

U. S. AIR FORCE
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
Beale Air Force Base
&
Lincoln Receiver Site



(See INRMP signature pages for plan approval date)

ABOUT THIS PLAN

This installation-specific Environmental Management Plan (EMP) is based on the United States Air Force's (USAF) standardized Integrated Natural Resources Management Plan (INRMP) template. This INRMP has been developed in cooperation with applicable stakeholders, which includes Sikes Act cooperating agencies and/or local equivalents, to document how natural resources will be managed. Where applicable, external resources, including Air Force Instructions (AFIs); Department of Defense Instructions (DoDIs); USAF Playbooks; federal, state, and local requirements; Biological Opinions; and permits are referenced.

Certain sections of this INRMP begin with standardized, USAF-wide "common text" language that address USAF and Department of Defense (DoD) policy and federal requirements. This common text language is restricted from editing to ensure that it remains standard throughout all plans. Immediately following the USAF-wide common text sections are installation sections. The installation sections contain installation-specific content to address local and/or installation-specific requirements. Installation sections are unrestricted and are maintained and updated by the approved plan owner.

NOTE: The terms "Natural Resources Manager," "NRM," and "NRM/POC" are used throughout this document to refer to the installation person responsible for the natural resources program, regardless of whether this person meets the qualifications within the definition of a natural resources management professional in DoDI 4715.03, Natural Resources Conservation Program.

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DOCUMENT CONTROL

Standardized INRMP Template

In accordance with (IAW) the Air Force Civil Engineer Center (AFCEC) Environmental Directorate (CZ) Business Rule (BR) 08, *Environmental Management Plan (EMP) Review, Update, and Maintenance*, the standard content in this INRMP template is reviewed periodically, updated as appropriate, and approved by the Natural Resources Subject Matter Expert (SME).

This version of the template is current as of 06/26/2020 and supersedes the 2018 version.

NOTE: Installations are not required to update their INRMPs every time this template is updated. When it is time for installations to update their INRMPs, they should refer to the eDASH EMP Repository to ensure they have the most current version.

Installation INRMP

Record of Review—The INRMP is updated no less than annually, or as changes to natural resource management and conservation practices occur, including those driven by changes in applicable regulations. IAW the Sikes Act and AFMAN 32-7003, *Environmental Conservation*, the INRMP is required to be reviewed for operation and effect no less than every five years. An INRMP is considered compliant with the Sikes Act if it has been approved in writing by the appropriate representative from each cooperating agency within the past five years. Approval of a new or revised INRMP is documented by signature on a signature page signed by the Installation Commander (or designee), and a designated representative of the United States Fish and Wildlife Service (USFWS), state fish and wildlife agency, and National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS) when applicable (AFMAN 32-7003).

Annual reviews and updates are accomplished by the installation Natural Resources Manager (NRM), and/or a Section Natural Resources Media Manager. The installation shall establish and maintain regular communications with the appropriate federal and state agencies. At a minimum, the installation NRM (with assistance as appropriate from the Section Natural Resources Media Manager) conducts an annual review of the INRMP in coordination with internal stakeholders and local representatives of USFWS, state fish and wildlife agency, and NOAA/NMFS, where applicable, and accomplishes pertinent updates. Installations will document the findings of the annual review in an Annual INRMP Review Summary. By signing the Annual INRMP Review Summary, the collaborating agency representative asserts concurrence with the findings. Any agreed updates are then made to the document, at a minimum updating the work plans.

INRMP APPROVAL/SIGNATURE PAGES

This Integrated Natural Resources Management Plan (INRMP) revised August 2019, has been prepared in accordance with regulations, standards, and procedures of the Department of Defense (DoD) and the U.S. Air Force (USAF) in cooperation with the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Wildlife (CDFW) and the National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS). The signatures below indicate the mutual agreement of the parties concerning the conservation, protection, and management of the fish and wildlife resources presented in this Plan.

CLARK.ANDREW
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Digitally signed by
CLARK.ANDREW.M.1099761810
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-07'00'

Commander, 9th Reconnaissance Wing
Beale Air Force Base

(Date)

Field Supervisor, Sacramento Fish and Wildlife Office
U.S Fish and Wildlife Service

(Date)

Regional Manager
California Department of Fish and Wildlife

(Date)

Director
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

(Date)

INRMP APPROVAL/SIGNATURE PAGES

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Commander, 9th Reconnaissance Wing
Beale Air Force Base

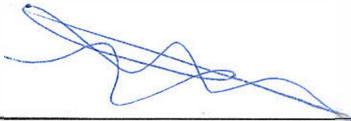
(Date)



Field Supervisor, Sacramento Fish and Wildlife Office
U.S Fish and Wildlife Service

8/20/19

(Date)



Regional Manager
California Department of Fish and Wildlife

9/23/19

(Date)

Director
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

(Date)

EXECUTIVE SUMMARY

The Integrated Natural Resources Management Plan (INRMP) is an interagency agreement clarifying how Department of Defense (DoD) natural resources are managed on Beale Air Force Base (AFB) in compliance with federal, state and local standards. This INRMP is designed to achieve an ecosystem management program that draws on a collaboratively developed vision of desired future ecosystem conditions by integrating ecological, economic and social factors.

The primary objective of the U.S. Air Force (USAF, or AF) natural resources program is to sustain, restore and modernize natural infrastructure to ensure operational capability and no net loss in the capability of AF lands and to support the military mission of the installation. Implementation of the INRMP will help ensure that Beale AFB lands continue to support present and future mission requirements while preserving, enhancing, and, where possible, restoring ecosystem integrity.

INRMP planning and decision-making is integrated with base comprehensive planning, individual project planning, pest management planning, Bird/Wildlife Aircraft Strike Hazard (BASH) reduction planning, airfield management planning, and cultural resources management planning. The INRMP was prepared using information from reports, surveys, legal documents, Geographic Information Systems (GIS) data, and personal communication with subject matter experts (SMEs). This plan is the annual update which builds upon past management and INRMP versions, integrating any relevant information obtained since the five-year update.

Management policies in the INRMP include broad goals and specific objectives that promote a comprehensive approach to addressing natural resource management issues. Various monitoring and reporting programs are included as projects or recommendations in the INRMP, and many activities proposed in the plan contain their own monitoring components.

The INRMP is a dynamic document that integrates all aspects of natural resource management and the installation's mission. Its goals and objectives must be considered early in the planning process for projects and mission changes on Beale AFB. All applicable Beale AFB Command, staff, offices, sections, flights, squadrons, groups, wings, tenants, and contractors must be aware of and comply with the INRMP for it to be an effective planning document.

This document is divided into chapters outlining general historic and contemporary information about Beale AFB, the physical and biological environment, current and historic management practices, and management goals and objectives. The INRMP is effective for five years from the date of last signatory.

An annual review of this version of the INRMP was completed in 2021.

1.0 OVERVIEW AND SCOPE

This INRMP was developed to provide for effective management and protection of natural resources. It summarizes the natural resources present on the installation and outlines strategies to adequately manage those resources. Natural resources are valuable assets of the USAF. They provide the natural infrastructure needed for testing weapons and technology, as well as for training military personnel for deployment. Sound management of natural resources increases the effectiveness of USAF adaptability in all environments. The USAF has stewardship responsibility for the physical lands on which installations are located to ensure all natural resources are properly conserved, protected, and used in sustainable ways. The primary objective of the USAF natural resources program is to sustain, restore, and modernize natural infrastructure to ensure operational capability and no net loss in the capability of USAF lands to support the military mission of the installation. The plan outlines and assigns responsibilities for the management of natural resources, discusses related concerns, and provides program management elements that will help to maintain or improve the natural resources within the context of the installation's mission. The INRMP is intended for use by all installation personnel. The Sikes Act is the legal driver for the INRMP.

1.1 Purpose and Scope

The INRMP is intended to be consistent with the Sikes Act, at 16 U.S. Code (USC) 670(a)(1) that requires the DoD to carry out a program for the conservation and rehabilitation of natural resources on military installations and further requires each military department to prepare and implement an INRMP for each installation under its control that has **significant natural resources**. Per Air Force Manual (AFMAN) 32-7003, *Environmental Conservation*, Section 3.4, Beale AFB is considered a Category I installation as it has significant natural resources requiring conservation and management. Criteria from AFMAN 32-7003 for identifying significant natural resources are as follows:

- The installation conducts on-the-ground military missions on unimproved lands that necessitates conservation measures to maintain the natural resources and minimize impacts of military testing and training activities (e.g., soil erosion control).
- Species listed as threatened or endangered in accordance with 16 USC §§ 1531- 1544 (referred to as the Endangered Species Act throughout this manual) are present on the installation, or critical habitat has been designated or is currently proposed on the installation, and active installation conservation measures are necessary to conserve the species.
- Hunting, fishing or other natural resources-based outdoor recreation activities (e.g. off-road vehicles) are allowed on the installation when consistent with the military mission.
- The installation operates outgrants (leases, licenses, permits) for livestock grazing, crop production, or stable operations that allow horseback riding on unimproved lands.
- The installation operates a commercial forestry program or implements forest management practices in support of readiness and training activities, maintaining forest health, or in support of other ecosystem management goals and objectives.
- The installation has significant Bird/Wildlife Aircraft Strike Hazard (BASH) issues that require habitat manipulation on or near the managed airfield; or require wildlife hazing or depredation activities that are beyond the scope of standard bird/wildlife prevention, control, and dispersal operations conducted under the auspices of a BASH Plan administered by the Wing Flight Safety office.

- Important or unique biological resources are present, such as wetlands, species listed for state protection, candidate species for federal protection, or unique habitats that provide essential loafing, nesting, or foraging areas for migratory birds, bats, or other wildlife protected by state or federal law. The unique character of a biological resource is determined through consultation with the USFWS and applicable state fish and wildlife agency, whereby it is established that ecological issues related to the resource require a level of planning and management that can only be addressed by an INRMP.

The INRMP provides goals for conserving and managing installation natural resources. Installation management strategies are intended to ensure “no net loss” in the capability of Beale lands to support the military mission of the installation by supporting sustainable ecosystems and complying with applicable environmental laws and regulations.

This INRMP is the primary guidance document for managing natural resources on the 23,192 acres of land on Beale AFB and the 235-acre Lincoln Receiver Site (LRS). Beale AFB operates two other Geographically Separated Units (GSU) in addition to LRS, but they do not require coverage under an INRMP. The Oroville Next Generation Radar (NEXRAD) site does not contain significant natural resources, and the base at Point Arena is closed and being prepared for disposal. The INRMP integrates all aspects of natural resources management with the mission of Beale AFB and is the primary tool for managing the ecosystem and habitats found on the base. Over the long term, implementation of this and future INRMPs will guide base staff in maintaining and improving the sustainability and biological diversity of terrestrial and aquatic ecosystems at Beale AFB while supporting sustainable economies, human use and the environment required for military operations. This plan was prepared and coordinated with internal stakeholders and local representatives of the U.S. Fish and Wildlife Service (USFWS), National Oceanic Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS), and the California Department of Fish and Wildlife (CDFW).

1.2 Management Philosophy

INRMP planning and decision-making is integrated with base comprehensive planning, project planning, pest management, BASH reduction, airfield management, and cultural resources management planning. The INRMP supports the base mission requirements while complying with the Sikes Act, Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), Clean Water Act (CWA), federal natural resource conservation laws and regulations, and various executive orders (including executive order [EO] 11990, EO 11988, EO 13186, and EO 13112).

This 2021 INRMP addresses natural resources management at the ecosystem level. Managing ecosystems involves treating the environment as a complex system of interrelated components rather than a collection of isolated units and considers other factors such as base development, economics, community values, and adjacent land uses. To address as many factors as possible in the INRMP, this document was prepared using an interdisciplinary approach. Plans created by SMEs in a broad range of topics including vegetation, wildlife, wetlands, soils, grazing, landscape management and planning, recreation planning, cultural resources, hydrology and water quality, habitat restoration, hazardous materials, and physical sciences were used to develop this and previous INRMP documents. This INRMP is prepared and implemented by the 9th Civil Engineer Squadron Installation Environmental Conservation and Compliance office (9 CES/CEIEC). Beale AFB staff members outside of 9 CES/CEIEC who provided input represent the installation command structure; 9th Reconnaissance Wing Safety Office (9 RW/SE); and other military personnel involved in planning: 9th Civil Engineer Squadron Engineering Flight Planning (9 CES/CENP), 9th Civil Engineer Squadron Installation Management Flight (9 CES/CEIE), 9th Civil Engineer Squadron

Installation Environmental Remediation (9 CES/CEIER), 9th Civil Engineer Squadron Installation Assets and Accountability (9 CES/CEIA), 9th Civil Engineer Squadron Facilities Operations and Maintenance Flight (9 CES/CEO), 9th Reconnaissance Wing office of the Judge Advocate General (9 RW/JAG), 9th Civil Engineer Squadron Fire Emergency Services Flight (9 CES/FES), and 9th Force Support Squadron Community Services Flight (9 FSS/FSW).

Information was also gathered in past development and annual updates of the INRMP from cattle lessees; representatives from the surrounding communities; Yuba County; California State University, Sacramento (CSUS); USFWS; CDFW; NOAA/NMFS; U.S. Army Corps of Engineers (USACE) Regulatory Branch; U.S. Natural Resources Conservation Service (NRCS); and the U.S. Environmental Protection Agency (EPA). Many of these agencies are signatory to plans that inform the INRMP; all of the information and reviews were used in development of the 2021 INRMP. Management recommendations in the INRMP include both broad and specific goals. An overall goal of ecosystem management is to preserve, improve, and enhance ecosystem integrity and support current and future mission requirements. This goal influences all aspects of the INRMP. Some goals, such as improving habitat for special-status species, provide general guidance for several INRMP issue areas. Highly specific goals relate to only one project or issue area, such as range improvements to facilitate the distribution of livestock and reduce conflicts with the military mission and other resources.

1.3 Authority

The Sikes Act, 16 USC 670 et. seq. provides for cooperation between the DoD and Department of Interior (DOI) for the protection of natural resources on military lands. On 18 November 1997, Congress passed the Sikes Act Improvement Amendment (SAIA), which requires the preparation and implementation of an INRMP to support the sustainable use by the public of natural resources to the extent that the use is consistent with the needs of fish and wildlife resources. As stated previously, the SAIA also requires the INRMP be prepared in cooperation with the USFWS and the fish and wildlife agency for the state in which the military installation is located. The cooperation with the USFWS and the state fish and wildlife agency is intended to "reflect the mutual agreement of the parties concerning conservation, protection and management of fish and wildlife resources."

Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, identifies DoD policies and procedures concerning natural resources management and INRMP reviews, public comment, and endangered species consultation. INRMPs are required to be jointly reviewed by the USFWS, NMFS, state conservation agency, and military proponent for operation and effect on a regular basis, every five years or less.

AFMAN 32-7003 implements the Sikes Act and DoD directives by establishing the INRMP as the primary planning document for natural resources at AF installations. AFMAN 32-7003 establishes the Installation or Wing Commander as the signatory authority for approval of the INRMP. The Commander's signature commits the AF to the goals and objectives of the INRMP. Once signed by the cooperating agencies (USFWS and CDFW), the INRMP takes on the status of an interagency compliance agreement.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states: "Ecosystem management of natural resources draws on a collaboratively developed vision of desired future ecosystem conditions that integrates ecological, economic and social factors." To effectively integrate ecological, economic and social factors along with the military mission into an effective ecosystem management program, the policy directive further states: "On DoD installations, ecosystem management will be achieved by developing and implementing INRMPs and ensuring that they remain current."

The Engle Act 10 USC 2671(a)(1) states that the United States is not subject to state law unless there is a clear and specific waiver of sovereign immunity. However, the Engle Act includes a clear and specific waiver requiring military installations to ensure that hunting, fishing and trapping activities on the installation are IAW state fish and game laws and that these activities obtain appropriate state permits/licenses. Therefore, those provisions in the California Code of Regulations (CCR) that pertain to recreational hunting and fishing should be complied with. The Engle Act waiver, which the AF applies to recreational hunting/fishing/trapping of game species on base, is not applicable to natural resources management activities (e.g., wildlife surveys, wildlife handling, depredation). This means that any federal government employee, contractor, or non-federal entity operating on the base, in compliance with federal law, are immune. This includes exemption from requirements under Title 14 relating to Scientific Collecting Permits (14 CCR 650) and Permits for Protected Animals (14 CCR 670.7).

A table of “Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP” is included as Appendix A to this plan. The table summarizes key legislation and guidance documents used to create and implement this INRMP. Refer to the complete listing of policies, the Federal Registry and the U.S. Code to ensure that all applicable guidance documents, laws and regulations are reviewed. Installation-specific policies, including state and local laws and regulations, are summarized in Table 1-1 below.

Table 1-1. Installation-specific policies (including state and/or local laws and regulations)

Installation-Specific Policies* (including State and/or Local Laws and Regulations)	
Base Recreation Access Policy¹	<ul style="list-style-type: none"> • Recreational use is limited to active duty or retired military and their family members, civil service personnel employed on Beale AFB and their families, and guests of the above. The public is not allowed general access to the base, but may be permitted controlled access for special events. Hunting is only open to those individuals listed above, dependent on FPCON level. Hunting or fishing guests must be accompanied, and no more than two guests are allowed per hunting visit. • Groups permitted to hunt on Beale AFB by FPCON level: • Force Protection Normal: No specific restrictions except those outlined in this INRMP, which will be superseded by the Beale AFI Supplement, once approved. • Force Protection Alpha: No specific restrictions except those outlined in this INRMP, which will be superseded by the Beale AFI Supplement, once approved. Volunteer game wardens will increase patrols of all known hunting areas and remote parts of the base in support of Force Protection initiatives. • Force Protection Bravo: Hunting is limited to active duty military, family members of active duty military assigned to Beale AFB, military retirees, and civilian workers assigned to Beale AFB. Guests are not authorized to hunt on base. The base CLEO and volunteer game wardens will increase patrols of all known hunting areas and remote parts of the base in support of Force Protection initiatives. • Force Protection Charlie/Delta: Hunting is terminated until further notice. The base CLEO or designee will respond to the hunting sign-in book and begin calling all hunters in the field. Any available volunteer game warden will respond to assist. <ul style="list-style-type: none"> ◦ Note 1: Hunting will not automatically resume if the Force Protection level is reduced. The CLEO will determine the re-opening of hunting on base after close coordination with 9 SFS and the base leadership.

Table 1-1. Installation-specific policies (including state and/or local laws and regulations)

Installation-Specific Policies* (including State and/or Local Laws and Regulations)	
	<ul style="list-style-type: none"> Note 2: The 9 SFS desk will be responsible for notifying the CLEO (or designee) of any change of Force Protection. The CLEO (or designee) will inform 9 SFS when hunting has reopened.
Title 14, California Code of Regulations (CCR)	<ul style="list-style-type: none"> All hunting and fishing are done IAW Title 14 CCR, as adopted by the California Fish and Game Commission. Base policies take precedent when more restrictive than Title 14, CCR.
Hunting and Fishing Permits¹	<ul style="list-style-type: none"> A Beale AFB hunting or fishing permit is required for anyone hunting or fishing on the base in addition to any other permits required by the state. Hunting permits are valid 1 July-30 June. Fishing permits are valid 1 January-31 December. Hunters must attend an annual safety course sponsored by the 9 CES/CEIEC and the volunteer game wardens and receive a signed Safety Course Authorization Form, which can be used to buy a hunting permit. The following permits and licenses must be carried at all times when hunting or fishing: (a) valid California hunting or fishing license; (b) applicable state hunting stamps (e.g., waterfowl or upland game bird stamps); (c) annual Beale hunting or fishing permit, filled out in ink; and (d) any other species-specific permits or tags.
Hunting Policies¹	<ul style="list-style-type: none"> Rifles, air and/or spring powered weapons may not be used for hunting. Buckshot is prohibited from use except by authorized personnel. No one may have a pistol in their possession while hunting or fishing. Use of lead shot prohibited. Recreational trapping of wildlife is prohibited. Coyote hunting is prohibited. Deer tags available to active duty military and retired military personnel only. The Beale AFB deer hunting season is from the 3rd Sat in Aug for 79 days. May be rescheduled by commanding officer with CDFW concurrence between season opener and Dec 31st. If individuals are drawn two years in a row in the deer tag lottery, they will be ineligible for the lottery in the following (3rd) year.
Fishing Restrictions¹	<ul style="list-style-type: none"> Fishing for native salmonids is catch and release only. Dry Creek is closed to fishing from 16 October to 15 April. Fishing is not permitted in Pond 4 or ponds/lakes with active construction sites. Lakes are closed to fishing during dam repair/maintenance and replacement projects. Lakes are subject to special fishing restrictions after sport fish stocking. Black bass limit 3/person/day, min size 15 in. Catfish limit 5/person/day min size 12 in, bullhead no limit.
Waterfowl Blind Policies¹	<ul style="list-style-type: none"> Blinds must be registered with 9 CES/CEIEC by September 1st. Blinds will not be placed within 150 yards of existing blinds or decoys in place. Blinds will be of the type that blend in with the surrounding environment and do not detract from the overall appearance of the area. Removable “net” like blinds will be used in areas where there is little shrub and tree growth and where permanent blind placement is not allowed.

Table 1-1. Installation-specific policies (including state and/or local laws and regulations)

Installation-Specific Policies* (including State and/or Local Laws and Regulations)	
	<ul style="list-style-type: none"> • Permanent floating blinds are not allowed. • Digging or the removal of live natural vegetation for the construction of blinds will not be permitted. • Planting or creating blinds out of live nonnative vegetation is prohibited. • Decoys will be removed when leaving the area. • Blinds constructed by hunters and left for the duration of the waterfowl hunting season will have the builder’s name and contact numbers (home/cell and work) conspicuously posted. • Blinds, once constructed, will be available to others when coordinated with the blind builder. • Each waterfowl hunter is limited to one blind.
Recreation Restrictions¹	<ul style="list-style-type: none"> • Activities such as gold panning and/or other mineral extraction or soil disturbance in base waterways, metal detecting, camping outside of designated areas, and any other activities not covered in Section 7.2, <i>Outdoor Recreation and Public Access to Natural Resources</i>, are prohibited without approval from the CEIEC NRM. • Any activities from which an individual may make a monetary profit from products or materials collected on Beale AFB are prohibited. • Campfires are not permitted on Beale AFB. • Gas-powered boats are not permitted on any base water bodies. • Recreational off-road driving of any motorized vehicle, including all-terrain vehicles and side-by-sides, is prohibited at all times.
Removal and Replacement of Landscaping Plants	<ul style="list-style-type: none"> • Removal of native and ornamental trees and shrubs requires the approval of the NRM. When removal of vegetation becomes necessary, trees and shrubs will be replaced with equivalent plants from the Beale AFB Landscape Design Plant List (Appendix O), followed by at least two years of maintenance (watering and weeding). Mitigation plantings will be coordinated with the NRM.
Removal and Replacement of Native Oaks	<ul style="list-style-type: none"> • Mature native oak trees that are removed during construction or maintenance projects must be replaced at a 3:1 ratio to ensure continued oak regeneration. Removal and replanting must be coordinated through the NRM. When possible, the replacement tree will be planted in the same vicinity as the removed tree. The replacement trees must be a 15-gallon size or larger native oaks. Replacement trees will be maintained for three years to ensure establishment.
Revegetating Bare Areas	<ul style="list-style-type: none"> • Areas requiring re-vegetation for soil stabilization will be seeded using the base-approved seed mix (Appendix N).
Invasive Plants	<ul style="list-style-type: none"> • Planting species classified under the Cal-IPC inventory as invasive or potentially invasive plants is prohibited.
Nonnative Aquatic Animals	<ul style="list-style-type: none"> • Any nonnative aquatic animals (e.g., red-eared sliders, American bullfrogs) caught as bycatch during trapping efforts for other species will be euthanized or turned over to 9 CES/CEIEC.
Wildlife Exclusion Zone (WEZ) Restrictions	<ul style="list-style-type: none"> • The reintroduction and/or relocation of raptors on Beale AFB is prohibited. • Artificial wildlife nesting structures are prohibited within the WEZ (Figure 7-12). • Artificial wildlife nesting structures may be installed outside of the WEZ, but must be maintained and monitored under a managed program.

Table 1-1. Installation-specific policies (including state and/or local laws and regulations)

Installation-Specific Policies* (including State and/or Local Laws and Regulations)	
	<ul style="list-style-type: none"> • All hatched young and adult birds found using artificial nesting structures will be banded to the extent practicable. 9 CES/CEIEC will annually (September) provide a report of band numbers to the 9 RW/SEF. • Artificial nesting programs that are determined to be a Bird/Wildlife Air Strike Hazard (BASH) risk will be discontinued. • Allowing or assisting Canada goose (<i>Branta canadensis</i>) nesting on Beale AFB is prohibited. Canada goose nests found on Beale AFB will be destroyed, when practicable, IAW the Beale AFB depredation permit and the USFWS resident Canada goose nest and egg depredation order.

*Policies guided by AFMAN 32-7003

Acronyms used in table: 9 CES/CEIEC = 9th Civil Engineering Squadron; 9 RW/SEF = 9th Flight Safety; 9 SFS = 9th Security Forces Squadron; AFB = Air Force Base; AFI = Air Force Instruction; CAL IPC = California Invasive Plant Council; CDFW = California Department of Fish and Wildlife; CLEO = Conservation Law Enforcement Officer; FPCON = Force Protection Condition; IAW = In Accordance With; INRMP = Integrated Natural Resources Management Plan; NRM = Natural Resources Manager; USFWS = U. S. Fish and Wildlife Service; WEZ = Wildlife Exclusion Zone

1.4 Integration with Other Plans

The INRMP is multidisciplinary and provides the summary of natural resources at Beale AFB. The information from an INRMP is incorporated into other plans that help identify management priorities and are mutually supportive of the INRMP. Some of the key plans that are integrated with the INRMP are listed below:

BASH Plan guides program goals of providing the safest possible flying environment while complying with the Sikes Act. At Beale AFB, natural resources are a key component when planning management of bird/wildlife hazards through preventative measures that include (1) identification and monitoring of threats, (2) habitat modification, and (3) harassment and relocation to discourage and non-lethally remove wildlife. The BASH Plan (Beale AFB 2016a) is implemented and updated by a U.S. Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services (USDA APHIS WS) employee and Flight Safety (9 RW/SEF).

Integrated Cultural Resources Management Plan (ICRMP) identifies, inventories, documents, and protects all cultural resources on Beale AFB. The ICRMP (Beale AFB 2018a) provides support for mission activities while maintaining compliance with cultural resources regulations and legislation. At Beale AFB, cultural resources protection is incorporated into natural resources management when conducting habitat improvement and restoration, grazing activities, and fire management. Beale AFB is in discussion with local tribes on how to incorporate Native American stewardship of Native American cultural resources and native plants on the installation. This plan is implemented and updated by the Cultural Resources Manager (CRM) (9 CES/CEIEC).

Installation Pest Management Plan (IPMP) outlines effective control methods for pest species (insects, rodents, mammals, birds and weeds) to minimize the impact to the military mission, natural resources and installation structures. The IPMP (Beale AFB 2018b) identifies which offices are responsible for the control of pest and nuisance animals and invasive plants. The plan provides processes for the safe and responsible use of pesticides in relation to human health and safety and natural resources protection. The IPMP is implemented and updated by the 9th Civil Engineering Squadron Operations Infrastructure Pest Management Shop (9 CES/CEOI).

Golf Course Environmental Management (GEM) Plan facilitates effective golf course management while minimizing environmental impacts and promoting the game of golf. At Beale AFB, the GEM Plan (Beale AFB 2014) provides for endangered species habitat awareness and management, maintaining water quality standards, utilizing pest management methods that protect the waterways, and ensuring water quality protection measures are incorporated to protect waterways on the golf course. The plan was prepared by Civil Engineering & Force Support Environmental and Golf staffs and implemented by the Coyote Run Golf Course.

Wildland Fire Management Plan (WFMP) provides for wildland fire prevention, management, and safety using methods that protect public property and natural and cultural resources. At Beale AFB, the WFMP (Choleta 2018) outlines methods to reduce undesirable plant species, protect sensitive habitats and procedures that support natural resource processes naturally influenced by fire. This plan is implemented by 9 CES/FES and 9 CES/CEIEC.

Storm Water Pollution Prevention Plan (SWPPP) outlines how the installation prevents discharges of potential pollution from industrial operations to storm water. The SWPPP (Beale AFB 2015) contains procedures to minimize the risk of industrial storm water pollution in drainage areas located within the installation's boundaries. This plan is implemented and updated by the Storm Water Manager (9 CES/CEIEC).

Installation Complex Encroachment Management Action Plan (ICEMAP) assists the Installation Commander, decision-makers, and stakeholders in identifying, preventing, and reducing encroachment challenges. This ICEMAP (Marstel-Day 2015) specifically analyzes the current and potential encroachment and sustainment challenges on or near Beale AFB and provides recommended management actions to address them. 9 CES/CEIE is a recommended stakeholder for some of the actions in this plan. This plan is implemented by base Command.

Installation Development Plan (IDP) replaces the General Plan. The IDP (ACC 2017) outlines planning and programming information related to land use, resource conservation, facilities and infrastructure development, and operations and maintenance. At Beale AFB, natural resource areas are key components in planning and development throughout the base. Wetland and endangered species habitat evaluations are key steps in determining locations for future development. This plan is implemented by Base Planning (9 CES/CENP).

Stand-Alone Plans and Guidelines—This INRMP also incorporates information and goals from various stand-alone plans and guidelines including the Invasive Plant Species Management Guidelines (IPSMG) (Hopkinson 2017a) and Grazing Management Guidelines (GMG) (Hopkinson 2017b). These plans are implemented by 9 CES/CEIEC.

Historical Plans

Below is a list of plans that are referenced in previous versions of the Beale AFB INRMP or other base planning documents. These plans have been superseded by newer plans or were never properly formalized or approved and, as such, are no longer implemented or serve as guidance documents. A brief description of each plan is included in Appendix B.

Base-wide Plans

- Base Comprehensive Plan (1997)
- Environmental Study of Growth Scenarios (1997)

- General Plan (1998)

Individual Plans

- Woodland Management Plan (1989)
- Community Forest Master Plan (1982)
- Fish and Wildlife Management Plan (1991)
- Urban Forestry Plan (1997)

2.0 INSTALLATION PROFILE

Table 2-1. INRMP responsibilities and scope.

Office of Primary Responsibility	9 CES/CEIE has overall responsibility for implementing the Natural Resources Management program and is the lead organization for monitoring compliance with applicable federal, state and local regulations
Natural Resources Manager/POC	Name: Tamara Gallentine Phone: (530)634-2738 Email: tamara.gallentine.2@us.af.mil
State and/or Local Regulatory POCs (Sikes Act cooperating agencies)	<u>USFWS</u> Cathy Johnson Habitat Conservation Division, Sacramento Fish and Wildlife Office 2800 Cottage Way, W-2605 Sacramento, CA 95825 <u>NOAA/NMFS</u> Howard Brown Sacramento River Basin Chief 650 Capitol Mall, Suite 5-100 Sacramento, CA 95814 <u>CDFW</u> Henry Lomeli 629 Entler Ave. Ste 12 Chico, CA 95928
Total acreage managed by installation	23,427 acres (23,192 Beale AFB and 235 LRS)
Total acreage of wetlands	2,550 acres (Beale AFB 2015 LiDAR)
Total acreage of forested land	Approx. 1,000 acres (oak woodland and riparian forest)
Does installation have any Biological Opinions?	Yes, see Table 7-2 in Section 7.4.3 <i>Current Biological Opinions and Consultations for T&E Species, and Their Terms and Conditions</i> All BOs and NLAAs on 9 CES share drive in folder: F:\CEAN\Conservation\NaturalResources\REGULATORY\USFWS
NR Program Applicability (Document applicability and current management practices in Section 7.0)	<input checked="" type="checkbox"/> Fish and Wildlife Management <input checked="" type="checkbox"/> Outdoor Recreation and Access to Natural Resources <input checked="" type="checkbox"/> Conservation Law Enforcement <input checked="" type="checkbox"/> Management of Threatened, Endangered, and Host Nation-Protected Species <input checked="" type="checkbox"/> Water Resource Protection <input checked="" type="checkbox"/> Wetland Protection <input checked="" type="checkbox"/> Grounds Maintenance <input checked="" type="checkbox"/> Forest Management <input checked="" type="checkbox"/> Wildland Fire Management <input checked="" type="checkbox"/> Agricultural Outleasing <input checked="" type="checkbox"/> Integrated Pest Management Program <input checked="" type="checkbox"/> Bird/Wildlife Aircraft Strike Hazard (BASH) <input type="checkbox"/> Coastal Zone and Marine Resources Management

Table 2-1. INRMP responsibilities and scope.

	<input checked="" type="checkbox"/> Cultural Resources Protection <input checked="" type="checkbox"/> Public Outreach <input checked="" type="checkbox"/> Geographic Information Systems (GIS)
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2.1 Installation Overview

2.1.1 Location and Area

Beale AFB occupies 23,192 acres in Yuba County, California, in the northeastern portion of the Sacramento Valley, at geographical coordinates 39°08° N and 121°26° W. The main base is approximately 40 miles north of Sacramento, 25 miles south of Oroville, 8 miles east of Marysville, and 20 miles west of Grass Valley (Figure 2-1). Beale AFB is also responsible for the management of three GSUs (

, Figure 2-1): a NEXRAD weather station near Oroville, CA; a deactivated base near Point Arena, CA; and the LRS.

The 235-acre LRS is located in Placer County, approximately 15 miles south of Beale AFB and 5 miles west-southwest of Lincoln, California. McClellan AFB managed the site until October 2000, when responsibility of the site was transferred to Beale AFB in preparation of McClellan’s closure in July 2001.

The Oroville NEXRAD site is located 25 miles north of Beale AFB. The property is too small to contain significant natural resources.

Point Arena is located 190 miles northwest of Beale AFB near Point Arena, CA. The site was activated as a Ground-Control Intercept (GCI) warning station and Ground Air Transmitter and Receiver (GATR) site in 1950. The base was transferred from Travis to Beale AFB in 1979. The site was deactivated, but Beale AFB retains caretaker status. 9 CES/CEIER is conducting hazardous material removal and other actions needed to prepare the site for disposal. Natural resources on this property are not managed due to its deactivated status.

Beale AFB is in the ecological and geographic transition zone between the flat agricultural lands of the Sacramento Valley and the foothills of the western slope of the Sierra Nevada Mountains. The Yuba and Bear rivers are to the north and south of Beale AFB, respectively. The base is in the Bear River watershed, and three named tributaries to the Bear River (Reeds, Hutchinson, and Dry creeks) run through the base.

Land use in the Sacramento Valley near Beale AFB is primarily agricultural, rural-residential, and industrial. Several aggregate extraction operations are located north of Beale AFB. Along the eastern boundary of the base, where the valley begins to rise into the Sierra Nevada foothills, is the larger of two parcels that constitute the Spenceville Wildlife Area (SWA) managed by CDFW. Beale AFB also borders three contiguous conservation easements to the northeast (see Section 2.1.6.3 Conservation Easements).

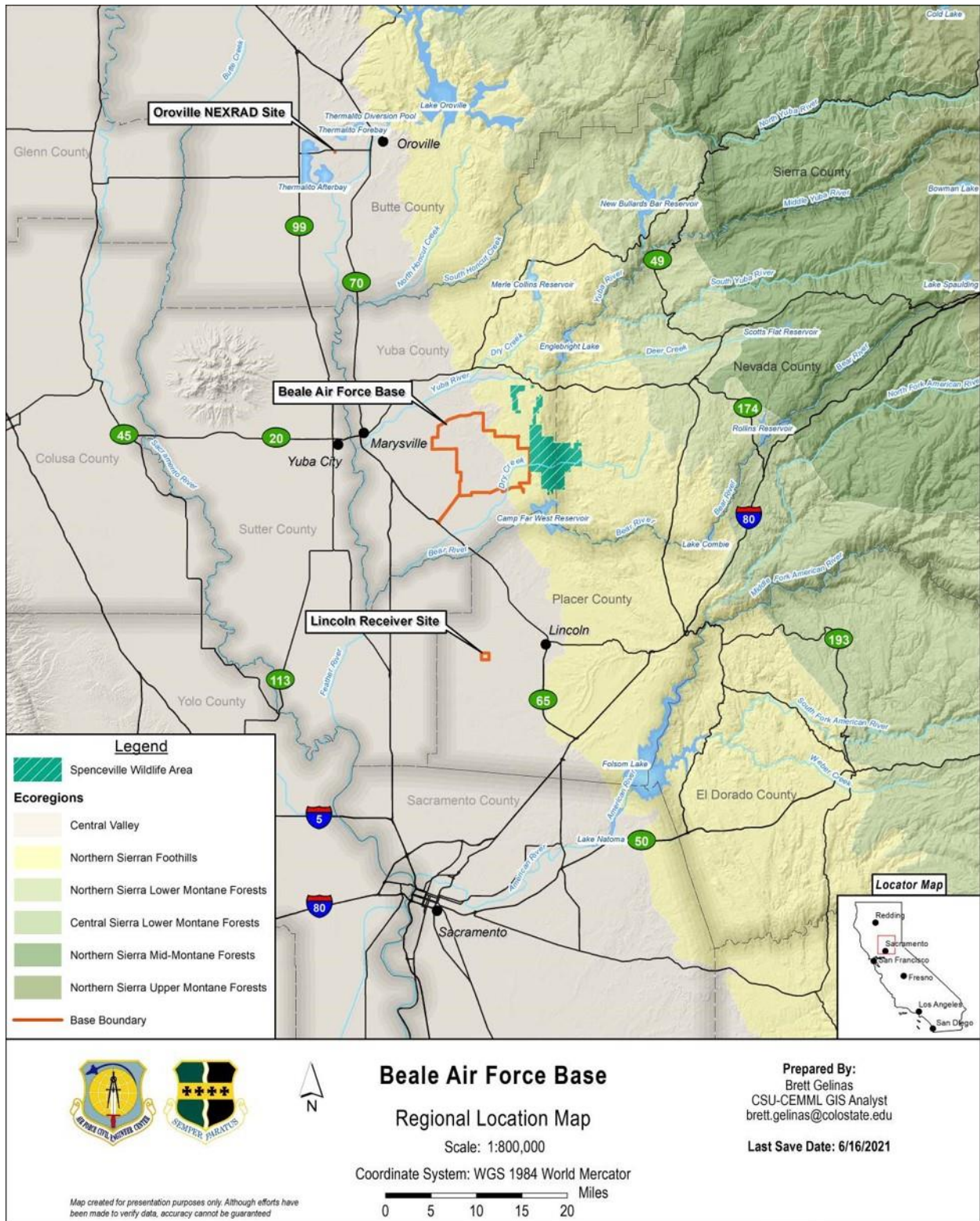


Figure 2-1. Regional location (Beale AFB GeoBase 2021, U.S. Census Bureau 2018, SCGIS Administration 2019).

Table 2-2. Installation and GSU locations and area descriptions (Source: Beale AFB 2019 INRMP, Real Property 2018).

Base/GSU Name	Main Use/Mission	Acreage	Addressed in INRMP?	Describe Natural Resource Implications
Beale AFB	High-altitude reconnaissance, training, full base operations	23,192	Yes, throughout	T&E species, vernal pools, noxious weeds, active base
Lincoln Receiver Site	Global High Frequency for U.S. Air Force/U.S. Navy West Coast Operations	235	Yes	T&E species, vernal pools, isolated site, noxious weeds
Oroville NEXRAD site	Weather radar site, no other use	0.16	No	Vernal pools, adjacent to golf course
Point Arena	Beale AFB has caretaker status	150	No	Hazardous material clean-up, T&E species

Acronyms in table: GSU = Geographically Separated Units; T&E = Threatened and endangered.

2.1.2 Installation History

The area in and around Beale AFB was inhabited by the Native American group known ethnographically as the Nisenan (also known as the Southern Maidu). The Nisenan territory encompassed the lower Feather River drainage. It extended north to include the Yuba River watershed, south to include the whole of the Bear and American river drainages and east to the crest of the Sierra Nevada Mountains. The upper reaches of the Consumnes River were occupied by the Nisenan people as well.

The first substantial contact with Euroamericans on Nisenan land took place between 1826 and 1836 when the Hudson's Bay Company conducted intensive fur trapping in the region. This contact exposed the Native American people to many new diseases to which the populations had no immunity. The Nisenan people lost 75% of their population during the epidemic of 1833 (Jones & Stokes Associates 1997a). The surviving Nisenan moved into the foothills and were displaced, dispersed, or died during the Gold Rush, which began in 1848. Thirty to fifty years after Euroamerican contact, nearly all Nisenan had vanished (Jones & Stokes Associates 1997a). Today, the majority of the Maiduan people (including persons descended from Nisenan, Konkow and Maidu groups) live in areas traditionally inhabited by their ancestors (Pacific Legacy 1998).

Early Europeans occupying the land that is now Beale AFB used the land for grazing cattle and dryland farming. Camp Beale became an Army base in 1942. It covered 85,000 acres including the 23,192 acres that Beale AFB currently occupies. The installation was named for General Edward Fitzgerald Beale, a famous military courier and explorer, Commissioner of Indian Affairs, Brigadier General of Militia for the State of California, leader of the first expedition of the U.S. Camel Corps, and U.S. Minister to Austria. The facility was used during World War II as an infantry training center, a personnel replacement depot and a prisoner-of-war camp. Maneuvers involving both tanks and aerial bombardment also took place at the base (Jones & Stokes Associates 1997a).

Camp Beale was declared surplus in 1947 and transferred to the USAF in 1948. The base was re-designated as the Beale Bombing and Gunnery Range and used as a flight training facility by the Aerial Observer Bombardier School at Mather AFB in Sacramento. Six 1,200-acre targets were designated and used in the training of bombardiers and navigators in radar techniques. In 1951, the base was officially re-designated as Beale AFB and used primarily as a training base for aviation engineers who used the base as a construction training ground. During the 1950s, the base underwent several organizational changes,

including periods as part of Air Training Command, Continental Air Command, Aviation Engineer Force, and Strategic Air Command. In 1959, the base was assigned the 14th Air Division and became the support base for three Titan Missile sites. In 1965, the Titan I missile program and the base squadron were deactivated. About the same time, the 420th Strategic Reconnaissance Wing (SRW), which was later redesignated as the 9 SRW (later the 9th Reconnaissance Wing [9 RW]), was activated on the base. Each of these commands and missions has resulted in the need to develop various facilities on base and other ground-disturbing activities.

Since the base was transferred to the USAF in 1948, approximately 63,000 acres of base lands have been auctioned to private landowners or included in the SWA. Currently, Beale AFB covers 23,192 acres (Real Property, email comm. 2018). Although the overall size of the base has been reduced, expansion of base missions, operations, and staffing have increased development on remaining base lands from the 1950s to the present.

2.1.3 Military Missions

The host organization at Beale AFB is 9 RW, an Air Combat Command (ACC) organization reporting to the 12th AF, based at Beale AFB since 1966. The mission statement of the 9 RW is: “Train, deploy and employ Beale Airmen and assets to deliver globally integrated intelligence, surveillance, and reconnaissance in support of national objectives.”

Beale AFB air operations are primarily focused on reconnaissance activities utilizing the RQ-4 Global Hawk and U-2 airframes. The RQ-4 Global Hawk is a high-altitude, long-endurance, remotely piloted aircraft with an integrated sensor suite that provides global all-weather, day or night intelligence, surveillance, and reconnaissance capability. The U-2 is a single-seat, single-engine, high-altitude reconnaissance aircraft, which is the highest-flying manned aircraft in the world. 9 RW currently also operates the U-2S and U-2ST (two-seat version). Additionally, T-38 aircraft are used as a part of the training curriculum for U-2 pilots. As of 2016, Beale AFB hosts a reserve air refueling wing contingent (940 ARW) with eight KC-135 aerial refueling tankers.

The USAF Global Communication Program provides Commanders-in-Chief United States Strategic Command a means of controlling strategic forces and also provides national command authorities the ability to exercise command and control of tactical/strategic aircraft. LRS technicians maintain automated communication systems, including SCOPE Command, Defense Information Systems Agency's integrated digital node switching, and T1 circuit connections for long-haul data, voice, and remote-control operations from the master net-control station at Andrews AFB.

There are three major tenant units located on Beale AFB (Table 2-3): 940 ARW, 7 SWS, and 548th Intelligence Group (548 ISR GP). 7 SWS operates the Precision Acquisition Vehicle Entry Phased Array Warning System (PAVE PAWS). 548 ISR GP consists of three squadrons. The 13th and 9th Intelligence Squadrons are responsible for the production and exploitation of the tangible intelligence, and the 48th Intelligence Squadron provides maintenance and sustainment of in-garrison & deployed segments of the AF Deployable Ground Station-2 (DGS-2) weapon system. Tenant units coordinate with 9 CES/CEIEC for issues related to natural resource management.

As of 2016, the total employee population at Beale AFB was approximately 4,224 active duty military personnel, 15 Air Force Reserve/Air National Guard (ANG), 687 non-extended duty ANG, and 1,339 civilians. As of September 2016, housing facilities provided for 76 officers and 424 enlisted families. Dormitories provided housing for 503 enlisted and transient personnel. Additional temporary lodging is under construction and will be available in fiscal year (FY) 19.

The base-managed LRS contains a global high frequency (HF) radio communications receiver that provides quality HF communications for USAF/U.S. Navy West Coast operations. The site provides rapid, reliable, two-way, long-haul HF communications between ground agencies, water vessels, DoD aircraft, and Mystic Star Presidential/ Very Important Person (VIP) support.

Table 2-3. List of tenants hosted at Beale AFB by 9 RW.

Tenant Organization
9th Reconnaissance Wing (9 RW) (Host)
940th Air Refueling Wing (940 ARW)
7th Space Warning Squadron (7 SWS)
548th Intelligence Group (548 ISR GP)
Air Force Office of Special Investigations Detachment 218 (AFOSI Det 218)
Air Combat Command Training Support Squadron Detachment 11 (ACC TRSS Det 11)
53rd Test and Evaluation Group Detachment 2 (53 TEG Det 2)
195th Wing California Air National Guard
713th Combat Operations Squadron Patch (713 COS)
13th Reconnaissance Squadron Patch (13 RS)—GSU of the 726th Operations Group
Pacific Liaison Region Civil Air Patrol Detachment 8 (PLR CAP Det 8)
372nd Training Squadron Detachment 21 (372 DS Det 21)

Source: Beale AFB 2019 INRMP, www.beale.af.mil 2018

2.1.4 *Natural Resources Needed to Support the Military Mission*

The primary aspects of the mission that are supported by natural resources are usable open space for flight operations and infrastructure expansion, recreation opportunities, and clean water. Proper management of natural resources through implementation of this INRMP, such as maintenance of biodiversity, reduces the likelihood of future possible legal restrictions such as new federally listed species under the ESA. There is the potential for impacts to natural resources during an emergency response. In order to protect life, limb and eyesight or to stop an immediate threat, Security Forces or other Beale emergency services may need to enter protected land either on foot or in a vehicle. Compliance with federal environmental laws will not delay or impede real-world security responses.

2.1.5 *Surrounding Communities*

2.1.5.1 **Communities**

Beale AFB is located in Yuba County, California, 40 miles north of the state capital of Sacramento (Figure 2-1). To the west of the base, in Yuba County, is the city of Marysville. Across the Feather River from Marysville is Yuba City, the capital of Sutter County. To the south, in Yuba County, is the town of Wheatland. South of Wheatland, are the cities of Lincoln and Roseville, located in Placer County. In the foothills to the east, in Nevada County, are the towns of Grass Valley and Nevada City. Unincorporated

communities located near the base include Linda, Olivehurst and Plumas Lake to the west, and Brown's Valley, Loma Rica and Smartsville to the north and east.

Yuba County—The city closest to Beale AFB is Marysville, located 13 miles away in Yuba County. The city sits on the east bank of the Feather River, where the Yuba and Feather rivers meet. In 2016 the population of Marysville was 12,250, up 1.5% from 2010 (U.S. Census Bureau 2016). In 2016 Yuba County had a population of 75,600, up 4.3% from 2010 (U.S. Census Bureau 2016). Agriculture is a major industry in Yuba County with a gross value of \$230 million in 2015. Top agricultural crops are walnuts, rice, prunes, and peaches (Yuba County 2015). Other major industries include cattle ranching and hay production, mining (primarily aggregate), and timber harvesting and processing.

Sutter County—Yuba City, located 16 miles to the northwest of the base, is part of Sutter County. It sits across from Marysville on the west bank of the Feather River, which constitutes the border between Yuba and Sutter counties. In 2016 Yuba City has a population of 66,845 and Sutter County had a population of 96,651, both increased roughly 2% from 2010 (U.S. Census Bureau 2016). Like Yuba County, agriculture is a major industry in Sutter County, which produces much of the world's rice, peaches, prunes, walnuts, and tomatoes.

Placer County—Twenty miles to the south of Beale AFB, in Placer County, are the cities of Lincoln and Roseville. Placer County had a population of 380,531 in 2016, up 9.2% from 2010 (U.S. Census Bureau 2016). Although relatively distant from the base, the rapidly expanding urban and suburban areas associated with the greater Sacramento area pose the greatest risk of urban encroachment.

Nevada County—Grass Valley is located 25 miles to the east of the base in Nevada County. In 2016, Nevada County had a population of 99,107, up 0.4% since 2010 (U.S. Census Bureau 2016). Most of the population in Nevada County is concentrated in the southern part of the county around Grass Valley and Nevada City.

2.1.5.2 Land Use

To the west and south of the base, land use is primarily agricultural, which creates a buffer between the base and the unincorporated community of Linda (Figure 2-1). Growth in Marysville is limited by the natural boundaries created by the Yuba and Feather rivers. Land uses in the unincorporated communities to the east of the base are a mix of residential, commercial, and industrial. Population growth is relatively slow, but urban expansion has occurred in this area. Increased industrial activity could negatively impact the base by generating pollutants, increasing traffic, and erecting structures that could interfere with air traffic.

To the north and east of Beale AFB are unincorporated communities, with land use being primarily rural-residential. This area includes the placer gold and aggregate mining Yuba Gold Fields operation adjacent to the base across Hammonton-Smartsville Road. Along the northern and northeastern boundary, there are three properties that Beale AFB has restrictive (conservation) easements on (see Section 2.1.5.3, *Conservation Easements*), and act as a buffer from development.

Land use is primarily agricultural in the area between Beale AFB and the town of Wheatland to the south. Crops grown here include rice, alfalfa, safflower, and corn, as well as peaches, walnuts, prunes, pears, and almonds. Land use in the Wheatland area is characterized as residential, commercial, and industrial. Expansion of any of these land uses has the potential to affect the base. In particular, groundwater pumping for agricultural irrigation has the potential to significantly alter the level of the water table under Beale

AFB. Past groundwater pumping had significant impacts prior to surface irrigation provided by the construction of the South Yuba Canal in 1983 (CH2M HILL 2017). Groundwater pumping for irrigation still occurs in drought years and may become more common as the effects of climate change are felt in the region.

The land between the base and the city of Grass Valley is foothill woodlands. Most of the land in this area is rural-residential, with some small-scale ranching and agriculture. At this time, the very slow rate of population growth, hilly to mountainous terrain, and existing conservation easements make encroachment of any kind from Nevada County unlikely.

2.1.6 Local and Regional Natural Areas

2.1.6.1 Local Land Condition and Natural Resources

The lands surrounding Beale AFB are primarily used for agriculture (Figure 2-2, Figure 2-3). Croplands, pastures, and rural properties provide varying degrees of benefit to wildlife. Rice fields are irrigated during the growing season, and the systems of canals and ditches used for irrigation serve as habitat for both native aquatic species, such as gartersnakes (*Thamnophis* sp.), as well as nonnative aquatic weeds and American bullfrogs (*Lithobates catesbeianus*). In the winter, fallow fields and pastures attract foraging waterfowl and ground-foraging songbirds. Weedy areas and hedgerows are used by small mammals and nesting birds. Crops themselves are also an attractant for birds and other animals.

A contiguous riparian woodland lines Dry Creek from the SWA where it flows onto the base to where it exits the southern base boundary. Summer water levels in Dry Creek depend on releases by the Nevada Irrigation District. Dry Creek and Best Slough, a seasonal fork in the creek, leave Beale AFB at its south/southeastern boundary and eventually drain into the Bear River. The Yuba River to the north and the Feather River to the east contain riparian habitat similar to that along Dry Creek and Best Slough. These areas support many native plant and animal species, including multiple special-status fish and wildlife species.

Reeds Creek stems from a spring off-base above Miller Lake and receives additional water from an irrigation canal on the northwest side of the base. Hutchinson Creek is fed by impoundments on the base, rain, small drainages and seeps north of the base. Reeds and Hutchinson creeks exit Beale AFB to the south and pass through cropland before reaching the Bear River (Figure 2-2). Washed-out and frequently flooded areas along the Yuba River support willow (*Salix* spp.) thickets and Armenian blackberry (*Rubus armeniacus*) stands similar to those found along Reeds and Hutchinson creeks.

2.1.6.2 Wildlife Areas

The SWA, operated by CDFW, is the most significant natural area in the vicinity of Beale AFB. The SWA is a public recreation area with opportunities for hunting, hiking and other outdoor recreation. The wildlife area is divided into two sections covering approximately 12,000 acres of what was previously part of Camp Beale. The larger of these two areas abuts the eastern boundary of the current Beale AFB. The oak woodlands on the eastern portion of Beale AFB make up a small portion of a much larger expanse of woodlands on the SWA.

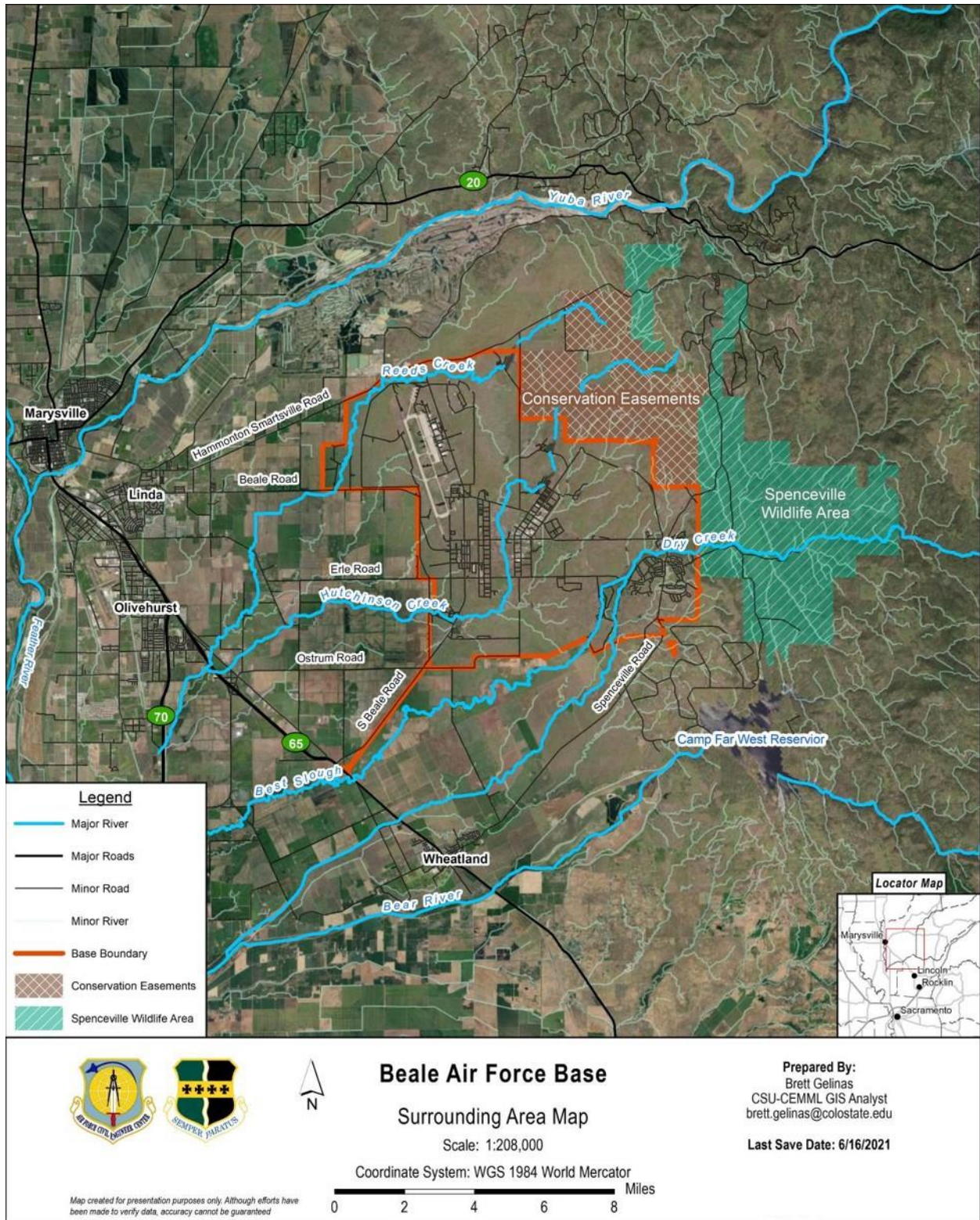
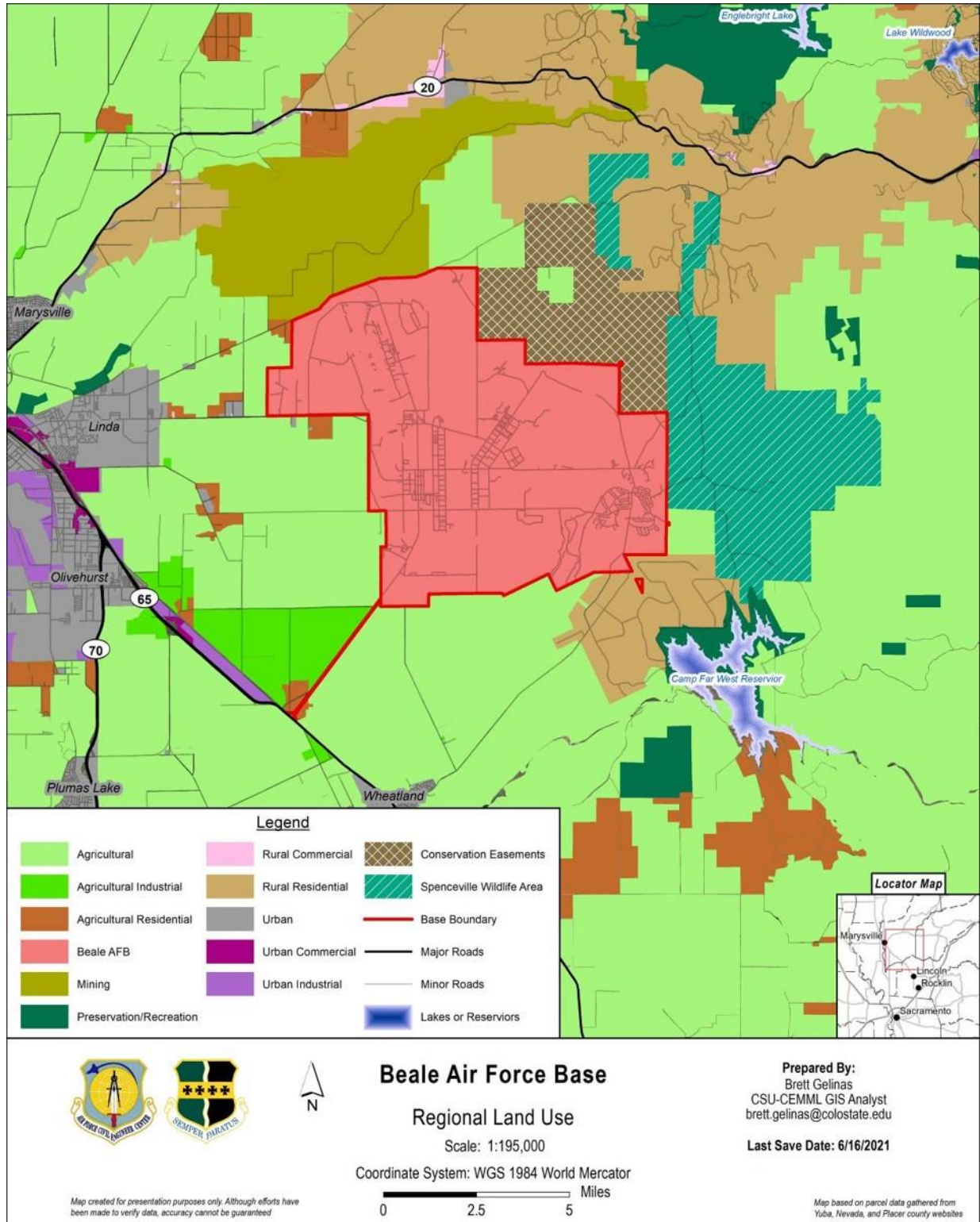


Figure 2-2. Location of Beale AFB, Spenceville Wildlife Area, and regional creeks.



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Figure 2-3. Regional land use (Beale AFB GeoBase 2021, U.S. Census Bureau 2018, SCGISAdmin 2019, Land IQ 2017).

2.1.6.3 Conservation Easements

Since 2011, Beale AFB has partnered with several agencies and non-profits to contribute funds to the purchase of conservation easements on three properties (Figure 2-3) deemed appropriate by the Readiness and Environmental Protection (REPI) Program. Restricting development on these properties protects the security needs of the base. In addition, the designation of these lands as conservation easements preserves natural habitats and contiguous open space around Beale AFB. The NRM will coordinate future conservation easements with CDFW to determine who should operate the property. CDFW will be given the right of first refusal before working through a land trust. Beale AFB is focused on western boundaries of the base and has requested over \$20 million in REPI and partner grants in 2018 for new easements there. Beale AFB does not manage the easements but retains status as grantee with rights to enforce and monitor them if needed.

Yuba Highland Property. The Yuba Highland property covers 2,453 acres of protected, contiguous open space in the Yuba Foothills directly north of the base and west of the SWA. The USAF and the Trust for Public Lands were granted a conservation easement over the property in 2011. The conservation easement is held and managed by CDFW. The property contains grazing land with riparian habitats and oak woodlands.

Marysville Ranch. The Marysville Ranch property is 1,277 acres of grassland and oak woodland habitat bordering the northeast corner of the base between the Yuba Highland property and the SWA. A conservation easement, granted over the property in 2013, is funded through a cooperative effort among CDFW, DoD, California Department of Transportation, and the Trust for Public Land. The easement preserves oak woodland savannas and maintains habitat linkages and open space buffers between the SWA and Beale AFB (Wildlife Conservation Board 2013).

Hidden Spring Ranch. In 2017, the USAF and the Trust for Public Lands were the granted a conservation easement over some of the land parcels that make up the Hidden Spring Ranch property. Acquisition of easements on other parcels of this property is ongoing. The property is composed of two distinct components totaling 2,325 acres of grazed agricultural land. The properties are located between the northern boundary of the base and Hammonton-Smartsville Road. The Bear Yuba Land Trust is the co-grantee and operator of the property.

2.1.6.4 Land Disposal

Land acquisition and disposal is handled by 9 CES/CEIA, which coordinates such actions with the Environmental Office. If parcels become available, the NRM will reach out to the INRMP CDFW Point of Contact (POC) to ask whether the parcel is desirable and coordinate with the 9 CES/CEIA and 9 RW/JAG on feasibility. Land disposal is planned at Point Arena Air Force Station.

2.2 Physical Environment

2.2.1 Climate

The regional climate around Beale AFB is Mediterranean subtropical, created by the base's location in the interior valley between the coast and Sierra Nevada mountain ranges. Because it is located inland from the Pacific Ocean, the valley experiences hot dry summers and cool wet winters. The region effectively has two seasons: a dry season lasting from May through October and a wet season lasting from November through April. The dry season is characterized by very low precipitation and warm temperatures. The wet

season is characterized by sometimes piercing northern winds and gusting southern winds, moderate precipitation, and cool temperatures.

The mean annual precipitation at Beale AFB is 21.9 inches, with almost 95% of all rainfall occurring from October through April (Beale AFB 2017a). Annual precipitation in California fluctuates significantly, with only seven out of the last 60 years having actual rainfall between 21 and 23 inches. This illustrates that the Mediterranean climate is defined by its variability; averages are seldom hit and should not be expected. The record high precipitation at the base is 38.5 inches and the record low is 4.3 inches (Figure 2-4). Winds at Beale AFB are channeled by the topography of the Sacramento Valley, with the prevailing wind direction at the base being south-southeast. The average wind speed is 5 knots, and the maximum annual gust is 77 knots.

Summer high temperatures can be extreme, reaching as high as 113 °F and persisting above 100 °F for many days at a time. Winters are mild, with a record low at Beale of 15.9 °F. The year-round average high temperature is 74 °F, and the year-round average low temperature is 50 °F (Figure 2-5). July is the hottest and driest month of the year, with the highest temperature ever recorded at Beale AFB (113 °F). From May-October, 100 °F days can be experienced, though most occur late June-September. The relative humidity is variable, with the average annual relative humidity being 61%.

Average temperatures and weather patterns at LRS are similar to Beale AFB. The average high temperature in July (normally LRS’s hottest month) is 95 °F and an average low of 38 °F in December and January, which are LRS’s historically coldest months. Total rainfall for the year averages 24.61 inches.

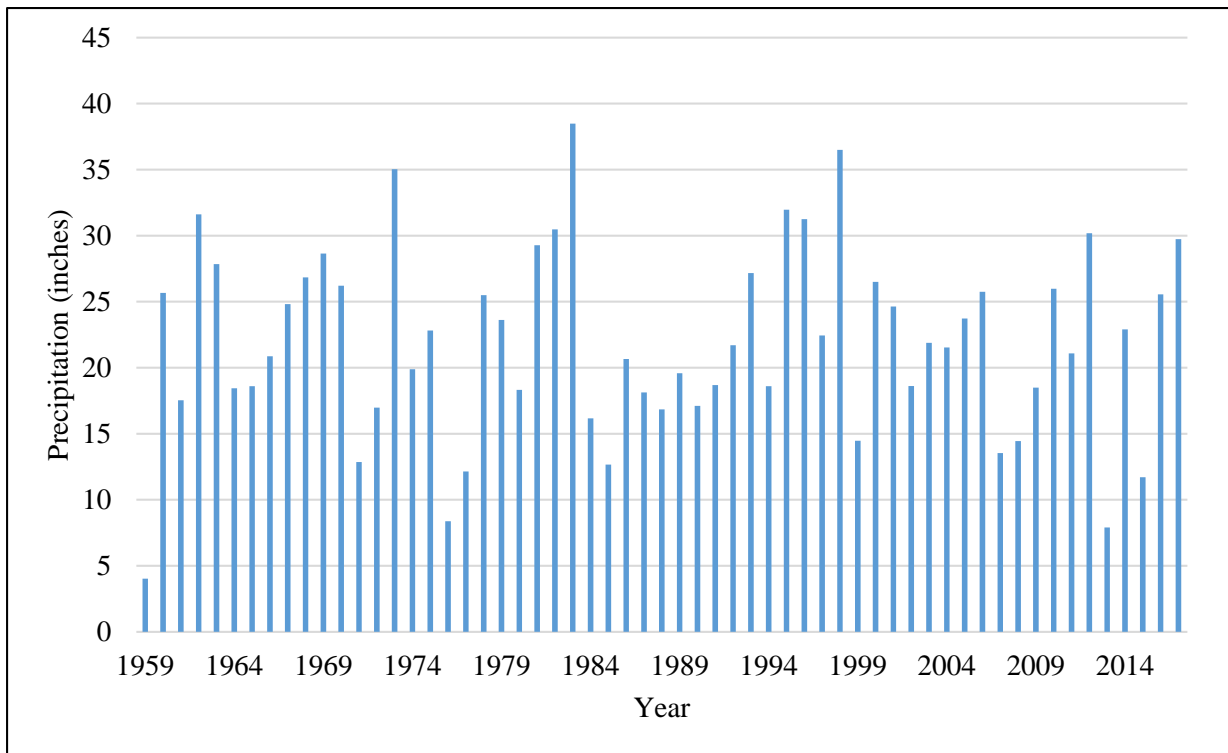


Figure 2-4. Annual precipitation totals recorded for Beale AFB 1959–2017 (Beale AFB 2017b).

