

Performance Component
Successful completion of NWCG Position Task Book for Firefighter 1.

Wildland Skills	NWCG Resources		
	Where to Find It	Lesson Style	Length (in hours)
Resources			
Apply Risk Management Process found in PMS 410-1 Fireline Handbook and PMS 461 Incident Response Pocket Guide	S-131 Fireline Reference Materials	Classroom/video	1 Hour
Sizeup			
Sizeup wildland fire • Define hazards and evaluate escape routes/safety zones • Point of origin and cause • Size of fire • Location of head • Values to be protected (improved properties, agricultural, recreational, etc.) • Weather conditions (current/forecasted) • Fuel group (may also include building materials and arrangement of improved properties) • Topography • Time of day • Current and expected fire behavior/intensity.	S-231[5] Sizeup Considerations Unit 3	Classroom	1.5 Hours
Safety			
Continuously evaluate incident/apply L.C.E.S.	S-131 Unit 3 Tactical Decision Making	Exercises (Sandtable)	5 Hours
Serve as a lookout			
Operate and maintain chainsaw in wildland environment, esp. sharpening and low-limbing techniques.	S-212[6] Unit 2 Maintenance S-212 Unit 3 Chain Saw Tasks and Techniques	Demonstration/ lecture Classroom/video	4 Hours 5 Hours

[4] *Firefighter Type 1*
[5] *Engine Boss*
[6] *Wildland Fire Chain Saws*

Non-supervisory Structural Firefighters: ADVANCED (cont.)

Wildland Skills	NWCG Resources		
	Where to Find It 	Lesson Style 	Length (in hours) 
Radio			
Training in programmable radios and narrow band radio use.	Narrow band tutorial in PowerPoint	http://www.fireradios.net/Tutorial.aspx	1 Hour
Maps and Compass			
• Accurately determine local declination • Use compass to point to true north • Accurately orient map using compass, landmarks, improved properties, streets, access roads, and topographic features • Accurately identify current location by determining back azimuths to two identifiable landmarks or topographic features • Verify location by comparing topographic features or street references with map. Describe location in terms of coordinates or other acceptable description. • Accurately read map symbols • Accurately compute distance and bearing • Navigate from point to point using map, compass, and pacing • Accurately navigate to an assigned destination • Utilize available property improvement maps to identify areas of concern	*Basic Land Navigation* PDF (PMS 465)	http://www.nwcg.gov/pms/pubs/pubs.htm	Self-study
		Estimated Total Training Time:	**17.5 Hours**

Resources Kit

- Incident Response Pocket Guide (IRPG) (PMS 461)
- Fireline Handbook (PMS 410-1)
- Fuels, Fire Behavior, and Tactics by geographic areas of the US.
- Radio programming guide.
- Equipment Safety Inspection Checklist (OF-296)
- Local specific materials.

Company Officer

Company Officer requires both academic knowledge and skill performance. The table below lists the skills required and where the skills are taught in the NWCG curriculum. Also listed is the NWCG Position Task Book to prove skill attainment at the Company Officer level.

Performance Component
Successful completion of NWCG Position Task Book for Single-Resource Boss (Engine).

Wildland Skills	NWCG Resources		
	Where to Find It	Lesson Style	Length (in hours)
Situational Awareness			
Evaluate fuels, topography, and weather through entire operational period.	S-290 Intermediate Wildland Fire Behavior	Classroom	32 Hours
Keep supervisor informed about progress, changes in conditions, fire behavior, and special events. Inform face-to-face, if possible.			
Fireline Construction and Safety Leadership			
Identify escape routes and safety zones.	S-230 Unit 4B Entrapment	Classroom	
Complete fireline construction assignment • Determine type of line construction. Locate fireline, reevaluate LCES as conditions change and work progresses. • Construct fireline based on principles of fireline construction, including burnout and backfiring.	S-230[7] Unit 4C Fireline Operations, Tactics and Safety	Classroom / video	4 Hours
Take special precautions for downhill and/or indirect line construction			
Adjust fireline location to specific conditions and provide for safety of assigned personnel			
Modify production standards and time frames for accomplishment of fireline construction tasks			
Utilize appropriate safety orders: Standard Fire Orders, Watch Out Situations, WUI Watch out situations and agency policy. • Develop plans based on safety guidelines, Spot check tactical operation for compliance in safety, and ensure all ops. Comply with LCES			
Complete fireline construction assignment. • Supervise portable pump/hose lay delivery system for tactical work assignment.	S-211[8] Unit 1D Portable Pump Setup	Classroom	1 hour

[7] *Crew Boss (Single Resource)*
[8] *Portable Pumps and Water Use*

Company Officer (cont.)

	NWCG Resources		
	Where to Find It	Lesson Style	Length (in hours)
Identify tactical capability and limitations of an engine.	S-231 Unit 1 Engine and Crew Capabilities and Limitations	Classroom	1 Hour
Locate water sources and check for volume, cleanliness, and permission from owner to use water source in engine re-supply.	S-215 Unit 5A Initial Operations and Site Preparation	Classroom	2 Hours
Compare engine attack method alternatives to type of assignment specifically Wildland engine tactics	S-215 Unit 5B Structure Protection Tactics, Engine Operations, Water Use and Class A Foam.	Classroom	2 Hours
Sustain water and chemical agent supply for engine assignment.			
Make specific assignments to protect structures.			
Check engine communications. Ensure compatibility and operation.			
Obtain engine maintenance schedule and ensure engine is maintained.			
Arrange/provide for en route logistical needs and check point	S-230 Unit 2 Mobilization	Classroom	1 Hour
Assemble assigned personnel for departure from incident and brief supervisors/subordinate personnel. Depart incident. Arrange/provide for enroute logistical needs. Demobilization procedures.	S-230 Unit 6 Demobilization and Post-Incident Responsibilities	Classroom	1 Hour
Check in with agency dispatcher prior to disassembly of crew at home location.			

[9] *Fire Operations in the Wildland Urban Interface*

Company Officer (cont.)

Resources Kit

- Incident Response Pocket Guide (IRPG) (PMS 461)
- Fireline Handbook (PMS 410-1)
- Fuels, Fire Behavior, and Tactics by geographic areas of the US.
- Radio programming guide

- Equipment Safety Inspection Checklist (OF-296)
- ICS 201 Incident Briefing form
- ICS 214 Unit Log form
- ICS 213 General Message form
- ICS 224 Crew Evaluation form
- ICS 221 Demobilization Checkout
- CA-1 Traumatic Injury Form (Federal form)
- OF-289 Property Loss or Damage Report
- Regional & National Mobilization Guides
- Local Specific Materials

Finance Forms

- Form 261 Crew Time Report
- Form 297 Emergency Equipment Shift Ticket
- Form 288 Emergency Firefighter Time Report
- Form 286 Emergency Equipment – Use Invoice

Strike Team/Task Force Leader

The role of the Strike Team/Task Force Leader requires academic knowledge and skill performance.

Performance Component
Position Task Book for Task Force Leader (TFL) Strike Team Leader (STL).

Wildland Skills	NWCG Resources		
	Where to Find It	Lesson Style	Length (in hours)
Plan Tactical Actions Monitor work progress Line scouting and beyond Long-term logistics	S-330[10] Unit 3, Engagement	Classroom	8 Hours
Provide for structural protection from wildland fire exposure	S-215, Unit 4 Structure Triage	Classroom Video	2.5 Hours
	S-215, Unit 5C, Support Resources and Unit 5D, Firing Devices	Classroom Video	1.75 Hours
		Estimated Total Training Time:	**12.25 Hours**

Resources Kit

- Incident Response Pocket Guide (IRPG) (PMS 461)
- Fireline Handbook (PMS 410-1)
- Fuels, Fire Behavior, and Tactics by geographic areas of the US.
- Radio programming guide
- Regional & National Mobilization Guides

- Equipment Safety Inspection Checklist (OF-296)
- ICS 201 Incident Briefing form
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[10] *Task Force/Strike Team Leader*

Appendix E. MCLB Barstow Dispatch Center Operations Guide

FORMAT PAGE

Appendix F. MCLB Barstow Standards of Cover

FORMAT PAGE

MARINE CORPS LOGISTICS BASE

BARSTOW

FIRE & EMERGENCY SERVICES

STANDARDS OF COVER

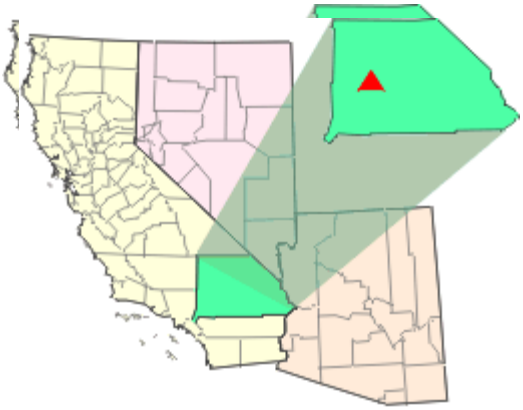
2016

Table of Contents

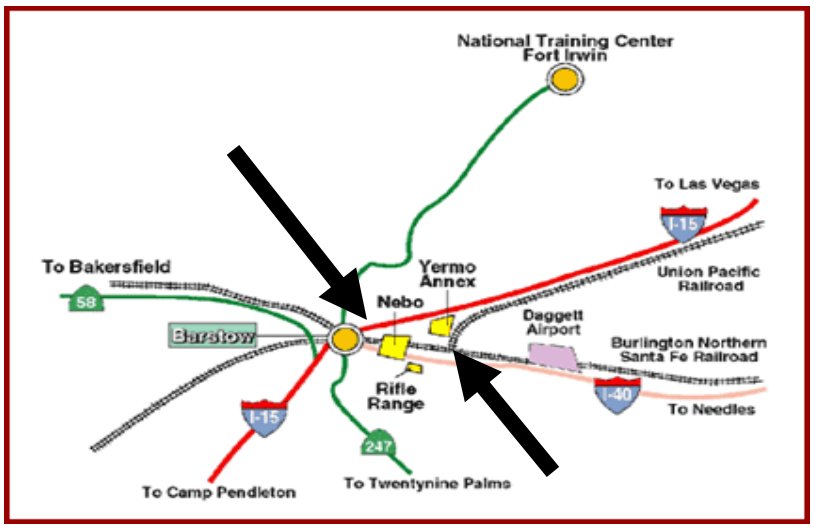
Executive Summary

Marine Corps Logistics Base Barstow Fire & Emergency Services is charged with protecting the lives and property within the boundaries of the installation. Effective department management is essential in ensuring our Governing Body and our community understands the risk of potential incidents, the services we provide, and our functional capabilities if an incident occurs. Our department maintains a high degree of analysis and evaluation of all components of the emergency response sequence to provide accurate feedback on our ability to safely respond to emergency incidents throughout the installation.

Community Served



MCLB Barstow is located halfway between Los Angeles and Las Vegas on Interstate 15. It is approximately 120 miles northeast of Los Angeles and 150 miles southwest of Las Vegas in the San Bernardino County high desert. Marine Corps Logistics Base (MCLB) Barstow consists of two geographically separated installations that function cooperatively under one Commander. The installation is situated in the Southwest Corner of California near the town of Barstow; the City of Barstow has a population of over 31,000.



The installation covers a total of 8.8 square miles and is home to 266 people. The population is predominantly a civilian workforce during the day and dwindles to a small population after the normal workday. The civilian workforce is employed to conduct maintenance and storage functions on Department of Defense equipment and material. The Major Commands on the installation include; Base Support Division (BSD) Facilities & Services Div (FSD), Human Resource Division (HRD), Resources Mgmt Division (RMD), Fleet Support Division (FSD), MC Multi-Commodity Maintenance Center (MC)3, Special Staff Offices (SSO), Morale, Welfare, Recreation (MWR), and the Defense Logistics Agency (DLA). Marine Corps Logistics Base, Barstow in conjunction with the Defense Distribution Depot receives stores, maintains, and issues all classes of supplies in support of Marine Corps activities and NASA support materials. The depot maintains 3,303,024 square feet of covered storage, including a 90,000 square foot munitions storage facility and 5,675,715 square yards of open storage. It supports the war reserve program and pre-positioned war reserve program where tanks, armored personnel carriers, and other combat support equipment have been preserved and are maintained in a ready status for use on short notice.

The Maintenance Center Barstow (MCB), at the Yermo Annex, houses the largest single story facility ever constructed for the Marine Corps. The 435,600 square foot industrial building is devoted solely to repairing and overhauling ground military equipment fielded by the Marine Corps. MCB restores unserviceable equipment through depot level repair or rebuild and accomplishes modification, fabrication and assembly.

Coordination and control of logistics support is provided to the NTC Army Movement Control Center at Yermo Annex. Annual rotation of Army brigades, with approximately 1200 vehicles, requiring unloading and loading of some 290 rail cars each rotation, arrive and depart through the base.

Located at a railroad hub, MCLB Barstow is ideally situated to accomplish its mission of supporting U.S. Marine Corps units along the west coast and in the Pacific. The City of Barstow functions as the western division point for Santa Fe's Transcontinental mainline and is also served by the Union Pacific's mainline to Los Angeles. The $55 million rail classification center in Barstow is the largest rail reclassification operation in the world. The City of Barstow is located at the crossroads of the national interstate highway system, the intersection of Interstate routes 15 and 40.

MCLB Barstow also possesses the largest Department of Defense railhead in the world. The rail and highway transportation network available to MCLB Barstow provides the capability to delivery material to all of the Marine Corps units it serves within one day. Barstow is served by three major highways, Interstate 15, Interstate 40, and State Highway 58. Barstow also intersects 2 of America's busiest cross-country railroads, the Burlington Northern-Santa Fe and the Union Pacific, which makes receiving and shipment of vital supplies and equipment to any part of the United States.

Mission Statement

The mission of the Marine Corps Logistics Base, (MCLB) Barstow is to procure, maintain, repair, store, and issue all types of supplies and equipment for Marine Corps forces generally west of the Mississippi to ships in support of the maritime pre-positioned ships program.

The mission of the MCLB Fire & Emergency Services is to provide highly capable all hazard emergency response in order to protect the lives and property of MCLB Barstow and its community.

To support our Mission, the vision of our department has prioritized eight Core Ethic Values:

1. ***People*** *– We value keeping our people safe and well trained.*
2. ***Leadership*** *– We value leading by example.*

3. ***Teamwork*** *– We value working together.*

4. ***Integrity*** *– We value the utmost integrity in everything we do.*

5. ***Diversity*** *– We value equality and fairness and we consider the needs of our staff and line personnel and the community we serve.*

6. ***Communication*** *– We value open and honest communication with our staff and with all of our stakeholders.*

7. ***Partnership*** *– We value working in partnership.*

8. ***Pursuit of Excellence*** *– We value continuous improvement at all levels of our organization.*

Organizational Principles

- Support a safe work environment concentrating all of our efforts on firefighter safety in everything we do.
- Establish and maintain the highest quality fire & emergency services program.
- Promote high professional standards.

Installation Layout

The base is made up of two separate areas/districts: Nebo (a Mormon name meaning "the Shepherd") and Yermo (a Native American name meaning "Desert Flower") Annex. MCLB Barstow encompasses 8.8 square miles, which includes Nebo, Yermo and the rifle/pistol range.

Department Profile

The department is staffed by trained fire protection personnel and is organized into four major elements, Operations, Prevention, Training and Administration. There are 66 federal civilian employees with staffing based upon Marine Corps Order 11000.11, Fire Protection and Emergency Services Management, and Department of Defense Instruction (DODI) 6055.06, DoD Fire and Emergency Service Program. Firefighters perform as Firefighter II, Hazardous Materials Operations, and Emergency Medical Technician (EMT) as a minimum. Firefighter Paramedics must meet full performance firefighter levels in addition to Advance Life Support (ALS) requirements. MCLB firefighters control, neutralize, mitigate, and/or extinguish any fire or emergency situation occurring within Marine Corps Logistics Base boundaries. Firefighters also perform containment and control measures at hazardous materials incidents. Due to the remote location of MCLB Barstow and limited resources, assistance from other agencies may be necessary to successfully mitigate some large incidents. Mutual aid from surrounding communities' plays a crucial role is necessary for incidents beyond the capabilities of this department.

MCLB Fire & Emergency Services provides both ALS and BLS emergency medical services in accordance with State of California and the Inland Counties Emergency Medical Authority (ICEMA). A memorandum of agreement with Naval Hospital Camp Pendleton requires the department to provide advanced (ALS) and basic (BLS) life support services as well as ambulance transport for all medical emergencies that occur at MCLBB. In addition, the 911 (911) Communications Center serves as Public Safety Answering Point (PSAP) for 9-1-1 calls and is the interface between our department, the Military Police and local mutual aid dispatching agencies. Medical assistance may require rescue, extrication, or firefighting actions to be carried out simultaneously to ensure the best possible assistance to the victim(s).

Fire Department Facilities

Our department resources are four engine companies, two ambulances, a rescue vehicle, Breathing Support Trailer, Haz-Mat Unit, Utility Tow Vehicle, and a 75ft Aerial, deployed between the two fire districts. There are 3 facilities utilized by the department.

Headquarters (Bldg 236)

Building 236 is an Administrative building which is designed to accommodate multiple departments aboard MCLB. These administrative sections include: Base Safety, Base Legal, Security and Emergency Services (Fire/Police), and Defense Logistics Agency (DLA). The east end consists of the Headquarters for Security and Emergency Services. Located in the west end is the Headquarters for Defense Logistics Agency. The Base Safety Office and Legal Offices are located in the center of the building. Training and Administrative functions are performed on a daily basis.

Fire Station #1 - Station 401 Barstow

Fire Station #1 was built in 1942 and is approximately 4400 square feet. It has an administrative section which accommodates two Captains, Assistant Chief of Operation, and a Prevention Officer. It also has sleeping quarters, fitness room, a remodeled kitchen area, day room, and a leisure room. The truck floor is filled with two Engine Companies, an ALS Ambulance Company, and a Utility Vehicle. The station is

staffed with a minimum of one medic, seven firefighters, two Captains, and an Assistant Chief of Operations.

Fire Station #2 - Station 402 Yermo

Fire Station #2 was built in 1942 and is approximately 11,000 square feet with a recent addition of a detached 2,500 square feet truck floor completed CY11. This station has a kitchen, leisure room, fitness rooms, storage, added additions (two offices & sleeping quarters), the Prevention Office, sleeping quarters, and administrative space. The Truck Floor's (2) houses an Engine Company, 75ft Aerial, ALS Ambulance, and a Rescue Truck. The station is staffed with a minimum of two medics, six firefighters, a Captain, and a Station Captain.

Training/Certification

As a minimum, all full performance firefighters maintain current certification in Hazardous Materials Operations, Emergency Medical Technician and Firefighter II levels. Hazardous Materials Technicians, Emergency Medical Technicians, and Paramedics must maintain additional certification through continuing education (CE) programs, required recertification processes or refresher training. Engine company members work together to provide life safety fire prevention inspections on the installation and to educate the members of the community in sound fire prevention practices. Additionally, engine company personnel perform annual, semi-annual fire suppression, and alarm systems tests and inspections. The Chief Inspector is the program manager for the Fire Prevention Division the Training Chief supervises the Prevention Branch of 5 fire inspectors assigned to inspect facilities and housing units. In addition, the Chief Inspector performs technical reviews of building renovations and construction projects.

Main Services Provided

Structural Firefighting
Emergency Medical Service
Hazardous Materials
Confined Space Rescue

Wildland Firefighting
Swift water rescue
Vehicle Extrication
Railroad emergencies

Risk

Emergency Medical Service

Our on base EMS responses constitute 47% of our call volume and average 5 incidents per month. Our call data indicates four high risk areas; Maintenance Center, Fleet Support Division, (warehouses) and rail operations (Army). Fire Station 402 provides support to the Army National Training Center (NTC) during training rotations and houses one of the largest military rail yard operations in the country. Fire Station 401 provides support to Base Housing, Occupational Health Facility, Child Day Care Center, sports fields/gymnasium, additional rail, and warehouse storage. Our closed community presents a different demographic than most cities or towns, while we do have both children and elderly citizens on the installation, the percentage of active adult are in good health is higher than most other communities. Most EMS responses on either facility are initiated due to industrial accidents, cardiac emergencies (due to an aging work force at the Maintenance Center), competitive sport activities, and a wide range of illness.

The MCLB EMS program consists of advanced and basic life support for patients within the borders of our community and our surrounding area. The standard response for a single patient requires the response of a BLS engine company and an ALS ambulance. All members of the engine company are California State EMT's.

In the event of a Multi Casualty Incident (MCI) additional apparatus will be responded as needed. Advanced Life Support and transportation to the treatment facility

(Barstow Community Hospital) is provided by MCLB Fire & Emergency Services. Personnel responding from the fire station on the initial dispatch have the ability to activate Mutual Aid Agreements for additional resources as needed.

Structural

Our structural responses account for 34% of our on base total incidents. MCLB Barstow facilities include almost all occupancy types and a wide variety of industrial processes. We have divided MCLB Barstow into two separate and distinct districts, Yermo and Nebo. We have identified high risk buildings using a combination of OVAP criteria in Emergency Reporting, our districts mission critical facility listing, and special hazards such as explosives, radiological and hazardous chemical processes. Many of our facilities are protected with automatic fire detection or suppression systems that report electronically to the 24-hour dispatch center. The majority of our structural fire responses have been to automatically transmitted fire alarms in warehouses and industrial facilities. Our available resources include three engine companies staffed by a crew of four, one aerial company staffed with a crew of 4, two ambulances and a chief officer. Additional assistance required to manage an incident is available on request through established mutual aid agreements.

Hazardous Materials

Hazardous materials responses account for approximately 4% of our annual call volume and are primarily natural gas leaks, fuel/chemical process spills or leaks. Another significant hazardous materials risk to both facilities is the main East-West rail corridor for the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) railway. These high volume rail lines travel directly through and around both facilities. An increase to our hazardous materials risk occurs when the BNSF Railroad stores bulk tank cars of hazardous material /chemicals on the rail siding along the north perimeter fence line of the Nebo facility (FDZ 6). Additionally, Interstate 40 is a very heavily traveled trucking route that runs directly through FDZ 4 and 5 of our installation. MCLB Fire & Emergency Services maintains an offensive capability to stop leaks, prevent further spills, and rescue and decontaminate grossly contaminated victims. The majority (80%)

of department personnel are certified to the State of California and or DOD Firefighter Certification Program level for Hazardous Materials Technician/Specialist with the remainder of our firefighters trained to the Operations and Decontamination level. We also maintain a hazardous materials response team capable of Level "A" entry, equipment trailer, a breathing air support trailer, and a mass decontamination stored for rapid response. The fire department hazardous material response teams follows the California OES type I equipment and follows NFPA 472 training requirements. All resources can be responded to an incident as needed. Mutual Aid Agreements will be activated in the event an incident which requires additional assistance.

Rail

The major east-west rail corridor for the Burlington Northern Santa Fe and Union Pacific rail runs through Nebo (FDZ 6) carrying a wide range of hazardous materials and products. This is a very busy route as it accommodates rail traffic twenty-four hours a day. MCLB Fire & Emergency personnel routinely cross train and participate in drills and exercises with the railroads and other emergency response agencies on a regular basis.

Confined Space Rescue

MCLB Barstow has several types of confined spaces; the main types of spaces are communications spaces, utility spaces, and storage tanks. There are more than 200 above and below ground permit-required spaces on MCLB. We maintain a capability to provide rescue from all of the spaces we have identified on Nebo and Yermo. Our resources include 20 DoD certified Confine Space Rescue Technicians (37% of personnel), a rescue truck with personal protective equipment, ropes, harnesses, rigging, and all other equipment items to effectively perform confined space rescue. San Bernardino County Fire, Ft. Irwin Fire, and Barstow Fire Protection District are mutual-aid assets that are available as needed.