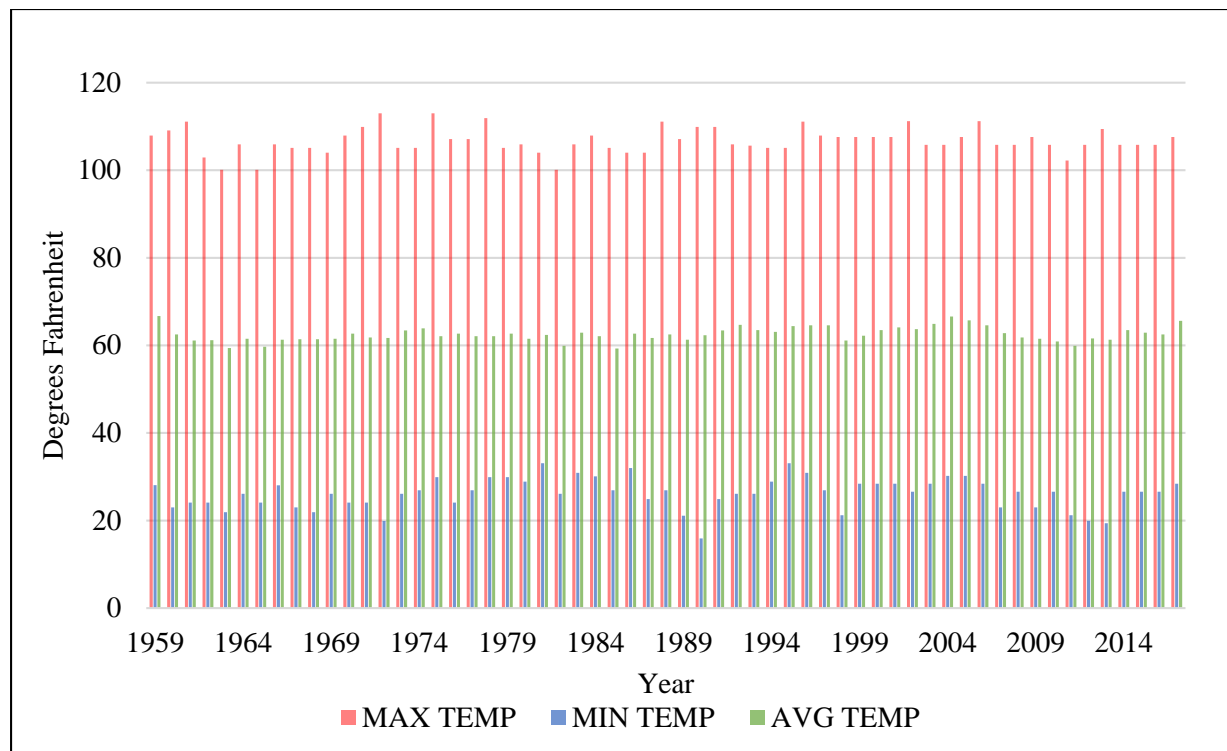


Figure 2-5. Minimum, maximum, and average annual temperatures recorded for Beale AFB 1959–2017 (Beale AFB 2017b).

Climate Change

Climate change reports were developed for all AF bases to meet the requirements for the inclusion of climate change in INRMPS per DoD Directive 4715.21, *Climate Change Adaptation and Resilience*, AFI 32-7064 and DoDI 4715.03 (Center for Environmental Management of Military Lands [CEMML] 2019). Climate data used in the report were generated originally for international climate assessment reports sanctioned and provided by the Intergovernmental Panel on Climate Change (Hibbard et al. 2007; Moss et al. 2008, 2010), and subsequently used by the US Fourth National Climate Assessment Report (USGCRP 2017). CEMML coordinated with AFCEC to establish a base historical time period, then choose two future time horizons and two future emission scenarios for climate models. Emission scenarios were based on assumptions about future worldwide changes in demographic development, socio-economic development, and technological change that result in different greenhouse gas concentrations in the atmosphere. Site-specific temperature and precipitation climate projections were generated for Beale AFB using the NASA DAYMET dataset, so the historical values are different than those reported by Beale AFB.

Data and analyses were generated for four climate change scenarios representing two global carbon emissions levels for two different target years. The emissions scenarios are medium emissions (RCP 4.5) and high emissions (RCP 8.5). The two timeframes are decades centered around 2030 (2026–2035) and 2050 (2046–2055). Climate projections for Beale AFB (Table 2-4) suggest minimum and maximum temperatures will increase over time for both RCP scenarios. For the decade centered around 2030, both scenarios project a similar degree of increase in average annual temperature of between 2.5 °F and 2.3 °F over the historic average. The two emissions scenario projections show higher warming by 2050, with RCP

4.5 expressing a warming of 3.0 °F and RCP 8.5 expressing a slightly greater warming of 4.0 °F for this period.

Table 2-4. Summary data of climate change analysis of the 30-year historical baseline period and the decadal average data for 2030 and 2050 for both emission scenarios (Source: CEMML 2019).

Variable	Historical	RCP 4.5		RCP 8.5	
	2000	2030	2050	2030	2050
Precip	28.9	32.9	29.5	29.0	32.2
Tmin	49.3	51.7	51.9	51.3	53.0
Tmax	75.9	78.6	79.3	78.6	80.2
Tave	62.6	65.1	65.6	64.9	66.6
GDD	5112	5709	5832	5674	6026
HotDays	90.4	110.3	117.7	115.7	117.3
WetDays	0.9	0.3	0.2	0	0.3

Acronyms in table: Precip = average annual precipitation; Tmin = annual average monthly average minimum temperatures °F; Tmax = annual average monthly average maximum temperatures °F; Tave = annual average temperature °F; GDD = average annual growing degree days with a base temperature of 50 °F; HotDays = average number of hot days exceeding 90 °F (average # of days per year); WetDays = annual number of days with precipitation exceeding 2 inches in a day (average # of days per year); RCP = Representative Concentration Pathway.

Average annual precipitation varies between emission scenarios and over time due to larger interconnected ocean-atmosphere dynamics associated with the National Center for Atmospheric Research Community Climate System Model. For 2030, the RCP 4.5 scenario projects an increase in average annual precipitation of 14% while RCP 8.5 shows a negligible increase of 0.3%. The 2050 RCP 4.5 scenario projects a small increase in average annual precipitation of 2%, while RCP 8.5 shows an increase of 11%.

Understanding changes in daily intensity and total precipitation for multi-day precipitation events is helpful to evaluate precipitation patterns in addition to assessment of annual averages. Three-day storm events (design storms) were generated from projected precipitation data based on RCP 4.5 and 8.5 emission scenarios for the 2030 and 2050 timeframes (Table 2-5, Table 2-6). Historical precipitation data were used to calculate a baseline storm event for the year 2000 for comparison. Each of the scenarios shows an increase in storm-related precipitation relative to the baseline.

Table 2-5. Climate change design storm precipitation for Dry Creek (source: CEMML 2019).

Design Storm		Baseline	RCP 4.5		RCP 8.5	
		2000	2030	2050	2030	2050
Precipitation (inches)	Day 1	1.79	2.51	1.84	1.66	1.98
	Day 2	1.62	3.58	2.84	1.98	3.40
	Day 3	2.00	2.05	1.68	2.32	1.90
	Total	5.41	8.14	6.36	5.96	7.28
Percent change from baseline			50%	18%	10%	35%

Acronyms in table: RCP = Representative Concentration Pathway.

Table 2-6. Climate change design storm precipitation for Hutchinson Creek (source: CEMML 2019).

Design Storm		Baseline	RCP 4.5		RCP 8.5	
		2000	2030	2050	2030	2050
Precipitation (inches)	Day 1	1.32	1.95	1.03	0.96	1.44
	Day 2	1.32	2.67	2.07	1.41	2.74
	Day 3	1.14	1.28	1.49	1.67	1.39
	Total	3.78	5.9	4.59	4.04	5.57
Percent change from baseline			56.1%	21.4%	6.9%	47.4%

Acronyms in table: RCP = Representative Concentration Pathway.

2.2.2 Landforms

The western and central portions of Beale AFB (which include the flightline and Main Base) consist of relatively flat grasslands, characteristic of the topography of the Central Valley. The eastern portion of the base (with the family housing area) contains low, rolling hills that gradually merge with the foothills of the Sierra Nevada Mountains. The elevation of Beale AFB ranges from 80-90 feet above mean sea level (National Geodetic Vertical Datum of 1929) along the western and southern boundary to more than 600 feet in the northeastern part of the base (Figure 2-6).

The topography of LRS is essentially level, with some shallow depressions, one drainage swale trending from south-southwest to north-northeast within the southeast area of the property, and a drainage canal flowing through the top northeast corner. Markham Ravine is located one mile to the north, and Auburn Ravine is located one-half mile to the south. The elevations of the site range between 84-95 feet above sea level. Surface drainage primarily flows toward the onsite swale.

2.2.3 Geology and Soils

2.2.3.1 Geology

Beale AFB is located on the boundary between the Great Valley and Sierra Nevada Geologic provinces. The Great Valley Province was formed as a basin between the Coast Range Province on the west and the Sierra Nevada Province on the east. The basin has filled with alluvial deposits from the erosion of the Sierra Nevada and the Coast ranges. Because of its location on the boundary of the two provinces, Beale AFB contains characteristics of both the Great Valley and the Sierra Nevada Mountains. Geological formations at LRS are similar to those at the Main Base. The hardpan at this site is near the surface.

Four geomorphic units, characteristic of the Great Valley Province, cover most of Beale AFB: river floodplains and channels of the Modesto Formation, low alluvial plains and fans of the Riverbank Formation, dissected uplands of the Mehrten Formation, and dissected uplands of the Laguna Formation (Figure 2-7). A fifth geomorphic unit, metavolcanic rock, occurs in the eastern portion of the base and is characteristic of the Sierra Nevada foothills.

- Modesto Formation river floodplains and channels lie along major drainages. As these streams have meandered in recent geologic time, they have deposited sand and gravel along their channels and silt and clay on their floodplains. These deposits range in thickness from 1-100 feet.
- Most of the western part of the base comprises Riverbank Formation low alluvial plains and fans. This unit is generally flat to gently rolling, with elevations ranging from 90 feet to approximately 200 feet. Little or no deposition is now occurring, and a mature soil profile containing cemented sediments has developed in many locations.
- The Mehrten Formation, located in the northern portion of the base, comprises dissected uplands consisting of volcanic mudflows that have been cut by stream activity.
- Dissected uplands of the Laguna Formation are located along the eastern edge of the Central Valley and make up most of the central portion of the base. This unit ranges from gently rolling land to dissected hills, with elevations of 100–300 feet above mean sea level.
- The eastern portion of the base contains the foothills of the Sierra Nevada Range. The surface rock in this portion of the foothills is metavolcanic rock. The topography becomes progressively steeper toward the east, with elevations exceeding 500 feet in some locations. Rock outcrops consist of older, consolidated sedimentary rocks. Along the eastern boundary of the base, crystalline basement rocks of the Sierra Nevada Mountains are exposed.

There are 14 soil map units of soil series or soil complexes on Beale AFB (Figure 2-8, Table 2-7; NRCS 2016) that can be grouped into two main categories: Central Valley Terraces and Sierra Nevada Foothill. The Main Base and flightline are on the valley soils. Family housing is on foothill soils. The subsoil consists of primarily sandy clay and gravel. Since the soils at Beale AFB contain a high amount of clay and have an underlying hardpan, the construction period is limited to the dry season. The Limited Operations Period for earth-disturbing activities is from 1 November–1 May to avoid problems arising from saturated soil in work areas. The soils become so soft during the wet season that even small All-Terrain Vehicles (ATVs) can get stuck.

The high clay content and underlying hardpan result in soils with slow permeability and a shallow rooting depth, which favor annual grasses and forbs. There are three types of valley soils that could be considered prime farmland if irrigated. However, there are a number of cropping limitations including poor fertility, flooding, and mound micro relief. The condition of the soils creates building restrictions as well, which are characterized by flood potential, shrink and swell potential, and poor soil drainage associated with the soil's cemented hardpan.

The foothill soils are suitable for wildlife habitat and livestock grazing. They favor native oaks, shrubs, forbs and annual grasses. Restrictions are soil depth (highly variable), slope (3-75%), and water erosion. Building restrictions consist of difficult slope, shallow depth to bedrock, and shrink-swell potential.

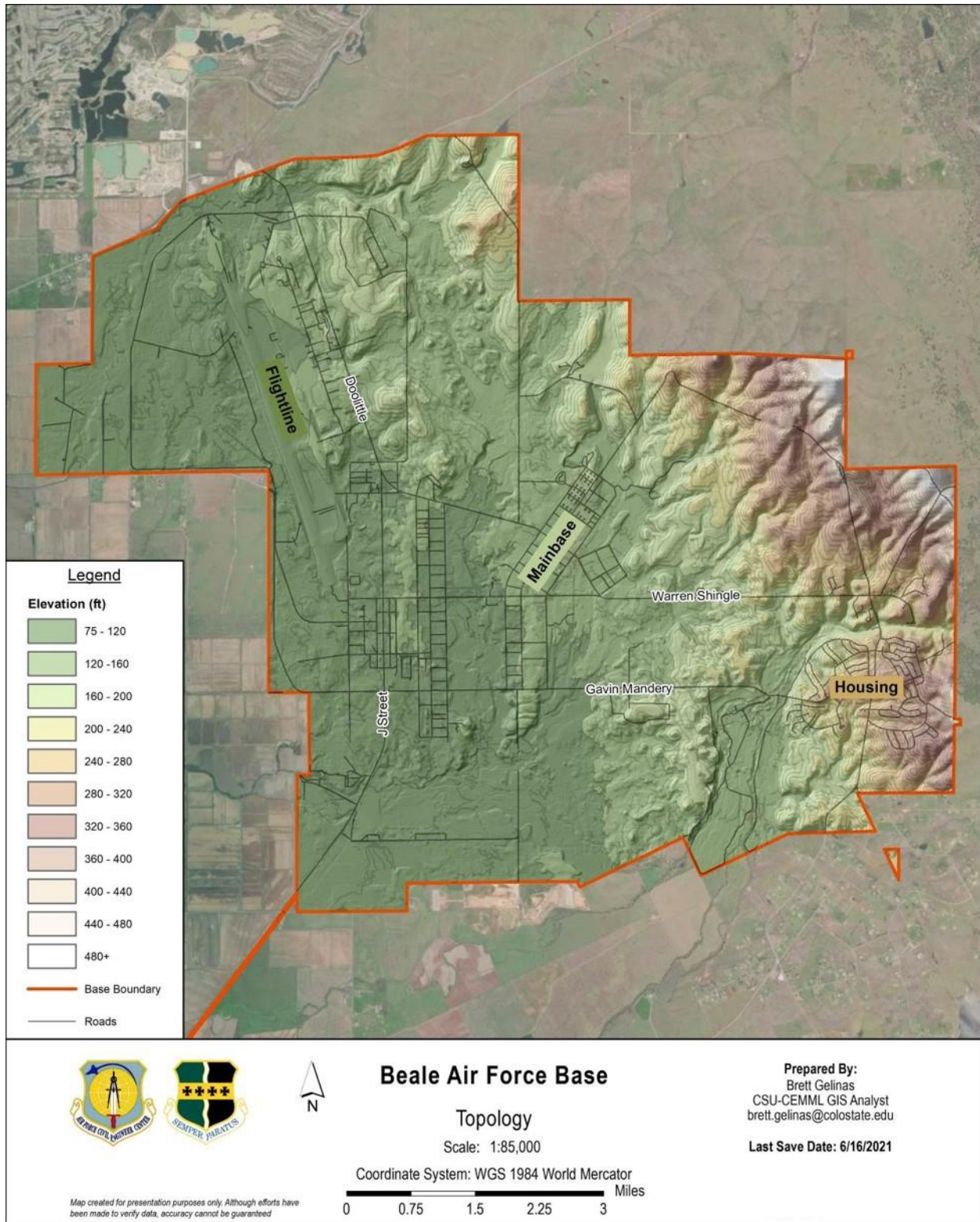
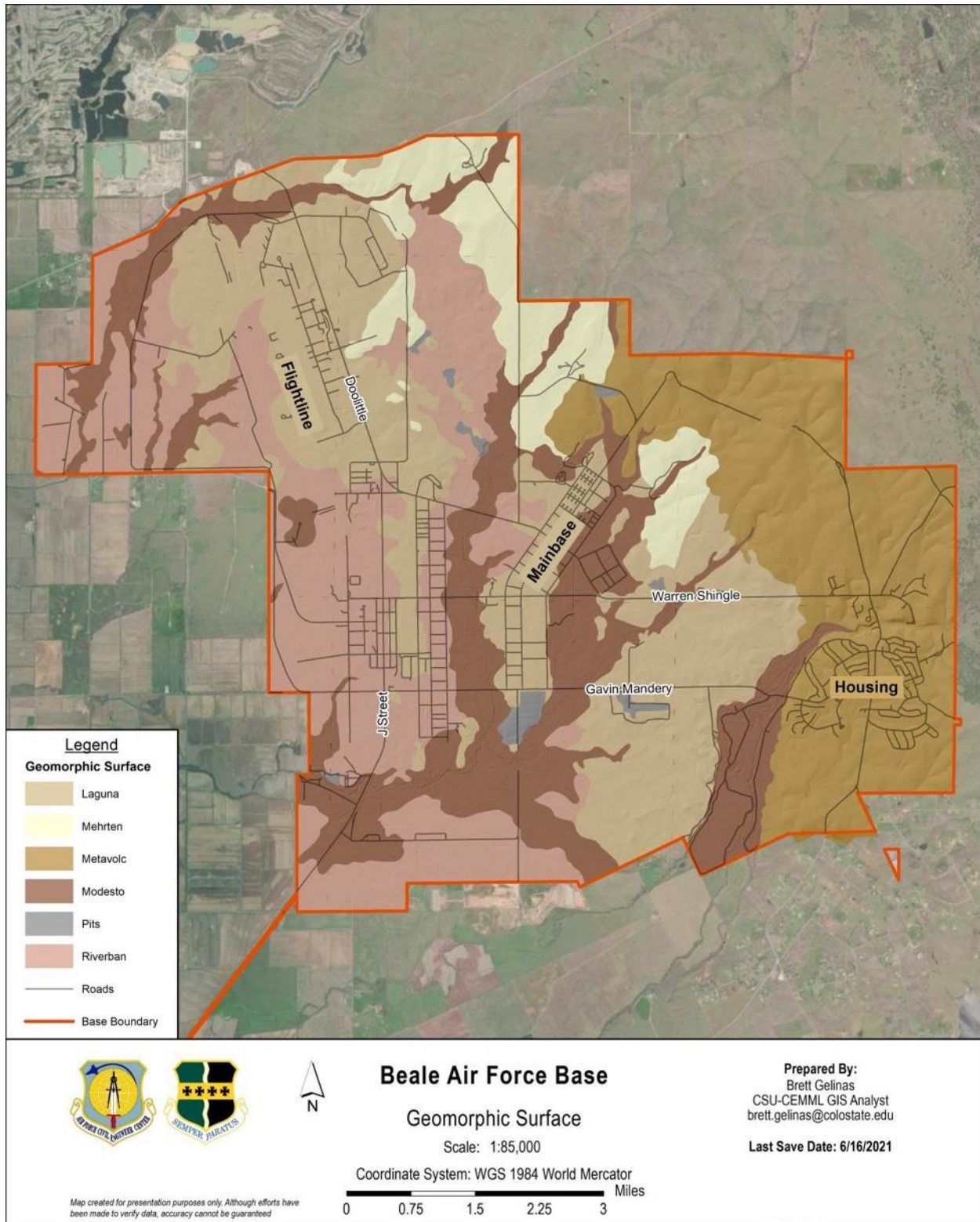


Figure 2-6. Topography of Beale AFB (Beale AFB 2016b).



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2 Figure 2-7. Geomorphic surface at Beale AFB (Beale AFB 2016b).

Table 2-7. Soil map units within the Beale AFB pasture units, with acreage and water-erosion hazard rating (source: Table 4–3 in the 2017 GMG [Hopkinson 2017b]).

Soil series/map unit, with percent slope class	Map symbol	Acreage	Water-erosion hazard
Argonaut-Auburn complex, 3–8%	102	2,154.0	slight
Argonaut-Auburn complex, 15–30%	104	86.2	severe
Auburn loam, 15–30%	108	100.5	severe
Auburn-Sobrante complex, 3–8%	110	319.0	slight
Auburn-Sobrante-Rock outcrop complex, 15–30%	118	18.7	severe
Hollenbeck clay, 0–3%	133	37.4	slight
Conejo loam, 0–2%	141	294.8	slight
Pardee gravelly loam, 3–8%	201	804.3	slight
Pardee-Ranchoseco complex, 0–3%	202	536.3	slight
Perkins loam, 0–2%	203	1,526.2	slight
Redding-Corning complex, 0–3%	209	1,080.5	slight
Redding-Corning complex, 3–8%	210	2,127.1	moderate
San Joaquin loam, 0–1%	214	2,617.5	slight
San Joaquin loam, 1–3%	215	1,068.8	slight
Dumps, landfills	145	8.5	
Water	254	10.0	

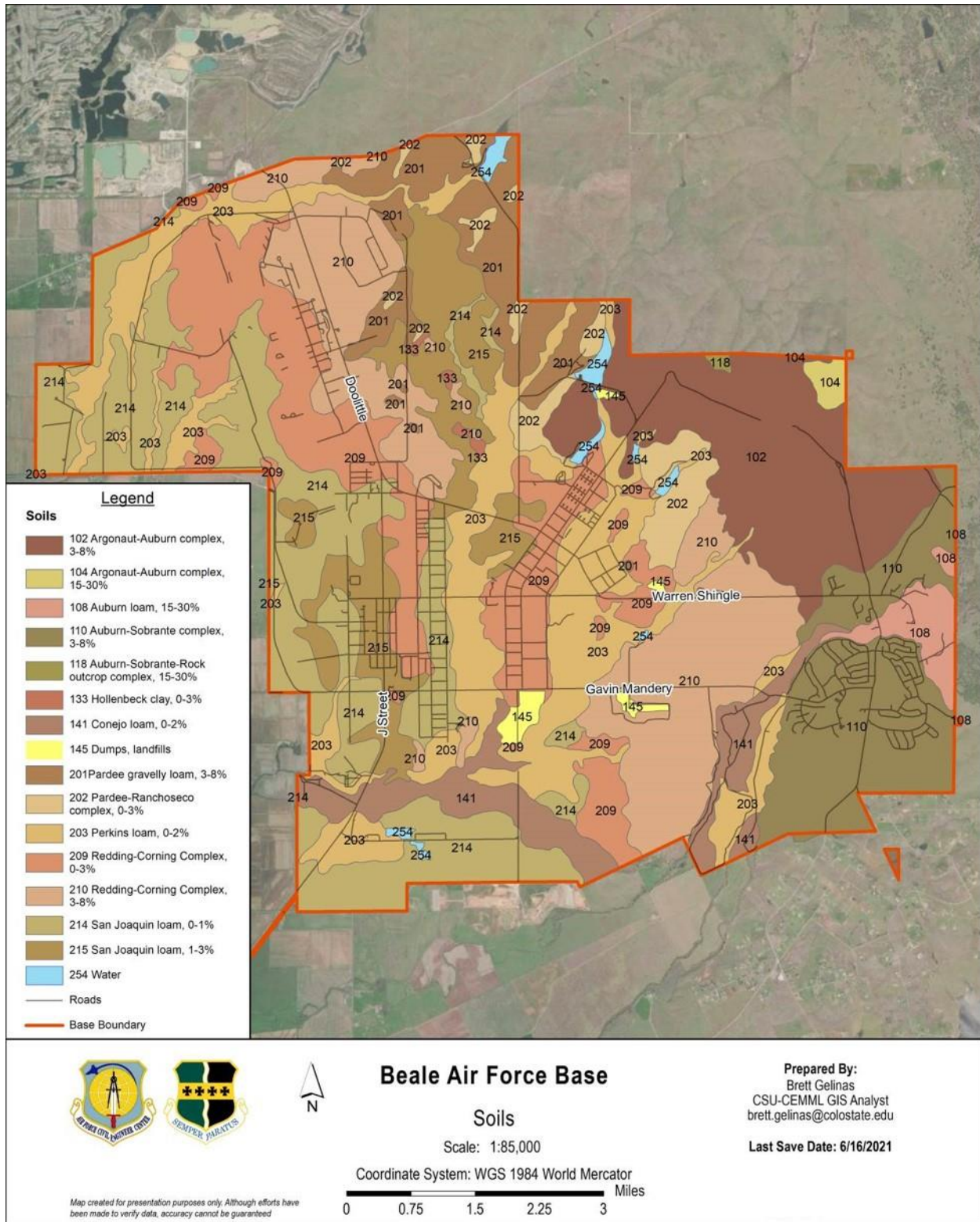
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4 Pits and dumps were mapped by the NRCS. They constitute a miscellaneous soil unit for areas that have
 5 been used for excavations and refuse deposits. The landfill sites at Beale AFB have been designated as pits
 6 and dumps. Because the soils associated with this designation vary greatly from site to site and may
 7 constitute a mixture of soil types from numerous sources, a general description of soil characteristics is not
 8 meaningful. There is one error in the mapping, in Section 9, T. 14 N., R. 5 E. The soil identification (ID)
 9 number 101 (Aiken-Horseshoe complex, 2-8% slopes) is a mountain soil. It has been determined by
 10 CES/CEIEC that this soil is most likely ID number 203 (Perkins Loam, 0-2% slopes).

11 Soils at LRS are predominantly sandy loams in the San Joaquin series (Figure 2-9). This series consists of
 12 well-drained, clay-pan soils underlain by indurated granitic alluvium. The Cometa series is also a well-
 13 drained, clay-pan soil underlain by compacted (but not indurated) alluvium (USDA 1980). The indurated
 14 layer of the San Joaquin soils creates the impermeable bottom of vernal pools.

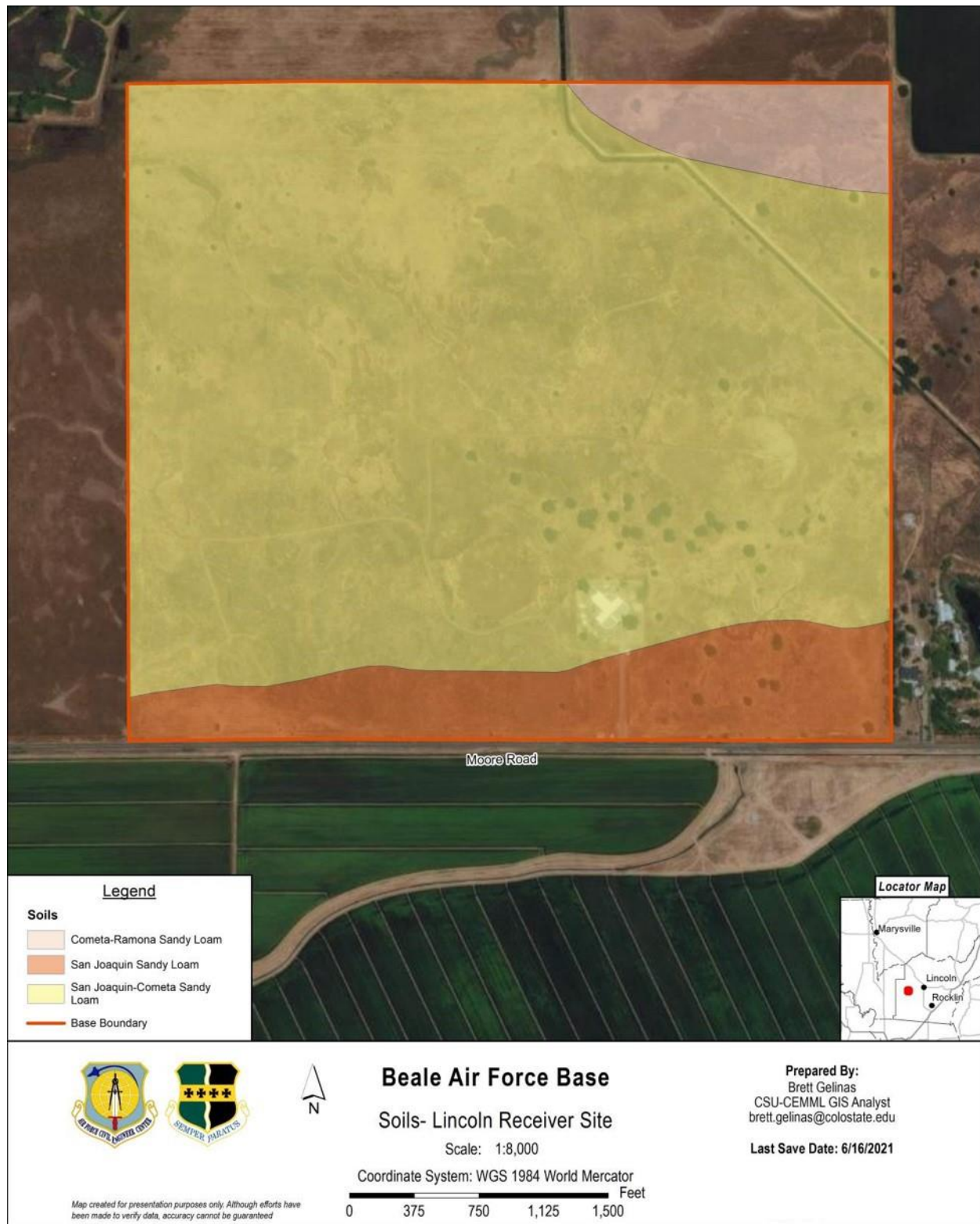
15 ID numbers and names of soils underlying LRS are as follows.

- 16 • 142 Cometa-Ramona sandy loam, 1-5%
- 17 • 181 San Joaquin sandy loam, 1-5%
- 18 • 182 San Joaquin-Cometa sandy loam, 1-5%



19

20 Figure 2-8. Soils on Beale AFB (USDA NRCS 2013).



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22 Figure 2-9. Soils on LRS (USDA NRCS 2013).

23 2.2.4 Hydrology

24 Hydrology and water management on Beale AFB is complex due to both natural and man-made influences.
25 Beale AFB is located on the eastern margin of the Sacramento Basin Hydrologic Area as designated by the
26 California Department of Water Resources, just east of the confluence of the Feather and Yuba rivers. This
27 is a region of elevation change between the Sierra Nevada foothills and the Central Valley, which influences
28 the direction of both ground and surface water flow (CH2M Hill 2017). Three large creeks pass through the
29 base, and multiple small seasonal drainages hold water during the wet season. Hydrology on the base has
30 been significantly altered by the creation of impoundments, channel re-direction, and groundwater
31 pumping. Impoundments have been created historically for flood control, stock watering, and recreation
32 areas. Groundwater has been contaminated by past military activities in many areas. Drinking water for the
33 base is drawn from the aquifer underlying the base west of the flightline. Water management on the base is
34 complicated by large annual fluctuations in precipitation, groundwater contamination resulting from
35 historical base activities, and regional groundwater pumping for crop irrigation.

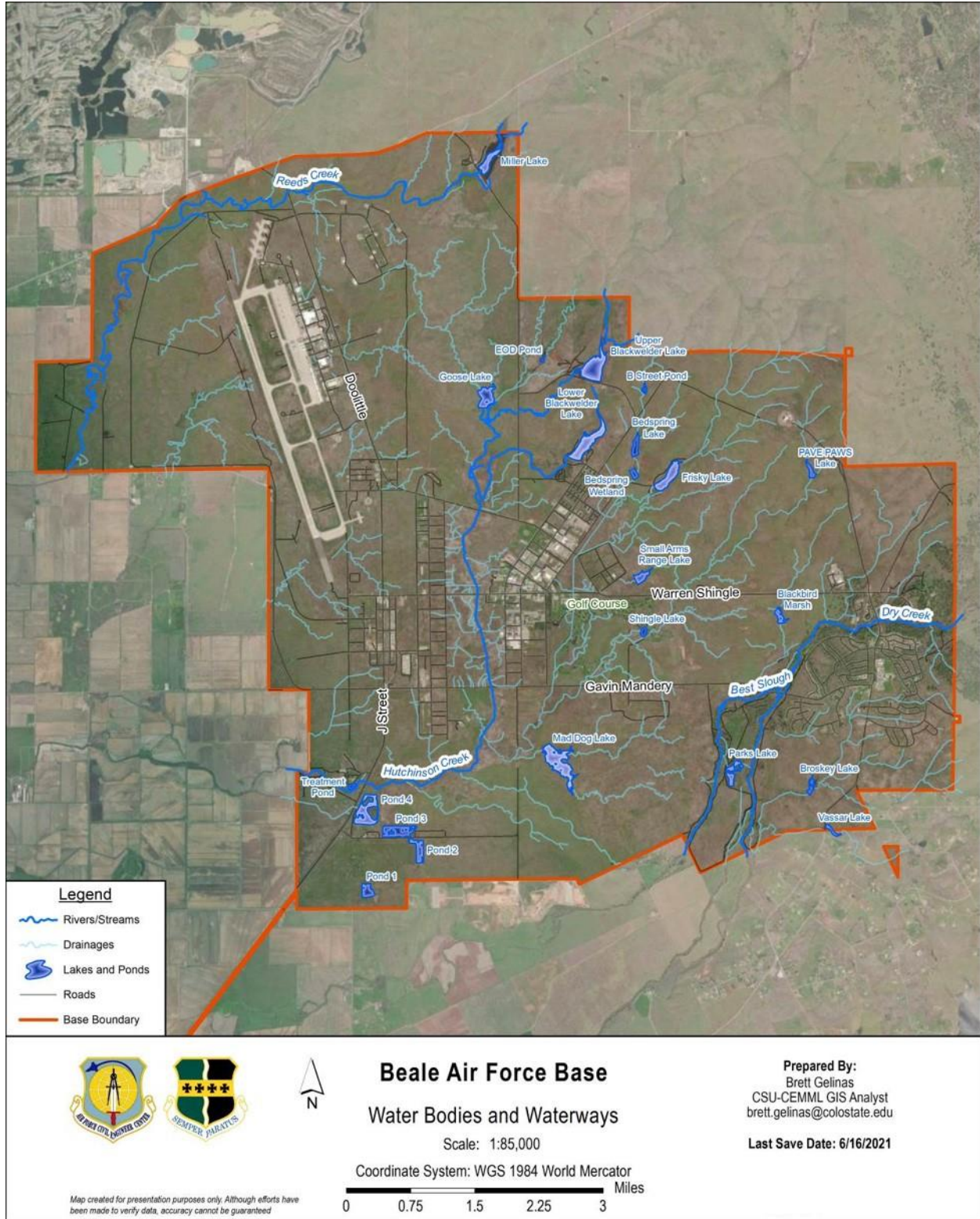
36 2.2.4.1 Groundwater

37 Prior to the development of irrigated agriculture in the Sacramento Basin, groundwater moved westward
38 through this margin from the Sierra Nevada foothills to discharge in the Feather and Sacramento rivers.
39 Due to extensive groundwater extraction, primarily for agricultural irrigation, the main groundwater
40 discharge is now through well withdrawals. Surface water diversions occur during drought years when
41 farmers make a profit by selling their water allotments back to the state in order to supply drinking water
42 to southern California. This then requires farmers to pump groundwater in order to water their crops and
43 make up for the diverted surface water. Groundwater extraction has altered the direction and depth of
44 groundwater movement near Beale AFB. The rivers no longer serve as the groundwater discharge points;
45 now water from the river channels recharges the groundwater system. The base's groundwater recharge
46 comes from the Yuba River to the north. The groundwater table on Beale AFB is shallowest in the western
47 portion of the base adjacent to the flightline (42–53 feet in 2016) and deepest in the eastern portion (260
48 feet or greater; CH2M HILL 2017).

49 2.2.4.2 Drainages

50 Beale AFB is flanked by major river systems to the north (Yuba River), west (Feather River), and south
51 (Bear River). Three named creeks flow southwesterly across the area of Beale AFB (Figure 2-10). Dry
52 Creek/Best Slough systems are naturally-occurring seasonal streams augmented by water from the Nevada
53 Irrigation District. Hutchinson and Reeds creeks also have seasonal flows (mostly spring runoff from the
54 Sierra Nevada). Dry Creek diverges into the Dry Creek/Best Slough system before discharging into the
55 Bear River. Hutchinson Creek merges with Reeds Creek southwest of Beale AFB, eventually draining into
56 Plumas Lake, a small impoundment south of Olivehurst.

57 Recent historical human-induced changes have altered stream morphology within Beale AFB. Historic
58 maps and late-nineteenth-century agricultural settlement patterns show that a stream channel once
59 connected Best Slough with Hutchinson Creek, crossing the south-central portion of present-day Beale
60 AFB. The watercourse is now characterized as an intermittent drainage. It has been proposed that the
61 principal cause of this alteration was channel infilling from historic mining upstream on Dry Creek. Infilling
62 of the network of sloughs in the western portion of Beale AFB was also likely a result of hydraulic gold
63 mining after 1850, an activity that discharged large quantities of gravel into water courses throughout the
64 region (Beale AFB 2018a).



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66 Figure 2-10. Water bodies and waterways at Beale AFB (Beale AFB 2016b).

Dry Creek enters the eastern side of the base from the adjacent SWA and is the main drainage for the eastern side of the base. Surface runoff from the family housing area drains into Dry Creek via small tributaries. Dry Creek was impounded to create the former Beale Lake, now a riparian restoration area after removal of the dam.

Hutchinson Creek originates from multiple small tributaries originating north of the base and is the main drainage for the central portion of the base including Main Base and parts of the flightline. Water from Upper and Lower Blackwelder, Goose, Frisky, Mad Dog, multiple other small lakes and ponds, and recycled wastewater from golf course irrigation all drain into Hutchinson Creek. Hutchinson Creek is a flood concern due to its proximity to Main Base. Hutchinson Creek has been the most altered of the three major drainages. Historic aerial photographs reveal that the creek was re-channeled and the Blackwelder reservoirs were constructed between 1952 and 1958.

Reeds Creek is fed by water released from Miller Lake, drainages around the flightline, and Brophy Canal. Reeds Creek enters the base at its northwestern boundary and flows southwest along its northern border before turning south. Brophy Canal joins Reeds Creek at the northern base boundary, fed by water from the Yuba River and groundwater pumping discharges used to rework old hydraulic mine tailings at the adjacent Yuba Gold Fields operation.

2.2.4.3 Surface Water

The creation of impoundments both before and after the establishment of Beale AFB dramatically changed the hydrology of the area. Many of the lakes were created more than 30 years ago by building dams and spillways. There are currently around 44 lakes and stock ponds on base, most of them man-made (Figure 2-10). These water bodies covered roughly 270 acres during the wet season prior to the reconstruction of the dams at Miller and Upper Blackwelder lakes and the breaching of dams at Bedsprings, Frisky, and Goose lakes. The impoundments ranged in size from 0.3 acres (both ammo ponds combined) to 46 acres (Miller Lake before dam reconstruction; see Table 2-8). Impoundments on base fluctuate in size throughout the year, depending on winter rainfall and summer temperatures. Water levels are highest during the winter and lower dramatically during the summer, when many of the smaller water bodies dry up completely.

Earthen dams on the base are ageing and have received infrequent maintenance. In 2016 the USACE assessed all 22 dams on the base for human safety and sedimentation concerns. Potential changes include raising the dam at Upper Blackwelder Lake and removing the dam at Goose Lake and letting it revert to wetlands. The dams at Miller and Upper Blackwelder lakes were repaired in FY18. The dams at Frisky, Goose, and Bedsprings lakes also require repair. Repair or removal of these dams will be done as funding becomes available. Beale Lake was the only impoundment on the base with a concrete dam, but it was removed in FY20 to facilitate fish passage, and the lake has been replaced by a riparian restoration site. This project is further discussed in Section 7.4, *Management of Threatened and Endangered Species, Species of Concern and Habitats*.

2.2.4.4 Drinking and Wastewater

Drinking water wells are drawn from an aquifer underlying the western portion of the base. There are seven active water supply wells, five water storage tanks, and a five million gallon per day (MGD) drinking water treatment plant. A contingency well has been bored near the Schneider Gate, but it is not operational as it lacks pumps, piping, and operational infrastructure.

Table 2-8. Surface water at Beale AFB (source: Beale AFB 2016b, updated 2018).

Water Body	Area (Acres)¹	Uses	Drainage
A Street Pond	1.3	Gray Water/Golf Course/Catch and Release Fishing	Hutchinson Creek
Ammo Ponds (2)	0.3	n/a	Reeds Creek
B Street Pond	1.6	Stock Pond/Hunting and Fishing	Hutchinson Creek
Blackbird Marsh	1.8	Catch and Keep Fishing	Dry Creek
Best Slough Lake	3.1	Catch and Release Fishing	Dry Creek
Dry Creek Overflow (3 individual ponds)	4.4	Overflow	Dry Creek
EOD Pond	0.4	Not accessible	Hutchinson Creek
Blackbird Basins	11 ²	Dam Breached/Closed	Hutchinson Creek
Goose Lake	29 ²	Dam Breached/Hunting	Hutchinson Creek
Golf Course Ponds (4)	4	Golf Course	Hutchinson Creek
Hospital (Clinic) Pond	4.3	Hunting and Fishing	Dry Creek
Lower Bedsprings Lake	2 ²	Overflow	Hutchinson Creek
Lower Blackwelder Lake	21.8	Flood Control/Recreation/Catch and Keep Fishing	Hutchinson Creek
Mad Dog Lake	24.2	Hunting and Fishing	Hutchinson Creek
Miller Lake	10.3	Flood Control/Recreation	Reeds Creek
Parks Lake	7	ERP Site/Catch and Release	Dry Creek
PAVE PAWS Pond	2.5	Catch and Keep Fishing	Dry Creek
Pond #1	7.7	Stock Pond	Hutchinson Creek
Pond #2	8	Stock Pond/Catch and Keep Fishing	Hutchinson Creek
Pond #3	18.2	Wastewater	Hutchinson Creek
Pond #4	22.4	Wastewater/Closed	Hutchinson Creek
Shingle Lake	0.8	Gray Water/Golf Course	Hutchinson Creek
Shingle Lake Overflow	0.6	Gray Water/Golf Course	Hutchinson Creek
Small Arms Range (CATM) Pond	3	Flood Control	Hutchinson Creek
Unnamed Ponds (10)	3.1	Flood Control/Stock Ponds/Recreation	Various
Upper Bedsprings Lake	6.4 ²	Dam Breached/Closed	Hutchinson Creek
Upper Blackwelder Lake	26	Flood Control/Recreation	Hutchinson Creek
Vassar Lake ³	1.2	Stock Pond/Catch and Keep Fishing	Dry Creek
Total	226.4		

¹ Acreage at capacity calculated using LiDAR or hand-drawn GIS.

² Historical acreage, current acreage to be determined.

³ Acreage within the base boundary.

Wastewater from most facilities at Beale AFB is treated at the base's wastewater treatment plant, located in the southwest corner of the base. The treated effluent is discharged into Pond 4, which serves as a storage pond. The treated water is either pumped to A Street Pond for golf course irrigation or dispersed as a land-based application to the existing 40-acre irrigation field south of the wastewater treatment plant.

2.2.4.5 Water Quality

There are currently more than 1,000 groundwater monitoring wells, extraction wells, and piezometers on the base (CH2M Hill 2017). As the result of historical Army and AF activities, groundwater in many places is contaminated with chemicals of concern, such as petrochemicals and solvents, at concentrations above maximum legal levels (Marshack 2016). Groundwater contaminant levels are monitored at 23 sites, including 15 groundwater plumes. Sites are monitored using a sampling strategy from the 1998 Installation Restoration Monitoring Plan (CH2M HILL 1998) as basis for the Base Groundwater Monitoring Plan sampling events (CH2M Hill 2017). There are several water bodies on base that have chemical contamination, including Best Slough and Parks Lake.

2.2.4.6 Hydrology and Climate Change

Modeling of stream channel overflow (or flood modeling) was conducted for Beale AFB to examine the extent of flooding along Dry Creek and Hutchinson Creek associated with climate projections (CEMML 2019). Flood modeling did not consider flooding of independent surface bodies, stormwater systems, or surface ponding. Flood modeling was conducted using local watershed characteristics and the design storms generated from climate projection data (

Table 2-5. Climate change design storm precipitation for Dry Creek (source: CEMML 2019).

and Table 2-6). The projected design storms do not represent extreme weather events (e.g., hurricanes, extraordinary storm fronts).

Inundation projections were influenced by four variable inputs: (1) variation in total precipitation between design storms, (2) variation between the daily distribution of precipitation over the three-day period, (3) land cover change over the watershed area used in hydrologic modeling, and (4) land cover change in the area within the installation used in hydraulic modeling. Projected changes in stream channel overflow can be used to assess potential vulnerabilities to species, habitat, mission, and built and natural infrastructure.

Stream channel overflow associated with the baseline design storm was estimated to inundate approximately 1,532 acres at Beale AFB along Dry Creek and Hutchinson Creek (Table 2-9). Under the RCP 4.5 emission scenario, inundation is projected to increase by 37% in 2030 and then reduce to 17% over baseline in 2050 (Table 2-9). Under the RCP 8.5 emission scenario, inundation is projected to increase by 17% in 2030 and continue increasing to 33% over baseline in 2050 (Table 2-9).

Table 2-9. Projected changes in inundation from stream channel overflow resulting from climate change (source: CEMML 2019).

	Baseline	RCP 4.5		RCP 8.5	
	2000	2030	2050	2030	2050
Projected inundation (acres)	1,532	2,098	1,793	1,792	2,035
Change in inundation from baseline		566	261	260	503
Percent change from baseline		37	17	17	33

Acronyms in table: RCP = Representative Concentration Pathway.

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

In 1995, Jones & Stokes Associates was retained by The Nature Conservancy (TNC) to classify and map habitats and species for the *Beale Air Force Base Ecosystem Study* (Jones & Stokes Associates 1995, 1996). Outcomes of the ecosystem study included the following:

- developing a classification system for habitats at Beale AFB;
- mapping existing vegetation classes;
- identifying plants and animals with special legal or biological status that have potential to occur at Beale AFB;
- mapping the locations of known occurrences of these special-status species; and
- creating some of the earliest GIS data on habitats and special-status species for Beale AFB.

The National Hierarchical Framework of Ecological Units (also known as Bailey's Ecoregions) is a regionalization classification and mapping system that links soils, physiography, and vegetation to stratify

the landscape into progressively smaller areas (Bailey 1983). North America is divided into a hierarchy of domains, divisions, provinces, and sections based on climate, vegetation, and topography.

The ecosystem classification of Beale AFB, including LRS, is Humid Temperate (Domain), Mediterranean (Division), and California Dry Steppe (Province). Beale AFB is within the Great Valley Section, which contains the alluvial plains of the Sacramento and San Joaquin valleys. Summers are hot and dry, and winters are mild. The subsection classification is Hardpan Terraces, which includes terraces along the eastern edge of the Sacramento and San Joaquin valleys.

2.3.2 Vegetation

Beale AFB is located within the Sacramento Valley Region of the California Floristic Province. Major features of the region that influence the distribution of plants and animals, both historically and currently, include the Sierra Nevada foothills, trending to the Sierra Nevada in the east; the Sacramento Valley to the west; and major rivers including the Feather, Yuba, and Sacramento rivers.

2.3.2.1 Historic Vegetation Cover

Until recently it was believed that prior to European arrival the grasslands of the Central Valley were composed primarily of perennial bunchgrasses, dominated by purple needle grass (*Stipa pulchra*; Burcham 1957). New research suggests that areas of the Central Valley now occupied by exotic annual grassland historically had highly diverse assemblages of herbaceous species, composed largely of annual forbs adapted to exploit local environmental conditions (Evet and Bartolome 2013).

The theory of forb-dominated grasslands is based on data of phytolith content in Central Valley soils (Evet and Bartolome 2013) as well as review of early Spanish primary literature, ethnographic accounts, and a growing body of restoration and management literature (Minnich 2008). Phytoliths are microscopic silica particles produced in plant tissues that are highly persistent in the soil and, in the case of grasses, often identifiable to groups of genera or occasionally to the species level even after thousands of years. In contrast, very few plant species commonly found in California grasslands other than grasses produce abundant silica particles. Through their analysis of soil samples, Evet and Bartolome (2013) posited that the degree of grass dominance at a site can be inferred from the content of the soil comprised of phytoliths. Soils with high concentrations of phytoliths occurred only in sites within 50 kilometers of the coast, indicating that more inland sites were likely not dominated by grasses, thus bolstering the theory of forb dominance (Evet and Bartolome 2013).

Part of the uncertainty in this theory stems from the fact that extensive mapping of California vegetation did not start until the 1920s, by which time the vegetation had already been altered from pre-European conditions (Chico State 2003). Introduced forbs and annual grasses have been found in adobe bricks dating from before and during the California mission period (1769-1824), indicating that these species were likely present and abundant prior to construction of the earliest European structures (Hendry 1931). After European settlement, four major factors contributed to the conversion of native vegetation to exotic annual grasses: over-grazing by domestic livestock, introduction of invasive plant species, fire suppression, and agricultural soil disturbance (Burcham 1957; Bartolome and Gemmill 1981; Fossum 1990; Heady et al. 1992).

Mixed-forb grassland covered millions of acres of the Central Valley floor (Chico State 2003). Vernal pool complexes ran throughout the grasslands with associated mound/intermound topography and connecting swales. Historically, two to three million acres of the Central Valley flooded seasonally, creating ephemeral and permanent wetlands (Fryer 2015). Valley/foothill hardwood woodlands, like those found on the eastern

side of the base, covered hundreds of thousands of acres in the northern Central Valley (Chico State 2003). Blue elderberry (*Sambucus nigra* ssp. *caerulea*) savannas occurred on floodplains, terraces, and openings in riparian corridors and woodlands of the Central Valley (Fryer 2015).

Historically, the western portion of Beale AFB contained large vernal pool fields. Before the base was established, many of these areas had already been disturbed or destroyed by farming activities. The earliest available aerial photographs were taken in 1940, but land disturbance and conversion started long before that. Land was leveled for irrigated crops, which led to permanent changes in wetland character or outright destruction. Dryland farming caused temporary wetland disturbance, but comparison of aerial photographs from 1940 and 1994 and field reconnaissance surveys shows that the basic integrity of the vernal pools has remained intact, and the wetlands recovered naturally.

The riparian forest corridor along Dry Creek and Best Slough was significantly different prior to European settlement. Historically there were distinct vegetation zones between stream banks, floodplains, and alluvial terraces (Smith and Klimas 2006). This area was cleared for agricultural use and placer mining in the early 1900s. Aerial photos from the 1940s show much less vegetation along this corridor than exists now, indicating that the area has naturally re-vegetated. The vegetation was probably similar to what is there now, dominated by oaks (*Quercus* spp.), Fremont cottonwood (*Populus fremontii*), and California sycamore (*Platanus racemosa*). Based on soil and hydrology, it is believed that woody vegetation along the riparian areas of Hutchinson and Reeds creeks was probably limited to willow shrublands.

Based on soil evidence, it is likely the oak woodland and savannas on the eastern portion of the base were also historically more extensive. Oak trees were cut down by miners, homesteaders, and ranchers for fuel. Grazing and competition from nonnative plants since the 1850s may have limited oak regeneration and recruitment. Blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), and associated shrubs have been most susceptible to these changes.

2.3.2.2 Current Vegetation Cover

There are four major vegetation communities that occur on Beale AFB: grassland, grassland associated vernal pool complexes, oak woodland, and riparian forest. Other vegetation communities that occupy smaller areas on the base include freshwater marsh, aquatic, ruderal, and scrubland. Figure 2-11 shows the current cover of each vegetation type on the base. Due to variations in elevation, topography and soils, a wide diversity of plants has been documented on Beale AFB; a complete list is included in Appendix C.

Vegetation at LRS is a fairly uniform mixture of grassland and associated vernal pool complexes with scattered oak trees (Figure 2-12).

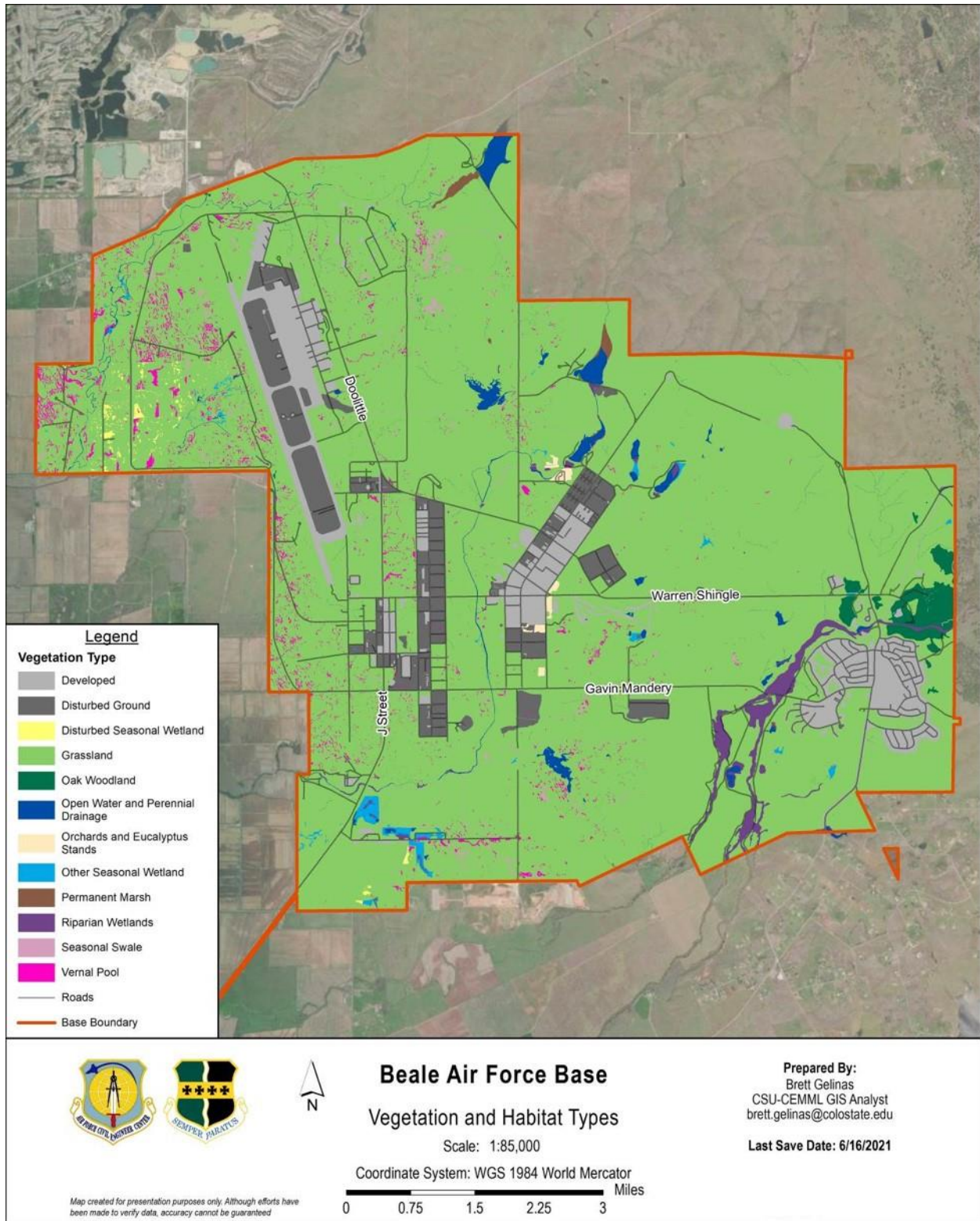
Grasslands: Grasslands cover approximately 18,835 acres of Beale AFB. LRS contains 202 acres of annual grasslands and forbs. Grasslands on the base completely lacking native vegetation are classified as the Mediterranean California Naturalized Annual and Perennial Grassland Group. The grasslands that still do contain native species are part of the California Annual and Perennial Grassland Macrogroup (Menke et al. 2011). These grasslands types and others found in the Central Valley are collectively referred to as Valley Grassland.

The majority of grassland cover on Beale AFB is comprised of nonnative naturalized or invasive species. Naturalized species include wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), rye grass (*Festuca perennis*), soft chess (*Bromus hordeaceus*), and foxtail barley (*Hordeum murinum*). Medusahead grass (*Elymus caput-medusae*) and barbed goatgrass (*Aegilops triuncialis*) are two invasive grasses present on the base that can have severe negative ecological impacts (Cal-IPC 2017). Yellow star-thistle (*Centaurea*

solstitialis) is an invasive forb (ranked High by Cal-IPC) that is also very abundant in the grasslands on the base. The California Invasive Plan Council (Cal-IPC) ranks non-native species in the state based on their invasiveness, degree of ecological disruption, range, etc. Ranking levels are: High (severe ecological impacts, high rates of dispersal, widely distributed), Moderate (substantial and apparent but not severe ecological impacts, moderate to high rates of dispersal often tied to disturbance, and range is limited to widespread), and Limited (invasive but with minor ecological impacts, low to moderate invasiveness, limited range but may be locally persistent). Medusahead grass and barbed goatgrass both score “High” in the Cal-IPC ranking.

Native grass species do persist in some areas occurring naturally, as part of restoration plantings, or from areas seeded with the base revegetation seed mix. These grasses are found in varying densities in pastures and roadsides throughout the base. Native grass species include perennial bunch grasses, such as purple needle grass, California melic (*Melica californica*), and squirreltail (*Elymus elymoides*), and annual grasses including oldfield three-awn (*Aristida oligantha*), California brome grass (*B. sitchensis* var. *carinatus*), and small fescue (*F. microstachys*).

A diverse assemblage of native and introduced forb species are intermixed with the grasses. Native forb species include turkey mullein (*Croton setiger*), clover species (*Trifolium* spp.), fiddleneck (*Amsinkia* spp.), yellow owl's-clover (*Orthocarpus luetus*), popcorn flower (*Plagiobothrus* spp.), California poppy (*Eschscholzia californica*), mariposa lily (*Calochortus luteus*), lupine (*Lupinus* spp.), vetch (*Vicia* spp.), and western blue-eyed-grass (*Sisyrinchium bellum*), while introduced forb species include common sheep sorrel (*Rumex acetosella*), filaree (*Erodium* spp.), field mustard (*Brassica rapa*), and spikeweed (*Centromadia pungens*). Grass and forb species found at LRS include soft chess, ripgut brome, wild oats, brome fescue (*Festuca bromoides*), red brome (*B. rubens*), redstem filaree (*E. cicutarium*), wall barley, rose clover (*Trifolium hirtum*), California burclover (*Medicago polymorpha*), lupine, vetch, mustard (*Brassica* spp.), yellow star-thistle (*Centaurea solstitialis*; ranked High by Cal-IPC), and other thistles. In addition, large swathes of medusahead grass infest upland areas at LRS.



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2 Figure 2-11. Vegetation and land use types on Beale AFB (Beale AFB 2017c).

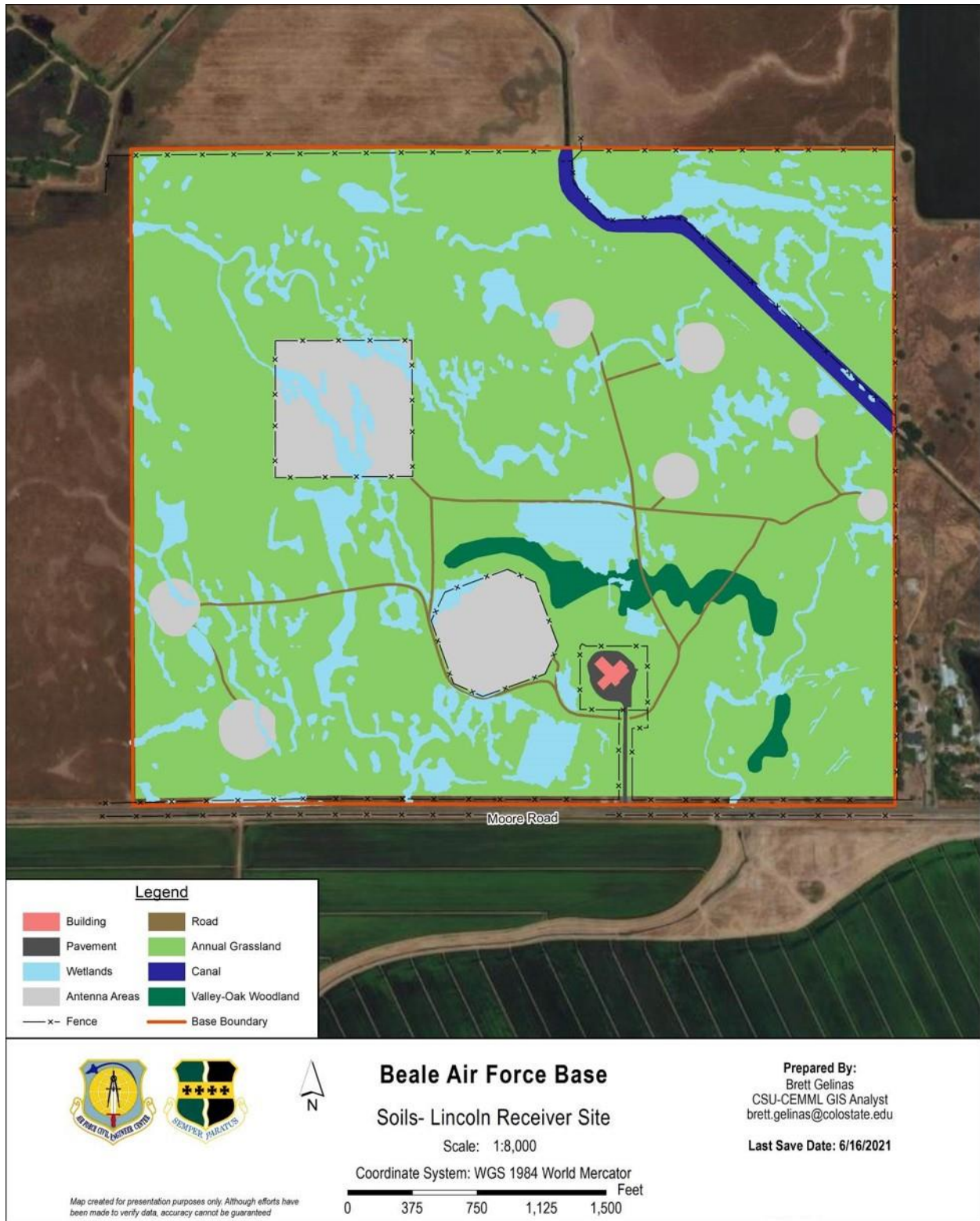


Figure 2-12. Vegetation types and land use on LRS (Beale AFB GeoBase 2021, Wildlands 1999).

Vernal Pool Complexes: Vernal pools are the result of unique soil, topography, and hydrology factors found in several regions of California and Oregon. Hardpan layers of soil or bedrock and rolling topography form shallow basins that are filled during winter rains, then slowly emptied through evaporation through the spring and summer. The pools pose extreme resource challenges to the inhabitants, which must tolerate fluctuations between inundation and complete desiccation each year. This results in a diverse community of plants and invertebrates, many of which live nowhere else and hold protected status. Vernal pools are extensive in the western, central and southern portions of the base, covering approximately 1,380 acres. The associated vegetation is classified as Vernal Pool and California Annual and Perennial Grassland Matrix (Menke et al. 2011).

With the exception of coyote-thistle (*Eryngium vaseyi*) and toad rush (*Juncus bufonius*), vernal pool plants are annuals that complete their entire life cycles in a single wet season. Seeds from the prior growing season germinate once pools are inundated, and they exist as aquatic plants until the pools begin to dry, when they transition to a terrestrial or semi-aquatic state. Flowers bloom and set seed in late spring after pools have dried. Mature seeds become part of the seed bank and lie dormant until the next wet season. Dominant plants of vernal pools on the base include coyote-thistle, California goldfields (*Lasthenia californica* ssp. *californica*), Fremont's goldfields (*L. fremontii*), white-headed navarretia (*Navarretia leucocephala*), bractless hedge-hyssop (*Gratiola ebracteata*), vernal pool buttercup (*Ranunculus bonariensis* var. *trisepalus*), annual hair grass (*Deschampsia danthonioides*), yellow owl's-clover, Sacramento beardstyle (*Pogogyne zizyphoroides*) and woolly marbles (*Psilocarphus brevissimus* var. *brevissimus*). At LRS, approximately 40 acres of vernal pools have been identified and mapped (AECOM 2013). The site is bisected by several shallow intermittent drainages and strings of seasonally ponded depressions that support vernal pool vegetation.

Oak Woodlands: Oak woodlands cover approximately 481 acres on Beale AFB. Oaks grow in small, isolated groves scattered throughout the dominant grassland community. Oak woodlands occur in the foothills on the east side of the base and as a component of the Dry Creek/Best Slough riparian corridor. Oak woodlands on the base are classified as *Quercus douglasii* (blue oak) Alliance (Menke et al. 2011). Blue oaks are intermixed with other oaks including interior live oak (*Quercus wislizeni*) and valley oak, as well as hardwood and conifer species such as California buckeye (*Aesculus californica*) and gray pine (*Pinus sabiniana*). The woodlands on the base have an annual grass understory that also contains shrubs such as manzanita (*Arctostaphylos* sp.), western poison oak (*Toxicodendron diversilobum*), and common buckbrush (*Ceanothus cuneatus*).

Oak trees do occur at LRS but not at a density considered a woodland.

Riparian Areas: Riparian vegetation includes vegetation along rivers, permanent and intermittent creeks, lakes, and ponds. Riparian systems are found in transition zones between aquatic and upland ecosystems and rely on access to groundwater to maintain lush growth. In their undisturbed condition, these areas are characterized by dominant vegetation adapted to periodic flooding or soil saturation. Riparian systems occur entirely within the 100-year floodplain of streams and rivers. However, most riparian plant species require flooding more frequently than once every 100 years.

The largest riparian area at Beale AFB is found along in Dry Creek and Best Slough. This area consists of a continuous corridor of well-developed riparian forest. Along other drainages, riparian vegetation is patchy and sparse, such as along Hutchinson and Reeds creeks. Hutchinson Creek is deeply incised/downcut below its natural streambed, which may contribute to declining riparian vegetation as the groundwater becomes deeper and less accessible to the vegetation. Portions of Dry Creek are also downcut, but periodic beaver dams aid in watering the adjacent floodplain riparian vegetation. Three specific types of riparian forest have

been identified at Beale AFB: cottonwood-willow riparian forest, valley oak riparian forest, and mixed riparian forest (Jones & Stokes Associates 1995).

The dominant cottonwood-willow riparian forest is composed of a multi-layered complex of cottonwoods with occasional valley oaks, boxelder (*Acer negundo*), California sycamore, Oregon ash (*Fraxinus latifolia*), white alder (*Alnus rhombifolia*) and willows. California wild grape (*Vitis californica*) are typically found draping the overstory and mid-story trees of the riparian forest. Thickets of California rose (*Rosa californica*), nonnative Armenian blackberry and other shrubs can also be found in the understory. Groundcover is usually dense and composed of grasses and herbs. Riparian scrub can also be found on the base along Hutchinson and Reeds creeks in addition to the Dry Creek/Best Slough riparian area. Riparian scrub on the base is generally composed of willows, often with emergent cottonwood and sycamores.

Multiple invasive species have been detected in riparian areas on Beale AFB including Armenian blackberry, giant reed (*Arundo donax*), purple top vervain (*Verbena bonariensis*), seashore vervain (*Verbena littoralis* [may be an error, pers. comm. M. Lipschutz]), tree of heaven (*Ailanthus*), black mustard (*Brassica nigra*), bull thistle (*Cirsium vulgare*), stinkwort (*Dittrichia graveolens*), and edible fig (*Ficus carica*) (CEMML 2016).

Other Vegetation Types: Other vegetation types include freshwater marsh, aquatic vegetation, ruderal vegetation, scrubland, and invasive species. Special-status plants and vernal pool vegetation are discussed in Section 2.3.4, *Threatened and Endangered Species and Species of Concern*.

- Freshwater Marsh. This vegetation is found in ponds and drainages that have a relatively permanent water supply. Freshwater marsh vegetation also intermingles with riparian woodland vegetation along drainages, such as Hutchinson Creek and Dry Creek. Marshlands contain perennial plants such as cattails (*Typha* spp.), common tules (*Schoenoplectus acutus* var. *occidentalis*), rushes (*Juncus* spp.), and sedges (*Carex* spp.), as well as scattered trees and shrubs such as willows, cottonwoods, and common buttonbush (*Cephalanthus occidentalis*).
- Aquatic Vegetation. Some drainages and impoundments on the base support aquatic vegetation. The vegetation includes free-floating and submerged rooted, obligate aquatic plants. These include pondweeds (*Potamogeton crispus*), waterpepper (*Persicaria hydropiper*), three-nerved duckweed (*Lemna aequinoctialis*), western waterweed (*Elodea bifoliata*), water milfoil (*Myriophyllum spicatum*) and Pacific azolla (*Azolla filiculoides*).
- Ruderal. Areas of annual grassland that undergo frequent or severe disturbance (e.g., corrals, staging areas and some roadsides) may be dominated by ruderal vegetation. This vegetation type typically grows within, or adjacent to, annual grassland and is characterized by a low absolute plant cover and species that are tolerant of trampling and other types of disturbance, some of which are noxious weeds. These areas are dominated by introduced weedy species including European grasses, yellow star-thistle, cheeseweed (*Malva parviflora*), blessed milk-thistle (*Silybum marianum*), common chicory (*Cichorium intybus*) and bindweed (*Convolvulus arvensis*).
- Scrubland. Although limited, some scrubland species are present on the base. They include common buckbrush, manzanita, toyon (*Heteromeles arbutifolia*), California sage (*Salvia* sp.), saltbrush (*Atriplex* sp.) and coyote brush (*Baccharis pilularis*). Restoration plantings in 2017 included native scrubland species that attract pollinators.
- Invasive Species. Medusahead is a problem on the base as it creates monocultures and is poor cattle forage when mature. The invasive forb yellow star-thistle is also a significant problem throughout the base, in particular near the flightline where it increases BASH risk by attracting seed-eating

birds. Other noxious weeds found in grasslands on Beale are Klamath weed (*Hypericum perforatum*; Cal-IPC ranked Limited), Italian thistle (*Carduus pycnocephalus ssp. pycnocephalus*; Moderate), skeleton weed (*Chondrilla juncea*; Moderate), and blessed milk-thistle. Invasive plants are discussed further in Section 7.11, *Integrated Pest Management*.

- **Gathering Areas.** Beale AFB is considering establishment of gathering areas for traditional stewardship of sensitive cultural sites and native plants for use by associated tribes. Pesticide and herbicide use within such sites may not be allowed once established, per traditional management practices.

2.3.2.3 Future Vegetation Cover

The predominant vegetation present at Beale AFB is grasslands. Climate change predictions suggest increased seasonal, annual, minimum, and maximum temperature and changing precipitation patterns. Because grasslands are relatively dry and require strong seasonality, even minor changes in temperature and precipitation could alter composition, distribution, and abundance of grassland species, and the products and services they provide (CEMML 2019). The extent of these changes will also depend on changes in the frequency and intensity of fire. Losses of vegetative cover coupled with increases in precipitation intensity and climate-induced reductions in soil aggregate stability could increase erosion rates. In addition, grasslands are negatively impacted by flooding, so predicted inundation increases could alter grassland areas along waterways. However, these are characteristics of native grasslands so it is unknown how the non-native grasses and forbs that make up most of the habitats on Beale AFB will fare. It is possible that climate shifts will allow new non-native grasses and forbs to begin colonizing Beale AFB and competing with non-native plants already present on the base.

Woodlands and Oak forests are also susceptible to climate change (CEMML 2019). There is a temperature below which the equilibrium state of the forest appears constant, but above which the equilibrium forest cover declines steadily. This threshold represents a point where some degree of loss of the forest is inevitable. As the threshold is exceeded, there is a gradual increase in the committed die-back, with changes that are more progressive than sudden. Therefore, forest vegetation at Beale AFB may experience some degree of die-back before impacts are observed. For example, if climate was stabilized at 2050, a significant die-back could still occur over the next 100-200 years.

2.3.2.4 Turf and Landscaped Areas

Turf and landscaped areas at Beale AFB are restricted to the improved grounds on the base, primarily in and around the flightline, Main Base, family housing areas, and along the principal transportation corridors. Most landscaping in these areas is turf of a variety of grass species. Shrubs and trees, both native and nonnative, have been planted in the improved areas. Common landscape trees include fruitless mulberry (*Morus alba*), Fremont's cottonwood, Lombardy poplar (*Populus nigra*), true cedars (*Cedrus* spp.) and pines. A list of plants approved for use in landscaped areas of the base is provided in the 2017 Base Design Compatibility Guide (DCG, ACC 2017) and included in Appendix O of this report. The list includes both native and nonnative plants that are drought tolerant and water efficient. The use of native species is highly encouraged in base landscaping whenever possible to increase habitat values and reduce maintenance and irrigation costs.

Several European olive (*Olea europaea*; Cal-IPC ranked Limited) orchards exist in and around the Main Base. These were planted prior to 1940. From 1988 to the early 2000s, more than 4,000 eucalyptus (*Eucalyptus* spp.; Cal-IPC Limited) trees were planted at three sites near the training and Main Base areas to supply firewood. Eucalyptus is an invasive plant and is no longer used in landscaping. Fruitless mulberry

trees were planted along Gavin Mandery and Warren Shingle roads in the 1960s as part of a base beautification effort.

Beale AFB landscaping will use native, well-adapted, appropriate landscaping whenever possible to comply with DoDI 47.15.03 and AFMAN 32-7003, conserve water resources, and contribute to pollinator and invertebrate resources. AFMAN 32-7003 instructs bases to "...utilize regionally native plants in landscape designs for improved and semi-improved grounds." It also encourages the use of landscape designs that reduce maintenance and reduce the need for irrigation, fertilization or pesticides to maintain a healthy condition. California has an enthusiastic and well-informed culture of using native plants for landscaping whenever possible, and native plants are often readily available at nurseries. Support for transitioning from exotic cultivars to native species and their maintenance is also readily available. Native plants support vastly more native invertebrate biodiversity, require less maintenance once established, and are less likely to suffer from pest problems than many cultivars (Zuefle et al. 2008).

2.3.3 Fish and Wildlife

The following description of native fauna at Beale AFB follows the same format as Section 2.3.2.2, *Current Vegetation Cover*. Common wildlife species associated with general vegetation types are described first, followed by individual descriptions of special-status wildlife species. For a list of wildlife species that have been observed at Beale AFB, see Appendix D.

2.3.3.1 Annual Grasslands

Annual grasslands provide nesting and breeding habitat for a variety of grassland birds, as well as foraging habitat for many bird species that breed in other habitats. The proximity of riparian areas, oak woodlands and wetlands enhances the value of annual grasslands. Annual grasslands at Beale AFB also provide foraging habitat for several bird species that are present in the region only during the winter. Open annual grasslands are particularly important for wintering raptors such as the rough-legged hawk (*Buteo lagopus*), which has been observed at the base. Many species of birds have been observed in the annual grassland during field surveys. Common species include the western kingbird (*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), lark sparrow (*Chondestes grammacus*), savannah sparrow (*Passerculus sandwichensis*), horned lark (*Eremophila alpestris*) and red-tailed hawk (*Buteo jamaicensis*). Wild turkeys (*Meleagris gallopavo*) are abundant in the annual grasslands and woodlands at Beale AFB. Birds of special interest that have been observed foraging in the annual grasslands at Beale AFB include Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*) and tricolored blackbird (TRBL) (*Agelaius tricolor*). Owls including Great-horned, Barn and Short-eared have been observed foraging in the grasslands at night. Barn owls (*Tyto alba*) are extremely abundant, often nesting in man-made structures adjacent to open areas.

Annual grasslands provide important habitat for many mammals as well, particularly for small rodents and their larger predators. Mammals observed (or of which signs were detected) in the annual grasslands at Beale AFB include mule deer (*Odocoileus hemionus*), black-tailed jack rabbit (*Lepus californicus*), desert cottontail rabbit (*Sylvagus autubonii*), brush rabbit (*Sylvagus bachmani*) Botta's pocket gopher (*Thomomys bottae*), North American deer mouse (*Peromyscus maniculatus*), California vole (*Microtus californicus*), California ground squirrel (*Otospermophilus beecheyi*) and coyote (*Canis latrans*).

Members of the rabbit family (hares, jackrabbits, cottontails, pikas, etc.) have recently been the focus of scrutiny for a newly arrived disease. Rabbit hemorrhagic disease (RHD) has been sporadically detected in the United States since 2018, but is currently established in New Mexico, Arizona, California, Colorado, Nevada, and Texas (USDA 2020). In California, seven southern counties have had wild rabbit, jackrabbit, and/or feral domestic rabbit RHD detections to date (CDFA 2021). The disease is serious and severe,

causing fever, hesitancy to eat, and respiratory or nervous signs, and it is generally fatal. RHD has caused dramatic declines in some wild rabbit populations. The virus causing RHD spreads through a wide variety of vectors including direct contact with bodily fluids, contact with infected carcasses, food, water, and any contaminated materials. People can spread the virus on clothing and shoes worn in infected sites.

Currently, the majority of guidance on RHD relates to prevention of infection in domestic rabbits, with some restrictions on the importation of rabbits into the state of California and recommendations on biosecurity controls for domestic rabbit keepers. Dead wild rabbits should be reported to CDFW, and hunters should be made aware of the disease.

Annual grasslands also provide habitat for several species of reptiles, including gophersnake (*Pituophis catenifer*), North American racer (*Coluber constrictor*), western rattlesnake (*Crotalus oreganus*), common king snake (*Lampropeltis getula*) and southern alligator lizard (*Elgaria multicarinata*). Western fence lizard (*Sceloporus occidentalis*) and western skink (*Plestiodon skiltonianus*) also are present at Beale AFB.

During the dry season, vernal pools are similar in their wildlife species composition to annual grasslands. During the wet season, however, from late fall to early spring, this habitat supports a higher diversity of bird species. Concentrations of several hundred ducks have been observed using seasonal wetlands in the northwestern corner of Beale AFB. Mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*) and American widgeon (*Mareca americana*) are the most common species. Concentrations of northern shoveler (*Spatula clypeata*), gadwall (*Mareca strepera*) and tundra swan (*Cygnus columbianus*) have also been observed. Other water birds that use seasonal wetlands include American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), long-billed curlew (*Numenius americanus*), greater yellowlegs (*Tringa melanoleuca*), long-billed dowitcher (*Limnodromus scolopaceus*), common snipe (*Gallinago gallinago*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), green-winged teal (*Anas crecca*), cinnamon teal (*Spatula cyanoptera*), Canada goose, white-faced ibis (*Plegadis chihi*) and killdeer (*Charadrius vociferus*). Amphibians such as the Pacific treefrog (*Pseudacris regilla*) and western toad (*Anaxyrus boreas*) also use vernal pools and other seasonal wetlands while they are inundated. Gartersnakes, northern raccoons (*Procyon lotor*) and other predators feed on these amphibians. Vernal pools also contain crustaceans including tadpole and fairy shrimp. These are important prey for other species.

Wildlife observed at LRS during surveys conducted in 1994 include black-tailed hare, Botta's pocket gopher, ring-necked pheasant (*Phasianus colchicus*), killdeer, northern flicker (*Colaptes auratus*), European starling (*Sturnus vulgaris*) and western meadowlark (JEG 1994).

Annual grasslands on Beale AFB—especially ungrazed and unmowed areas— provide important floral resources for pollinators (Marty 2020). The *Monarch Butterfly, Crotch's Bumble Bee and Western Bumble Bee: Habitat Assessment and Species Survey Year 1 Report* (Marty 2020) identified four species of bumble bee (*Bombus*), seven other species of bees, and 19 species of Lepidoptera (butterflies, moths, and skippers) utilizing grasslands. Some of the species documented include the yellow-faced bumble bee (*Bombus vosnesenskii*), California bumble bee (*Bombus californicus*), black-tailed bumble bee (*Bombus melanopygus*), Van Dyke's bumble bee (*Bombus vandykei*), the European honey bee (*Apis mellifera*), eastern tailed blue (*Cupido comyntas*), painted lady (*Vanessa cardui*), the common ringlet (*Coenonympha tullia*), and the monarch butterfly (*Danaus plexippus*). In 2021, pollinator surveys detected Crotch's bumblebee at Beale AFB and Lincoln Receiver (Pers. Comm. Dr. Jaymee Marty, June 2021). An incidental observation of a monarch butterfly was made on Beale AFB in June of 2020.

2.3.3.2 Oak Woodlands

Oak woodlands provide important nesting, roosting and perching habitat for a variety of bird species. They also provide shade in the summer and cover in the winter for many bird and mammal species. Acorns produced in the oak woodlands are an important food resource for many species of wildlife, including wild turkey, California quail (*Callipepla californica*), acorn woodpecker (*Melanerpes formicivorus*), California scrub-jay (*Aphelocoma californica*), deer and California ground squirrel. Oak foliage and bark support insect populations that provide food for insectivorous birds, including bushtit (*Psaltriparus minimus*), yellow-rumped warbler (*Setophaga coronata*) and Hutton's vireo. Oaks also provide nest sites for cavity-nesting birds, including the acorn woodpecker, Nuttall's woodpecker, ash-throated flycatcher (*Myiarchus cinerascens*), western bluebird (*Sialia mexicana*), tree swallow (*Tachycineta bicolor*), oak titmouse (*Baeolophus inornatus*) and white-breasted nuthatch (*Sitta carolinensis*).

2.3.3.3 Riparian Forest

The riparian forest, especially mixed riparian forest, is the most structurally diverse habitat on Beale AFB and one of the most important habitats for wildlife on the base. The riparian forest provides a source of water and cover and can function as a travel or migration corridor for many species. The structural diversity provides many habitat niches in a small area (e.g., canopy, brushy understory, tree cavities, and leaf litter). The yellow-rumped warbler, Hutton's vireo and ash-throated flycatcher forage on insects in the trees and shrubs. This habitat provides nesting and rearing cover for California quail, California scrub-jay, song sparrow (*Melospiza melodia*), house wren (*Troglodytes aedon*), Bewick's wren (*Thryomanes bewickii*) and other birds. Many mammals, amphibians, and reptiles occupy mixed riparian forests, including several species of bats, the western gray squirrel (*Sciurus griseus*), dusky-footed woodrat, northern gray fox (*Urocyon cinereoargenteus*), northern raccoon, striped skunk (*Mephitis mephitis*), Virginia opossum, mule deer, California slender salamander, western fence lizard, southern alligator lizard and western rattlesnake.

2.3.3.4 Freshwater Marsh

Permanent wetlands are important habitats because of their high biological value and scarcity in the immediate region and the Sacramento Valley relative to their historical distribution. Freshwater marsh within Beale AFB provides important foraging habitat for fish-eating birds such as American bittern (*Botaurus lentiginosus*), great blue heron, great egret and belted kingfisher (*Megaceryle alcyon*). These aquatic habitats also attract mallard, American coot (*Fulica americana*), common moorhen, (*Gallinula chloropus*) northern pintail, American widgeon and other water birds. Concentrations of northern shoveler, gadwall and tundra swan have also been observed. Other water birds that use permanent wetlands at Beale AFB include American avocet, black-necked stilt, long-billed curlew, greater yellowlegs, long-billed dowitcher, common snipe, snowy egret, black-crowned night-heron (*Nycticorax nycticorax*), red-winged blackbird (*Agelaius phoeniceus*), TRBL and green heron (*Butorides virescens*). Several species, such as marsh wren (*Cistothorus palustris*) and song sparrow, nest in cattails and other emergent vegetation.

Several mammals, such as northern raccoon, striped skunk, North American beaver (*Castor canadensis*), North American river otter (*Lontra canadensis*) and common muskrat (*Ondatra zibethicus*), probably live in freshwater marsh habitats at Beale AFB. Amphibians such as the Pacific treefrog and American bullfrog have been observed in this habitat. The bullfrog is an invasive aggressive nuisance species and may be largely responsible for the extirpation of numerous native California amphibian species.

Freshwater marsh along Dry Creek and Best Slough functions as one component of the overall aquatic system in these perennial drainages. The varying types of aquatic habitats along Dry Creek and Best Slough support wildlife species very similar to those described above, as well as both native and nonnative fisheries.

Although perennial drainages at Beale AFB provide habitat primarily for year-round resident fish species, fall-run Chinook salmon (*Oncorhynchus tshawytscha*) and Central Valley steelhead (*Oncorhynchus mykiss*) have been known to use Dry Creek. Common native fish species that may occur in Dry Creek and Best Slough include speckled dace (*Rhinichthys osculus*), California roach (*Hesperoleucus symmetricus*), hardhead (*Mylopharodon conocephalus*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis occidentalis*) and Sacramento tule perch (*Hysterocarpus traskii traskii*). Common nonnatives include mosquitofish (*Gambusia* sp.), largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), and redear sunfish (*Lepomis microlophus*).

2.3.3.5 Ponds, Lakes, and Reservoirs

Ponds, lakes and reservoirs provide habitat for many of the same wetland and open water-associated wildlife species described above for the freshwater marsh. The open water provides suitable foraging and resting habitat for dabbling ducks (such as mallard, gadwall and northern pintail) and other water birds, including American coots and pied-billed grebe (*Podilymbus podiceps*). Great blue heron, great egret, double-crested cormorant (*Phalacrocorax auritus*) and other fish-eating birds forage in this habitat. Ponds, lakes, and reservoirs provide foraging habitat and drinking water sources for bats. Common amphibians such as the Sierran treefrog (*Pseudacris sierra*) and bullfrog also are likely to live in this habitat. Ponds, lakes and reservoirs at Beale AFB support a variety of warm-water fish species including sunfish, bass, carp and catfish. Dry Creek in the location of the former Beale Lake may also support some of the native fish species mentioned in Section 2.3.3.4, *Freshwater Marsh*. Water temperatures in stock ponds and lakes at Beale AFB are likely too warm to sustain trout fisheries.

2.3.3.6 Wildlife and Climate Change

Fish and wildlife species at Beale AFB may experience moderate affects from climate change (CEMML 2019). Habitat change and disruption to food availability resulting from climate change are threats to all species at Beale AFB. Habitat requirements for some species may change as they employ behavioral adaptations. Prey populations or forage abundance may be affected by changes in temperature and precipitation. Changes in seasonal cues for prey or forage emergence could result in a mis-match between food availability and food needs of some species. Some species are further imperiled by life stages that are sensitive to temperature and precipitation changes. In addition, stream channel overflow can alter instream and riparian habitat.

Increased precipitation may have a positive impact on aquatic and semiaquatic animals. Wildlife including North American beavers, common muskrats, North American river otters, Pacific treefrogs, turtles, various fish species and a number of water fowl may benefit from increased habitat availability in vernal pools, wetlands and marshes. However, these changes are more likely to benefit invasive aquatic wildlife that require year-round water sources and thrive at higher water temperatures. If increased precipitation leads to expansion of riparian areas, this could benefit wildlife, particularly birds that use this habitat for nesting and foraging.

Increases in precipitation could also lead to increased plant community productivity, which would promote higher arthropod abundance and benefit insectivorous wildlife. Increased productivity may also benefit herbivorous mammals. On the other hand, changing vegetation communities could have a negative impact on specialist wildlife species that have historically depended on specific native plant species (Dukes & Mooney 1999). These alterations could also create or improve habitat conditions for new and existing invasive plant and animal species, exacerbating competition with native species that are already experiencing reduced fitness due to shifting environmental conditions (Hellmann et al. 2008).

Rising temperatures may produce a range of negative impacts on wildlife species at Beale AFB. Generalist fish and amphibian species may be able to withstand the projected changes in temperature, but species that require specific temperature ranges for reproduction or other life cycles stages may not be adversely affected. Young fishes and amphibians inhabiting small bodies of water are particularly vulnerable to extreme heat, and temperatures in small bodies of water can fluctuate rapidly. Increasing air temperatures will result in increasing water temperatures, creating more favorable environments for future algal blooms (Paerl et al. 2011). Rising water temperatures will also result in decreased dissolved oxygen content, further decreasing habitat quality for fish and amphibians, particularly in still and slow-moving aquatic systems.

Increased temperatures, fire frequency and intensity can create new niches for invasive species that previously would not have found this climate habitable. Rising temperatures may also alter time frames of when terrestrial insects emerge from overwintering underground or aquatic insects emerge from water. This, in turn, could impact bird migration as migration would no longer coincide with insect emergence, eliminating a major feeding opportunity and potentially leading to decreased populations.

2.3.4 *Threatened and Endangered Species and Species of Concern*

There are 61 threatened, endangered, or other special-status plant, fish, and wildlife species known or with the potential to occur at Beale AFB, and nine special-status wildlife species that have been observed at LRS (Table 2-10). Location information can be obtained through 9 CES/CEIEC. Species that are known or are likely to occur on Beale AFB are discussed in further detail in the text of this section. Species that are not likely to occur, but are protected, are included in Table 2-10 for reference. A number of special-status species designations apply to plants and animals found on Beale AFB:

- Federal Threatened and Endangered (T&E) species—Listed as Threatened or Endangered under the federal ESA and afforded all of the protections provided by that law. A species is federally listed under Section 4 of ESA 30 days after a final rule is published in the Federal Register. Per Air Force Manual (AFMAN) 32-7003, Installations known to sustain federally listed T&E species or their habitats must address T&E species conservation in the INRMP.
- Federal Candidate Species—Candidate species are those species for which USFWS or NMFS have conducted a 12-month status review and determined that listing is “warranted but precluded” by species that are a higher listing priority. The status of candidate species is re-evaluated annually. These species have no legal protection under the ESA, but, when practical, the base will provide protections to federal candidates similar to those species afforded full protection under the ESA.
- Federal Proposed Species—If a 12-month finding concludes that listing a species is warranted it is considered a “Proposed” species. A 60-day comment period follows to allow for public, scientific, and agency input. These species have no legal protection under the ESA, but, when practical, the base will provide protections to federal proposed species similar to those species afforded full protection under the ESA.
- Federal Review Species—Species that are under review have a 90-day determination stating that there is sufficient information to indicate the listing “may be warranted” and a determination will be made after a 12-month status review. These species have no legal protection under the ESA.
- Federal Petitioned Species—Species that have been petitioned for listing are those for which an organization has sent a petition to USFWS stating that the species should be considered for listing, but do not yet have 90-day finding from USFWS. These species have no legal protection under the ESA.

- Federally Delisted Species—A species is removed from the endangered species list and considered “delisted” or “recovered” when the USFWS has determined it is able to survive on its own in the wild, and threats to the species survival have been eliminated or controlled and the protection of the ESA is no longer necessary.
- California State T&E Species—Listed as Threatened or Endangered under the California Endangered Species Act (CESA) and afforded all of the protections provided by that law. Per AFI 32-7064, Section 8.1 *ESA Compliance*, this INRMP will provide for the protection and conservation of state listed protected species when practicable and when not in direct conflict with the military mission.
- California State Petitioned, Candidate and Delisted Species—Like the ESA there are multiple steps to listing a species under the CESA. There are state petitioned and candidate species, as well as species that have been delisted or recovered under the CESA. Unlike under the federal ESA, once it is determined that a petitioned species may warrant listing it is considered a candidate species. Similar to federal petitioned, candidate, and delisted species, they are afforded no legal protections under the CESA.
- State Fully Protected (FP)—The classification of FP was California’s initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Many, but not all, of the species originally listed as FP were subsequently listed under the CESA. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. These species are afforded legal protection under California Fish and Game Code Sections 3511, 4700, 5050 and 5515.
- Federal Species of Concern (SoC)—SoC are sensitive species that have not been listed, proposed for listing nor placed in candidate status. Species of concern is an informal term used by NMFS and some, but not all, USFWS offices. SoC receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a T&E species.
- Bird of Conservation Concern (BCC)—These are species of migratory and non-migratory birds (beyond those already designated as federal T&E species) that represent the highest conservation priorities (USFWS 2008). The USFWS identified “Bird Conservation Regions” and species are considered BCCs for a specific region, and not necessarily throughout the species’ entire range. Beale AFB is within Bird Conservation Region 15 (Sierra Nevada) and 32 (Coastal California). This designation does not convey any legal protection.
- Department of Defense-Partners in Flight (DoD-PIF) Mission-Sensitive Priority Bird Species (MSPBS)—The DoD-PIF Program identified bird species that occur on DoD lands and are at risk of becoming federally listed if current populations trends continue. The purpose of the list is to help DoD NRMs prioritize monitoring and management efforts on those species (and their habitats) that have the greatest potential to impact the military mission should they become federally listed. This designation does not convey any legal protection. The Partners In Flight Ranks include List C- common birds in steep decline that are not warranted for inclusion on the watch lists, List D- (Yellow Watch List) not declining but vulnerable due to small range or population and moderate threats, and List R- (Red Watch List) species with extremely high vulnerability due to small population and range, high threats, and range-wide declines (Rosenberg et al. 2016).
- California Species of Special Concern (SSC)—CDFW has designated certain vertebrate species as SSC because declining population levels, limited ranges, and/or continuing threats have made them

vulnerable to extinction. The goal of designating species as an SSC is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long-term viability. This status does not convey any legal protection.

- California state Watch List (WL) species—CDFW maintains a list consisting of taxa that were previously designated as SSC but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status. This designation does not convey any legal protection.
- Western Bat Working Group (WBWG) priority species—The WBWG is composed of agencies, organizations, and individuals interested in bat research, management, and conservation from 13 western states and provinces. Species are ranked as High, Medium, or Low Priority in each of 10 regions in western North America. Beale AFB is within Region 5 (Mediterranean Division). This ranking does not convey any legal protection.
- California Native Plant Society (CNPS) rare plant rank—The California Rare Plant Ranks are a ranking system originally developed by CNPS to better define and categorize rarity in California's flora. This ranking does not convey any legal protection.
- State Ranking—The state rank is a reflection of the overall imperilment status of an element throughout its range within California. State ranks represent a letter and number score that reflects a combination of rarity, threat, and trend factors, with weighting being heavier on rarity than the other two. This ranking does not convey any legal protection.

Table 2-10. Special-status species known to occupy habitats on or near Beale AFB or LRS.

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
Plants						
Legenere <i>Legenere limosa</i>	CNPS 1B.1/S2	Found in Alameda, Lake, Monterey, Napa, Placer, Sacramento, San Joaquin, San Mateo, Santa Clara, Shasta, Solano, Sonoma, Stanislaus, Tehama and Yuba counties	Vernal pools	Loss of habitat, grazing, road widening, non-native plants and development	Yes, small populations	Not surveyed
Veiny monardella <i>Monardella venosa</i>	CNPS 1B.1/S1	Found in Butte, Sutter, Tuolumne, and Yuba counties	Heavy clay, Cismontane woodland, and valley and foothill grasslands	Loss of habitat, development	Not detected in surveys	Not surveyed
Hartweg's golden sunburst <i>Pseudobahia bahiifolia</i>	FE/CNPS 1B.1/S1	Found in Yuba, Calaveras, Tuolumne, Stanislaus, Merced, Madera, and Fresno Counties	Clay soils, Foothill woodland, Valley grassland.	Residential development, conversion of pasture to orchards & vineyards, non-native species invasion	Not detected in surveys	Not detected in surveys
Layne's ragwort <i>Packera layneae</i>	FT/CNPS 1B.2/S2	Found in Butte, Yuba, Placer, El Dorado, and Tuolumne counties	Serpentine soils. Foothill woodland, chaparral.	Development, changes in surface hydrology, loss of habitat, alteration of fire regime, suppression of disturbance	Not detected in surveys	Not detected in surveys
Dwarf downingia <i>Downingia pusilla</i>	CNPS 2B.2/S2	Found in Fresno, Merced, Napa, Placer, Sacramento San Joaquin, Solano, Sonoma, Stanislaus, Tehama and Yuba counties	Vernal pools	Loss of habitat	Yes, several locations	Not surveyed
Brazilian watermeal <i>Wolffia brasiliensis</i>	CNPS 2B.3/S2	Butte, Glenn, Sutter and Yuba counties	Marshes and swamps-assorted shallow freshwater	Unknown	Not detected in surveys	Not surveyed
Sinkbells <i>Frittilaria agrestis</i>	CNPS 4.2/S3	Found in Alameda, Contra Costa, Fresno, Kern, Mendocino, Merced, Monterey, Placer, Sacramento, Santa Barbara, San Benito, Santa Clara, Santa Cruz, San Luis Obispo, San	Clay, chaparral, cismontane woodland, pinyon juniper woodland, valley and foothill grassland	Development, Grazing pressure and vehicles	Yes, small population	Not surveyed

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
		Mateo, Stanislaus, Tuolumne, Ventura, and Yuba counties.				
Brandegee's clarkia <i>Clarkia biloba</i> ssp. <i>brandegeae</i>	CNPS 4.2/S4	Butte, El Dorado, Nevada, Placer, Sacramento, Sierra and Yuba counties	Roadcuts, Chaparral, cismontane woodland, lower montane coniferous forest	Non-native plants, road maintenance, fire and suppression, development	Not detected in surveys	Not surveyed
Dwarf dwarf cudweed/ Hogwallow starfish <i>Hesperevax caulescens</i>	CNPS 4.2/S3	Alameda, Amador, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Merced, Monterey, Napa, Sacramento, San Diego, San Joaquin, San Luis Obispo, Solano, Stanislaus, Sutter, Tehama, Yolo, and Yuba counties	Valley and foothill grassland (mesic, clay), vernal pools	Habitat loss (development/agriculture), possibly overgrazing	Detected in 2016	Not detected
Tehama navarretia <i>Navarretia heterandra</i>	CNPS 4.3	Butte, Colusa, Lake, Shasta, Tehama, Trinity, and Yuba counties	Mesic areas in valley and foothill grasslands, vernal pools	Limited distribution	Detected in 2003	Not surveyed
Invertebrates						
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	Central Valley, central and south Coast Ranges from Shasta County to Santa Barbara County; isolated populations in Riverside County	Vernal pools; also found in sandstone rock outcrop pools	Habitat loss to agricultural and urban development	Yes; numerous locations	Surveyed - not detected, though suitable habitat exists
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE	Disjunct occurrences in Solano, Merced, Tehama, Butte, and Glenn counties	Large, deep vernal pools in annual grasslands	Habitat loss to agricultural and urban development	Not detected during surveys. Not likely to occur-outside range.	Surveyed - not detected, not likely to occur-outside range.
Vernal pool tadpole shrimp	FE	Shasta County south to Merced County	Vernal pools; ephemeral stock ponds	Habitat loss to agricultural and urban development	Yes; numerous locations	Yes

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Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
<i>Lepidurus packardi</i>						
Valley elderberry longhorn beetle (VELB) <i>Desmocerus californicus dimorphus</i>	FT	Streamside habitats below 2,000 feet through the Central Valley of California	Riparian and oak savannas habitats with elderberry shrubs	Loss and fragmentation of riparian habitats. Beale AFB has planted elderberries.	Elderberry shrubs present. Beetle exit holes observed in shrubs along Best Slough and Dry Creek.	Surveyed—not detected. No suitable habitat
Monarch butterfly <i>Danaus plexippus plexippus</i>	FC	In spring and summer, in open fields and meadows with milkweed. In winter it resides on the coast of southern California and at high altitudes in central Mexico.	Open fields and grasslands with milkweed present	Loss of habitat, specifically milkweeds	Butterflies and caterpillars observed at multiple locations adjacent drainages on Beale AFB.	Surveyed- not detected
Crotch's bumblebee <i>Bombus crotchii</i>	SC	Southern 2/3 of the state in Central and San Joaquin valleys, coastal areas south of San Francisco Bay. Historically occurred in northern Central Valley.	Open grassland and scrub habitats.	Habitat loss, overexploitation, competition, disease, pesticide use, global climate change	Detected on 6/21/21 during pollinator surveys.	Detected on 6/29/21 during pollinator surveys.
Western bumblebee (WBB) <i>Bombus occidentalis</i>	FR/SC	Northern California	Areas with blooming flowers from early February to late November	Habitat fragmentation and widespread pesticide use	Surveyed- not detected	Surveyed- not detected
Fish						
Steelhead—Central Valley DPS	FT	Central Valley of California below natural and human-made barriers	Perennial and intermittent streams	Loss and degradation of spawning habitat. Mortality to adults and juveniles from water	Observed upstream of Beale AFB at Spenceville Wildlife Area;	Not surveyed. No suitable habitat

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
<i>Oncorhynchus mykiss irideus</i>				diversions, dams, and other activities	may use Dry Creek in higher flow years	
Chinook salmon— Central Valley fall/late fall-run ESU <i>Oncorhynchus tshawytscha</i>	SoC/ SSC	Central Valley of California below natural and human-made barriers	Perennial and intermittent streams	Loss of, or loss of access to, spawning habitat; changes in stream hydrology, increases in predator species	Small run reported in Dry Creek 2012, successful spawn in 2014/15 with 400 fry, also observed in 2015/16	Not surveyed. No suitable habitat
Chinook salmon— Central Valley spring-run ESU <i>Oncorhynchus tshawytscha</i>	FT/ST	Central Valley of California—primarily along the Sacramento River and its tributaries	Deep and large streams	Loss of, or loss of access to, spawning habitat; changes in stream hydrology, increases in predator species	Surveyed. Not detected, but has small potential to occur during high flow years	Not reported. Not likely to occur—unsuitable habitat
Delta smelt <i>Hypomesus transpacificus</i>	FT/SE	Primarily in the upper reaches of the San Francisco Bay and Sacramento-San Joaquin Delta estuary. Also observed in the Central Valley north of Modesto and in the coast and Sierra Nevada Mountains.	Brackish water below 25°C	Water diversion, loss of habitat, competition and predation from non-native species, water pollution	Not surveyed. Not likely to occur	Not surveyed, no suitable habitat
Sacramento perch <i>Archoplites interruptus</i>	SSC-in native range only	Its native range included most of Central Valley, the Coast Range and Sierra foothill watershed. It is now restricted to small disjunct populations, the closest of which is Collins Lake, Yuba County.	Sluggish, heavily vegetated waters of sloughs and lakes	Non-native fish, habitat destruction	Potential to occur, but species-specific surveys have not been done	Not surveyed. Potential to occur
Amphibians						
California tiger salamander— Central California DPS	FT/ ST	Yolo County in the north to Santa Barbara County in the south; potential breeding habitat occurs in seasonal wetlands and stock ponds; potential upland habitat exists throughout annual grasslands	Open woodlands and annual grasslands for hibernation; ponds or pools (especially vernal pools) in streams for breeding	Loss of grasslands and wetlands to agricultural and urban uses	Not detected during surveys; base is north of the species' range	Surveyed-not reported. Not likely to occur outside range,

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Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
<i>Ambystoma tigrinum californiense</i>					(known from Travis AFB)–not likely to occur	unsuitable habitat
Western spadefoot <i>Spea hammondi</i>	FR/SSC	Valleys and foothills in California–potential habitat exists in vernal pool habitats	Floodplains and vernal pools	Loss of vernal pools and other seasonal wetlands	Faint calls heard during 2018 surveys, possible calls heard/recorded during 2012, 2016, and 2017 surveys	Heard calling from within site in 2018, several visual and aural detections in canals and irrigated fields adjacent to site
Foothill yellow-legged frog (FYLF) <i>Rana boylei</i>	FR/SC/SE	Sierra Nevada foothills and Coast ranges	Shallow streams with riffles	Alteration of stream habitats by urbanization and hydroelectric projects	Marginal habitat exists but it has not been detected during surveys and is likely not to occur due to predator abundance (bullfrog). The closest occurrence is 11.3 miles to the northeast	Not surveyed. No suitable habitat
California red-legged frog (CRLF) <i>Rana draytonii</i>	FT/SSC	Locally abundant in the San Francisco Bay Area and the central coast, there are isolated populations in Sierra Nevada, northern Coast and Traverse ranges	Slow-moving streams, perennial and ephemeral ponds with upland sheltering such as rocks, small mammal burrows, logs etc. Breeding is in deep, slow-moving water with varying amounts of	Loss of habitat due to urban growth, overgrazing by cattle, invasion of non-native plants, degraded water quality and introduced predators such as bullfrogs	Surveys have produced no detections. Likely extirpated from area. Habitat is degraded by	Surveyed–not detected. Not likely to occur–unsuitable habitat

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Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
			emergent vegetation that stays cool in the summer		presence of predatory bullfrogs	
Reptiles						
Western pond turtle (WPT) <i>Actinemys (Emys) marmorata</i>	FR/SSC	Foothills and lowlands throughout California	Ponds, marshes, and streams for foraging and cover; adjacent grasslands and savannas for nesting	Loss and alteration of aquatic and wetland habitat; habitat fragmentation	Yes; several locations	Surveyed/Not Reported. Habitat is marginal.
Giant gartersnake (GGS) <i>Thamnophis gigas</i>	FT/ST	Central Valley, not Yuba County	Marshes, water conveyance channels, and adjacent uplands	Loss of wetland and adjacent habitats	Possible sighting in Reeds Creek in 2004. not detected during protocol surveys 2005-2018	No detections reported. Marginal habitat present
Birds						
American white pelican <i>Pelecanus erythrorhynchos</i>	SSC	In California, nests on lakes along the Oregon border, in Klamath Basin. Winters in large wetlands throughout California, including San Francisco Bay, lower Sacramento Valley, Salton Sea and Colorado River	Found in fresh or saltwater bodies of various depths	Destruction of nesting islands and breeding habitat, human disturbance	Known to occur at Pond 4, Upper Blackwelder, Lower Blackwelder, Goose, and Miller Lakes	Not surveyed
Western least bittern <i>Ixobrychus exilis hesperis</i>	SSC	Permanent residents along the Colorado River and Salton Sea, as well as isolated areas in Imperial, San Diego, and Los Angeles counties; summers in Tulare Lake and parts of Fresno, Merced, Madera, Siskiyou, and Modoc Counties; along the Sacramento River in Yolo, Sutter, Colusa, Glenn, and Butte counties	Found in marshlands and along pond edges, where tules and rushes can provide cover; nests are built low in the tules over the water	Loss of wetland habitat	Not surveyed	Not surveyed

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
Cooper's hawk <i>Accipiter cooperii</i>	WL	Breeding resident throughout most of the woodlands and forests of California; potential breeding habitat in the riparian area near wet meadows	Oak woodlands, riparian woodlands, and second-growth coniferous forests for nesting; often nests near water; uses snags and dead branches for resting and perching; woodlands and edges of other habitats for foraging	Loss of lowland riparian habitats; vulnerable to human disturbance	Confirmed breeder in Dry Creek area. Detected year-round	Observed foraging over site
Sharp-shinned hawk <i>Accipiter striatus</i>	WL	Uncommon breeding bird in California; breeds in central and north Coast Ranges, Cascade Range, and Sierra Nevada	Breeds primarily in lower elevation conifer forests and oak, pinon-juniper, aspen, and riparian woodlands; nests in single-tiered dense pole and small tree stands; feeds in open stands; often nests near water	Pesticide-related reproductive failure; vulnerable to human disturbance and timber harvesting	Winter visitor	Observed foraging over site
Ferruginous hawk <i>Buteo regalis</i>	WL	Winters in the Central Valley and Sierra Nevada and Coast ranges foothills; grasslands provide suitable foraging habitat	Open grassland with perch sites	Conversion of grasslands to agricultural crops and human disturbances	Winter resident	Not surveyed
Swainson's hawk <i>Buteo swainsoni</i>	ST	Klamath Basin and lowland Central Valley of California	Riparian habitats and isolated trees for nesting; grasslands and agricultural fields for foraging	Loss of riparian and agricultural habitats; vulnerable to human disturbance	Summer visitor; confirmed nesting at Beale AFB in 2004, 2016–2018	Observed foraging over site
Northern harrier <i>Circus hudsonius</i>	BCC/SSC	Lowlands and valleys throughout California; grasslands and wetlands (emergent vegetation) support suitable foraging habitat	Nests in dense grasslands and wetlands; forages in wetlands, grasslands, and agricultural fields	Loss of wetlands and grasslands	Year-round resident	Observed foraging over site
White-tailed kite	FP	Lowlands throughout California, except the Mojave Desert; potential nester in valley oak woodland and riparian woodland	Open savannas, grasslands, and wetlands for foraging; trees and large shrubs in	Loss of wetlands and grasslands	Irregular visitor	Observed foraging over site

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
<i>Elanus caeruleus</i>			riparian and oak woodland areas for nesting			
Bald eagle <i>Haliaeetus leucocephalus</i>	FD/SE, FP/MSPBS	Nests in Shasta, Tehama, Butte, Plumas, Nevada and El Dorado counties in the Cascade Range and Sierra Nevada, usually near streams or lakes; winters throughout northern California near lakes, reservoirs and rice fields where suitable habitat exists; suitable foraging habitat exists along the American River	Large lakes or streams with large trees for nesting; lakes, reservoirs, and streams with perching trees for foraging	Nest sites vulnerable to human disturbance; susceptible to biological concentrations of pesticides; changes in stream hydrology can affect foraging habitat	Regular winter visitor	Not surveyed
Golden eagle <i>Aquila chrysaetos</i>	WL/FP/MSPBS	Throughout California	Grasslands and savannas for foraging; oak	Vulnerable to human disturbance during	Year-round visitor	Not surveyed
Osprey <i>Pandion haliaetus</i>	WL	Throughout California during breeding season; nests in Sierra Nevada Range, Cascade Range, Coast Range, Upper Sacramento River, Yuba River, Rollins Lake and occasionally Lake Wildwood; visitor to Thermolito Afterbay	Rivers, lakes, and reservoirs with perching trees for foraging; large trees within 1 mile of aquatic habitats (lakes and streams) for nesting	Vulnerable to disturbance during the nesting season; susceptible to biological concentrations of pesticides; changes in stream hydrology can affect foraging habitat	Regular visitor	Not surveyed
Prairie falcon <i>Falco mexicanus</i>	BCC/WL	Breeds in southern California mountains and deserts, Sierra Nevada, Coast ranges, and northeastern California; winters throughout the state, including the Central Valley	Nests on cliff ledges and escarpments; forages in open country, including grasslands; feeds on insects, small mammals, and birds	Pesticide contamination, human persecution, and decline in prey species abundance	Regular winter visitor	Observed foraging over site
Peregrine falcon <i>Falco peregrinus</i>	FD/SD, FP	Rare nester in the Central Valley of California; transient in western Sierra Nevada; nests in the central and northern Coast ranges and Sierra Nevada; winters in the Central Valley	Protected ledges of high cliffs, usually adjacent to marshes, lakes, or rivers, for nesting; open habitats for foraging; in winter forages in grasslands and wetlands	Susceptible to biological concentrations of pesticides, loss of foraging habitat, and disturbance of nests	Regular winter visitor	Not surveyed

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
California black rail <i>Laterallus jamaicensis coturniculus</i>	ST, FP/ MSPBS	Permanent resident in the San Francisco Bay and eastward through the Delta into Sacramento and San Joaquin counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial counties	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes emergent vegetation at low elevations	Loss of wetland habitat	Observed in marsh below Miller Lake, at pond by Small Arms Range and at PAVE PAWS lake as recently as 2009. Subsequent surveys have not found any on base.	Not surveyed—no suitable habitat
Greater sandhill crane <i>Antigone canadensis tabida</i>	ST, FP	Breeds on the plains east of the Cascade ranges and south to Sierra County; winters in the Central Valley, southern Imperial County, Lake Havasu National Wildlife Refuge, and the Colorado River Indian Reserve	Summers in open terrain near shallow lakes or freshwater marshes; winters in plains and valleys near bodies of fresh water and agricultural fields	Loss of wetlands	Winter visitor (Observed in February during 2001 BASH surveys, observed 2015, 2016, 2017 and 2018-winter)	Not surveyed
Short-eared owl <i>Asio flammeus</i>	BCC/SSC	Permanent residents along the coast from Del Norte to Monterey County, in the Sierra Nevada north of Nevada County, the plains east of the Cascades, and Mono County; winters on the coast from San Luis Obispo to San Diego County, the Central Valley from Tehama to Kern County, the eastern Sierra Nevada from Sierra to Alpine County, the Channel Islands, and Imperial County; small isolated populations also nest in the Central Valley	Use fresh and saltwater marshes, lowland meadows, and irrigated alfalfa fields; need dense tules or tall grass for nesting and daytime roosts	Loss of wetlands and grasslands	Winter resident	Not surveyed

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
Western Yellow-billed cuckoo— western DPS (WYBC) <i>Coccyzus americanus occidentalis</i>	FT /SE	Small pockets of dense riparian forest, mostly along the Sacramento River and the north coast of California and into northeastern Oregon	Wooded forests with dense cover and water nearby	Loss of habitat due to anthropogenic removal or conversion and/or invasive species encroachment; vulnerable to human disturbance during nesting; pesticide use	Not detected during surveys. Possible incidental detections in 2014 and 2017 not confirmed. Possibly present during migration. Nesting habitat not yet confirmed.	Not surveyed. No suitable habitat
Western burrowing owl <i>Athene cunicularia hypugea</i>	BCC/ SSC/ MSPBS	Foothills and valleys throughout California; lowland California; nests in annual grasslands	Breeds and forages in annual grasslands and agricultural fields; open, dry, and nearly level grassland or prairie habitat	Loss of habitat due to anthropogenic removal or conversion and/or invasive species encroachment; ground squirrel control	Year-round resident—sporadic breeding confirmed	Not surveyed
Bank swallow <i>Riparia riparia</i>	PIF-C/ST	Valleys and basins throughout California; nests along Feather River	Streamside habitats with steep banks and very little vegetation	Loss of habitat resulting from flood control projects	Rare visitor to the base, observed by BASH employee near flightline	Not surveyed—no suitable habitat
Olive-sided flycatcher <i>Contopus cooperi</i>	PIF-D/ BCC/SSC	Summer resident in areas of conifer forest the entire length of the state, ranging in elevation from near sea level on the coast to 9400 feet (2865 meters) in the interior	Mid- to high-elevation conifer forests with open canopy cover	Habitat degradation on the breeding grounds from development and snag removal; loss of winter habitat in Central America	Migrant in spring and fall	Not surveyed
Willow flycatcher <i>Empidonax trailii</i>	SE	Breeds primarily in Oregon, Washington and Idaho, but occasionally in the foothills and mountain of western Sierra Nevada and Cascade Range	Bushes and willow thickets, brushy fields along woodland edges, often near marshes or other water bodies	Loss of streamside habitat	Some detections in the Dry Creek area by sight and sound breeding has	Not surveyed

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
					not been confirmed. May be migrant	
Loggerhead shrike <i>Lanius ludovicianus</i>	BCC/SSC/ MSPBS	A common resident and winter visitor in lowlands and foothills throughout California. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood- conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats	Grasslands and agricultural areas. Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Loss of habitat	Year-round resident	Observed using site for foraging
Oak titmouse <i>Baeolophus inornatus</i>	PIF-D/BCC/ WL	Found in most of California west of the Sierra Nevada and Cascade ranges	Oak woodland and dry slopes throughout California	Loss of habitat	Year-round resident	Not surveyed
Yellow-billed magpie <i>Pica nuttalli</i>	PIF-D/BCC	Year-round resident in the Central Valley down through the Central Coast	Stream groves, scattered oaks, ranches, farms and orchards	Pesticides and contaminants, as well as West Nile Virus and habitat degradation	Occasional visitor	Not documented
Lewis's woodpecker <i>Melanerpes lewis</i>	PIF-D/BCC	Throughout the central valley in winter and year-round in the Sierra and northcentral part of the state	Oak woodlands, cottonwood groves and scattered forests	Habitat loss and degradation	Yes, winter resident	Not documented
Yellow warbler <i>Setophaga petechia</i>	SSC	Found in montane riparian woodlands in the Sierra Nevada, northeastern California, interior valleys, and south-central coasts; found in Central Valley riparian woodlands during migration; breeds in the Great Basin, Sierra Nevada, Cascade Ranges, Klamath Mountains, Coast ranges, Transverse Ranges, Colorado River, and north Sacramento Valley	Riparian (including willow and cottonwood) forests and scrub habitats for nesting and foraging; breeds in riparian woodlands, montane chaparral, conifer forests with substantial brush; and desert woodlands	Loss of riparian habitats; cowbird nest parasitism	Migrant in spring and fall, possible summer resident	Not surveyed
Yellow-breasted chat <i>Icteria virens</i>	SSC	Considered rare in riparian woodlands and thickets in northern California, along California coast, Sierra Nevada foothills, and northern Central Valley; suitable nesting	Nests in dense, multi-layered riparian forests with perennial or nearly perennial water	Loss of riparian forests	Summer resident	Not surveyed—no suitable habitat

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
		habitat exists along Feather River; known occurrence at Sweetwater Creek near the confluence with Folsom Lake and at Weber Creek; suitable habitat may occur along other foothill streams				
Grasshopper sparrow <i>Ammodramus savannarum</i>	SSC/MSPBS	Breeds in coastal and interior valley areas of California. Also found in Oregon, Washington, Idaho, Wyoming and Montana and all states east of the Rockies	Open grasslands, especially where grasshoppers are plentiful.	Habitat loss, fragmentation and degradation	Summer resident	Not surveyed
Tricolored blackbird (TRBL) <i>Agelaius tricolor</i>	PIF-R/BCC/ST/ MSPBS	Mountain valleys, foothills, and lowland valleys throughout California; grasslands near nesting sites are suitable foraging habitat; potential breeding habitat exists in Hamilton Slough	Breeds in freshwater marshes and blackberry thickets, cattail and tule marshes. Utilizes grasslands, agricultural fields, irrigated pastures, and wetlands for foraging; known to forage up to 3 miles from nesting colony.	Loss of riparian and wetland breeding habitats; nest disturbance; aerial spraying of herbicides and pesticides; mortality from poisoned grain; vulnerable to human disturbance at nesting colonies; suitable nesting habitat exists along Feather River	Year-round resident, nesting at A Street Pond, Reeds Creek 2015, 2016. Nested at Goose Lake in 2017. Nesting to the south of base in 2018.	Not surveyed, should be verified in blackberries
Mammals						
Pallid bat <i>Antrozous pallidus</i>	SSC/ WBWG	Widespread through Central Valley and surrounding foothills	Open, dry habitats with rocky areas for roosting; roosts in undisturbed areas, such as abandoned buildings and caves	Sensitive to disturbances and may abandon a roost if disturbed	Yes, several locations	Not Surveyed.
Long-legged myotis <i>Myotis volans</i>	WBWG	Widespread throughout California	Uses abandoned buildings, cracks in the ground, cliff crevices, exfoliating tree bark, and hollows within snags as summer day roosts; caves and mine tunnels as hibernacula	Sensitive to disturbances and may abandon a roost if disturbed	Yes, several locations	Not Surveyed.

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
Western red bat <i>Lasiurus blossevillii</i>	SSC/ WBWG	Widespread throughout California	Known to roost in cottonwoods or willows, but it is commonly detected in a variety of habitats	Sensitive to the loss of riparian habitat and the use of pesticides	Yes—one found dead near the running path by the golf course	Not Surveyed.
Townsend’s big-eared bat <i>Corynorhinus townsendii</i>	SSC/ WBWG	From southern British Colombia down the Pacific coast to central Mexico and east to the Great Plains	Coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural land and coastal habitats	Disturbance and/or destruction of roost sites	Yes, confirmed via acoustic survey. Also observed in the SWA	Not Surveyed.
Western mastiff bat <i>Eumops perotis</i>	SSC/WGWW	Southern California along the coast to San Francisco, along the Central Valley into Oregon	Woodlands, coastal scrub, grasslands, palm oases, chaparral, desert scrub, and urban areas	Urban/suburban expansion, destruction of cliff habitat, recreational climbing, poorly managed grazing and pesticide application	Detected in 2020 using valley oak woodland habitat in summer and grassland habitat in fall.	Not detected during acoustic surveys in 2017.
Little brown bat <i>Myotis lucifugus</i>	SSC/WBWG	The seven northern California counties and in two bands, one along the coast as far south as San Francisco and on band along the Sierra Nevada range as far south as northern Kern County.	Sagebrush, bitterbrush, alkali desert scrub, wet meadow, and montane chaparral and less commonly in valley foothill woodlands, mixed chaparral, coastal scrub, and grasslands	White-nose syndrome (where present), pesticide build-up, deforestation, and mining	Detected during acoustic surveys in 2017, but not in 2020 surveys, suggesting limited usage	Detected during acoustic surveys in 2017.
Marysville kangaroo rat <i>Dipodomys californicus eximus</i>	SSC	Marysville (Sutter) Buttes in Sutter County	Occurs in grassland and sparse chaparral habitats above the valley floor on slopes with well-drained soils	Extremely localized distribution; possible declines from overgrazing or agricultural	Not likely—possibly extirpated	Not surveyed
Ringtail <i>Bassariscus astutus</i>	FP	Found in the Sierra Nevada and Coast ranges, and the Sacramento Valley; upper and middle portions of the Sacramento River, Feather	Prefers riparian forests, chaparral, brushland, oak woodlands, and rocky hillsides	Loss of lowland riparian habitats	Scat observed in Dry Creek area in 2000 during	Not surveyed

Common and Scientific Name	Conservation Status ^a	Distribution in California	Preferred Habitats	Reason for Decline or Concern	Occurrence at Beale AFB	Occurrence at Lincoln Receiver Site
		River, and Bobelaine Sanctuary; occurs in riparian woodlands in the Chico area			trapping surveys conducted by CSUS	
^a Status Codes						
Federal						
BCC	United States Fish and Wildlife Service (USFWS) Birds of Conservation Concern. (No ESA protections) (USFWS 2008)					
FE	Federally listed as endangered under the federal ESA.					
FT	Federally listed as threatened under the federal ESA.					
FD	Federally delisted under the ESA.					
FR	Species under federal review are those species that have either been petitioned for federal listing or for which the USFWS has concluded in their 90-day finding that there is substantial scientific or commercial information indicating that listing may be warranted. No ESA protections.					
FC	Species for which the USFWS has sufficient information on biological status and threats to propose them as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.					
SoC	Species of concern are sensitive species that have not been listed, proposed for listing nor placed in candidate status. Species of concern is an informal term used by NMFS and some, but not all, U.S. Fish & Wildlife Service offices—no ESA protections.					
State						
SE	Listed as endangered under the California Endangered Species Act (CESA).					
ST	Listed as threatened under the CESA.					
SD	Delisted under the CESA.					
FP	Fully protected under the California Fish and Game Code.					
SC	Candidate for listing as threatened or endangered. Full CESA protections.					
SSC	Species of special concern—no CESA protections.					
WL	Watch List-taxa to watch due to population declines—No CESA protections.					
Western Bat Working Group						
WBWG	Listed as a high priority species by the Western Bat Working Group. No ESA or CESA protection.					
California Native Plant Society (CNPS) Rare Plant Rank (No ESA or CESA protections)						
CNPS 1B.1	Rare or endangered in California and elsewhere (1: Seriously endangered in California).					
CNPS 2B.2	Rare or endangered in California, common elsewhere (2: Fairly endangered in California).					
CNPS 2B.3	Rare or endangered in California, common elsewhere (3: Not very endangered in California).					
CNPS 4.2	Limited distribution in California (2: Fairly endangered in California).					
CNPS 4.3	Limited distribution in California (3: Not very endangered in California)					
Plant State Rank (No ESA or CESA protections)						
S1	Critically imperiled.					
S2	Imperiled.					

S3	Vulnerable.
Partners in Flight (PIF) Ranks	
MSPBS	Department of Defense-Partners in Flight; Mission-Sensitive Priority Bird Species (No ESA protections)
PIF-C	Common birds in steep decline, not warranted for inclusion on the Watch List (No ESA protections)
PIF-D	Yellow Watch List, not declining but vulnerable due to small range or population and moderate threats (No ESA protections)
PIF-R	Red Watch List, species with extremely high vulnerability due to small population and range, high threats, and range-wide declines (No ESA protections)
Other Acronyms	
DPS	Distinct Population Segment
ESU	Ecologically Significant Unit
SWA	Spenceville Wildlife Area

References: INRMP (2016), California Native Plant Society Inventory of Rare and Endangered Plants (2018), USFWS–Information for Planning and Consultation (2018), CDFW–State and Federally Listed Endangered and Threatened Animals of California (2018), Shuford and Gardali (2008).

2.3.4.1 Special Status Plants

Legenere (CNPS 1B.1, S2, USFWS SoC)

Legenere (*Legenere limosa*) is considered rare and endangered in California and elsewhere by CNPS (Rank 1B.1) (CNPS 2018) and is considered imperiled by the state of California (S2). It is designated as a Species of Special Concern (SoC) by USFWS. This species is found along lakeshores and in vernal pools, marshes, and other seasonally inundated habitats. Legenere is an inconspicuous annual that is a member of the bellflower family. It is generally 4-6 inches tall but can attain height of up to 12 inches, with minute white flowers. The flowering period for legenere is generally from April to June. Loss of vernal pool and other wetland habitats is considered the primary cause of population declines of this species. A Calflora report for this species is included in Appendix E.

Populations of legenere were first found in four vernal pools at Beale AFB during 1996 surveys and it has been detected in two pools on the base regularly during since then. This species has not been detected on LRS.

Veiny Monardella (CNPS 1B.1, S1).

Veiny monardella (*Monardella venosa*) is considered rare and endangered in California and elsewhere by CNPS (Rank 1B.1) and is considered critically imperiled by the state of California (S1). It grows in heavy clay soils in cismontane woodland and valley and foothill grasslands in Butte, Sutter, Tuolumne, and Yuba counties. Veiny monardella is a member of the mint family and an annual plant. It grows to 15 inches tall and may be branched or not. Flowers are purple, clustered at the tops of stems, and have long stamens. Flowers are present June through July. Its decline is attributed to loss of habitat and development.

Veiny monardella has not been detected on Beale AFB or LRS.

Hartweg's Golden Sunburst (FE, CNPS 1B.1, S1).

Hartweg's golden sunburst (*Pseudobahia bahiifolia*) is federally endangered and considered rare, threatened, or endangered in California and elsewhere by CNPS (Rank 1B.1). This species is found growing in clay soils in foothill woodlands and valley grasslands habitat. Bearing small sunflower-shaped heads, the plants reach 2-8 inches in height and are members of Asteraceae family. It generally flowers in March and April. It is recorded from Yuba, Calaveras, Tuolumne, Stanislaus, Merced, Madera, and Fresno counties. The species' decline is attributed to residential development, conversion of ranches to orchards and vineyards, and non-native species invasion.

Hartweg's golden sunburst has not been detected on Beale AFB or LRS.

Layne's Ragwort (FT, CNPS 1B.2, S2).

Layne's ragwort (*Packera layneae*) is federally threatened and considered rare, threatened, or endangered in California and elsewhere by CNPS (Rank 1B.2). This species grows in Serpentine soils in foothill woodland and chaparral habitats in Butte, Yuba, Placer, El Dorado, and Tuolumne counties. An herbaceous perennial, plants grow one to two feet tall and bear small yellow sunflower-shaped heads in April to June. Decline is attributed to development, changes in surface hydrology, loss of habitat, alteration of fire regime, and suppression of disturbance.

Layne's ragwort has not been detected on Beale AFB or LRS.

Dwarf Downingia (CNPS Rank 2B.2, S2)

Dwarf downingia (*Downingia pusilla*) is considered by the California Native Plant Society (CNPS) as rare and endangered in California but is more common elsewhere (CNPS Rank 2B.2) (CNPS 2018), and California S2. This species is found predominantly in northern claypan vernal pool habitats. Dwarf downingia is a diminutive (1 - 2-inch tall) annual with a very small white to blue flower that has two minute yellow spots. It is a member of the bellflower family. This species typically flowers from March to May. It is known to be present in the Central Valley from Tehama County to Merced County and from Sonoma to Placer County (CNPS 2018). The decline in occurrences of dwarf downingia in California is most likely attributable to loss or degradation of vernal pools across its natural range. A Calflora report for this species is included in Appendix E.

Populations of dwarf downingia were found in four vernal pools at Beale AFB during 1996 surveys and observed in the grazed portions of the LRS. Dwarf downingia has been recorded on Beale AFB regularly during rare plant surveys that have generally targeted legenera, since they can be found in similar habitats. The observations of dwarf downingia and legenera (both vernal pool obligate species) during 1996 surveys were the first such records for Yuba County and represent an expansion of the known range for these species (Jones & Stokes Associates 1996).

Brazilian Watermeal (CNPS 2B.3/S2)

Brazilian watermeal (*Wolffia brasiliensis*) is considered as rare and endangered in California but more common elsewhere (CNPS Rank 2B.3 and California S2). It grows in marshes, swamps, and assorted shallow freshwater features. Entirely aquatic, Brazilian watermeal is a member of the Arum family that occurs in Central California (in Butte, Glenn Sutter, and Yuba counties) to the eastern United States and South America. It was unknown in the state of California prior to 1988, and may in fact be a recent introduction from more tropical habitats (UC Jepson Eflora). Plants float in mats on the surface of the water and have leaves up to 1.2 millimeters long. Reasons for decline are unknown, and this species has not been detected on Beale AFB or LRS.

Stinkbells (CNPS Rank 4.2, California S3)

Stinkbells (*Fritillaria agrestis*) is considered to have limited distribution and be fairly endangered in California (CNPS Rank 4.2) and is considered vulnerable by the state (S3). The USFWS considers stinkbells a species of local concern, which means that its conservation may be of some local importance, but it has no formal protection. This species grows on heavy clay soils of flat, low-lying valley bottoms in nonnative annual grasslands. It also has been found in chaparral and woodland communities. This species has decreased in abundance because of the effects of grazing, off-road vehicle use, development, and land use changes. A Calflora report for this species is included in Appendix E.

Fewer than 10 individual stinkbells were found on Beale AFB on March 13 and 18, 1992 (Griggs pers. comm.). This population was not present during 1996 surveys, however, two populations containing between 60 and 150 individuals were identified by Matt Wacker of the Center for Natural Lands Management in 2005. Stinkbells were also observed on Beale AFB in 2018. LRS has not been surveyed for this species.

Brandege's Clarkia (CNPS 4.2)

Brandege's clarkia (*Clarkia biloba* ssp. *brandegeae*) is considered to have limited distribution and be fairly endangered in California. It grows in roadcuts and openings in chaparral, cismontane woodland, and lower montane coniferous forests in Butte, El Dorado, Nevada, Placer, Sacramento, Sierra, and Yuba

counties. This species can be as tall as three feet with delicate, pink, four-petaled flowers and linear to lanceolate leaves. The three subspecies characteristics intergrade, so identification may be difficult. Reasons for decline include road maintenance, non-native plant invasion, fire suppression, and development. It has not been detected in surveys of Beale AFB or LRS.

Dwarf Dwarf-Cudweed/Hogwallow Starfish (CNPS 4.2, California S3)

Dwarf dwarf-cudweed (*Hesperevax caulescens*), also commonly called hogwallow starfish, has a CNPS ranking of 4.2, and is considered vulnerable by California (S3). This species is found in mesic areas in valley and foothill grasslands on clay soils. Dwarf dwarf-cudweed is an annual herb in the Asteraceae family and is found in counties throughout the Central Valley region. It blooms from March to June. A Calflora report for this species is included in Appendix E.

Dwarf dwarf-cudweed is known from only one occurrence at Beale AFB, and was detected most recently in 2016. This species has not been detected at LRS.

Tehama Navarretia (CNPS Rank 4.3)

Tehama navarretia (*Navarretia heterandra*) is considered to have limited distribution in California but is not very endangered in California (CNPS Rank 4.3). Tehama navarretia is found in mesic areas in valley and foothill grasslands and vernal pools. This species is an annual herb in the Polemoniaceae family and is found in Butte, Colusa, Lake, Shasta, Tehama, Trinity, and Yuba counties. It blooms from April to June.

Tehama navarretia was recorded on Beale AFB in 2003 during annual rangeland monitoring. LRS has not been surveyed for this species.

2.3.4.2 Special Status Invertebrates

Vernal Pool Tadpole Shrimp (Federally Endangered)

The vernal pool tadpole shrimp (*Lepidurus packardii*) is federally listed as endangered. This species is found in suitable habitats in the Central Valley from Shasta County to Merced County (USFWS 1994). The vernal pool tadpole shrimp typically occurs in vernal pool complexes rather than individual pools (Fugate 1992). These pools range in size from 21 to 3,834,675 square feet (Olcott Lake at Jepson Prairie), in temperature from 50 to 84 °F, and in pH from 6.2 to 8.5 (Syrdahl 1993, King 1996, USFWS 2005a). Typically, the vernal pool tadpole shrimp is found in pools that are deeper than 4.7 inches, pond for 15 to 30 days, and do not suffer wide daily temperature fluctuations (Rogers 2001). However, vernal pools exhibit daily and seasonal fluctuations in pH, temperature, dissolved oxygen, and other water chemistry characteristics (Syrdahl 1993). Although the vernal pool tadpole shrimp is found on a variety of geologic formations and soil types, Helm (1998) found that over 50 percent of vernal pool tadpole shrimp occurrences were on High Terrace landforms and Redding and Corning soils. The species has also been observed in stock ponds and other seasonal wetlands.