Auto Extrication

Automobile extrication is one of our most common mutual aid responses and accounts for a high percentage of our call volume, predominately on Interstate 40 and I-15 where we cover a 60 mile stretch on both highways. We do encounter accidents throughout the installation, but many do not require mutual aid assistance. Our standard response for automobile extrication is a 4-person engine company, a 2-person rescue vehicle, and a chief fire officer. EMS support is provided by MCLB firefighter paramedics.

Compliance Methodology

Time Points and Time Intervals

All emergency events follow a specific series of events. Emergency systems primarily intercede after the "point of awareness" of the emergency event. An emergency response time continuum is composed of the following time points and intervals for all emergencies:

Emergency Incident

The emergency response system is identified. These identifiers may include an individual that recognizes or witnesses a need for an emergency response or an electrical or mechanical system such as a smoke or heat detector.

Alarm: An alarm begins when the emergency response system is activated. An example is when the 911 system is initiated by someone in need or when a local or central alarm is transmitted to a receiving agency.

Notification: Notification begins when the Fire Department dispatcher receives the call or alarm.

Alarm Processing: Alarm processing is defined as the interval of time between the notification of alarm to the Fire Department dispatcher and the receipt of the alarm by the

emergency responders. This is the first point at which the actual recording of time begins in the response time continuum. The current standard from DoDI 6055.06 Table E3.T1 7 minutes ART.

On-Scene Time: On-scene time is the point at which the responding unit arrives at the emergency and ends the recording of the total response time.

Initiation of Action: This is the point at which operations to mitigate the incident begins. Actions may include size-up, resource deployment or when patient contact is initiated.

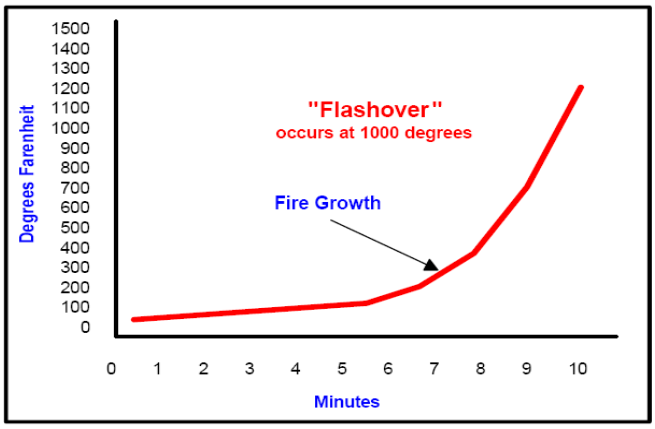
Termination of Incident: Termination is the time at which the emergency units have completed the assignment and are available to respond to another request for service or the "available" time.

Total Response Time: Total response time is calculated from notification point until the units arrive on-scene.

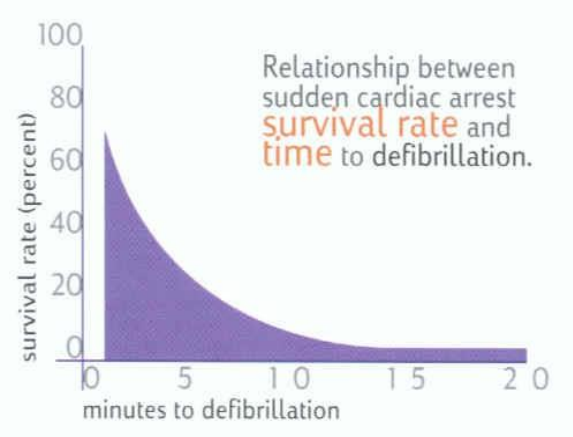
Elements of Response Time: The recommendation for response time is based on information that suggests intervention at a structure fire prior to the flashover stage is crucial. From the point of awareness until the arrival of emergency crews, conditions deteriorate rapidly with maximum temperatures and flashover occurring within an 8-10 minute time frame. Flashover is that point of a fire's growth at which there is a significant shift in its destruction of life and property. From an emergency medical perspective, brain damage is very likely in cardiac arrest patients after four minutes without oxygen flow to the brain. The American Heart Association also refers to a five-minute time frame in which external defibrillation provides for the greatest chance of survival.

Impact

The ability of a fire service agency to intervene in an emergency event in a timely fashion is predicated on proper distribution of the first arriving apparatus and having enough resources on scene to safely mitigate the emergency event. For structure fires, this critical point is prior to the fire reaching flashover which instantly incinerates the contents of the room or structure affected by the fire. Below is a visual indicator that illustrates the time/temperature curve and the importance of being able to intervene before conditions become untenable for occupants.



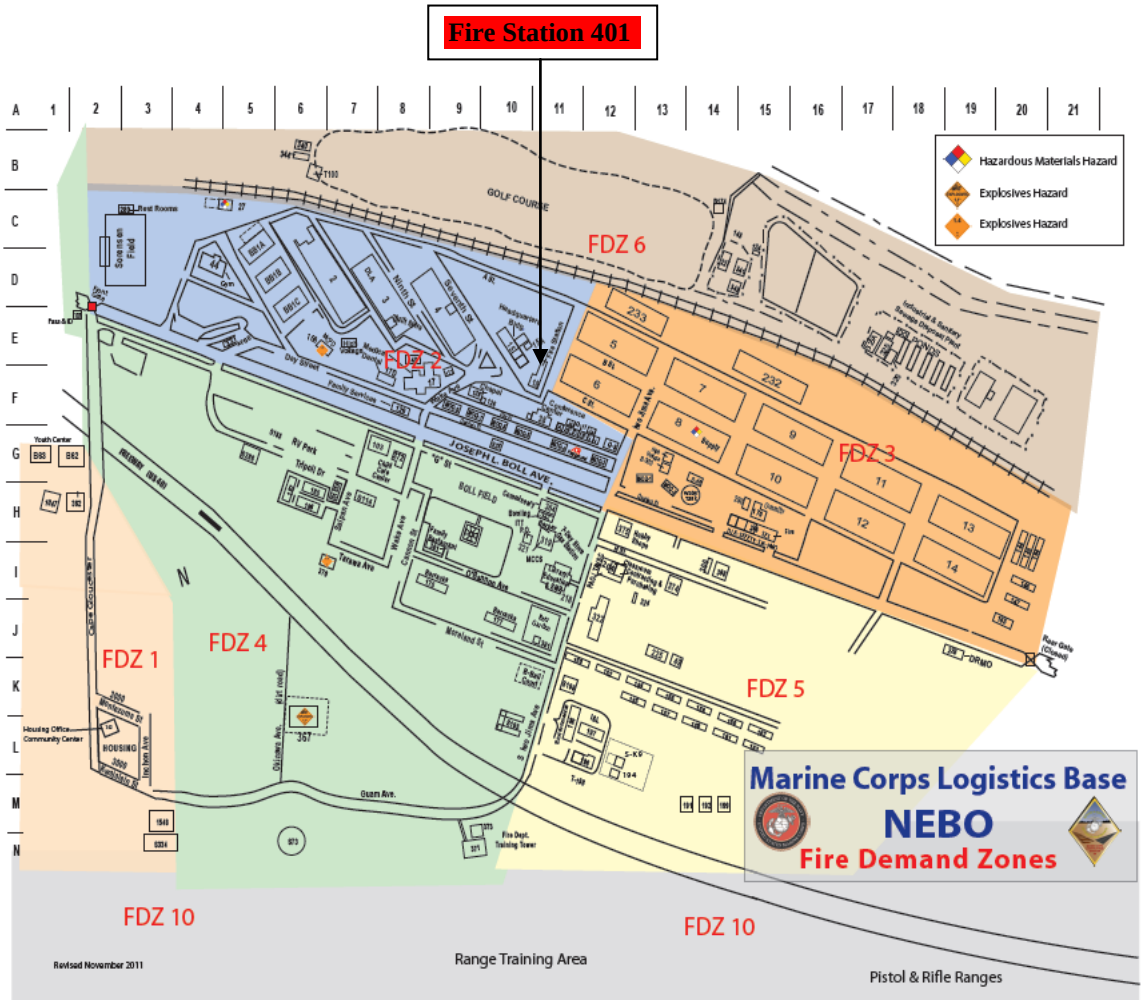
Emergency medical events also have a critical window of opportunity that requires a rapid response time of 4-6 minutes. Emergency Medical Services (EMS) identifies brain death as a critical point in time around which to deploy resources. When breathing stops, the brain undergoes potential irreversible damage within four to six minutes without oxygen. Additionally, the rapid application of an automatic electronic defibrillator has a significant impact on a patient survivability rate as indicated in the graph below.



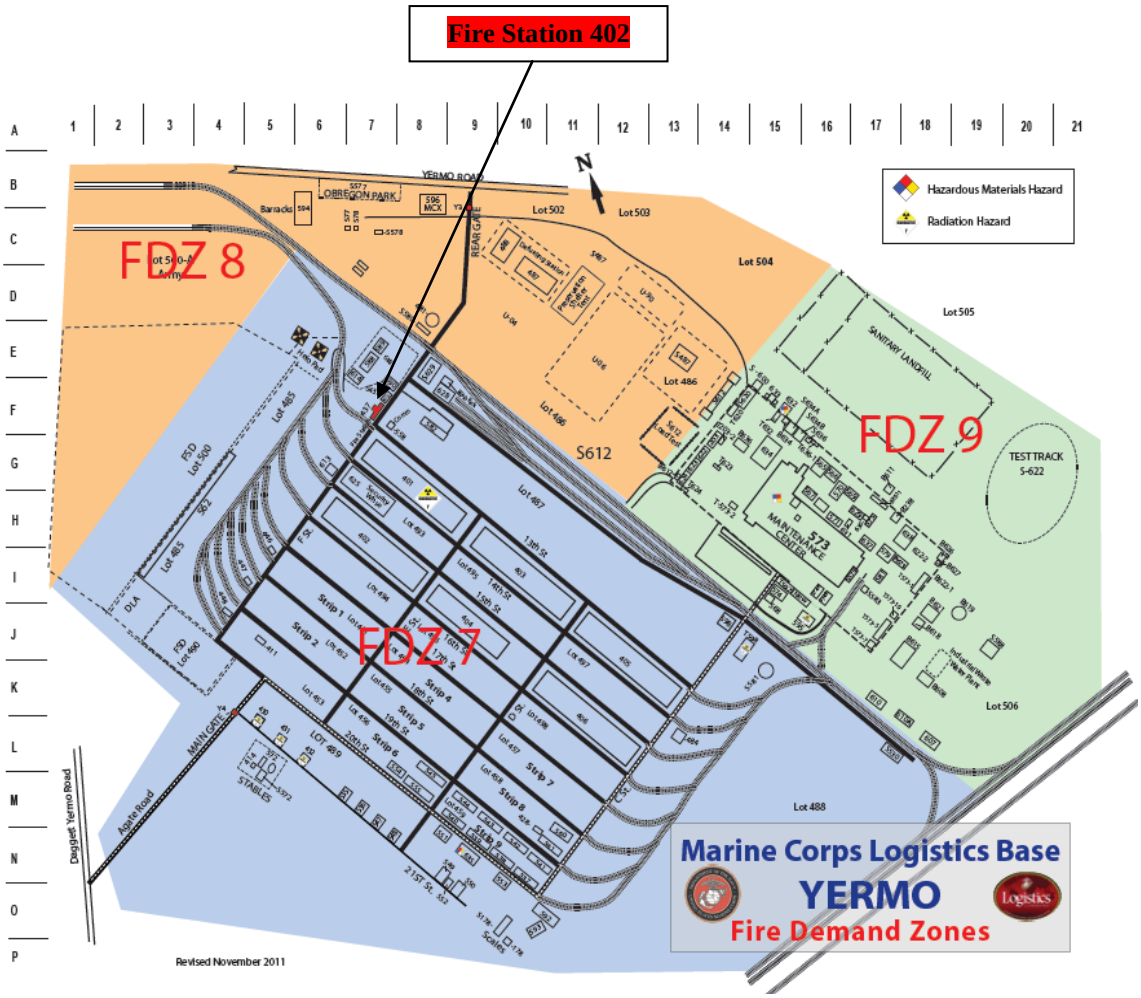
Coverage Zones

In order to provide adequate coverage and response times, MCLB Barstow is divided into two fire protection districts, Nebo and Yermo. Each district is divided into fire demand zones to facilitate response planning and performance analysis of the service delivery system.

District 1, Nebo (Fire Demand Zones 1 – 6 & 10)



District 2, Yermo (Fire Demand Zones 7 – 9)



Distribution

The fire stations and the available resources must be located to assure rapid deployment of necessary resources to minimize and terminate emergencies. The primary measurement to evaluate distribution is travel times for vehicles that are capable of intervening at each emergency incident. Proper distribution is necessary to ensure that first-due emergency vehicles arrive promptly and are able to mitigate or contain any emergency.

Water Demand

Fire flow must be addressed when considering risk factors. Department of Defense agencies use a specific method for computing water demand for facilities that is outlined in Unified Facilities Criteria 3-600-01, *Fire Protection Engineering for Facilities*. Minimum fire flow requirements are separated into two different elements; facilities with installed suppression systems and those without. Water demand is an assessment of water supply needed once a structure has become fully involved. The Fire & Emergency Services Division maintains the water supply system and periodically performs fire flow tests on our hydrants.

Unsprinklered Facilities

The basic elements that we consider when computing water demand for facilities without installed fire suppression systems are:

Identifying occupancy risk

Determining a risk value using six weighted factors

Selecting the fire flow and required duration from the chart provided in UFC 3-600-1, Fire Protection Engineering for Facilities.

Table C. Water Demands for Unsprinklered Facilities:

TOTAL WEIGHTED VALUE						
Occupancy Hazard Classification	Fire Flows (gpm at 20 psi residual pressure)			Duration (minutes)		
	6-10	11-15	16+	6-10	11-15	16+
Light	750	1125	1500	60	90	120
Ordinary Group 1	1000	1500	2000	90	120	150
Ordinary Group 2	1500	2250	3000	90	120	150
Extra	2500	3750	5000	150	195	240

Sprinklered Facilities

Water Demand for facilities with suppression is calculated by:

Identifying occupancy risk

Multiplying the design area for the type of risk by the design density

Adding the hose demand

Table 4. Water Demand for Sprinklered Facilities:

OCCUPANCY CLASSIFICATION[1]	SPRINKLER		HOSE Gal/Min (L/Min)	DURATION OF SUPPLY Minutes
	DESIGN DENSITY[2] (Gal/Min)/FT^2 (L/min/m^2)	DESIGN AREA FT^2 (m^2)		
Light Hazard	0.10 (4.1)	3000 (280)	250 (950)	45
Ordinary-Hazard Group 1	0.15 (6.1)	3000 (280)	500 (1900)	60
Ordinary-Hazard Group 2	0.20 (8.2)	3000(280)	500 (1900)	75
Extra-Hazard Group 1	0.30 (12.2)	3000 (280)	750 (2840)	120
Extra-Hazard Group 2	0.40 (16.3)	3000 (280)	750 (2840)	120

In view of its role as a logistics and equipment repair base, mission critical facilities are regarded as being the warehouses on the Nebo annex and the maintenance center on the Yermo annex. All major warehouses at both Nebo and Yermo are sprinklered with systems that are in conformance with current requirements for rack storage of Group “A” Plastics and Class IV commodities. However, because of severe problems with microbiologically influenced corrosion (MIC) the real availability of these systems in a major fire event has become questionable. We were funded in 2013 to replace all galvanized system aboard both annexes. As of January 1, 2014 100% of all the galvanized fire sprinkler systems have been converted to black pipe. For these reasons fire flow calculations are provided for the largest of the warehouses, assuming total non-availability of the sprinkler system. The most hydraulically demanding facility on our installation is Building 573, Maintenance Facility. In accordance with Appendix

C of UFC 3-600-01, the required fire flow for this facility is calculated using unsprinklered factors due to the industrial impact.

The weighted water demand factors for Bldg 573, Maintenance Facility are:

Response Time by Fire Department:	2 (Less than 3 miles)
Type of Construction:	2 (Type II Construction)
Number of Stories:	2 (Two Stories)
Separation Distance:	1 (60ft. or more)
Building Floor Area:	5 (Greater than 40,000)
Firefighting Access:	2 (>230ft.Hose Layout)
Total Weighted Value	14

The facility is considered to be an Ordinary Hazard Group 2 (Occupancy Classification) which requires 2,250 gpms for 120 minutes. We meet the minimum fire flow requirements to meet the water demand by providing more than 3,000 gpms through our resources dispatched for every structural event.

STANDARDS OF COVERAGE FOR MCLB BARSTOW

The MCLB Fire & Emergency Services Division is an aggressive, full service fire department. A first due company shall be able to provide a safe interior attack at a structure fire, advanced life support at a medical call, isolate the area and deny entry at a hazardous spill, or initiate a specialized rescue evolution. Our predominant structural response is false alarms and alarm system malfunctions. These types of emergencies totaled 161 of our 55 structural responses in CY2015. Our non-fire responses are primarily emergency medical calls as 75 of the 161 emergencies we responded to were medical calls in CY2015**.**

Service Objectives

Our level of service objectives are all based on a 90% success rate, the specific objectives are listed below:

Aggregate Response Time

Service Type	Standard	Apparatus	Staffing
Structural			
First Arriving	7:00	1	4
Full Alarm Assignment	15:00	3	13
EMS			
BLS	7:00	1	2
ALS	12:00	1	2
HAZMAT			
First Arriving (Defensive)	7:00	1	4
Full Alarm (Offensive)	22:00	3	15
Technical Rescue			
First Arriving	7:00	1	4
Full Alarm	22:00	3	13

Implementation Strategy:

This standard of cover is implemented using a Computer Aided Dispatch system. All districts and categories of response are delineated to ensure the appropriate resources are dispatched to emergency events.

Incident Management:

The senior fire official from our department serves as the Initial On-Scene Commander at all incidents on MCLB Barstow except for security issues. Our on duty Assistant Chief for Operations (GS-11) is normally the senior fire official. They use a common incident management system to organize and communicate at the scene of an emergency. Their minimum certifications include Fire Officer III, Hazardous Materials Incident Commander. Our incident management system is aligned with regional mutual aid agencies and we utilize integrated call signs to ensure consistency when operating with units from other emergency response organizations. Each incident in our jurisdiction follows a common template:

Isolate the hazardous area & deny entry

Identify hazards

Safely employ available resources

Assess risk & determine realistic course of action

Assign a Rapid Intervention Team

Provide for accurate accountability of the responders on scene

Assign an Incident Safety Officer

Establish a staging area for incoming units

Provide a rehabilitation area

Coordinate the arrival of follow-on forces

Provide favorable outcome

Critical Tasks:

Structural Responses:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Safety Officer	1
Providing Water Supply	1
Pump Operations	1
Forcible Entry	2
Fire Attack	2
Search and Rescue	2
Ventilation	2
Overhaul	2
Ladder Placement	2
Rapid Intervention-Safety Team	2

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

Medical Responses:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Safety Officer	1
Patient Assessment/Treatment	2
Extrication	2
Immobilization	2 Per Victim
Litter/Gurney Carry	2 Per Victim

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

Technical Rescue Emergencies:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Safety Officer	1
System Set-up	4
Crew members	2
Hardware/Software	4
Patient Assessment/Treatment	2
Immobilization	2 Per Victim
Litter/Gurney Carry	2 Per Victim

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

Hazardous Materials/WMD Incidents:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Safety Officer	1
Providing Water Supply	1
Hose Deployment	1
Product Identification	2
Product Control	2
Product Neutralization	2
Decontamination	1
Rapid Intervention-Safety Team	2

NOTE 1: Our role is to provide command and control, rescue, extinguishment, and containment actions. Neutralization, recovery, clean up and disposition of the chemical is not a fire department function. We may be required in a support role during these functions.

NOTE 2: Any or all of these functions may have to be performed simultaneously to be effective.

Wildland Fire:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Safety Officer	1
Providing Water Supply	1
Fire Attack	2
Overhaul	1

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

Miscellaneous Responses:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Safety Officer	1
Providing Water Supply	1
Pump Operations	1
Fire Attack	2
Overhaul	3

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

Department Performance

The performance data collected for CY 2015 shows an effective distribution and concentration posture for our resources. The Department of Defense requires installations to analyze aggregate response time which is from the Time of Call Receipt until the first arriving unit is at the scene of the reported emergency.

Baseline Suppression Response Objectives

For 90% of fire responses, the first due apparatus shall arrive within 7 minutes ART.

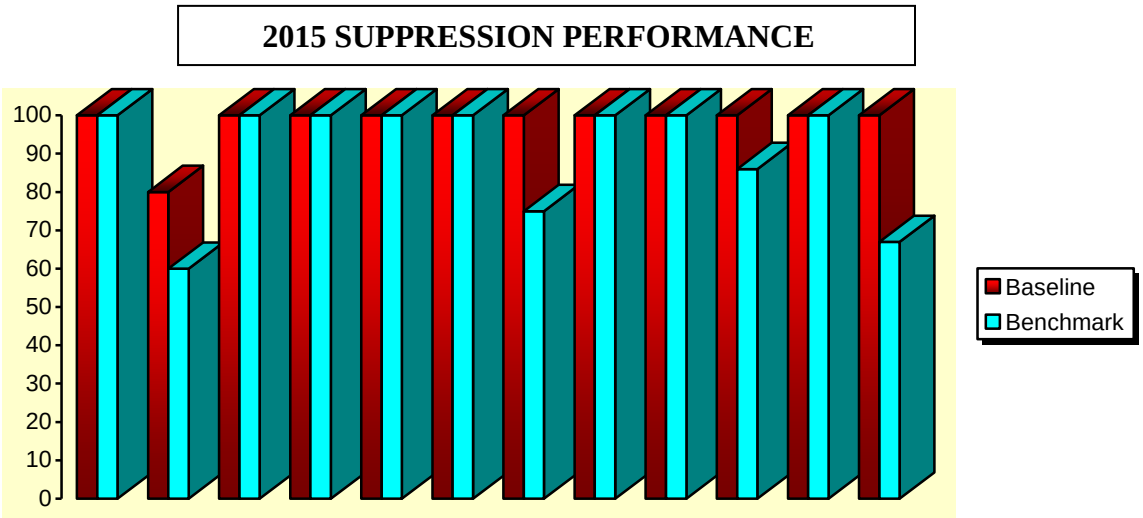
For 90% of fire responses, the initial full alarm assignment arrives within 15 minutes ART.

Benchmark Suppression Response Objectives

For fire responses, the first due apparatus shall arrive within 6 ½ minutes ART.

Suppression Performance

The department exceeded our baseline, and just met our benchmark Standard of Cover response objectives for ART. For 2015 98 % baseline suppression responses, the first-due apparatus arrived within 7 minutes ART. There was one suppression response, for the full alarm assignment arrived within 15 minutes ART. For 2015 91% benchmark suppression responses, the first-due apparatus arrived within 6 ½ minutes ART.



Baseline EMS Response Objectives

For 90% of all priority EMS incidents, a basic life support force with AED capabilities or an ALS medic unit will arrive within 7 minutes ART.

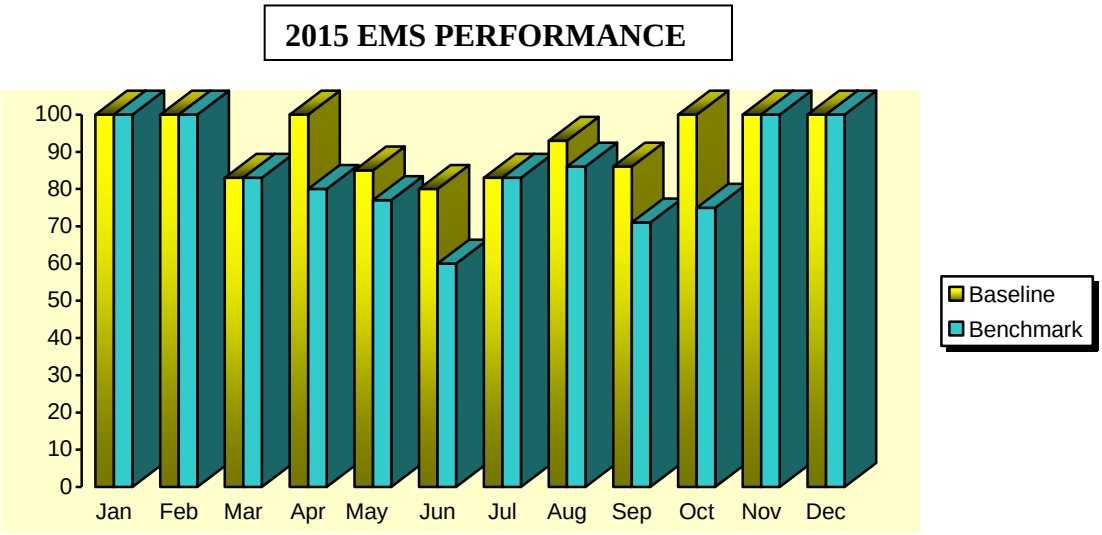
For 90% of all EMS incidents, the transport unit (BLS with AED or ALS Capability) will arrive within 12 minutes ART.

Benchmark EMS Response Objectives

For all priority EMS incidents, a basic life support force with AED capabilities or an ALS medic unit will arrive within 6 ½ minutes ART.

EMS Performance

The department met our baseline, but slightly missed the benchmark Standard of Cover response objectives for ART. For 2015 91% of baseline EMS incidents, a basic life support force with AED capabilities or an ALS medic unit arrived within 7 minutes ART and for 100% of all EMS Incidents; the transport unit (BLS with AED or ALS Capability) arrived within 12 minutes ART. For 2015 83% benchmark EMS incidents, an ALS medic unit arrived within 6 1/2 minutes ART.



Baseline Hazardous Material/CBRNE Response Objectives

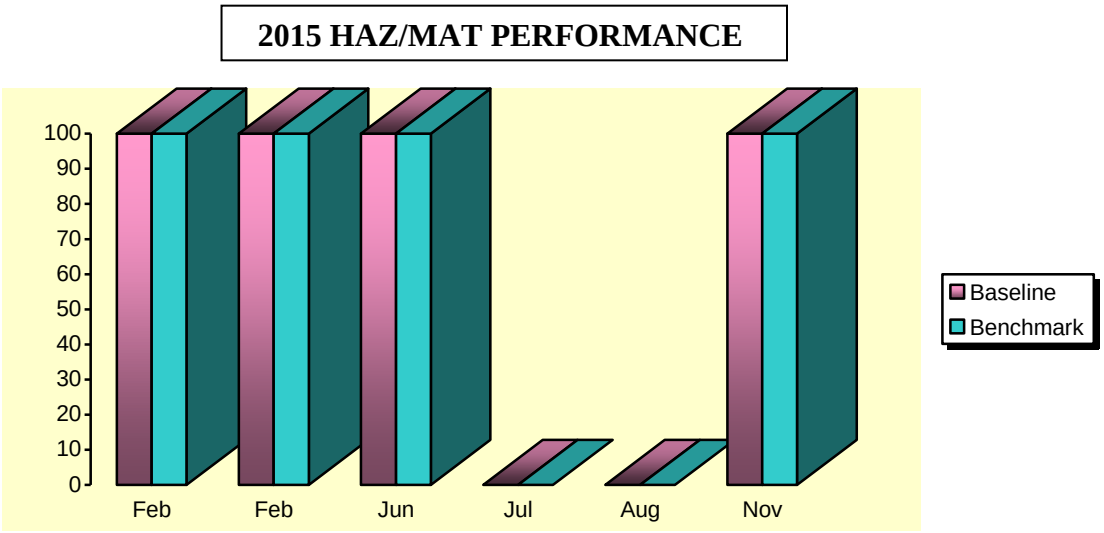
For 90% of all potential hazardous material incidents, the first due apparatus arrives within 7 minutes ART. For 90% of hazardous material incidents, the initial full alarm assignments arrive within 22 minutes ART.

Benchmark Hazardous Material/CBRNE Response Objectives

For 90% of hazardous material incidents, the first due apparatus arrives within 6 ½ minutes ART.

Hazardous Material/CBRNE Performance

The department met our stated baseline and benchmark Standard of Cover response objectives. For 2015 67% of baseline potential hazardous incidents, the first due apparatus arrived within 7 minutes ART. There were none hazardous material incidents, the initial full alarm assignment arrived within 22 minutes ART. For 2015 67% of benchmark potential hazardous material incidents, the first due apparatus arrived within 6 ½ minutes ART.



Baseline Technical Rescue Response Objective(s)

For 90% of all technical rescue incidents, the first due apparatus arrives within 7 minutes ART.

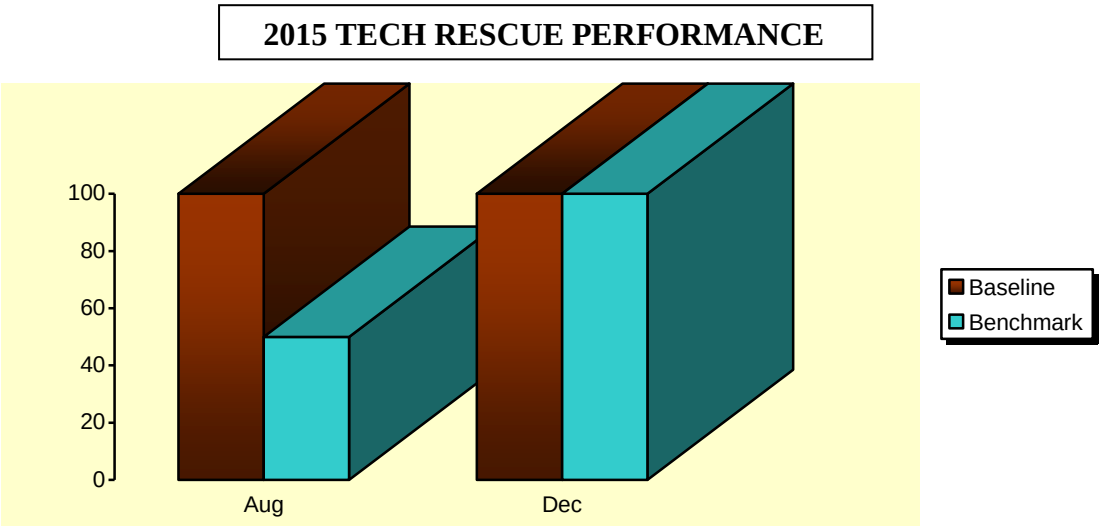
For 90% of all technical rescue incidents, the initial full alarm assignment arrives within 22 minutes ART.

Benchmark Technical Rescue Response Objective(s)

For technical rescue incidents, the first due apparatus arrives within 6 ½ minutes ART.

Technical Rescue Performance

The department met our stated baseline and benchmark Standard of Cover response objectives. For 2015 100% of baseline technical rescue incidents, the first due apparatus arrived within 7 minutes ART. There was one technical rescue incidents, the initial full alarm assignment arrived within 22 minutes ART. For 2015 67% of benchmark technical rescue incidents, the first due apparatus arrived within 6 ½ minutes ART.



Overall Evaluation

Our department met each element in our standard of cover for each of the services we provide to our community. A recurring analysis is conducted and our performance is published monthly to our governing body to present an accurate report of our capabilities. Additional stakeholders are also included in the marketing of our performance to ensure consistent and visible delivery of emergency response.

Appendix G. Fire Weather Data and BEHAVE Outputs

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FIRE WEATHER DATA

Fire weather records were downloaded from the National Wildfire Coordination Group and were loaded into FireFamily Plus software for processing. Data were collected from the Opal Mountain weather station, with data covering the years 1991 to 2015, and the Mojave River Sink weather station, with data from 1988 to 2014 (Table G-1).

Table G-1. Model Results

Attribute	Opal Mountain	Mojave River Sink
Wind Speed (20 feet)	20	14
Maximum Relative Humidity (percent)	69	64
Minimum Relative Humidity (percent)	20	20
Mean Relative Humidity (percent)	43	41
Lowest Relative Humidity (percent)	1	1
Maximum Temperature (°F)	102	114
Minimum Temperature (°F)	75	81
Mean Temperature (°F)	88	97
Dry Blub at 1,300 hours (°F)	92	101
1-Hour Fuel Moisture (percent)	1	1
Herb Fuel Moisture (percent)	1	1
Woody Fuel Moisture (percent)	50	50
Burn Index	121	61
Spread Index	140	193
Energy Release Component	26	4

°F – degrees Fahrenheit

Data were input and processed using FireFamily Plus, and the percentile weather was calculated using the Burn Index, which is a function of both the energy release component and the spread component. Values were extracted from the “high” category, 90th percentile, to avoid overestimation, and the fuel moisture values were used for analysis in Behave Plus version 5.0.5 (Figure G-1). The inputs for fuel moistures were derived from the averaged Burn Index values from both Opal Mountain and Mojave River Sink.

Fuel models GR1 and SH5 were used, representing sparse, dry grassland, and stands or clusters of *Tamarix ramosissima*, respectively. The SH5 model results illustrate an escaped fire situation, but due to the isolated distributions of the fuels the spread would be limited to the extent of the fuel source, except in the cases where additional fuels were in close proximity and subject to ignition from the flaming front or within spotting distance.

Figure G-1. BEHAVE Plus Data

BehavePlus 5.0.5 (Build 307)

Barstow Fire Behavior combined
Wed, Aug 24, 2016 at 15:55:32

Input Worksheet

Inputs: SURFACE, CONTAIN

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		gr1, sh1, sh5
Fuel Moisture		
1-h Moisture	%	1.75
10-h Moisture	%	2.23
100-h Moisture	%	4.1
Live Herbaceous Moisture	%	50
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	10.2
Terrain		
Slope Steepness	%	20
Fire		
Fire Size at Report	ac	.1
Suppression		
Suppression Tactic		Head
Line Construction Offset	ch	0
Resource Name		E1,E2,E3,E4
Resource Line Production Rate	ch/h	24,24,24,24
Resource Arrival Time	h	.2,.2,.4,.4
Resource Duration	h	.5,.5,1,1
Notes		

Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Results

Fuel Model	ROS (max)	Flame Length	Area at Attack	Perimeter at Attack	Contain Status	Time from Report	Contain Area	Fireline Constructed	Res Used
	ch/h	ft	ac	ch		h	ac	ch	
gr1	33.9	3.1	2.5	20.5	Contained	1.0	13.2	43.9	4
sh1	51.6	7.1	3.5	27.5	Escaped	0.4	-1.0	0.0	2
sh5	268.2	31.7	70.6	123.4	Escaped	0.4	-1.0	0.0	2

% - percent; **mi** – miles; **h** – hour(s); **ac** – acre(s); **ch** – chain (66 feet); **ROS** – rate of spread; **Res** - resources

Appendix H. MCLB Barstow Fire Investigation Plan

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Criterion 5D - Fire Investigation Program

There is an adequate, effective and efficient program directed toward identification of the causes and origins of fire, explosions, and other emergency situations that endanger life or property.

Summary

All fires on MCLB are investigated although our department does not maintain a full-time staffed position for fire investigation. The incident commander is responsible to initiate the on-the-spot investigation and requests the support from the Chief Inspector as needed. Additional agencies within the USMC and mutual agreements allow us to utilize subject matter experts to assist with all investigations if the need arises.

PERFORMANCE INDICATER - 5D.1 CC

The agency fire investigation program is authorized by adopted statute, code, or ordinance.

Description

The Fire Investigation Program is authorized and adopted statute in the Marine Corps Order 11000.11, *Fire Protection and Emergency Services Program, Chapter 7, Fire Investigation.* It states all fires shall be investigated by emergency services to determine probable cause. Fires which may involve criminal activity will be reported promptly to the Naval Criminal Investigation Service (NCIS). Fires involving loss of life, multiple serious injuries, property damage, failure of fire protection systems, fire bombing, etc, shall be reported to HQMC.

Management Instruction 6.2, *Fire Investigation* is the MCLB Barstow Fire & Emergency Services policy that outlines the fire investigation program.

Appraisal

The system in place is effective in meeting this competency; it is mandated from Marine Corps Order 11000.11.

Plan

Continue to utilize the adopted Marine Corps Order 11000.11, and update Management Instruction 6.2, *Fire Investigation* annually or as needed.

Reference

Marine Corps Order 11000.11, *Fire Protection and Emergency Services Program, Chapter 7, Fire Investigation*

Management Instruction 6.2, *Fire Investigation*

PERFORMANCE INDICATOR - 5D.2 CC

The scientific method (or an equivalent) is utilized to investigate and determine the cause and origin of all significant fires and explosions.

Description

All fires on MCLB Barstow are investigated in accordance with guidance outlined in Marine Corps Order 11000.11, *Marine Corps Fire Protection and Emergency Services Program* and Management Instruction 6.2. At MCLBB, our fire department provides technical expertise during the initial investigation and requests assistance from the Base's Criminal Investigation Division (CID) Office, and/or the Naval Criminal Investigative Services, NCIS (if suspicious or criminal related): or San Bernardino County Fire Department through mutual aid to conduct technical fire investigations.

Our fire department is responsible for initiating fire investigations and seeking assistance from outside agencies to conduct technical fire investigations if needed. The Incident Commander will initiate the on-the-spot investigation, and request the support from the Chief Inspector as needed.

Appraisal

The process we have in place is sound. The investigation experts from the installation and surrounding community are well trained and eager to assist us during the rare occasions that we require their assistance.

Plan

Continue to utilize published guidance to conduct fire investigations on MCLB Barstow. Additionally, seek assistance from the Base CID Office, NCIS, and initiate our mutual aid agreement with San Bernardino County Fire Department to assist on technical fire investigations if needed.

References

MCO 11000.11, *Marine Corps Fire Protection and Emergency Services Program*

Management Instruction 6.2, *Fire Investigation*

Mutual Aid Agreement, *San Bernardino County Fire Department*

PERFORMANCE INDICATOR - 5D.3 CC

The program has adequate staff with specific expertise, training, and credentials to accomplish the program goals and objectives.

Description

MCLB Barstow Fire & Emergency Services does not maintain a full-time staff position for fire investigation. The incident commander is responsible to initiate the on-the-spot investigation and requests the support from the Chief Inspector as needed. If a technical fire investigation is required, assistance will be acquired from outside agencies if required.

Appraisal

Although we rarely have fires on the installation that require a formal investigation, the staffing method is very effective. For example, the Base has not had a reportable fire loss since 1996. Currently all of the Fire Prevention Branch personnel are limited in technical fire investigation. Outside agencies to include the San Bernardino County Fire Department personnel are highly qualified to perform formal investigations as required.

Plan

Continue to perform initial fire investigations and seek assistance from San Bernardino County Fire Department to assist on technical fire investigations. If the demand for formal investigations increases, we will consider a full-time investigator and request executive steering committee to fund the position.

References

Management Instruction 6.2, *Fire Investigation*

Mutual Aid Agreement, *San Bernardino County Fire Department*

PERFORMANCE INDICATOR - 5D.4

The agency defines and provides appropriate and adequate equipment, supplies, and materials to meet the fire investigation program needs.

Description

The MCLB Barstow Fire & Emergency Services has a basic fire investigation kit to help conduct initial investigations of fire incidents. In the event a technical fire investigation is needed, NCIS will be requested initially, and then outside agencies such as San Bernardino County Fire Department will be called in. The NCIS maintains a kit dedicated for Fire Investigation Incidents and meets the requirements of NFPA Standard 921, *Conducting Fire Investigations*, Section 12.4.1. It contains items necessary to secure items for testing, photos, and evidence.

Appraisal

Although we rarely have fires on base that require a formal investigation, the process we have in place works well. Experts from the federal agencies and surrounding community are well trained and equipped to assist us if we require their assistance.

Plan

We will continue to perform initial fire investigations, and seek assistance from the San Bernardino County Fire Department and outside federal agencies as needed. In addition we will seek funding for the National Fire Academy Fire/Arson Investigation course for Fire Prevention personnel. As additional courses are needed, funding will be requested to continue to improve our program for Fire Investigation.

References

Management Instruction 6.2, *Fire Investigation*
Mutual Aid Agreement, *San Bernardino County Fire Department*
NFPA Standard 921, *Conducting Fire Investigations*

PERFORMANCE INDICATOR - 5D.5

The agency establishes agreement and support from other agencies to aid the agency in accomplishing its goals and objectives.

Description

Fire investigations are the responsibility of the MCLB Barstow Fire & Emergency Services, in accordance with MCO 11000.11, *Marine Corps Fire Protection and Emergency Services Program*. The Base CID Office, NCIS, and other federal agencies are responsible to conduct investigations on all fires that are suspected of arson. Additionally, our department has a mutual aid agreement with the San Bernardino County Fire Department for assisting with fire investigations.

Other agencies that assist during fire investigations include:
Base Photographer – Available 24 hours a day to provide physical photo evidence taken in photographic sequence
MCLB Barstow Police Department – Provide scene security on any fires believed to be arson in nature and to protect potential evidence
San Bernardino County Fire Department – Technical fire investigation assistance
Explosive Ordnance Disposal at Ft. Irwin – Provides assistance with explosive devices

Appraisal

Although we rarely have fires that require a formal investigation, the support we receive from other agencies is fantastic. Experts from the base and surrounding community are well trained and eager to assist us during the rare occasions that we require their assistance.

Plan

Continue to perform initial fire investigations and seek assistance from the Base CID Office, NCIS, other federal agencies, and San Bernardino County Fire Department to assist on technical fire investigations. Review and update Mutual Aid Agreements every three years or as needed.

References

Management Instruction 6.2, *Fire Investigation*

Mutual Aid Agreements

PERFORMANCE INDICATOR - 5D.6 CC

Current standard operating procedures/general operating guidelines are in place to direct the fire cause and investigation program.

Description

All fires on base are investigated in accordance with guidance outlined in MCO 11000.11 *Marine Corps Fire Protection and Emergency Services Program*. MCLB Barstow Fire & Emergency Services Management Instruction 6.1, *Fire Prevention Program* and Management Instruction 6.2, *Fire Investigation Program,* detail specific procedures for the Prevention and Investigation Programs.

Appraisal

We rarely have fires on base that require a formal investigation; however, the process we have in place is sound. Our instructions provide clear guidance on conducting fire investigations.

Plan

Continue to perform initial fire investigations and seek assistance from the Base CID Office, NCIS and San Bernardino County Fire Department to assist on technical fire investigations.

References

MCO 11000.11, *Marine Corps Fire Protection and Emergency Services Program*
Management Instruction 6.1, *Fire Prevention Program*
Management Instruction 6.2, *Fire Investigation Program*

PERFORMANCE INDICATOR - 5D.7

The agency information system allows for documentation and analysis of the fire investigation programs.

Description

Our department uses the National Fire Incident Reporting System (NFIRS) for reporting and tracking all fire incidents. All investigation data is forwarded to the Federal Emergency Management Agency. We also maintain a separate record of all emergency incidents which includes fire loss data and fire investigation activities. All data is locally available for analysis, we currently utilize Emergency Reporting Records Management data base. The documentation and analysis of fire investigation activities is a function of the Prevention Division, in accordance with MCO 11000.11 *Marine Corps Fire Protection and Emergency Services Program.* In the cases where we activate our mutual aid agreement with San Bernardino County Fire Department or NCIS, they document their findings and forward them to the MCLB Barstow Fire & Emergency Services Chief Inspector. In addition, a detailed report is completed for every fire incident and allows an opportunity for analysis of fire cause and associated program performance.

Appraisal

Our information system is comprehensive and is an accurate method for documenting fire loss information. Forwarding our fire investigation information ensures our data is considered when analyzing national trends.

Plan

Continue to provide information for analysis and distribution of data to fire departments throughout the Department of Defense.

References

MCO 11000.11 *Marine Corps Fire Protection and Emergency Services Program*

Emergency Reporting System, *Fire Incident Report*

Management Instruction 6.2, *Fire Investigation*

Mutual Aid Agreements

PERFORMANCE INDICATOR - 5D.8 CC

An appraisal is conducted at least annually, to determine the effectiveness of the fire investigation program.

Description

Since the fire loss on base is extremely low compared to the civilian sector, it is a rare occasion when a need for formal fire investigation is needed. The USMC Fire and Emergency Services do not staff positions for Fire Investigations, however, the effectiveness of the local Base CID Office and the Naval Criminal Investigative Services (NCIS) office is the system the USMC has in place in addressing fire investigations. Due to the remoteness of MCLB Barstow, we are primarily limited to the local County Fire Department for effective non-criminal in-depth fire investigations. An annual appraisal of the Fire Investigation program is completed by the Chief Inspector.

Appraisal

Our internal Management Instruction 6.2, Fire Investigation is reviewed annually; we anticipate no changes in the need for outside trained and certified fire investigators. Department of the Navy, has assigned this responsibility to the NCIS to conduct and coordinate formal fire investigations. Our limitations are known by Head Quarters Marine Corps, (HQMC).

Plan

Continue to review and modify our Management Instruction as changes occur to the Department of the Navy regulations in regards to conducting formal fire investigations. Adjust our Fire Investigation program as changes to our foundation documents are modified or specific direction from HQMC Fire and Emergency Services Program Manager

References

Management Instruction 6.2 *Fire Investigation Program*

Annual Appraisal, *Fire Investigation Program*

NFPA Standard 921, *Conducting Fire Investigations*

Appendix G. Environmental Assessment

FORMAT PAGE

FINDING OF NO SIGNIFICANT IMPACT
REVISION OF THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA
APRIL 2017

Pursuant to the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code§§ 4321-4370h); Department of the Navy (DoN) procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order P5090.2A, Change 3, dated 26 August 2013, *Environmental Compliance and Protection Manual,* the DoN gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) will not be prepared for the proposed implementation of the Revised Integrated Natural Resources Management Plan (INRMP) for the Marine Corps Logistics Base (MCLB) Barstow, California.

Purpose and Need: The Revised INRMP provides an updated long-term strategy to coordinate all natural resources management activities of MCLB Barstow and allows for sustainable multipurpose use of the resources. The Revised INRMP's objectives are to manage natural resources and military use so there is no net loss of the MCLB Barstow's ability to support its military purposes in a manner consistent with Department of Defense (DoD) ecosystem management principles. Further, management prescribed by the revised INRMP benefits threatened and endangered species on MCLB Barstow consistent with federal and state recovery actions for these species under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531, *et seq.*).

Description of the Proposed Action: The Proposed Action is the implementation of the Revised INRMP. This plans reflects MCLB Barstow's commitment to conserve, protect, and enhance the Base's natural resources in a manner that supports and enhances realistic military training. The primary objective of the plan is to provide a proactive natural resources management tool that allows MCLB Barstow to achieve its resource management goals, mission requirements, and compliance with environmental regulations and policies.

Alternatives Considered: Two alternatives, the Preferred Alternative and a No Action Alternative, were evaluated for their potential direct, indirect, and cumulative impacts on the human environment.

The Preferred Alternative (Proposed Action) would involve the full implementation of the INRMP, as required by law. This alternative would meet regulatory requirements, and provide information, guidance, and standard operating procedures to MCLB Barstow's staff and tenant and transient organizations to ensure the successful management and protection of the Base's natural resources.

The No Action Alternative is required under the CEQ regulations that implement the NEPA process and serves as a baseline or benchmark to compare to the Proposed Action and alternatives. Under the No Action Alternative, the Revised INRMP for MCLB Barstow would not be implemented, and management activities currently being conducted under the 2011 INRMP would continue. While this alternative would meet most regulatory requirements and provide guidance and standard operating procedures to MCLB Barstow staff, it would provide less information and fewer benefits to MCLB Barstow's natural resources.

Anticipated Environmental Effects: The EA analyzed the environmental impacts that would potentially result from implementation of the Proposed Action and Alternatives. An initial impact evaluation found that the extent of potential impacts to the majority of resources was not measurable

or was negligible or clearly less than significant and are therefore not addressed further. Those resources include: land use; geology, topography, and soils; hydrology and water resources; air quality; cultural resources; noise; visual resources; socioeconomics; transportation and circulation; utilities; hazardous materials and waste; and human health and safety. Biological resources were analyzed in depth within the EA.