The life cycle of the vernal pool tadpole shrimp is linked to the periodic filling and drying of its vernal pool habitat. When pools are dry, the eggs lie dormant in the dry pool sediments. After rainwater fills the pools during winter the dormant eggs hatch (Lanway 1974, Ahl 1991). Unlike the eggs of many fairy shrimp species, the eggs of the vernal pool tadpole shrimp do not require a freezing or drying period to hatch (Ahl 1991). Adult shrimp are often present and reproductive in vernal pools until the pools dry up in spring (Ahl 1991; USFWS 1994). The loss of vernal pools is the primary cause for the decline of the vernal pool tadpole shrimp. An estimated 90% of the suitable habitat for this species has been destroyed by human activities (e.g., commercial and residential development, agricultural development, off-highway vehicle use, water

development projects, and flood control projects). Habitat loss has occurred as a result of not only direct destruction and modification of vernal pools, but also alterations in vernal pool watersheds caused by modification of surrounding uplands (USFWS 1994).

Vernal pool tadpole shrimp were first detected in wet-season surveys in 1996 (Jones & Stokes Associates 1996) and have been fairly consistently detected in surveys (2008, 2010, 2012, 2014-18) at various locations.

Vernal pool tadpole shrimp were first detected in 1997 at LRS. A subsequent survey in 2013 identified six more locations.

Vernal Pool Fairy Shrimp (Federally Threatened)

The vernal pool fairy shrimp (*Branchinecta lynchi*) is federally listed as threatened. This species is found at locations scattered throughout the Central Valley from Shasta County to Tulare County, along the Coast Ranges from Solano County to San Luis Obispo and Santa Barbara counties, and in southern California in Riverside and San Diego counties. The vernal pool habitats form in depressions above an impervious substrate layer, or claypan/duripan, in alluvial fans and terraces that are known primarily from the eastern side of the Central Valley of California (Vollmar 2002). In general, the vernal pool fairy shrimp has a sporadic distribution within the vernal pool complexes, with most pools being uninhabited by the species (USFWS 1994). The vernal pool fairy shrimp has the widest geographic range of the federally listed vernal pool crustaceans, but it is seldom abundant where found, especially where it co-occurs with other species (USFWS 2007a). The vernal pool fairy shrimp has an ephemeral life cycle and exists only in vernal pools or vernal pool-like habitats; the species does not occur in riverine, marine, or other permanent bodies of water (USFWS 2007a). Like most other fairy shrimps, the vernal pool fairy shrimp lacks any substantial anti-predator defenses and does not persist in waters with fish (King et al. 1996, Eriksen and Belk 1999).

Like the vernal pool tadpole shrimp, the fairy shrimp lay cysts or embryos that lie dormant at the bottom of vernal pools through the dry season. The cysts hatch and fairy shrimp emerge once the pools fill up again from winter rainfall. The vernal pool fairy shrimp occurs only in cool-water pools. Individuals hatch from cysts during cold-weather winter storms; they require water temperatures of 50 °F or lower to hatch (Helm 1998, Eriksen and Belk 1999). Immature and adult shrimp are known to die off when water temperatures approach 75 °F (Helm 1998). In years with warm winter rains, vernal pool fairy shrimp apparently do not hatch in at least a portion of their range (USFWS 2007a). In years with low amounts of precipitation or atypical timing of precipitation, (or in substandard habitat) vernal pool species may die off before reproducing (Eriksen and Belk 1999). Although their tolerable temperature range is very narrow, vernal pool fairy shrimp have been observed in vernal pools from December to early May. The time to maturity and reproduction is temperature-dependent, varying between 18 days and 147 days, with a mean of 39.7 days (Helm 1998). Because this species can mature relatively quickly it is able to persist in short-lived, shallow pools (USFWS 1994).

The loss of vernal pool habitat is the primary cause for the decline of the vernal pool fairy shrimp. An estimated 90% of the suitable habitat for this species has been destroyed by human activities (e.g., development, agriculture, off-road vehicle [ORV] use, flood control projects). Habitat loss has occurred as a result of not only direct destruction and modification of vernal pools, but also alterations in vernal pool watersheds caused by modification of surrounding uplands (USFWS 1994).

Vernal pool fairy shrimp were first detected in 1992 and have been consistently detected in all surveys since (2008, 2010, 2012, 2014, and 2015-18). Robust vernal pool monitoring has occurred annually since 2004

for plant and animal species, restoration/mitigation bank effectiveness, and other physical attributes. Reports for those annual surveys/monitoring efforts are available from the 9 CES/CEIEC Office.

Vernal pool fairy shrimp have not been detected on LRS.

Conservancy Fairy Shrimp (Federally Endangered)

The conservancy fairy shrimp (*Branchinecta conservatio*) is federally listed as endangered. They are endemic to vernal pools within the Central Valley and Ventura County. Typically they inhabit large, turbid vernal pools, sometimes referred to as playa pools; these pools are inundated for longer periods than typical vernal pools (well into the summer months) and can be identified by their large size (>196 ft in diameter). Conservancy fairy shrimp follow a similar life cycle to vernal pool fairy shrimp, hatching out of cysts during winter rains and completing their life cycle by early summer. Conservancy fairy shrimp were incorrectly reported at Beale AFB in 1991, however subsequent analysis of specimens collected identified them as vernal pool fairy shrimp (USFWS 2012a). No conservancy fairy shrimp have been identified at Beale AFB or the LRS, in any subsequent vernal pool survey efforts to date.

Valley Elderberry Longhorn Beetle (VELB) (Federally Threatened)

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is federally listed as threatened. This species is found throughout the Central Valley and associated foothills from about the 3,000-foot elevation contour on the east throughout the watershed of the Central Valley on the west. The VELB was listed under the ESA in 1980. There was a proposed rule to delist the species in 2012 (USFWS 2012b), but it was later withdrawn (USFWS 2014a). The main cause of decline for the VELB is thought to be habitat fragmentation (Collinge et al. 2000). Low dispersal abilities make repopulating isolated habitats difficult. High levels of dust from recreation traffic (Talley and Holyoak 2006) and expansion of invasive species such as the Argentine ant (*Linepithema humile*) (Huxel 2000) are also potential causes for the decline of the VELB.

The VELB requires elderberry shrubs (*Sambucus* spp.) for reproduction and survival. VELB are rarely seen because they spend most of their life cycle as larvae within the stems of elderberry shrubs. Often the only evidence of the beetles' presence is exit holes created by the larvae just prior to the pupal stage. Adult emergence is from late March through June. During this period, adults mate, lay eggs, and die. The life cycle takes one or two years to complete.

Elderberry shrubs are found in riparian woodlands on Beale AFB. Beetle exit holes were observed in elderberry shrubs during their transplantation in preparation for the Site 17 Remedial Action along Best Slough. Extensive elderberry shrub plantings were conducted by previous 9 CES/CEIEC managers at Beale AFB prior to 2015. These plantings are primarily in restoration projects along Best Slough. Exit holes were also identified in 13 elderberry shrubs during protocol-level surveys for a representative sub-sample of 51 shrubs conducted in February and March of 2005 (EDAW 2005). Additional exit holes were found during surveys in 2016 (AuxilliAll 2016). Known elderberry shrubs on Beale AFB have been mapped and are protected as habitat for the species. For location information, please contact the NRM in 9 CES/CEIEC.

There is no suitable habitat for the species at LRS.

Monarch Butterfly (Federal Candidate)

The monarch butterfly (*Danaus plexippus*) occurs globally; however, populations in the United States have suffered severe declines in the last 20 years. The western population of the monarch butterfly (*Danaus plexippus plexippus*) has declined more than 50% since 1997, while the eastern population (east of the

Rockies) has declined by more than 90% since 1995 (The Center for Biological Diversity et al. 2014). Individuals of the western population are known to utilize habitats on Beale AFB. The populations in North America represent the vast majority of the world's population of monarch butterflies (The Center for Biological Diversity et al. 2014). It is currently under review by USFWS for listing under the ESA. On December 15 2020, the USFWS found that providing threatened and endangered species status to the monarch butterfly is warranted but precluded by higher-priority listing actions (USFWS 2020b). The monarch butterfly will become a candidate species and its status will be reviewed annually.

Monarch butterflies embark on a multi-generational migration to and from breeding and overwintering areas that can cover thousands of miles. In late summer, the western population travels from Canada and northwestern states to overwinter on the California coast. The next spring, they return north and east where they lay eggs on available milkweed, which the caterpillars feed on until they transform into butterflies. This next generation continues north, following the newly emerging milkweed. The process continues for several generations until the last generation in late summer migrates south to the California coast to overwinter and start the cycle all over (Jepson et al. 2015). Beale AFB offers suitable habitat in the spring and summer months, but temperature fluctuations are too extreme in the winter to support wintering monarchs.

Monarch caterpillars are dependent on native milkweeds (*Asclepias eriocarpa* and *A. fascicularis* are the two native species documented on Beale AFB) for food as they eat milkweed exclusively until they pupate and become butterflies. As butterflies, monarchs utilize the nectar of various species of flowering plants, providing pollination at the same time.

Reduction in available milkweed is a leading cause of monarch decline (The Center for Biological Diversity et al. 2014). There may be many reasons for milkweed reduction such as land conversion, over-grazing, changes in agricultural practices and climate change. Additionally, monarchs suffer from over-exposure to pesticides (Pecenka and Lundgren 2015), high mortality during migration (Badgett and Davis 2015), habitat fragmentation (Pleasants and Oberhauser 2013), and the spread of invasive tropical milkweed (*A. curassavica*), which is planted by gardeners to attract monarchs but may harm them instead. Climate change is likely to put additional pressure on the monarch butterfly by shifting breeding ranges (Batalden et al. 2007) and accounting for more volatile weather patterns at overwintering sites (Barve et al. 2012).

Beale AFB has 10 known monarch breeding sites that incorporate naturally occurring and artificially planted native milkweed plants (Snow 2020). The base is also host to two pollinator habitat enhancement sites: one was created adjacent a drainage that runs perpendicular to Gavin Mandery Drive near the base clinic and the other along Dry Creek Nature Trail. Both adult monarch butterflies and caterpillars were observed using the area near the clinic in summer 2018. Between 2016 and 2019, monarch butterflies were observed breeding at eight additional sites adjacent drainages including the north end of Dry Creek, Hutchinson Creek near Goose Lake, and along two unnamed drainages near the intersection of A street and Gavin Mandery Drive, and an unnamed drainage near PAVE PAWS (Chadwick McCready personal communication 2019).

Surveys of monarch habitat and breeding activity began in 2020 (Marty 2020). No monarch activity was observed on Beale AFB or LRS during these surveys. However, one incidental observation of an adult monarch occurred at Beale AFB in June 2020. In addition, abundant milkweed was observed during their surveys, especially along Hutchinson Creek. Future surveys are planned for March through September 2021.

Crotch's Bumble Bee (State Candidate)

Crotch's bumble bee (*Bombus crotchii*) is currently a candidate for state listing. They are distributed throughout California from the coasts, through the Central Valley, to the eastern foothills; their range also includes Baja California and southwest Nevada. Suitable habitat includes open grasslands and scrub habitat with access to foraging resources, soft soil for nesting, and leaf litter and other debris for overwintering. The flight period of the queen is from February–October, with peaks in April and July; worker and male flight period is from March–September, peaking in July. Declines in Crotch's bumble bee abundance have been largest in the Central Valley due to conversion of grassland habitat to agriculture and urban development. Threats are thought to include pesticide and herbicide use, competition with managed bees, and disease (CDFW 2019). Suitable habitat is present at Beale AFB and the LRS and pollinator surveys confirmed Crotch's bumble bee presence at both sites in 2021.

Western Bumble Bee (WBB) (Federal Review/State Candidate)

The WBB (*Bombus occidentalis*) was once widely distributed throughout western North America. Habitat losses in the lower elevation reaches of central California to southern British Columbia have likely contributed to population declines since the late 1990s (Hatfield et al. 2015). This species is under review for protection under the ESA. It was petitioned for protections under the ESA in 2015, and a 90-day finding was issued by the USFWS in March 2016 (USFWS 2016a) and a status review was initiated. It is scheduled for a 12-month finding in FY23. The WBB is also a candidate for listing under the CESA.

The WBB lives in colonies with one queen, female workers, and, later in the season, new reproductive members of the colony. WBB colonies are considered large compared to other species of bumble bees and may contain more than 1,600 workers and produce as many as 360 queens. The bumble bees are most active in California from early April to November, which is the flight period for the workers and males, whereas the flight period for queens is early February to late November, peaking both in late June and late September (Hatfield et al. 2015). Most of the workers, the males, and the old queen die as winter approaches, and the remaining reproductive members overwinter in hibernacula (Hatfield et al. 2015). Not much is known about their overwintering sites.

They feed on a variety of flowering plants and require plants that produce adequate nectar and pollen and bloom for sufficient time while the colony is active (early February to late November). The number of queens a colony can produce is directly dependent on the amount of pollen the workers can collect (Hatfield et al. 2015). Bumble bees are essential for pollinating crops like tomatoes, and there are some commercially reared WBBs used for that purpose.

The spread of the parasite *Nosema bombi* has been associated with the bumble bee's decline as well as other parasites spread by non-native European honeybees. Other factors include stressors such as habitat loss due to agricultural modifications, urban development, grazing, logging, and climate change. Overgrazing is especially harmful to the bumble bee because it removes all flowering species and food sources (Hatfield et al. 2015).

Neonicotinoid insecticides are particularly harmful to all pollinator species, not just the WBB, because their toxins are persistent and expressed in the pollen and nectar of treated plants. Bumble bees unknowingly collect the toxin and take it back to the colony, exposing the rest of the colony and potentially destroying it. Herbicides also remove flowering plants and sources of food (Hatfield et al. 2015). Bumble bee surveys were initiated on Beale AFB and LRS in 2020. No WBBs were identified during the first year of sampling, but surveys will continue in 2021 (Marty 2020).

2.3.4.3 Special Status Fish

Special status fish that have the potential to occur on Beale AFB are designated as an Evolutionarily Significant Unit (ESU) or a Distinct Population Segment (DPS). Under the Endangered Species Act, a DPS is a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the entire species. NOAA/NMFS and the Fish and Wildlife Service released a joint policy defining the criteria for identifying a population as a DPS (USFWS 1996a). The term ESU applies exclusively to Pacific salmon stocks and is defined as “A salmon stock considered a distinct population, and hence a “species” under the ESA, if it represents an ESU of the biological species. The stock must satisfy two criteria to be considered an ESU: (1) It must be substantially reproductively isolated from other conspecific population units; and (2) it must represent an important component in the evolutionary legacy of the species” (USFWS 1991). Only Pacific salmon stocks that meet these criteria are considered by NMFS for listing under the ESA. West coast steelhead populations are now referred to as DPSs rather than ESUs on T&E species lists, but Chinook salmon stocks are still identified as ESUs.

Steelhead—Central Valley DPS (Federally Threatened)

Historically, steelhead (*Oncorhynchus mykiss*) spawned and reared in most upstream portions of the upper Sacramento and San Joaquin rivers and most, if not all, of their perennial tributaries. Because they have greater swimming and leaping abilities than Chinook salmon (*Oncorhynchus tshawytscha*), steelhead can migrate farther into headwater streams where water temperatures are generally lower.

On 9 August 1996 the NMFS identified 15 ESUs of West Coast steelhead, 10 of which were proposed for listing as either threatened or endangered under the federal ESA (USFWS 1996c). The Central Valley ESU, which includes the steelhead in the American River (and those that may occur at Beale AFB), was subsequently listed as threatened. Critical habitat for Central Valley steelhead was designated on 16 February 2000 and includes all river reaches accessible to steelhead in the Sacramento and San Joaquin rivers and their tributaries in California (USFWS 2000). On 30 April 2002, the U.S. District Court for the District of Columbia approved a consent decree for NMFS to withdraw the February 2000 critical habitat designation for Central Valley steelhead, under litigation that challenged the adequacy of the economic analysis. In 2005, new critical habitat was established for the species to include the lower Bear River watershed south of the base, as well as the Lower Yuba River watershed to the north (USFWS 2005b). Dry Creek, which runs through the eastern portion of Beale AFB, and its fork Best Slough, are tributaries to the Lower Bear River.

As an anadromous species, steelhead migrate to sea as juveniles and typically return to natal streams to spawn as two to four-year-old adults. Upstream migration into Beale AFB would likely occur only through Dry Creek. Potential migration into Dry Creek is expected to occur between August and March and peak in January, similar to migration on the lower American River. Most spawning takes place between late December and April. The optimum temperature for spawning is 48-52°F (McEwan and Nelson 1991). Unlike other salmon, steelhead do not always die after spawning; many return to the ocean and spawn another season. Successful spawning requires an average water depth of approximately 14 inches and a current of approximately two feet per second (Barnhart 1986). Spawning sites selected by steelhead generally have gravel particle sizes that are 0.25-3.0 inches in diameter, in which steelhead excavate their nest, or redd (Reynolds et al. 1993).

Declines in steelhead populations are attributed primarily to the degradation and removal of suitable habitat through such mechanisms as increases in water temperature, changes in flow, creation of migration barriers, decreases in the quantity and quality of spawning gravel, and deteriorating water quality. Activities that have caused these habitat alterations include construction and operation of dams and reservoirs, water

diversions, removal of riparian vegetation, logging, urban and agricultural runoff, and channelization of streams and rivers.

The current status of steelhead in Dry Creek on Beale AFB is unknown. Surveys have not detected the species in Dry Creek. Portions of Dry Creek could potentially provide suitable spawning habitat, as there is some riffle habitat that exists in this reach (USFWS 2016c). A baseline survey determined anadromous salmonids likely did not migrate upstream of Beale Lake due to the presence of the dam and undersized fish ladder (USFWS 2016c). However, there have been anecdotal reports of steelhead observed upstream on the SWA after the fish ladder was constructed at Beale Lake in 1987 (Beale AFB 2016b). The dam has now been removed and the site is currently under restoration.

There is no habitat for Central Valley steelhead on LRS.

Chinook Salmon—Central Valley Fall/Late Fall-Run ESU (Federal SoC/State SSC) & Central Valley Spring-Run ESU (Federally & State Threatened)

Chinook salmon (*Oncorhynchus tshawytscha*), which have the potential to occur in the Dry Creek drainage, are considered part of the California Central Valley fall/late fall-run ESU (fall-run), or potentially the Central Valley spring-run ESU (spring-run). Populations of both ESUs spawn in the Sacramento and San Joaquin river systems. The spring-run ESU is listed on both the federal and state level as threatened, whereas the fall-run ESU is designated as a federal SoC after listing was determined not to be warranted (USFWS 1998, 2004a). Although the overall population of Chinook salmon in the fall-run ESU is relatively high, this is due largely to hatchery fish; the occurrence of naturally-producing individuals is declining. Because of the population's dependence on hatchery fish, the CDFW has designated it a species of special concern (SSC).

In the past, and as recently as 2012 and 2015/16, salmon have been observed in Dry Creek during high flow years (Nelson pers. comm. 1996). Successful spawning was observed in the winter of 2014/15, with 400 fry present in Dry Creek. These were expected to be fall-run Chinook salmon. The fish ladder at the Beale Lake Dam was constructed to allow migration of salmonid species past the dam, but the entire dam structure has now been removed and replaced with a riparian restoration site. Although the current status of the salmon fishery in Dry Creek is unknown, the creek could continue to be used by fall-run Chinook salmon. Salmon have also been found in unnamed drainages west of Beale AFB's flightline and in associated infrastructure (2014 and 2015) where spawning could not be successful. Some carcasses found west of the flightline in 2015 had pit tags from the Consumnes River populations.

Adult fall-run Chinook salmon migrate into the Sacramento and San Joaquin river systems from July through December and spawn from early October through late December. Peak spawning occurs in October and November, although the timing of the runs varies from stream to stream. Egg incubation occurs from October through March, and juvenile rearing and smolt emigration occurs from January through June. Although the majority of young fall-run Chinook salmon migrate to the ocean during the first few months following emergence, a small number may remain in fresh water and migrate as yearlings.

Sexually immature spring-run Chinook salmon migrate into the Sacramento and San Joaquin river systems from late March through September, holding in cool water habitats throughout the summer to reach sexual maturity, and spawning from mid-August through early October. Juvenile rearing and smolt emigration occurs from November through March. Juvenile spring-run salmon typically remain in freshwater for 12–16 months before migrating to the ocean, but some may migrate as young-of-the-year within eight months of hatching (NMFS 2014).

All Chinook salmon require cold, freshwater streams with suitable gravel for reproduction. Females deposit their eggs in nests or redds, which they excavate in the gravel bottom in areas of relatively swift water. Eggs generally hatch in approximately 6-12 weeks, and newly emerged larvae remain in the gravel for another two to four weeks until the yolk is absorbed (Moyle 1976; Beauchamp et al. 1983; Allen and Hassler 1986). For maximum survival of incubating eggs and larvae, water temperatures must be between 39°F and 57°F. After emerging, Chinook salmon fry tend to seek shallow, near-shore habitat with slow water velocities and then move to progressively deeper, faster water as they grow. Juveniles typically rear in fresh water for up to five months before migrating to sea. Chinook salmon spend two to four years maturing in the ocean before returning to their natal streams to spawn. All the adult salmon die after spawning.

Declines in both Chinook salmon ESUs are attributed to the same reasons as steelhead (see above). The current status of fall-run Chinook salmon in Dry Creek on Beale AFB is unknown. However, based on cursory evaluations of creek conditions, suitable spawning habitat appears to be available within the installation boundaries at least for some years. Surveys have not detected spring-run Chinook salmon on Beale AFB, and they are unlikely to use Dry Creek except during high-flow years.

There is no habitat for either Chinook salmon ESU on LRS.

Delta Smelt (Federally Threatened/State Endangered)

The delta smelt (*Hypomesus transpacificus*) is federally listed as threatened and state listed as endangered. They are small (usually 2.4-2.8 inch standard length) euryhaline fish, endemic to the upper Sacramento-San Joaquin delta. Delta smelt are most abundant in shallow areas with spring salinities around two parts per thousand; conditions typical at the northwest delta in the channel of the Sacramento River. They school in open, surface waters and spawn in fresh water sloughs and shallow edge-waters from January–July, in water temperatures of 44-72 degrees Fahrenheit. Delta smelt declines have been caused by increased upstream water storage and diversions from the Sacramento-San Joaquin River system (particularly during dry years), entrapment in diversions, pollution, and loss of genetic integrity due to hybridization with non-native Japanese pond smelt (*Hypomesus nipponensis*) (USFWS 1996b). Surveys for delta smelt have not been conducted and they are unlikely to occur this far upstream of the river system on Beale AFB.

There is no suitable habitat on the LRS.

Sacramento Perch (Species of Special Concern)

Sacramento perch (*Archoplites interruptus*) are predatory fish native to the Central Valley and designated as a state species of significant concern. They inhabit heavily vegetated slow moving rivers, lakes and sloughs, and are able to survive in high temperatures, salinity, and turbidity. They reach sexual maturity at 2–3 years and spawn between March–April, when water temperatures are 64–84 degrees Fahrenheit. Males defend territories of shallow nests and will guard the embryos for several days after spawning. Sacramento perch declines are caused by water diversion from the Sacramento-San Joaquin delta, and competition with introduced non-native game fish (University of California, 2021). They have the potential to occur at Beale AFB and the LRS; however, species-specific surveys have not been conducted.

2.3.4.4 Special Status Reptiles and Amphibians

California Tiger Salamander—Central California DPS (Federally and State Threatened)

The Central California DPS of the California tiger salamander (*Ambystoma californiense*) is one of three DPS located throughout California. This DPS is endemic to the Sacramento-San Joaquin river systems and listed at the federal and state level as threatened. Their habitat consists of annual grasslands, open oak woodlands, and vernal pools. They spend the majority of the year within small mammal burrows

underground, emerging with seasonal rains (typically in November–April) for breeding in vernal pools. They will also breed in livestock tanks and other ephemeral pools that lack predatory fish. Adults leave breeding pools shortly after mating, however development of juveniles can take 3–6 months; California tiger salamanders therefore require deeper vernal pools that are inundated for longer periods. After metamorphosis, juveniles will leave the natal pool and enter small mammal burrows in adjacent upland habitat. These burrows require small mammal activity for maintenance and California tiger salamander populations are strongly correlated with small mammal populations, especially California ground squirrel (*Otospermophilus beecheyi*), and Botta’s pocket gopher (*Thomomys bottae*). They are threatened by habitat loss and fragmentation from agricultural and urban development, non-native species competition and predation, road crossing mortality, small-mammal eradication efforts, and water contamination (USFWS 2014e). Species-specific surveys have been conducted at Beale AFB and the LRS without detecting California tiger salamanders, and both are outside of the species’ known range.

Western Spadefoot (WST) (Federal Review/State SSC)

The western spadefoot (*Spea hammondi*) is under review for protection under the ESA and is a California SSC. It was first petitioned for review in 1994. In 2015, the USFWS published a 90-day finding that concluded that the species may warrant protection under the ESA (USFWS 2015a) and a status review is currently being conducted. The 12-month finding for the WST is scheduled for FY20.

The WST is often called a toad, though it is not a true toad. Unlike true toads, it has relatively smooth skin, a single keratinous spade on each hind foot, teeth in the upper jaw, and cat-like eyes that are round at night and create vertical ellipses in bright light (Stebbins 2003). The WST is endemic to California and Baja California (CIRE 2018a). It occupies lowlands with washes, alluvial fans, playas, alkali flats, vernal pools in the Central Valley, and some coastal areas down to San Diego. The WST prefers open vegetation and sandy to gravelly soil that it can burrow into using the horny spades on its hind feet. It is largely terrestrial and utilizes water to breed (Stebbins 2003).

Declines are likely due to habitat loss/degradation, climate change, and predator expansion by bullfrogs and crayfish (CIRE 2018a).

Beale AFB has suitable habitat for WST in its many vernal pools. Surveys conducted in 2016 reported six possible audible detections (Ayuda 2016). Surveys conducted in 2017 confirmed one location with an audible detection on the west side of the flightline (CIRE 2018a). In 2018 faint calls were detected at three locations on the west side of the base and at LRS (H.T. Harvey et al. 2018). In 2017 environmental DNA (eDNA) samples detected no WST at Beale AFB (CIRE 2018a). eDNA is organismal DNA that can be found in the environment. It originates from cellular material shed by organisms (via skin, excrement, etc.) into aquatic or terrestrial environments that can be sampled and monitored using new molecular methods.

LRS is surrounded by habitat that is utilized by WST. Because they are nocturnal and access to LRS is restricted, presence within the fence-line has not yet been confirmed, although audible calls were reported in 2017 by H. T. Harvey (H. T. Harvey 2017). Song meter recordings detected the presence of WST in 2017 at LRS, and there was one possible audible detection during the day at this site (CIRE 2018a). These audible detections, combined with the abundance of habitat on LRS and the confirmed visual presence of WST at locations surrounding the site, suggest that there are likely several WSTs present on LRS.

Foothill Yellow-legged Frog (FYLF) (Federal Review/State Candidate/State SSC)

The foothill yellow-legged frog (*Rana boylei*) is under review by USFWS for listing under the ESA and is a candidate for listing under the CESA. It was determined to warrant a status review in July 2015 (USFWS

2015a) and a 12-month finding is scheduled for FY20 (USFWS 2016b). It became a candidate for state listing in June 2017.

Historically, this frog ranged from northern Oregon, south along the California coast, and the foothills of the Cascade and Sierra Nevada ranges. It is estimated to have lost 45% of its overall range in California. It occupies rocky rivers and streams with a rocky substrate and open sunny banks in forests, chaparral, and woodlands (Stebbins 2003).

A habitat assessment has been completed for Beale AFB and it was determined that there is limited suitable habitat in the upstream reaches of Dry Creek above Gavin Mandery (CIRE 2017). Surveys conducted in this area produced zero detections of either adults or eggs. It is unlikely that FYLFs will occupy this habitat unless populations increase and their range expands. Beale AFB is at the very edge of their range. The closest recorded detection in the California Natural Diversity Database (CNDDDB) is 8.77 miles to the northeast of the base (CNDDDB 2018).

LRS does not have suitable habitat for FYLF.

California Red-legged Frog (CRLF) (Federally Threatened and State Species of Special Concern)

CRLF (*Rana aurora draytonii*) is a subspecies of the red-legged frog that is federally listed as threatened. The current range includes coastal drainages of central California, from Marin County, to northern Baja California, Mexico. This species breeds from November–April in a variety of aquatic habitat types, including streams, deep pools, backwaters, ponds, marshes and some stock ponds, all with associated shrubby riparian or emergent vegetation. Outside of the breeding season, they use riparian habitat, leaf litter and small mammal burrows close to streams. During periods of wet weather, they may disperse over uplands at night, travelling from 0.25–2 miles. They are threatened by the same factors as the California tiger salamander above (USFWS 2002). Marginal habitat exists on Beale AFB, however they have not been detected during surveys and they are unlikely to occur due to the abundance of bullfrogs. The nearest occurrence is 11.3 miles northeast.

No suitable habitat exists on the LRS.

Western Pond Turtle (WPT) (Federal Review/State SSC)

The western pond turtle (*Actinemys* sp.) is under review for protection under the ESA by USFWS and is designated a SSC by CDFW. The pond turtles found on Beale AFB were classified as the northwestern pond turtle (*Actinemys marmorata*), one of two species of the WPT, along with the southwestern pond turtle (*A. palida*), but recent genetic evidence suggests that there may be more than two species. The USFWS issued a 90-day rule that the WPT may warrant listing under the ESA in April 2015 (USFWS 2015c) and is scheduled for a 12-month finding in FY21.

The WPT is found in suitable aquatic habitats west of the crest of the Sierra Nevada in California and in parts of Oregon, Washington and Mexico (Stebbins 1985; Zeiner et al. 1988). The northwestern subspecies is generally found from San Francisco Bay north to the Columbia River drainage in Oregon and Washington.

The WPT still occupies most of its historic range, but many local populations are declining or have been extirpated (USFWS 1992). These declines are primarily a result of loss of wetland habitats to agricultural and urban uses and flood control and water diversion projects. Competition for resources and depredation are other factors contributing to their decline. Invasive red-eared sliders (*Trachemys scripta elegans*) compete with WPT for food and basking and nesting sites (Lambert et al. 2013) and can potentially

introduce disease and parasites to WPT (Thomson and Shaffer 2010). Invasive, non-native bullfrogs have also been identified as a major threat to WPT survival (Bury and Germano 2008; Pramuk et al. 2013). Adult bullfrogs are predatory generalists and will eat anything that fits in their mouth, including small turtles (CABI 2017). Non-native fish such as largemouth bass will also prey on young WPT (Bury and Germano 2008). Anthropogenic threats to the WPT include habitat destruction, water pollution, depredation, disease, overexploitation, recreation (fishing and boating), roads and vehicles, fire, and drought (USFWS 2004b).

The WPT is generally associated with permanent or nearly permanent wetlands in a wide variety of environments below an elevation of 6,000 feet (Zeiner et al. 1990). Pond turtles live in quiet waters of lowland ponds, marshes, lakes, and reservoirs and in streams with deep pools, rocks, logs, and streamside vegetation that provide escape cover and basking sites (Stebbins 1972). WPTs are highly aquatic but leave the water to bask and lay eggs. They may lay their eggs along sandy wetland margins or at upland locations as far as 1,300 feet from water (Holland and Bury 1992). Hatchling and adult turtles may overwinter at upland sites (Holland pers. comm. 1992).

WPTs have been observed at many locations at Beale AFB: in a freshwater marsh outfall pond below Miller Lake as well as in the lake itself (near the extreme north-central portion of the base); in Beale Lake and below Beale Lake Dam prior to dam removal, Parks Lake (between Best Slough and Dry Creek), Goose Lake, Blackbird Basins, Upper and Lower Blackwelder lakes, Mosquito Pond, PAVE PAWS Pond, Pond 4 (wastewater holding pond), Dry Creek, and Reeds Creek.

There is one canal located on LRS that could support WPT; however, surveys in 2017 did not detect any (CIRE 2017).

Giant Gartersnake (GGS) (Federally Threatened/State Threatened)

The giant gartersnake (*Thamnophis gigas*) is federally and state listed as threatened. It inhabits a variety of aquatic habitats, such as agricultural wetlands, irrigation and drainage canals, marshes, sloughs, ponds, lakes, and streams. The snakes are primarily restricted to aquatic habitat and nearby basking areas during their active period (April 1-October 1). The GGS inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period (i.e., November to mid-March). GGS typically select burrows with sunny exposure along south and west-facing slopes. GGS also use burrows as refuge from extreme heat during its active period. The Western Ecological Research Center (WERC), formerly the Biological Resources Division (BRD), of the United States Geologic Service (USGS) has documented GGS using burrows in the summer as much as 165 feet away from the marsh edge (Wylie et al. 1997).

Overwintering snakes have also been documented using burrows as far as 820 feet from the edge of marsh habitat. During radio-telemetry studies conducted by the WERC, GGS typically moved little from day to day. However, total activity varied widely between individuals. GGS have been documented moving up to five miles over the period of a few days (Wylie et al. 1997).

The breeding season extends through March and April, and females give birth to live young from late July through early September (Hansen and Hansen 1990). Brood size is variable, ranging from 10 to 46 young, with a mean of 23 (Hansen and Hansen 1990). Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own.

GGS is known from 13 separate populations in California. These populations are isolated, without protected dispersal corridors to other adjacent populations. They are threatened by land use practices and other human activities, including development of wetland and suitable agricultural habitats.

The nearest GGS record lies just over 10 miles north of Beale AFB, north of the Yuba River and between the towns of Browns Valley and Live Oak and approximately 11 miles southwest of Beale AFB, south of the Bear River and northeast of the town of Rio Oso. The former is hydrologically isolated from the Beale AFB watersheds. The latter and adjacent records within the American Basin north of the Natomas Cross Canal and east of the Feather River are the only recorded observations of GGS that are hydrologically connected to the potential habitat at Beale AFB (CNDDDB 2018). Dry Creek flows directly to the Bear River, and both Reeds Creek and Hutchinson Creek flow into Algodon Slough, which in turn flows into the Bear River. The Bear River itself has not been documented to support GGS.

Suitable habitat for the GGS exists at Beale AFB along Reeds Creek in the western portion of the base. This area is part of the American Basin Recovery Unit as described in the Recovery Plan for the Giant Gartersnake (USFWS 2017a). When managed to do so, it contains permanent features such as sufficient water during the active summer season to supply cover and food such as small fish and amphibians and emergent, herbaceous aquatic vegetation accompanied by vegetated banks to provide basking and foraging habitat (Hansen 2004). Water is provided by the Yuba County Water Agency in the dry summer months when the snake is active.

A possible sighting of a GGS in Reeds Creek was reported in 2005 by Morgan Ball, a ManTech employee experienced with this species. The behavior of the snake indicated that it may be aquatic: when startled by Ball the snake fled into the water and remained completely submerged (including the head). Typically, when a terrestrial gartersnake goes into the water it keeps its head above the surface. The sighting was brief, but because of the behavior displayed, was deemed by the GGS expert Eric Hansen reliable enough to warrant field surveys (Kirsten Christopherson personal comm. 2019). Trapping surveys were conducted in 2005, 2014, 2015, 2016 and 2018. No GGS has been captured as a result of surveys. This trapping effort is substantial enough, given the known distribution of the species to determine that, while some habitat components may be present, the GGS is not likely to be present on Beale AFB at this time.

There is no suitable habitat for GGS on LRS.

2.3.4.5 Special Status Birds

American White Pelican (State SSC)

The American white pelican (*Pelecanus erythrorhynchos*) is designated by CDFW as an SSC. Historically, this species nested on large lakes throughout California. Today there are no remaining nesting colonies in California except along the Oregon border, possibly due to destruction of nesting islands and breeding habitat and human disturbance. During the nonbreeding season (August to December), American white pelicans are common on salt ponds of San Francisco Bay, large lakes and estuaries in the Central Valley and on the coastal slope from Sonoma County southward. They are also common migrants at the Salton Sea and Colorado River. Flocks of migrating pelicans can be seen overhead in fall and spring, especially in southern California. At Beale AFB, nonbreeding pelicans have been seen at Reeds Creek, Pond 4, Upper Blackwelder, Lower Blackwelder, Goose, and Miller lakes.

There is no suitable habitat for American white pelicans on LRS.

Western Least Bittern (State Species of Special Concern)

Western least bittern (*Ixobrychus exilis hesperis*) are listed as a state species of special concern in California. They are distributed from southeastern Canada to the United States, Mexico, and Costa Rica. They breed in the Central Valley and migrate south to Baja California, Arizona, and central Mexico. Suitable habitat includes freshwater and brackish marshes with a mosaic of emergent vegetation, clumps of

woody vegetation, and open water. Nests are well concealed within emergent vegetation (most frequently *Typha*, *Carex*, and *Scripus spp.*) and when in productive habitat they are considered semi-colonial, with nests within 3.2 ft of each other. Clutches of 4–5 eggs are typical, incubation lasts 19–21 days, and chicks are semialtricial for 1–2 weeks, depending on the adults for food regurgitation. Western least bitterns feed on small fish, insects, and crustaceans. Loss of wetland habitat to development and hydrologic changes from groundwater pumping and surface water diversion is the greatest threat to this species (U.S. Bureau of Reclamation 2016). Suitable habitat exists at Beale AFB and the LRS, however no surveys have been conducted to date.

Cooper's Hawk and Sharp-shinned Hawk (State WL)

Cooper's hawk (*Accipiter cooperii*) and sharp-shinned hawk (*Accipiter striatus*) are both CDFW WL species. Both Cooper's and sharp-shinned hawks nest in deciduous and coniferous forests. Sharp-shinned hawks tend to use conifers only at higher elevations, whereas Cooper's hawks use lower elevation deciduous trees for nesting. The diet of sharp-shinned hawks is specialized on birds, and they tend to hunt within the forest canopy. Cooper's hawks prey on birds, but their diet also includes mammals and reptiles, and they tend to forage at shrub and ground level. Both of these species have been observed foraging at Beale AFB in the winter. Cooper's hawks have been known to nest in Dry Creek/Best Slough area near Parks Lake (Ayuda 2017; Michelle Ocken personal observation 2018).

Both Cooper's and sharp-shinned hawks have been observed foraging at LRS in the winter.

Ferruginous Hawk (State WL)

The ferruginous hawk (*Buteo regalis*) is designated as an SSC by CDFW. This species is a winter resident and migrant at low elevations in the Modoc Plateau, Central Valley, and Coast Ranges of California (Zeiner et al. 1990). It is a relatively common winter resident in open grassland, agricultural habitats of the Sacramento Valley and the foothills, and interior valleys of the central coast. It is also fairly common during winter in southwestern California and the Great Basin region of northeastern California.

Conversion of grasslands to agriculture and direct human disturbance to nest sites are thought to be the primary causes of declines in the breeding population. In California, ferruginous hawks winter in open range, including grasslands, deserts and agricultural areas, where their diet consists of pocket gophers, ground squirrels, rabbits, and mice. They use trees, poles, and utility line structures as perch sites.

Ferruginous hawks have been observed at Beale AFB on numerous occasions throughout the winter. Most of the base is suitable as foraging habitat.

The area surrounding LRS may also provide suitable foraging habitat for ferruginous hawks, although usage has not been documented.

Swainson's Hawk (State Threatened)

The Swainson's hawk (*Buteo swainsoni*) is state-listed as a threatened species. Swainson's hawks prefer to nest in riparian areas with isolated trees bordered by suitable foraging habitat (i.e., grasslands, active agriculture or fallow fields). Agricultural fields provide important foraging habitat for Swainson's hawks. Alfalfa, fallow fields, dry and irrigated pastures, and other low-growing row crops (including corn after harvest) are preferred foraging habitats for Swainson's hawks. Swainson's hawks are summer residents in the Central Valley, where they arrive in April to breed and generally nest within a riparian corridor.

Swainson's hawks have been observed foraging at Beale AFB and were confirmed to nest on base during a survey conducted by CDFW in 2004 and again in 2015, 2016, 2017, and 2018 (Michelle Ocken, personal observations, 2018).

There has been no sign of Swainson's hawks nesting at LRS; however, the site may provide foraging habitat.

Northern Harrier (Federal BCC State SSC)

The northern harrier (*Circus hudsonius*) is designated by CDFW as an SSC (Remsen 1978). Northern harriers nest primarily in the Central Valley, central and north coast, and Great Basin regions of the northeastern California. In winter, their distribution also includes the eastern side of the Sierra Nevada and southern California.

The decline of northern harrier populations in California is attributed to loss of marshland and grasslands (Johnsgard 1990). Local northern harrier populations continue to decline as habitat is lost (CPIF 2000).

Northern harriers nest on the ground in grassland, marshland and some agricultural habitats. Optimal habitats are undisturbed marshlands with tall grasses to conceal nest sites and with nearby open foraging areas; however, disturbed habitats, such as levee banks and the weedy margins of farm fields and irrigation ditches, also provide nesting sites.

Northern harriers have been observed at Beale AFB on several occasions during winter and during the breeding season. Several nest sites have been located on the base, especially in the southwestern portion near the wastewater treatment plant land-based discharge water cannons system.

Northern harriers have been observed foraging over LRS.

White-tailed Kite (State FP)

The white-tailed kite is designated as a fully protected species under the California Fish and Game Code. It breeds and winters throughout lowland California (except desert regions), including the Central Valley, central and southern coastal valleys, Sierra Nevada foothills, and coast from Del Norte County to San Diego County.

White-tailed kites are found primarily in open grassland and agricultural habitats. Nests are usually constructed in medium-sized trees in riparian or oak woodland habitats. Grasslands, agricultural fields, pastures and roadsides are used for foraging.

White-tailed kite populations declined noticeably during the early part of the 20th century (Grinnell and Miller 1944). These declines have been attributed to the conversion of native habitats to agricultural land and urban development. Because of its increased use of suboptimal agricultural habitats, however, the species is now fairly common in some areas of California, such as the Central Valley.

Five active white-tailed kite nests and one possible nest were last located during breeding raptor surveys conducted at Beale AFB in 1996 (Jones & Stokes Associates 1996). White-tailed kites are regularly observed during winter bird surveys and semi-regularly during spring and early summer. Suitable woodland nesting habitat and grassland foraging habitat for white-tailed kites occur throughout the base.

White-tailed kites have been observed foraging over LRS.

Bald Eagle (Federally Delisted, BGEPA, State Endangered, and FP/DoD-PIF MSPBS)

The bald eagle (*Haliaeetus leucocephalus*) has been federally delisted, but is still federally protected under the BGEPA, and is a federal BCC (USFWS 2008). It is also listed as endangered under the CESA and is considered a DoD-PIF MSPBS. Historically, bald eagles nested throughout California; however, the current bald eagle nesting population is restricted primarily to mountainous habitats in the northern Sierra Nevada, Cascade Range, and northern portion of the Coast Ranges (CDFG 1992). Recently, bald eagles have nested in southern California, in the central portion of the Coast Ranges, and on five of the eight Channel Islands. They winter at lakes, reservoirs, agricultural flooded rice fields, and along river systems throughout most of central and northern California, and in a few southern California localities (CDFG 1994).

The nesting population of bald eagles in California is increasing in numbers and range, and the wintering population appears stable. Past declines in bald eagle populations have been attributed to the agricultural pesticide dichlorodiphenyltrichloroethane (DDT); harassment by humans; and destruction of riparian, wetland, and coniferous forest habitats (Detrich 1985).

Bald eagle nesting territories in California are found primarily in ponderosa pine and mixed conifer forests (Lehman 1979). Bald eagle nest sites are always associated with a lake, river or other large water body that supports abundant fish or waterfowl as prey. Bald eagles winter along rivers, lakes, and reservoirs that support abundant fish or waterfowl and have large trees or snags for perch sites. They often roost communally during winter in areas isolated from human disturbance.

Bald eagles have been observed at Beale AFB during winter. They are known to winter north and east of Beale AFB along the Yuba River, and individuals are common in the Sacramento Valley where they prey on wintering waterfowl. Bald eagles have been observed several years in the winter foraging in flooded rice fields just off base, as well as at several of the lakes on base (Michelle Ocken, personal observation, 2012-2018).

Bald eagles may forage in the rice fields around LRS; however, sightings of the species have not been documented for this site.

Golden Eagle (Federal Bald and Golden Eagle Protection Act (BGEPA)/State FP and WL/DoD-PIF MSPBS)

The golden eagle (*Aquila chrysaetos*) is protected under the federal BGEPA (1940). It is also a federal BCC (USFWS 2008), a state fully protected (FP) and WL species, and a DoD-Partners in Flight (DoD-PIF); Mission-Sensitive Priority Bird Species (MSPBS). Golden eagles are sparsely distributed throughout most of California, primarily occupying mountain and desert habitats. Loss of large, unfragmented habitat areas as a result of land development, human intrusion and disturbance is thought to be the primary reason for the decline of the golden eagle population in California. Golden eagles nest on cliff ledges, on high rocky outcrops, and in large trees. Grassland, oak savanna, and open woodland and chaparral provide suitable foraging habitat where golden eagles hunt for rabbits and squirrels. Several golden eagle observations have been recorded at Beale AFB. Although golden eagles could use some of the trees on the base as nest trees, the level of human disturbance in the area makes this unlikely. Golden eagles nest in the foothills east/northeast of the base; but no active nests are known from the SWA, immediately northeast of the base (Whitmore pers. comm. 1996). Golden eagles have nested near Lake Englebright, north of Beale AFB.

Status of the golden eagle at LRS is currently unknown.

Osprey (State WL)

Osprey (*Pandion haliaetus*) is designated as an SSC by CDFW. Osprey typically nest in large trees or snags near lakes, large streams, shorelines or bays, with open clear water for foraging. Their breeding range

includes northern California through the Cascade and Sierra Nevada ranges and Coast Range to Marin County. Population declines have been attributed to removal of nesting trees, degradation of river and lake environmental quality, boating on nesting lakes, and shooting. Osprey have been observed at Miller, Goose and Upper and Lower Blackwelder lakes.

LRS does not provide adequate habitat for osprey.

Prairie Falcon (Federal BCC/State WL)

The prairie falcon (*Falco mexicanus*) is designated as an SSC by CDFW. It nests in suitable habitats throughout northeastern California, the Coast Ranges, middle elevations of the Sierra Nevada and deserts. Prairie falcons are found throughout California during winter. Loss and fragmentation of open range habitats and direct disturbance to cliffside nesting sites are thought to be the primary causes of population declines, and eggshell thinning resulting from DDT poisoning may have also contributed. Prairie falcons usually nest on sheltered ledges of cliffs overlooking open rangeland foraging habitat (Zeiner et al. 1990). Foraging habitat consists of large areas of open grassland, rangeland, or desert scrub habitat where prairie falcons hunt for rodents, birds and reptiles. Prairie falcons have been observed at Beale AFB during winter. The base does not support suitable nesting habitat, and no nests are known from the immediate vicinity.

Prairie falcons have also been observed foraging over LRS.

Peregrine Falcon (Federally Delisted /State Delisted and FP)

The peregrine falcon (*Falco peregrinus*) was both state and federally listed under the respective ESAs; however, due to the recovery of species, it has since been delisted by both agencies. It remains a California FP species. Historically, resident peregrine falcons were found throughout most of California (CDFG 1980; USFWS 1982). The population increases during winter when migrating birds arrive from the north (Grinnell and Miller 1944). Peregrine falcons historically nested throughout the state, with breeding pairs concentrated along the coast and around the Channel Islands (Grinnell and Miller 1944). The widespread use of DDT was a primary cause of the decline in peregrine falcon populations (USFWS 1982). Other causes of decline include illegal shooting, illegal taking of eggs and chicks for falconry, and habitat destruction (CDFW 1980).

Peregrine falcons nest on protected ledges of high cliffs, primarily in woodland, forest and coastal habitats (CDFW 1980; USFWS 1982). Falcons prefer to nest near marshes, lakes and rivers that support an abundance of birds, but they may travel several miles from their nesting grounds to forage on pigeons, shorebirds, waterfowl, and songbirds (Grinnell and Miller 1944; CDFW 1980; Johnsgard 1990).

Peregrine falcons have been observed at Beale AFB during winter. Beale AFB does not support suitable nesting habitat for peregrine falcons, and no nests are known to exist in the immediate vicinity. Most of the base, however, provides suitable winter foraging habitat for this species.

Peregrine falcons may hunt ducks in the rice fields around LRS in the winter; however, sightings have not been documented.

California Black Rail (State Threatened and FP/DoD-PIF MSPBS)

The California black rail (*Laterallus jamaicensis coturniculus*) is listed as threatened under the CESA and is a state FP species, it is a DoD-PIF MSPBS. Historically, the range of the California black rail is thought to have extended from the San Francisco Bay Area (including the Sacramento-San Joaquin River Delta) south along the coast to northern Baja California, as well as in the San Bernardino/Riverside area, at the Salton Sea, and along the lower Colorado River. Currently, California black rails are confined to the

northern San Francisco Bay estuary, with small, isolated populations along the outer coast in Tomales Bay, Bolinas Lagoon, Morro Bay, and Bodega Bay (Manolis 1978; Evans et al. 1991). Although first described as birds of the coastal salt marshes, California black rails have since been found regularly inhabiting freshwater marshes (Wilbur 1974). Preferred habitat varies from almost pure pickleweed along the coast to sedges, saltgrass, and bulrush in inland areas. Nesting occurs from March to early June (Bent 1926; Wilbur 1974). The major threat to the California black rail has been and currently remains the loss or degradation of wetland habitat.

There are several CNDDDB records for this species directly to the west and north of Beale AFB. However, a probable breeding population of black rails has recently been identified along tributaries of Dry Creek at the University of California Sierra Foothill Research and Extension Center in Yuba County (Aigner et al. 1995). Other populations of California black rail have been observed on Cox Creek and multiple small patches of palustrine emergent marsh in the SWA in Yuba County, southeast of Beale AFB on an unnamed tributary to Rock Creek in Nevada County, and in the Little Dry Creek Unit of Upper Butte Basin Wildlife Area in Butte County (CNDDDB 2018).

Freshwater marsh habitat along the middle reaches of Reeds Creek and around several of the reservoirs are also considered potential habitats for this species. California black rails were observed at Beale AFB during summer 1997 in the marsh area below Miller Lake. The University of California, Berkeley, Sierra Foothills Research Station conducted regional black rail surveys on and around Beale AFB from 2002 to 2010. At least one black rail was identified on the base near PAVE PAWS Pond in 2002. Because the marsh area being occupied by the black rail was within a cattle pasture, fencing was erected around the area to exclude cattle. A black rail was documented at PAVE PAWS Pond again in 2003 and 2004, and again in 2006, 2008 and 2009. Another black rail was detected at Goose Lake in 2002 and one was detected at small arms range pond in 2007 and 2008.

Although potential California black rail habitat exists on Beale AFB, and black rails were detected on the base between 2002 and 2009, surveys have not detected the bird since 2009. Nathan Van Schmidt, a black rail researcher from UC Berkeley, noted that most sites on Beale AFB have fairly low black rail occupancy because intense seasonal fluctuations in water levels tend to flood out black rails in the winter and then are too low-water in the summer (pers. comm. to Lauren Wilson, February 2017). Known potential black rail habitat on Beale AFB is fenced, and no grazing is permitted in black rail habitat on Beale AFB (Ann Bedlion, pers. comm., May 2017).

LRS does not have suitable habitat for California black rail and has not been surveyed for this species.

Greater Sandhill Crane (State Threatened and FP)

The greater sandhill crane (*Antigone canadensis tabida*) is state listed as threatened and is a FP species under the California Fish and Game Code. Historically, the greater sandhill crane was a fairly common breeder on the northeastern plateau of California. The population has been greatly reduced in numbers and breeds only in parts of Siskiyou, Modoc, and Lassen counties, and in Sierra Valley in Plumas and Sierra counties. During the breeding season, cranes can be found in and near wet meadows, and other freshwater wetland habitats. They winter primarily in the Sacramento and San Joaquin valleys from Tehama County south to Kings County in annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open emergent wetlands.

At Beale AFB, the greater sandhill crane is considered an irregular winter visitor and was observed on base during the 2015/16 winter during the northward migration and again in 2018 in the open grasslands on the southern portion of the base (Michelle Ocken, personal observation, 2018).

LRS has very limited suitable habitat for cranes, and they have not been documented at that site.

Short-eared Owl (Federal BCC/State SSC)

The short-eared owl (*Asio flammeus*) is designated as an SSC by CDFW and a Federal BCC (USFWS 2021a). This species formerly bred throughout lowland California; its current breeding range includes the Great Basin region of northeastern California, the central and north coasts, the Colorado River basin, and portions of the northern Sacramento-San Joaquin River Delta. Wintering birds also live in suitable habitats throughout the Central Valley and the inner central portion of the Coast Ranges. The short-eared owl is a ground-nesting species that uses tall grasslands, seasonal wetlands, marshes, and meadows as nesting, roosting, and foraging habitat. It is generally found in open, flat, treeless areas using fence posts and mounds as perches (Zeiner et al. 1990).

Population declines are generally attributed to the loss, degradation, and fragmentation of wetland and grassland communities from agriculture, industrial and urban development, and grazing.

Short-eared owls have been observed on several occasions at Beale AFB during winter. Although no breeding birds have been detected, portions of the base, particularly the marsh habitats on the western side of the base, provide suitable breeding habitat.

No short-eared owl have been documented at LRS despite the presence of marginal habitat.

Western Yellow-billed Cuckoo (WYBC) (Federally Threatened State Endangered)

In 1998, the western Distinct Population Segment (DPS) of the yellow-billed cuckoo (*Coccyzus americanus occidentalis*) was petitioned to be listed as federally endangered (USFWS 2001). In 2002, higher priority species precluded federal action even though the petition was determined to have merit. A proposed rule to list this DPS as threatened was recorded in the Federal Register on October 3, 2013 (USFWS 2013), and the final listing rule was published on October 3, 2014 (USFWS 2014c). The listing designation went into effect on November 3, 2014 (Halterman et al. 2015). However, in 2017, a petition was submitted requesting that the western DPS of the WYBC be de-listed due to an error in DPS analysis, and utilization of additional habitat by the species. In 2020, the USFWS determined that desilting was not warranted and the yellow-billed cuckoo remains listed as threatened with critical habitat designated in 2021 (USFWS 2020a, 2021a). No critical habitat units are on Beale AFB or the LRS; the closest critical habitat unit is on the Sacramento River National Wildlife Refuge (USFWS 2021b). The state of California listed the species as endangered under the CESA in 1971.

The western population of the WYBC is known to breed throughout most riparian systems in western North America. Its range extends from southern British Columbia to northern Mexico (Hughes 1999). Its range has diminished considerably since the 1850s and has been extirpated from British Columbia, Washington, and Oregon. In California, this distinct population currently breeds in the riparian corridor along the Sacramento River and some of its tributaries, the South Fork Kern River, restoration sites near Blythe and the lower Colorado River (Halterman et al. 2015). Laymon (1998) reported that they occasionally breed along the Feather River from Oroville to Verona, Butte, Yuba and Sutter counties; San Bernardino and Riverside counties; Inyo County; Los Angeles County; and Imperial County.

A Neotropical migrant, this species winters in South America and breeds in North America. Its migration routes are not well understood; however, small patches of suitable habitat may provide crucial stopover sites during migration in which birds may rest and feed before continuing migration (Halterman et al. 2015).

The WYBC is an obligate riparian breeder, utilizing riparian woodlands and native broadleaf trees at low to moderate elevations (Halterman et al. 2015). It prefers areas with dense cover and nearby water. This includes woodlands with low scrubby vegetation, overgrown orchards, abandoned farmland and dense thickets along streams and marshes. Girvetz and Greco (2009) found that cottonwoods were the most important factor in determining suitable nesting habitat because cottonwoods tended to support their preferred prey species. Willows are also important nesting substrate for the western subspecies. Although they appear to prefer utilizing dense riparian woodlands and native broadleaf trees and shrubs of approximately 50 acres, they have been recorded using newly restored stands of riparian saplings of one to two years of age (post planting) on the Sacramento River in California (Halterman et al. 2015).

The WYBC feeds primarily on large insects such as cicadas, grasshoppers, katydids, and caterpillars, but will also feed on lizards, frogs, and spiders, as well as many other insects (Halterman et al. 2015).

Declines in the species have been attributed to the loss and degradation of riparian habitats throughout its range. Riparian habitat losses have been estimated to be between 90-98% in California (Greco 2008). Pesticide use in riparian areas may also impact the species by reducing the prey base.

There have been two possible visual detections and one audible detection of WYBC in the past five years on Beale AFB (Michelle Ocken personal observation, 2018). Each observation was considered tentative due to the difficulty in obtaining clear visual confirmation. All observations were located in the southeastern portion of Beale AFB in or near the Dry Creek/Best Slough area by qualified biologists working in the area. The most recent audible observation of the WYBC was on June 3, 2016. It was heard at the Monitoring Avian Productivity and Survivorship (MAPS) bird banding station on Best Slough. CNDDDB has two reports of WYBC within a 10-mile radius of Beale AFB. One is seven miles to the west at the confluence of the Yuba and Feather rivers, and the other is 9.4 miles northwest on the Feather River (CNDDDB 2018). Surveys for breeding WYBC conducted in 2018 did not detect any birds on Beale AFB, although suitable habitat was identified (Halterman 2018).

There is no habitat for WYBC at LRS, and no CNDDDB occurrences within a 10-mile radius of the site (CNDDDB 2018).

Western Burrowing Owl (Federal BCC/State SSC/DoD-PIF MSPBS)

The western burrowing owl (*Athene cunicularia hypugea*) is designated as an SSC by CDFW, a federal BCC (USFWS 2008) and a DoD-PIF MSPBS. In California, burrowing owls are found throughout the Central Valley, in the interior portion of the Coast Ranges, the Imperial Valley, and along the coast.

The western burrowing owl populations have been experiencing declines over the past several years (Wellicome and Holroyd 2001). In northern California, these declines are primarily due to human-caused habitat loss and fragmentation such as conversion of grasslands to croplands or urban areas that are unsuitable to the owls, or to burrowing mammal control that reduces prey bases and burrows (Restani et al. 2008; Moulton et al. 2006).

Western burrowing owls are ground-dwelling owls that live and breed in burrows that have been excavated by other burrowing mammals such as ground squirrels, coyotes, or badgers. In the northern Sacramento Valley, suitable natural burrows not associated with burrowing mammals can likely be found in vertical cutbanks for drainages (Ocken 2017). Optimal habitat conditions include open, dry and nearly level grasslands or prairies (Johnsgard 1988). In the Central Valley, western burrowing owls often nest along roadsides adjacent to agricultural fields, along field borders, in annual grasslands and dryland pastures, and

along levee embankments that are open to adjacent fields. In winter, the owl often utilizes roadside culverts, rock/debris piles and artificial burrows (Ocken 2017).

California is considered an important wintering ground for migrant western burrowing owl, which breed across North America (James & Ethier 1989; Klute et al. 2003). Beale AFB provides ample suitable winter habitat for this species. Western burrowing owl nests and wintering burrows have been found at Beale AFB. Although the base supports ideal topography and grassland foraging habitat for burrowing owls, the ground squirrel population is limited (possibly because of hardpan soils), thereby limiting the number of potential burrow sites for burrowing owls. Man-made, artificial burrows have been installed at Beale AFB at various locations with varying degrees of successful use. Most of these burrows are in need of maintenance and/or relocation.

LRS has limited habitat for western burrowing owls, and the species has not been documented at the site.

Bank Swallow (State Threatened, PIC-C)

The bank swallow (*Riparia riparia*) is listed as threatened under the CESA and by PIF as a common species in steep decline. The bank swallow is a Neotropical migrant found primarily in riparian and other lowland habitats in California west of the deserts during the spring-fall period. In summer the species is restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes. In migration it flocks with other swallows over a variety of open habitats. The species is predominantly a colonial breeder, with colonies ranging in size from 10 to 1,500 nesting pairs in California, although most colonies have 100-200 nesting pairs (Garrison et al. 1987). A large percent of the current breeding population in California occurs along banks of the Sacramento and Feather rivers in the northern Central Valley. Channelization and stabilization of the banks of rivers used for nesting and other destruction and disturbance of nesting areas are major factors in the decline of this species (Green 2008a).

Bank swallows are rare visitors to Beale AFB. There is a documented observation of an individual bank swallow near the flightline by the BASH Program Manager (Laughlin 2017).

Bank swallows have not been detected on LRS.

Olive-sided Flycatcher (Federal BCC/State SCC)

The olive-sided flycatcher (*Contopus cooperi*) is a federal BCC (USFWS 2008), a PIF-D (not declining but vulnerable) and a California SSC. This species is a Neotropical migrant that winters in Central and South America and breeds in North America from Alaska to Baja California Norte. In California it is a summer resident in conifer forest the entire length of the state, ranging in elevation from near sea level on the coast to 9400 feet in the interior. Breeding habitat for the olive-sided flycatcher is primarily late-successional conifer forests with open canopies, or edges, openings, and natural and human-created clearings in otherwise dense forests, generally at mid to high elevations (3018–6988 feet). Habitat degradation and loss is the most significant threat to the olive-sided flycatcher. Development has been observed to negatively impact the species, and removal of snags during logging operations reduces preferred nesting habitat on breeding grounds. In addition, destruction of forests in Central America, where these birds maintain their winter territories has likely affected the species (Shuford and Gardali 2008).

There is no suitable breeding habitat for this species on Beale AFB, so it only likely to be present on the base during migration.

There is no suitable habitat for olive-sided flycatchers on LRS.

Willow Flycatcher (State Endangered)

The willow flycatcher (*Empidonax trailii*) is CESA endangered species. There are three subspecies of willow flycatcher that breed in California. The subspecies most likely to be found on Beale AFB is the "little willow flycatcher" (*E.t. brewsteri*). A different subspecies, the southwestern willow flycatcher (*E.t. extimus*), is federally listed as endangered. Beale AFB lies outside the range of southwestern willow flycatcher. The third species (*E.t. adastus*) occurs in the great basin and central Rocky Mountains.

Willow flycatchers occupy a variety of shrubby, often wet habitats throughout the United States and, in California especially, have an affinity for willow thickets near water (Grinnell and Miller 1944). In the Central Valley, it is mostly found during migration. Its breeding range in the state is somewhat restricted to the Sierra Nevada/Cascade ranges and in a few sporadic locations in southern California. In the spring, migration can occur from April to early June. Threats to the species include habitat destruction and degradation and overgrazing by livestock (Remsen 1978; Serena 1982).

Willow flycatchers have been detected during migration in the Dry Creek/Best Slough area on Beale AFB.

There is no suitable habitat for willow flycatchers on LRS.

Loggerhead Shrike (State SSC/ DoD-PIF MSPBS)

Loggerhead shrike (*Lanius ludovicianus*) is a CDFW SSC and a DoD-PIF MSPBS. Loggerhead shrikes nest in small trees or shrubs in grasslands and other open country and forage in grasslands and agricultural areas. Threats to shrikes include loss of habitat due to conversion of native shrublands and grasslands to agriculture and urban development. Loggerhead shrikes have been observed regularly along fencelines in grasslands on Beale AFB.

Loggerhead shrikes have not been observed on LRS.

Oak Titmouse (PIF-D/Federal BCC/State WL)

The oak titmouse is a small songbird that is strongly associated with oak woodlands. It is a federal BCC (USFWS 2008), PIF-D, and a CDFW WL species. The U. S. breeding population has declined by an estimated 51% between 1970 and 2014 (Rosenburg et al. 2016). Threats to this species include loss of habitat as oak woodlands are cleared for agriculture, rangeland or urbanization. The harvesting of old trees for firewood is also a factor as older trees tend to have more cavities in them, providing breeding habitat for the species. In California, the oak titmouse can be found sporadically throughout the state where suitable oak woodlands exist. Suitable oak woodlands may vary, but they show a clear preference for open woodlands with a dominance of tree species, especially oaks. They are a resident species that breeds in tree cavities and feeds on seeds, fruits, and insects.

Oak titmice were captured and banded in multiple years at Beale AFB's MAPS station when it was active in the Dry Creek/Best Slough area (Ayuda 2016, 2017).

LRS has limited habitat for oak titmice, so they are unlikely to occupy that site.

Lewis's Woodpecker (Federal BCC, PIF-D)

Lewis's woodpecker (*Melanerpes lewis*) is a federal BCC (USFWS 2008) and PIF-D. This species is an uncommon, local winter resident occurring in open oak savannahs, deciduous, and coniferous habitats. It is found along eastern slopes of the Coast Ranges and also winters in the Central Valley, Modoc Plateau, and the mountain ranges in southern California. The species breeds locally in late May and early June along

eastern slopes of the Coast Ranges, and in the Sierra Nevada, Warner Mountains, Klamath Mountains, and in the Cascade Range (Harvey and Ahlborn 2008). Suitable habitat for this species includes open, deciduous, and coniferous habitats with brushy understory, and scattered snags and live trees for nesting and perching. Loss of habitat and nest sites to land cultivation and development has reduced the breeding population in northern California (Bock 1970).

Lewis's woodpeckers are winter residents on Beale AFB.

Lewis's woodpeckers have not been documented on LRS.

Yellow-billed Magpie (Federal BCC/PIF-D)

The yellow-billed magpie (*Pica nuttali*) is a federal BCC (USFWS 2008) and PIF-D. This species is endemic to California; found in the Central Valley and coastal mountain ranges south from San Francisco Bay to Santa Barbara County. It inhabits valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, orchard, vineyard, cropland, pasture, and urban habitats (Green 2008b). This species has experienced declines due to pesticides and contaminants, as well as West Nile Virus and habitat degradation. Because of its limited range and specialized habitat requirements, climate change could pose a serious threat to the species.

The species is a year-round resident of the Central Valley but is only an occasional visitor to Beale AFB.

Yellow-billed magpies have not been documented on LRS.

Yellow Warbler (State SSC)

The yellow warbler (*Setophaga petechia*) is a California SSC. Yellow warblers typically nest in willow thickets. Historically, they were common nesters along the Sacramento River and tributaries throughout the Central Valley. By 1973, they were considered uncommon in this region, and recent studies have not detected yellow warbler breeding in riparian habitats on the valley floor, including locations where there still is apparently suitable habitat, such as the Consumnes River Preserve, Sacramento County, Bobelaine Audubon Reserve, Sutter County or Sacramento River National Wildlife Refuge.

At Beale AFB, the yellow warbler is considered a spring and fall migrant; however, breeding cannot be precluded.

There is very limited suitable habitat for yellow warblers on LRS.

Yellow-breasted Chat (State SSC)

The yellow-breasted chat (*Icteria virens*) is designated by CDFW as an SSC. The species was once a fairly common summer resident and breeder in riparian woodlands throughout most of California, exclusive of the higher mountains and coastal islands (Grinnell and Miller 1944). The species has declined dramatically throughout its historical range in the state. It is rare in southern California and an uncommon breeding bird along the coastal foothills and in the northern Sacramento Valley and Sierra Nevada foothills (Zeiner et al. 1990).