Based on information gathered and presented in the EA, it has been determined that implementation of the Proposed Action as the Preferred Alternative, or the No Action Alternative would have no significant direct, indirect, or cumulative adverse impacts on the environment. Adverse impacts associated with implementing the Proposed Action would be minor in context and intensity, and most would be temporary. Long-term, beneficial impacts would be expected as a result of many of the natural resources management activities in the Revised INRMP. Consequently, the overall environmental effect of implementing the Proposed Action is anticipated to be less than significant and beneficial.

Agency Coordination and Public Involvement: Both the USFWS and the CDFW were invited to review and comment on an early draft of the Revised INRMP and EA. Other agencies and the public were asked to review and comment on both the November 2016 Draft Revised INRMP and Draft EA during the 30-day public review process.

Public and Agency Comments: The November 2016 Draft Revised INRMP, Draft EA and a draft copy of this Finding of No Significant Impact (FONSI) were made available to the general public and applicable government agencies for review and comment during a 30-day period that commenced with the publication of a Notice of Availability in the *Desert Dispatch* and *Daily Press* newspapers on 3, 4 and 5 February 2017. Copies of the November 2016 Draft Revised INRMP, Draft EA, and Draft FONSI along with instructions for submitting comments were made available at the Barstow Branch Library and online at http://www.mclbbarstow.marines.mil.

No comments were received during the 30-day public review period.

Findings: Based on the analysis contained in the EA, I have selected implementation of the Proposed Action, the DoN's Preferred Alternative, and find that it will have no significant impact on the human environment. This FONSI is based on the attached EA which has been independently evaluated by the DoN, and determined to adequately and accurately discuss the purpose and need, the alternatives, environmental issues, and impacts of the Proposed Action. Consequently, implementation of the Proposed Action does not require the preparation of an Environmental Impact Statement.

Approved By:

_____ _____

COLONEL SEKOU S. KAREGA Date
Commanding Officer
Marine Corps Logistics Base
Barstow, California

ENVIRONMENTAL ASSESSMENT

REVISION OF THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN, MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA

Prepared for:

Marine Corps Logistics Base
Barstow, California

Naval Facilities Command
Southwest, San Diego,
California

Prepared by:

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Phoenix, Arizona 85016

April 2017

ENVIRONMENTAL ASSESSMENT
REVISION OF THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA

Lead Agency for the EA: United States Department of the Navy

Title of Proposed Action: Revision of the Integrated Natural Resources Management Plan, Marine Corps Logistics Base Barstow, California

Location of the Proposed Action: State of California, San Bernardino County

Document Type: Environmental Assessment

Abstract

This Environmental Assessment has been prepared by the United States Department of the Navy in accordance with the National Environmental Policy Act of 1969, the Council on Environmental Quality implementing regulations set forth in 40 Code of Federal Regulations Parts 1500-1508; Marine Corps Order P5090.2A with changes 1-3*, Environmental Compliance and Protection Manual,* Chapter 12; and other applicable laws. The Proposed Action is the implementation of the Revised Integrated Natural Resources Management Plan (INRMP) for the Marine Corps Logistics Base Barstow (MCLB Barstow), which is located in San Bernardino County in California.

This Environmental Assessment describes the potential environmental consequences resulting from the Proposed Action (Alternative 1 – Implementation of the Revised INRMP) and the No Action Alternative (Alternative 2) in the following resource areas: land use; topography, geology, and soils; hydrology and water resources; biological resources; cultural resources; air quality; noise; visual resources; socioeconomics; transportation and circulation; utilities; hazardous materials and wastes; and health and human safety.

Prepared by: United States Department of the Navy

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April 2017

FORMAT PAGE

EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared by the United States Department of the Navy (DoN) in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality implementing regulations set forth in 40 Code of Federal Regulations Parts 1500-1508; Marine Corps Order P5090.2A with changes 1-3*, Environmental Compliance and Protection Manual,* Chapter 12; and other applicable laws.

The Proposed Action is implementation of the Revised Integrated Natural Resources Management Plan (INRMP) for the Marine Corps Logistics Base Barstow (MCLB Barstow), which is located in San Bernardino County in California. A revision to the 2011 INRMP was required under the Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, *et seq.*), which mandates the Secretary of the Navy to update the INRMPs of each Installation every five years when and if environmental conditions change, or if programs for the management of individual resources are proposed to change.

MCLB Barstow is responsible for providing and maintaining the range conditions needed for the military training mission at MCLB Barstow, as well as managing and protecting natural resources in accordance with the Sikes Act (16 United States Code 670a-f, as amended) and Marine Corps Order P5090.2A with changes 1-3*,* Chapter 12.

Two alternatives are analyzed in this EA, the Proposed Action (which is the Preferred Alternative implementing the Revised INRMP), and the No Action Alternative.

Alternative 1 – Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for MCLB Barstow

The Proposed Action would adopt the Revised INRMP, which updates the program and project priorities for MCLB Barstow and integrates new conservation measures outlined in the EA for training and Rifle Range activities (MCLB Barstow 2016). The Proposed Action includes the natural resource management programs and action steps (including projects) for MCLB Barstow that are listed in the Revised INRMP.

This EA is partially “tiered” to the 2016 EA for Range and Training Activities (MCLB Barstow 2016) which considered in-depth, those actions and activities associated with proposed new range and training activities at MCLB Barstow. In accordance with 40 CFR 1508.28, it has been determined that the conditions and environmental effects described in the 2016 Range and Training EA (MCLB Barstow 2016) remain valid and are incorporated herein by reference where applicable. No new or further evaluation of the environmental effects associated with those previously identified proposed new range and training activities (and evaluated under the 2016 Range and Training EA) are included in this EA. This EA only evaluates the environmental effects associated with those actions and activities associated with the implementation of the Revised INRMP, exclusive (as explained above) of effects associated with previously documented, and evaluated, proposed new range or training activities.

Alternative 2 – No Action Alternative: Retain the 2011 INRMP with No Changes

The NEPA process requires the consideration of a No Action Alternative. This alternative serves as a baseline or benchmark for comparison to the Proposed Action. Under the No Action Alternative, the Revised INRMP would not be implemented, and natural resource management activities on the Base would continue under the 2011 INRMP guidance. This alternative would fail to meet the legal requirements of the Navy as set out by the Sikes Act and would provide less information and fewer benefits to the conservation and protection of MCLB Barstow's natural resources.

Table ES-1 summarizes the potential impacts from both alternatives.

Table ES-1. Summary of Potential Impacts by Alternative

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Land Use	No impacts to land use are expected from the implementation of the Proposed Action. Programs and projects proposed in the Revised INRMP would not change land use at MCLB Barstow and would not result in any new land use incompatibilities. Proposed natural resources management projects would benefit current land use by improving the quality of the training environment.	No impacts to land use are expected from the implementation of the No Action Alternative.
Topography, Geology, and Soils	No significant impacts to topography or geology are expected from the implementation of the Proposed Action. Incidental and minimal impacts to soils may occur due to natural resource surveys and invasive species management. Soil conditions may benefit from the establishment of a monitoring framework for erosion and other soil-related impacts.	No significant impacts to topography or geology are expected from the implementation of the No Action Alternative. Incidental and minimal impacts to soils may occur due to natural resource surveys similar to the Proposed Action.
Hydrology and Water Resources	No impacts to hydrological or water resources are expected from the implementation of the Proposed Action. The minimal locations for open water that exist at MCLB Barstow will not be impacted nor polluted by the proposed projects. The Mojave River would benefit through the removal of invasive plants and reduction in soil erosion.	No impacts to hydrological or water resources are expected from the implementation of the No Action Alternative.

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Biological Resources	The Revised INRMP would have moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of enhanced monitoring and surveying of biological resources. Restoration and maintenance of native habitats would aid in the recovery of listed species and the continued functioning of ecosystems. Long-term benefits to all biological resources would occur through proactive natural resource management, including those required for desert tortoise by the applicable BO.	The 2011 INRMP has moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of monitoring and surveying of biological resources. Long-term benefits to biological resources would occur through proactive natural resource management.
Cultural Resources	No significant impacts to cultural resources are expected from the implementation of the Proposed Action. Incidental and minimal impacts to cultural resources may occur due to natural resource surveys. Cultural resources would benefit from the protection given to wildlife habitat where cultural resources may exist.	No significant impacts to cultural resource are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.
Air Quality	No significant impacts to air quality are expected from the implementation of the Proposed Action. Some activities would result in minor increases in emissions such as fugitive dust and vehicle and equipment exhaust. Equipment usages associated with INRMP implementation projects are not known at this time. Proposed emissions would be significantly below the *de minimis* thresholds for the Mojave Desert Air Basin (western portion of San Bernardino county), which are 25 tons per year for volatile organic compounds and NO_x and 100 tons per year for PM_{10}. Pesticide application would result in minor, temporary impacts to air quality. Overall, impacts would be less than significant and would not contribute significant emissions to local or regional air quality.	No significant impacts to air quality are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Noise	No significant impacts from noise are expected from the implementation of the Proposed Action. Minor, infrequent noise increases would be associated with the project vehicles needed to access the range for natural resource surveys and other wildlife or range management activities.	No significant impacts from noise are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.
Visual Resources	No impacts to visual resources would result from the implementation of the Proposed Action. None of the proposed projects would impact visual resources.	No impacts to visual resources would result from the implementation of the No Action Alternative.
Socioeconomics	No impacts to socioeconomics are expected from the implementation of the Proposed Action. The implementation of the Revised INRMP would not affect nearby residents, and the implementation of the Proposed Action would have no significant impacts on the local economy.	No impacts to socioeconomics would result from the implementation of the No Action Alternative.
Transportation and Circulation	No significant impacts to transportation and circulation are expected from the implementation of the Proposed Action. Minor, short-term increase in traffic would occur during the implementation of natural resource surveys, but this would not result in any significant impacts.	No significant impacts to transportation and circulation are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.
Utilities	No impacts to utilities are expected from the implementation of the Proposed Action. The Proposed Action would not create any new utilities on the Base nor would it impact the existing infrastructure.	No impacts to utilities are expected from the implementation of the No Action Alternative.
Hazardous Materials and Wastes	No significant impacts from the use or storage of hazardous materials and waste are expected from the implementation of the Proposed Action. Pesticides may be used to manage nonnative and invasive plant species. Fire suppressants may be used to mitigate fire danger following a Wildland Fire Management Plan. All use of pesticide and fire suppressants would be minor and infrequent and would follow all regulations and guidelines.	No significant impacts from the use or storage of hazardous materials and waste are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Health and Human Safety	No significant impacts to human health or safety are expected from the implementation of the Proposed Action. All personnel associated with the implementation of the Proposed Action would be required to comply with applicable health and safety regulations.	No significant impacts to human health or safety are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.

INRMP – Integrated Natural Resources Management Plan; **MCLB Barstow** – Marine Corps Logistics Base Barstow; **BO** – Biological Opinion; **NO_x** – nitrogen oxides; **PM_{10}** – particulate matter less than 10 microns in diameter

Conclusion and Recommendation

Based on the detailed analysis contained herein, it is the conclusion of this EA that neither alternative would constitute a major federal action with significant impact on human health or the environment.

It is recommended that a Finding of No Significant Impact for the Proposed Action be signed to complete the process of analysis under NEPA.

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LIST OF ACRONYMS AND ABBREVIATIONS

BASH	Bird Aircraft Strike Hazard
BEAP	Base Exterior Architecture Plan
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BO	Biological Opinion
Cal-PIF	California Partners in Flight
CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Commanding Officer
DoD	Department of Defense
DoN	Department of the Navy
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning System
I-40	Interstate 40
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
JWoUS	Jurisdictional Waters of the United States
KD	Known Distance

LZ	Landing Zone
LHA	Landing Helicopter Assault
LHD	Landing Helicopter Dock
MBTA	Migratory Bird Treaty Act
MCLB	Marine Corps Logistics Base
MILCON	Military Construction Program
MOU	Memorandum of Understanding
Nebo	Nebo Main Base
NEPA	National Environmental Policy Act
NI	No Impact
NO_x	Nitrogen Oxides
NPS	Nonpoint Source
NRI	National Resources Inventory
NSI	No Significant Impact
PM_{10}	Particulate Matter Less than 10 Microns in Diameter
POAM	Projects, Objectives, Actions, and Milestones
ROI	Region of Influence
sf	Square Feet
T&E	Threatened and Endangered
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps

1.0 PURPOSE AND NEED

1.1 Introduction

Established in 1942 and fully responsible as of 1958 for all United States Marine Corps (USMC) logistics west of the Mississippi River, Marine Corps Logistics Base (MCLB) Barstow is of vital importance to the USMC. As one of only two logistics bases operated by the USMC, MCLB Barstow serves an important role as a major West Coast Marine Corps Logistics and Maintenance Center (Figure 1-1). Its primary mission is twofold: (1) to procure, maintain, store, and issue all classes of supplies and equipment and (2) to repair and rebuild USMC-owned and other Department of Defense (DoD) equipment. MCLB Barstow furnishes supplies for USMC facilities worldwide and is a direct support provider for all installations. MCLB Barstow is also responsible for the technical training of Marines, developing and maintaining their skills and job efficiency. In addition, MCLB Barstow is currently reviewing the possibility of increasing range and training activities on the Base. Thus, the necessity of keeping MCLB Barstow fully in service can best be understood from two main perspectives: (1) the necessity of maintaining a vital and crucial logistics Base for the USMC and the training this logistics center provides and (2) the superlative qualities of MCLB Barstow for supporting the increase in training currently proposed to take place at the Rifle Range.

This Environmental Assessment (EA) has been prepared by the Department of the Navy (DoN) in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) implementing regulations set forth in 40 Code of Federal Regulations (CFR) Parts 1500-1508; Marine Corps Order P5090.2A with changes 1-3*, Environmental Compliance and Protection Manual,* Chapter 12; and other applicable laws. The Proposed Action is the implementation of the Revised Integrated Natural Resources Management Plan (INRMP) for MCLB Barstow.

The Commanding Officer (CO) of MCLB Barstow is responsible for providing and maintaining the logistics center and the range conditions needed for the military training mission at MCLB Barstow, as well as managing and protecting natural resources in accordance with the Sikes Act (16 U.S.C. 670a-f, as amended), and Marine Corps Order P5090.2A with changes 1-3*,* Chapter 12 (USMC 2013).

1.2 Purpose and Need for Action

The purpose of the MCLB Barstow INRMP is to ensure that natural resource conservation measures and military operations on the Base are integrated and consistent with applicable environmental stewardship and legal requirements. The INRMP was written to assist the CO of MCLB Barstow in providing effective management of natural resources to ensure that MCLB Barstow land remains available and in good condition to support the Base's military mission. The Revised INRMP would build on and supersede the 2011 MCLB Barstow INRMP and set the agenda for managing MCLB Barstow's natural resources from 2017 through 2021.

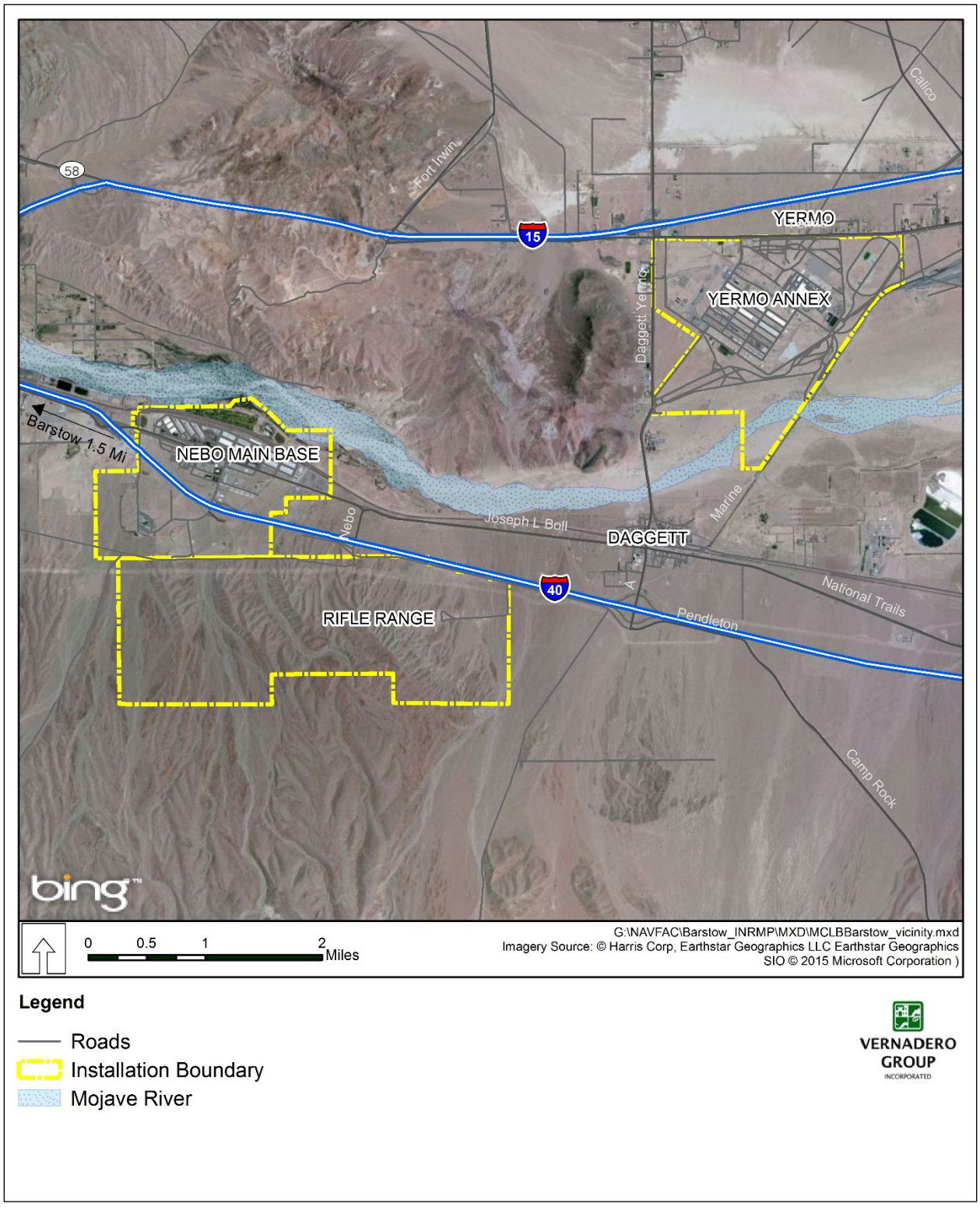

Figure 1-1. Administrative Jurisdiction and Range Boundary of MCLB Barstow

1.3 Summary of Key Environmental Compliance Requirements

1.3.1 National Environmental Policy Act

NEPA (42 U.S.C. 4321–4370h) is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed major federal actions before those actions are taken. NEPA established the CEQ, which was charged with the development of implementing regulations and ensuring federal agency compliance with NEPA. The process for implementing NEPA is codified in 40 CFR 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (CEQ regulations).

The USMC implements NEPA through (32 CFR 775, *Procedures for Implementing the National Environmental Policy Act*, and Marine Corps Order P5090.2A with changes 1-3 (USMC 2013).

1.3.2 Integration of Other Environmental Statutes and Regulations

According to CEQ and USMC regulations, NEPA requirements must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively" (40 CFR 1500.2). The NEPA process does not replace procedural or substantive requirements of other environmental statutes and regulations; it addresses them collectively in the form of an EA or Environmental Impact Statement (EIS), which enables the decision maker to have a comprehensive view of the key environmental issues and requirements associated with a proposed action and its alternatives.

1.4 Scope of Review

This EA is partially "tiered" to the 2016 EA for Range and Training Activities (MCLB Barstow 2016), which considered in-depth, those actions and activities associated with proposed new range and training activities at MCLB Barstow. In accordance with 40 CFR 1508.28, it has been determined that the conditions and environmental effects described in the 2016 Range and Training EA (MCLB Barstow 2016) remain valid and are incorporated herein by reference where applicable. No new or further evaluation of the environmental effects associated with those previously identified proposed new range and training activities (and evaluated under the 2016 Range and Training EA) are included in this EA. This EA only evaluates the environmental effects associated with those actions and activities associated with the implementation of the Revised INRMP, exclusive (as explained above) of effects associated with previously documented, and evaluated, proposed new range or training activities.

1.5 Decision to Be Made

Local command for military operation and administration of MCLB Barstow is delegated by the Secretary of the Navy to the CO of MCLB Barstow. The decision to be made by the MCLB Barstow CO based on the analysis in this EA is whether or not an EIS needs to be prepared. An EIS would need to be prepared if the Proposed Action or another selected alternative is expected to have significant impacts on the human or natural environment. If an EIS is deemed unnecessary based on the alternative selected for implementation, this decision would be

documented in a Finding of No Significant Impact (FONSI) and signed by the CO of MCLB Barstow.

1.6 Public Participation Opportunities

In keeping with established USMC policy to provide a transparent and open decision-making process, MCLB Barstow will make this document available to applicable federal, state, and local agencies, stakeholders, and the general public for review and comment. Input from agency responses will be incorporated into the analysis of potential environmental impacts. Materials relating to agency or public involvement will be included in Appendix A as they become available.

A public notice was published in the *Desert Dispatch and Daily Press newspapers*. In addition, the Public Draft EA was made available for electronic viewing via the following website: http://www.mclbbarstow.marines.mil.

The Draft INRMP, Draft EA and Draft Finding of No Significant Impact (FONSI) were made available at the following public library location:

Barstow Branch Library
304 E. Buena Vista Street
Barstow, California 92311

Comments must have been postmarked within 30 days of the publishing date of the Notice of Availability to be considered part of the NEPA process. Comments were to be submitted to:

MCLB Barstow Environmental Division
Attn: Benjamin Cody Leslie
Marine Corps Logistics Base Barstow
Box 110570. B196, South Iwo Jima Ave
Barstow, CA 92311-5050

A final decision document in the form of a FONSI or a Notice of Intent to complete an EIS is to be issued following completion of the 30-day review period and will appropriately address comments received under this NEPA process.

1.7 Comments Received

There were no comments received during the 30-day review period.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section describes the Proposed Action and the No Action Alternative. The NEPA process evaluates the potential environmental consequences associated with a proposed action and considers all reasonably acceptable alternative courses of action. In addition, CEQ regulations specify the inclusion of a No Action Alternative against which potential impacts can be compared (the baseline). While the No Action Alternative would not satisfy the purpose or need for the Proposed Action, it is analyzed in accordance with CEQ regulations.

2.1 Alternative 1 – Proposed Action and Preferred Alternative

The Proposed Action is the implementation of the Revised INRMP for MCLB Barstow. The Revised INRMP reflects MCLB Barstow's continued commitment to conserve, protect, and enhance the Base's natural resources in a manner that supports and enhances realistic military training. The INRMP's primary objective is to provide a proactive natural resources management tool that allows MCLB Barstow to achieve resource management goals, mission requirements, and compliance with environmental regulations and policies. Proposed programs and projects (action steps) are outlined in Table 2-1.

Alternative 1 (Proposed Action) is the USMC's Preferred Alternative. This alternative would implement the Revised INRMP, meet regulatory requirements, and provide information, guidance, and standard operating procedures to the MCLB Barstow Environmental Division to ensure the successful management and protection of the MCLB Barstow's natural resources in support of the military mission.

Table 2-1. INRMP Programs and Projects

Program Area	Action Step	Frequency	Project Description
INRMP Implementation	4.1-1: Ensure POAM are conducted annually. Develop tasks, timelines, and cost estimates	Annual	INRMP implementation will provide for the sound management of natural resources.
	4.1-2: Develop an Annual Phasing Plan for POAM of this INRMP.	Annual	INRMP reviews will ensure that management goals and objectives are met and and/or reevaluated as needed.
	4.1-3: Program funding for INRMP annual reviews, as-needed updates and five-year revisions.	Annual	INRMP funding will ensure successful implementation of the Management Plan.
	4.1-4: Provide sufficient natural resource personnel and training to meet the needs of INRMP implementation.	Ongoing	This requires the training and placement of qualified staff.
NEPA Review	4.2-1: Perform Categorical Exclusion, EA, and/or EIS reviews to (1) identify the potential effects of the proposed action from a local and regional ecosystems management perspective; (2) identify less damaging alternatives; (3) identify other laws and regulations that may be applicable; (4) ensure that adequate mitigation is planned, if required; (5) assess the level of regulatory interface required; and (6) assess consistency with natural resources management goals, objectives, BOs, and conservation programs.	Ongoing	NEPA reviews will ensure that all potential impacts of proposed projects on natural resources are examined.
Federal ESA Compliance	4.3-1: Adhere to the conservation measures and relevant avoidance measures identified in current USFWS BOs.	Ongoing	This requires compliance with the detailed conservation measures prescribed within BOs.
	4.3-2: Manage federally T&E species and their habitats for their conservation and to prevent jeopardy to the species and adverse modification of their critical habitat.	Ongoing	MCLB Barstow should continue to actively participate in species recovery efforts by considering T&E species information in the planning and implementation of military activities, conducting population and density surveys, and performing habitat maintenance.
	4.3-3: Manage listed species and habitats in a manner that minimizes impacts to both the mission and species.	Ongoing	MCLB Barstow should continue to actively participate in species recovery efforts by considering T&E species information in the planning and implementation of military activities, conducting population and density surveys, and performing habitat maintenance.

Program Area	Action Step	Frequency	Project Description
	4.3-4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally T&E species and maintain and update these data.	Ongoing	This involves participating in research, workshops, training, interagency meetings, and literature reviews.
	4.3-5: Develop and maintain a robust GIS database to document the spatial and temporal distribution of listed species and update it as survey data become available.	Ongoing	A central database of field survey data and other geospatial data will be maintained.
	4.3-6: Anticipate the need to consult with USFWS under Section 7(a) of the ESA for any proposed actions on MCLB Barstow that may affect listed species.	Ongoing	MCLB Barstow will proactively prepare documentation specific to T&E species in advance of meetings with regulators.
Threatened or Endangered Species, and Critical Habitat	4.4-1: Maintain a database that tracks locations of desert tortoises found on base to assist in planning activities and apply new information from current research to MCLB Barstow's management goals through adaptive management	Once	This is recommended by the 2017 Range and Training BO.
	4.4-2: Assist the USFWS with its range-wide monitoring program within the Ord-Rodman Critical Habitat Unit, which lies adjacent to the Rifle Range.	Annual	The 2011 desert tortoise recovery plan recommends implementing a range-wide survey program; the 2017 Range and Training BO recommends that MCLB Barstow participate with the USFWS and other partners in conducting surveys of the Ord-Rodman Critical Habitat Unit.
	4.4-3: Appoint a USFWS-approved desert tortoise management representative when specified by project requirements associated with proposed new range and training activities.	Varies	This is required by the 2017 Range and Training BO. This individual will ensure compliance with the 2017 BO.
	4.4-4: Conduct clearance surveys following USFWS recommendations for the construction of LZs, LHA/LHD sites, access roads, bivouac areas, vehicle loading/refueling areas, and range maintenance and sustainment activities.	Varies	This is required by the 2017 Range and Training BO. Surveys will follow 100% coverage standards.

Program Area	Action Step	Frequency	Project Description
	4.4-5: Evaluate desert tortoise carcasses to attempt to determine the cause of death and track results in the database (see step 4.4-1). Evaluate all common raven's nests and frequently used roost or perch sites on MCLB Barstow to determine whether they are preying on desert tortoises; if desert tortoise carcasses are found, contact the USFWS or USDA Wildlife Services to address the issue.	Ongoing	This is recommended by the 2017 Range and Training BO. Raven nests will be the primary focus of this effort.
	4.4-6: Maintain signage to indicate the presence of desert tortoise and outline appropriate activities in desert tortoise habitat.	Ongoing	This is required by the 2017 Range and Training BO. The signs will be placed at the Rifle Range.
	4.4-7: Restore degraded/disturbed tortoise habitat with native vegetation associated with proposed new range and training activities.	Ongoing	Planting, reseeding, and other restoration activities will be performed.
	4.4-8: Distribute relevant species information to interested parties (e.g., the BLM pamphlet that contains information on status, management, significance, and what citizens can do to help).	Ongoing	This will involve the dissemination of information to entities outside of the Base.
	4.4-9: Provide natural and cultural awareness training to all personnel who train or conduct activities on the range complex.	Ongoing	This is required by the Range and Training BO.
	4.4-10: Appropriately mark and delineate critical habitat adjacent to project footprints associated with proposed new range and training activities.	Once	This may involve signage and/or fencing to delineate critical habitat near construction areas.
	4.4-11: Attend regional species and habitat conservation planning events held by organizations such as the Desert Tortoise Management Oversight Group, Desert Managers Group, and Desert Tortoise Council and participate, as appropriate, in regional conservation efforts for the desert tortoise with the USFWS and other partners.	Ongoing	This involves coordination with regional affiliates and monitoring efforts with partnering agencies.
	4.4-12: Conduct annual surveys for neotropical migratory birds (including southwestern willow flycatchers and least Bell's vireos).	Annual	Biologists will conduct surveys for neotropical migratory birds along the Mojave River and in any additional riparian habitats.

Program Area	Action Step	Frequency	Project Description
	4.4-13: Conduct invasive species control in riparian habitat along the Mojave River.	Ongoing	This involves mechanical, chemical, or physical removal of invasive species.
	4.4-14: Conduct native riparian habitat enhancement along the Mojave River through the outplanting of native riparian species.	Varies	Planting, reseeding, and other restoration activities will be performed.
Critical Habitat	No actions.		
Other Special Status Species	4.6-1: Conduct baseline presence/absence surveys and periodic monitoring for other special status species with the potential to occur on MCLB Barstow.	Ongoing	Biologists will periodically survey for T&E species across the Base.
	4.6-2: Conduct Basewide special status plant species surveys identified as BLM sensitive, CNPS, FWS candidates every five years.	Once	Biologists will update the sensitive plant surveys every five years.
	4.6-3: Maintain an updated list of special status plant species with the potential to occur on MCLB Barstow and their sensitivity status.	Ongoing	This will involve maintaining and updating a database as survey results are obtained.
	4.6-4: Maintain a cumulative map and record of surveys and findings for special status plant species.	Ongoing	This will involve maintaining and updating a database as survey results are obtained.
Migratory Birds and Eagles	4.7-1: Avoid or minimize impacts to migratory birds and eagles and their habitats.	Ongoing	MCLB Barstow will maintain compliance with the MBTA and BGEPA.
	4.7-2: During the breeding season, precede all vegetation removal associated with the increase in training and Rifle Range construction with a preconstruction survey conducted by a qualified wildlife biologist.	Varies	Biological monitoring will be performed during construction and range activities that have the potential to disturb MBTA and BGEPA species.
	4.7-3: Conduct preclearance surveys prior to the removal of trees or shrubs during the breeding season.	Varies	Biologists will conduct surveys in advance of the removal of vegetation.
	4.7-4: Conduct periodic mortality surveys in the vicinity of the wind turbine and large solar arrays.	Varies	Surveys will take place periodically to assess the impact (if any) of alternative energy sources on avian resources.

Program Area	Action Step	Frequency	Project Description
	4.7-5: Prepare educational materials regarding the Base's migratory birds and management practices. Include information on what personnel can do to help, species lists, and activities detrimental to the bird population.	Varies	Materials may include signage, posters, brochures, etc.
	4.7-6: Collect and assess information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation.	Varies	This will ensure compliance with the MBTA.
	4.7-7: Participate in regional or national inventory and monitoring programs such as the Breeding Bird Survey, Breeding Biology Research and Monitoring Database, Christmas bird counts, bird atlas projects, and game bird surveys where practicable, feasible, and accessible, taking safety and security into consideration.	Ongoing	This will require coordination with regional efforts.
Soil Erosion Prevention and Control	4.8-1: Implement BMPs and soil erosion control measures.	Ongoing	This will require standard soil control measures to be implemented.
	4.8-2: Identify soil erosion hazards and prioritize restoration activities.	Ongoing	This involves periodic monitoring of erosion control issues on all ranges.
	4.8-3: Keep a record of the most effective BMPs for use in NEPA planning and mitigations. Maintain an updated BMP list.	Ongoing	This involves creating and maintaining a database.
	4.8-4: Pursue reasonable and cost-effective means to work with off-Base organizations such as BLM and the County, through Letters of Agreement, MOUs, and contracts to control and prevent soil erosion.	Ongoing	This will require coordination with regional partners.
	4.8-5: Monitor and manage the impacts of training and range maintenance activities on soil resources.	Ongoing	This involves measuring and monitoring soil conditions and trends.
Water Resources	4.9-1: Cooperate with the Mojave Water Agency, San Bernardino County Flood Control District, and other agencies to consider long-term improvements and long-term maintenance within the Mojave River corridor that would capture storm water runoff, allowing percolation into the aquifer.	Ongoing	This will require coordination with regional partners.

Program Area	Action Step	Frequency	Project Description
	4.9-2: Participate in cooperative watershed planning with federal, state, and local agencies.	Ongoing	Will require coordination with regional partners.
	4.9-3: Promote activities and measures that facilitate the reclamation and reuse of wastewater.	Ongoing	This will ensure water is conserved on the Base to the extent possible.
	4.9-4: Meter water use to provide records of use and incentive for conservation.	Ongoing	This will ensure water metering is accurate.
	4.9-5: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural value while continuing federal water rights.	Once	This will require a study to exam the feasibility of the proposed action.
	4.9-6: Protect and maintain local surface water rights by scrutinizing proposed off-site actions in the upper Mojave River watershed that could adversely impact stream flow conditions.	Ongoing	This will ensure the Base maintains sufficient water.
	4.9-7: Protect and maintain local groundwater rights by evaluating water rights implications before drilling any new wells on the Base.	Ongoing	This will ensure the Base maintains sufficient water.
	4.9-8: Participate in a regional DoD strategy to protect access of military installations in the desert to a reliable and adequate supply of quality water in the context of increased population growth.	Once	This will require coordination with regional partners.
	4.9-9: Prevent NPS pollution from on-site sources by providing an educational program for personnel to explain NPS concerns.	Ongoing	This will require the development of an educational plan or presentation.
	4.9-10: Initiate BMPs to prevent or treat NPS pollution.	Ongoing	This will require standard measures be implemented.
	4.9-11: Prevent the burying, dumping, draining, or otherwise disposing of any type of ammunition, explosive material, pyrotechnic, chemical ammunition, or any type of hazardous waste (including oil, fuel and/or chemicals) onto the ground or into the water at MCLB Barstow.	Ongoing	This will ensure contaminants do not enter the water supply.
	4.9-12: Support all agencies in eliminating all sources of pollution that may contaminate water quality in the Mojave River system.	Ongoing	MCLB Barstow will coordinate will agencies where pollution may be an issue.

Program Area	Action Step	Frequency	Project Description
	4.9-13: Cooperate and coordinate with all governmental agencies, including the Regional Water Quality Control Boards, to apply measures to prevent surface and groundwater pollution.	Ongoing	This will require coordination with regional partners, including Regional Water Quality Control Boards.
	4.9-14: Prevent point-source pollution from on-site sources by investigating cross-connections and pretreatment solutions for phenols or boiler discharges coming from industrial sources.	Ongoing	This involves surveying industrial areas for possible problem spots.
	4.9-15: Require wastewater collection and treatment systems that are consistent with the protection of public health and water quality.	Ongoing	This will require coordination with other entities on the Base to ensure compliance.
	4.9-16: Accomplish protective measures to avoid or minimize the destructive effects of floods on Base personnel and resources.	Ongoing	This involves determining what measures should be in place to prevent damage.
	4.9-17: Challenge upstream development practices that may create injury to MCLB Barstow.	Ongoing	This will require coordination with regional partners.
Vegetation	4.10-1: Update vegetation mapping and GIS data.	Ongoing	The project will create a vegetation map at a sufficient scale to be used by the Base.
	4.10-2: Prevent unnecessary damage of or disturbance to native plant communities through educational awareness and avoidance measures.	Ongoing	This will rely on an updated cumulative map of sensitive plants and vegetation mapping.
	4.10-3: Maintain an inventory of wetlands and monitor changes annually.	Ongoing	This will require all previous data to be inserted into a single database.
	4.10-4: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural values while continuing federal water rights.	Once	This will require a study to examine the feasibility of the proposed action.
	4.10-5: Monitor wetland community plant species composition and relative cover, paying particular attention to exotics and invasion by noxious weeds.	Ongoing	Biologists will conduct periodic surveys of wetland plant communities along Mojave River.

Program Area	Action Step	Frequency	Project Description
	4.10-6: Ensure that activities in the jurisdictional wetland and waters of the U.S. along the Mojave River are permitted through the USACE. This includes any movement or deposition of soil. Any action affecting the Mojave River requires an environmental review under NEPA.	Ongoing	MCLB Barstow will maintain compliance with the CWA.
Invasive and Nonnative Plant Species	4.11-1: Remap invasive and nonnative species infestations every three to five years.	Varies	Invasive plant occurrences will be recorded using GPS units whenever encountered during vegetation and wildlife surveys. This includes surveys for invasive and nonnative plants.
	4.11-2: Eradicate giant reed (*Arundo donax*) along the river area in Nebo.	Ongoing	Plant occurrences will be recorded using GPS units whenever encountered during vegetation and wildlife surveys. This includes surveys for invasive and nonnative plants.
	4.11-3: Target salt cedar (*Tamarisk* spp.) for removal. Target giant reed and salt cedar for eradication as soon as feasible, and other weeds as prioritized in the guidelines of the Mojave Weed Management Area and the 2015 NRI.	Ongoing	Invasive and nonnative plants will be removed by physical, chemical, or mechanical means.
	4.11-4: Work with others who are trying to find solutions to the spread of exotic annuals in the desert, which may affect the desert tortoise and create a wildland fuel hazard. Support implementation of The Mojave Weed Control MOU.	Ongoing	This will require coordination with regional partners. Implementation of the Mojave Weed Control MOU may require invasive and nonnative plants to be removed by physical, chemical, or mechanical means.
	4.11-5: Educate Base personnel and contractors on the identification of noxious weeds, the importance of noxious weed control, and measures to minimize their spread. Develop a brochure.	Ongoing	This will involve coordination with internal Base departments and the development of a brochure.
	4.11-6: Ensure construction vehicles coming onto base are clean and free from excessive soil/mud that could carry unwanted seeds or other biological hitchhikers.	Varies	This will involve enforcing power-washing requirements.
	4.11-7: Initiate an early detection and rapid response program.	Once	Invasive and nonnative plants will be surveyed periodically and rapid response planning initiated.
Wildlife Protection and Management	4.12-1: Define and map habitat values on the Base using ecosystem, landscape ecology, and multispecies concepts. Begin with habitat values for the desert tortoise.	Once	This will require GIS analysis of habitat at varying scales.

Program Area	Action Step	Frequency	Project Description
	4.12-2: Create a Revegetation Plan. Restore all habitat impacted by construction associated with the increase in training and Rifle Range activities per the Revegetation Plan.	Once	The Revegetation Plan will be developed by MCLB Barstow and approved by the USFWS
	4.12-3: Monitor habitat condition and the effectiveness of management activities.	Ongoing	This will involve periodic monitoring of resources at MCLB Barstow.
	4.12-4: Establish guzzlers (watering systems for wildlife) as appropriate in coordination with the CDFW. Avoid areas managed for desert tortoise due to safety concerns.	Once	New water sources may be installed to increase the surface water available for wildlife.
	4.12-5: Update the 2015 NRI every five years as it pertains to general wildlife species. Update the presence, absence, and relative abundance of wildlife in all taxonomic groups, with focused surveys for sensitive species.	Varies	This may involve coordinating surveys with partnering agencies to ensure survey data are consistent with regional efforts.
	4.12-6: Inventory and monitor pollinator populations. Establish the baseline conditions of pollinators and the plants that support them.	Ongoing	This involves surveys for pollinators.
	4.12-7: Identify and develop landscapes that benefit pollinators.	Ongoing	This may require plantings or the alteration of landscapes to benefit pollinators.
	4.12-8: Develop BMPs that ensure that pollinators are not adversely impacted by Base activities.	Once	This will involve establishing a database of BMPs with respect to pollinators.
	4.12-9: Determine the status, health, and habitat use of neotropical migratory birds and raptors, emphasizing certain target or indicator species not currently considered sensitive. In support of Cal-PIF's riparian bird management strategy, consider reproductive success and survival rates when monitoring populations, assessing habitat value, and developing conservation plans.	Ongoing	MCLB Barstow will continue to conduct avian surveys and support habitat for avian resources.

Program Area	Action Step	Frequency	Project Description
	4.12-10: Prioritize riparian sites for protection and restoration according to the means described in the Cal-PIF Riparian Bird Conservation Plan: current indicators of avian population health, proximity to existing high-quality sites, sites with intact adjacent uplands, sites with an intact natural hydrology or the potential to restore the natural processes of the system, and sites with surrounding land use that would not undermine restoration success.	Ongoing	This will require GIS analysis of riparian areas in order to prioritize sites.
	4.12-11: Enhance suitable urban habitats to encourage migratory stopovers.	Ongoing	This may include the maintenance, removal, or planting of plants to encourage stopovers.
	4.12-12: Monitor the use of stables on the Yermo Annex by birds (e.g., cowbirds) that depredate the nest of sensitive species especially, and provide management intervention if necessary.	Ongoing	Biologists will conduct surveys of the Yermo Annex with a focus on cowbirds.
	4.12-13: Limit disturbances during the breeding season. Promote understory and groundcover quality by postponing mowing until after the peak breeding season. If mowing must be done during the breeding season, maintain a low herbaceous layer of no more than 6 inches to discourage birds from nesting. Limit restoration activities and disturbances such as grazing, disking, and herbicide application to the nonbreeding season. When such actions are absolutely necessary during the breeding season, schedule the disturbances to minimize their impacts on nesting birds.	Ongoing	This will ensure compliance with the MBTA.
	4.12-14: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of mammal species on the Base.	Varies	This may involve coordinating surveys in cooperation with partnering agencies to ensure survey data are consistent with regional efforts.
	4.12-15: Discourage bat inhabitation of occupied buildings through appropriate and biologically acceptable measures. Encourage the relocation of bat colonies to alternative roosting sites.	Ongoing	This involves the proactive closing off and/or blocking of potential bat roosts within and on structures and the possible installation of bat boxes.
	4.12-16: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of herpetological species.	Varies	This may involve coordinating surveys in cooperation with partnering agencies to ensure survey data are consistent with regional efforts.

Program Area	Action Step	Frequency	Project Description
	4.12-17: Develop and implement a study on habitat use and the needs of herpetological species.	Once	This involves a literature review and targeted herpetological surveys at the Base.
	4.12-18: Conduct repeatable Basewide surveys to develop a baseline invertebrate diurnal and nocturnal species list, focusing on insects, to determine abundance and diversity.	Ongoing	This may involve coordinating surveys in cooperation with partnering agencies to ensure survey data are consistent with regional efforts.
	4.12-19: Conduct feral species abatement when necessary to protect native wildlife from domestic and feral animals.	Ongoing	This may involve coordinating with appropriate entities to implement abatement as needed.
	4.12-20: Conduct educational programs for residents on controlling pets and how to reduce practices that may attract coyotes or ravens to housing areas.	Ongoing	This will involve developing educational materials.
	4.12-21: Provide education awareness materials to rotational units and Base personnel on how to employ proper waste management practices.	Ongoing	This will involve developing a presentation to deliver the material.
	4.12-22: Develop raven management procedures.	Ongoing	TBD
	4.12-23: Reduce attraction of common ravens and other potential desert tortoise predators to the maximum extent possible. Monitor the progress and outcomes of the updated Desert Tortoise Recovery Plan for the west Mojave Desert and the Raven Management Plan.	Ongoing	This will require education of base personnel to ensure they do not feed common ravens intentionally or inadvertently and to report any observations.
	4.12-24: Establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that may adversely impact readiness or military operations by affecting the health of personnel or by damaging structures, material, or property.	Ongoing	This will require the development of an IPM Plan.
Ecosystem Management	4.13-1: Continue to participate in partnerships that manage ecosystems across boundaries.	Ongoing	This will require coordination with regional partners.
	4.13-2: Support research to gain the best available scientific information to guide natural resource and conservation decisions.	Ongoing	Access by researchers and collaborators will be coordinated to ensure safety and deconfliction with military training.

Program Area	Action Step	Frequency	Project Description
	4.13-3: Define and understand MCLB Barstow's regional relevance and responsibility towards regional conservation efforts.	Once	This consists of researching regional conservation plans with respect to the MCLB Barstow's natural resources.
Bird/Animal Aircraft Strike Hazard Reduction Program	4.14-1: Create and implement a BASH program if necessary.	Once	This will involve assessing the need for a BASH program and the implementation of one if it is deemed necessary.
	4.14-2: Update this program as necessary and periodically evaluate possible improvements that might further reduce BASH incidents.	Varies	Actions will support the BASH program in maintaining BASH records, submitting remains for identification, and providing other program support.
Wildland Fire Management	4.15-1: Implement measures as described in the 2016 Wildland Fire Management Plan for MCLB Barstow.	Once	Implement measures as described in the 2016 Wildland Fire Management Plan for MCLB Barstow.
	4.15-2: Educate military personnel, employees, and the public about the scope and effect of wildland fire management, including fuels management, prevention, hazard/risk assessment, rehabilitation, and the role of fire in ecosystem management.	Ongoing	This involves the development and dissemination of a presentation/educational materials.
Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies relevant to natural resources in the context of climate change.	Once	Climate change assessments will be performed.
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.	Varies	MCLB Barstow will examine species and their vulnerabilities.
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.	Ongoing	MCLB Barstow will partner in collaborative ventures to access the most current information on local and regional levels.
Leases	4.17-1: Develop and implement a system to capture the full cost of supporting tenants. Provide oversight, inspection, and monitoring of outgrants for compliance with environmental protection laws.	Once	This will require establishing a management system.
Encroachment	4.18-1: Seek public recognition and support for excellent stewardship of the property.	Ongoing	Light construction will be performed to install and maintain signs and other control measures.

Program Area	Action Step	Frequency	Project Description
	4.18-2: Identify through markers, fencing, or signage all of MCLB Barstow's boundaries with safety, security, or resource sensitivity concerns to prevent trespassing and other unlawful activities. Install appropriate signs to deter illegal trash dumping on the Rifle Range.	Ongoing	Light construction will be performed to install and maintain signs and other control measures.
Outdoor Recreation	4.19-1: Consider the installation of a trail for walking and fitness along the river.	Once	This would involve a feasibility study.
	4.19-2: Develop a "viewing station" and interpretive panel for natural resource values or restoration and enhancement projects.	Once	Light construction will be performed to install and maintain a signs/viewing station.
	4.19-3: Eliminate unauthorized off-road vehicle use.	Ongoing	MCLB Barstow will monitor areas of concern to minimize off-road use on Base.
Conservation Education and Awareness	4.20-1: Provide a clear, concise manual of environmental precautions and restrictions to be used by personnel. The manual should be reviewed annually.	Annual	This will require the development and dissemination of a manual.
	4.20-2: Support a natural resource orientation program for new personnel.	Ongoing	This involves the development of new orientation materials.
	4.20-3: Educate personnel about resources to support land management goals by way of classes, workshops, displays in communal areas, literature, and signs.	Ongoing	This involves the development of educational materials.
	4.20-4: Identify and evaluate suitable interpretive opportunities on MCLB Barstow, such as promoting the development of recreational, scenic, and historic trails for people with diverse interests and abilities.	Ongoing	MCLB Barstow will Identify opportunities as they arise.
Public Outreach	4.21-1: Submit materials for DoD and other environmental awards. Research potential awards, identify criteria, and develop a schedule for submission.	Ongoing	This will require the submission of project details, etc.
	4.21-2: Support Public Visitation Days by providing information, lectures, slideshows, and tours, if appropriate.	Ongoing	MCLB Barstow will coordinate as needed to support Public Visitation Days.
Cultural Resources	4.22-1: Evaluate potential impacts to cultural resources resulting from projects or activities that involve ground-disturbing activities.	Ongoing	MCLB Barstow will ensure compliance with all applicable cultural resource laws and regulations.