Chats breed in well-developed riparian woodlands, where they build their nests in dense, brushy thickets and tangles consisting most commonly of willows, tall weeds, blackberry vines and grapevines (Grinnell and Miller 1944). The loss and degradation of riparian areas in the Sacramento and San Joaquin valleys have contributed to the decline of chat populations in California (Remsen 1978). Because most remaining

riparian areas are narrow and the vegetation is sparse, the lack of cover could expose the chat to increasing amounts of nest parasitism by the brown-headed cowbird (*Molothrus ater*; Remsen 1978).

Singing male chats, an indication that breeding sites are nearby, have been observed near the confluence of Dry Creek and Best Slough. These waterways support the only suitable breeding habitat for chats on Beale AFB.

LRS does not have suitable habitat for yellow-breasted chats.

Grasshopper Sparrow (State SSC/DoD-PIF MSPBS)

The grasshopper sparrow (*Ammodramus savannarum*) is designated an SSC by the CDFW and a DoD-PIF MSPBS. They have experienced a 75% decline in population size since 1966. Population declines are likely due to habitat loss/degradation, which includes exotic grass and shrub invasions, altered fire regimes, over-grazing/mowing, pesticide use, human disturbance, and climate change (Ruth 2015).

This species is a furtive grassland bird whose diet consists of insects, primarily grasshoppers, as its name suggests. More abundant east of the Rockies during breeding season, it also breeds in the Central Valley and coast of California. It prefers open grassland with patches of bare ground and makes a cup nest of grass stems and blades, well concealed on the ground.

Grasshopper sparrows have been observed on Beale AFB in the summer.

No detections of grasshopper sparrows have been reported for LRS.

Tricolored Blackbird (TRBL) (BCC/State Threatened and SSC/DoD-PIF MSPBS/PIF-R)

The tricolored blackbird is state-listed as threatened under the CESA. The TRBL was petitioned for listing under the ESA in February 2015 and on September 18, 2015, the Service stated in the Federal Register that a petition for listing presented substantial scientific or commercial information indicating that listing the TRBL may be warranted (USFWS 2015b), prompting a review of the species status. The 12-month finding for the TRBL determined that it did not warrant listing under the federal ESA (USFWS 2019). The species was granted candidate status under the CESA in January 2016 (Fish and Game Commission 2016) and was determined to warrant listing as state threatened in 2018 (Fish and Game Commission 2018). This species is a federal BCC (USFWS 2008) and a DOD-PIF MSPBS on the Red Watchlist (PIF 2021).

The species is largely endemic to California (Neff 1937). During the breeding season, TRBLs are found in the Central Valley, in the low foothills of the Sierra Nevada and Coast Ranges from Shasta County south to Kern County, along the coast from Sonoma County south to the Mexican border, and on the Modoc Plateau (Grinnell and Miller 1944; Beedy et al. 1991). The TRBL population has declined primarily as a result of the conversion of wetland breeding habitats and grassland foraging habitats to agricultural uses. Habitat loss, reduction of food resources, incidental poisoning of nesting colonies adjacent to agricultural fields, nest disturbance by predators and humans, and competition with red-winged blackbirds threaten remaining populations of TRBLs (Beedy et al. 1991).

The TRBL is generally considered a marsh species, nesting primarily in tule and cattail marsh habitats. With the reduction of wetland habitats in California, increasing numbers of TRBLs have recently been found nesting in non-marsh habitats, such as blackberry brambles, thistle stands and nettle stands (Beedy et al. 1991). TRBLs nest in small (50-100 individuals) to large colonies (as many as 50,000 individuals). TRBLs forage in large flocks and may travel as far as three to four miles from nest or roost sites to forage (Orians 1961). This species does not have high site fidelity; Airola et al. (2016) found that of the sites used for breeding by TRBL in the central Sierra foothills, most (70%) were used only for a single year during

the three years of the study. In the Central Valley, foraging habitat consists primarily of pastures and certain types of agricultural fields. TRBLs eat mostly insects (e.g., grasshoppers, beetles and weevils), and colony site selection is primarily a function of proximity to concentrated insect food supplies (Beedy et al. 1991).

Large flocks of TRBLs have been observed in various locations at Beale AFB during winter/spring. TRBLs probably forage across the entire base during winter. During the breeding season, TRBLs have been observed near Upper Blackwelder Lake. Nesting colonies have been observed at Lower Blackwelder Lake and Miller Lake and most recently at A Street Pond and lower Reeds Creek in 2015/2016 (CIRE 2017). Large flocks have also been observed nesting off-base and foraging on base.

TRBLs have presented a BASH risk in the past on Beale AFB. Large flocks of nesting birds crossed back and forth across the runway from nesting habitat to foraging habitat. The creation of TRBL habitat in areas of the base away from the flightline could benefit the species and avoid conflicts with aircraft that have occurred in the past.

There is no suitable nesting habitat for TRBL on LRS, but a large breeding colony was observed on an adjacent property in summer 2020 with TRBL using the LRS for foraging.

2.3.4.6 Special Status Mammals

Pallid Bat (State SSC/WBVG High-Priority)

The pallid bat (*Antrozous pallidus*) is designated as an SSC by CDFW and a WBVG high priority species. It occurs throughout the low elevations of California. Pallid bats use a variety of habitats, including grasslands, shrublands, woodlands, and forests, but are most common in open, dry habitats with rocky areas for roosting. Other roosts are in caves, crevices, mines, and occasionally hollow trees and buildings. It is a yearlong resident in most of its range.

At Beale AFB, pallid bats were visually observed at the abandoned recreation building and detected at all nine of the acoustic survey sites during surveys in spring 2004. There were no detections of the species during 2014-2015 surveys; however, pallid bats were detected in acoustic surveys in 2017 and 2018 (CIRE 2018b, H. T. Harvey & Associates 2017a). In August 2018 two pallid bats (a sub-adult female and mature male) were captured and radio-tagged. The bats were radio-tracked to a presumed maternity colony roost located in a large blue oak approximately one mile east of Foothill Chapel. Because one of the individuals was a sub-adult, it is believed that this is the location of the maternity colony associated with the pallid bats that night-roost on the chapel. No attempt was made to count the total number of bats roosting in the blue oak at the time of discovery. Based on findings to date, it appears that this species night roosts in the Foothill Chapel (and may night roost in other structures on Beale AFB), but a maternity colony of this species does not occur at the Foothill Chapel (H.T. Harvey & Associates 2018b). Pallid bats were detected in valley oak and blue oak woodlands throughout the summer in 2020, with no detections during the winter, suggesting this species uses Beale AFB to raise young (H.T. Harvey & Associates 2021). A maternity roost was confirmed east of Beale AFB in 2019, but not in 2020; this species is known to frequently switch maternity colony roosts within a neighborhood of roosts throughout the maternity season (H.T. Harvey & Associates 2021).

Pallid bats were also detected during acoustic surveys at the LRS in 2017 (CIRE 2018b).

Long-legged Myotis (WBVG High-Priority)

The long-legged myotis (*Myotis volans*) is designated by WBVG as a high priority species. It inhabits western North America from southeast Alaska to central Mexico. Long-legged myotis is primarily found

in coniferous forests, but it may also inhabit riparian and desert habitats. Suitable roosts include buildings, rock crevices, beneath exfoliating tree bark, bridges, caves, and mines. It is unknown whether this species migrates in the portion of its range where winters are less severe.

At Beale AFB, long-legged myotis was detected at two sites, Dry Creek and the wastewater treatment ponds in 2004. The species was detected in the Dry Creek area during 2017 acoustic surveys, but not during year-round surveys in 2020 (CIRE 2018b, H.T Harvey & Associates 2021).

Long-legged myotis were not detected during acoustic surveys at the LRS in 2017 (CIRE 2018b).

Western Red Bat (State SSC/WBVG High-Priority)

The western red bat (*Lasiurus blossevillii*) is designated as a SSC by CDFW and is a WBVG high priority species. It has no federal or state status. Little is known about this species; much of the natural history for western red bat is inferred from what is known about the eastern red bat. In California, this species is known to roost in cottonwoods and willows, but it is commonly detected in a variety of habitats, including chaparral. The range of the western red bat extends from British Columbia to Central and South America. It is a seasonal resident of California.

At Beale AFB, western red bat was detected at two sites, Bedspring Lake and the wastewater treatment ponds, during the summer surveys. They were also detected at six of nine survey sites during the fall survey, likely due to increased abundance during the fall migration. There were also a large number of acoustic detections of this species in 2017, 2018 and 2020 (CIRE 2018b; H.T. Harvey & Associates 2018b, 2021). Based on the relatively large numbers of acoustic detections, it is believed that this species occurs in fairly high densities along Dry Creek and Best Slough. Furthermore, because these high densities occur during the maternity season, and the large valley oaks and Fremont cottonwoods (*Populus fremontii*) provide good maternity season roosting habitat, it is likely that these areas support a population of females raising young. This species is difficult to physically capture, but locating clusters of females raising young could help determine sensitive areas that could be managed and protected with buffers as needed (H.T. Harvey & Associates 2018b).

Western red bats were detected during acoustic surveys at the LRS in 2017 (CIRE 2018b).

Townsend's Big-eared Bat (State SSC/WBVG High-Priority)

Townsend's big-eared bat (*Corynorhinus townsendii*) is designated by CDFW as an SSC and by WBVG as a high priority species. A petition was submitted for its protection under the CESA in 2012, and, in June 2013, it became a candidate species. However, in 2016, the California Fish and Game Commission determined that listing the species was unwarranted under the CESA.

It is a year-round resident in California. Townsend's big-eared bat is found primarily in rural settings in a wide variety of habitats. It typically roosts during the day in caves and mines but can also roost in buildings. Night roosts are in more open settings and include bridges.

At Beale AFB, the Townsend's big-eared bat was not detected during summer and fall surveys in 2004, but was detected during surveys in 2016, 2017, 2018 and 2020 (H.T. Harvey & Associates 2016, 2017a, 2018b, 2021). In spring 2020, there was one detection of Townsend's big-eared bat in riverine habitat, and detections in multiple habitats during year-round surveys (H.T. Harvey & Associates 2021). Based on the very few recordings of Townsend's big-eared bats recorded during acoustic surveys, there do not appear to be any maternity colonies of Townsend's big-eared bats on Beale AFB at this time (H.T. Harvey & Associates 2018b).

Townsend's big-eared bats were detected during acoustic surveys at the LRS in 2017 (CIRE 2018b).

Western Mastiff Bat (State SSC/WBWG High-Priority)

Western mastiff bats (*Eumops perotis californicus*) are a State SSC and WBWG considers it a high-priority species. The western mastiff bat is an uncommon resident bat that occurs throughout southern California, along the coast as far north as San Francisco, and in a band along the central valley into Oregon (CDFW 1988). Western mastiff bats occupy many open habitats that are in arid to semi-arid regions including woodlands, coastal scrub, grasslands, palm oases, chaparral, desert scrub, and urban areas. These bats catch and feed on insects in flight, primarily preying on night-flying hymenopterous insects (Zeiner et al. 1990).

Western mastiff bats take cover in crevices in cliff faces, high buildings, trees, and tunnels. When roosting in rock crevices, they need a vertical face to drop off to take flight. Nursery roosts are described as tight rock crevices at least 90 cm (35 in) deep and 5 cm (2 in) wide, or crevices in buildings (Zeiner et al. 1990).

At Beale AFB, the Western mastiff bat was not detected during summer and fall surveys in 2004, 2016, 2017, or 2018, but was detected four times during year-round surveys in 2020 (H.T. Harvey & Associates 2016, 2017a, 2018b, 2021; CIRE 2018b). The 2020 survey confirmed Western mastiff bats using the valley oak woodland habitat in the summer, and one detection in grassland habitat in the fall (H.T. & Associates 2021).

Western mastiff bats were not detected during acoustic surveys at the LRS in 2017 (CIRE 2018b).

Little Brown Bat ([little brown myotis] SCC/WBWG Medium-Priority)

The little brown bat (also known as little brown myotis) (*Myotis lucifugus*) is designated an SSC in California and a high-priority species by the WBWG. It occurs in the seven northern California counties, and in two bands along the coast as far south as San Francisco, and along the Sierra Nevada range as far south as northern Kern County (CDFW 1997). It occurs fairly commonly in sagebrush, bitterbrush, alkali desert scrub, wet meadow, and montane chaparral and less commonly in valley foothill woodlands, redwood, mixed chaparral, low sagebrush, alpine dwarf-shrub, coastal scrub, and grasslands.

Little brown bats emerge from roosts at dusk and are most active in the hours after dusk and before dawn. They may enter torpor daily even outside of hibernating season which lasts from September or November into March or May depending on location. During fall, large groups may aggregate after migration down in elevation or for long-distance migrations, and such swarming is associated with mating (CDFW 2005).

At Beale AFB, the little brown bat was not detected during summer and fall surveys in 2004 and 2016, but was confirmed infrequently during surveys in 2017 (H.T. Harvey & Associates 2016, 2017a, 2018b; CIRE 2018b). Additional surveys throughout the year and in multiple habitat types in 2020 did not detect the little brown bat (H.T. Harvey & Associates 2021), suggesting limited use of Beale AFB by the species.

Little brown bats were detected during acoustic surveys at the LRS in 2017 (CIRE 2018b).

Marysville Kangaroo Rat (State Species of Special Concern)

Marysville kangaroo rat (*Dipodomys californicus eximius*) is a subspecies of the California kangaroo rat (*D. californicus*) restricted in range to the Marysville Butte area of Sutter County, west of Beale AFB. They are designated as a species of special concern at the state level. Little is known about their specific habitat requirements, but they are presumably similar to *D. californicus*, which uses grasslands with well-drained soils for burrowing. Additional research on the Marysville kangaroo rat is required to determine population

sizes, habitat requirements and threats. Threats possibly include overgrazing and agricultural impacts on their grassland habitat (Williams 1986). Marysville kangaroo rats are unlikely to occur on Beale AFB.

They are possibly present on the LRS, but no surveys have been conducted to date.

Ringtail (State FP)

The ringtail (*Bassariscus astutus*) is a California Fish and Game Code FP species. Ringtails occur in various riparian habitats, in brush stands of most forest and shrub habitats, at low to middle elevations, especially where there are hollow trees, logs, snags, or rocky areas for cover.

At Beale AFB, ringtail scat was detected in 2000 in the Dry Creek area during a trapping study conducted by students at CSUS.

LRS does not have suitable habitat for ringtails.

2.3.5 *Wetlands and Floodplains*

The regulatory framework governing and defining waters of the United States (WoUS) has recently been revised. On 23 December 2019, the EPA and Department of the Army (DOA) issued a new rule repealing the 2015 Clean Water Rule, which had interpreted the CWA to include a broad range of waters. The 2019 rule was intended to restore the CWA to its prior language, with agencies implementing the pre-2015 rule “informed by applicable agency guidance documents and consistent with Supreme Court decisions and longstanding agency practice” (84 Federal Register [FR] 56626). On 22 June 2020, the Navigable Waters Protection Rule (NWPR): Definition of “Waters of the United States” went into effect. This rule provides definitions of what is included in WoUS and stipulates waters that are specifically excluded from jurisdiction such as ephemeral streams, prior converted cropland, and waste treatment systems, among others.

All WoUS are administered by the USACE. Under 40 Code of Federal Regulation (CFR) 328.3 the Regulatory Definition of “Waters of the United States” is:

- (1) The territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide;
- (2) Tributaries;
- (3) Lakes and ponds, and impoundments of jurisdictional waters; and
- (4) Adjacent wetlands.

The definition of wetlands is unchanged from prior Rules, but *adjacent wetlands* are now restricted to those that:

- (i) Abut, meaning to touch at least at one point or side of, a water identified in paragraph (a)(1), (2), or (3) above;
- (ii) Are inundated by flooding from a water identified in paragraph (a)(1), (2), or (3) above in a typical year;
- (iii) Are physically separated from a water identified in paragraph (a)(1), (2), or (3) above only by a natural berm, bank, dune, or similar natural feature; or
- (iv) Are physically separated from a water identified in paragraph (a)(1), (2), or (3) above only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct

hydrologic surface connection between the wetlands and the water identified in paragraph (a)(1), (2), or (3) above in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The NWPR also sets out definitions of several key terms important to determining a water body's legal status:

Ephemeral- The term ephemeral means surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall).

Intermittent- The term intermittent means surface water flowing continuously during certain times of the year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts).

Perennial. The term perennial means surface water flowing continuously year-round.

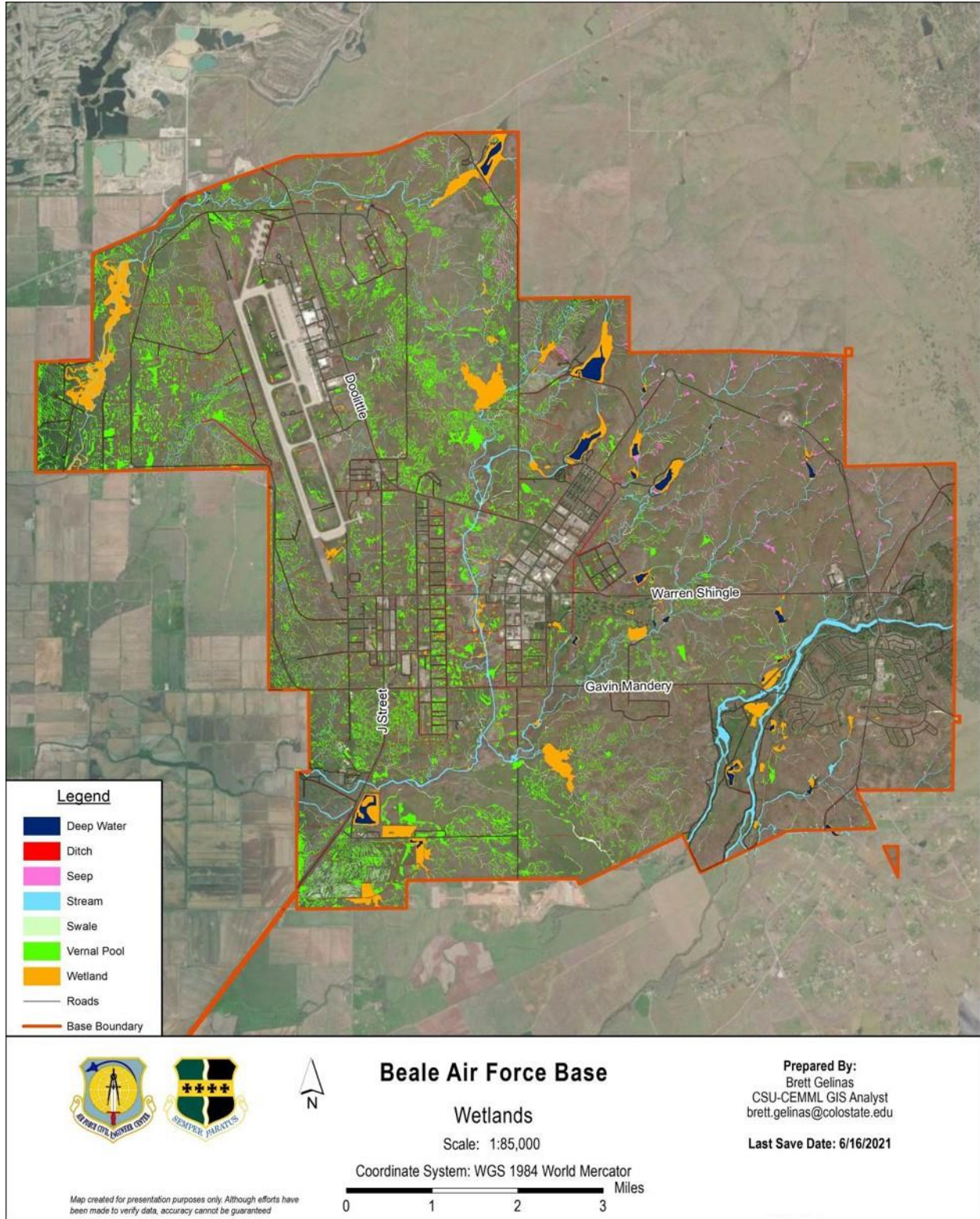
Ordinary high water mark. The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Typical year. The term typical year means when precipitation and other climatic variables are within the normal periodic range (e.g., seasonally, annually) for the geographic area of the applicable aquatic resource based on a rolling thirty-year period.

EO 11988, *Floodplain Management* Provides direction regarding actions of Federal agencies in floodplains, and requires permits from state, territory and Federal review agencies for any construction within a 100-year floodplain and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for acquiring, managing and disposing of Federal lands and facilities. Floodplain management and planning is important from both a regulatory standpoint and for practical reasons to protect infrastructure. Floodplain maps are maintained by the Federal Emergency Management Administration (FEMA), and Beale AFB participated in a pilot study to delineate floodplains with more detail in 2018 (CEMML 2018c).

2.3.5.1 Wetlands

A Preliminary Jurisdictional Determination from USACE concurred that there are approximately 3,089 acres of wetlands, including vernal pools, and/or other water bodies present within the base that are potential WoUS regulated under Section 404 of the CWA, as depicted in the 23 February 2010, Beale AFB Wetland Delineation drawings. This includes 2,328 acres of wetlands and 761 acres of non-wetland waters (Figure 2-13). There are some areas, such as "Vernal Pool Swale Complexes," that were too complicated to delineate based solely on remote sensing. In this case, it was estimated that 50% of these areas are wetlands. Wetland delineation reports have also been prepared for specific projects. Wetland types at Beale AFB of particular importance to wildlife include vernal pools, riparian forests and freshwater marsh. There are approximately 40 acres of wetlands on LRS; all are vernal pools (Figure 2-14). Wetlands and freshwater marsh areas at Beale AFB may be vulnerable to changing climate conditions with increases in air and surface water temperatures, alterations in the magnitude and seasonality of precipitation and run-off, and potential shifts in reproductive phenology and distribution of plants and animals (CEMML 2019).



1

2 Figure 2-13. Wetlands on Beale AFB (Beale AFB 2017c).



3

4 Figure 2-14. Wetlands on LRS (Beale AFB GeoBase 2021, Wildlands 1999).

5 2.3.5.2 Floodplains

6 According to 2003 Federal Emergency Management Agency (FEMA) data, there are roughly 2,500 acres
7 of floodplains across Beale AFB, many of which are situated near mission-critical assets. In 2018, an
8 analysis of light detection and ranging (LiDAR) and land use classification data by CEMML determined
9 that this acreage may be underestimated by as much as 122% (CEMML 2018c). The CEMML analysis
10 found additional flood prone areas adjacent to the FEMA-identified floodplains as well as new areas not
11 modeled by FEMA that were picked up by the more sophisticated and higher-resolution CEMML process.
12 Large floodplains exist around the major drainages at Beale AFB (Dry, Reeds, and Hutchinson creeks and
13 Best Slough) and surround two unnamed drainages west of the flightline (Figure 2-15). The CEMML-
14 modeled areas extend up the drainages and in most cases include larger portions of the banks of each creek.
15 These areas may flood during heavy rainfall in the region due to impervious soil conditions and lack of
16 topographic relief. The total area of Beale AFB subject to flooding in a 100-year event was mapped as
17 5,878 acres, while the 500-year flood area is 7,455 acres. LRS is outside the 100-year floodplain, which
18 extends along the southern boundary of the site (Figure 2-16).

19 Drought has heightened the relative severity of flood events because of the hardpanning of soils, which
20 decreases infiltration and increases sheet flow over the land surface. Furthermore, a significant portion of
21 the riparian areas that buffer the stream networks in the region has been removed in favor of agricultural
22 production, limiting the potential for natural flood attenuation.

23 This issue is compounded by large-scale alterations in the regional hydrology that channels water courses
24 into artificial levees and dykes for agricultural irrigation. The combination of drought, riparian degradation,
25 and human-driven changes to hydrology results in an overall greater regional vulnerability to flooding
26 during seasonal storms (Marstel-Day 2015). Floodplains in Figure 2-15 are designated as 100- and 500-
27 year floodplains.

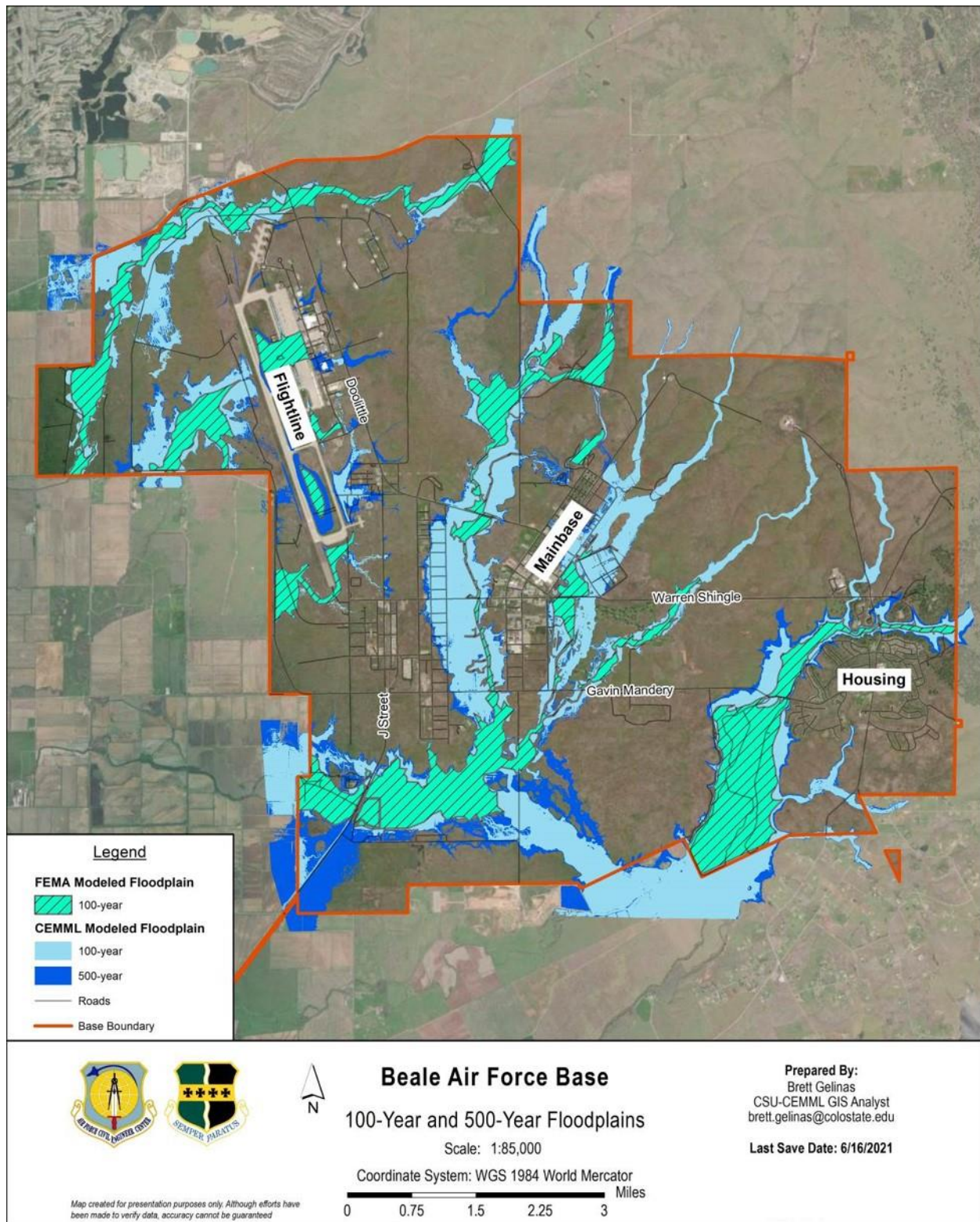
28 2.3.5.3 Riparian Areas

29 Riparian areas at Beale AFB are primarily associated with lakes and perennial streams. Riparian systems
30 occur in transition zones between aquatic and upland ecosystems and, in their undisturbed condition, are
31 characterized by dominant vegetation that is tolerant of and adapted to periodic flooding or soil saturation.
32 Prime riparian habitat on the base is found along Dry Creek and Best Slough. Past management actions
33 have resulted in most creeks and ephemeral streams on base (except Reeds Creek) having downcut
34 streambeds. This has impaired the adjacent vegetation by lowering the water table and elevated sediment
35 delivery within the watersheds as vegetation degraded and erosion increased in the channel and along banks.
36 Freshwater marsh vegetation grows in ponds and drainages with permanent water sources and intermingles
37 with riparian woodland vegetation along drainages throughout the base, such as Hutchinson Creek and Dry
38 Creek.

39 2.3.5.4 Vernal Pools

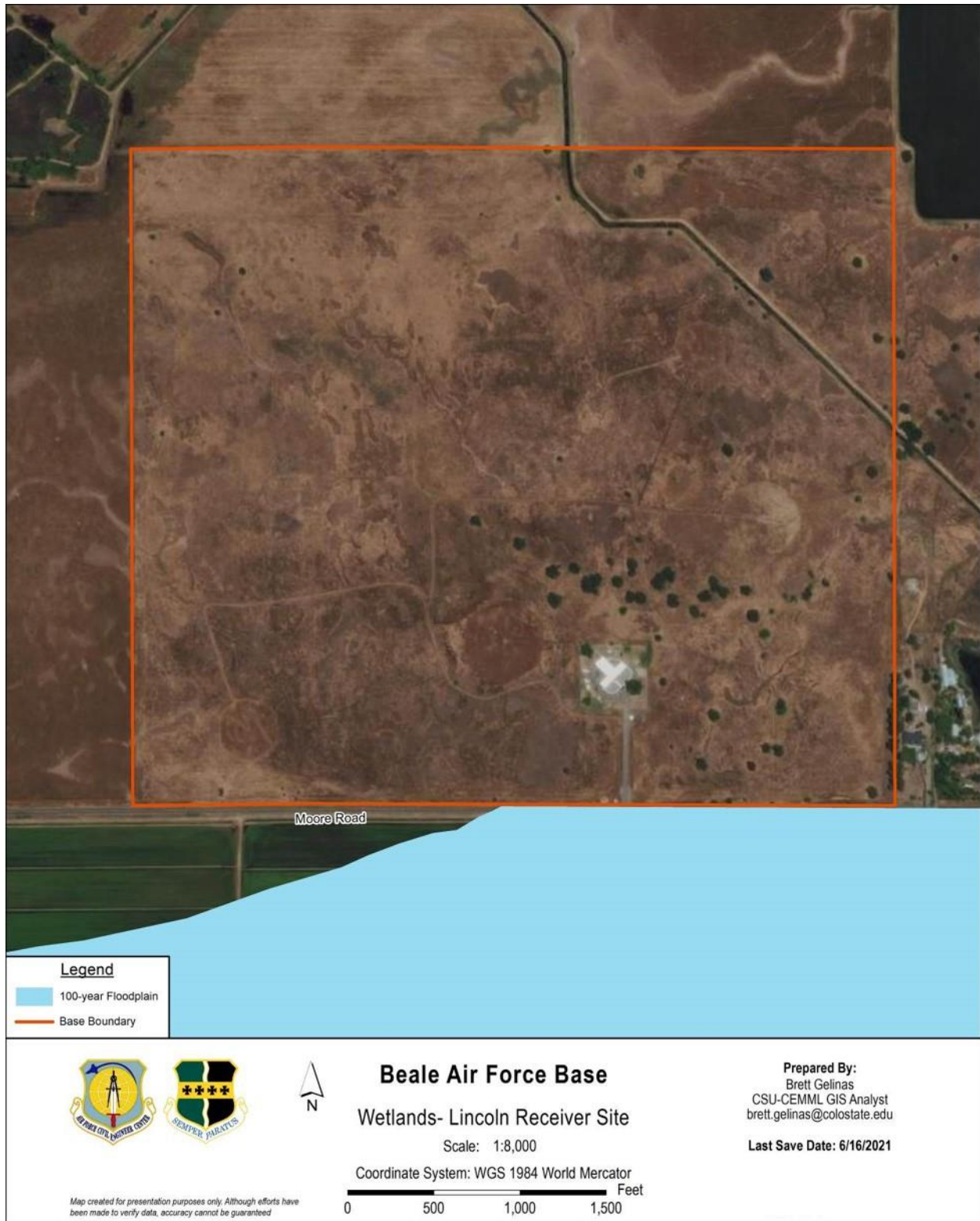
40 Vernal pools are extensive in the western, central, and southern portions of the base, covering 1,379 acres.
41 There are 111 vernal pool microsheds mapped on Beale AFB, ranging in size from 0.2 ac to 1,900 ac (Figure
42 2-17). Vernal pools have a claypan, hardpan, or bedrock bottom that prevents or slows water percolation
43 through the soil profile. Annual water levels in pools are entirely dependent upon rainfall, leading to
44 inconsistent water levels and hydro-periods from year to year. In high water years, pools may remain
45 inundated through the winter. These pools provide unique habitat for plants that germinate as aquatic or
46 semiaquatic plants but must survive a terrestrial life and a drought environment as the pool dries. There are

47 approximately 35 acres of man-made vernal pools at two sites on the base, one west of the flightline and
48 one near the Wheatland Gate.



49

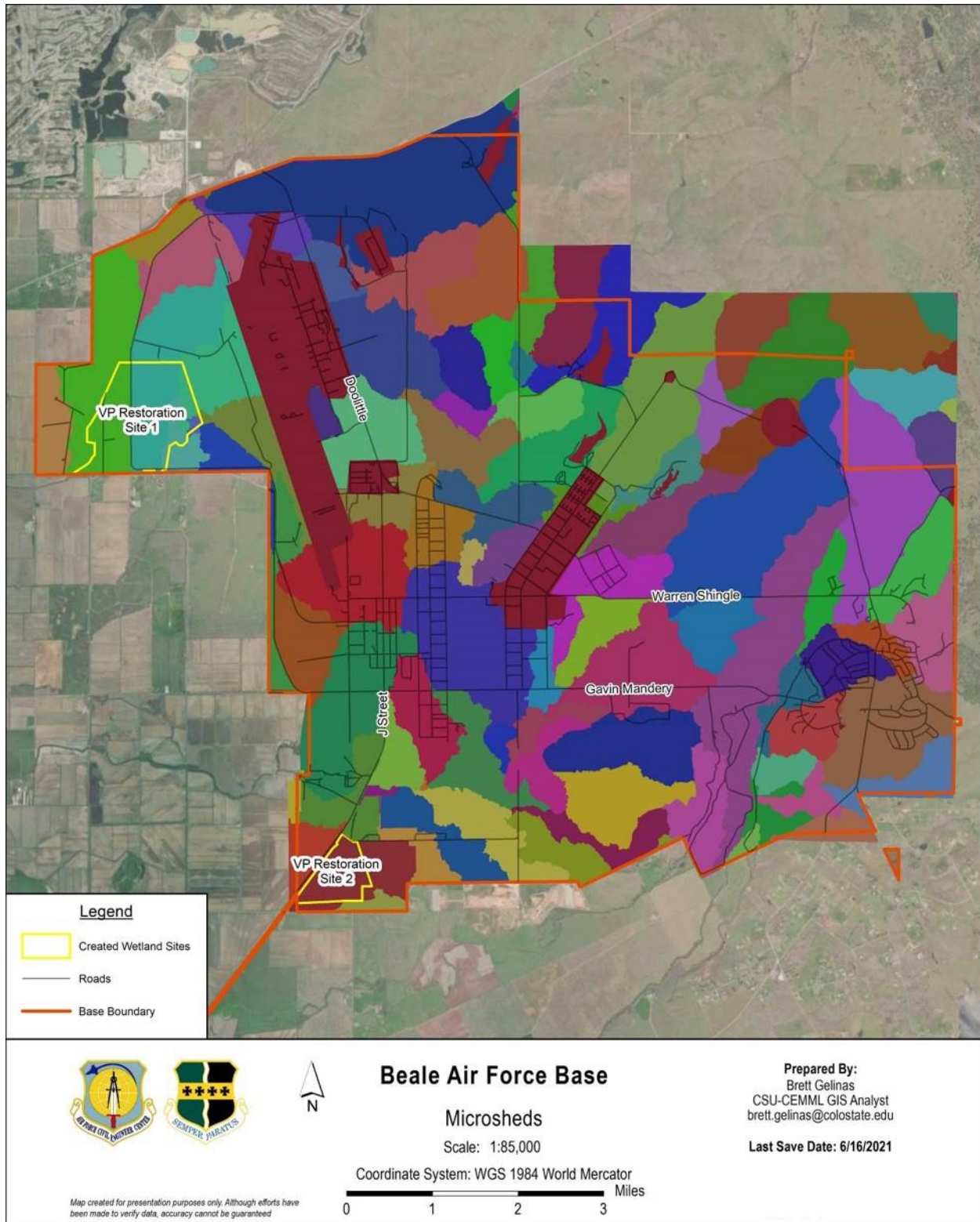
50 Figure 2-15. The 100- and 500-year floodplains at Beale AFB (Beale AFB 2016b, CEMML 2018c).



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51

52 Figure 2-16. LRS floodplain (Beale AFB GeoBase 2021).



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53

54 Figure 2-17. Microsheds mapped on Beale AFB.

55 2.3.6 *Other Natural Resource Information*

56 Not Applicable.

57 **2.4 Mission and Natural Resources**58 2.4.1 *Natural Resource Constraints to Mission and Mission Planning*

59 Natural resource constraints to future planning and missions at Beale AFB are created by a combination of
60 legal factors (e.g., federal and state environmental laws and regulations) and physical factors (e.g.,
61 floodplains and wetlands). The Beale AFB ICEMAP (Marstel-Day 2015) identifies the significant
62 encroachment and sustainment challenges facing the base. The ICEMAP considers natural resource issues
63 to be four of the top five most significant challenges facing Beale AFB. The challenges identified (in order
64 of severity) are:

- 65 • Presence of T&E species
- 66 • Potential for flooding
- 67 • Ongoing regional drought
- 68 • Lack of alternative water supply
- 69 • Degraded facilities and infrastructure

70 The four most significant issues act as constraints on addressing the fifth most pressing issue, infrastructure
71 repair and expansion. Constraints on LRS include wetlands and T&E species habitat.

72 2.4.1.1 **Regulatory Constraints**

73 Significant constraints to planning for future development and mission operations at Beale AFB involve
74 compliance with the following federal and state environmental laws and regulations designed to protect
75 these resources.

76 Federal CWA

77 There are approximately 2,328 acres of wetlands and 761 acres of non-wetland WoUS on Beale AFB
78 (Figure 2-13), and approximately 40 acres on LRS (Figure 2-14). Any areas defined as a wetland or WoUS
79 by USACE are protected under the CWA, and projects that occur within these areas may require a permit
80 and potentially wetland or stream mitigation. Wetland and stream mitigation owed by Beale AFB for past
81 projects is covered in Section 7.6, *Wetland Protection*.

82 Federal ESA

83 The base ICEMAP identifies T&E species and critical habitat as the greatest encroachment and sustainment
84 challenge on the base (Marstel-Day 2015). Multiple federally listed T&E species occur or have the potential
85 to occur on Beale AFB and LRS (see Section 2.3.4, *Threatened and Endangered Species and Species of*
86 *Concern*). There is no designated critical habitat for federally listed T&E species on Beale AFB or LRS
87 due to the benefits provided to these species through the INRMP. Beale AFB consults with USFWS on a
88 project-by-project basis if suitable habitat for T&E species occurs within or near a project area.

89 MBTA and BGEPA

90 The location of Beale AFB along the Pacific flyway creates a heightened BASH risk. Because migratory
91 birds are protected under the MBTA, take by harassment or lethal force requires a permit. Golden and bald
92 eagles, which are protected under the MBTA and BGEPA, have been observed on the base. The BGEPA
93 requires specific USFWS permits for the "taking" of bald or golden eagles. Fines and/or mitigation may be
94 required if these regulations are violated.

95 2.4.1.2 **Physical Constraints**

96 Natural resources can provide numerous direct physical constraints to base planning and mission
97 operations. At Beale AFB, the most significant of these physical constraints are mission critical assets
98 located in floodplains, the potential for drought and groundwater availability, characteristics of the
99 topography and soils of the base that limit development, and the extreme weather and fire conditions
100 associated with climate change.

101 Floodplains

102 The Beale AFB ICEMAP identifies flooding as the second most significant encroachment and sustainment
103 challenge facing Beale AFB. Flooding is a significant issue within California's northern Sacramento Valley,
104 which is characterized by its low-lying topography, proximity to major rivers, and relatively impervious
105 soils. Beale AFB has roughly 2,500 acres of floodplains (Figure 2-15) across the installation, many of which
106 are situated near mission-critical assets. Seasonal flooding events can cause significant damage or delays
107 to operations and infrastructure. Emergency flood mitigation measures, such as pumping water off of the
108 flightline, have the potential to create significant environmental issues if contaminants are discharged into
109 nearby surface water.

110 Drought

111 The Beale AFB ICEMAP identifies drought as the third greatest encroachment and sustainment challenge
112 facing Beale AFB. California's hydrology has always included extended dry periods. Much of California's
113 water system was originally designed to withstand a seven-year dry period without severe damage to the
114 economy and environment. Today some regions and many communities struggle to maintain adequate
115 water supplies after only a year or two of dry conditions. Climate change makes this situation even more
116 challenging (California Natural Resources Agency et al. 2016).

117 California has put in place new regulations to improve water conservation and sustainability; however, the
118 restrictions on overall water consumption throughout the state may pose a threat to the health of the aquifer
119 below Beale AFB. Reductions in surface water allocations are likely to increase the demand for
120 groundwater withdrawal, which could compound the cut in aquifer recharge caused by the drought. Actions
121 such as regulating the drilling of wells and the amount of water that can be pumped from basins by different
122 stakeholders will help keep agriculture from overdrawing the basins for irrigation but may also restrict the
123 amount of water available to Beale AFB.

124 Topography and Soils

125 The eastern portion of Beale AFB (containing the family housing and clinic areas) is composed primarily
126 of gently sloping hills that gradually merge with the foothills of the Sierra Nevada Mountains. Isolated
127 areas of steep slopes in this portion of the base may present constraints to development and base missions.
128 Argonaut soils, which are the dominant soil type north of the hospital, also limit development because of

129 high shrink-swell potential, low soil strength, and shallow depth to bedrock. Several areas in the eastern
 130 portion of the base are characterized by rock outcrops that may also pose development limitations.

131 Climate Change

132 Beale AFB’s primary mission of providing high-altitude surveillance does not require specific habitat or
 133 vegetation types that would be an integral part of mission readiness at other installations. The primary
 134 resources required for sustainment of the mission are adequate air space and predictable weather and flight
 135 conditions. Wildland fires in the area of Beale AFB are projected to increase, which could have primary
 136 effects on the military mission such as damaging equipment, preventing personnel access, and reducing
 137 visibility from wildfire smoke.

138 Future impacts to the mission at Beale AFB linked to climate change could include:

- 139 • Increases in temperature and wind velocity leading to unsafe environmental conditions for the
 140 launch of aircraft and equipment, resulting in increased maintenance requirements, requirements
 141 for new equipment, or decreased launch capacity (DoD 2014);
- 142 • Increased dust generation effecting equipment and visibility (DoD 2014);
- 143 • Increased wind velocities damaging vital mission infrastructure (Sydeman et al. 2014);
- 144 • Increased drought potential (Glick et al. 2011);
- 145 • Increased flooding damaging mission infrastructure and impeding access to various parts of the
 146 base;
- 147 • Potential loss of future training areas that may be needed in light of a changing geopolitical
 148 landscape and base realignment.

149 In addition to these direct effects, climate change has the potential to disrupt the acquisition and
 150 transportation of materials required for the maintenance, construction, and storage of the equipment
 151 required for these systems (DoD 2014).

152 **2.4.1.3 General Planning with Yuba County**

153 Beale AFB works with Yuba County and adjacent landowners on future land use both on and off base to
 154 help address natural resource constraints.

155 *2.4.2 Land Use*

156 AFMAN 32-7003 defines three categories of land use:

157 **Improved Grounds:** Includes land occupied by buildings and other permanent structures as well as lawns
 158 and landscape plantings on which grounds maintenance personnel annually plan and perform intensive
 159 maintenance activities. Improved Grounds include the cantonment area, parade grounds, drill fields, athletic
 160 areas, golf courses (excluding roughs), cemeteries, and housing areas. Grass in these areas is normally
 161 maintained by regular mowing during the growing season.

162 **Semi-improved Grounds:** Land where periodic maintenance is performed primarily for operational
 163 reasons (such as erosion and dust control, bird control, and visual clear zones). This land use classification
 164 includes areas adjacent to runways, taxiways, aprons, runway clear zones, lateral safety zones, rifle and
 165 pistol ranges, weapons firing and bombing ranges, picnic areas, ammunition storage areas, antenna

166 facilities, and golf course roughs. Semi-improved grounds areas are mowed less often than the maintained
 167 turf grass on improved grounds.

168 **Unimproved Grounds.** Land that is not classified as ‘improved’ or ‘semi-improved’ grounds. Unimproved
 169 grounds include forest lands, croplands and grazing lands, lakes, ponds, and wetlands, and any areas where
 170 natural vegetation is allowed to grow unimpeded by maintenance activities.

171 Beale AFB covers 23,192 acres and contains improved, semi-improved, and unimproved land areas based
 172 on land classifications defined in AFMAN 32-7003. Development at Beale AFB has incorporated generally
 173 good land use principles and policies. Within Beale AFB, a variety of land uses can be found that are typical
 174 of military installations across all service branches. The four largest land uses at Beale AFB are open space,
 175 airfield, industrial, and housing. Collectively, they comprise approximately 96% of the land use total for the
 176 installation (Figure 2-18, Table 2-11).

177 Beale AFB is a large installation with three distinct built-up areas: the flightline, Main Base, and privatized
 178 housing area. These three areas effectively group compatible and separate conflicting land uses into
 179 compact development clusters. Large areas of open space, as well as ranges and training areas, provide
 180 buffers between the more intensely developed flightline, Main Base, and privatized housing areas.

181 A small amount of land on LRS is improved, with the majority being unimproved land (Table 2-12).

182 **2.4.2.1 Improved Grounds**

183 Improved grounds include all areas at Beale AFB on which personnel annually plan and perform intensive
 184 maintenance activities. Approximately 2,089 acres at Beale AFB are included in the improved grounds
 185 category. Improved grounds are mostly clustered in three main developed areas, with smaller areas of
 186 improved ground located across the base.

187 **2.4.2.2 Semi-Improved Grounds**

188 Approximately 33 acres of the 235-acre LRS are improved grounds. The developments consist of antenna
 189 fields, Building 4131, a stabilization pond, an abandoned power substation, and the Moore irrigation canal,
 190 which carries water managed by the South Sutter Water District. Semi-Improved Grounds

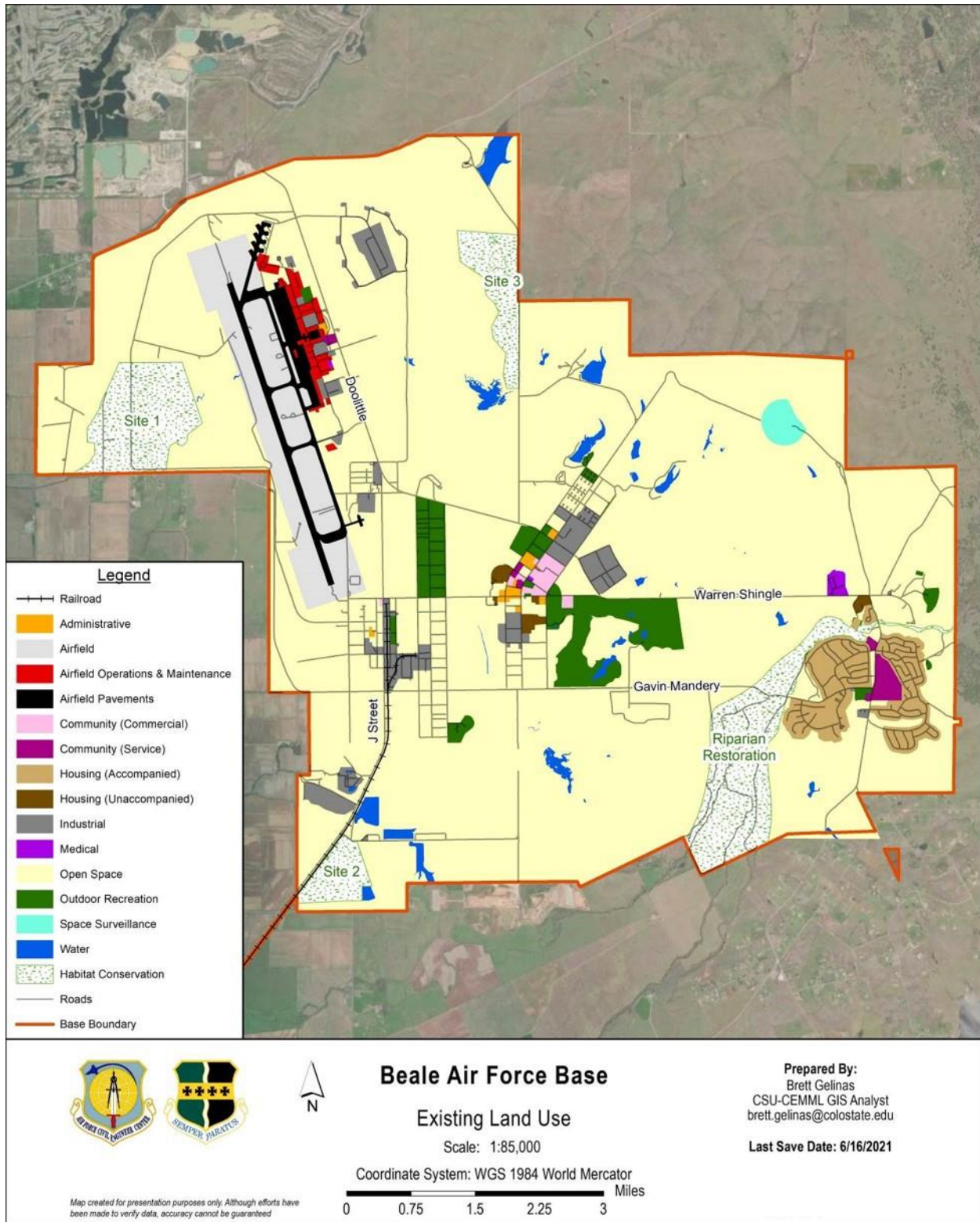
191 Semi-improved grounds include all areas of the base on which personnel perform periodic maintenance
 192 primarily for operational and aesthetic reasons. Most of this land is adjacent to runways, taxiways and
 193 aprons, or on rifle and pistol ranges, in training areas, and on golf course roughs.

194 **2.4.2.3 Unimproved Grounds**

195 Approximately 20,022 acres at Beale AFB fall into this category. Of this area, 12,789 acres are used for
 196 grazing. Unimproved grounds also include areas related to specific natural resource conservation and
 197 management activities, including vernal pool restoration (666 acres), vernal pool conservation (257 acres)
 198 and the riparian conservation area (approximately 736 acres). There are approximately 200 acres of
 199 unimproved grounds on LRS.

200 *Planning Districts*

201 The Beale AFB IDP designated five planning districts for the base: Airfield, Main Base, Boomtown
 202 (training) including PAVE PAWS, Industrial, and Beale Heights. Beale AFB planning districts were formed
 203 based on framework plan elements and relationships to the existing transportation network, and established
 204 land-use patterns.



205

206 Figure 2-18. Existing land uses at Beale AFB (Beale AFB 2017c).

207

Table 2-11. Acreage and typical facilities/features of land uses on Beale AFB (Source: Installation Development Plan 2015.).

Land Use Category	Typical Facilities/Features	Existing Area (acres)
Administration	Headquarters, Security Operations, Office	36
Airfield	Runway, Taxiway, Apron, Overrun	1,285
Communities Commercial and support)	Dining Facility, Club, Commissary, Base Exchange, Gym/Recreation Center, Theater, Religious Facility	223
Housing (Unaccompanied and family)	Dormitory and Visitor Housing—Visiting Quarters, Temporary Lodging Facility	613
Industrial	Munitions, Base Engineering, Maintenance Shop, Warehousing	713
Medical/Dental	Clinic, Pharmacy	21
Open Space	Conservation Area, Buffer Space, Quantity Distance Arc	19,562
Operations and maintenance	Hangar, Aircraft Maintenance Unit, Squad Operations, Control Tower, Fire Station, Training Functions (including Simulator, High Bay Technical Training, Classroom, Maneuver Area, Firing Range)	385
Outdoor Recreation	Outdoor Court, Athletic Field, Golf Course, Range	304
Uncategorized		50
Total		23,192

208

209

Table 2-12. Acreage of LRS (source: Beale AFB 2016b).

Total Acreage	Undeveloped Acreage	Developed Acreage	Number of Buildings Present	Major Facilities Present	T&E Species Present?
235	202	33	2	Antenna fields, abandoned power substation, stabilization pond, Moore irrigation canal.	Yes

210

211 Airfield

212 The Airfield District includes all airfield pavements and airfield operations at Beale AFB. Operations
 213 facilities include the runway, associated runway clear zones, taxiways, aprons, ramps, hangars, and airfield
 214 and mission support facilities. Support facilities include air traffic control, aircraft rescue and firefighting,
 215 fueling storage and dispensing facilities, airfield operations, passenger terminal, aircraft maintenance units
 216 and the supply distribution center. The munitions training and storage area is also located in the eastern
 217 portion of the Airfield District.

218 Main Base

219 The Main Base area is in the core of the installation and functions as Beale AFB's central business district.
220 Most of Beale AFB's overall land uses are represented in this district, including administrative and mission
221 support, dormitories, recreation, worship and commercial facilities. Outdoor recreation functions, such as
222 athletic fields, FamCamp, and Lower Blackwelder Lake are located at the edges of the Main Base District.

223 Boomtown (Training)

224 The Boomtown District serves as the training mission support function for Beale AFB. This district includes
225 parts of Dragon Town (the old residential Main Base area when Beale AFB was Camp Beale), firing ranges,
226 and large areas designated for explosives training. This district also includes a dedicated area for the PAVE
227 PAWS operational footprint in the northeastern corner of the district. The Boomtown District is mostly
228 categorized as Open Space and Outdoor Recreation land use. The area known as Dragon Town is
229 categorized as Operations (Training) and Industrial.

230 Industrial

231 The Industrial District consists of a large area in the southwestern portion of the installation and includes a
232 narrow band of industrial and administrative land use designations located between the Main Base and
233 Airfield districts. Existing land uses include manufacturing and production and includes major utility
234 infrastructure systems that support the installation. The wastewater treatment plant for the base is located
235 in the western portion of the Industrial District. The petroleum, oil, and lubricants (POL) storage tanks for
236 the Airfield District are also located at 9th and F Streets. The Beale AFB rail spur runs parallel to South
237 Beale Road from the Union Pacific railroad, which runs parallel to SR65. Railroad facilities are located at
238 the terminus of the Beale AFB rail spur, east of J Street and south of Warren Shingle Road.

239 Beale Heights

240 The Beale Heights District occupies the foothills adjacent to the eastern base boundary. Accompanied
241 Housing is the primary land use; however, other significant functions are represented: Medical/Dental
242 Services and Community Commercial and Support Services, including the Far West and Lone Tree
243 Schools, shoppette, Foothills Chapel, youth and childcare centers, outdoor recreational facilities and
244 housing for bachelor/visiting officers.

245 *2.4.3 Current Major Mission Impacts on Natural Resources*

246 This section describes existing conditions and impacts on the environment at Beale AFB related to air
247 quality, noise, water resources and hazardous materials. Most of this information is derived from the
248 Environmental Study of Growth Scenarios (Harding Lawson Associates 1997). Existing conditions and
249 impacts relative to other environmental issue areas are either addressed elsewhere in this INRMP (e.g.,
250 vegetation, wildlife, wetlands) or are not included in this document because they have no effect on
251 ecosystem functions at Beale AFB (e.g., traffic, socioeconomics).

252 **2.4.3.1 Air Quality**

253 Beale AFB is located in the Northern Sacramento Valley Air Basin, which includes Shasta, Tehama, Glenn,
254 Butte, Colusa, Yuba and Sutter counties. The Feather River Air Quality Management District (FRAQMD)
255 is responsible for implementing and enforcing state and federal air quality regulations in the Yuba County
256 and Sutter County portions of the Northern Sacramento Valley Air Basin. All air permits are obtained
257 through FRAQMD and updated/renewed annually. Emission sources at Beale AFB include mobile sources

258 (e.g., aircraft, automobiles, and grounds maintenance equipment), stationary sources (e.g., power
259 generation, fire training exercises, fuel cell maintenance, painting operations, welding operations, and
260 woodworking facilities), and prescribed burning for fuel hazard reduction and natural resources
261 management. Emissions at Beale AFB have decreased significantly from 1988 to present due the change to
262 a much less volatile jet fuel (from Jet Propellant 4 to Jet Propellant 8) and the reduction of aircraft and
263 personnel below the numbers stated by Harding Lawson Associates in 1996 and 1997.

264 2.4.3.2 **Noise**

265 The principal source of noise at Beale AFB is aircraft operations, which result in direct and indirect effects
266 on the surrounding community. The Beale Air Force Base Comprehensive Land Use Plan, prepared by the
267 Airport Land Use Commission (1993) of Sacramento, Sutter, Yolo, and Yuba counties, designates a series
268 of restrictive zones surrounding the airport facility, both on and off the base. These restrictive zones include
269 land use restrictions designed to protect the navigable airspace around the installation for aircraft safety,
270 minimize the number of people exposed to noise from aircraft operations, and minimize the number of
271 people exposed to hazards related to aircraft operation and potential accidents. The USAF also maintains a
272 3,000-foot by 3,000-foot clear zone free of development uses at each end of the base runway.

273 Using the NOISEMAP computer program, ground noise levels generated by aircraft activity at Beale AFB
274 were estimated in 2005. Noise contours for Beale AFB are based on the average busy day, existing and
275 planned future peacetime levels of activity, and the assumption that future military aircraft will make no
276 more noise than those presently in use. Of the three primary functional areas at Beale AFB (flightline, Main
277 Base and family housing), the flightline has the highest noise levels, with almost the entire area located
278 within the 80-decibel (dB) contour. Most of the flight activity takes place east of the airfield and is regulated
279 to a southeasterly flow. Consequently, most takeoffs are toward sparsely populated rural areas in Yuba and
280 Placer counties. The northern patterns also fly over sparsely populated areas. The Main Base registers
281 average noise levels below 60 dB. The family housing functional area, which is furthest from the flightline,
282 has ambient noise levels below 60 dB.

283 2.4.3.3 **Water Resources**

284 Groundwater quality on Beale AFB meets most state and federal primary water quality standards at all
285 monitoring locations except at a limited number of isolated hazardous waste sites (Harding Lawson
286 Associates 1997). Surface water quality on the base has low mineral content (i.e., total dissolved solids
287 [TDS]) and is unimpaired by any significant sources of pollution. The existing water supply provides source
288 water to the wastewater treatment system (5 MGD capacity), which is then conveyed to the five storage
289 tanks that have a combined storage capacity of 6 MGD, which is adequate to meet Beale AFB demand. The
290 base uses recycled treated wastewater for golf course irrigation. The base continues to actively pursue
291 projects to reduce the amount of inflow and infiltration into the wastewater collection system by making
292 pipeline repairs. The base has a permit to discharge treated effluent to either the irrigation fields or to the
293 base golf course. The portion of a National Pollutant Discharge Elimination System (NPDES) permit for
294 surface discharges to Hutchinson Creek has been rescinded.

295 2.4.3.4 **Hazardous Materials and Waste**

296 Issues regarding hazardous materials include the ongoing use, storage, and disposal of hazardous materials
297 on Beale AFB. Hazardous material storage sites that are still actively used are managed under Beale AFB's
298 Hazardous Material Management Process, IAW AFI 32-7086, *Hazardous Materials Management*, and the
299 Beale AFB Supplement to AFI 32-7086.

300 Active hazardous waste disposal sites are managed under Beale AFB's Hazardous Waste Management Plan
301 (HWMP) (Beale AFB 2018c). Beale AFB does not have a Resource Conservation and Recovery Act
302 (RCRA) Part B Permit; instead, Beale AFB has a Central Accumulation Point (CAP) at Building 539 to
303 accumulate and consolidate hazardous waste for up to 90 days from Initial Accumulation Point (IAP) sites
304 throughout the base. 9 CES/CEIER and contractor personnel are responsible for disposal activities. Most
305 hazardous waste on base is disposed of through the Defense Reutilization and Marketing Office (DRMO).

306 2.4.3.5 **Environmental Remediation**

307 Environmental remediation and restoration activities are conducted under the Environmental Restoration
308 Program, a component of the Air Force Civil Engineer Center, Environmental Directorate, staffed by
309 AFCEC/CZOW employees. Beale AFB has 187 remediation sites defined in the following categories:

- 310 • 49 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) defined
311 Environmental Restoration Program (ERP) sites (32 closed, 10 in study phase, 7 long-term
312 monitoring).
- 313 • 12 RCRA defined sites (5 closed, 5 in study phase, 2 in long-term monitoring).
- 314 • 4 Leaking Underground Fuel Tank (LUFT) defined sites (2 closed, 1 conditional closure, 1 in long-
315 term monitoring).
- 316 • 122 Military Munition Response Sites (MMRSs) (114 closed, 8 in investigation phase)

317 The 65 CERCLA/RCRA/LUFT sites include landfills, transformer solvent dumping areas, fuel spill areas,
318 above-ground fuel storage areas, sites associated with photographic processing waste treatment, jet engine
319 test cells, pesticide/herbicide storage and mixing areas, and fire training areas. Twenty-five of the
320 CERCLA/RCRA/LUFT sites are undergoing active investigation or remediation, and 40 are closed. Closed
321 sites have been cleaned up and are designated as unlimited use with unrestricted exposure. At this time, no
322 further action is expected for 8 ERP sites, based on findings of insignificant contamination or the adequacy
323 of completed interim remedial actions. Remediation technologies at all CERCLA/RCRA/LUFT and
324 MMRSs include one or more of the following: excavation, soil vapor extraction, bioventing, groundwater
325 pump and treat, enhanced in-situ bioremediation, in-situ chemical oxidation, enhanced dechlorination,
326 phyto-remediation, slurry walls, reactive barriers, and in-ground bioreactors.

327 Investigations, clean up, and monitoring activities in the Environmental Restoration Program may impact
328 listed species depending on location and type of activity. The program has historically used the Beale PBO
329 to cover activities, though it expired in 2017. Current remediation contracts include minimization measures
330 from the expired PBO. However, MRS removal actions will follow minimization measures for MRS
331 specific BOs. Most activities either have no effect (NE) or may affect, not likely to adversely affect (NLAA)
332 listed species. One informal consultation has been conducted since the expiration of the PBO. Three formal
333 consultations have been conducted since the expiration of the PBO for the Military Munitions Response
334 Program (MMRP). The ERP Manager coordinates with the NRM if activities have the potential to impact
335 federally listed T&E species and may require consultation with USFWS. The ERP Manager deals with
336 CDFW directly when activities have the potential to impact state-listed T&E species.

337 2.4.3.6 **Natural Resource Emergency Response**

338 Emergencies such as wildfires, wildfire control, flooding, emergency repairs to roads or bridges in protected
339 WoUS, major changes in mission precipitated by emergencies, etc. have the potential to affect natural
340 resources before regulators can be properly informed. For instance, firebreaks may need to be built through
341 wetlands or a bridge in imminent danger of collapse may need repairs that would impact protected

342 waterways or an endangered species. These situations require actions quickly, but can still be completed
343 within the regulatory framework with proper notifications and documentation submitted to regulators.
344 Below are general guidelines for emergency notifications for applicable regulations.

345 1. Clean Water Act, Impacts to Waters of the United States

346 In the event that an emergency or emergency response results in disturbance in jurisdictional wetlands or
347 waters, Beale AFB would contact the base USACE POC as early as possible with an emergency notification
348 to obtain a permit for the actions. The Sacramento District issues Regional General Permit No. 8 for the
349 following activities: Permanent or temporary work or structures in navigable waters of the U.S., and/or the
350 permanent or temporary discharge of dredged and/or fill material into waters of the U.S., including
351 wetlands, for repair or protection activities for which this office has determined that an emergency situation
352 exists. Typical activities authorized under this RGP include, but are not limited to: bank stabilization;
353 restoration of damaged areas; temporary fills for staging, access, and dewatering; and, repair, replacement,
354 or rehabilitation of existing structures and/or fills (i.e. roads, bridges, utility pipelines and flood control
355 structures, including attendant features, irrigation pumps or intakes, and other existing structures located in
356 waters of the U.S.).

357 2. National Environmental Protection Act, Impacts to Protected Species and Habitat

358 In the event that an emergency or emergency response results in damage to a protected species or critical
359 habitat, the Council on Environmental Quality (CEQ) provides guidance on emergencies and NEPA in a
360 September 14, 2020 memorandum to Federal Departments and Agencies. This memorandum provides a
361 information for determining the appropriate path forward for the NEPA environmental review of all actions
362 proposed in response to an emergency situation, including natural disasters, catastrophic wildfires, threats
363 to species and their habitat, economic crisis, infectious disease outbreaks, potential dam failures, and insect
364 infestations.

365 The protection of listed species and designated critical habitat is initiated when it would not interfere with
366 the emergency response to protect human life and property. Consequently, the first action is to initiate a
367 response to the emergency and then to determine if there are actions that can be taken to protect or reduce
368 effects to listed species. The following steps should be followed in the event of an emergency that results
369 in damage to protected species or habitat:

370 **STEP 1 (Initiating Contact)** During any emergency response, the Federal agency will contact the Fish and
371 Wildlife Service (Service) by telephone or facsimile (as quickly as possible following the onset of the
372 emergency). Hopefully, the responding agency would have previously established a list of emergency
373 contacts that includes the appropriate Service office responsible for the area where the emergency exists.
374 The Federal agency will provide the Service the project location, a description of the emergency response
375 action and timelines.

376 **STEP 2 (Service Recommendations)** During this initial contact, the Service will recommend actions that
377 may be implemented to minimize the impacts to any listed species or critical habitat in the area. The
378 emergency response agency will proceed with all necessary actions to stop the imminent threat to human
379 life or property. At the same time, the Service will provide the agency, within 48 hours, a letter to explain
380 the protective procedures that were identified during the initial contact.

381 **STEP 3 (Service Evaluation)** The Service will continue to evaluate the emergency. If this evaluation
382 indicates that the emergency response procedures may result in jeopardy/adverse modification, and no
383 means of reducing or avoiding this impact are available, the Service will advise the responding agency of
384 this and document this conclusion. The agency will not stop or delay their emergency response because of

385 this notification. In such a situation, the Federal agency and the Service will discuss actions to remediate
386 the effects following conclusion of the emergency.

387 **STEP 4 (Emergency Over)** Once the emergency is under control, the action agency will identify any
388 incidental take of a species or an adverse effect to critical habitat that resulted from the emergency response
389 action and initiate formal consultation. This formal consultation follows 2 standard procedures, includes a
390 description of what action the agency took to respond to the emergency, and identifies the final impacts to
391 listed species.