Program Area	Action Step	Frequency	Project Description
Construction	4.23-1: Evaluate and minimize potential impacts to natural resources resulting from construction projects by using the NEPA process.	Ongoing	This will require NEPA analysis for all projects with potential impacts.
	4.23-2: Develop the minimum network of roads needed to meet requirements for military readiness, safety and security, fire control, and environmental protection.	Ongoing	This will require light construction to maintain roads.
	4.23-3: Develop a 5- to 10-year Long-Term Maintenance Plan.	Once	This will involve coordination with internal Base entities as needed.
	4.23-4: Develop a list of appropriate mitigation practices for routine maintenance.	Once	MCLB Barstow will maintain a database of mitigation practices for reference.
	4.23-5: Monitor resource conditions and the effectiveness of BMPs as mitigation.	Ongoing	This will require periodic surveys of established BMPs.
	4.23-6: Develop contingency plans for emergency maintenance activities that may impact natural resources.	Once	These plans will protect natural resources to the extent feasible during emergency maintenance activities.
Landscaping and Grounds Maintenance	4.24-1: Conduct an irrigation system audit.	Once.	The audit will cover all areas where landscaping exists.
	4.24-2: Continue to reduce water wastage on lawns. Continue to limit the use of lawns where at all possible; use xeriscaping instead of lawns where at all possible.	Ongoing	MCLB Barstow will follow the guidelines of the BEAP.
	4.24-3: Reduce use of water for landscaping while continuing to provide a high-quality living environment to Base personnel.	Ongoing	MCLB Barstow will follow the guidelines of BEAP.
	4.24-4: For all landscaping projects, use a palette of native plants that are suitable for the local climate, dry soils, and low level of maintenance funding found at the Base. Plant material should be used to resolve site problems as well as to improve the overall aesthetics of the site.	Ongoing	MCLB Barstow will follow the guidelines of the BEAP.
Environmental Permitting	4.25-1: Comply with the CWA Section 404 permit and Section 401 state water quality certification if a project may affect a floodplain, wetland, or watercourse.	Ongoing	Permits will be obtained if needed.
	4.25-2: Seek and obtain regional 404 permits (four months in advance) from the USACE, if needed.	Varies	Permits will be obtained if needed.

Program Area	Action Step	Frequency	Project Description
	4.25-3: Obtain a five-year regional permit for all routine maintenance practices, if beneficial and needed.	Once	Permits will be obtained if needed.
Geographic Information Services Management	4.26-1: Continue development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.	Ongoing	GIS data collected in the field during surveys and other management actions will be centrally maintained.
Law Enforcement Systems	4.27-1: Establish and maintain adequate control measures (e.g., signs, gates, fences) to provide for security, safety, and protection of natural resources.	Ongoing	Light construction will be performed to install and maintain signs and other control measures.

POAM – projects, objectives, actions and milestones; **INRMP** – Integrated Natural Resources Management Plan; **EA** – Environmental Assessment; **EIS** – Environmental Impact Statement; **NEPA** – National Environmental Policy Act; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **T&E** – threatened and endangered; **MCLB** – Marine Corps Logistics Base; **GIS** – geographic information system; **LZ** – landing zone; **LHA** – landing helicopter assault; **LHD** – landing helicopter dock; **MBTA** – Migratory Bird Treaty Act; **BGEPA** –Bald and Golden Eagle Protection Act; **BMP** – best management practice; **BLM** – Bureau of Land Management; **MOU** – Memorandum of Understanding; **DoD** – United States Department of Defense; **NPS** – nonpoint source; **U.S.** – United States; **USACE** – United States Army Corps of Engineers; **CWA** – Clean Water Act; **GPS** – global positioning system; **NRI** – National Resources Inventory; **CDFW** – California Department of Fish and Wildlife; **Cal-PIF** – California Partners in Flight; **MBTA** – Migratory Bird Treaty Act; **IPM** – Integrated Pest Management; **BASH** – Bird Aircraft Strike Hazard; **BEAP** – Base Exterior Architecture Plan

2.2 No Action Alternative

The No Action Alternative is required under the CEQ regulations that implement the NEPA process and serves as a baseline or benchmark to compare to the Proposed Action and alternatives. Under the No Action Alternative, the Revised INRMP for MCLB Barstow would not be implemented, and management activities currently being conducted under the 2011 INRMP would continue. While this alternative would continue to provide guidance and standard operating procedures to MCLB Barstow staff, it would provide less information and fewer benefits to MCLB Barstow's natural resources. Furthermore, failure to update the 2011 INRMP would not meet the legal requirements of the Sikes Act which requires installations to complete a Revised INRMP when either environmental conditions or military use of lands change.

FORMAT PAGE

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the conditions of, and possible impacts to, environmental resources potentially affected by the Proposed Action and the No Action Alternative. The description of existing conditions can provide a baseline understanding of resources that allows environmental changes from the implementation of an alternative to be identified and evaluated.

Following the existing conditions, potential changes or impacts to the resources are described as environmental consequences. As stated in CEQ regulations, 40 CFR 1508.14, the “human environment potentially affected” is interpreted comprehensively to include the natural and physical resources and the relationship of people with those resources. The term “environment” as used in this EA encompasses all aspects of the physical, biological, social, and cultural surroundings.

In compliance with the NEPA and CEQ regulations, the description of the affected environment focuses only on those aspects potentially subject to impacts. Finally, cumulative impacts are addressed, defined by CEQ regulations (40 CFR 1500-1508) as those impacts attributable to the Proposed Action when combined with other past, present, or reasonably foreseeable future impacts, regardless of the source.

3.1 Affected Environment

Implementation of the Revised INRMP would result in very few and only minor changes to the operation and management of MCLB Barstow. A multidisciplinary group reviewed the proposed INRMP programs and projects and conducted an initial evaluation to identify any resource areas that could be dismissed from further detailed analysis because impacts to that resource area would not be measurable, would be negligible, or are clearly less than significant. This initial evaluation allows the analysis in this EA to be focused on resource areas with the greatest potential for impact. Appendix B provides a summary of this initial evaluation with a table of INRMP programs and projects and the expected levels of potential impact under the Proposed Action.

As a result of this initial evaluation, several resource areas were eliminated from further evaluation because impacts to those areas would not be measurable or would be negligible or clearly less than significant. These resource areas are identified in Table 3-1. Remaining resource discussions follow the table and are cross-referenced to the discussion of each resource in the Revised INRMP so information on the affected environment and previous discussions of activities on the Base can be easily located.

Table 3-1. Resource Areas Dismissed from Further Analysis

Resource Area	Discussion
Land Use	No impacts to land use are expected from the implementation of the Proposed Action. Programs and projects proposed in the Revised INRMP would not change land use at MCLB Barstow and would not result in any new land use incompatibilities. Proposed natural resources management projects would benefit current land use by improving the quality of the training environment.
Topography, Geology, and Soils	No impacts to topography or geology are expected from the implementation of the Proposed Action. Incidental and minimal impacts to soils may occur due to natural resource surveys. Soil conditions may benefit from the establishment of a monitoring framework for erosion and other soil-related impacts.
Hydrology and Water Resources	No impacts to hydrological or water resources are expected from the implementation of the Proposed Action. The minimal locations for open water that exist at MCLB Barstow will not be impacted nor polluted by the proposed projects. The Mojave River would benefit through the removal of invasive plants and reduction in soil erosion.
Cultural Resources	No significant impacts to cultural resources are expected from the implementation of the Proposed Action. Incidental and minimal impacts to cultural resources may occur due to natural resource surveys; however, the potential for impacts is minimized and mitigated through Section 106 consultation and other regulatory procedures that are required in these events, as prescribed in the Base Integrated Cultural Resource Management Plan. Cultural resources would benefit from the protection given to wildlife habitat where cultural resources may exist.
Air Quality	No significant impacts to air quality are expected from the implementation of the Proposed Action. Some activities would result in minor increases in emissions such as fugitive dust and vehicle and equipment exhaust. Equipment usages associated with INRMP implementation projects are not known at this time. Proposed emissions would be significantly below the *de minimis* thresholds for the Mojave Desert Air Basin (western portion of San Bernardino County), which are 25 tons per year for volatile organic compounds and NO_x and 100 tons per year for PM_{10}. Pesticide application would result in minor, temporary impacts to air quality. Overall, impacts would be less than significant and would not contribute significant emissions to local or regional air quality.
Noise	No significant impacts from noise are expected from the implementation of the Proposed Action. Minor, infrequent noise increases would be associated with the project vehicles needed to access the range for natural resource surveys and other wildlife management activities.
Visual Resources	No impacts to visual resources would result from the implementation of the Proposed Action. None of the proposed projects would impact visual resources.
Socioeconomics	No impacts to socioeconomics are expected from the implementation of the Proposed Action. The implementation of the Revised INRMP would not affect nearby residents, and the implementation of the Proposed Action would have no significant impacts on the local economy.
Transportation and Circulation	No significant impacts to transportation and circulation are expected from the implementation of the Proposed Action. A minor, short-term increase in traffic would occur during the implementation of natural resource surveys, but this would not result in any significant impacts.
Utilities	No impacts to utilities are expected from the implementation of the Proposed Action. The Proposed Action would not create any new utilities on the Base nor would it impact the existing infrastructure.

Resource Area	Discussion
Hazardous Materials and Wastes	No significant impacts from the use or storage of hazardous materials and waste are expected from the implementation of the Proposed Action. Pesticides may be used to manage nonnative and invasive plant species. Fire suppressants may be used to mitigate fire danger following a Wildland Fire Management Plan. All use of pesticides and fire suppressants would be minor and infrequent and would follow all regulations and guidelines.
Health and Human Safety	No significant impacts to human health or safety are expected from the implementation of the Proposed Action. All personnel associated with the implementation of the Proposed Action would be required to comply with applicable health and safety regulations.

INRMP – Integrated Natural Resources Management Plan; **MCLB** – Marine Corps Logistics Base; **NO_x** – nitrogen oxides; **PM_{10}** – particulate matter less than 10 microns in diameter

As a result of the initial evaluation, biological resources is the only resource area identified with a potential to receive more than negligible impacts or that warrants further review and evaluation. A detailed description of the affected environment associated with biological resources is found in the Revised INRMP, and this EA will not replicate the entirety of the data. This EA will, however, summarize the affected environment for biological resources and indicate where additional, more detailed affected environment information can be found in the Revised INRMP. These summarized data are meant to assist the reader in understanding the context of the potential environmental consequences discussed later in this section, without having to refer to the INRMP for basic information.

Vegetation and Wildlife

As shown in Figure 3-1, creosote bush scrub dominates the native habitat at MCLB Barstow, constituting over 80.44 percent (2,809 out of 3,492 acres) of all native habitat. Other communities found on the Base include: desert pavement, desert wash scrub, creosote/desert wash scrub mix, desert wash thicket and cottonwood-willow desert riparian. The most recent vegetation mapping at MCLB Barstow is from a botanical survey conducted in the spring of 1996 to inventory plant species and delineate plant communities on the Base (Tierra Data Inc. 1996). For an in-depth description of the four natural communities at MCLB Barstow, refer to Section 3.3.1 of the Revised INRMP. MCLB Barstow supports approximately 221 species of wildlife. For an in-depth description of the wildlife observed at MCLB Barstow, refer to Section 3.3.2 of the Revised INRMP.

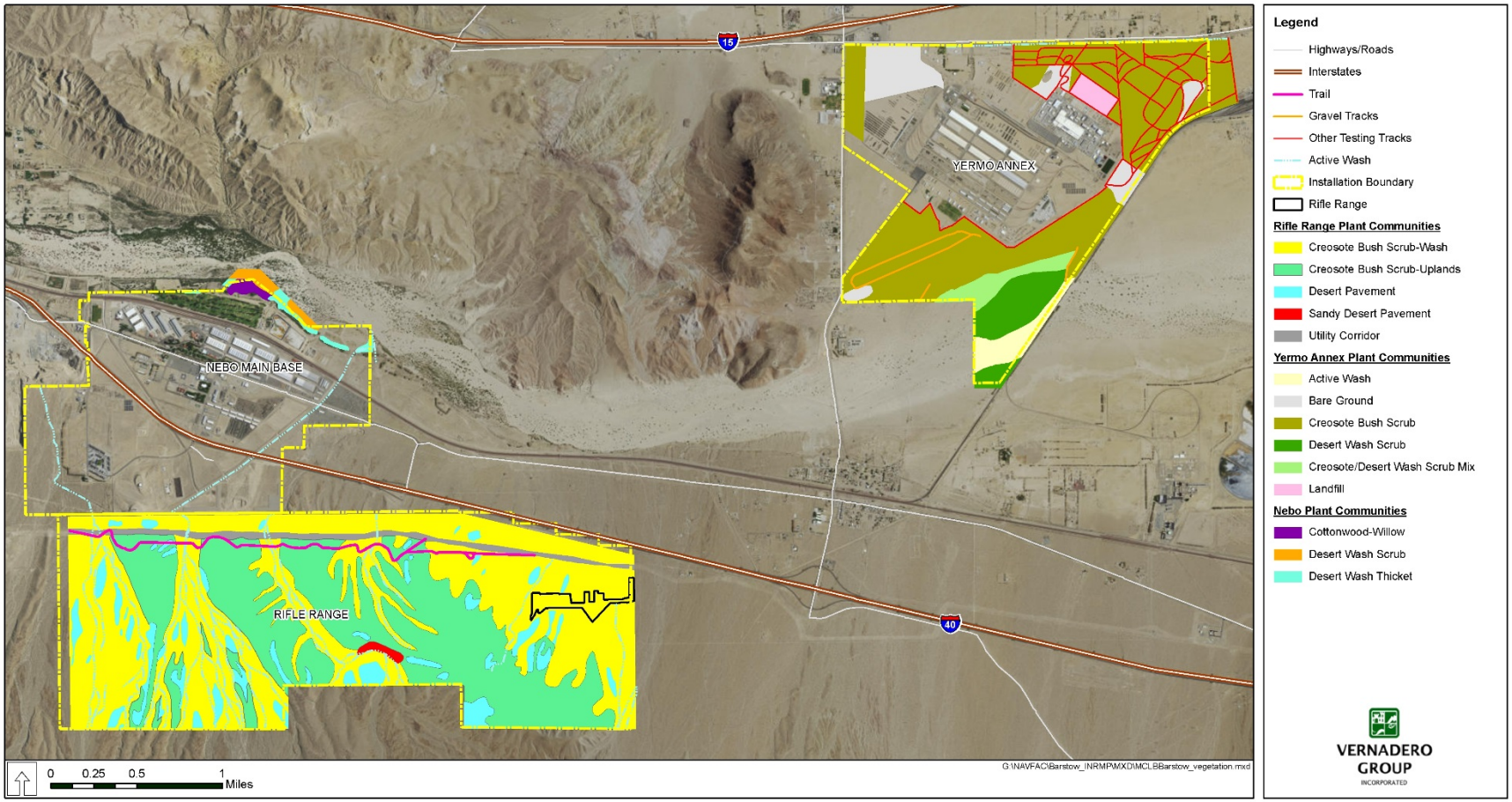

Figure 3-1. Vegetation Communities at MCLB Barstow

Special Status Species

Special status species include federally threatened or endangered species protected by the Endangered Species Act (ESA), as well as species protected by the California ESA. This definition also includes species that are considered species of special concern by either the U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Wildlife or are considered rare plants by the California Native Plant Society. In 2014 and 2015, a Natural Resource Inventory was conducted which surveyed for rare plants and avian, mammalian, and herpetological resources. The final report from this work also consolidated previous survey results and created a master observed species list, including all special status species found on Base. Historically, special status species reported to be on MCLB Barstow had been observed during focused surveys, such as for the desert tortoise, or by incidental observation.

The primary special status species of concern on MCLB Barstow is the Agassiz desert tortoise (*Gopherus agassizii*), as it is the only federally threatened or endangered species found on MCLB Barstow that is protected by the ESA (and California ESA). Other special status species observed on MCLB Barstow are considered species of special concern by either the USFWS or California Department of Fish and Wildlife or are considered rare plants by the California Native Plant Society (2015). These species can be found listed in Table 3-2. Special status species that may occur at MCLB Barstow are discussed in depth in Section 3.3.3 and Appendix B of the Revised INRMP.

Table 3-2. Special Status Species Observed on MCLB Barstow

Common Name Scientific Name	Habitat	Observed Range Location at MCLB Barstow
Reptiles		
Desert Tortoise (*Gopherus agassizii*)	Creosote bush, burrobush, Mojave yucca, blackbrush, Joshua tree, and galleta grass on flats, alluvial fans, bajadas, rocky terrain, and washes where soil is friable enough for tortoises to dig burrows. Can be found on rocky areas with slopes of up to 40%.	Rifle Range
Birds		
Brewer's Sparrow (*Spizella breweri*)	Sagebrush and scrub habitats. One of the few species that is mainly a sagebrush obligate. Can also be found in habitat dominated by creosote bush and saltbush.	Nebo, Rifle Range
Burrowing Owl (*Athene cunicularia hypugaea*)	Open, dry grasslands and desert habitats. Nests in burrows.	Rifle Range
Cooper's Hawk (*Accipiter cooperii*)	Woodlands and riparian areas. Nests and forages along riparian areas.	Nebo

Common Name Scientific Name	Habitat	Observed Range Location at MCLB Barstow
Crissal Thrasher (*Toxostoma crissale*)	Dense, low, scrubby vegetation, such as desert and foothill scrub and riparian brush	Nebo
Golden Eagle (*Aquila chrysaetos*)	Widespread in mountainous areas of the western Mojave Desert and open habitats, especially in mountains or hilly county. Nests on cliff faces or in large trees with nests frequently used for many years by the same breeding pair.	Rifle Range
Le Conte's Thrasher (*Toxostoma lecontei*)	Desert scrub, mesquite, tall riparian brush and, in transitional habitat, chaparral.	Rifle Range
Loggerhead Shrike (*Lanius ludovicianus)*	Found commonly in desert habitats: creosote scrub and desert washes.	Rifle Range, Yermo Annex
Lucy's Warbler (*Oreothlypis luciae*)	Mesquite woodlands along desert streams and washes, such as willows and cottonwoods.	Nebo
Northern Harrier (*Circus cyaneus*)	Often overwinters in desert and desert riparian habitats.	Yermo
Nuttall's Woodpecker (*Picoides nuttallii*)	Woodlands along desert streams and washes, such as willows and cottonwoods.	Nebo
Olive-Sided Flycatcher (*Contopus cooperi*)	Most likely a migrant on the Base. Uses woodland habitat around the golf course as a stopover.	Nebo
Short-Eared Owl (*Asio flammeaus*)	Most likely a migrant on the Base. Uses woodland habitat around the golf course as a stopover.	Rifle Range
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Riparian woodland typically with a canopy and an understory of shrubs or saplings. Young tamarisk thickets are not occupied anywhere.	Nebo
Swainson's Hawk (*Buteo swainsoni*)	Observed as a migrant through the Mojave Desert. May use riparian habitat as stopover.	Rifle Range
Vermillion Flycatcher (*Pyrocephalus rubinus*)	Local breeder in the west Mojave Desert. Low-lying riparian areas with accessible water, such as park land or golf courses.	Nebo
Willow Flycatcher (*Empidonax traillii*)	Local breeder in the west Mojave Desert. Low-lying riparian areas with accessible water, such as park land or golf courses.	Nebo
Yellow-Breasted Chat (*Icteria virens*)	Brushy open country, including desert thickets. Usually nests in dense riparian thickets.	Nebo

Common Name Scientific Name	Habitat	Observed Range Location at MCLB Barstow
Yellow Warbler (*Dendroica petechia*)	Cottonwoods and willows of riparian woodlands or forests with a dense understory.	Nebo
Mammals		
American Badger (*Taxidea taxus*)	Dry, open areas with little vegetation. Includes arid desert land and areas adjacent to riparian habitat where prey may be present.	Nebo
Pallid Bat (*Antrozous pallidus*)	Desert scrub habitat below 1,800 feet.	Nebo
Southern Grasshopper Mouse (*Onychomys torridus*)	Desert scrub and other desert habitats where burrows and prey are present.	Nebo
Plants		
Howe's Hedgehog Cactus (*Echinocereus engelmannii* var. *howei*)	Creosote bush scrub.	Nebo, Rifle Range
Threetooth Blazingstar (*Mentzelia tridentate*)	Creosote bush scrub.	Rifle Range

MCLB – Marine Corps Logistics Base

Habitat for Protected Species

Critical habitat is a specific geographic area deemed essential for the conservation of a threatened or endangered species and may require specific management and protection. Critical habitat may include areas that are not currently occupied by the species but are needed for its recovery. Critical habitat for the Agassiz desert tortoise occurs on the southern portion of the Rifle Range (Figure 3-2). Multiple Biological Opinions (BOs) issued by the USFWS (No. 1-8-93-F-16; No. 1-8-97-F-20R; No. 1-8-97-F-20R; NEED No. for draft BO) have concluded that the activities of MCLB Barstow, specifically at the Rifle Range, would not jeopardize the desert tortoise nor result in significant destruction or adverse modification of its critical habitat (USFWS 1993, 1997, 2003). The USFWS based its opinion on the small percentage of critical habitat on MCLB Barstow affected by training, conservation measures enacted by the Base, established areas for the conservation of desert tortoises on the range, and the development and pending development of a Management Plan associated with the applicable BO (Section 3.3.3 in the Revised INRMP contains a more in-depth discussion of critical habitat for the desert tortoise on MCLB Barstow).

Wetlands and Aquatic Habitat

Congress enacted the Clean Water Act in 1972 to restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 U.S.C. 1251, *et seq.*). Section 404 of the Clean Water Act delegates jurisdictional authority over wetlands to the U.S. Army Corps of Engineers

and the U.S. Environmental Protection Agency. Wildlife water sources exist on the Base at the percolation ponds and the small pond found on the golf course and, when appropriate weather condition dictate, surface water can be found within the Mojave River as it crosses the Base.

Jurisdictional Waters of the United States (JWoUS) can also be found on MCLB Barstow. Many of the washes on the Rifle Range (Figure 3-3) and one on Nebo have been previously mapped as JWoUS; all are outside the boundaries of the Mojave River. MCLB Barstow also harbors jurisdictional wetlands, which are a particular type of JWoUS. Jurisdictional wetlands must meet three requirements as defined by the USACE: prevalence of hydrophytic vegetation, presence of hydric soils, and wetland hydrology. These wetlands are found in Nebo along the southern edge of the Mojave River where the river's boundary crosses onto the Base. This habitat covers just 0.09 acre (Figure 3-3). Section 3.1.3 in the Revised INRMP provides a complete description of the water resources at MCLB Barstow.