392 **STEP 5 (Consultation Completed)** The Service will prepare an after-the-fact biological opinion to cover
393 any incidental take that occurred during the emergency response and document the final impacts to the
394 listed species. This biological opinion could contain suggestions for after-the-fact remediation in the form
395 of reasonable and prudent alternatives, or reasonable and prudent measures when incidental take of listed
396 species or adverse modification of critical habitat attributable to the emergency response occurred. With
397 the finalization of the biological opinion, the action agency has completed their compliance with the ESA.

398 2.4.4 Potential Future Mission Impacts on Natural Resources

399 Beale AFB is a national asset, ideally suited for continued development as a prominent 21st century AFB. It
400 has significant potential to accept new missions; additional aircraft, personnel, and equipment; and the
401 expanded facilities necessary to support them. Current priorities of the 9 RW include modernizing and
402 upgrading base infrastructure and facilities and preparedness to accept expanded mission sets.

403 Beale AFB offers significant expansion capacity with its abundant land resources. In total, the IDP identifies
404 104 parcels on Beale AFB totaling approximately 4,037 acres that could be developed or redeveloped, equal
405 to 17.4% of Beale AFB's total acreage. Some of these acres identified as developable may be affected by
406 major constraints that can be mitigated, such as wetlands and floodplains; they have experienced previous
407 development; or they have facilities and infrastructure that could be or are planned to be removed to
408 facilitate infill redevelopment opportunities. DoD and USAF-prescribed development principles and best
409 management practices for more efficient land use and resource conservation encourage infill development
410 and other more efficient land development and land use techniques to maximize resources before
411 considering development on previously undeveloped land or land acquisition. Development of some parcels
412 will trigger regulatory environmental review/consultation with USFWS, USACE, California State Water
413 Resources Control Board, and NOAA/NMFS, due to their proximity to wetlands and/or vernal pools.

414 2.4.4.1 Air Quality

415 Build-out of the IDP planning districts would result in emissions of fugitive dust and exhaust as a result of
416 earth-moving activities during construction. Particulate matter (PM) smaller than or equal to 2.5 microns
417 in diameter (PM_{2.5}) is anticipated to be *de minimis*, provided fugitive dust control measures are
418 implemented and adhered to throughout the duration of construction. Emissions from construction
419 equipment (carbon dioxide [CO₂], oxides of nitrogen [NO_x], and volatile organic carbons [VOC]) would
420 be minimal because construction activities would take place over at least a five-year build-out period. A
421 minimal number of VOCs from painting new buildings would be emitted during the construction period.
422 Increased emissions would result from increased vehicle traffic on and off-base associated with military
423 personnel reassigned to the base, dependents, and civilian employees. Emissions from aircraft, stationary
424 sources and area sources of emissions have yet to be determined because it is not known whether additional
425 aircraft would be assigned to Beale AFB and what specific types and amounts of new air emission sources
426 would be included.

427 2.4.4.2 **Noise**

428 The following analysis of potential impacts on the noise environment at Beale AFB is based on calculations
429 of increases in noise levels resulting from increased traffic volumes and fleet mix. Changes in aircraft
430 operations based on new missions will require separate analysis as they occur (Harding Lawson Associates
431 1997). If noise exposure for new or changed aircraft operations results in a change of day-night average
432 sound level of 2 dB or more compared to the existing noise contour map for any noise sensitive area, the
433 Air Installation Compatible Use Zone (AICUZ) must be updated (AFI 32-7063, *Air Installations*
434 *Compatible Use Zones Program*).

435 Exterior noise levels in the Main Base are estimated to range from an average of 72.9 to 78.6 dB, an increase
436 of 0.1-1.3 dB from existing conditions. These levels are consistent with other typical commercial centers.
437 Anticipated increases in noise attributable to additional traffic would be less than significant, based on the
438 intensity of the impact and affected land uses in the Main Base.

439 The family housing area is expected to have exterior noise levels averaging 68.2-73.8 dB near busy
440 intersections. This would be an increase of 1.9-4.6 dB from existing conditions, primarily attributable to
441 increased traffic noise. These noise levels are consistent with expected levels for moderately sized suburban
442 residential developments. Interior noise levels would be 20-30 dB lower than exterior noise levels based on
443 the type of structure (20 dB lower in wood housing and 30 dB lower in steel or concrete buildings) and
444 implementation of improved noise shielding techniques. Based on the context and the intensity of this
445 effect, the increase in noise would not be substantial.

446 2.4.4.3 **Water Resources**

447 The water supply and wastewater treatment systems at Beale AFB are considered adequate to support
448 increases in base population. Peak daily demand for water (2.3 MGD for 2017) is 46% of the rated treated
449 capacity. The sanitary sewer system is operating at approximately 45% of its 0.75 MGD design capacity.
450 Beale is considering regional alternatives to wastewater treatment for the future. Base community planners
451 have begun to plan for xeriscaping at new buildings instead of more traditional landscaping.

452 2.4.4.4 **Hazardous Materials**

453 New development associated with expanding missions at Beale AFB could generate increased levels of
454 hazardous materials and waste or conflict with ongoing hazardous waste management programs on the
455 base, including the ERP. As a result, existing or future personnel and buildings could be exposed to
456 hazardous materials and waste unless appropriate facility siting, remediation actions, and measures to
457 minimize generation of hazardous materials are implemented. Beale AFB is currently implementing several
458 measures to reduce sources of hazardous materials and would continue to do so as new development
459 proceeds. Methods to achieve source reduction of hazardous materials include: control of purchase, use,
460 and reuse of hazardous materials by the Hazardous Materials Management Process Team using the
461 Enterprise Environmental, Safety, and Occupational Health Management Information System to require
462 the use of the least hazardous available material to the reasonable extent possible; product substitution
463 through pollution prevention inquiries and use of Air Force Technical Order (AFTO) Form 22; and changes
464 in, or elimination of, hazardous materials generating processes. AFTO Form 22 is used to recommend
465 changes to tech manuals. These changes are important to make when Hazardous Materials Management
466 Process Team finds a tech order that instructs personnel to waste/overuse chemicals when not necessary.

467 **3.0 ENVIRONMENTAL MANAGEMENT SYSTEM**

468 The USAF environmental program adheres to the Environmental Management System (EMS) framework
469 and its Plan, Do, Check, Act cycle for ensuring mission success. Executive Order (EO) 13834, *Efficient*
470 *Federal Operations*; DoDI 4715.17, *Environmental Management Systems*; AFI 32-7001, *Environmental*
471 *Management*; and International Organization for Standardization (ISO) 14001 standard, *Environmental*
472 *Management Systems—Requirements with guidance for use*, provide guidance on how environmental
473 programs should be established, implemented, and maintained to operate under the EMS framework.

474 The natural resources program employs EMS-based processes to achieve compliance with all legal
475 obligations and current policy drivers, effectively manage associated risks, and instill a culture of continual
476 improvement. The INRMP serves as an administrative operational control that defines compliance-related
477 activities and processes.

478 **4.0 GENERAL ROLES AND RESPONSIBILITIES**

479 General roles and responsibilities that are necessary to implement and support the natural resources program
 480 are listed in Table 4-1 below. Specific natural resources management-related roles and responsibilities are
 481 described in appropriate sections of this plan.

482

Table 4-1. Installation roles and responsibilities.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	Installation Role/Responsibility Description
Installation Commander	<ul style="list-style-type: none"> • Approving the INRMP prepared pursuant to the Sikes Act, Section 101(a)(2). • Providing for appropriate staffing of professionally trained natural resource management personnel to insure implementation of the INRMP, pursuant to 16 USC § 670e-2. • Signing cooperative agreements and interagency agreements entered into, pursuant to 16 USC § 670c-1. • Approving and signing the installation Wildland Fire Management Plan and designating the Installation Wildland Fire Program Coordinator (WFPC) in coordination with the installation Fire Chief.
AFCEC Natural Resources Media Manager/Subject Matter Expert (SME)/ Subject Matter Specialist (SMS)	<p>SME/SMS are the Natural Resources (NR) Program managers for the entire Air Force and/or West Region. They provide technical assistance and guidance to AF NRMs on natural resources issues; advocate for resources required to implement approved INRMPs; and administer the reimbursable forestry, agricultural and grazing, and fish and wildlife account programs as well as dispersed outdoor recreation programs. Installation Support Section (ISS) Media Manager provide and manage contracts, interagency agreements, cooperative agreements for Natural Resources Programs and provide technical assistance and guidance on managing natural resources.</p>
Installation Natural Resources Manager (NRM)/POC	<p>Ensure compliance with all natural resources laws and regulations. Coordinate with installation components to assess the potential impacts of proposed activities on sensitive natural resources, and make recommendations to reduce, avoid, or mitigate adverse effects to comply with applicable laws and regulations. Prepare, sustain, and implement an installation INRMP pursuant to the Sikes Act, Section 101(a)(2). Overall responsibility to manage the NR programs Ensures that the program complies with AFMAN 32-7003, Beale AFB supplements, EOs, and all applicable federal, state, and local laws. This includes managing all aspects of the installation's fish and wildlife program, including the hunting and fishing program, coordination with state and federal fish and wildlife agencies, and fish and wildlife habitat improvement, conservation, and rehabilitation. The NRM oversees the firewood program and agricultural outlease program including grazing lease preparation,</p>

Table 4-1. Installation roles and responsibilities.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	Installation Role/Responsibility Description
	<p>rangeland management and monitoring, and infrastructure maintenance and expansion. The NRM prepares, coordinates, and implements all natural resources plans and cooperative agreements at Beale AFB. NRM reviews all work requests (AF Form 332), for approval/disapproval prior to starting projects. This policy is necessary to ensure that the NRM can properly allocate and schedule resources. NRM is also designated the Office of Primary Responsibility (OPR) to administer funds for hunting/fishing user permit sales. NRM prescribes operating conditions of off-road vehicles (ORVs) that are designed to protect resource values, preserve public health and welfare, and minimize use conflicts. NRM (or designated substitute) is designated OPR to monitor all conservation activities and maintain status and minutes of meetings. All plans, permits, and projects that may affect natural resources shall be reviewed and evaluated by the NRM to ensure consistency with the INRMP and well as compliance with federal laws and regulations.</p>
<p>Installation Security Forces (9 SFS)</p>	<p>Enforcement of laws and AFIs to support natural resources management.</p>
<p>Installation Unit Environmental Coordinators (UECs); see AFI 32-7001, <i>Environmental Management</i>, for role description</p>	<p>Unit level reporting and coordination with 9 CES/CEIE.</p>
<p>Installation Fire Emergencies Services, Fire Chief (9 FES Fire Chief)</p>	<ul style="list-style-type: none"> • Serve as the incident commander during wildfire incidents, and may delegate incident commander authority to others based on the complexity of the incident. • Prepare for both initial and extended wildfire suppression operations per National Fire Protection Association (NFPA) Standard 1710, and in accordance with DoDI 6055.6, Enclosure 3, paragraph 8.1.2. • Responsible for fire prevention and minimizing adverse consequences within the Wildland Urban Interface as per AFI 32-2001. • Initiate requests for AFCEC/CZOF assistance during a wildfire. • Develop Mutual Assistance Agreements with regional and local fire departments and land management agencies for wildfire suppression assistance, and initiate mutual aid requests.

Table 4-1. Installation roles and responsibilities.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	Installation Role/Responsibility Description
	<ul style="list-style-type: none"> • Submit requests to the AFCEC/CZOF training manager for NWCG Incident Qualification Cards for qualified Fire Emergency Services personnel. • Planning and coordination of prescribed fire actions and wildfire rehabilitation IAW the Wildland Fire Management Program and in coordination with the NRM.
Installation Wildland Fire Program Coordinator (WFPC)	<ul style="list-style-type: none"> • Serve as the primary point of contact between the installation and AFCEC/CZOF for all matters concerning wildland fire. • Initiate and ensure appropriate installation coordination and timely completion of the WFMP annual review. • Coordinate with the AFCEC/CZOF WSM lead to identify NWCG training requirements needed to implement the installation WFMP. • Submit requests for Incident Qualification Cards to AFCEC/CZOF for installations personnel not employed by Fire Emergency Services as specified in the installation WFMP. • Coordinate with the installation NRM to assess the need for an Emergency Stabilization Plan and/or a Burned Area Emergency Response Plan after a wildfire incident. • Responsible for acquiring required approvals of Agency Administrator Ignition Authorization and Prescribed Burn Go/No Go Checklist prior to initiation of a prescribed burn. • Report significant wildfire incidents on the installation as soon as practicable to the RFMO.
Pest Manager (9 CES/CEOI)	Lead applicator for pesticides, aids nonnative plant control, especially in BASH areas. Coordinates with NRM to ensure that the Installation Pest Management Plan (IPMP) and INRMP activities are mutually supportive.
Range Operating Agency	Management of the Combat Arms Training and Maintenance (CATM) range, heavy weapons range, Explosive Ordnance Disposal (EOD) range, and Rod-and-Gun Club. Oversight by 9 SFS, 9 CES, and 9 FSS respectively ensures environmental compliance. 9 CES/CEIE performs inspections for solid waste management, hazardous materials (HazMat), water quality, and other aspects as appropriate.
Conservation Law Enforcement Officer (CLEO)	Works with the CEIEC or NR program and with Security Forces. As agreed to by the 9 RW Wing Commander, the CLEO may enforce conservation laws and regulations, including ESA, MBTA, Archeological Resource Protection Act, CWA, and California state hunting and fishing regulations. The CLEO may also enforce EOs and policies, and DoD, AF, and Beale AFB directives.

Table 4-1. Installation roles and responsibilities.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	Installation Role/Responsibility Description
NEPA/Environmental Impact Analysis Process (EIAP) Manager	Oversees National Environmental Policy Act (NEPA) compliance by coordinating NEPA review among all CEIE Program Managers (air, water, natural and cultural resources, etc.), consolidating concerns/comments, preparing 813s and Environmental Assessments, and educating proponents on compliance with NEPA. Ensures Program Managers are given the opportunity to review applicable projects.
National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS)	Reviews and coordinates anadromous fisheries management and issues and INRMP preparation. Signatory of the INRMP per DoDI 4715.03 <i>Natural Resources Conservation Program</i> and AFI 32-7064. Advises protocols and need for surveys of special-status species and assesses potential impacts from the base projects and activities.
U.S. Forest Service (USFS)	N/A
U.S. Fish and Wildlife Service (USFWS)	Reviews and coordinates federally listed species and Sikes Act compliance, issues migratory bird depredation permits, assists with INRMP preparation, and may support wildland fire function. Signatory of the INRMP per The Sikes Act Section 101(a)(2) (16 USC 670a(a)(2)), <i>Cooperative plan for conservation and rehabilitation</i> ; DoDI 4715.03, <i>Natural Resources Conservation Program</i> ; and AFMAN 32-7003. Issues incidental take statements and concurrence for impacts to federally listed species under Section 7(a)(2) <i>Federal Agency Actions and Consultations</i> . Issues Section 10(a)(1) Permits under the Endangered Species Act. 10(a)(1)A permits allow incidental take for scientific monitoring and collecting and can be issued to the USAF with named qualified staff who possess the necessary experience. USFWS also provides monitoring and management assistance as needed for species of special interest.
Civil Engineering Squadron's Environmental Section (9 CES/CEIE)	Prepares, coordinates, and implements all natural resources plans at Beale AFB in cooperation with the Air Force Civil Engineer Center (AFCEC) ISS.
California Department of Fish and Wildlife (CDFW)	Coordinates hunting and fishing program and INRMP preparation. Signatory of the INRMP per The Sikes Act Section 101(a)(2) (16 USC 670a(a)(2)) DoDI 4715.03, and AFMAN 32-7003.
Deputy Base Civil Engineer (9 CES/CD)	Recommends minor changes to the INRMP and coordinates implementation of the INRMP, may be delegated authority to sign annual INRMP reviews.

Table 4-1. Installation roles and responsibilities.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	Installation Role/Responsibility Description
9 Mission Support Group (9 MSG)	Coordinates the INRMP.
Environmental Safety and Occupational Health (ESOH) Council	Reviews the INRMP and approves minor changes to the INRMP.
Utility Shop (9 CES/CEOF)	Implement the Avian Protection Plan (APP) when electrical utility equipment is replaced and repaired. Report avian electrocutions and utility pole caused fire to NRM.
Outdoor Adventure Center (OAC) (9 FSS/FSWO) and Rod-and-Gun Club (9 FSS/FSWR)	Assist the NRM by collecting funds and issuing hunting and fishing licenses. Maintains some recreation facilities and provides information about recreation opportunities on the base.

483 **5.0 TRAINING**

484 USAF installation NRMs/POCs and other natural resources support personnel require specific education,
 485 training, and work experience to adequately perform their jobs. Section 107 of the Sikes Act requires that
 486 professionally trained personnel perform the tasks necessary to update and carry out certain actions required
 487 within this INRMP. Specific training and certification may be necessary to maintain a level of competence
 488 in relevant areas as installation needs change, or to fulfill a permitting requirement.

489 Installation Supplement—Training

- 490 • NRMs at Category I installations must take the course, “DoD Natural Resources Compliance,”
 491 endorsed by the DoD Interservice Environmental Education Review Board and offered for all DoD
 492 Components by the Naval School, Civil Engineer Corps Officers School (CECOS). See
 493 <http://www.netc.navy.mil/centers/csfe/cecos/> for CECOS course schedules and registration
 494 information. Other applicable environmental management courses are offered by the Air Force
 495 Institute of Technology (<http://www.afit.edu>), the National Conservation Training Center managed
 496 by the USFWS (<http://www.training.fws.gov>), and the Bureau of Land Management Training
 497 Center (<https://www.blm.gov/learn/national-training-center>).
- 498 • Natural resources management personnel shall be encouraged to attain professional registration,
 499 certification or licensing for their related fields, and may be allowed to attend appropriate national,
 500 regional, and state conferences and training courses.
- 501 • All individuals who will be enforcing fish, wildlife and natural resources laws on USAF lands must
 502 receive specialized, professional training on the enforcement of fish, wildlife and natural resources
 503 in compliance with the Sikes Act. This training may be obtained by successfully completing the
 504 Land Management Police Training (LMPT) course at the Federal Law Enforcement Training
 505 Center (FLETC) (<http://www.fletc.gov/>).
- 506 • Individuals participating in the capture and handling of sick, injured, or nuisance wildlife should
 507 receive appropriate training, including training that is mandatory to attain any required permits.
- 508 • Personnel supporting the BASH Program should receive flightline drivers training, training in
 509 identification of bird species occurring on airfields, and specialized training in the use of firearms
 510 and pyrotechnics as appropriate for their expected level of involvement.
- 511 • The DoD-supported publication *Conserving Biodiversity on Military Lands—A Handbook for*
 512 *Natural Resources Managers* (<http://dodbiodiversity.org>) provides guidance, case studies and other
 513 information regarding the management of natural resources on DoD installations.

514 Natural resources management training is provided to ensure that base personnel, contractors, and visitors
 515 are aware of their role in the program and the importance of their participation to its success. Training
 516 records are maintained IAW the Recordkeeping and Reporting section of this plan. Below are key NR
 517 management-related training requirements and programs:

- 518 • DoD records management
- 519 • Management of sensitive data
- 520 • GIS geodatabase management
- 521 • Federally listed species biology and sampling/survey protocols
- 522 • Wetland delineation training

- 523 • Habitat restoration
- 524 • Trainings on new information, techniques
- 525 • Skills from scientific research

526 **6.0 RECORDKEEPING AND REPORTING**

527 **6.1 *Recordkeeping***

528 The installation maintains required records IAW Air Force Manual 33-363, *Management of Records*, and
529 disposes of records IAW the Air Force Records Management System (AFRIMS) records disposition
530 schedule (RDS). Numerous types of records must be maintained to support implementation of the natural
531 resources program. Specific records are identified in applicable sections of this plan, in the Natural
532 Resources Playbook and in referenced documents.

533 *Installation Supplement—Recordkeeping*

534 Natural resources documents include USFWS and NOAA Fisheries consultations, management plans,
535 survey reports, spatial data, and EIAP documents including USAF Form 813s and Environmental
536 Assessments for natural resource projects.

537 Documents and data written or collected after 2010 are stored on the 9th Civil Engineering Squadron
538 (9CES) shared computer drive at 'F:\CEAN\Conservation\Natural Resources'. EIAP documents written for
539 natural resource projects are housed on the shared drive in the NEPA folder at 'F:\CEAN\EIAP_NEPA'.
540 Spatial data is located on the 9 CES GeoBase shared drive at 'Z:\Environmental'; 'Z:\IGI&S'; and
541 'F:\CEAN\GIS\Beale'.

542 Data and documents collected/written prior to 2010 may be on the shared drive and a number of pre-2010
543 documents were included as appendices in previous versions of this INRMP. Documents not available
544 electronically can be found in the Natural Resources Library, located in the main room in building 25390.

545 **6.2 *Reporting***

546 The installation NRM is responsible for responding to natural resources-related data calls and reporting
547 requirements. The NRM and supporting AFCEC Media Manager and SMSs should refer to the
548 Environmental Reporting Playbook for guidance on execution of data gathering, quality control/quality
549 assurance, and report development.

550 *Installation Supplement –Reporting*

551 **7.0 NATURAL RESOURCES PROGRAM MANAGEMENT**

552 This section describes the current status of the installation's natural resources management program and
553 program areas of interest. Current management practices, including common day-to-day management
554 practices and ongoing special initiatives, are described for each applicable program area used to manage
555 existing resources. Program elements in this outline that do not exist on the installation are identified as not
556 applicable and include a justification, as necessary.

557 *Installation Supplement –Natural Resources Program Management*

558 The Sikes Act (Section 670 a (a)(3)(B)) requires "sustainable multipurpose use of resources, which shall
559 include hunting, fishing, trapping and non-consumptive use", in addition to preparation and implementation
560 of an INRMP. The principal policy that has guided Natural Resources Program management on the Beale
561 AFB is AFI 32-7064, Integrated Natural Resources Management, Beale Supplement 1 (October 31, 2000)
562 (Appendix F1). Many natural resource policies and guidance have changed since the publication of the
563 installation supplement in 2000, and updated guidance in AFMAN 32-7003 has been issued. The Beale AFI
564 Supplement is no longer needed, and relevant information from that document has been incorporated into
565 this INRMP.

566 **7.1 Fish and Wildlife Management**

567 *Applicability Statement*

568 This section applies to all USAF installations that maintain an INRMP. The installation is required to
569 implement this element.

570 *Program Overview/Current Management Practices*

571 Fish and wildlife management is overseen by the 9 CES/CEIEC NRM and guided by AFMAN 32-7003
572 and Title 14 of the CCR, *Natural Resources*, as adopted by the California Fish and Game Commission.

573 **7.1.1 Hunting and Fishing Program**

574 Per AFMAN 32-7003, the base NRM has direct oversight of the Hunting and Fishing Program. Until this
575 INRMP update, hunting and fishing information and regulations were detailed in the AFI 32-7064 Beale
576 Supplement, developed in 2000. This document was determined to be unnecessary and although the
577 document itself is obsolete and superseded by this INRMP, the regulations are still enforced and are now
578 detailed in the sections below. Day-to-day activities are performed by the Hunting and Fishing Program
579 Manager and supported by a CLEO and volunteer game wardens. Enforcement of natural resource laws is
580 covered in Section 7.3, *Conservation Law Enforcement*. Hunting and fishing programs are conducted IAW
581 Title 14 of the CCR, as adopted by the California Fish and Game Commission. A summary of Beale AFB
582 policies that will be revoked and replaced by regulations in Title 14 of the CCR is included in Section
583 7.1.1.16, *Changes to the Hunting and Fishing Program*. The base will determine the need for NEPA
584 analysis of these policy changes. Base-specific guidelines and policies relating to hunting and fishing
585 access, duck blind policies, deer lottery procedures, can now be found in the INRMP sections below. The
586 base will request input from CDFW on any new base policies that are more restrictive than hunting and
587 fishing regulations included in Title 14 of the CCR. Hunting season is 1 July-30 June, fishing season is 1
588 January-31 December.

589 Hunting on base is a privilege regulated by the 9th Mission Support Group Deputy Commander (MSG/CD)
590 with input from various sources. The 9 MSG/CD reserves the right to terminate, restrict, or add additional

591 regulations and procedures based on safety and Force Protection issues facing the base. The Hunting and
 592 Fishing Program Manager (HPM) and CLEO, or Chief Game Warden will work closely with the 9th
 593 Security Forces to ensure hunting on base is regulated in accordance with the desires of the MSG/CD to
 594 include restricting, regulating or termination of all hunting on base, dependent on FPCON. It is the
 595 responsibility of all hunters to check in for each hunt at the Three Bridges area sign-in book. Hunters must
 596 also be aware of current Force Protection levels prior to entering the field by calling the Law Enforcement
 597 desk or asking Law Enforcement personnel when entering the base.

598 **7.1.1.1 Duties of the Base Civil Engineer (or designated substitute):**

- 599 • Supervises, controls, and manages the Natural Resources program at Beale AFB to ensure the
 600 program complies with all applicable federal, state and local laws. This includes managing all
 601 aspects of the installation’s fish and wildlife program, including habitat improvement, conservation
 602 and rehabilitation, and hunting and fishing programs.
- 603 • Prepares, coordinates, and implements all natural resources plans and cooperative agreements at
 604 Beale AFB. Performs all consultations with environmental regulating agencies including but not
 605 limited to USACE, USFWS, and CDFW, for all 9 RW actions.
- 606 • Sets access policies for hunting, fishing, and 9 CES managed outdoor recreation programs, and
 607 determines extent of use.
- 608 • Reviews all BCE (or designated substitute) work requests (AF Form 332), for approval/disapproval
 609 prior to starting projects. This policy is necessary to ensure that the BCE (or designated substitute)
 610 can properly allocate and schedule resources, and ensure environmental compliance.
- 611 • Is designated OPR to administer funds for hunting/fishing user permit sales.
- 612 • The BCE (or designated substitute) is designated OPR to monitor all conservation activities and
 613 maintain status and minutes of meetings.

614 **7.1.1.2 Duties of the Hunt Program Manager**

615 The HPM is the point of contact for the deer hunt, and is responsible for administering the hunting program
 616 and answering questions about the deer hunt. Other duties include the following:

- 617 • Advertising: A preliminary notice will be entered on the base web site and other base outreach
 618 media at least four (2) months prior to the lottery. This advertisement will serve as a reminder to
 619 personnel who may be absent in the months immediately preceding the drawing. The lottery and
 620 associated hunt will be advertised on the base web site at least two (2) weeks prior to the tag
 621 drawing.
- 622 • Public Affairs (9 RW/PA): PA assists the Natural Resources staff in placing the advertisements on
 623 the base web site.
- 624 • The lottery will be held at least two (2) weeks prior to the DFW's application deadline. Names will
 625 be drawn randomly by Environmental Element personnel (9 CES/CEIE). The Natural Resources
 626 staff will record the names of selected hunters as well as non-selectees. Applicants not attending
 627 the drawing will be notified of their status within one (1) week. The HPM or NRM will forward
 628 the selected tags to the CDFW License and Revenue Branch at least one (1) week before their
 629 application deadline.

- 630 • Deer Hunt Orientation: This mandatory briefing allows the HPM and base Game Wardens to
631 provide critical information to the deer hunters including Beale AFB hunting procedures, safety
632 requirements, Deer Kill Data form information, and Game Warden contact information.

633 Prospective hunters must possess a current California Hunting License and a Beale Hunting Card. Deer tag
634 applications are available at most sporting goods stores. Applications must be submitted to the Natural
635 Resources staff at 6425 at 6601 B Street (building 25390) no later than one (1) hour before the lottery
636 drawing.

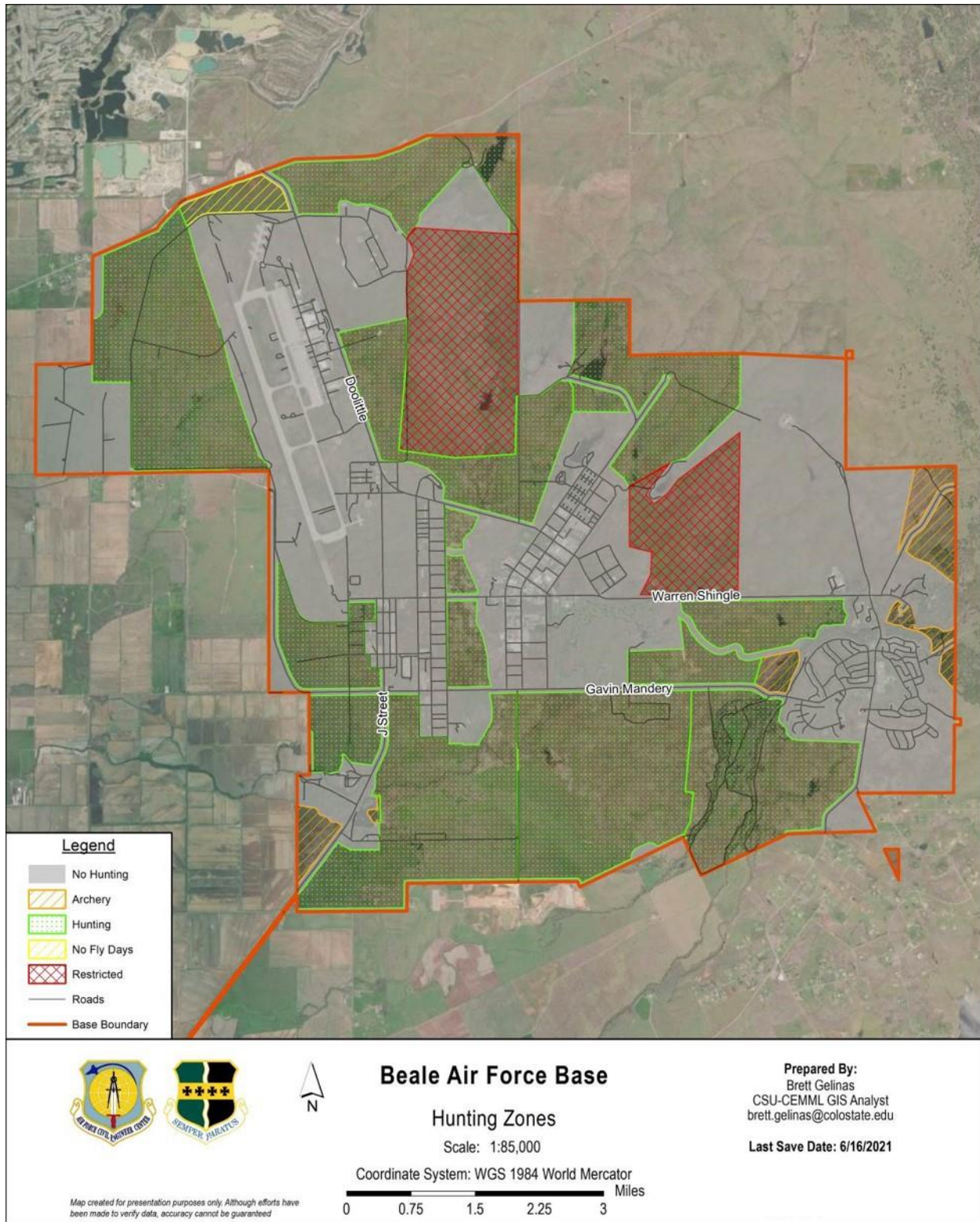
637 Non-selected applications will be returned to the individuals, who may submit their applications directly to
638 DFW to be eligible for alternate hunting locations.

639 Appropriate weapons and ammunition for the deer hunt are as follows: Shotguns, slugs only (3 rounds
640 maximum in gun), muzzle-loading rifles, and bow & arrow (see California Fish and Wildlife Code for
641 definitions of these terms).

642 7.1.1.3 **Hunting and Fishing Requirements**

643 Hunting is permitted in designated areas only. Hunting and fishing will be in accordance with Title 14 of
644 the California Administrative Code as adopted by the Fish and Game Commission. See the California
645 Hunting Regulations for more detailed information. The restrictions detailed in these sections will take
646 precedence where they impose requirements more stringent than California law, generally for the safety of
647 users on the base or to meet other conservation requirements. Additional restrictions apply to some areas as
648 indicated in Figure 7-1. At this time, hunting is limited to active duty military, family members of active
649 duty military assigned to Beale AFB, military retirees, and DoD civilian workers assigned to Beale AFB.
650 Additional information on approved activities and access can be found in Section 7.2, *Outdoor Recreation*.
651 All individuals, including guests when FPCON allow, must obtain all applicable licenses, permits, stamps
652 and any necessary trainings in order to hunt or fish on Beale AFB. A Beale AFB hunting or fishing permit
653 is required for anyone hunting or fishing on the base in addition to any permits required by the state of
654 California. In order to get a base hunting permit, hunters must attend an orientation course sponsored by 9
655 CES that is conducted by the CLEO or a volunteer base game warden. The hunter will receive a signed
656 Orientation Course Authorization Form that can be used to purchase a hunting permit for that year. The
657 NRM, with assistance from the CLEO, will find ways to improve recordkeeping for hunter briefings. Hunting
658 permits are valid 1 July-30 June. Fishing permits are valid 1 January-31 December of that calendar year. The
659 following permits and licenses must be carried at all times when hunting or fishing.

- 660 • Valid California hunting or fishing license
- 661 • Applicable state hunting stamps (e.g., waterfowl or upland game bird stamps)
- 662 • Federal waterfowl stamp (if applicable)
- 663 • Annual Beale hunting or fishing permit filled out in ink



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665 Figure 7-1. Beale AFB hunting zones (Beale AFB GeoBase 2021).

666

667 Permits will be filled out and authenticated in ink prior to hunting or fishing and rendered invalid if amended
 668 or altered in any fashion. All personnel interested in hunting on Beale AFB will be required to attend
 669 briefings/courses regarding hunting/outdoor use rules for Beale AFB to ensure safe outdoor practices in
 670 accordance with this regulation. These briefings/courses will be implemented based on current FPCON and
 671 the requirement for safety of all in the field. The HPM - 9 CES/CEIE in coordination with the Chief Game
 672 Warden will determine when such briefings are appropriate. Special arrangements can be made through 9
 673 MSG/CD to accommodate distinguished visitors wishing to hunt or fish during their stay on Beale. Hunters
 674 under the age of 16 years will be accompanied by a military member and/or a person 18 years or older with
 675 applicable valid identification card. Any hunter planning to hunt migratory game birds (ducks, geese, coots,
 676 dove, band-tailed pigeon, snipe, gallinules or black brant) must complete a Harvest Information Program
 677 (HIP) survey and affix a HIP Stamp to their California Hunting License. HIP surveys and stamps are
 678 available at some license agents and at most DFG license sales offices. Hunters may be cited for hunting
 679 migratory game birds without a HIP stamp affixed to their license.

680 Per AFMAN 32-7003, there are nine categories of participants in an installation's hunting and fishing
 681 program, and the INRMP should establish criteria and protocols addressing user access and conduct for Open
 682 and Restricted areas for the categories. These categories are listed below.

- 683 • Active Duty Military (includes Reserve on full-time orders and National Guard on Active Duty
 684 (Title 10 status)
- 685 • Department of Defense Civilians
- 686 • Active Duty Military Dependents and Family Members
- 687 • Disabled Veterans
- 688 • Military Retirees
- 689 • Department of Defense Civilian Retirees
- 690 • Employees of Installation Prime Contractors (defined as a contractor under a 5-year or more term
 691 contract
- 692 • Civilians enlisted in the National Guard and Reserve that are not on active duty (Title 10 status).
- 693 • General Public

694 Note that civilian categories are defined and do not automatically include all holders of Common Access
 695 Cards, but is specific to DoD Civilian employees. At Beale AFB, this does not include contracted civilians
 696 who work on base.

697 Hunting and fishing must be limited to ensure safety and a sustainable level of fish and game is preserved
 698 for future seasons. Therefore, privileges will be limited to the following as determined by FPCON:

- 699 • Force Protection Normal—No specific restrictions except those outlined in this INRMP.
- 700 • Force Protection Alpha—No specific restrictions except those outlined in this INRMP. Volunteer
 701 game wardens will increase patrols of all known hunting areas and remote parts of the base in
 702 support of Force Protection initiatives.
- 703 • Force Protection Bravo—Hunting is limited to Active Duty Military, Active Duty Military
 704 Dependents and Family Members, Military Retirees and Department of Defense
 705 Civilians/Department of Defense Civilian Retirees. Guests are not authorized to hunt on base. The

706 base CLEO and volunteer game wardens will increase patrols of all known hunting areas and
 707 remote parts of the base in support of Force Protection initiatives.

708 • Force Protection Charlie/Delta—Hunting is terminated until further notice. The base CLEO or
 709 designee will respond to the hunting sign-in book and begin calling all hunters in the field. Any
 710 available volunteer game warden will respond to assist.

711 ◦ Note 1—Hunting will not automatically resume if the Force Protection level is reduced. The
 712 CLEO will determine the re-opening of hunting on base after close coordination with 9th
 713 Security Forces Squadron (9 SFS) and the base leadership.

714 ◦ Note 2—The 9 SFS desk will be responsible for notifying the CLEO (or designee) of any
 715 change of Force Protection. The CLEO (or designee) will inform 9 SFS when hunting has
 716 reopened.

717 All hunting and fishing will be controlled and held within manageable quotas depending on the extent of
 718 the natural resources on base. Opportunities for recreational purposes will be equitably distributed by
 719 impartial selection by such procedures as drawings or lotteries, or on a first-come, first-served basis.

720 Hunters will wear a conspicuous outer garment no less than 100 square inches in material in one of the
 721 following colors while hunting: red, yellow, or orange. Hunters of migratory birds and/or turkeys may use
 722 camouflaged clothing. Camouflaged clothing is allowed when hunting deer during archery season.

723 Hunters are required to know and use safe firearm practices and procedures at all times.

724 Hunters are urged to use extreme caution when hunting and fishing seasons overlap. Base lakes are closed
 725 to fishing until 11 a.m. during waterfowl season.

726 Trapping of wildlife on Beale AFB is prohibited except when carried out under special authorization by 9
 727 CES/CEIE.

728 **7.1.1.4 Demand**

729 The demand for hunting on Beale AFB varies from year to year due to personnel movement, but there are
 730 local retirees and civilian employees who regularly hunt on the base. Ninety-two hunting permits were sold
 731 in the July 2017 to June 2018 hunting season. The number of hunting permits sold annually from 2010/11 -
 732 2015/16 was between 125 and 165. There are no records for hunting permit sales in 2012/13, 2015/16, or
 733 2016/17.

734 Fishing demand is at least double that of hunting. In 2017 the Outdoor Adventure Center (OAC) sold 220
 735 fishing permits. Due to multiple lake closures and dam repair and replacement projects, fishing
 736 opportunities were limited in 2017/18. Opportunities for fishing are being restored in lakes where dams have
 737 been repaired.

738 Under Title 14, CCR, section 360(c), the California Fish and Game Commission annually allocates to Beale
 739 AFB 20 either-sex deer tags. Selected personnel who have been drawn to deer hunt on base by the lottery
 740 system can purchase their Beale hunting card after they have received their mandatory deer hunting briefing.
 741 Rod and Gun Club staff are the authorized points of contact. The annual deer hunt serves as a tool for
 742 controlling the resident deer herd. This activity helps lower the probability of car/deer collisions, and assists
 743 DFW's game management program. Deer hunting is allowed on Beale AFB only during the season
 744 designated by the California Department of Fish and Wildlife.

745 The base will conduct surveys of game species including deer, waterfowl and turkey every two years to

746 assess recreation availability and capacity. Demand will be estimated using hunting permit sales and
747 information collected from hunter surveys. Surveys will be distributed during hunter orientation concerning
748 game species, frequency of hunting, voluntary reporting of waterfowl take and species from the previous
749 year (if applicable), perceived availability of hunting areas, and identify aspects of the hunting and fishing
750 program that can be improved. To help determine hunting demand for newly opened species, hunters will
751 report take of all furbearers and non-game mammals to the NRM or CLEO. The CLEO or volunteer game
752 wardens will hand out surveys during hunter orientation that ask which species individuals hunt, frequency
753 of hunting, voluntary reporting of take from the previous year, perceived availability of hunting areas,
754 interest in electronic registration and tracking methods, and other aspects of the Hunting and Fishing Program
755 that can be improved.

756 7.1.1.5 **Fees and Monies**

757 Administrative and management costs associated with hunting, fishing, trapping, and the management of
758 outdoor recreation access will be fully reimbursed by user fees. Base hunting and fishing permits are
759 charged under the authority of Regulation 16 USC 670f. Hunting and fishing permits are managed by 9
760 CES/CEIEC IAW AFMAN 32-7003. Hunting and fishing fees are collected by the installation and
761 deposited into the USAF account for fish and wildlife management 57X5095. DoD Form 1131, *Cash*
762 *Collection Voucher*, is used to report cash collections to 57X5095.

763 Per AFMAN 32-7003, these fees are used only for the protection, conservation, and management of fish
764 and wildlife, to include habitat improvement and related activities. Authorized uses of 57X5095 funds
765 include civilian pay, vehicle and equipment procurement, and other administrative expenses directly related
766 to the management of the Fish and Wildlife Program on the installation. Vehicles and equipment procured
767 with 57X5095 funds may only be used to support fish and wildlife management activities that implement
768 the INRMP.

769 Hunting and fishing permits are issued to the Rod-and-Gun Club and fishing permits are issued to the OAC.
770 These places administer the sale of the permits. Both sellers charge a \$1.50 administrative fee per permit.
771 The fees are set by the NRM and are subject to change. Hunting and fishing fees were increased to \$15 in
772 2019/20 and are \$20 in 2020/21. The fee for fishing permits was waived in 2017/18 and 2018/19 due to
773 multiple lake closures. Under Regulation 16 USC 670f, volunteer game wardens are not authorized to sell
774 hunting or fishing permits, nor collect permit fees.

775 7.1.1.6 **Weapons**

776 Rifles, air and/or spring powered weapons will not be used for hunting.

777 In accordance with California State laws, resident small game, game birds, and waterfowl will be taken by
778 shotgun, 10 gauge or smaller using shot shells only, and incapable of holding more than three shells in the
779 magazine and chamber combined. Shotgun shells may not be used or possessed that contain shot size larger
780 than T shot in steel or other nontoxic shot approved by USFWS. All shot shall be loose in the shell. BB
781 shot or smaller with a weapon capable of holding not more than three shells. Waterfowl may only be hunted
782 with steel shot or nontoxic shot approved by the U.S. Fish and Wildlife Service. Geese may only be hunted
783 with shot no larger than T. Turkey, no larger than number two (2) shot permitted.

784 No one may have a pistol in their possession while hunting or fishing.

785 All weapons propelling a single projectile are prohibited from use except for shotgun slugs or muzzle-
786 loading rifles when used for deer hunting only, or under the following circumstances:

- 787 • Supervised approved firing at the small arms ranges.
- 788 • Authorized animal/pest control, Security Forces personnel, Natural Resources and Game Warden
- 789 personnel, when approved by 9 CES/CEIE or for imminent human health and safety hazards.

790 Buckshot is prohibited from use except by authorized personnel.

791 Hunters may not carry a loaded firearm in a vehicle or shoot from, within, or upon any vehicle, whether
 792 moving or parked. For the purpose of this regulation, a loaded firearm is defined as any weapon with a
 793 round in the chamber or magazine in the weapon. A muzzle-loader firearm shall be deemed to be loaded
 794 when it is capped or primed *and* has a powder charge and ball or shot in the barrel or cylinder.

795 The use of lead ammunition is prohibited in the state of California, including on Beale AFB.

796 Prior to participating in archery or crossbow hunts, each hunter must demonstrate proficiency on a 3-D
 797 target. Demonstration will be administered by a game warden.

798 **7.1.1.7 Fish and Game Species**

799 Game animals found on Beale AFB include deer, waterfowl, upland gamebirds, small game, and furbearers.
 800 Fish species include bluegill, bass, crappie, sunfish, catfish, and trout. Because coyotes are important to
 801 Nisenan culture, Beale AFB does not allow recreational coyote hunting on the base at this time. Fish and
 802 game species found on Beale AFB and open seasons are listed in Table 7-1.

803
 804

Table 7-1. Seasons, special hunts and limits for game species found on Beale AFB.

Species	CDFW Special Hunt Conditions	Season*	Daily Limit	Notes
Upland Game Birds				
Pheasant		Fall/winter	Varies	
	Archery	Fall/winter	Varies	
	Falconry	Summer-winter	Varies	
Quail	Zone Q1	Fall/winter	10	
	Archery, falconry	Summer/fall	10	
Wild turkey	Fall	Fall	1 male or female	Limited to 2 per season
Bearded turkey	Spring (general)	Spring	1 male	Limited to 3 per season for ALL hunts, including archery and special
	Spring (Archery)	Spring	1 male	Limited to 3 per season for ALL hunts, including general and special
Mourning dove		Fall/winter	15	
Eurasian collared-dove		All year	No limit	
Band-tailed pigeon	Southern Zone	Fall	2	
Snipe		Fall/winter	8	
Waterfowl				

Table 7-1. Seasons, special hunts and limits for game species found on Beale AFB.

Species	CDFW Special Hunt Conditions	Season*	Daily Limit	Notes
Coots and Moorhens		See duck season	25	
Ducks		Fall/winter	7	See Title 14 CCR 502(d) for species-specific limits
Scaup		Fall/winter	3	Included in 7/day duck limit
Geese	Early season	Fall	10	Large Canada goose only
	Regular season	Fall/winter	30	30 Total: 20 white/10 dark
	Late season	Winter/spring	20	Whitefronted & White Geese only
All Waterfowl	Falconry	Fall/winter ³	see note	Bag limits same as regular season
Deer				
Deer, either sex	Zone G-7 (Beale AFB only)	3rd Sat in Aug for 79 days	1	May be re-scheduled by commanding officer with CDFW concurrence between season opener and Dec 31st. Single slugs, muzzleloaders, and archery only. Base specific regulation.
Small Game				
Tree squirrel	General	Fall/winter	4	
	Archery/falconry	Summer/fall	4	
Rabbits	General	Summer-winter	5	
	Falconry	Winter/spring	5	
Jackrabbit	General	Year-round	No limit	
Furbearers				
North American beaver		fall-spring	No limit	
Northern gray fox		fall/spring	No Limit	Archery only
Northern raccoon		fall-spring	No limit	Archery only
North American river otter	Recreational take prohibited			
Non-Game				
American crow		Winter/spring	24	
Bobcat	Bobcat hunting banned in the state of California (Assembly Bill 1254, 2019)			
Coyote	Coyote hunting prohibited on the base			
Striped skunk		Year-round	No limit	
Virginia opossum		Year-round	No limit	

Table 7-1. Seasons, special hunts and limits for game species found on Beale AFB.

Species	CDFW Special Hunt Conditions	Season*	Daily Limit	Notes
Fish				
Black bass		Year-round	3	Minimum size 15 inches
Catfish and bullhead		Year-round	No limit	No minimum size
Sunfish and crappie		Year-round	25	25 combined limit, no minimum size
Bluegill, redear, shiners		Year-round	No limit	No minimum size
Trout, steelhead, salmon		Spring-fall	n/a	May be taken IAW applicable regulations (See CDFW freshwater fishing regulations and any applicable supplements, bag limits and water bodies open to fishing determined annually).
Crayfish		Year-round	No limit	May only be taken by hand, hook and line, dip net, or traps less than 3ft in greatest dimension.
Reptiles and Amphibians				
Bullfrog		Year-round	No limit	May be taken day or night; state and base fishing license required
Red-eared slider		Year-round	No limit	May be taken by hand or hook and line (control efforts may use other techniques).
Western rattlesnake		Year-round	2	May be taken by any method; state and base fishing license required
Other non-protected reptiles and amphibians	May be taken all year, day or night. See 14 CCR 5.60 and 5.05 and for bag limits and closures.			

*Dates subject to change, check CDFW website for most current information.

CCR = California Code of Regulations; CDFW = California Department of Fish and Wildlife.

Source: Title 14 CCR.

805

806 **7.1.1.8 Deer Hunt**

807 There is a limited deer hunt for active and retired military. Under Title 14, CCR, Section 360(c), the
 808 California Fish and Game Commission annually allocates 20 either-sex deer tags to Beale AFB. Tags are
 809 distributed through a lottery system, with 16 tags drawn for active duty military and four for retired military.
 810 In most years, only 50% of the tags are filled (Ed Broskey, personal communication, 2018). Starting in
 811 2020, the lottery rules will be changed so that anyone who is drawn in two consecutive lotteries will be
 812 ineligible for the lottery in year three. Additional information on the deer hunt and lottery, such as advertising
 813 requirements and lottery procedures, will be included in the 2019/20 AFMAN 32-7003 Beale Supplement.

814 7.1.1.9 **Waterfowl Hunting and Blind Guidelines**

815 Because of its location along the Pacific flyway, a large number of waterfowl use the area in and around
 816 Beale AFB. Duck hunting is permitted around all lakes and streams within designated hunting areas.
 817 Hunters are allowed to erect duck hunting blinds IAW guidelines below. Guidelines for erecting duck blinds
 818 will be included in the revised AFMAN 32-7003 Beale Supplement. Once approved, these guidelines will
 819 supersede the guidelines listed here.

- 820 • Permanent blinds must be registered by September 1st, prior to waterfowl hunting season. Blinds
 821 will be registered with the HPM - CES/CEIE and the Game Wardens.
- 822 • Blinds will not be placed within 150 yards of existing blinds or decoys in place.
- 823 • Blinds will be of the type that blend in with the surrounding environment and do not detract from
 824 the overall appearance of the area. Blinds that fall into disrepair or accumulate garbage (including
 825 accumulations of spent shells) will be required to be removed.
- 826 • Removable “net” like blinds will be used in areas where there is little shrub and tree growth and
 827 where permanent blind placement is not allowed.
- 828 • Floating blinds are not authorized, except for boats for use in waterfowl hunting, in accordance
 829 with California Fish and Wildlife laws.
- 830 • Blinds will not be allowed in areas considered sensitive wetlands by 9 CES/CEIE. Digging or
 831 removing live natural vegetation for the construction of blinds will not be permitted.
- 832 • Planting of or constructing blinds with live nonnative plant material is prohibited.
- 833 • Decoys will be removed when the hunter leaves the area after each hunting session. Decoys may
 834 be stored in a box or bag inside the blind between hunts.
- 835 • Prohibition on Electronic or Mechanically-operated Devices. Electronic or mechanically-operated
 836 calling or sound-reproducing devices are prohibited when attempting to take migratory game birds.
 837 It is unlawful to use electronic or mechanically-operated spinning blade devices or spinning wing
 838 decoys when attempting to take waterfowl between the start of waterfowl season and November
 839 30. For the purposes of this regulation, wind-powered spinning blade devices and kites are not
 840 prohibited.
- 841 • Blinds constructed by hunters and left for the duration of the waterfowl- hunting season will have
 842 the builder’s name, cell/home phone number, and work phone number conspicuously posted. These
 843 blinds, once constructed, will be available to others when coordinated with the blind builder.
- 844 • Each waterfowl hunter is limited to one blind.

845 7.1.1.10 **Resident, Migratory, and Upland Game Bird Hunting Requirements**

846 Resident upland game birds include the following species: California quail, Eurasian collared-doves, ring-
 847 necked pheasant, and wild turkeys. Migratory game birds include the following species: mourning dove,
 848 band-tailed pigeon, common snipe, American coot, common moorhen and waterfowl. A current upland
 849 game bird stamp must be affixed to the state hunting license of all adults wishing to hunt upland game birds

850 No game birds may be pursued, herded, or taken from a moving or parked vehicle of any kind.

851 No game birds may be intentionally harassed, herded, or driven to disrupt their normal behavior patterns.

852 No game birds may be taken within 400 yards of a baited area.

853 Only the following will be used to take resident small game and migratory game birds: Shotguns 10 gauge
854 or smaller using shot shells only; falconry; and/or hunting dogs. Bow and arrow/crossbow may be used for
855 deer or turkey hunting.

856 The use of live decoys is prohibited.

857 **7.1.1.11 Turkey Hunting and Blind Guidelines**

858 The following rules will apply for turkey hunting:

- 859 • Pop-up Blinds: Only 1 blind per hunter and only 2 blinds per family/household allowed.
- 860 • ALL BLINDS will be marked with owner's name and a contact number.
- 861 • If a pop-up blind is left in the field unattended, it will be considered permanent, and it is required
862 to be registered/reported to the volunteer game wardens and/or the Federal Wildlife Officer (FWO).
863 You will mark the hunting map with a colored pin to indicate the location. You can leave the
864 blind/pin in the map until the season ends. The blind will not be moved without re-registration.
865 Doing so will terminate the use of your blind for the duration of the season and it shall be removed.
- 866 • For other turkey hunters who wish to use a pop-up blind on a temporary basis, the definition of
867 temporary is that you the hunter decide to carry in and then carry out your blind on a daily basis
868 during the spring turkey season. You will pin the map with a colored pin. You will remove your
869 pin after you are done hunting and when you sign out of the area.
- 870 • If another hunter wishes to use one of the permanent blinds, they can call the day before they plan
871 to hunt and make arrangements with blind owner to see if the owner will be using the blind that
872 planned day or if someone else has already made arrangements with blind owner. However, if the
873 blind is not occupied within an hour after sunrise then it is open to the first hunter to sign in.
- 874 • Blinds will not be allowed in areas considered wetlands by 9 CES/CEIEC. Coordinate with the
875 FWO for proper placement.
- 876 • Blinds will not be placed within 100 yards of another blind in the archery areas and 200 yards in
877 any gun area for spring turkey season.
- 878 • Blinds shall not be placed in the field any earlier than 1 week prior to the appropriate season.
- 879 • Blinds shall not remain in the field any longer than 1 week after the appropriate season.
- 880 • No digging or live vegetation harvesting is permitted. Only local dead or down vegetation is
881 allowed to be added for camouflaging of the blind.
- 882 • Archery Area: Junior hunters are being allowed to use crossbows in archery only areas during junior
883 hunt only.
- 884 • If you have any questions or concerns about these policies, feel free to contact
885 Edward.Broskey@us.af.mil or 530 218-4879 and Tamara.Gallentine.2@us.af.mil.

886

887 **7.1.1.12 Fishing and Fish Stocking**

888 Fishing is allowed year-round in all lakes and streams on base with the following conditions and exceptions:

- 889 • Fishing in Dry Creek and Best Slough are catch-and-release only.
- 890 • The area that Beale Lake occupied will be treated like Dry Creek once it reverts to a creek.
- 891 • Fishing is not permitted in Parks Lake due to historic solvent contamination.
- 892 • Lakes are closed to fishing during dam repair/maintenance and replacement projects.
- 893 • Lakes are subject to special fishing restrictions after sport fish stocking.
- 894 • While fishing on Beale AFB, anglers 16 years or older will have in their possession a valid
- 895 identification card, state fishing license with appropriate stamps, and a Beale fishing card. Children
- 896 12 years of age, but less than 16, need a valid identification card in their possession to fish.
- 897 • No one may use a gasoline engine to propel either a boat or raft on Beale AFB lakes, except as
- 898 authorized by 9 CES/CEIE (generally for administrative purposes). Electric motors are acceptable.
- 899 • Homemade rafts are prohibited on all lakes. Prior to placing any boat into Beale AFB water, the
- 900 boat operator must inspect and remove any debris from other waterways on the boat to prevent
- 901 introduction of invasive species.
- 902 • No one may have a pistol in their possession while fishing.
- 903 • Fishing by bow and arrow is permitted for the take of carp, goldfish, and suckers subject to the
- 904 following restrictions:
 - 905 ◦ Bows utilized in the taking of carp, goldfish, and suckers must have a minimum draw weight
 - 906 of 45 pounds.
 - 907 ◦ Arrows utilized in the taking of carp, goldfish, and suckers will be of the harpoon type only.
 - 908 The length of the arrow will not exceed 36 inches. The arrow will be attached to the bow by
 - 909 line, preferably braided nylon, with minimum test strength of 40 pounds and a maximum length
 - 910 of 100 feet.
 - 911 ◦ There are no size or possession limits on carp, goldfish, and suckers. All fisherman and bow
 - 912 fisherman shall remove all carp and goldfish that are taken or caught without releasing them
 - 913 into the waterways.
- 914 • Hunters and anglers are urged to use extreme caution when fishing and hunting seasons overlap.
- 915 • All fishing tournaments or derbies must be coordinated/approved by 9 CES/CEIE and Chief Game
- 916 Warden.
- 917 • No one may transport live game fish for purposes of transplantation to and from any Beale AFB
- 918 lake, stream, or impoundment except for stocking by authorized 9 CES personnel.
- 919 • Base lakes are closed to fishing until 11 a.m. during waterfowl season.
- 920 • Fishing in Blackbird Basins is catch and release only.
- 921 • Fishing in Dry Creek and Beale Lake is only permitted from 1 May through 15 October to protect
- 922 the adult Central Valley Steelhead, a federally listed threatened species. Other restrictions when
- 923 fishing in these locations include those listed below.
 - 924 ◦ Only artificial flies and lures will be used.
 - 925 ◦ No treble hooks will be used.
 - 926 ◦ On single barbless hooks, there must be at least a 7/16" hook gap size.

- 927 ◦ No one will be permitted on Beale Dam or the fish ladder at any time.
- 928 ◦ Dry Creek is catch-and-release only.
- 929 • Base Fish Creel and Size Limits (Except Beale Lake and Dry Creek)
- 930 ◦ Bass limit is three (3) per day, per person, minimum size is 15 inches
- 931 ◦ Crappie limit is 20 per day, per person, no size limit
- 932 ◦ Channel catfish limit is five per day, per person, and fish must be 12 inches or over. Bullheads
- 933 have no creel limit
- 934 ◦ Bluegill, red-ear sunfish, and shiners, no limit
- 935 ◦ It is illegal to fish for, possess, or take anadromous fish on Beale AFB including salmon and
- 936 steelhead. Salmon have been observed in several places on base where they cannot spawn. All
- 937 observations of anadromous fish and carcasses should be reported to 9 CES/CEIE or a Game
- 938 Warden.

939 After a lake has been stocked, fishing may be prohibited for up to 18 months. After that, fishing will be
 940 permitted as catch-and-release until the population is considered stable and has a sufficient number of large
 941 adults, as determined by the NRM. After that time, take will be permitted IAW the base policies. Lakes on
 942 the base are considered privately-owned waters, and, as such, certain fish species (white catfish, channel
 943 catfish, blue catfish, largemouth bass, bluegill, Sacramento perch, rainbow trout, red-ear sunfish) can be
 944 stocked without a permit.

945 In 2018, the base stocked fish in Miller Lake. Some fish were relocated from Upper Blackwelder Lake. The
 946 base also purchased 200 largemouth bass, 300 red-ear sunfish, and 2,400 bluegill to be stocked in Miller
 947 Lake. Fish numbers in Miller Lake will be monitored for three to five years after stocking in 2018. Fish
 948 stocking is also planned for Upper Blackwelder Lake.

949 **7.1.1.13 Hunting and Fishing Violations**

950 Anyone who violates any of the provisions of this regulation, or commits any acts inconsistent with good
 951 safety practices, which results in injury or damage to persons or property (including ruts from off-road
 952 driving), may have any hunting and/or fishing privileges withdrawn. This action will be taken
 953 independently of other punitive and administrative action. Additionally, the Base Magistrate, 9 MSG/CD
 954 may withdraw hunting and fishing privileges for any actions inconsistent with security, order or hunting
 955 equity. Violators may be required to surrender their hunting and fishing permits, cards, and/or license to a
 956 game warden. The game warden will provide an AF Form 1168 to the 9th Security Forces Squadron.

957 Civilians who are caught violating the federal, state, and/or Beale AFB Fish and Wildlife regulations may
 958 be escorted from the base and/or issued a letter of debarment by the 9th RW Commander and prosecuted
 959 under Federal Law 10 USC 2671 before a U. S. Magistrate. Violators may be prosecuted under Federal
 960 Law 10 USC 2671 before an U. S. Magistrate or before the Municipal Court under the Fish and Game
 961 Code/Title 14, Administrative Code. Violators may also be prosecuted under California Fish and Game
 962 laws.

963 Violations by military personnel will result in lost hunting and fishing privileges for a minimum of one (or
 964 more) year. If the violation is major in nature the 9 MSG/CD may refer the case to the Judge Advocate.
 965 This determination will be made by the 9th Mission Support Group Deputy Commander in consultation
 966 with 9 CES/CEIE and the Chief Game Warden.

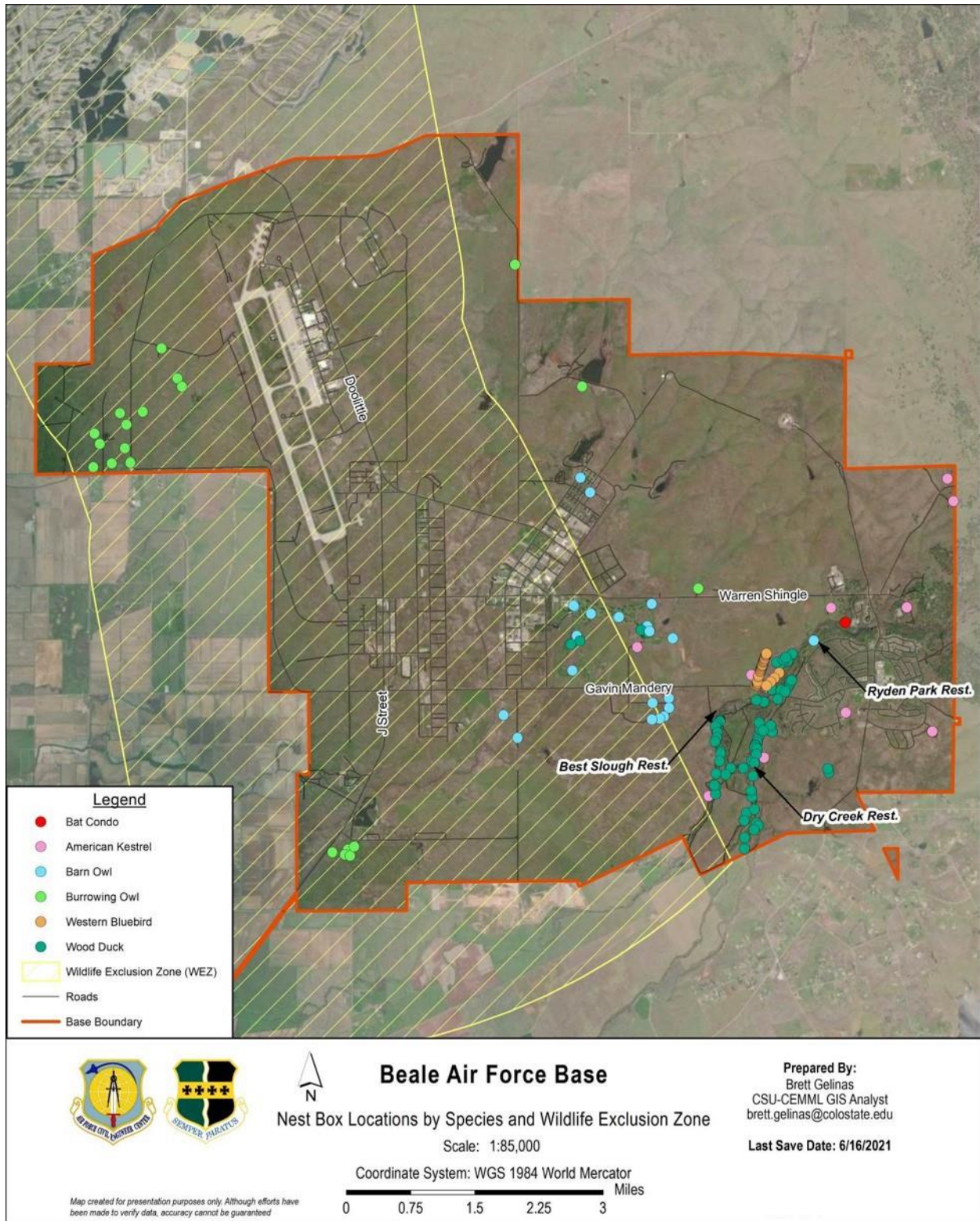
967 7.1.2 *Fish and Wildlife Habitat Enhancement*968 7.1.2.1 **Habitat Structures**

969 There are habitat enhancement structures for several species of wildlife on Beale AFB (Figure 7-2).
 970 Artificial burrows have been installed for western burrowing owls. Brush piles have been created to provide
 971 reptile habitat. Nest boxes have been installed for wood ducks (*Aix sponsa*), western bluebirds, barn owls,
 972 and American kestrels (*Falco sparverius*). Information on nest box installation and maintenance and design
 973 schematics for the various types of next boxes are included in Appendix G.

974 Active wildlife management often is necessary to sustain and enhance biological diversity and viability of
 975 wildlife populations and to improve the compatibility of wildlife and human activities. At Beale AFB, fish
 976 and wildlife management activities must be closely coordinated with land management and mission-related
 977 activities. Artificial habitat structures may not be installed within the wildlife exclusion zone (WEZ), which
 978 is a locally defined, airfield-specific area of zero tolerance for wildlife. It encompasses the aircraft
 979 movement area, clear zones, any additional habitat attractants (e.g., water treatment facilities, golf courses
 980 and athletic fields) in proximity to the airfield, and low-level flight corridors (approach/departure; see
 981 Section 7.12, *Bird/Wildlife Aircraft Strike Hazard*).

982 Artificial nesting and roosting structures include:

- 983 • American Kestrel Nest Boxes—Boxes were installed on the base in 2012/13 in cooperation with
 984 USFWS and the American Kestrel Partnership. In 2018, nine nest boxes were still up at Beale AFB
 985 and three were up at LRS. Data is entered into the American Kestrel Partnership website
 986 (<https://kestrel.peregrinefund.org>). Nest box plans and monitoring information is included in
 987 Appendix G1.
- 988 • Barn Owl Nest Boxes—Nest boxes have been installed in several areas on base as part of Boy
 989 Scout Eagle projects. As of 2018, there were 21 owl boxes located throughout the base, outside of
 990 the WEZ. Boxes were installed at Landfills 2 and 3 to attract barn owls as a non-chemical form of
 991 rodent control, which supports the Installation Pest Management Program by minimizing the use
 992 of chemical pest control methods. In 2017, eight nest boxes were installed at the golf course.
 993 Additional owl boxes are located near FamCamp and Ryden Park. Owl nest box monitoring was
 994 funded in 2017, but the boxes are not monitored most years. Plans for constructing a barn owl nest
 995 box are included in Appendix G2.
- 996 • Bat Condo—An artificial bat roost (“bat condo”) was installed near the Lakehouse in 2010 as
 997 mitigation for the demolition of the old Recreation Building. Bats did not appear to be using the
 998 condo, so an inspection and assessment were done in 2018 (H.T. Harvey & Associates 2018b).
 999 While few bats or their signs were noted at the bat condo, owl pellets were found below the bat
 1000 condo and bird guano on the inner walls of the condo, implying that birds (possibly barn owls) have
 1001 used the bat condo with greater frequency than bats. Barn owls are known bat predators. Based on
 1002 data from temperature loggers, the low and high temperatures recorded inside the bat condo differed
 1003 by only about 2°F from outside temperatures. This temperature regime does not meet bat habitat
 1004 requirements. It was recommended that the bat condo be taken down and re-designed such that
 1005 there are no built-in perches that can be used by owls, moved closer to water, and be retrofitted
 1006 with a ceramic tile roof that provides more types of crevice and temperature options. However,
 1007 there is abundant natural roosting habitat among mature trees in the vicinity, and additional roosting
 1008 habitat may be unnecessary. Plans used for constructing the bat box are included in Appendix G3.



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1009

1010 Figure 7-2. Nest box locations by species and wildlife exclusion zone (WEZ) (Beale AFB GeoBase 2021,
 1011 Beale AFB 2017c).

1012 Bridges may pose an opportunity for expanding bat habitat on base. Bridges can offer day and
 1013 nighttime roosting sites for a wide range of bat species, and retrofitting old bridges or including
 1014 features in new designs can be a low-cost option for creating suitable roosts (Keeley & Tuttle 1999).

1015 • Burrowing Owl Burrows—Seventeen artificial burrows were installed for western burrowing owls
 1016 on the base prior to 2016. They were located west of the flightline and in the vernal pool restoration
 1017 area near the Wheatland Gate. Both areas are within the WEZ. Surveys for burrowing owls have
 1018 been conducted regularly under the Fence-to-Fence contract. In recent years, surveyors have been
 1019 unable to locate the majority of the burrows due to tall grass and the burrows being buried by
 1020 gophers (Michelle Ocken, personal communication, 2018). Owls have been observed using three
 1021 of the burrows during the winter but not during the breeding season. The base will relocate the
 1022 burrows. If the base chooses to install artificial burrows in the future, they will be located outside
 1023 of the WEZ in habitat that is conducive to use (i.e., not in tall grass). Plans for two types of artificial
 1024 burrows are included in Appendix G4.

1025 • Western Bluebird Nest Boxes—Thirty bluebird nest boxes were installed along a single fence row
 1026 near Dry Creek. Data from nest box monitoring is shared by entering it into the Cornell Nest Watch
 1027 site (<https://nestwatch.org>). Bluebird boxes routinely used by house wrens will be moved to more
 1028 suitable habitat. These boxes are monitored by a volunteer or 9 CES/CEIEC personnel, if available,
 1029 using the protocol in Appendix G5. Nestlings from these nest boxes have been banded regularly
 1030 since 2017.

1031 Wood Duck Nest Boxes—Nest boxes for wood ducks were installed in the Dry Creek riparian corridor in
 1032 the 1990s under a Cooperative Management Agreement between the California Waterfowl Association and
 1033 Beale AFB. There were 61 intact nest boxes within the Dry Creek riparian corridor and four at the golf
 1034 course in 2018. The nest boxes are monitored by volunteers and banded by the California Waterfowl
 1035 Association. Nest box plans and monitoring information are included in Appendix G6.

1036 **7.1.2.2 Vegetation Community Enhancement**

1037 Four major wildlife habitat and vegetation associations have been identified at Beale AFB that are of
 1038 particular importance to fish and wildlife: annual grassland with associated vernal pools and intermittent
 1039 streams; riparian deciduous woodland associated with perennial streams and lakes; lakes, impoundments,
 1040 and associated marsh habitat; and oak woodland/savanna. General habitat management actions, either
 1041 ongoing or planned, and actions to improve fish and wildlife habitat conditions within these areas are
 1042 discussed below. These measures will generally not be implemented in and around the flightline area to
 1043 minimize the potential for BASH conflicts.

1044 Beale AFB borders three restrictive conservation easements and the SWA. These lands preserve open
 1045 grassland and oak woodland habitats. Preserving these woodland habitats adjacent to the base reduces
 1046 habitat fragmentation from development and creates a wildlife corridor. Beale AFB is actively
 1047 implementing the California State Wildlife Action Plan (SWAP) goal of increasing the coverage of native
 1048 vegetation and key native plant species statewide. The NRM will identify other mutual land management
 1049 goals and potential collaborative projects with the SWA and conservation-easement operators.

1050 Riparian Woodland Habitat Management and Restoration

1051 Riparian forests and shrublands offer the most structural diversity and provide important wildlife habitat
 1052 found on Beale AFB. These riparian zones also play an important role in flood control, acting to slow the
 1053 flow of floodwater and allowing water to percolate into the water table (River Partners 2011). Lower Dry

1054 Creek, at the southern end of the base, occupies an ecologically strategic position for revegetation with
 1055 native species (Treber et al.1996).

1056 Habitat mapping and a wetland survey using the California Rapid Assessment Method (CRAM) were done
 1057 in the Dry Creek riparian area in 2016 to establish a baseline against which future similar surveys will be
 1058 compared (H.T. Harvey 2016). The survey effort indicated that the riparian community at Dry Creek is in
 1059 good condition overall. Actions that could improve ecological conditions include those that improve buffer
 1060 and landscape conditions (e.g., treatment of invasive plants), hydrology (e.g., improvement of water source
 1061 and channel stability), and biotic structure (e.g., treatment of invasive plants).

1062 The primary goals of riparian restoration are to enhance existing riparian habitat by removing and
 1063 controlling nonnative invasive species and restoring extirpated riparian habitat that no longer has hydrology
 1064 to support riparian species to oak woodland, shrubland, or native grassland as appropriate for the site
 1065 conditions. In 2011, River Partners Inc, a nonprofit organization focused on large-scale riparian
 1066 restorations, created a Restoration Plan for the Dry Creek Riparian Area (River Partners 2011). This plan
 1067 calls for large-scale revegetation and management of Dry Creek, Best Slough, and its adjacent uplands with
 1068 native trees, shrubs, and grasses. While the plan has not yet been realized, numerous small revegetation
 1069 projects have been conducted at various locations along Dry Creek and Best Slough, with mixed results.
 1070 Small-scale plantings have suffered from a variety of issues, including insufficient watering, improper
 1071 installation/plant selection, herbivore damage, and suppression from nonnative invasive weeds. The base
 1072 will implement a riparian invasive weed work plan from the GMG (Hopkinson 2017b) once environmental
 1073 analysis and permitting has been completed.

1074 Numerous oak and riparian woodland restoration projects have been conducted on the base, including:

- 1075 • 40-acre restoration area with over 5,600 riparian tree and shrub seedlings between Dry Creek and
 1076 Best Slough (California State University [CSU], Chico project, fall 1997).
- 1077 • 16 acres with approximately 500 native trees and shrubs restored in between Dry Creek/Best
 1078 Slough (CSU, Chico project, November 1999).
- 1079 • 2,800 native trees and shrubs along Dry Creek (volunteer project, December 2001-January 2002)
- 1080 • 150 native trees and shrubs at Blackbird Marsh (volunteer project, December 2002).
- 1081 • 200 native trees and shrubs at Upper and Lower Blackwelder lakes (volunteer project for National
 1082 Public Lands Day, September 2003 and 140 more in 2015).
- 1083 • 445 native trees and shrubs on old motocross area, just east of Dry Creek (volunteer project,
 1084 December 2003).
- 1085 • 760 native trees and shrubs west of Dry Creek (volunteer project, December 2004 and 70 more in
 1086 2016).
- 1087 • 500 native trees and shrubs were planted for National Public Lands Day along the Ryden Park
 1088 nature trail (volunteer project, Sept-Dec 2017).

1089 Trees have also been planted by volunteers in developed and semi-developed areas of the base to promote
 1090 conservation and base beautification:

- 1091 • Planting at various locations for Arbor Day/Tree City annually since 2005.
- 1092 • Ryden Park planting for National Public Lands Day in 2007.
- 1093 • Old Environmental Building 2561 for National Public Lands Day in 2008.
- 1094 • O’Mally Field planting.

- 1095
- Tree plantings along the running trail next to the golf course.

1096 Continual monitoring of each restoration site is an important part of the restoration project and is necessary
1097 to demonstrate that a project has been successful, or to determine the causes if less than successful. Annual
1098 monitoring of plant mortality will be conducted before the end of the growing season and after large-scale
1099 weed control has been completed to allow easy access to plants while conducting surveys. Maps of
1100 individual sites will be updated annually as new plants are added or new restoration sites created. In
1101 addition, plants will be watered weekly during the dry season (typically May-October) to ensure minimal
1102 loss of plants to drought stress. Planting sites will be maintained in conjunction with watering during the
1103 dry season and once a month during the rainy season (typically November-April), and the focus will be on
1104 spot removal of invasive weeds from around individual plants and upkeep of browsing guards to prevent
1105 competition with weeds and damage to plants from herbivores.

1106 Current and future restoration sites will be monitored for at least the first three years after installation to
1107 document site survivorship. Documentation will include a description of the restoration site with photos,
1108 an analysis of the cause(s) of failure or success, and recommendations to improve the restoration sites (River
1109 Partners 2011). If the restoration site meets the 80% survival benchmark by the third year of monitoring, it
1110 will be considered successful and no further monitoring and reporting will be conducted. If this benchmark
1111 is not met but monitoring indicates that the causes of mortality can be addressed, new container plants will
1112 be added to bolster the survivorship of the site and the site will be monitored for an additional three years
1113 to ensure the plants are established. Future restoration efforts will focus on expanding successful planting
1114 sites to create wildlife corridors between upland and riparian areas and fragmented habitat. Riparian
1115 management reports are prepared annually (CEMML 2017a, 2018b, 2019, 2020a; HDR 2015), which
1116 include all restoration sites still within the monitoring period.

1117 In 2019, CEMML monitored the Ryden Park and Best Slough sites. The Best Slough site was planted
1118 originally in 2001 with approximately 90 plants added between 2015 and 2017. The Ryden Park site was
1119 planted in 2012 as an NPLD day event. Subsequent plantings occurred in 2015 and 2017 as mitigation
1120 plantings. Overall survivorship was 39 percent for the two sites. Herbivory damage from voles and deer
1121 have been the most significant challenge to meeting the 70 percent survivorship benchmark. The 2019
1122 report recommended additional plantings supported with more frequent and earlier watering, monitoring
1123 for invasive plants, addition of mulch, and more proactive herbivore control.

1124 Between January 2019 and January 2020, CEMML biologists monitored Dry Creek and Best Slough. Both
1125 sites did not succeed in their survival goal of 70% and will be replanted in fall 2020. Monitoring and
1126 maintenance will continue for another three years after the plantings to ensure both sites meet mitigation
1127 standards.

1128 Grassland Habitat Enhancement

1129 Habitat restoration treatments such as replanting or reseeding are used on Beale AFB to promote desirable
1130 species and habitat conditions. Historically, Beale AFB has focused on grassland restoration activities that
1131 used purple needle grass as the major vegetation component. New research indicates that inland California
1132 grasslands were historically dominated by annual forbs (Evet and Bartolome 2013). In light of this new
1133 research, any restoration treatments will be reseeded using a mixture of native grasses and forbs. The Beale
1134 AFB seed mix was updated in 2018 to include a greater diversity of plant species, all of which are native
1135 (Appendix N).

1136 Pollinator Habitat Creation

1137 Significant declines in pollinator populations precipitated President Obama to issue a memorandum:
 1138 “Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators” on June 20, 2014
 1139 (Presidential Memo).

1140 In response, the USAF Pollinator Conservation Strategy was created to address pollinator conservation.
 1141 The strategic vision of the document is “Sustain the Air Force mission and ecological integrity on Air Force
 1142 installations by implementing management practices that support pollinators and enhance their habitat,
 1143 especially those with regulatory protections. Broaden awareness among Air Force personnel of the decrease
 1144 in pollinator populations and measures needed to improve their status.” The strategic vision will be
 1145 accomplished by implementing the following goals:

- 1146 • Conserve pollinator species of conservation concern in cooperation with USFWS, the state fish and
 1147 wildlife agencies, and other partners using INRMPs and other tools.
- 1148 • Conserve and enhance pollinator habitat on AF installations when it is compatible with the mission,
 1149 using INRMPs and other tools.
- 1150 • Reduce pesticide use and adverse impacts of pest control on pollinators through use of INRMPs
 1151 and IPMPs.
- 1152 • Promote pollinator conservation through education and outreach.
- 1153 • Develop partnerships for pollinator conservation off-installation to lessen regulatory burdens by
 1154 aiding the recovery of listed pollinators and preventing further pollinator declines.

1155 Most vegetation restoration projects at Beale AFB have primarily focused on riparian trees while ignoring
 1156 pollinator habitat such as xeric shrubs and annual wildflowers. To address this shortcoming, Beale AFB
 1157 and the National Environmental Education Foundation partnered with CEMML to conduct two native
 1158 pollinator habitat restoration projects within undeveloped areas of the base, one along a seasonal drainage
 1159 near the base medical clinic and another along the base nature trail that runs parallel to Dry Creek (CEMML
 1160 2018a; CEMML 2020b). The project goal was to establish a diverse array of native forbs, grasses, shrubs,
 1161 and trees that would provide resources and habitat to monarch butterflies, WBB, and other native pollinators
 1162 throughout the year. A total of 500 native shrubs and trees were planted between September 2017 and
 1163 January 2018. Twenty-four species of regionally native perennials, shrubs, and trees were planted using
 1164 information from the Riparian Restoration Plan (River Partners 2011), the Xerces Society Pollinator Habitat
 1165 guidelines for the Central Valley (Vaughan et al. 2015), the Theodore Payne Foundation Planting Guide
 1166 (Theodore Payne Foundation 2015), and input from local native nurseries.

1167 Pollinator habitat enhancement and site maintenance continued in 2019 and 2020, with 50 additional native
 1168 shrubs, perennials, and trees planted at the Clinic Site (CEMML 2020b). Monitoring and maintenance of
 1169 pollinator habitat is necessary while trees, shrubs, and perennials become established in newly vegetated
 1170 areas and may also be necessary in the long-term to ensure the habitat remains suitable for pollinators.
 1171 Ongoing maintenance includes watering, non-native invasive plant removal, and mowing (CEMML
 1172 2020b). A survival rate of 70% is expected for planting sites to be considered successful. As of 2020, the
 1173 Clinic Site has a survival rate of 88% and the Dry Creek Site has a survival rate of 58% (CEMML 2020b).
 1174 Based on the high survival of plants at the Clinic Site, additional plants were added in 2020.

1175 With its focus on creating pollinator habitat, the base has been recognized as a hotspot for monarch activity
 1176 in certain years (Snow 2020). Pollinator surveys were conducted at these sites in 2020 and will continue
 1177 through FY2021 to establish a better database of what species are using the sites. Though no observations

1178 of WBB or Monarch butterflies were made at the sites in 2020, the surveys recorded abundant floral
 1179 resources and numerous other species of bees and butterflies (Marty 2020). Crotch's bumblebee was
 1180 recorded during pollinator surveys in June 2021 at both Beale AFB and at LRS (pers. comm. Dr. Jaymee
 1181 Marty, June 2021)

1182 7.1.3 Migratory Birds

1183 IAW the MBTA of 1918 (Title 16 USC §§703-712) and EO 13186, *Responsibilities of Federal Agencies*
 1184 *to Protect Migratory Birds*, January 10, 2001, the AF is to avoid or minimize the negative impact of AF
 1185 actions on migratory birds. Pursuant to EO 13186, the DoD entered into a Memorandum of Understanding
 1186 (MOU) with USFWS, September 5, 2014, to promote the conservation of migratory birds. The MOU
 1187 identifies activities where cooperation between the parties will contribute substantially to the conservation
 1188 of migratory birds and their habitats.

1189 Following the DoD *Guidance for Addressing Migratory Bird Management in Integrated Natural Resources*
 1190 *Management Plans* (DoD 2017), Beale AFB will manage and monitor the effects that both military
 1191 readiness (e.g., Migratory Bird Readiness Rule) and non-readiness activities have on migratory bird species
 1192 and populations. Through the implementation of this INRMP and proper management of migratory bird
 1193 species and habitats, including the timely implementation of appropriate conservation practices, Beale AFB
 1194 will be able to avoid or minimize impacts to migratory birds.

1195 7.1.3.1 Migratory Birds on Beale AFB

1196 Beale AFB does a number of projects and activities to protect and promote the conservation of migratory
 1197 birds. The NRM coordinates with the BASH Program Manager to maintain the area around the flightline
 1198 in a way that discourages use by wildlife. Construction best management practices (BMPs) are followed to
 1199 ensure the protection of nesting migratory birds. There are nesting structures for multiple species of birds,
 1200 as described in Section 7.1.2.1, *Habitat Structures*. The base is restoring riparian oak woodland habitats
 1201 important to resident and migratory bird species. The base operated a MAPS station until 2018, which was
 1202 replaced by breeding bird surveys starting in FY19. Management activities that benefit special-status
 1203 migratory bird species are discussed in Section 7.4, *Management of Threatened and Endangered Species,*
 1204 *Species of Concern and Habitat*.

1205 Beale AFB has participated in bird surveys sponsored by non-profit organizations including single-species
 1206 surveys of western burrowing owl, TRBL, and Swainson's hawk. Beale AFB participated in the Audubon-
 1207 sponsored Central Valley Winter Raptor Survey from 2007 to 2009, and resumed them in 2019. The public
 1208 is granted limited access to the base for the annual Marysville Swan Festival, and volunteers can participate
 1209 in the annual Christmas Bird Count in the Marysville circle.

1210 7.1.3.2 Conflicts with the Mission

1211 Due to its location along the Pacific Flyway, a large number of migratory birds pass through Beale AFB.
 1212 There are extensive wetlands and multiple impoundments on the base, and the base is adjacent to crop fields
 1213 that are seasonally flooded. These all act as attractants to water birds and create significant BASH concerns.
 1214 The WEZ is maintained in a way that reduces bird use to the extent possible, but regardless of management
 1215 actions, the area is likely to be heavily used by birds. Habitat creation and enhancement activities are
 1216 coordinated and assessed through the NEPA process to prevent an increase in BASH concerns. Active
 1217 coordination is needed between the base NRM, airfield managers, and safety and operational personnel
 1218 regarding BASH issues. Nesting migratory birds are also a common problem on construction sites due to
 1219 nest protection under the MBTA.

1220 **7.1.3.3 Construction Best Management Practices**

1221 Beale AFB considers any potential effects to migratory birds during project planning and when conducting
 1222 routine activities. Through the AF Form 813 and AF Form 103 processes, the NRM identifies potential
 1223 nesting habitat and works with the contractor and shop personnel to determine appropriate BMPs. Specific
 1224 instructions on migratory bird protection are provided to contractors and shop personnel on the
 1225 Environmental Analysis Form (AF Form 813). Any projects that start between 1 March and 31 August must
 1226 comply with the migratory bird AMMs below:

- 1227 • Pre-construction surveys for migratory bird nests are required for any construction projects or
 1228 maintenance activities conducted during the breeding season (1 March-31 August).
- 1229 • Incomplete or empty nests are removed; nests containing eggs or chicks are not to be removed.
 1230 Birds exhibiting nesting behavior in construction areas are hazed when possible.
- 1231 • Once nests are established, avoidance is the only practical protection measure. A buffer is flagged
 1232 around active nests at a distance that is sufficient to protect the nest from disturbance by project
 1233 activities.
- 1234 • Contractors are encouraged to conduct any project-related vegetation removal before 1 March.
- 1235 • Proactive exclusion measures are encouraged to prevent birds from using areas and structures
 1236 where construction will occur.
- 1237 • Other methods to discourage nesting birds include noise cannons and scarecrows or other visual
 1238 deterrents.
- 1239 • If nest removal or re-location cannot be avoided, permits are obtained from USFWS on an as-
 1240 needed basis by 9 CES/CEIEC.
- 1241 • Injured or trapped birds will be reported to 9 CES/CEIEC. Trapped birds will be freed or exit holes
 1242 created, and injured native birds are taken to rehabilitation facilities by permitted 9 CES/CEIEC
 1243 staff. Injured birds that are rehabilitated must be released off-base, but captured birds not requiring
 1244 rehabilitation may be released at a suitable location on-base.

1245 **7.1.3.4 Avian Protection Plan**

1246 Beale AFB developed an Avian Protection Plan (APP) in 2017 that replaced the 2004 APP. The plan is
 1247 specifically designed to reduce operational and avian risks resulting from avian interactions with its electric
 1248 utility facilities. A copy of the plan can be obtained through CEIE. The APP was developed IAW the Avian
 1249 Power Line Interaction Committee (APLIC) and USFWS Guidelines (2005), which recommend avian
 1250 protection (APLIC 2006) to minimize potential electrocution and collision hazards for birds on its existing
 1251 power grid and to improve compliance with the MBTA, BGEPA, and ESA. The APP is designed to provide
 1252 a primary resource for activities relating to avian protection for Beale AFB management and field
 1253 personnel. The document addresses avian protection issues, the regulatory context for avian protection,
 1254 regulatory compliance procedures, training programs in avian protection, and various avian-protection
 1255 strategies.

1256 Base-wide power pole replacement and retrofit started in 2017. Surveys of power poles on the base are
 1257 conducted regularly and the findings are reported to 9 CES/CEIEC and the electrical shop. The NRM will
 1258 coordinate with the electrical shop to ensure that poles are being retrofitted correctly and that the electrical
 1259 shop is reporting bird strikes to 9 CES/CEIEC. Avian protection orientation training will be provided on a
 1260 semi-annual basis to all new Exterior Electric Shop personnel. Adherence to the APP is anticipated to

1261 reduce the occurrence of wildfire caused by electrocuted birds. Between 1989 and 2015, at least 34 fires on
1262 base were caused by power lines (see Section 7.9, *Wildland Fire Management*), some of which were due
1263 to avian electrocutions.

1264 7.1.3.5 Permits

1265 Per AFMAN 32-7003, any proposal to intentionally kill, wound, capture, or collect a migratory bird requires
1266 a migratory bird depredation permit (MBDP) issued by the USFWS IAW Title 50 CFR 21.41, *Migratory*
1267 *Bird Permits, Depredation Permits*. However, according to Section 315 of the *Bob Stump National Defense*
1268 *Authorization Act* of 2003, MBTA requirements indicated in 16 USC 703, *Taking, killing, or possessing*
1269 *migratory birds unlawful*, do not apply to the incidental taking of a migratory bird by a member of the
1270 Armed Forces during a military readiness activity. Military readiness activities and conditions are defined
1271 in AFMAN 32-7003, Section 3.34.2, *Incidental Takes of Migratory Birds During Military Readiness*
1272 *Activity*, and 50 CFR 21.3, *Migratory Bird Permits, Definitions*.

1273 The base holds a MBDP permit for take and harassment activities necessary to reduce BASH, which is
1274 renewed annually. Prior to 2018, the permit was held by 9 RW/CC and overseen by the 9 CES/CEIE Flight
1275 Chief. Based upon new guidance, 9 RW/SEF became the permit holder starting with the 2018 permit
1276 renewal. Additional information on take of migratory birds during BASH reduction activities can be found
1277 in Section 7.12, *Bird/Wildlife Air Strike Hazard*.

1278 Bald eagles and golden eagles, their eggs, and their nests receive protection under the MBTA and the
1279 BGEPA (16 USC 668-668d, 54 Stat. 250 and amendments). The BGEPA states “no person shall take,
1280 possess, sell, purchase, barter, offer for sale, transport, export, or import any bald or golden eagle alive or
1281 dead, or any part, nests or eggs thereof without a valid permit to do so.” The BGEPA permit was issued to
1282 the 9 RW/CC in 2018 but does not specify a sub-permittee. The BGEPA permit is renewed every five years.

1283 The USFWS regulations set forth in 50 CFR 21.27 establish the issuance of permits for special purpose
1284 activities related to migratory birds, and their parts, nests, or eggs, which are otherwise outside the scope
1285 of the standard permits. A Special Purpose Utility Permit authorizes utilities to “collect, transport and
1286 temporarily possess migratory birds found dead on utility property, structures, and rights-of-way for avian
1287 mortality monitoring or disposal purposes” and was designed to address the need to salvage and retain
1288 specimens to confirm identification. A Special Purpose Utility Permit was prepared for Beale AFB in 2017
1289 as part of the APP so that the carcasses of electrocuted birds could be moved for identification and disposal.
1290 This permit application was submitted in 2019 by CES. Annual tracking and reporting of all electrocuted
1291 birds on the base are a requirement of the permit. All other MBTA permits are obtained by 9 CES/CEIEC
1292 as necessary.

1293 7.1.3.6 Surveys and Research

1294 A variety of studies and surveys for migratory birds have been conducted on Beale AFB (Table 4 in
1295 Appendix I). Surveys of wintering raptors have been included in contracts for annual special-status species
1296 surveys. The California Waterfowl Association did waterfowl surveys in the 1990s, and future surveys of
1297 nesting and wintering waterfowl on the base will be considered. The surveys would provide information on
1298 the availability of game and hunting opportunities on Beale AFB.

1299 Several studies and surveys have been done directly in support of the BASH reduction program. These
1300 studies looked at avian habitat use in areas around the flightline. In 2017, nestlings from bird boxes around
1301 the base were banded as part of a one-time effort in order to determine if avian use of nest boxes on base
1302 were causing an increased BASH concern. A total of 115 birds from six species (American kestrel, barn

1303 owl, western bluebird, tree swallow, house wren, and wood duck) were banded. If banded birds are found
 1304 dead on base or are involved in a BASH incident, they should be reported to the NRM (CEMML 2017b).
 1305 Nestlings from kestrel boxes and wood duck hens are banded annually in association with other base
 1306 projects (see Section 7.1.2.1 *Habitat Structures*, above).

1307 Monitoring Avian Productivity and Survivorship (MAPS)

1308 Beale AFB established a MAPS station as part of the Institute for Bird Populations program
 1309 (<http://www.birdpop.org/maps.htm>). The MAPS station was located in between Dry Creek and Best Slough
 1310 to monitor trends in bird populations through annual mist netting and banding. Over time, the results of the
 1311 surveys were intended to be used to measure trends and establish relationships among bird species
 1312 abundance, richness and diversity, vegetation, and landscape characteristics. The capture rate at the Beale
 1313 AFB MAPS station declined and depredation of birds in the net by raptors forced the closure of the station.
 1314 Starting in 2019, the base began conducting breeding bird surveys using the standardized USGS protocol
 1315 (USGS 2018).

1316 *7.1.4 Incorporating Climate Change into Fish and Wildlife Management*

1317 Many of the current fish and wildlife management issues at Beale AFB will likely remain or potentially
 1318 magnify as climate change alters precipitation, temperature, and associated conditions. As temperatures
 1319 increase in lakes and ponds, oxygen levels may lower. As aquatic temperatures rise, so will the risk of algal
 1320 blooms, further depleting oxygen levels in these systems. Oxygen levels will need to be monitored to ensure
 1321 that fish and macroinvertebrate populations remain stable. Efforts to detect and remove invasive aquatic
 1322 plants and algae from ponds may become necessary to maintain fish stocks. Providing shade through
 1323 planting of trees around water sources will help to prevent excessive increases in water temperature (Poff
 1324 et al. 2002).

1325 Concerns with invasive plant and animal species are likely to increase as rising temperatures and increased
 1326 fires push out native species, creating less competition and opening niches for new or existing invasive
 1327 species. Fish and wildlife surveys, invasive plant surveys, and rare plant surveys will continue to be
 1328 conducted routinely to monitor populations of pest species and favorable wildlife and plant species.
 1329 Particular attention should be paid to monitoring disease in game populations as changing climatic
 1330 conditions can lead to increased zoonotic disease. Monitoring waterfowl populations will become
 1331 increasingly important. With increases in precipitation and aquatic habitat on Beale AFB, there is potential
 1332 for waterfowl populations to expand, further increasing BASH concerns. If precipitation increases lead to
 1333 larger vernal pool extents, this may increase habitat for listed vernal pool obligate plant and invertebrate
 1334 species, so long as the temperature and water quality remain within tolerances.

1335 **7.2 Outdoor Recreation and Public Access to Natural Resources**

1336 *Applicability Statement*

1337 This section applies to all USAF installations that maintain an INRMP. The installation is required to
 1338 implement this element.

1339 *Program Overview/Current Management Practices*

1340 Outdoor recreation on the base is guided by AFMAN 32-7003. Other than the horseback riding stables,
 1341 recreation facilities are operated and maintained by the DoD. Use of base facilities such as parks, picnic
 1342 areas, and trails are free of charge. Fees are charged for some club-operated facilities such as the golf course,
 1343 FamCamp and the Rod-and-Gun Club. An outdoor recreation and management plan was developed in 1987

1344 but is so old as to be obsolete. Activities such as gold panning, metal detecting, camping outside of
 1345 designated areas, and other activities not covered in this section are prohibited without the approval of the
 1346 NRM. Any activities from which an individual may make a monetary profit from products or materials
 1347 collected on Beale AFB are prohibited.

1348 7.2.1 *Access*

1349 The military population and the assigned military mission (i.e., strategic reconnaissance and nuclear
 1350 deterrence—Class A resources) preclude general public access to the base for recreational use. The
 1351 installation policy is to limit recreational use to active duty or retired military and their family members, civil
 1352 service personnel employed on Beale AFB, and their families. The public is allowed controlled access for
 1353 special events (e.g., Earth Day, Christmas bird count) or certain groups with special arrangements (e.g.,
 1354 Boy Scouts, student groups).

1355 Recreation is not allowed on all areas of the base. Restrictions are primarily for safety and security reasons,
 1356 such as active firing ranges and secure areas such as PAVE PAWS. Special conditions are in place to protect
 1357 natural resources and to avoid safety risks. Signs are posted outside of areas closed to general access.

1358 7.2.2 *Developed Recreation Areas*

1359 7.2.2.1 **7.2.2.1 Parks and Picnic Areas**

1360 There are three parks on base and multiple picnic areas and play structures. Ryden Park is a three-acre
 1361 community park located along Dry Creek in the family housing area. The park consists of two covered
 1362 pavilions with picnic tables, additional uncovered picnic tables, and barbecue grills. The park is visually
 1363 attractive, adjacent to a bridge over Dry Creek, and shaded by large oak trees. Groups of more than 30
 1364 people are requested to reserve the picnic areas at Ryden Park (with no fee) through the OAC.

1365 Candy Cane Park is approximately two acres located adjacent to the family housing area. It is in oak
 1366 woodlands near the eastern edge of the base. It has a covered pavilion with picnic tables, a barbecue grill,
 1367 and playground equipment. This park is appropriate for small gatherings.

1368 O'Malley Field is located within the Main Base just off of Doolittle Road and C St. There are two baseball
 1369 diamonds and a soccer field.

1370 Several play areas for children have been developed in the housing and Main Base areas. There are covered
 1371 and uncovered picnic tables and a grill at Lower Blackwelder Lake. There is a baseball diamond located
 1372 behind the Youth Center in Family Housing.

1373 7.2.2.2 **Paths and Trails**

1374 A 1.5-mile nature trail (including interpretive signs, a bulletin board, and two kiosks) has been developed
 1375 near the housing area along Dry Creek. The trail begins at the riparian restoration area and ends at Ryden
 1376 Park. Portions of the trail get washed out regularly during winter rains. Trail maintenance and improvements
 1377 are ongoing. With the help of volunteers, a native restoration planting was created along the trail as part of
 1378 the 2017 National Public Lands Day.

1379 A paved Americans with Disabilities Act-compliant pedestrian and bicycle trail with a bridge overlooking
 1380 Dry Creek extends from the flightline area to Ryden Park. Bulletin and informational boards at trailheads
 1381 are maintained and updated as necessary. 9 CES maintains both of these trails.

1382 7.2.2.3 **Bicycles and Mountain Bikes**

1383 Bicycles are permitted on paved and unpaved roads, but there are currently no off-road areas designated for
1384 mountain bike use.

1385 7.2.2.4 **Campground Facilities**

1386 The OAC operates a one-acre recreational vehicle (RV) campground, north of Main Base, called
1387 "FamCamp". There are 44 spaces for RVs with electrical, sewage, and water hookups available for a daily
1388 or monthly fee. A covered pavilion with picnic tables is located at Lower Blackwelder Lake, adjacent to
1389 FamCamp. There are bathrooms, showers, and laundry facilities in a building with the office. There are no
1390 tent camping sites at FamCamp.

1391 7.2.2.5 **Dry Creek Saddle Club**

1392 The Dry Creek Saddle Club is a privately-operated stable located on the base. The club provides stables
1393 and riding areas for members. Riding trails are also available in the immediate vicinity of the saddle club
1394 and an extensive trail system is just off-base in the SWA.

1395 7.2.2.6 **Community Garden**

1396 There is a community garden in the Family Housing area, created and maintained by the residents.

1397 7.2.3 *Dispersed Recreation Areas*

1398 Dispersed recreation such as hiking, wildlife viewing, and sightseeing are permitted in all areas open to the
1399 general base population. Some unpaved roads are gated, but foot traffic is permitted. Much of the base is
1400 not easily accessible by roads. These areas are primarily used only by hunters. Designated hunting and
1401 fishing areas on Beale AFB are discussed in Section 7.1, *Fish and Wildlife Management*. Other than a 1.5-
1402 mile nature trail, there are no hiking trails in dispersed recreation areas.

1403 7.2.3.1 **Dispersed Camping**

1404 At this time, there are no areas on base for tent camping. There are no dispersed camping areas, and tent
1405 camping is not permitted at FamCamp. Campfires are not permitted on Beale AFB without permission from
1406 the Fire Department. Historically, the European olive orchard below Lower Blackwelder Lake and an area
1407 near Candy Cane Park were used as tent camping sites. The European olive orchard adjacent to the dam
1408 creating Lower Blackwelder Lake was occasionally used as a Boy Scout camping area, but the riprap used
1409 to create the dam provides attractive habitat for rattlesnakes.

1410 7.2.3.2 **Recreational Lakes**

1411 Fishing is permitted in all lakes and streams on Beale AFB unless otherwise posted and with the conditions
1412 and exceptions outlined in Section 7.2.4, *Recreation Demand*. Gas-powered boats are not permitted on any
1413 base water bodies unless permission has been granted by 9 CES/CEIEC. Electric motors are acceptable.
1414 Some of the impoundments contain hazardous rubble and/or chemical contamination. The dam impounding
1415 Beale Lake has been removed, and the lake has been replaced by a riparian restoration site. Upper
1416 Blackwelder and Blackbird Basins were closed in 2017 for dam repair and safety reasons. When the lakes
1417 will be reopened to recreation is still to be determined. Miller Lake was closed to recreation during dam
1418 repair in 2017. The lake has been re-opened to boating and hunting but remains closed to fishing until fish
1419 stocks are stable.

1420 Infrastructure and amenities are present at some of the lakes. Lower and Upper Blackwelder lakes both
1421 have boat launches and docks. Developments such as vehicle barriers, picnic tables, shade trees, pavilions,
1422 and additional signage would make base lakes more attractive for recreation. New picnic tables and shade
1423 pavilions will be installed at Miller and Upper Blackwelder lakes after dam repairs are complete. A boat
1424 launch has been built and the Wing has funded the purchase of two docks at Miller Lake to create the
1425 infrastructure necessary to make it a fishing lake. Areas designated as parking areas have not been well
1426 marked, and visitors often park their vehicles in inappropriate areas, often causing erosion and other issues.
1427 There is currently an effort to install “Keep Out” signs at problem areas when they are identified. Additional
1428 information on base lakes and impoundments including size, location and uses is included in Section 2.2.4,
1429 *Hydrology*.

1430 7.2.4 *Recreation Demand*

1431 In years since 2010, between 80 and 165 hunting permits were sold annually. In 2017 the OAC sold 220
1432 fishing permits. There is currently no way to track non-consumptive dispersed recreation. AFMAN 32-
1433 7003 recommends that the carrying capacity of outdoor recreation areas be determined by comparing OAC
1434 visitor data against outdoor recreation space standards provided by the state or National Park Service and
1435 by monitoring recreation use to prevent damage to the resource.

1436 7.2.5 *Responsibilities and Coordination with Other Offices*

1437 Responsibilities for maintaining outdoor recreation facilities, particularly parks and playgrounds, require
1438 clarification. In general, the proponent of recreation infrastructure projects will be responsible for
1439 maintenance. 9 CES/CEIEC will only be responsible for maintaining infrastructure associated with hunting
1440 and fishing such as docks, boat launches, the hunter sign-in kiosk, and trash cans at lakes. If trash cans are
1441 not being emptied, they will be removed and replaced with “Pack Your Trash” signs. Other facilities and
1442 recreation areas that should be maintained by 9 CES/CEIEC need to be identified.

1443 The 9th Force Support Squadron Community Services Flight Outdoor Recreation office (9 FSS/FSWO)
1444 manages most of the outdoor recreation programs and facilities. The OAC is responsible for coordinating
1445 and managing recreation programs and performing minor maintenance to outdoor recreation facilities. The
1446 OAC is also responsible for programs that require use of non-appropriated funds. The OAC's staff, however,
1447 is carrying out park maintenance activities that should be conducted by base personnel and funded by
1448 operations and maintenance budgets.

1449 Current budgets to maintain outdoor recreation facilities and manage natural resources are limited. Using
1450 volunteer assistance can help reduce costs of managing recreation areas and park facilities. Involving base
1451 residents will foster a sense of community and stewardship over recreation areas. 9 CES/CEIEC is working
1452 to increase the number of volunteer opportunities for base personnel.

1453 7.2.6 *Off-Road Vehicles*

1454 Off-road driving of any motorized vehicle, including ATVs and side-by-sides, for recreational purposes is
1455 prohibited at all times. Due to the prevalence of vernal pools and their protected status under the CWA and
1456 as habitat for federally listed species under ESA, and the potential to start wildfires during the dry season,
1457 off-road driving is prohibited and restricted to mission-supporting official activities after training is
1458 provided by 9 CES/CEIEC. New personnel are informed of this restriction during newcomer's briefings.
1459 Most shops in 9 CES and 9 SFS require off-road driving training to be provided by 9 CES/CEIEC.

1460 When damage from ORV use is reported in areas easily accessible by road, the perpetrator will clean up
 1461 the area. Ruts are knocked down and filled in to maintain a visually pleasing atmosphere, prevent erosion,
 1462 maintain hydrologic flow, maintain clean water, and prevent the creation of new vernal pools. The ruts are
 1463 seeded using the base-approved native seed mix and covered with straw to reduce erosion. The NRM will
 1464 contact the appropriate tribal entities if Native American cultural sites are damaged as a result of off-road
 1465 driving or other type of recreation as required by the Beale AFB ICRMP, Section 7.7 *Suspected Vandalism*.
 1466 There are currently no areas designated for off-road driving or mountain biking.

1467 **7.3 Conservation Law Enforcement**

1468 *Applicability Statement*

1469 This section applies to all USAF installations that maintain an INRMP. The installation is required to
 1470 implement this element.

1471 *Program Overview/Current Management Practices*

1472 The conservation law enforcement program at Beale AFB is guided by AFMAN 32-7003; DoDI 5525.17,
 1473 *Conservation Law Enforcement Program (CLEP)*; and applicable base plans and performance work
 1474 statements (PWS). DoDI 5525.17 provides guidance for conservation law enforcement on DoD
 1475 installations. Enclosure 2 *Responsibilities*, Section 3, *DoD Component Heads* of DoDI 5525.17 requires
 1476 that sufficient numbers of natural resources law enforcement personnel are available and assigned
 1477 responsibility to perform tasks necessary to carry out the CLEP. Historically the program has been guided
 1478 by the AFI 32-7064 Beale Supplement 1 but these policies no longer apply and the policies described there
 1479 have been transferred to relevant sections of this INRMP.

1480 The compliance and enforcement of natural resource laws is the responsibility of the 9 CES/CC, and the
 1481 program will be managed as stipulated in the Beale AFB- CLEP agreement. Per AFMAN 32-7003, Section
 1482 3.33.1, *Conservation Law Enforcement, Cooperative Law Enforcement*, Commanders shall provide
 1483 reasonable access to federal and state conservation officers for the purpose of fish and wildlife law
 1484 enforcement on AF installations.

1485 California has a complex regulatory climate, and Beale AFB has numerous natural and cultural resources
 1486 protected by federal laws within close proximity to recreational and mission assets. Given the size of the
 1487 hunting and fishing program, the relatively large area open to recreation, re-occurring problems with off-
 1488 road driving, and sensitive cultural and natural resources, the base qualifies for a CLEO, in addition to 9
 1489 SFS and volunteer game wardens per DoDI 5525.17, Section 3.a, *Policy*, and AFMAN 32-7003, Section
 1490 3.33. For decades the program was enforced by volunteer game wardens and the HPM without additional
 1491 external oversight.

1492 Through an AFCEC-funded Interagency Agreement (IA) with the USFWS, a FLETC-trained CLEO
 1493 position was filled in FY19 to provide conservation law enforcement to Beale and Travis AFBs. The
 1494 CLEO's duty station will be Beale AFB with travel to Travis AFB on an as-needed basis. Beale AFB will
 1495 develop a MOU and SOW prior to the arrival of the USFWS officer. An enforcement plan will be included
 1496 in the SOW.

1497 *7.3.1 Current Conservation Law Enforcement Activities and Program Emphasis*

1498 Program emphasis and activities focus on natural resource vulnerabilities. The CLEO shall perform the
 1499 following activities:

- 1500 • Manage and enforce base-regulated hunting and fishing program, including licenses, take
 1501 regulations, open seasons, lure regulations, etc.
- 1502 • Monitor approved hunting areas.
- 1503 • Provide safety training to hunters.
- 1504 • Conduct outreach to the installation populace to promote engagement in the hunting program.
- 1505 • Oversee registration and maintenance of hunting blinds.
- 1506 • Assist NRM with fish stocking, wildlife food and cover establishment, and habitat improvement
 1507 projects IAW the INRMP.
- 1508 • Make clear designated hunting and fishing areas, including area closures.
- 1509 • Assist with nuisance species incidents.
- 1510 • Address incidents involving deer kills by automobiles or other causes.

1511 Additional activities that are not currently conducted, but would help address natural resource
 1512 vulnerabilities include:

- 1513 • Manage and/or enforce ORV regulations and restrictions.
- 1514 • Report and track natural and cultural resource crimes and their disposition (both military and civil)
 1515 and include a summary in the INRMP and ICRMP.
- 1516 • Report non-compliance with laws and regulations IAW military service criminal data reporting
 1517 procedures.
- 1518 • Improve inter-jurisdictional conservation law enforcement among military departments, federal,
 1519 state, tribal, and local law enforcement and land management agencies.

1520 **Beale AFB Conservation Law Enforcement and Volunteer Game Wardens (Game Wardens)**
 1521 **Program**

1522 AFMAN 32-7003 directs bases to establish a CLEO either as a permanent staff member or under an
 1523 agreement with a law enforcement program that manages conservation work (e.g., USFWS Officer or State
 1524 Fish and Wildlife Warden). A USFWS CLEO was assigned to Beale AFB in 2020 to enforce compliance
 1525 with hunting, fishing, and other natural resource laws. Under the direction of the CLEO and HPM the
 1526 Volunteer Game Wardens assist with patrols and report violations to the CLEO.

- 1527 • 9 SFS/SO may be involved in enforcement of fish and game laws through the CLEO or Volunteer
 1528 Game Wardens on Beale AFB. 9 SFS may become involved when notified by a game warden that
 1529 a violation has occurred which will require oversight for significant violations or coordination on
 1530 violations when both fish and game laws and other laws have been violated.
- 1531 • Chief Game Warden: The 9th Mission Support Group Deputy Commander (9 MSG/CD), who is
 1532 also the Base Magistrate, will appoint the chief game warden. The chief game warden will be a
 1533 Technical Sergeant or higher. The Chief Game Warden will be responsible to 9 CES/CEIE, 9 SFS,

1534 and 9 MSG/CD respectively. The Chief Game Warden will actively monitor the warden program
 1535 to coordinate duty schedules, training and all other Warden activities for Game Wardens. Chief
 1536 Game Warden will ensure complete and accurate records of all warden activities are maintained
 1537 and forwarded to the HPM at least monthly.

1538 • Volunteer Game Wardens: The Volunteer Game Wardens will work under the direction of the
 1539 NRM, CLEO, and Chief Volunteer Game Warden, and monitor hunter and fisher compliance with
 1540 conservation laws and regulations. Any Volunteer Game Warden activities besides hunter training
 1541 and conservation law compliance patrols must be coordinated in advance with 9 CES/CEIE.
 1542 Volunteer Game Wardens may be removed from the Volunteer Game Warden program at the
 1543 discretion of the NRM. Removal will be documented in writing with reason stated.

1544 Volunteer Game Warden supervision will primarily be performed by the HPM and CLEO for Volunteer
 1545 Game Warden duties, and the NRM for conservation duties. In the absence of a CLEO the Chief Volunteer
 1546 Game Warden may provide some oversight.

1547 The Chief Game Warden and NRM will review all applications and appointments of Game Wardens and
 1548 Reserve Game Wardens. Active Game Warden status will be reviewed yearly by the Chief Game Warden
 1549 by communicating with the appropriate First Sergeant or Commander to ensure no disciplinary actions or
 1550 other administrative actions have been taken that would question the reliability of personnel acting in these
 1551 positions.

1552 The selection criteria for Volunteer Game Wardens is as follows:

- 1553 • Minimum of a 4 on Enlisted Performance Report (EPR) on the applicant’s last two EPRs and
 1554 no active Unfavorable Information File (UIF).
- 1555 • Supervisor/Commander’s recommendation.
- 1556 • No significant disciplinary action within the year preceding the application date.
- 1557 • Shall be a staff sergeant (E-5) or above to hold the position of game warden.

1558 Applications will be issued by the HPM or Chief Game Warden. The applicant’s AF Form 110, Individual
 1559 Incident Reference Record, AF-Form 1313, Driver Record, will be screened for any prior significant
 1560 violations. Once reviewed, the applications will be forwarded to the 9 MSG/CD, Chief Game Warden, and
 1561 9 SFS and a determination will be made. If denied the privilege to become a Game Warden, the application
 1562 will be returned to the individual, with specific reasons indicated.

1563 Game wardens are authorized to operate private vehicles off roads only when necessary to perform essential
 1564 game warden duties. Off-road travel will be minimized and limited to established roads as much as possible.
 1565 When off-road travel is necessary, wardens will ensure the ground is firm enough to prevent rutting before
 1566 leaving established roads. Vehicles equipped with catalytic converters will avoid fire risk areas.

1567 Game wardens must maintain a current and complete log of warden activities to submit to 9 CES/CEIE.
 1568 This information will include, but is not limited to the following: patrols conducted, calls received, deer
 1569 fatality (age, weight, sex, location, cause of death), fatality date of other species. Information should be
 1570 documented and provided to 9 CES/CEIE within one week.

1571 Game Wardens are authorized free hunting and fishing permits for Beale AFB. No other special privileges
 1572 are authorized based solely on status as a Game Warden.

1573 Reporting of vehicle/deer strikes is essential to the deer management program. Deer fatalities should be
 1574 reported as soon as possible to 9 CES/CEIE-HPM. The reporting of incidents involving deer kills by
 1575 automobiles or other causes will be handled in the following manner:

- 1576 • If a citizen’s complaint is received, the Security Forces desk sergeant will make a determination
 1577 whether or not to dispatch a patrol to investigate the incident. In addition, a base Game Warden
 1578 may be notified to respond to assess the situation and terminate the animal if necessary.
- 1579 • If the incident is reported directly to a base Game Warden, the warden will notify the 9th Security
 1580 Forces Law Enforcement Desk (634-2131) and advise them of the incident as soon as possible. If
 1581 necessary, Security Forces personnel may be dispatched to assist and record the circumstances.

1582 **7.3.2 Source of Authority for Natural Resources Law Enforcement**

1583 Per the Sikes Act, the DoD is permitted to enforce all federal natural resource laws on military installations.
 1584 Per AFMAN 32-7003, Commanders are responsible for enforcement of state and federal fish and game
 1585 laws on AF installations. Hunting and fishing are IAW CCR Title 14; however, base regulations take
 1586 precedence when more stringent than California law. Beale AFB has exclusive jurisdiction over all lands
 1587 within the base boundary (JA 1985), and as such is responsible for enforcing all laws and regulations within
 1588 that area.

1589 In an area of exclusive jurisdiction, if an offense occurs that does not have a federal statute to cover it, Title
 1590 18 USC Section 13, known as the Assimilative Crimes Act, allows a federal officer or agent to assimilate
 1591 an applicable state law in federal court.

1592 **7.3.3 Training and Certification Requirements for conservation law Enforcement personnel**

1593 AFMAN 32-7003 states that the Commander may designate military and civilian personnel as fish and
 1594 wildlife law enforcement officers only if those persons have been certified in conservation law enforcement
 1595 through successful completion of the LMPT course at FLETC or, alternatively, have been commissioned
 1596 as a fish and wildlife conservation officer in the state where the installation is located. Law enforcement
 1597 personnel who do not possess either federal or state fish and wildlife enforcement certification can be used
 1598 to supplement fish and wildlife law enforcement under the direct supervision of certified personnel.
 1599 Historically, Beale AFB’s Hunting Program Manager and volunteer game wardens do not meet the
 1600 requirements in AFMAN 32-7003 Section 3.33.2, *Fish and Wildlife Law Enforcement by Air Force*
 1601 *Personnel* to perform conservation law enforcement duties.

1602 Volunteer game wardens will be chosen by the NRM, the 9 CES/CEIE Section Chief, and the Hunting
 1603 Program Manager, and signed off by either the CC or CD. Candidates must be a staff sergeant (E-5) or
 1604 above to hold the position of game warden. Acceptance will be based on career performance,
 1605 recommendations, and relevant experience. The 9 SFS will train volunteer game wardens on proper use of
 1606 the following forms: AF Form 52, *Evidence Tag*; AF Form 1668, *Field Interview*; and DoD Form 1805,
 1607 *Court Violation Notice*.

1608 **7.4 Management of Threatened and Endangered Species, Species of Concern, and Habitats**

1609 **Applicability Statement**

1610 This section applies to USAF installations that have threatened and endangered species on USAF property.
 1611 This section **IS** applicable to this installation.

1612 *Program Overview/Current Management Practices*

1613 The federal ESA (Title 16 U.S.C. §§1531-1544) requires military installations to protect and conserve
 1614 federally listed T&E plants and animals and their habitats. Section 7(a)(1) of the ESA states that all federal
 1615 departments and agencies shall utilize their respective authorities to conserve threatened and endangered
 1616 species. Conservation includes the use of all methods and procedures which are necessary to bring any T&E
 1617 species to the point where the measures pursuant to the ESA are no longer necessary. AFMAN 32-7003,
 1618 Section 3.38, *ESA Compliance*, requires that ESA candidate species and state listed species be given the
 1619 same protection afforded federally listed species when practicable and consistent with the military mission.
 1620 Species that do not fall into those categories may be monitored to inform resource managers of the status
 1621 of those species that are in danger of becoming listed on the base. Annual work plans and contracted/partner
 1622 inventories in the INRMP fulfill these requirements.

1623 **7.4.1.1 Status of Threatened and Endangered Species Inventories**

1624 AFD 32-70, Environmental Quality, further requires that all installations prepare and maintain a current
 1625 inventory of T&E species and habitats as part of the base habitat inventory. All surveys conducted for
 1626 species listed in this section will utilize the most current approved protocols, unless otherwise directed by
 1627 9 CES/CEIEC (Appendix H). See Appendix I for individual survey report listings.

1628 **7.4.1.2 Federally Threatened or Endangered Species**

1629 Baselines have been established for all federally T&E species present at either Beale AFB or LRS with the
 1630 exception of WYBC. A habitat assessment and presence/absence surveys for breeding WYBC were
 1631 conducted in 2018 and none were detected (Halterman 2018). 2021 is the third year of a five-year effort to
 1632 establish a baseline of WYBC presence, breeding status, and current population for Beale AFB. Habitat on-
 1633 base is of lower quality than nearby off-base sites, but there are unconfirmed records of sightings on base.
 1634 It is possible that this species uses habitat on Beale AFB during migration. The closest CNDDDB-recorded
 1635 occurrence is approximately 5.5 miles to the west of Beale AFB (CNDDDB 2018). There is no suitable
 1636 habitat on LRS.

1637 **7.4.1.3 Federal Candidate Species or Species under Review**

1638 Federal candidate species are those species for which USFWS or NMFS have conducted a 12-month status
 1639 review and determined that listing is “warranted but precluded” by species that are a higher listing priority.
 1640 The status of candidate species is re-evaluated annually. When practical, the base will provide protections
 1641 to federal candidates similar to those species afforded full protection under the ESA. Species that are “under
 1642 review” have a 90-day determination stating that there is sufficient information to indicate the listing “may
 1643 be warranted” and a determination will be made after a 12-month status review. Final decisions on status
 1644 can take years, and these species have no protection under the ESA.

1645 There are four species that have the potential to occur on Beale AFB that are currently under review for
 1646 listing under the ESA. Three of those species (monarch butterfly, WST and WPT) have been confirmed
 1647 present on Beale AFB, but WBB has not been documented during surveys. The WST has also been
 1648 confirmed to be present at LRS. The federal candidate species (monarch butterfly) was observed
 1649 incidentally on Beale AFB in June 2020, although no activity was observed during the 2020 survey. There
 1650 are no proposed species or species petitioned for federal listing with the potential to occur on Beale AFB
 1651 or LRS. Listing status for species found on Beale AFB is discussed in detail in Section 2.3.4. *Threatened
 1652 and Endangered Species and Species of Concern.*

1653 Baselines for federal review species help apprise 9 CES/CEIEC personnel in advance of possible ESA
 1654 listing, and implement management practices that may help to lessen the need for listing. Data from multiple
 1655 years of population surveys have been used to establish a population baseline on Beale AFB for the WPT,
 1656 a federal review species. A combination of habitat assessments and species surveys have concluded that
 1657 WPT likely does not use the limited habitat (a canal) that exists on LRS. Federal review species, the WST
 1658 and FYLF, are currently being inventoried. The FYLF is also a state candidate species for listing. FYLF
 1659 surveys were conducted in 2019 and 2020 with no detections. WST nighttime scouting was conducted in
 1660 2019 and 2020. Surveys using eDNA were planned for WST but the suspected breeding/sampling pools
 1661 did not fill in either year.

1662 The base is currently one year into a two-year survey for the federal review species, WBB and monarch
 1663 butterfly (Marty 2020). Though neither species was observed during the first year of sampling, the monarch
 1664 butterfly has been observed on base (Snow 2020).

1665 7.4.1.4 California T&E and FP Species

1666 Several state-listed species can be found on Beale AFB properties. Per AFMAN 32-7003, Section 3.38.2
 1667 *State Listed Species*, INRMPs provide for the protection and conservation of state listed protected species
 1668 when practicable and consistent with the military mission. Although this is not required by the ESA,
 1669 conservation measures will be implemented for species listed as T&E under the CESA when such protection
 1670 is not in direct conflict with the military mission. When conflicts occur, the base will consult with the
 1671 appropriate state authority to determine if any conservation measures can be feasibly implemented to
 1672 mitigate impacts.

1673 Of the state T&E species found on Beale AFB, only the state threatened California black rail has been
 1674 specifically monitored on the base enough to determine a baseline. The presence of this species has been
 1675 verified on the base by researchers from U.C. Berkeley and the Sierra Nevada Field Station (2002-2017).
 1676 The species was detected in 2002, 2003 2004, 2006, 2007, 2008, and 2009. Additional surveys in 2020 did
 1677 not detect any birds. USFWS took over surveys in 2021. Although surveys have continued for 16 years, the
 1678 species has not been detected on the base since 2009 and is feared to have been extirpated.

1679 Surveys for the state threatened TRBL were conducted in 2005 and 2015 and 2016 as part of a statewide
 1680 survey. The base does not have the final reports for this effort. An inventory of the TRBL began in 2018
 1681 with a habitat suitability assessment. TRBL surveys were conducted at suitable habitat (UC Davis Portal
 1682 colony locations and habitat modeled as medium to high suitability in CIRE report) in 2020 and 2021. This
 1683 species is observed on base in most years. Habitat restoration (pond enlargement and vegetation
 1684 improvement) is planned for Blackbird Marsh (formerly Clinic Pond) and Blackbird Basins (drainages and
 1685 weirs above Frisky Lake) that would benefit and attract TRBLs in the future. This restoration is intended
 1686 to satisfy mitigation requirements for a 2015 MBTA violation in which active TRBL nesting habitat and
 1687 nests were destroyed.

1688 Surveys for the state endangered/federally threatened WYBC on Beale AFB were conducted in 2018 in
 1689 areas considered suitable habitat (Halterman 2018). The species has not yet been confirmed on the base,
 1690 but there have been three unconfirmed observations.

1691 Surveys for state threatened Swainson's hawk are conducted on an as-needed basis to determine its presence
 1692 in or near proposed construction sites. There have been several nesting locations of this species reported on
 1693 Beale AFB. Sightings have also been reported at LRS.

1694 All other state listed/fully protected species are recorded as incidental sightings.

1695 7.4.1.5 **California State Candidate Species and SSC**

1696 The WBB is a candidate for state listing. Habitat assessments and surveys for the state candidate species
 1697 FYLF were conducted in 2016, 2017 and 2018. This species was not detected on the base during surveys
 1698 in 2020 (Marty 2020).

1699 There are several California SSC known to be present at Beale AFB, such as the western burrowing owl.
 1700 Several surveys have been conducted and artificial habitat has been created for this species. More study is
 1701 needed to determine if the species is benefitting from the base’s efforts, and artificial burrows are in need
 1702 of maintenance and possible relocation to avoid creating a BASH concern, as many of the burrows are
 1703 located within the WEZ. There are no reported western burrowing owls at LRS.

1704 Inventory of the western red bat, a California SSC, is ongoing as part of general bat surveys at Beale AFB.
 1705 The species was first verified on base in 2004 (Heady 2004). Bat surveys have been conducted in 2004,
 1706 2014, 2015, 2016 and 2017. Bat surveys have also detected two other SSC, the pallid bat and Townsend’s
 1707 big-eared bat.

1708 While the designation of SSC does not confer any regulatory protections, Beale AFB attempts to improve
 1709 habitat for multiple species when possible, and many of these species may benefit from efforts to improve
 1710 more imperiled species’ habitats.

1711 7.4.1.6 **Special-Status Plants**

1712 Beale AFB and LRS are surveyed annually for plants with a California Rare Plant Rank of 1B (Rare,
 1713 Endangered) or 2B (Endangered in CA) and 4.2 (limited distribution in California) with a likelihood of
 1714 occurring on either property. The number listed after the decimal point designates the level of threat within
 1715 the ranking. For example, a ranking with a designation of .1 indicates that it is seriously threatened (over
 1716 80% of occurrences threatened), while a designation of .2 is moderately threatened (20-80% threatened).
 1717 The following plants have been or are currently being surveyed on Beale AFB.

- 1718 • Surveys for legenera (1B.1) were conducted in 2008, 2010, 2012, 2016 and 2018. The plant was
 1719 detected in two pools during all surveys except in 2008.
- 1720 • Dwarf downingia (2B.2) has been recorded on Beale AFB during rare plant surveys that have
 1721 generally targeted legenera, since they can be found in similar habitats.
- 1722 • Stinkbells (4.2) were detected in 2018 on Beale AFB during rare plant surveys.
- 1723 • Hogwallow starfish (4.2), also called dwarf dwarf cudweed, was detected in 2016 on Beale AFB
 1724 during rare plant surveys.
- 1725 • Veiny monardella (1B.1), Brazilian watermeal (2B.3) Brandegee’s clarkia (4.2), Layne’s ragwort
 1726 (*Packera layneae*) and Hartweg’s golden sunburst (*Pseudobahia bahiafolia*) have potential to
 1727 occur but have not been detected.

1728 California Rare Plant Ranks do not confer any regulatory obligations or protections; however, an
 1729 understanding of at-risk species enables resource managers to make better management decisions.

1730 7.4.2 *Ongoing Threatened and Endangered Monitoring Programs*

1731 The performance standard for all species listed here, unless otherwise noted, is to maintain or increase the
 1732 population of the species on the base in alignment with USFWS Recovery Plans and ESA Section 7a1
 1733 requirements. Survey protocols, where established, may be found in Appendix H.

1734 7.4.2.1 **Vernal Pool Crustaceans**

1735 • Vernal pool tadpole shrimp—Federal Endangered

1736 • Vernal pool fairy shrimp—Federal Threatened

1737 Surveys are conducted at least every other year in approximately 100 vernal pools within Beale AFB's
 1738 Conservation Areas. Eighty locations were selected randomly each year along with 20 reference pools
 1739 known to support adult fairy or tadpole shrimp from prior years. These reference pools were located in the
 1740 Conservation Areas. Beale AFB also conducted dry season surveys in 1996, 2005-10, 2012, and 2015/16
 1741 to determine if cysts were present. This allowed the base to better study the presence or absence of shrimp
 1742 within the vernal pool landscape and compare results to wet season surveys. Sampling is conducted during
 1743 the early, middle, and late portions of the wet season. Surveys will be discontinued as sufficient baseline
 1744 data has been collected.

1745 Going forward, Beale AFB may opt to survey pools on the base or LRS if there is a need for surveys prior
 1746 to a construction project. Data derived from these surveys assists project planners and enables design
 1747 engineers to minimize impacts to valuable vernal pool invertebrate habitat when possible. In general, all
 1748 pools with habitat conditions suitable for federally listed crustaceans must be protected under Section 7
 1749 consultations unless data is available to show the pool isn't suitable.

1750 No other monitoring is planned. If future management questions or actions may affect vernal pool
 1751 crustaceans, a monitoring program may be developed to track effects/success.

1752 Management of vernal pool crustaceans is primarily through management of their habitat. Cattle grazing is
 1753 an ongoing management priority as it provides beneficial impacts to vernal pool grasslands (see Marty
 1754 2005, 2015). Additionally, implementation of Beale AFB's new IPSMG (Hopkinson 2017a) should benefit
 1755 vernal pool habitat where implemented to control invasive plants that access deep soil water resources like
 1756 yellow star-thistle, which can have tap roots extending four feet or more (DiTomaso et al. 2013). Yellow
 1757 star-thistle control around the airfield and airfield approach in 2015 may have had some beneficial effects,
 1758 but ongoing treatments are only occurring in the immediate vicinity of the airfield. Future management
 1759 activities could include a reoccurring survey to identify, investigate, and remedy threats to vernal pool
 1760 habitats around the base. Currently this is only done when observed during non-target surveys.

1761 Beale AFB also conducts dry season crustacean surveys every other year to determine if cysts are present.
 1762 This allows the base to better study the presence or absence of shrimp within the vernal pool landscape as
 1763 it is believed by some to be a more reliable form of detection because it is not as dependent on timing as
 1764 habitat conditions.

1765 Surveys are conducted as needed at LRS.

1766 7.4.2.2 **Valley Elderberry Longhorn Beetle (VELB)—Federal Threatened**

1767 Surveys for this species occurred in 1998, 2005, 2013, and 2015, 2016, and 2021. From 2021
 1768 onward, surveys for VELB are scheduled to be conducted every year on approximately 100 randomly
 1769 selected elderberry shrubs Basewide. These surveys monitor the condition of each shrub to determine
 1770 physical conditions (e.g., alive, dead, robust or senescent) and establish a general index of live-stem
 1771 abundance (number and width of stems greater than 1-inch diameter at ground level). The presence and
 1772 relative age of exit holes is also recorded. Individual physical tags and geodatabase tags are added for each
 1773 elderberry surveyed. These surveys occur in late spring or early summer. Starting in 2018, surveys include

1774 an investigation of threats and recommendations for habitat improvement. Additional GIS data were
1775 gathered in 2020 to update elderberry location data.

1776 Management plans for the VELB should include planting elderberry in existing elderberry stands with
1777 known VELB presence to ensure continuous VELB recruitment to maturing elderberry shrubs. The highest
1778 priority for conserving this species should be placed on preventing loss of elderberry plant stands through
1779 catastrophic events such as drought or wildfire (Dobbins and Holyoak 2021). Additional vectors of damage
1780 or death to elderberry shrubs include cattle breakage and vole girdling. For elderberry shrubs in agricultural
1781 areas with grazing cattle, hog panels are used to prevent cattle damage. For plants damaged by voles,
1782 removing weeds around the plants can reduce vole inhabitation (Desrochers and Segoiun, 2014).
1783 Additionally, preventative weed whacking of herbaceous vegetation surrounding plants known to contain
1784 VELB is recommended.

1785 Although few of Beale AFB's elderberry are near heavily-used roads, for those plants that are exposed to
1786 dust deposition, road maintenance and traffic limitation can reduce exposing the insects to dust. Dirt paths
1787 used by recreational foot traffic or off road vehicles are often the largest contributors to dust deposition on
1788 elderberry plants (Talley and Holyoak 2006). Monitoring for the Argentine ant and controlling its spread
1789 will be important in preventing the decline of the VELB (Huxel 2000). Removal of invasive plants like the
1790 black locust (*Robinia pseudoacacia*), giant reed, and smallflower tamarisk (*Tamarix parviflora*) helps to
1791 ensure survival of the host, elderberry plants (Talley et al. 2006).

1792 7.4.2.3 Monarch Butterfly—Federal Candidate

1793 The base has begun planting native milkweed in areas that may be beneficial to monarch butterflies.

1794 Locations will be tracked in the GIS geodatabase. A one-time, baseline monarch survey is needed at Beale
1795 AFB and LRS to acquire information about the species' status, distribution, habitat availability, and threats.
1796 Surveys will include habitat assessments and mapping native milkweed plants. Incidental sightings are
1797 reported via Beale AFB's Incidental Wildlife Report form. Once baseline data is collected, established
1798 Environmental Impact Assessment Process (EIAP) procedures and minimization measures will be
1799 developed to limit impacts from military activities. Newly planted milkweed areas will be monitored for
1800 up to three years post-planting to document any subsequent use by monarchs. All known populations
1801 (natural or planted) of host plants and/or overwintering areas will be checked on a re-occurring basis for
1802 monarch presence/absence, impacts, and threats at least once every three to five years or another frequency
1803 outlined in standard protocols from CDFW or USFWS. Annual monarch surveys will initially be conducted
1804 by the Xerces Society in partnership with Washington State University as part of a DoD Legacy project to
1805 acquire a baseline of the species' status on Beale AFB. Future surveys will be conducted by qualified
1806 individuals. Timing and survey protocol will follow the best available recommendations established.

1807 7.4.2.4 Western Bumble Bee—Federal Review/California Petitioned for Listing

1808 Annual WBB surveys and habitat assessments were initiated in 2020 and will be conducted for five years
1809 to acquire a baseline of the species' status on Beale AFB and LRS. These surveys include the newly planted
1810 native pollinator restoration sites. . Incidental sightings are reported via Beale AFB's Incidental Wildlife
1811 Report form. As of 2020, no WBBs have been observed on Beale AFB or LRS (Marty 2020).

1812 In the event that WBBs are found on base, the USAF Pollinator Reference Guide can be utilized to
1813 determine the appropriate steps that need to be taken. Section 1.B.2 outlines the process for addressing
1814 federally protected pollinator species (U.S. Fish and Wildlife Service 2007). WBBs will benefit from
1815 general pollinator habitat enhancement occurring on base. Best practices for the western bumble bee include

1816 increasing habitat connectivity, increasing floral resources, and reducing chemical applications (Goulson
 1817 et al. 2015). Honey bees are non-native, domesticated, and largely responsible for spreading the parasite
 1818 *Nosema bombi*, which has had detrimental impacts on bumble bee populations (Kent et al. 2018). As such,
 1819 in the case that WBB is observed on base, managers may consider removing honey bee hives and/or
 1820 prohibiting new honey bee hives in an effort to protect native bee populations.