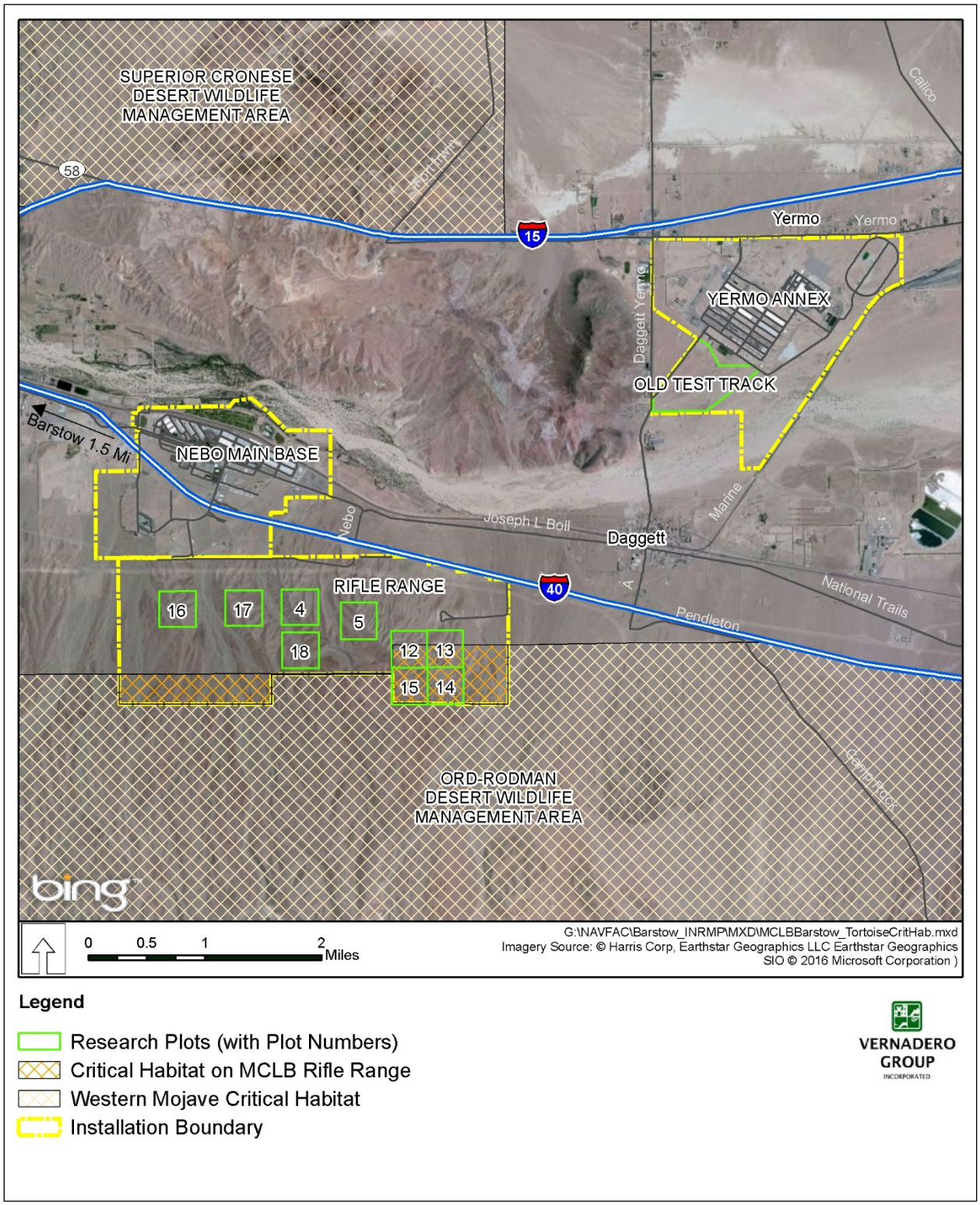

Figure 3-2. Critical Habitat for Desert Tortoise Found at MCLB Barstow

Figure 3-3. Surface Water on or Adjacent to MCLB Barstow

3.2 Environmental Consequences

3.2.1 Alternative 1 (Proposed Action)

The objective of the Revised INRMP is to effectively manage MCLB Barstow's natural resources so as to ensure that they remain available and in good condition to support the Base's military mission with "no net loss" of military training capability. Physical impacts from INRMP programs and projects are generally divided into three categories: natural resource surveys, vegetation restoration, and nonnative and invasive species removal. Although some minor, adverse impacts are expected as a result of these and other programs and projects proposed in the Revised INRMP, they would be less than significant and the long-term benefit to the natural environment would outweigh the temporary adverse impacts.

Natural resources surveys would be conducted by surveyors traversing habitat. Impacts may include trampled vegetation or invertebrates, noise disturbance of nesting birds and other wildlife, soil erosion and compaction, and creation of fugitive dust. These impacts, however, would be minor, temporary, and infrequent and would not any result in any long-term adverse impacts to biological resources.

Vegetation restoration often consists of removing vegetation and re-contouring the project site. Impacts may include trampled vegetation or invertebrates, noise disturbances of nesting birds and other wildlife, soil erosion and compaction, and creation of fugitive dust. This type of work would have temporary and minor adverse impacts to the habitat, but once completed would benefit overall habitat quality and biological resources at MCLB Barstow.

Nonnative and invasive species removal would be performed by physical, mechanical, and/or chemical means; all three methods could temporarily impact biological resources. Physical removal would include personnel or contractors traversing infested areas to hand pull vegetation, possibly trampling nontarget vegetation and invertebrates, and generally disturbing wildlife. Mechanical removal would involve using gas-powered machinery, such as weed whackers and mowers, which would create noise disturbances of wildlife and disturb soils. Chemical treatment of nonnative and invasive species would be conducted in accordance with the Base's Integrated Pest Management Plan and applicable federal, state, and local laws and regulations. In the event of a petroleum or chemical spill, the Base would enact its Spill Plans to contain and clean up the spilled material. Overall, nonnative and invasive species removal would provide long-term, beneficial impacts by eradicating pest and invasive species that damage or destroy native species.

3.2.2 No Action Alternative

If the No Action Alternative is selected, the Revised INRMP would not be implemented and MCLB Barstow would retain the management strategies in the 2011 INRMP. The continued implementation of the 2011 INRMP would have similar direct impacts to biological resources as the implementation of the Revised INRMP. Impacts would be minor, temporary, and infrequent and would not present long-term impacts to biological resources.

3.3 Cumulative Impacts

NEPA defines cumulative effects as the impact on the environment which results from incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).

The Region of Influence (ROI) for cumulative impacts analysis depends on the action and the extent of the impacts' reach. For biological resources, the ROI extends beyond MCLB Barstow boundaries because external activities may affect regional wildlife populations, the viability of biological resources, and the ability of wildlife to move on and off MCLB Barstow via wildlife corridors. External activities include the alternative and traditional energy projects in various stages of development within the ROI. Threats to regional biological resources resulting from the projects in and around MCLB Barstow are mainly related to the impacts those projects will have on desert tortoises and their viability in the region. For this analysis the ROI considers ecological relationships at the landscape level; as such the ROI generally encompasses the western and southern portions of Mojave Desert adjacent to MCLB Barstow.

Table 3-3 lists all projects considered in the cumulative analysis. Multiple military training, construction, and INRMP implementation projects are currently under way on MCLB Barstow. Environmental reviews have been completed for all projects taking place at MCLB Barstow and impacts to biological resources, specifically desert tortoises, are minimized to the greatest extent possible. In addition, given the large size of the ROI and the avoidance and mitigation measures implemented under projects both on and off Base in the ROI, the reviewed projects are only expected to have minor impacts to the continued viability of desert tortoise.

Implementation of the Revised INRMP, when combined with current and planned projects on MCLB Barstow and external projects identified in Table 3-3, is not expected to have any adverse cumulative impact on biological resources within the ROI.

On the contrary, the Revised INRMP provides benefits to biological resources due to surveying for and increasing the knowledge of biological resources; protecting, restoring, and enhancing habitat; removing invasive and nonnative species; and complying with laws and regulations designed to enhance and protect biological resources within the Base's boundaries. MCLB Barstow also implements intense and proactive management of the desert tortoise population on the Rifle Range (see the USFWS 2017 BO for detailed discussion of measures). Overall positive cumulative impacts to biological resources are expected with the implementation of the Proposed Action or the No Action Alternative. Additional positive cumulative impacts to biological resources are expected from the Proposed Action as a result of an up-to-date and robust proposed natural resource management program.

Table 3-3. Cumulative Projects and Potential Impacts

Project Name	Project Location	Project Description	Project Timeline	Notable Potential Project Impacts
KD Rifle Range Communication System Upgrades	MCLB Barstow (KD Range Complex)	Upgrade the KD Rifle Range communications system, including construction of a new communication shelter and installation of a microwave antenna. The existing, temporary tear-gas facility would be moved approximately 24 feet northeast from its current location to accommodate construction of the new communication shelter. The project would include limited use of an emergency backup diesel generator of under 50 horsepower.	2016 to 2018	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Bachelor Officers Quarters (MILCON P110)	MCLB Barstow (Nebo)	Construct a multistory Bachelor Officer Quarters (15,672 sf) with 26 rooms for 14 officers. Community service areas include an administrative area, laundry facilities, lounges, housekeeping areas, linen storage, a community kitchen, mail service, a game room, vending, and public restrooms. The existing Bachelor Officer Quarter (Building 11) would be demolished.	2011 to 2019	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Indoor Physical Fitness Center (MILCON P203)	MCLB Barstow (Nebo)	Demolish Building 44 (physical fitness center) and construct a new physical fitness center (16,500 sf). The facility would include a gym, a basketball court, an aerobics/exercise room, an administrative area, a fitness assessment room, a laundry facility, a vending area, and a locker room with a shower, toilets, and a sauna.	2010 to 2018	Air Quality/GHGs, Cultural Resources, Noise
Building 573 Rehabilitation/ Modernization (MILCON P608)	MCLB Barstow (Yermo Annex)	Repair/replace and upgrade Building 573 (Combat Vehicle Maintenance Shop), including the building components, heating and air-conditioning system, overhead cranes and crane tracks, breakrooms and restrooms, and electrical lighting figures.	2010 to 2017	Air Quality/GHGs, Noise
I&L Operations/ Maintenance Facility (MILCON P804)	MCLB Barstow (Yermo Annex)	Demolish Building 588 (Operations/Maintenance Facility) and construct a new vehicle and equipment shop, lubrication shop, and railroad support maintenance facility (9,515 sf).	2010 to 2016	Air Quality/GHGs, Cultural Resources, Noise, Water Resources
Combat Vehicle Repair Facility (MILCON P930)	MCLB Barstow (Yermo Annex)	Construct a combat vehicle repair facility (10,171 sf), including maintenance bays, administrative space, and locker/shower areas. Current combat vehicle work stations would be consolidated at this centralized facility.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources

Project Name	Project Location	Project Description	Project Timeline	Notable Potential Project Impacts
Fleet Support Operations/ Training (MILCON P935)	MCLB Barstow (Yermo Annex)	Construct a new building (11,776 sf) to support existing administrative operations of the Fleet Support Center currently located in Warehouse 406.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Composite Repair Facility (MILCON P938)	MCLB Barstow (Yermo Annex)	Construct a composite repair facility (46,651 sf) to centralize Maintenance Center functions of the fabrication shop, body shop, and associated administrative functions.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Engine Dynamometer Facility (MILCON P939)	MCLB Barstow (Yermo Annex)	Construct an engine dynamometer facility (10,516 sf) to generate power to offset electricity costs at the Yermo Annex. The facility would include test room cells, test control spaces, administrative spaces, and a telecommunications room. Four cooling towers and a Paxman Dynamometer (i.e., a device for measuring mechanical power) within Building 573 would be demolished.	2011 to 2013	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Potable Water Line Project (MILCON P941)	MCLB Barstow (Nebo and Yermo Annex)	Construct an interconnecting potable water pipeline (33,973 linear feet) between Nebo and the Yermo Annex and a pump station to provide adequate infrastructure and a reliable potable water supply.	2010 to 2014	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Paxman Addition (MILCON P944)	MCLB Barstow (Yermo Annex)	Construct a Paxman engine test and repair facility (10,506 sf) that includes engine test and spin test cells and control rooms.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Electro-Optic Facility (MILCON P945)	MCLB Barstow (Yermo Annex)	Construct a new maintenance and repair shop (45,015 sf) for guided missile systems.	2010 to 2015	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources

Project Name	Project Location	Project Description	Project Timeline	Notable Potential Project Impacts
Turret Facility (MILCON P946)	MCLB Barstow (Yermo Annex)	Construct a turret facility (60,000 sf) for maintenance and repair of small arms, automatic weapons, mortars, artillery guns, launchers, and turrets currently conducted in Building 573.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Land Acquisition (MILCON P948)	MCLB Barstow (Nebo)	Purchase 600 acres of privately held land (two single-family residences), transfer 4,500 acres of Bureau of Land Management property, and obtain local government easements. The land will be fenced off, existing buildings demolished, and public roads closed to develop a “land bridge” between Nebo and the Yermo Annex.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Operations/ Training Facility (MILCON P949)	MCLB Barstow (Yermo Annex)	Construct an operations/training facility (36,845 sf), including administrative space, a Command Control Center, training classrooms, and restrooms.	2010 to 2014	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Industrial Basins (MILCON P950)	MCLB Barstow (Yermo Annex)	Construct three evaporation basins (11,000 sf each) at the Industrial Waste Treatment Facility and relocate a vapor and electrical lines.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Material-Handling Equipment Repair Shop (MILCON P953)	MCLB Barstow (Yermo Annex)	Construct a material-handling equipment repair shop (6,760 sf), including a vehicle car wash.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Consolidate Fire Department (MILCON P954)	MCLB Barstow (Nebo)	Renovate Building 322 (14,354 sf) to consolidate all fire/rescue department functions within Nebo. Construction would include the removal and disposal of asbestos and lead-based paint.	2010 to 2014	Air Quality/GHGs, Noise
Nebo Main Gate Improvement (MILCON 955)	MCLB Barstow (Nebo)	Redesign Nebo’s main gate to allow adequate approach and response zones, a sentry booth, an inspection enclosure, and an overwatch structure (185 sf). A portion of Cape Gloucester Avenue would be demolished, and the road would be realigned further east from the Base’s boundary.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources

Project Name	Project Location	Project Description	Project Timeline	Notable Potential Project Impacts
Yermo Annex Main Gate Upgrades (MILCON P956)	MCLB Barstow (Yermo Annex)	Redesign the Yermo Annex's main gate to serve as both a truck inspection area and privately owned vehicle entrance (170 sf) and provide adequate approach and response zones. The project includes demolition of the current guard shack/ID checkpoint and construction of a new security checkpoint.	2010 to 2015	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise
Nebo Truck Inspection (MILCON P957)	MCLB Barstow (Nebo)	Redesign Nebo's back gate to provide a truck inspection area with adequate approach and response zones; demolish the existing guard shack/ID checkpoint; construct a sentry booth, an inspection enclosure, and overwatch structure (185 sf); and demolish a portion of Boll Avenue and reroute the road further west from the Base's boundary.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Construction of an Aboveground Storage Tank (MILCON P958)	MCLB Barstow (Yermo Annex)	Construct three aboveground fuel storage tanks and a fuel dispersing spot (75 sf) in the Yermo Annex to provide fuel for government vehicles and decrease the number of tanker trips from Nebo.	2010 to 2016	Air Quality/GHGs, Noise
Communication Station and Infrastructure (MILCON P959)	MCLB Barstow (Nebo)	Construct a communication building (34,014 sf) to provide an alternative command and control facility on MCLB Barstow.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Fire Station (MILCON P961)	MCLB Barstow (Yermo Annex)	Construct a fire station (16,921 sf) to support two fire engines, one ambulance, and 16 crew members.	2010 to 2015	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Family Service Center (MILCON P962)	MCLB Barstow (Nebo)	Construct a family service center (8,751 sf) to support informational programs and family services for military personnel and dependents.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
School-Age Facility (MILCON P963)	MCLB Barstow (Nebo)	Construct a childcare facility (2,336 sf), to provide before- and after-school care for youth between the ages of 6 and 12.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources

Project Name	Project Location	Project Description	Project Timeline	Notable Potential Project Impacts
General Warehouse (MILCON P964)	MCLB Barstow (Yermo Annex)	Construct a general warehouse (173,999 sf) to provide covered space for bulk storage, space for receiving and packing, office space, and restroom facilities.	2010 to 2017	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Yermo Annex Back Gate (MILCON P966)	MCLB Barstow (Yermo Annex)	Reconstruct the Yermo Annex's back gate (5,737 sf) to provide an inspection area for privately owned vehicles with adequate approach and response zones. The project includes construction of a sentry booth, ID inspection building, and new vehicle entry road/turnaround area.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise
Combat Vehicle Repair Facility (MILCON P967)	MCLB Barstow (Yermo Annex)	Construct a combat vehicle repair facility (5,995 sf) to meet the requirements for ongoing fleet readiness.	2010 to 2015	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Warrior Training Facility (MILCON P968)	MCLB Barstow (Nebo)	Construct a new training facility to accommodate the new increased mission for the Warrior Strengthening Program. Construct a 6,230 sf facility and 88 parking spots. The facility would include computerized training classrooms, training rooms, administrative space for training staff, and storage.	2010 to 2016	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources
Coolwater-Lugo Transmission Project (formerly South of Kramer)	Kramer Junction and Lucerne Valley	Expand transmission capacity in the Kramer Junction and Lucerne Valley areas and deliver renewable power. The project includes construction of 65 to 70 miles of new, high-voltage transmission lines and the new Desert View substation, upgrades to the Coolwater and Lugo substations, and 45 miles of new, overhead telecommunication cables.	2011 to 2018	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise
Barstow Casino and Resort	City of Barstow	Construct a gaming facility, hotel, parking area, and other facilities (i.e., restaurants and retail, banquet/meeting, and administrative space) on 23 acres.	2001 to 2020	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources

Project Name	Project Location	Project Description	Project Timeline	Notable Potential Project Impacts
Regrade Median Cross- Slopes on I-40	San Bernardino County along I-40, passing through the City of Barstow and communities of Daggett, Nebo, and Newberry Springs	Regrade median cross-slopes along I-40 and conduct drainage improvements and modifications to the median over an approximately 25-mile area. The project would preserve and improve the existing California Highway Patrol access points on I-40.	2017 to 2019	Air Quality/GHGs, Biological Resources, Noise
Bureau of Land Management West Mojave Route Land Use Plan Amendment to the California Desert Conservation Area Plan	Portions of San Bernardino, Los Angeles, Kern, and Inyo counties	The project includes transportation-management-related plan amendments to the California Desert Conservation Area Plan. The project includes planning recommendations/guidance for 3.1 million acres within the West Mojave Planning Area, managed by the Bureau of Land Management.	2016 to 2026	Air Quality/GHG, Biological Resources
Calnev Pipeline Expansion Project	MCLB Barstow (Range Complex and Yermo Annex)	The project includes the construction, operation, and maintenance of approximately 233 miles of new 16-inch-diameter pipeline and ancillary facilities from a facility in Colton, California, to a facility in Las Vegas, Nevada. The proposed pipeline would parallel two system pipelines for most of the route.	2010 to 2020	Air Quality/GHGs, Biological Resources, Cultural Resources, Noise, Water Resources

MCLB – Marine Corps Logistics Base; **KD** – known distance; **GHG** – greenhouse gas; **MILCON** – military construction; **Nebo** – Nebo Main Base; **sf** – square feet; **ID** – identification; **I-40** – Interstate 40

4.0 SUMMARY OF FINDINGS AND CONCLUSIONS

A summary of potential impacts associated with both alternatives evaluated in this EA is provided in Table 4-1. Based on the analysis contained herein, this EA concludes that neither the implementation of Alternative 1 (Proposed Action) nor the No Action Alternative will constitute a major federal action with a significant impact to human health or the environment. It is recommended that a FONSI be issued to complete the analysis under the NEPA.

Table 4-1. Summary of Impacts by Alternative

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Land Use	No impacts to land use are expected from the implementation of the Proposed Action. Programs and projects proposed in the Revised INRMP would not change land use at MCLB Barstow and would not result in any new land use incompatibilities. Proposed natural resources management projects would benefit current land use by improving the quality of the training environment.	No impacts to land use are expected from the implementation of the No Action Alternative.
Topography, Geology, and Soils	No significant impacts to topography or geology are expected from the implementation of the Proposed Action. Incidental and minimal impacts to soils may occur due to natural resource surveys and invasive species management. Soil conditions may benefit from the establishment of a monitoring framework for erosion and other soil-related impacts.	No significant impacts to topography or geology are expected from the implementation of the No Action Alternative. Incidental and minimal impacts to soils may occur due to natural resource surveys similar to the Proposed Action.
Hydrology and Water Resources	No impacts to hydrological or water resources are expected from the implementation of the Proposed Action. The minimal locations for open water that exist at MCLB Barstow will not be impacted nor polluted by the proposed projects. The Mojave River would benefit through the removal of invasive plants and reduction in soil erosion.	No impacts to hydrological or water resources are expected from the implementation of the No Action Alternative.

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Biological Resources	The Revised INRMP would have moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of enhanced monitoring and surveying of biological resources. Restoration and maintenance of native habitats would aid in the recovery of listed species and the continued functioning of ecosystems. Long-term benefits to all biological resources would occur through proactive natural resource management, including those required for desert tortoise by the applicable BO.	The 2011 INRMP has moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of monitoring and surveying of biological resources. Long-term benefits to biological resources would occur through proactive natural resource management.
Cultural Resources	No significant impacts to cultural resources are expected from the implementation of the Proposed Action. Incidental and minimal impacts to cultural resources may occur due to natural resource surveys. Cultural resources would benefit from the protection given to wildlife habitat where cultural resources may exist.	No significant impacts to cultural resource are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.
Air Quality	No significant impacts to air quality are expected from the implementation of the Proposed Action. Some activities would result in minor increases in emissions such as fugitive dust and vehicle and equipment exhaust. Equipment usages associated with INRMP implementation projects are not known at this time. Proposed emissions would be significantly below the *de minimis* thresholds for the Mojave Desert Air Basin (western portion of San Bernardino county), which are 25 tons per year for volatile organic compounds and NO_x and 100 tons per year for PM_{10}. Pesticide application would result in minor, temporary impacts to air quality. Overall, impacts would be less than significant and would not contribute significant emissions to local or regional air quality.	No significant impacts to air quality are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Noise	No significant impacts from noise are expected from the implementation of the Proposed Action. Minor, infrequent noise increases would be associated with the project vehicles needed to access the range for natural resource surveys and other wildlife or range management activities.	No significant impacts from noise are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.
Visual Resources	No impacts to visual resources would result from the implementation of the Proposed Action. None of the proposed projects would impact visual resources.	No impacts to visual resources would result from the implementation of the No Action Alternative.
Socioeconomics	No impacts to socioeconomics are expected from the implementation of the Proposed Action. The implementation of the Revised INRMP would not affect nearby residents, and the implementation of the Proposed Action would have no significant impacts on the local economy.	No impacts to socioeconomics would result from the implementation of the No Action Alternative.
Transportation and Circulation	No significant impacts to transportation and circulation are expected from the implementation of the Proposed Action. Minor, short-term increase in traffic would occur during the implementation of natural resource surveys, but this would not result in any significant impacts.	No significant impacts to transportation and circulation are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.
Utilities	No impacts to utilities are expected from the implementation of the Proposed Action. The Proposed Action would not create any new utilities on the Base nor would it impact the existing infrastructure.	No impacts to utilities are expected from the implementation of the No Action Alternative.
Hazardous Materials and Wastes	No significant impacts from the use or storage of hazardous materials and waste are expected from the implementation of the Proposed Action. Pesticides may be used to manage nonnative and invasive plant species. Fire suppressants may be used to mitigate fire danger following a Wildland Fire Management Plan. All use of pesticide and fire suppressants would be minor and infrequent and would follow all regulations and guidelines.	No significant impacts from the use or storage of hazardous materials and waste are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP	No Action Alternative: Retain the 2011 INRMP with No Changes
Health and Human Safety	No significant impacts to human health or safety are expected from the implementation of the Proposed Action. All personnel associated with the implementation of the Proposed Action would be required to comply with applicable health and safety regulations.	No significant impacts to human health or safety are expected from the implementation of the No Action Alternative. The extent of potential impacts are comparable to those identified under the Proposed Action.

INRMP – Integrated Natural Resources Management Plan; **MCLB Barstow** – Marine Corps Logistics Base Barstow; **BO** – Biological Opinion; **NO_x** – nitrogen oxides; **PM_{10}** – particulate matter less than 10 microns in diameter

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Aaron Hebshi, PhD	Navy Technical Representative Naval Facilities Engineering Command Southwest Central Integrated Product Team (code: AE20.CD) 1220 Pacific Highway San Diego, California 92132 Project role: Naval Facilities Engineering Command contributor and reviewer
Anicka Kratina-Hathaway	Wildlife Biologist Vernadero Group Inc. 3110 Camino del Rio South, Suite 309 San Diego, California 92108 Project role: environmental analysis, preparer
Nicole Kimball	Wildlife Biologist Vernadero Group Inc. 3110 Camino del Rio South, Suite 309 San Diego, California 92108 Project role: peer review and technical editing

Benjamin Cody Leslie	Environmental Division Marine Corps Logistics Base Barstow Barstow, California 92311 Project role: MCLB Barstow contributor and reviewer
Kyle McCann	Wildlife Biologist Vernadero Group Inc. 3110 Camino del Rio South, Suite 309 San Diego, California 92108 Project role: environmental analysis, preparer

7.0 LIST OF INDIVIDUALS AND AGENCIES CONSULTED

Jon Aunger, Plans and Conservation Branch Chief, MCLB Barstow Conservation Division

Ray Bransfield, US Fish and Wildlife Service

FORMAT PAGE

Appendix A. Public Involvement, Interagency Coordination, and Distribution List

FORMAT PAGE

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA,
County of San Bernardino

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the publisher of the DESERT DISPATCH, a newspaper of general circulation, published in the City of Barstow, County of San Bernardino, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, under the date of February 27, 1996, Case Number BVC 02359, that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

February 3 and 4

All in the year 2017.

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated this: 6th **day of** February, **2017.**

Signature

Leslie Jacobs

This space is the County Clerk's Filing Stamp

Proof of Publication of
PUBLIC NOTICE

PUBLIC NOTICE

DRAFT INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA

The Department of Navy (DoN) has prepared a Draft Revised Integrated Natural Resources Management Plan (INRMP) for Marine Corps Logistics Base (MCLB) Barstow. A Draft Environmental Assessment (EA) was also prepared to analyze the potential for environmental impacts associated with implementation of the INRMP. Pursuant to the National Environmental Policy Act (NEPA), the DoN gives notice that the Draft Revised INRMP, Draft EA and Draft Finding of No Significant Impact (FONSI) are available for public review and comment.

PROPOSED ACTION: The Proposed Action is implementation of the Revised INRMP for MCLB Barstow. This plans reflects MCLB Barstow's commitment to conserve, protect, and enhance the Base's natural resources in a manner that supports and enhances realistic military training. The primary objective of the plan is to provide a proactive natural resources management tool that allows the DoN, U.S. Marine Corps, and MCLB Barstow to achieve resource management goals, mission requirements, and compliance with environmental regulations and policies.

HOW TO REVIEW AND COMMENT ON THE DRAFT INRMP AND EA: The Draft Revised INRMP, Draft EA and Draft FONSI are being made available for a 30-day review period commencing with the publication of this notice. A hardcopy version is available for review at the Barstow Branch Library located at 304 E. Buena Vista Street, Barstow, California 92311. In addition, the Draft Revised INRMP, Draft EA and Draft FONSI are also available for electronic viewing at: http://www.mclbbarstow.marines.mil/Portals/132/Environmental%20Dept/MCLBBarstowINRMP%20PR Draft%2026JAN17.pdf

Comments must be postmarked by 06 March 2017 to be considered part of the National Environmental Policy Act review process. Comments should be submitted to: Naval Facilities Engineering Command Southwest, Dr. Aaron Hebshi, Central Integrated Product Team, 1220 Pacific Highway, Bldg. 1, San Diego, California 92132-5190, aaron.hebshi@navy.mil

Published in the Desert Dispatch February 3, 4, 2017 (FSa-12)

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA,
County of San Bernardino

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the publisher of the DAILY PRESS, a newspaper of general circulation, published in the City of Victorville, County of San Bernardino, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, under the date of November 21, 1938, Case number 43096, that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

February 3, 4 and 5

All in the year 2017.

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated this: 6th **day of** February, **2017.**

Leslie Jacobs

Signature

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February 3, 4, 5, 2017
(ESaSu-R9)

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26 January 2017

Librarian
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304 E. Buena Vista Street
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Dear Librarian,

Enclosed please find one (1) hardcopy of the:

DRAFT INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT MARINE CORPS LOGISTICS BASE BARSTOW, CALIFORNIA

We are providing this copy to your library as a repository for federal environmental documentation related to regional federal activities.

Please make this document available for public review upon receipt and until at least 6 March 2017. Instructions for the submittal of public comments are provided herein and must be postmarked to the Government by no later than 6 March 2017.

Please contact me if you have any questions.

Respectfully,

Michael Collins
Project Manager

Copy: Project Administrative Record

Appendix B. Anticipated Levels of Potential Impact under the Preferred Alternative by Program Area

FORMAT PAGE

Table B-1. Program Areas – Anticipated Levels of Potential Impact under the Preferred Alternative

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
INRMP Implementation	4.1-1: Ensure POAM are conducted annually. Develop tasks, timelines, and cost estimates.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NSI	NSI	NSI
	4.1-2: Develop an Annual Phasing Plan for POAM of this INRMP.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.1-3: Program funding for INRMP annual reviews, as-needed updates and five-year revisions.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.1-4: Provide sufficient natural resource personnel and training to meet the needs of INRMP implementation.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
NEPA Review	4.2-1: Perform Categorical Exclusion, EA, and/or EIS reviews to (1) identify the potential effects of the proposed action from a local and regional ecosystems management perspective; (2) identify less damaging alternatives; (3) identify other laws and regulations that may be applicable; (4) ensure that adequate mitigation is planned, if required; 5) assess the level of regulatory interface required; and 6) assess consistency with natural resources management goals, objectives, BOs, and conservation programs.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
Federal ESA Compliance	4.3-1: Adhere to the conservation measures and relevant avoidance measures identified in all USFWS BOs written for species on MCLB Barstow.	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NSI	NI	NSI
	4.3-2: Manage federally T&E species and their habitats to prevent jeopardy to the species and to assist in their conservation and recovery.	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NSI	NI	NSI
	4.3-3: Manage species and their habitats in a manner that minimizes impacts to both the mission and the species.	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.3-4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally T&E species and maintain and update these data.	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.3-5: Develop and maintain a robust GIS database to document the spatial and temporal distribution of listed species and updated it as survey data become available.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.3-6: Anticipate the need to consult with the USFWS under Section 7(a) of the ESA for any proposed actions on MCLB Barstow that may affect listed species.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
Threatened or Endangered Species, and Critical Habitat	4.4-1: MCLB Barstow will prepare a Desert Tortoise Conservation Plan that includes tortoise status, results and application of recent research, identification of short-term and long-term research studies and conservation measures, development of an ongoing monitoring program to understand long-term effects of ongoing military training, and identification of management goals, priorities, and guidelines for specific management actions.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.4-2: Conduct annual Desert Tortoise surveys and reporting for population monitoring.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-3: Appoint a USFWS-approved Desert Tortoise Management Representative when specified by project requirements.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.4-4: Conduct clearance surveys following USFWS recommendations for the construction of LZs, LHA/LHD sites, access roads, bivouac areas, vehicle loading/refueling areas, and range maintenance and sustainment activities.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.4-5: Evaluate all predator or predator nests found within the Rifle Range for evidence of tortoise predation. If predator-damaged shells are found, the surrounding area will be searched and any predator animals will be documented by the Environmental Division.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-6: Maintain signage to indicate the presence of desert tortoises and outline appropriate activities in desert tortoise habitat.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-7: Restore degraded/disturbed tortoise habitat with native vegetation.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-8: Distribute information to interested parties (e.g., the BLM pamphlet that contains information on status, management, significance, and what citizens can do to help).	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.4-9: Provide natural and cultural awareness training to all personnel who train or conduct activities on the range complex.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.4-10: Appropriately mark and delineate critical habitat adjacent to project footprints.	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.4-11: Attend regional species and habitat conservation planning events held by organizations such as the Desert Tortoise Management Oversight Group, Desert Managers Group, and Desert Tortoise Council.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.4-12: Conduct annual riparian presence/absence and breeding surveys.	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-13: Conduct invasive species control in riparian habitat along the Mojave River.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-14: Conduct native riparian habitat enhancement along the Mojave River through the outplanting of native riparian species.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-15: Attend regional species and habitat conservation planning events for organizations such as the Desert Managers.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Critical Habitat	No actions.													
Other Special Status Species	4.6-1: Conduct baseline presence/absence surveys and periodic monitoring for other special status species.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
Migratory Birds and Eagles	4.7-1: Avoid or minimize impacts to migratory birds and eagles and their habitats.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.7-2: During the breeding season, precede all vegetation removal associated with the increase in training and Rifle Range construction with a preconstruction survey conducted by a qualified wildlife biologist.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.7-3: Conduct preclearance surveys prior to the removal of trees or shrubs during the breeding season.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.7-4: Conduct periodic mortality surveys in the vicinity of the wind turbine and large solar arrays.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.7-5: Prepare educational materials regarding the Base's migratory birds and management practices. Include information on what personnel can do to help, species lists, and activities detrimental to the bird population.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.7-6: Collect and assess information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.7-7: Participate in regional or national inventory and monitoring programs such as the Breeding Bird Survey, Breeding Biology Research and Monitoring Database, Christmas bird counts, bird atlas projects, and game bird surveys where practicable, feasible, and accessible, taking safety and security into consideration.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
Soil Erosion Prevention and Control	4.8-1: Implement BMPs and soil erosion control measures, including those specified in BOs.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.8-2: Identify soil erosion hazards and prioritize restoration activities.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.8-3: Keep a record of the most effective BMPs for use in NEPA planning and mitigations. Maintain an updated BMP list.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.8-4: Pursue reasonable and cost-effective means to work with off-Base organizations in controlling and preventing soil erosion.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.8-5: Monitor and manage the impacts of training and range maintenance activities on soil resources.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
Water Resources	4.9-1: Cooperate with the Mojave Water Agency, San Bernardino County Flood Control District, and other agencies to consider long-term improvements and long-term maintenance within the Mojave River corridor that would capture storm water runoff, allowing percolation into the aquifer.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NI	NI	NSI
	4.9-2: Participate in cooperative watershed planning with federal, state, and local agencies.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.9-3: Promote activities and measures that facilitate the reclamation and reuse of wastewater.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.9-4: Meter water use to provide records of use and incentives for conservation.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.9-5: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural value while continuing federal water rights.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
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	4.9-6: Protect and maintain local surface water rights by scrutinizing proposed off-site actions in the upper Mojave River watershed that could adversely impact stream flow conditions.	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.9-7: Protect and maintain local groundwater rights by evaluating water rights implications before drilling any new wells on the Base.	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.9-8: Participate in a regional DoD strategy to protect access of military installations in the desert to a reliable and adequate supply of quality water in the context of increased population growth.	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.9-9: Prevent NPS pollution from on-site sources by providing an educational program for personnel to explain NPS concerns.	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.9-10: Initiate BMPs to prevent or treat NPS pollution.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NI	NI	NSI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.9-11: Prevent the burying, dumping, draining, or otherwise disposing of any type of ammunition, explosive material, pyrotechnic, chemical ammunition, or any type of hazardous waste (including oil, fuel and/or chemicals) onto the ground or into the water at MCLB Barstow.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NSI	NI	NSI
	4.9-12: Support all agencies in eliminating all sources of pollution that may contaminate water quality in the Mojave River system.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NI	NSI	NSI
	4.9-13: Cooperate and coordinate with all governmental agencies, including the Regional Water Quality Control Boards, to apply measures to prevent surface and groundwater pollution.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NSI	NSI	NSI
	4.9-14: Prevent point-source pollution from on-site sources by investigating cross-connections and pretreatment solutions for phenols or boiler discharges coming from industrial sources.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NSI	NSI	NSI
	4.9-15: Require wastewater collection and treatment systems that are consistent with the protection of public health and water quality.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NI	NSI	NSI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.9-16: Accomplish protective measures to avoid or minimize the destructive effects of floods on Base personnel and resources.	NI	NSI	NSI	NSI	NSI	NSI	NSI	NI	NSI	NI	NI	NSI	NSI
	4.9-17: Challenge upstream development practices that may create injury to MCLB Barstow.	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Vegetation	4.10-1: Update vegetation mapping and GIS data.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.10-2: Prevent unnecessary damage of or disturbance to native plant communities.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.10-3: Maintain an updated list of sensitive plant species.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.10-4: Determine the feasibility of utilizing nearby historic wells to supplement available water and both improve the wetlands' and riparian habitat's natural values while continuing federal water rights.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.10-5: Monitor wetland community plant species composition and relative cover, paying particular attention to exotics and invasion by noxious weeds.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI

Program Area	Action Step	Resource Areas with Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.10-6: Ensure that activities in the jurisdictional wetlands and waters of the U.S. along the Mojave River are permitted through the USACE. This includes any movement or deposition of soil. Any action affecting the Mojave River requires an environmental review under NEPA.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
Invasive and Nonnative Plant Species	4.11-1: Remap invasive and nonnative species infestations every three to five years.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.11-2: Eradicate the giant reed (*Arundo donax*) along the river area in Nebo.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.11-3: Target salt cedar (*Tamarisk* spp.) for removal. Target giant reed and salt cedar for eradication as soon as feasible, and other weeds as prioritized in the guidelines of the Mojave Weed Management Area and the 2015 NRI.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.11-4: Work with others who are trying to find solutions to the spread of exotic annuals in the desert, which may affect the desert tortoise and create a wildland fuel hazard. Support the implementation of the Mojave Weed Control MOU.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI

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	4.11-5: Educate Base personnel and contractors on the identification of noxious weeds, the importance of noxious weed control, and measures to minimize their spread. Develop a brochure.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.11-6: Ensure construction vehicles coming onto base are clean and free from excessive soil/mud that could carry unwanted seeds or other biological hitchhikers.	NI	NI	NSI	NI	NI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.11-7: Initiate an early detection and rapid response program.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Wildlife Protection and Management	4.12-1: Define and map habitat values on the Base using ecosystem, landscape ecology, and multispecies concepts. Begin with habitat values for the desert tortoise.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.12-2: Create a Revegetation Plan. Restore all habitat impacted by construction associated with the increase in Training and Rifle Range activities per the Revegetation Plan.	NI	NSI	NSI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
	4.12-3: Monitor habitat condition and the effectiveness of management activities.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	4.12-4: Establish guzzlers (watering systems for wildlife) as appropriate in coordination with the CDFW. Avoid areas managed for desert tortoises due to safety concerns.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NSI	NSI	NSI
	4.12-5: Update the 2015 NRI every five years as it pertains to general wildlife species. Update the presence, absence, and relative abundance of wildlife in all taxonomic groups, with focused surveys for sensitive species.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NSI	NSI	NSI
	4.12-6: Inventory and monitor pollinator populations. Establish baseline conditions of pollinators and the plants that support them.	NI	NI	NI	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NSI
	4.12-7: Identify and develop landscapes that benefit pollinators.	NI	NSI	NI	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NSI
	4.12-8: Develop BMPs that ensure that pollinators are not adversely impacted by Base activities.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	4.12-9: Determine the status, health, and habitat use of neotropical migratory birds and raptors, emphasizing certain target or indicator species not currently considered sensitive. In support of Cal-PIF's riparian bird management strategy, consider reproductive success and survival rates when monitoring populations, assessing habitat value, and developing conservation plans.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.12-10: Prioritize riparian sites for protection and restoration according to the means described in the Cal-PIF Riparian Bird Conservation Plan: current indicators of avian population health, their proximity to existing high-quality sites, sites with intact adjacent uplands, sites with an intact natural hydrology or the potential to restore the natural processes of the system, and sites with surrounding land use that would not undermine restoration success.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.12-11: Enhance suitable urban habitats to encourage migratory stopovers.	NI	NSI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NSI

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	4.12-12: Monitor the use of stables on the Yermo Annex by birds (e.g., cowbirds) that depredate the nests of sensitive species especially, and provide management intervention if necessary.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NSI
	4.12-13: Limit disturbances during the breeding season. Promote understory and groundcover quality by postponing mowing until after the peak breeding season. If mowing must be done during the breeding season, maintain a low herbaceous layer of no more than 6 inches to discourage birds from nesting. Limit restoration activities and disturbances such as grazing, disking, and herbicide application to the nonbreeding season. When such actions are absolutely necessary during the breeding season, schedule the disturbances to minimize their impacts on nesting birds.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.12-14: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of mammal species on the Base.	NI	NSI	NI	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NSI

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	4.12-15: Discourage bat inhabitation of occupied buildings through appropriate and biologically acceptable measures. Encourage the relocation of bat colonies to alternative roosting sites.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.12-16: Revise the 2015 NRI every five years to update its discussion of the presence, absence, and relative abundance of herpetological species.	NI	NSI	NI	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NSI
	4.12-17: Develop and implement a study of the habitat use and needs of herpetological species.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.12-18: Conduct repeatable Basewide surveys to develop a baseline for invertebrate diurnal and nocturnal species list, focusing on insects, to determine their abundance and diversity.	NI	NSI	NI	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NSI
	4.12-19: Conduct feral species abatement when necessary to protect native wildlife from domestic and feral animals.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NSI
	4.12-20: Conduct educational programs for residents on controlling pets and how to reduce practices that may attract coyotes or ravens to housing areas.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	4.12-21: Provide education awareness materials to rotational units and base personnel on how to employ proper waste management practices.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.12-22: Develop raven management procedures.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NSI
	4.12-23: Reduce the attraction of common ravens and other potential desert tortoise predators to the maximum extent possible. Monitor the progress and outcomes of the updated Desert Tortoise Recovery Plan for the West Mojave Desert and the Raven Management Plan.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NSI
	4.12-24: Establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that may adversely impact readiness or military operations by affecting the health of personnel or by damaging structures, material, or property.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Ecosystem Management	4.13-1: Continue to participate in partnerships that manage ecosystems across boundaries.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NSI	NSI	NSI

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	4.13-2: Support research to gain the best available scientific information to guide natural resource and conservation decisions.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.13-3: Define and understand MCLB Barstow's regional relevance and responsibility towards regional conservation efforts.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Bird/Animal Aircraft Strike Hazard Reduction Program	4.14-1: Create and implement a BASH program if necessary.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.14-2: Update this program as necessary and periodically evaluate possible improvements that might further reduce BASH incidents.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Wildland Fire Management	4.15-1: Implement measures as described in the 2016 Wildland Fire Management Plan for MCLB Barstow.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.15-2: Educate military personnel, employees, and the public about the scope and effect of wildland fire management, including fuels management, prevention, hazard/risk assessment, rehabilitation, and the role of fire in ecosystem management.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies relevant to natural resources in the context of climate change.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
Leases	4.17-1: Develop and implement a system to capture the full cost of supporting tenants. Provide oversight, inspection, and monitoring of outgrants for compliance with environmental protection laws.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Encroachment	4.18-1: Seek public recognition and support for excellent stewardship of the property.	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI

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	4.18-2: Identify through markers, fencing, or signage all of MCLB Barstow's boundaries with safety, security, or resource sensitivity concerns to prevent trespassing and other unlawful activities. Install appropriate signs to deter illegal trash dumping on the Rifle Range.	NI	NSI	NI	NSI	NI	NSI	NI	NI	NI	NI	NI	NI	NSI
Outdoor Recreation	4.19-1: Consider the installation of a trail for walking and fitness along the river.	NI	NSI	NI	NI	NSI	NSI	NI	NI	NI	NI	NI	NI	NSI
	4.19-2: Develop a "viewing station" and interpretive panel for natural resource values or restoration and enhancement projects.	NI	NI	NI	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NSI
	4.19-3: Eliminate unauthorized off-road vehicle use.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NSI
Conservation Education and Awareness	4.20-1: Provide a clear, concise manual of environmental precautions and restrictions to be used by personnel. The manual should be reviewed annually.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NSI	NSI
	4.20-2: Support a natural resource orientation program for new personnel.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	4.20-3: Educate personnel about resources to support land management goals by way of classes, workshops, displays in communal areas, literature, and signs.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.20-4: Identify and evaluate suitable interpretive opportunities on MCLB Barstow, such as promoting the development of recreational, scenic, and historic trails for people with diverse interests and abilities.	NI	NSI	NI	NI	NSI	NSI	NI	NI	NI	NI	NI	NI	NSI
Public Outreach	4.21-1: Submit materials for DoD and other environmental awards. Research potential awards, identify criteria and develop a schedule for submission.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.21-2: Support Public Visitation Days by providing information, lectures, slide shows and tours, if appropriate.	NI	NI	NI	NI	NSI	NSI	NI	NI	NI	NI	NI	NI	NSI
Cultural Resources	4.22-1: Evaluate potential impacts to cultural resources resulting from natural resource projects that involve ground disturbing activities.	NI	NI	NI	NSI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Construction	4.23-1: Evaluate and minimize potential impacts to natural resources resulting from construction by using the NEPA process.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	4.23-2: Develop the minimum network of roads needed to meet requirements for military readiness, safety and security, fire control, and environmental protection.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.23-3: Develop a 5- to 10-year Long-Term Maintenance Plan.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.23-4: Develop a list of appropriate mitigation practices for routine maintenance.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.23-5: Monitor resource conditions and the effectiveness of BMPs as mitigation.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.23-6: Develop contingency plans for emergency maintenance activities that may impact natural resources.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Landscaping and Grounds Maintenance	4.24-1: Conduct an irrigation system audit.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.24-2: Continue to reduce water wastage on lawns. Continue to limit the use of lawns where at all possible; use xeriscaping instead of lawns where at all possible.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.24-3: Reduce use of water for landscaping while continuing to provide a high-quality living environment for Base personnel.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	4.24-4: For all landscaping projects, use a palette of native plants that are suitable for the local climate, dry soils, and low level of maintenance funding found at the Base. Plant material should be used to resolve site problems as well as to improve the overall aesthetics of the site.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NSI
Environmental Permitting	4.25-1: Comply with the CWA Section 404 permit and Section 401 state water quality certification if a project may affect a floodplain, wetland, or watercourse.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.25-2: Seek and obtain regional 404 permits (four months in advance) from the USACE, if needed.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.25-3: Obtain a five-year regional permit for all routine maintenance practices, if beneficial and needed.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Geographic Information Services Management	4.26-1: Continue the development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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Law Enforcement Systems	4.27-1: Establish and maintain adequate control measures (signs, gates, fences, etc.) to provide for security, safety, and protection of natural resources.	NI	NSI	NSI	NSI	NSI	NSI	NI	NI	NI	NI	NI	NI	NSI

INRMP – Integrated Natural Resources Management Plan; **POAM –** projects, objectives, actions and milestones; **NI –** no impact; **NSI –** no significant impact; **EA** – Environmental Assessment; **EIS** – Environmental Impact Statement; **BO** – Biological Opinion; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **MCLB** – Marine Corps Logistics Base; **T&E** – threatened and endangered; **GIS** – geographic information system; **LZ** – landing zone; **LHA** – landing helicopter assault; **LHD** – landing helicopter dock; **BLM** – Bureau of Land Management; **BMP** – best management practice; **NEPA** – National Environmental Policy Act; **DoD** – United States Department of Defense; **NPS** – nonpoint source; **GIS** – geographic information system; **U.S.** – United States; **USACE** – United States Army Corps of Engineers; **NRI** – National Resources Inventory; **MOU** – Memorandum of Understanding; **CDFW** – California Department of Fish and Wildlife; **Cal-PIF** – California Partners in Flight; **IPM** – Integrated Pest Management; **BASH** – Bird Aircraft Strike Hazard; **CWA** – Clean Water Act

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