1821 **7.4.2.5 Giant Gartersnake—Federal Threatened/California Threatened**

1822 Presence of GGS has not been confirmed on base, though suitable habitat exists and there was one
 1823 unconfirmed sighting in 2005. The population baseline for GGS was acquired from surveys that occurred
 1824 in 2005-2016 and 2018. No GGS was captured as a result of surveys. This trapping effort is substantial
 1825 enough, given the known distribution of the species to determine that, while some habitat components may
 1826 be present, the GGS is not likely to be present on Beale AFB at this time. New technologies such as eDNA
 1827 or trained dogs will be used to further examine possible presence of this species. If these new methods do
 1828 not detect GGS, Beale AFB will engage with USFWS to reduce or eliminate conservation and Section 7
 1829 requirements along Reeds Creek under past Section 7 consultations that require water diversions to Reeds
 1830 Creek (NLAA #81420-2011-I-0776-2). As of 2021, GGS are no longer included in consultation with
 1831 USFWS.

1832 There is suitable habitat for this species at LRS; however, there have been no detections to date, and surveys
 1833 have not been conducted at this location since 2005.

1834 **7.4.2.6 Western Pond Turtle (WPT)—Federal Review/California SSC**

1835 Eight years of surveys (2010-2018) have been conducted for WPT and a baseline has been acquired. Habitat
 1836 assessments have identified several wetlands that provide suitable habitat. A “Plan for Non-Native Red-
 1837 Eared Slider and American Bullfrog Control, Beale AFB” was completed in 2017 (CEMML 2017c) and is
 1838 being implemented. Additional surveys will only be conducted after habitat modifications or improvements
 1839 to determine the species’ response to modifications or improvements. Incidental sightings are recorded via
 1840 Beale AFB’s Incidental Wildlife Report form.

1841 An assessment in 2017 determined that LRS had only moderately suitable habitat for WPT, and no
 1842 detections have been made. Additional surveys are not planned.

1843 **7.4.2.7 California Red-legged Frog—Federal Threatened/California SSC**

1844 Based on a 2006 reptile and amphibian survey of the base, it is believed that California red-legged frogs
 1845 were likely historically present but are presumed extirpated (EDAW 2006). Assessments have determined
 1846 that any structurally suitable habitat for this species on Beale AFB is rendered unsuitable by the presence
 1847 of bullfrogs and their easy access to suitable pools (Bumgardner Biological 2007). Surveys may be
 1848 conducted every five years, if habitat conditions change. If this species is found on Beale AFB, survey
 1849 timing will be re-evaluated. Incidental sightings are recorded via Beale AFB’s Incidental Wildlife Report
 1850 form.

1851 **7.4.2.8 Foothill Yellow-legged Frog—Federal Review/California Candidate/California**
 1852 **Endangered**

1853 A habitat assessment was conducted in 2017 and suitable FYLF habitat identified (CIRE 2017). Surveys in
 1854 2008 and 2017 produced no detections of the species. Annual FYLF surveys will be conducted for five
 1855 years to establish a baseline. Incidental sightings are recorded on Beale AFB’s Incidental Wildlife Report
 1856 form. New technologies such as eDNA may be used to further examine possible presence of this species.

1857 7.4.2.9 **Western Spadefoot—Federal Review/California SSC**

1858 Several surveys have been conducted for WST with no visual confirmation of presence. In 2017 acoustic
 1859 monitors were used and the species was detected (CIRE 2017). In 2018 faint calls were heard at three
 1860 locations on Beale AFB (H.T. Harvey et al. 2018a). WST is known to use the area surrounding LRS.
 1861 Acoustic surveyors heard calling from within the site, and photographed WST on the road just outside of
 1862 the site in 2018 (H.T. Harvey et al. 2018a). Annual WST surveys continued for five years (2016-2020) to
 1863 establish a baseline. Incidental sightings are recorded on Beale AFB’s Incidental Wildlife Report form.
 1864 New technologies such as eDNA may be used to further examine possible presence of this species.

1865 7.4.2.10 **Salmonids**

- 1866 • Steelhead (Central Valley DPS)—Federal Threatened
- 1867 • Chinook Salmon (Central Valley spring-run ESU)—Federal Threatened
- 1868 • Chinook Salmon (Central Valley fall/late fall-run ESU)—Federal SoC/California SSC

1869 Through 2018, annual salmonid surveys were conducted in appropriate habitat along Dry Creek and Best
 1870 Slough. A project conducted in cooperation with the USFWS removed the Beale Lake dam (fish ladder) in
 1871 2019-20 to improve upstream passage of steelhead to the SWA. The SWA has the most suitable water
 1872 temperature conditions for summer steelhead rearing in Dry Creek (USFWS 2016c). This habitat
 1873 modification will require continued surveillance for the species above and below the dam site for five years
 1874 to determine the response to the modification. Snorkel surveys are conducted in spring and will take place
 1875 four to six times each year.

1876 7.4.2.11 **Yellow-billed Cuckoo (Western DPS) (WYBC)—Federal Threatened/Federal
 1877 BCC/California Endangered**

1878 Five years (2018-2022) of WYBC surveys will be conducted to acquire a baseline of the species’ status on
 1879 Beale AFB. Survey protocol requires four complete surveys between mid-June and mid-August at 14-day
 1880 (+/- 3 days) intervals (Haltermann 2018). Incidental sightings are reported via Beale AFB’s Incidental
 1881 Wildlife Report form.

1882 Management of the species will include protection of individuals under ESA Section 7 requirements. The
 1883 WYBC is currently included in a draft PBA, which has not yet been submitted to the USFWS.

1884 There is no suitable habitat for this species at LRS.

1885 7.4.2.12 **Tricolored Blackbird (TRBL) —Federal BCC/California Threatened/ DoD-PIF MSPBS**

1886 Tricolored blackbird is known to occur on Beale AFB, but a baseline has not yet been established. Annual
 1887 TRBL presence/absence and nesting surveys will be conducted for five years to establish a baseline and
 1888 establish known areas of use (2019-2023). A habitat suitability assessment was conducted in 2017 (CIRE
 1889 2017). This species presents a possible BASH risk and will be monitored regularly for nesting or foraging
 1890 near the flightline. Sightings from the annual Audubon Christmas Bird Count are recorded as well as
 1891 incidental sightings on Beale AFB’s Incidental Wildlife Report form.

1892 In 2018, Beale AFB initiated efforts to improve and create new TRBL habitat to off-set impacts to the
 1893 species in 2015 (see Section 7.4.6). Suitable sites were selected in 2019 along with completion of habitat
 1894 improvement designs and NEPA planning. Habitat improvements are still in planning/permitting stage and
 1895 implementation is planned for 2023. Monitoring will continue for five years to measure response and
 1896 success of the habitat improvements.

1897 7.4.2.13 **Bald Eagle—Federal Delisted/Federal BCC/Federal BGEPA/California**
 1898 **Endangered/California FP/ DoD-PIF MSPBS**

1899 Bald eagle sightings are regularly recorded when observed during the annual Audubon Christmas Bird
 1900 Count and every other year during the Winter Raptor Survey. Incidental sightings are recorded via Beale
 1901 AFB’s Incidental Wildlife Report form.

1902 7.4.2.14 **Golden Eagle—Federal BCC/Federal BGEPA/California FP/DoD-PIF MSPBS**

1903 Sightings are recorded from the annual Audubon Christmas Bird Count and every other year from the
 1904 Winter Raptor Survey. Incidental sightings are recorded via Beale AFB’s Incidental Wildlife Report form.

1905 7.4.2.15 **California Black Rail—Federal BCC/California Threatened/California FP/ DoD-PIF**
 1906 **MSPBS**

1907 Surveys for this species have been conducted yearly from 2002-2018 by UC Berkeley. Additional surveys
 1908 were contracted by Beale AFB in 2016 and 2018. UC Berkeley also completed a habitat suitability model.
 1909 Black rails have been detected at Goose Lake, PAVE PAWS pond, and CATM pond in the past; but no
 1910 detections have been made on Beale AFB property since 2009. Researchers from UC Berkeley are
 1911 continuing to study the bird on Beale AFB, surveying the same locations they have in the past. 2018 surveys
 1912 by H.T. Harvey in new areas of the base (within habitat mapped as suitable by UC Berkeley) found lack of
 1913 suitability. Beale AFB will update its habitat maps once this report is received and conduct further
 1914 assessments at Goose Lake, PAVE PAWS pond, and CATM pond (if not included in 2018 assessment) as
 1915 needed to determine if further modifications are possible to improve or further protect this habitat. New
 1916 habitat assessments may be needed after various dams on the base are repaired. Beale AFB is currently
 1917 looking for opportunities to enhance habitat for this species.

1918 The new GMG (2017) discusses the black rail in the context of grazing management. From March through
 1919 July (or as long as livestock are present—likely March-May), Beale AFB will monitor spring cover in Beale
 1920 AFB’s black rail breeding marsh habitat (Goose, PAVE PAWS, and CATM pond) and reduce grazing in
 1921 those areas if spring vegetation cover falls below 60% of normal levels (see GMG 2017, Section 9.1).
 1922 Richmond et al. (2012) recommend minimizing grazing impacts to black rails in non-irrigated marshes by
 1923 excluding livestock or limiting livestock use with alternative water sources. Fall residual dry matter (RDM)
 1924 monitoring in California black rail marsh habitat does not adequately characterize spring marsh vegetation
 1925 cover, critical for black rail breeding success (Richmond et al. 2012).

1926 Black rail habitat at PAVE PAWS pond was fenced to exclude cattle grazing to benefit rail habitat
 1927 conditions. Beale AFB began excluding cattle from other known locations for black rails (CATM pond and
 1928 Goose Lake) in 2002.

1929 7.4.2.16 **Swainson’s Hawk—Federal BCC/California Threatened**

1930 Surveys for this species are not regularly conducted. Annual Swainson’s hawk surveys will be conducted
 1931 for five years to establish a baseline. Surveys will include habitat assessments as needed and will utilize
 1932 established protocols from CDFW. This raptor is only present during the breeding season, and so
 1933 observations are not captured in the annual Audubon Christmas Bird Count or the Winter Raptor Survey
 1934 that occurs every other year. This species is known to nest on Beale AFB. It has also been reported at LRS.
 1935 Incidental sightings of the species are recorded on Beale AFB’s Incidental Wildlife Report form.

1936 7.4.2.17 **Greater Sandhill Crane—California Threatened/California FP**

1937 Incidental sighting reports indicate that the greater sandhill crane is sporadically present at Beale AFB. Its
 1938 status is unknown at LRS. No surveys are currently being conducted for this species specifically; however,
 1939 annual Audubon Christmas Bird Count observations are recorded as incidental sightings on Beale AFB's
 1940 Incidental Wildlife Report form.

1941 7.4.2.18 **White-tailed Kite—California FP**

1942 Incidental sighting reports indicate that the white-tailed kite is present at Beale AFB. Its status is unknown
 1943 at LRS. No surveys are currently being conducted for this species specifically; however, sightings are
 1944 recorded from the annual Audubon Christmas Bird Count and every other year from the Winter Raptor
 1945 Survey. Incidental sightings are recorded via Beale AFB's Incidental Wildlife Report form.

1946 7.4.2.19 **Peregrine Falcon—Federal Delisted/Federal BCC/California Delisted/California FP**

1947 Peregrine falcon observations are recorded when observed during the annual Audubon Christmas Bird
 1948 Count as well as every other year during the Winter Raptor Survey. Incidental sightings are recorded via
 1949 Beale AFB's Incidental Wildlife Report form

1950 7.4.2.20 **Ringtail—California FP**

1951 Surveys have not been conducted for this species on Beale AFB or LRS, though scat was detected in the
 1952 Dry Creek area in 2000. If a planned project has the potential to impact the species, ringtail surveys will be
 1953 conducted prior to commencement of the project to determine presence. Presently, surveys are not planned
 1954 due to other priorities.

1955 7.4.2.21 **Species of Concern**

1956 The fall/late-fall run Chinook salmon is the only federal SoC that occurs on the base, it is also a California
 1957 SSC (see Section 7.4.2.10, *Salmonids*). There are an additional 18 California SSC that have the potential to
 1958 occur on the base, 14 of which have been confirmed present. Only WST have been confirmed present on
 1959 the LRS. Many of the SSC have additional conservation designations that can be found in Table 2-10 in
 1960 Section 2.3.4 *Threatened and Endangered Species and Species of Concern*. Very few SSC are regularly
 1961 monitored with the exception of the western burrowing owl, pallid bat, Townsend's big-eared bat, western
 1962 red bat and fall-run Chinook salmon.

1963 • Western Burrowing Owl—Surveys for this species have been conducted for several years (2010,
 1964 2013, 2015, 2016 and 2018); however, a more thorough baseline dataset is needed. Winter and
 1965 breeding surveys are conducted every other year but tend to focus on locations where artificial
 1966 burrows were installed. Future monitoring efforts will identify all known locations on Beale AFB
 1967 and LRS. Annual Audubon Christmas Bird Count observations are recorded as are those for the
 1968 Winter Raptor Survey conducted every other year. Incidental sightings are recorded on Beale
 1969 AFB's Incidental Wildlife Report form.

1970 ◦ Seventeen artificial burrows have been installed on the base but have not received any
 1971 maintenance. Many of these burrows have not been rediscovered in recent years and are
 1972 assumed to be unusable, likely due to partial burial from gophers or other burrowing mammals.
 1973 Most of the artificial burrows were installed in areas west of the flightline and within the WEZ.
 1974 These should be relocated to an area that will not interfere with flight operations. All burrows,
 1975 present and future, will be maintained on an annual to biannual basis. Maintenance will include
 1976 soil management such as soil accumulation removal if gophers or voles bury burrow entrances,

1977 as well as vegetation management to keep vegetation growth low and sparse as is preferred by
 1978 burrowing owls (Klute et al. 2003).

1979 • Non species-specific bat surveys were conducted in 2004, 2014, 2015, 2016, 2018 and 2020. In
 1980 these surveys, pallid bats, Townsend’s big-eared bats, and western red bats have all been detected.

1981 ◦ The first bat surveys were conducted in 2004. Surveys did not resume until 2014 and were
 1982 conducted in 2015 and 2016. All three surveys used different methodologies to answer various
 1983 questions about specific species and their use of the landscape. Internal bat habitat data
 1984 (temperature and humidity via data loggers) were collected in 2017 to assess existing
 1985 conditions in known roosts and an artificial roost that is not being used. A Bat Monitoring
 1986 Protocol was developed in 2016 (H.T. Harvey & Associates 2016) and was first implemented
 1987 in 2018, including targeted acoustic surveys for western red bat in woodland habitats along
 1988 Best Slough. Acoustic monitors will record for 30 days in May, July, and September every
 1989 other year for five years (until 2026). Once baseline data collection is complete in 2026,
 1990 monitoring will stop. If management activities that could improve habitat or address threats to
 1991 the species are identified during monitoring surveys, the INRMP will be updated. Ongoing
 1992 surveys will utilize the 2016 monitoring protocol developed for the base unless otherwise
 1993 directed by 9 CES/CEIEC.

1994 ◦ The bat species found on Beale AFB congregate in cavernous locations like the abandoned
 1995 buildings and attics and show high fidelity to such sites (returning year after year). Bats will be
 1996 surveyed using exit counts at summer day roosts and visual counts at winter roosts
 1997 (hibernacula), if present. (Townsend’s big-eared bat is considered a “whisper bat,” so it is
 1998 sometimes missed during acoustic surveys [Loeb et al. 2015], which are not recommended for
 1999 this species.)

2000 Radio transmitters can be attached to female Townsend’s big-eared bats to facilitate radio telemetry
 2001 identification of the maternity colony or any day roosts. Once roost sites have been identified, exit counts
 2002 at summer day roosts can be conducted during fair weather (above 50°F at night with no precipitation and
 2003 mild to no wind) for two days in each of two periods (the first between early May and mid-June before
 2004 young are born, and the second between mid-August and the end of September, after the year’s young
 2005 become volant). Only exit counts can be conducted during summer; conducting visual roost surveys (i.e.,
 2006 counting bats inside the area in which they are roosting) during the summer maternity season should always
 2007 be avoided. The females of this species are known to abandon their newborns and juveniles when disturbed
 2008 during the breeding season. Surveys can be conducted every other year, with data compared among years
 2009 after the third dataset has been collected, to identify population trends. Additionally, visual surveys can be
 2010 conducted no more often than once a year to minimize disturbance (Kunz 2003).

2011 *7.4.3 Current Biological Opinions and Consultations for T&E Species and Their Terms and Conditions*

2012 Table 7-2 shows the current Biological Opinions (BOs) and Not Likely to Adversely Affect Findings
 2013 (NLAAs) that have been issued by or received concurrence from the USFWS at the installation. Copies of
 2014 these documents may be requested from 9 CES/CEIEC. A common term and condition of the BOs received
 2015 by Beale AFB from USFWS is the preservation of or restoration/creation of vernal pools to protect them
 2016 from development in perpetuity. It is Beale AFB’s intention to honor this condition to the greatest extent
 2017 possible; however, only the U. S. Congress has the authority to make such an agreement. Therefore, should
 2018 protections for vernal pools created, restored, or preserved under BOs be altered due to mission essential
 2019 activities, Beale AFB will re-initiate consultation under Section 7.

Table 7-2. Past and current USFWS consultations for T&E species.

Project Name	Type	Concurrence Date	USFWS Concurrence Number	Species	Direct Impacts (acres)	Indirect Impacts (acres)	Terms and Conditions
Anti-Terrorism/Force Protection (AT/FP) Upgrades	BA	21 Sep 2004	1-1-04-F-0294	VPFS, VPTS, VELB	23.33	7.11	Preserve: 60.44 acres VP Habitat Restore/create: 23.33 acres VP habitat. (on-base)
Wing Infrastructure Development Outlook (WINDO) amendment	BA	10 Nov 2005	1-1-06-F-0008	VPFS, VPTS	7.1	0.72	Preserve: 2.54 acres VP Habitat Restore/create: 0.55 acres VP habitat. (on-base)
Combat Arms Training and Maintenance Facilities Upgrade	NLAA	10 Apr 2008	81420-2008-I-0945-1	VPFS	—	—	Follow Avoidance and Minimization Measures (AMMs)
A St. Pond Expansion	BA	7 Aug 2008	81420-2008-F-1076-1	VPFS	0.162	0.061	Preserve: 0.446 acres VP Habitat Restore/create: 0.162 acres VP habitat. (on-base)
PAVE PAWS Water Main	NLAA	16 Sep 2008	81420-2008-I-1865-1	VPFS	—	—	Follow AMMs
Combined Gate Security Upgrades	BA	21 Oct 2008	81420-2008-F-1864-1	VPFS	0.261	0	Preserve: 0.522 acres VP Habitat Restore/create: 0.261 acres VP habitat. (on-base)
Golf Course Drainage Repair and Restoration	NLAA	27 Oct 2008	81420-2008-I-1824-1	VPFS	—	—	Follow AMMs
Land Based Water Discharge	NLAA	7 Jan 2009	81420-2009-I-0255-1	VPFS	—	—	Follow AMMs
Bridge #2627 Replacement	NLAA	15 Apr 2009	81420-2009-I-0591-1	VPFS	—	—	Follow AMMs
Kinder-Morgan Petroleum Pipeline Investigation	NLAA	30 Sep 2009	81420-2009-I-1160-1	VPFS	—	—	Follow AMMs
AFCOMAC Lightning Protection System	NLAA	27 Oct 2009	81420-2009-I-1309-1	VPFS	—	—	Follow AMMs
Vernal Pool Hydrology Study	NLAA	27 Oct 2009	81420-2010-I-0045-1	VPFS	—	—	Follow AMMs
Munitions Storage Area Road Widening,	NLAA	21 May 2010	81420-2010-I-0655-1	VPFS	—	—	Follow AMMs

Table 7-2. Past and current USFWS consultations for T&E species.

Project Name	Type	Concurrence Date	USFWS Concurrence Number	Species	Direct Impacts (acres)	Indirect Impacts (acres)	Terms and Conditions
Parking Lot Construction, and Bioreactor							
Communication Line Access Hole	NLAA	21 May 2010	81420-2010-I-0685-1	VPFS	—	—	Follow AMMs
Proposed Airfield Lightning Vault Replacement	NLAA	28 Mar 2011	08ESMF00-2012-I-0212	VPFS	—	—	Follow AMMs
Lightning Protection System for Communication Shelters	NLAA	24 May 2011	81420-2011-I-0414	VPFS	—	—	Follow AMMs
Monitoring Well Installation	NLAA	09 Jun 2011	81420-2011-I-0604-1	VPFS	—	—	Follow AMMs
Cathodic Protection	NLAA	08 Aug 2011	81420-2011-I-0604-1	VPFS	—	—	Follow AMMs
Lincoln Site 2011 Monitoring Wells Installation & Goat Grazing	NLAA	21 Sep 2011	81420-2011-I-0742-1	VPFS	—	—	Follow AMMs
Reeds Creek Restoration Plan	NLAA	21 Nov 2011	81420-2011-I-0776-1	VPFS, GGS	—	—	Monitor the site and flow of water through each of the levelers in order to maintain a combination of adequate water flow to satisfy GGS habitat requirements (3 cfm). (on-base)
Modifications to Reeds Creek Restoration Plan	NLAA	30 Aug 2012	81420-2011-I-0776-2	GGS, VELB, VPFS	—	—	Follow AMMs
Vernal Pool Hydrology Monitoring and Assessment Project	NLAA	07 Dec 2011	08ESMF00-2012-I-0055	VPFS, VPTS	—	—	Follow AMMs

Table 7-2. Past and current USFWS consultations for T&E species.

Project Name	Type	Concurrence Date	USFWS Concurrence Number	Species	Direct Impacts (acres)	Indirect Impacts (acres)	Terms and Conditions
Military Munitions Response Program (MMRP)	BA	10 Sept 2012	08ESMF00-2012-F-0464-1	VPFS	0.47	0	Preserve: 1.41 acres VP Habitat (on-base)
Flight Line Secondary Water Main Project	NLAA	16 Oct 2012	08ESMF00-2012-I-0557-1	VPFS	—	—	Follow AMMs
Building Demolition of the FSS Warehouse Bldg 2153	NLAA	04 Feb 2013	08ESMF00-2012-I-0556-1	VPFS	—	—	Follow AMMs
Contingency Well Improvements	NLAA	22 Mar 2013	08ESMF00-2013-I-0212	VPFS	—	—	Follow AMMs
Construct Warehouse District	NLAA	08 Jul 2013	08ESMF00-2013-I-0435	VPFS	—	—	Follow AMMs
Consolidate and Upgrade AFCOMAC	NLAA	09 July 2013	08ESMF00-2013-I-0336-1	VPFS	—	—	Follow AMMs
Base Wide Culvert Repair Project	NLAA	21 Aug 2013	08ESMF00-2013-I-0524	VPFS	—	—	Follow AMMs
Removal Action Activities GR592 Munitions Response Site (Golf Course)	NLAA	14 Nov 2013	08ESMF00-2013-I-0581-1	VPFS	—	—	Follow AMMs
Recology Green Rail Project	NLAA	26 Nov 2013	08ESMF00-2013-I-0575-1	GGs, VPFS, VPTS	—	—	Follow AMMs. USACE proponent for consultation.
Temporary Lodging Facility	BA	05 Dec 2013	08ESMF00-2013-F-0582-1	VPFS	0.007	0	Preserve: 0.021 acres VP Habitat (off-base at Colusa Basin Mitigation Bank)
Bridge 2710 and 2720 Replacement	NLAA	29 Jan 2014	08ESMF00-2014-I-0208-1	VPFS	—	—	Follow AMMs
Demolish Building 355	NLAA	31 Jan 2014	08ESMF00-2014-I-0207-1	VPFS	—	—	Follow AMMs
Lincoln Receiver Antenna Upgrades	NLAA	18 Apr 2014	08ESMF00-2014-I-0285-1	VPFS	—	—	Follow AMMs

Table 7-2. Past and current USFWS consultations for T&E species.

Project Name	Type	Concurrence Date	USFWS Concurrence Number	Species	Direct Impacts (acres)	Indirect Impacts (acres)	Terms and Conditions
New Distributed Common Ground System (DCGS)	BA	27 May 2014	08ESMF00-2014-I-0371	VPFS	0	0.132	Preserve: 0.396 acres VP Habitat (off-base at Gill Ranch)
ERP Site SD001 Soil Pile Removal	NLAA	10 Jun 2014	FF08ESMF00-2014-I-0426	VPFS	—	—	Follow AMMs
Flightline Stormwater Upgrade Project	NLAA	23 Jun 2014	FF08ESMF00-2014-I-0442	VPFS	—	—	Follow AMMs
Dry Creek Sanitary Sewer Line Upgrade Project	NLAA	02 Jul 2014	08ESMF00-2014-I-0452	VPFS	—	—	Follow AMMs
Four Bridges Replacement Project	NLAA	08 Jul 2014	08ESMF00-2014-I-0470	GGs, VPFS	—	—	Follow AMMs
Construct Common Mission Control Center Facility (CMCC)	NLAA	06 May 2015	08ESMF00-2015-I-0346	VPFS	—	—	Follow AMMs
ISR Campus Electrical Grid Repair Project	NLAA	06 May 2015	08ESMF00-2015-I-0347	VPFS	—	—	Follow AMMs
Airfield Windcone and Flightline Obstruction Lighting Project	NLAA	01 Jun 2015	08ESMF00-2015-I-0589	VPFS	—	—	Follow AMMs
Repairs for Wastewater Sub-basins 2, 3, and 5	NLAA	18 Sep 2015	08ESMF00-2015-I-1183	GGs, VELB, VPFS	—	—	Follow AMMs
Invasive Weed Control on Reeds Creek	NLAA	08 Oct 2015	08ESMF00-2016-I-0006	GGs, VELB, VPFS	—	—	Follow AMMs
Vernal Pool Hydrology Monitoring and Assessment Project 2018	NLAA	12 Jan 2018	08ESMF00-2018-I-0748-001	VPFS, VPTS	—	—	Follow AMMs
PGE Phase 1B Pole Replacement	NLAA	10 May 2018	08ESMF00-2018-I-2018-1	VPFS, VPTS	—	—	Follow AMMs

Table 7-2. Past and current USFWS consultations for T&E species.

Project Name	Type	Concurrence Date	USFWS Concurrence Number	Species	Direct Impacts (acres)	Indirect Impacts (acres)	Terms and Conditions
Site 17 Remedial Action	NLAA	12 Jun 2018	08ESMF00-2018-I-2212-1	GGs, VELB	—	—	Follow AMMs
Solar Well Installation and Trough Relocation	NLAA	03 Oct 2018	N/A	VPFS, VPTS	—	—	Follow AMMs
Repair Well Field Power Poles	NLAA	22 Mar 2019	08ESMF00-2019-I-1425-1	VPFS, VPTS	—	—	Follow AMMs
Consolidate and Upgrade ACOMAC (Revision)	NLAA	10 Apr 2019	08ESMF00-2019-I-10336-R001	VPFS	—	—	Follow AMMs
AT/FP Update	letter	n/a (notification only)	1-1-04-F-0294	VPFS, VPTS, VELB	—	—	Follow AMMs in original consultation
Air Force Flight Operations Multiple Installations Continental US	PBA	To be determined (TBD)	08ESMF00-2018-TA-1413-1	WYBC TRBL	—	—	TBD

AFCOMAC = Air Force Combat Ammunition Center; AMMs = avoidance and minimization measures; AT/FP = Anti-Terrorism/Force Protection; BA = Biological Assessment; cfm = cubic feet per minute; CMCC = Common Mission Control Center Facility; DCGS = Distributed Common Ground System; ERP = Environmental Remediation Program; FSS = Force Support Squadron; GGS = Giant Gartersnake; ISR = Intelligence, Surveillance, Reconnaissance; MMRP = Military Munitions Response Program; NLAA = Not Likely to Adversely Affect; PGE = Pacific Gas & Electric; USFWS: U.S. Fish & Wildlife Service; VELB: Valley Elderberry Longhorn Beetle; VP = Vernal Pool; VPFS = Vernal Pool Fairy Shrimp; VPTS = Vernal Pool Tadpole Shrimp; WINDO = Wing Infrastructure Development Outlook

2021 Past consultation strategies included the development and use of a Special Area Management Plan (SAMP;
2022 described in Section 7.6.2 *Permitting Strategies* in 7.6 *Wetland Protection* and Appendix B). The SAMP is
2023 used in this INRMP and by the Community Planner. The intent of the plan is to request a Regional General
2024 Permit from the USACE for a Section 404 permit, and then a Section 401 permit from the Regional Water
2025 Quality Board. Once this has been completed, it would supersede the HCMP. This process has been delayed
2026 but may be restarted. The SAMP-defined habitat quality and development categories identified for Beale
2027 AFB are retained in the PBA drafted for Beale AFB in 2018. The PBA has not yet been submitted for
2028 formal consultation. The PBA retains the principles of low, medium, and high quality habitat and
2029 development areas as defined by the IDP as Conservation Planning Category Areas (Figure 7-3), and
2030 includes them in a decision-making framework for level of effect determinations (i.e. projects within 250
2031 feet in high quality areas are more likely to conclude that a project will have adverse effects versus a not
2032 likely to adversely affect determination).

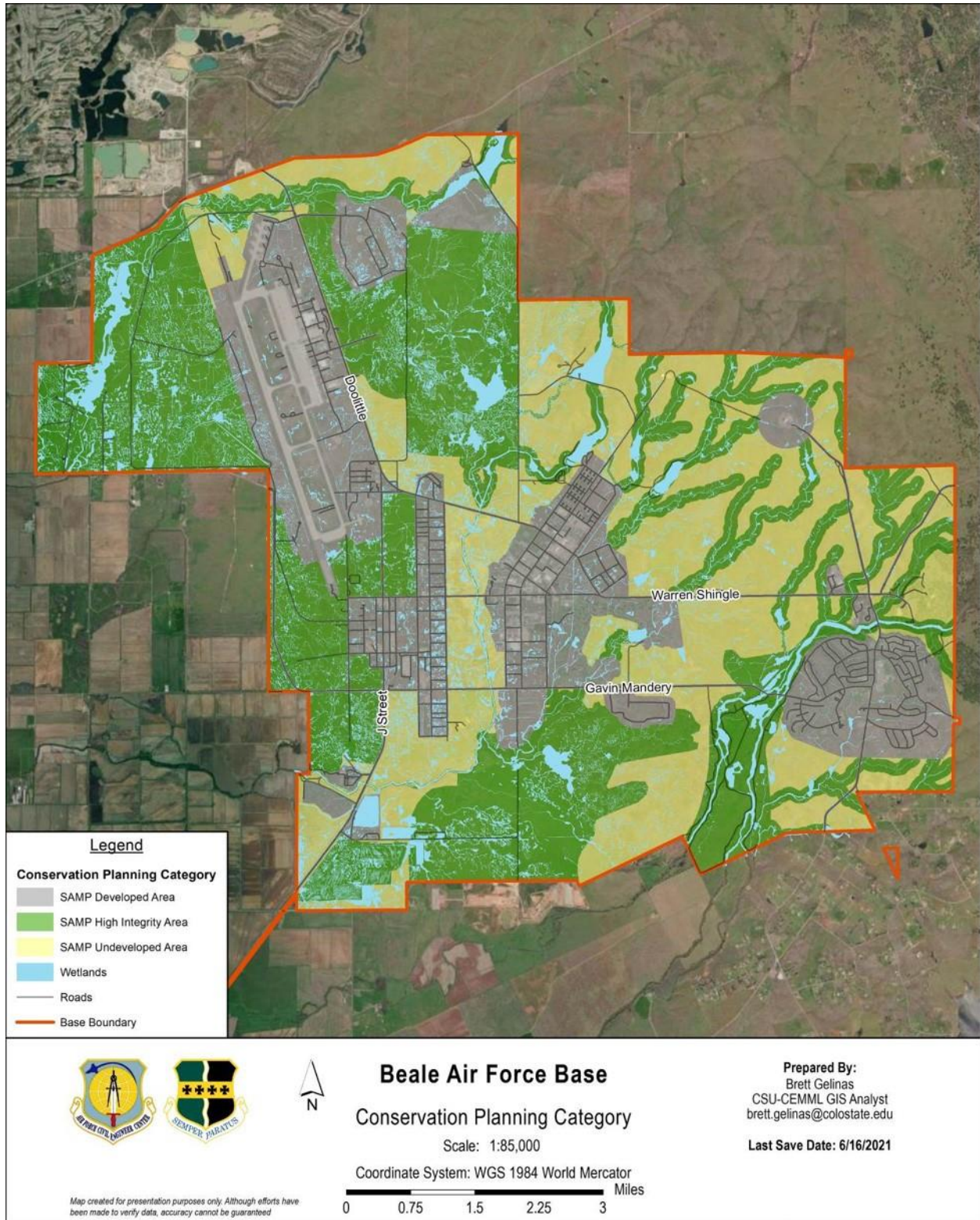
2033 7.4.4 *Health of Existing On-Installation Habitats of Concern*

2034 In 2010, an oak restoration study was done on Beale AFB. In this study, the health status of oak woodlands
2035 on Beale AFB was evaluated. Of the 17 sites that were evaluated, seven were rated “excellent” while five
2036 were rated “good.” Only the lower areas of Dry Creek to the southwest and southeast were rated less than
2037 “good” (“poor” and “fair,” respectively) (EM Assist 2010). Some bat roost sites may be susceptible to
2038 contamination by the fungus (*Pseudogymnoascus destructans* or Pd) that causes white-nose Syndrome.
2039 This fungus grows well in the cold temperatures and high humidities found in most roost sites. There is
2040 some risk of human-caused contamination of roost sites. Although the presence of Pd has not been
2041 confirmed on Beale AFB, measures will be taken to mitigate the risks of contamination as described in the
2042 California White-Nose Syndrome Action Plan (working draft, 2018) (Appendix J).

2043 In 2016, Beale AFB contracted H.T. Harvey & Associates to conduct riparian community surveys (H.T.
2044 Harvey & Associates 2017b). Using the CRAM, they found that the average score was above 87 (out of a
2045 maximum possible score of 100) and overall that the riparian community on Beale AFB is in good
2046 condition. Some suggestions to improve conditions further included managing invasive plant species and
2047 removing flow obstructions (such as notching Beale Lake dam, which was accomplished in 2020).

2048 The Institute of Ecohydrology has been monitoring and assessing vernal pools at Restoration Sites 1 and 2
2049 on the base. This assessment is measuring the success of the mitigation pools at each site and suggests
2050 remediation for pools that are not performing as well as expected. In a report from 2012, the Institute of
2051 Ecohydrology identified which pools might need remediation, and Beale AFB is attempting to make the
2052 necessary changes to these pools to ensure success.

2053 A vernal pool vegetation map and California Rapid Assessment Method (CRAM) evaluation of a selection
2054 of pools was completed for Beale AFB’s vernal pool communities in 2016 (Ayuda 2016). The average
2055 CRAM score was 81.0 out of a possible 100. Five vernal pool areas that were identified in the vernal pool
2056 habitat map were assessed, and stressors were identified in each of these areas that may negatively impact
2057 the functioning of the vernal pools. Stressors with the likelihood to have the greatest negative impact to the
2058 condition of the assessment area included grazing, invasive plants, intensive row-crop agriculture, flow
2059 diversions or unnatural inflows, and plowing/disking. The area with the most stressors was Assessment
2060 Area 1 (Ayuda 2016).



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2061

2062 Figure 7-3. Conservation planning categories used to determine project effects on natural resources (Beale
 2063 AFB GeoBase 2021).

7.4.5 *Relationship of Any On-Installation Habitats of Concern with Similar Local and Regional Critical Habitat*

Critical habitat under the ESA is defined as a specific geographic area(s) that consists of habitat features that are essential for the recovery of threatened and/or endangered species. It may include habitat that is not currently occupied by the species but that will be needed for the species to recover (USFWS 2017b).

Beale AFB is located within 4.5 miles of critical habitat established for Central Valley steelhead to the north of the base and approximately 6.5 miles of critical habitat for the same species to the west (CNDDDB 2018). This critical habitat is located in the lower Yuba River and Feather River respectively and is not directly connected to watersheds on Beale AFB; however, in times of high-water flow, it may be possible for steelhead to move into the base's watersheds. Adult salmonids have been located in waterways on the western side of the base during times of high-water flow. This is a concern because there is no breeding habitat in those waterways. Efforts have been made to capture any of these salmon found on base and relocate them to an appropriate waterway. The use of a weir may be needed in the future to eliminate this hazard to the fish.

Beale AFB contains more than 1,300 acres of vernal pool habitat that are suitable habitat for the threatened vernal pool fairy shrimp and the endangered vernal pool tadpole shrimp. LRS has approximately 36 acres of wetlands, most of which are vernal pools.

In 2005, Beale AFB entered into an agreement with USACE to designate Conservation Areas on the base that contain high quality vernal pools as well as vernal pool areas that have been restored/created. It was agreed that these areas would be preserved to the greatest extent possible as long as the AF was in control of the land.

In the final designation of critical habitat for vernal pool tadpole shrimp and vernal pool fairy shrimp (August 6, 2003), USFWS agreed to exempt Beale AFB lands. USFWS had included Beale AFB lands in the proposed designation because it contains vernal pool tadpole shrimp occurrences with large vernal pool complexes that maintain the primary constituent elements essential for the conservation of the species and because it contains large, relatively undisturbed vernal pool grassland habitats and habitat supporting vernal pool fairy shrimp.

ESA (16 USC) Section 4(a)(3)(B)(i) states:

“The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under Section 101 of the Sikes Act (16 USC 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.” This was later clarified in 2012 “Exemption of an area covered under an INRMP under the Sikes Act is based on the statutory condition that the Secretary has determined the plan provides a benefit to a species” (USFWS 2014d).

The Conservation Areas created on Beale AFB have preserved 923 acres of high-quality vernal pool habitat for as long as the DoD is in control of the land. This provides a significant benefit to the species by providing large tracts of protected vernal pool habitat and enhancing vernal pools where necessary. Continual monitoring efforts of reference pools in these areas show that these protected species are continuing to do well and provide a good compass for determining the overall health of the system.

7.4.6 *Management Concerns*

Management of special-status species on Beale AFB requires a balance of strategies that will promote the continued existence and recovery of the species while not hindering the ongoing mission of the base. Management concerns at Beale AFB regarding T&E species include the following:

- Management of vernal pool fairy shrimp and vernal pool tadpole shrimp populations and their habitat on Beale AFB lands. Ongoing efforts will improve the awareness of base personnel and contractors regarding regulations that address management and protection of vernal pool fairy shrimp and vernal pool tadpole shrimp populations and their habitat.
- Mosquito management using pesticides near vernal pools could have adverse effects on vernal pool fairy shrimp and vernal pool tadpole shrimp. Future mosquito management activities conducted by the 9 CES/CEOI pest management specialist will be coordinated with the NRM to ensure compliance with the federal ESA and that ESA compliance measures are included in the base Pest Management Plan.
- Mosquito management in the Dry Creek/Best Slough area has the potential to adversely affect the WYBC and other migratory birds by diminishing insect food sources. Non-target pesticides used for mosquito control can also kill other arthropods that birds feed on. Future mosquito management activities conducted by the 9 CES/CEOI pest management specialist will be coordinated with the NRM to ensure compliance with the federal ESA and that ESA compliance measures are included in the base Pest Management Plan.
- TRBLs are known to utilize areas west of the flightline on Beale AFB. This presented a serious BASH risk in 2015. Efforts have been made to eliminate nesting habitat in this area to minimize risks to flying aircraft and personnel. However, nesting habitat still exists southwest of the flightline, and medium-sized flocks have been seen foraging west of the flightline. To compensate for lost nesting habitat on the base, new habitat is proposed to be created on base, east of the flightline. Blackbird Marsh and Blackbird Basins have both been proposed as mitigation sites.
- Management of potential habitat for GGS on Beale AFB lands. A possible sighting of a GGS in Reeds Creek was reported in spring 2004. The sighting was deemed reliable enough to warrant field surveys to confirm presence or suggest absence. A known species expert conducted a habitat assessment for GGS on Beale AFB in 2004. Portions of Reeds Creek, Parks Lake and Best Slough were classified as having attributes considered suitable for GGS. Trapping efforts produced no GGS in 2005, 2014-2018. Although Beale AFB continues to have suitable habitat for the species, it is assumed to be not currently present on base. To ensure proper monitoring of the species, periodic surveys (every three to five years) will be conducted to inform management decisions in areas that provide suitable habitat to the species. Informal consultations with USFWS specified that a minimum flow of water should be maintain in Reeds Creek throughout the summer to manage habitat for this species (Reeds Creek Restoration Plan NLAA 2012).
- Uncertain status of Central Valley steelhead at Beale AFB. Because the Central Valley steelhead is listed by the NMFS as threatened, habitat management for this species could be required by Beale AFB. Critical habitat for Central Valley steelhead was designated in the lower reaches of the Yuba River, which is 4.5 miles north of Beale AFB. There is also critical habitat for the species 6.5 miles to the west of the base in the Feather River. Neither of these habitats is directly connected to watersheds on Beale AFB; however, this species is known to be present in Dry Creek on the SWA, upstream of the base. The current status of this species on Beale AFB has not been fully assessed.

Beale AFB has removed the Beale Lake dam on Dry Creek and converted it to a riparian restoration site. The removal of this obstruction should improve existing habitat for these salmonids and improve their ability to move upstream to spawn. Beale AFB must provide adequate, sufficient protection and conservation of steelhead species and their habitat to preclude the need for NOAA/NMFS to include the portion of Dry Creek on Beale AFB in proposals to designate formal critical habitat.

- California black rails (state listed as threatened) have been detected at Beale AFB at PAVE PAWS Pond, Goose Lake, the small arms range pond and just downstream of Miller Lake through a study by the University of California. Several of the dams on the base that have been leaking are in need of repair. These leaking dams create wetlands just beyond the dam that could be attractive to the black rail. Two of the dams that have been repaired were found to have suitable habitat for California black rail, and occupancy surveys should be conducted at each dam site that is in need of repair to ensure potential impacts may be avoided when repairs are done. These surveys would also provide information to help develop management strategies and help base managers minimize impacts resulting from activities occurring outside development areas. Existing wetlands on the base can also be managed to ensure no net loss of rail habitat.
- Management actions taken to protect threatened and endangered species will be influenced by the speed at which the climate changes, the nature of the climatic changes, and the ability of the species to respond to those changes. Our understanding of species' responses to changing climate is not yet sufficient to be able to predict how an individual species will respond. Many current management activities are appropriate for increasing resilience or facilitating adaptation to climate change. An ecosystem approach that prioritizes functional diversity, maintenance of habitat, habitat variability, and connectivity can help support genetic diversity that may be important for adaptation and can help species migrate to more favorable habitats. Research into actionable science used for biodiversity conservation in changing conditions has developed several key principles. Historic patterns used for management decisions are likely to be insufficient for future management challenges (CEMML 2019). Proactive approaches that anticipate change can help extend the period over which species can adapt to changing climate and avoid catastrophic declines associated with stochastic events that act on an already stressed ecosystem. Further climate analysis and decisions about adaptation of management activities needs to occur at Beale AFB to better address the threat of climate change.

7.4.7 *Climate Change and Threatened and Endangered Species and Habitats*

A recent assessment listed 47 of the special status species on Beale AFB as moderately or highly vulnerable to the effects of climate change (CEMML 2019). Projected changes in temperature and precipitation at Beale AFB are likely to impact species in a variety of ways, including both habitat flooding and creating drought conditions (CEMML 2019). Given that Beale AFB is home to several vernal pool endemic plant and animal species capable of capitalizing on occasional flooding, some may benefit from this aspect of the projections in some years, while suffering or being indifferent in other years.

Conservation efforts that focus on preserving a single species or rare habitat may no longer be sufficient. Management strategies will need to shift from focusing on restoration and historic species assemblages to more dynamic management approaches which accommodate species moving to different latitudes and altitudes and the reorganization of communities. Yet, these efforts and shifts in strategy must be balanced with adhering to existing laws and regulations which require individual species management (CNRA 2014).

Adaptive management strategies should be oriented towards longer-term security and should emphasize finding new alternatives and opportunities. Climate change adaptation includes actions that enable species, communities, and ecosystems to adjust to changing conditions (Comer et al. 2012), such as maintaining healthy, genetically diverse populations, improving ecosystem function, reducing non-climate stressors on ecosystems, reducing risks to species and habitats, and providing adequate time for species evolution if appropriate (CNRA 2009). Creating and maintaining natural corridors to facilitate movement of species between current suitable areas and future suitable areas is an important strategy for adapting to climate change. Beale AFB has efforts underway to create corridors for connectivity to the State Wildlife Area and conservation easements on neighboring lands. The creation of refugia—areas of refuge that conserve natural elements that may be degraded or eliminated elsewhere—can also help preserve species and habitats, sometimes in new configurations (CNRA 2014).

The primary strategy by the State of California for preserving biodiversity is to create a reserve system which connects current and future suitable habitats for species. This is intended to allow species to adapt to new climate change conditions, accommodate range shifts of regionally-limited native plant species, and offer escape routes from wildfires, flood, drought, disease, and invasive species-degraded habitat. The reserve system will incorporate federal, state, protected habitats, mitigation lands, and conservation easements with working lands (i.e., industrial timberland, rangeland, and agricultural land) (CNRA 2009).

With Spenceville Wildlife Area (SWA) to the east and three conservation easements to the northeast of Beale AFB, natural resource managers will need to be aware of the evolving efforts in the local area to connect sustainable habitats as part of the reserve system. Beale AFB could play an important role in local biodiversity and habitat conservation due to the numerous T&E species on the installation and the presence of vernal pool, wetland, and riparian habitats. Additionally, as an ecological and geographic transition zone between the flat agricultural lands of the Sacramento Valley and the foothills of the western slope of the Sierra Nevada Mountains, Beale AFB could help bridge current suitable habitats and future suitable habitats for some species.

Vernal pools and wetlands are home to the majority of the special status plant species, are the preferred breeding habitat for several amphibian species, and support many protected invertebrate species at Beale AFB (CEMML 2019). Working to preserve these critical habitats may help strike a balance between adapting to climate change and meeting ESA requirements. See below for additional guidance on preserving and managing wetland and vernal pool habitats. Implementing the aforementioned wildland fire, invasive species, and aquatic habitat management strategies will also help reduce some of the climate related threats to T&E species and stressors on ecosystems.

7.5 Water Resource Protection

Applicability Statement

This section applies to USAF installations that have water resources. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Activities that may impact WoUS, as defined in Title 40 CFR 110.1, require evaluation for compliance with CWA regulations (AFMAN, Section 3.18.2, *CWA Section 404 Compliance*). Section 401 of the CWA, *Certification* directs that any proponent of an action that requires a federal license or permit, such as a Section 404 or NPDES permit, must obtain a Water Quality Certificate from the state water pollution control agency.

Management and protection of water resources on Beale AFB is a collaborative effort between multiple parties including 9 CES/CEIE, the ERP, grounds maintenance, and the utilities shop. Within 9 CES/CEIE, the NRM and the Storm Water Program Manager oversee water resource protection. The program is guided by AFMAN 32-7003, AFI 32-1067, *Water and Fuel Systems*, and the Storm Water Pollution Prevention Plan (SWPPP) (Beale AFB 2015). The SWPPP identifies potential sources of pollutants in runoff from industrial activities that could affect the quality of storm water. Other plans, including the GEM Plan and the IPMP, contain water conservation and pollution prevention measures specific to their activities.

7.5.1 *Regional Water Issues*

7.5.1.1 **State Water Issues**

The California Water Action Plan identifies a number of challenges that California faces regarding water availability, quality, and sustainability. In the mid-20th century, state, federal, and local agencies vastly expanded the state's system of reservoirs, canals, pumps, and pipelines to store water and deliver it to agricultural and urban users in dry areas. Also, in the late 20th century, significant investments were made in the state's flood protection system, including levees and bypasses. These changes to the physical infrastructure have resulted in unintended consequences to the natural world. In general, there is broad consensus about California's water resource challenges:

- Uncertain water supplies
- Water scarcity/drought
- Declining groundwater supplies
- Poor water quality
- Declining native fish species and loss of wildlife habitat
- Floods
- Supply disruptions
- Population growth and climate change further increase the severity of these risks

The California Water Action Plan was developed to meet three broad objectives: more reliable water supplies, the restoration of important species and habitat, and a more resilient, sustainably managed water resources system (water supply, water quality, flood protection, and environment) that can withstand inevitable and unforeseen pressures in the coming decades. The actions below will move California toward more sustainable water management by providing a more reliable water supply for farms and communities, restoring important wildlife habitat and species, and helping the state's water systems and environment become more resilient.

- Make conservation a California way of life
- Increase regional self-reliance and integrated water management across all levels of government
- Achieve the co-equal goals for the San Francisco Bay Delta
- Protect and restore important ecosystems
- Manage and prepare for dry periods
- Expand water storage capacity and improve groundwater management
- Provide safe water for all communities
- Increase flood protection
- Increase operational and regulatory efficiency
- Identify sustainable and integrated financing opportunities

7.5.1.2 County Water Issues

The Sacramento Valley experiences fluctuations in static water levels due to groundwater pumping in the spring and summer to accommodate agriculture. Because of extensive groundwater extraction, primarily for irrigation, the main groundwater discharge is now through well withdrawals instead of into streams. This has altered the direction of groundwater movement near Beale AFB. The rivers no longer serve as the groundwater discharge points. In fact, water from the river channels now recharges the groundwater system (CH2M Hill 2017).

In 2016, the ERP began to see significant changes in the gradient and direction of flow of groundwater, caused by groundwater pumping from adjacent farms. Until recently, farmers were able to obtain irrigation water from surface canals. When Yuba County began diverting water to southern California, farmers were given the opportunity to sell their water back to the county at a significant profit. This led to farmers pumping groundwater from beneath their properties to irrigate their crops.

Groundwater pumping has become so extreme that there is a risk of pulling contaminated groundwater from chemical plumes under the base. If effluent is detected in nearby water wells, the base will have to ask the Yuba County Water Board to restrict the amount of water being pumped by farmers on properties adjacent to the base. If this occurs, it is likely the AF will have to reimburse the farmers for the lost water revenue (Darren Rector, personal communication, 2018). Despite the effects to groundwater flow and gradient under other parts of the base, there has not been a change in the groundwater gradient underneath the wellfield. This is due to water infiltration from the adjacent canal and nearby Yuba River (Darren Rector, personal communication, 2018).

The Beale AFB ICEMAP (Marstel-Day 2015) considers drought to be the third greatest encroachment and sustainment challenge facing the base. However, Beale AFB has no plan in place to address water shortage due to drought, and there are no plans to address state-level adjudication of groundwater resources. Even the Drinking Water Contingency Plan does not address long-term water supply issues or limitations due to drought. The ICEMAP recommends preparing a Water Resource Management and Sustainment Plan for Beale AFB to account for climate change, drought, and groundwater legislation; updating AFI 32-1067, *Water and Fuel Systems*, to address gaps related to assessing water rights and identifying and planning for sustainable water supplies; and engaging in a regional dialogue with external stakeholders to address climate adaptation planning.

7.5.2 Storm Water Management

The SWPPP is designed to minimize the exposure of industrial materials and areas of industrial activity to rain, snow, snowmelt, and runoff. Minimization of exposure to storm water mixes both structural and nonstructural BMPs and specifies particular BMPs to consider when minimizing exposure. Examples of such BMPs include grading/berming areas to minimize runoff; locating materials indoors; spill clean-up; containing vehicle fluid leaks or drain fluids before storing vehicles on-site; secondary containment of materials; conducting cleaning activities undercover, indoors, or in bermed areas; and draining all wash water to a proper collection system.

Based on the geologic conditions and topographic characteristics of the base, there are five watersheds/stormwater drainage basins (SWBs) at Beale AFB (Figure 7-4). Each SWB represents a unique drainage pattern and area and is affected differently by industrial and non-industrial land uses (Table 7-3). The SWBs at Beale AFB are important to identify and monitor for the management and prevention of pollutant discharges to surface waters. The risks of various industrial activities relative to the location and

quality of storm water basins are important to consider in developing and implementing BMPs and other measures that protect water resources.

Storm water regulations require BMPs to effectively reduce the contamination or potential for contamination of storm water. Compliance with the General Permit requires the SWPPP to implement at least a minimum level of BMPs, which may include simple “common sense” procedures such as keeping a shop floor clean of waste and debris. Additional BMPs may include more complex measures like installing filtration systems at a facility that has the tendency to drip or spill oils.

Minimum BMPs (mostly non-structural BMPs) represent common practices that can be implemented by most facilities.

- Non-structural BMPs are inexpensive, relatively simple, and applicable to a wide variety of facilities and operations. Non-structural BMPs include administrative procedures, restrictions on operations, or movement of equipment that will help prevent storm water pollution.

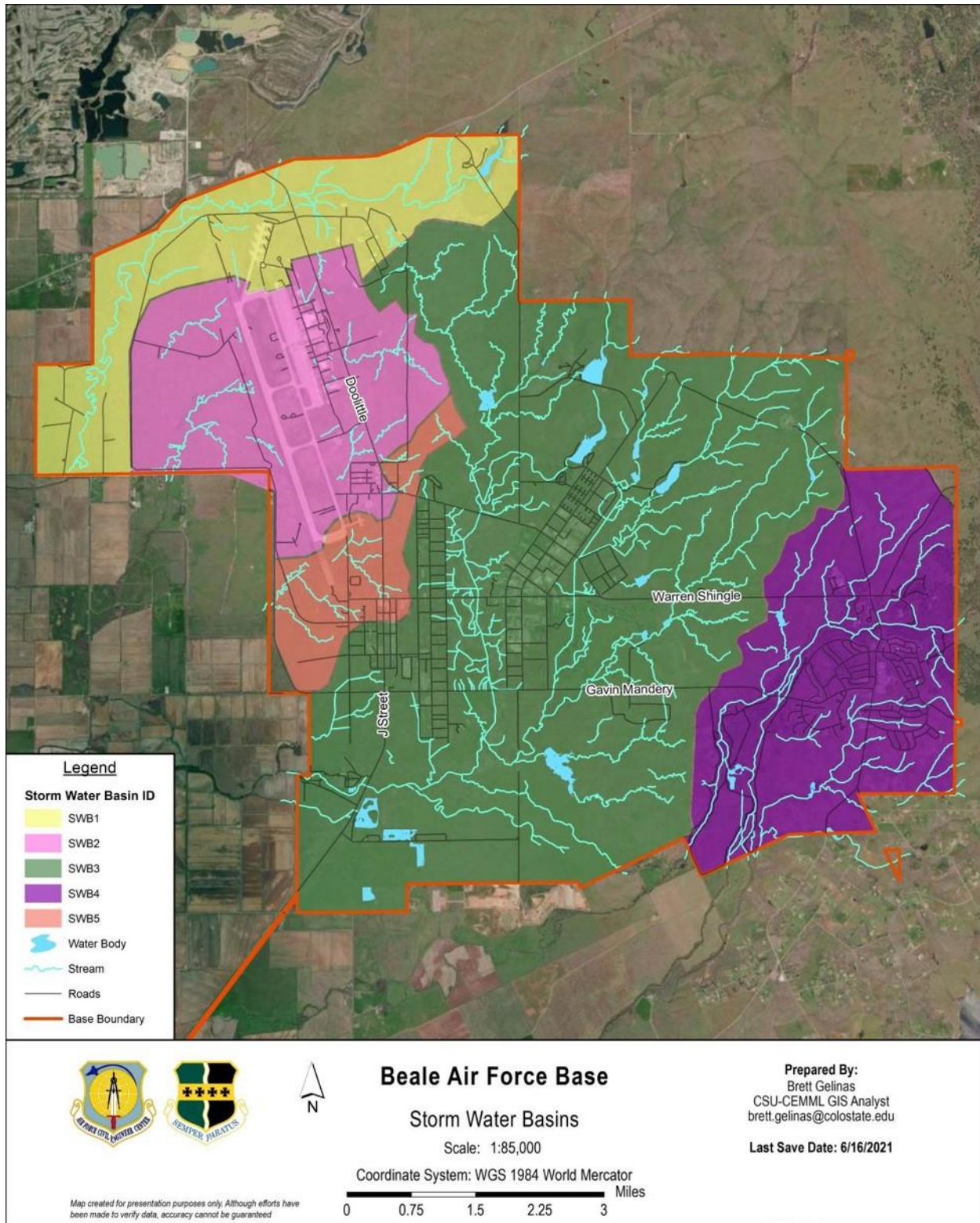
Advanced BMPs consist of treatment control BMPs, exposure reduction BMPs, and storm water containment and discharge reduction BMPs. BMPs that exceed the performance expectation of the minimum BMPs are considered advanced BMPs.

- Storm Water Containment BMPs include BMPs that infiltrate, retain, or reduce the volume of storm water runoff.
- Discharge Reduction BMPs include BMPs that are designed to lower the overall amount of potential storm water discharge from a site.
- Exposure Minimization BMPs prevent contact between storm water and the pollution source and can be structural or non-structural. Examples of exposure minimization nonstructural and structural BMPs include using alternative non-toxic chemicals and constructing a cover over an industrial activity area to prevent contact with rainfall.
- Treatment Control BMPs are typically structures that treat storm water to remove pollutant(s). Treatment control BMPs may exhibit a range of pollutant removal effectiveness, even if maintained and operated properly.

The SWPPP BMPs are implemented to comply with technology-based effluent limits by implementing measures to minimize exposure, good housekeeping, maintenance, spill prevention and response procedures, erosion and sediment controls, management and runoff, and employee training.

7.5.3 *Nonpoint-Source Pollution*

IAW AFMAN 32-7003, nonpoint-source pollution in storm water draining into the base's water bodies should be minimized. Pollutants include sediment, nutrients, pesticides, oils and greases, and debris. BMPs will be implemented during construction, land management, and ground maintenance activities. The base is responsible for ensuring that BMPs for specific projects are consistent with the state's nonpoint-source pollution management program, as required by Section 319 of the CWA.



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- 1
- 2 Figure 7-4. Beale AFB Storm Water Basins (SWB) (Beale AFB GeoBase 2021).

3 Table 7-3. Characteristics of Beale AFB Storm Water Basins (source: Storm Water Pollution Prevention Plan [Beale AFB 2015]).

Storm Water Basin	Total Area (Acres)	Impervious Area		Pervious Area		Beale AFB Location	Industrial Activities	Receiving Water Bodies	Industrial Activities Exposed to Storm Water	General Permit Coverage Required
		Acres	%	Acres	%					
SWB-1	2,676.8	67.7	2.5	2,609.1	97.5	Northwest Portion		Reeds Creek	Yes	Yes
SWB-2	3,289.6	410.4	12.5	2,879.2	87.5	Northwest Central	North Flightline and Open Space. Industrial Activities Include: Aircraft and Vehicle Maintenance and Refueling, Equipment Storage	Unnamed tributary to Reeds Creek	Yes	Yes
SWB-3	12,025.5	371.5	3.1	11,654.0	96.9	Central	Base Administration and Support Functions, Vehicle Maintenance, Petroleum Storage, Open Space	Hutchinson Creek	Yes	Yes
SWB-4	4,046.3	203.8	5.0	3,824.5	95.0	East	Municipal Housing and Family Services, Open Space	Dry Creek and Best Slough	No	No
SWB-5	1,104.3	63.3	5.7	10,410	94.3	West Central	South Flightline, Open Space	Two unnamed tributaries to Reeds Creek	Yes	Yes
Total:	23,142.5	1,116.8	4.8	22,025.7	95.2					

Acronyms in table: SWB = Storm Water Basin.

5 As Beale AFB continues to expand its facilities and increase the number of base personnel and residents,
6 the potential for nonpoint-source pollution will continue to increase. Additional development could also
7 increase the quantity of storm water runoff and discharge of pollutants from construction activities and
8 urban sources (e.g., vehicles, wash water and pesticide runoff). Ongoing public awareness actions are
9 needed regarding proper disposal of polluting substances and dumping of potentially hazardous materials
10 into the storm drain system. 9 CES/CEIE personnel explain all aspects of the environmental programs at
11 weekly new employee briefings. New employees are informed of proper measures for disposing of
12 pollutants and locations where they are permitted to work on and wash automobiles.

13 7.5.3.1 Industrial Pollutants

14 Categorically, the largest potential sources of pollutants in storm water discharges at Beale AFB are: (1)
15 drips and leaks of vehicle fluids from aircraft, military vehicles, and Aerospace Ground Equipment in
16 industrial areas; and drips and leaks from personal vehicles in industrial, office and military family housing
17 areas; (2) accidental releases of fuel; and (3) releases of Aqueous Film-Forming Foam (AFFF) used for
18 fighting fires in hangars or other buildings where there is a danger of explosion from fuel systems. The
19 SWPPP details BMPs for industrial activities and locations where they should be implemented.

20 7.5.3.2 Erosion and Sediment Controls

21 Erosion and sediment control are consistent water quality concerns on and around construction sites. The
22 SWPPP requires the use of structural and/or non-structural control measures to stabilize exposed areas and
23 contain runoff. The SWPPP requires the implementation of five BMPs to prevent erosion and sediment
24 discharges:

- 25 • Implement effective wind erosion controls.
- 26 • Provide effective stabilization of erodible areas prior to a forecasted storm event.
- 27 • Stabilize site entrances, prevent material tracking offsite and implement perimeter controls.
- 28 • Divert run-off and storm water generated from within the facility away from all erodible materials.
- 29 • Ensure compliance with the design storm standards in Section X.H.6 of the Multi-Sector General
30 Permit. The U.S. EPA has developed online resources for erosion and sediment controls.

31 The base SWPPP does not cover construction sites greater than one acre; such projects are required to create
32 their own SWPPP, which will be reviewed by the Storm Water Program Manager. The standard
33 construction contract for the base will be reviewed and modified, if needed, to include BMPs that are
34 consistent with the requirements of the base SWPPP and AFMAN 32-7003. The base will also identify and
35 implement BMPs to minimize soil erosion associated with routine grounds maintenance, construction and
36 other ground-disturbing or vegetation removal activities.

37 7.5.3.3 Pesticide Use

38 The use of pesticides in or near waterways is a potential source of water pollution. All pesticide application
39 is done IAW federal and state regulations and DoD Pest Management Programs prescribed in AFI 32-1053,
40 *Pest Management Program*; DoDI 4150.7, *DoD Pest Management Training and Certification Program*;
41 *The DoD Plan for Non-Federal Insecticide, Fungicide, and Rodenticide Act Pesticide Applicators*; the base
42 IPMP; and the *Weed Toolkit* in Appendix T. Herbicide application that is non-mission essential will be
43 allowed pending EIAP.

44 The application of pesticides in or around WoUS requires a NPDES permit. This permit covers point source
45 discharge of residues resulting from pesticide applications into WoUS. An Aquatic Pesticide Application

46 Plan (APAP) was prepared as part of the permit and described project-specific protocols, BMPs and water
47 quality monitoring procedures needed for herbicide application to blackberry along Reeds Creek, giant reed
48 in Dry Creek, and spot treatment of other riparian weeds. The base will determine if there are additional
49 routine activities that require coverage under this permit.

50 7.5.4 *Water Quality Monitoring*

51 There are currently more than 1,000 groundwater monitoring wells, extraction wells, and piezometers on
52 the base (CH2M Hill 2017). As the result of historical Army and AF activities, groundwater in many places
53 is contaminated with petrochemicals and solvents at concentrations above maximum legal levels (Marshack
54 2016). Groundwater contaminant levels are monitored at 23 wells using a sampling strategy outlined in the
55 1998 Installation Restoration Monitoring Plan (CH2M HILL 1998).

56 Compliance with storm water discharge permits is ensured by conducting regular inspections and
57 sampling/analysis. Protocols and timing of storm water sampling are detailed in the SWPPP. Records of
58 inspections are submitted to California Regional Water Quality Control Board in the Beale AFB
59 Comprehensive Site Compliance Evaluation and Annual Storm Water Report.

60 9 CES/CEIER outsources the sampling, analysis, and monitoring of the wastewater to assess compliance
61 with applicable state and federal standards. Bioenvironmental Engineering conducts regular sampling
62 studies on base drinking water systems and wells to assess compliance with applicable state and federal
63 standards.

64 The need and protocols for water quality monitoring during and after herbicide application will be specified
65 in APAPs and are the responsibility of the contractor or 9 CES/CEIEC for in-house jobs. Pest Management
66 is responsible for any water quality monitoring related to its pesticide applications.

67 7.5.5 *Wastewater Treatment*

68 Wastewater from most facilities at Beale AFB is treated at the base's wastewater treatment plant (WWTP),
69 located in the southwest corner of the base. Some facilities have their own leach fields. The treated effluent
70 is conveyed to Pond 4 for storage. The treated water is either pumped to A Street Pond for irrigation at the
71 golf course or dispersed as a land-based application to the existing 40-acre irrigation field south of the
72 WWTP.

73 During periods of heavy rainfall, inflow and infiltration causes excessive flow into the WWTP. Extreme
74 inflow could cause the base's WWTP to exceed treatment capacity during or following a major storm, and
75 effluent limitations may be exceeded. The ACC Sustainment Team visited Beale in 2012 and rated the
76 wastewater program as degraded. In order to solve the problem, base personnel have programmed and
77 completed several pipeline rehabilitation projects to reduce inflow and infiltration in the collection system.
78 In addition, proposals are being considered for an enhanced use lease of Beale's WWTP with a non-federal
79 partner.

80 The effluent limits for TDSs have exceeded both the average and maximum daily limits on a regular basis.
81 Beale AFB is awaiting a revision to its current Waste Discharge Requirements. The limits to be established
82 in the revised permit will dictate what action, if any, will be required.

83 7.5.6 *Drinking Water*

84 The original water supply system for Beale AFB was constructed in 1941 but permitted in 2001. Drinking
85 water at the base is currently supplied by seven active wells, which are located north of the Schneider Gate

86 and west of the flightline area. One contingency well has been drilled near the Main Gate, but it is not in
87 operation yet.

88 Groundwater use varies from 0.5 to 2.5 MGD. The variation in daily use is a result of high summer demand
89 for irrigation purposes in housing and other developed areas. Replacing some turfed areas in housing with
90 more water-efficient landscaping can be explored, and options that incorporate low-maintenance native
91 plants and support pollinators should be considered. The existing groundwater wells can produce as much
92 as 12 MGD; however, the limiting factor is the water treatment plant, which only has a capacity of 5.7
93 MGD. At this time, the existing on-base storage of 3.5 million gallons, plus the treatment capacity of 5.7
94 MGD, are adequate to meet maximum daily demands.

95 Currently, the base groundwater supplies meet all primary water quality standards. In 2003, Beale
96 constructed a new 5-MGD drinking water treatment plant at the corner of Doolittle and J Street in order to
97 deal with mineral deposits that were causing discolored water. Since that time, the drinking water on the
98 base has met the Safe Drinking Water Act aesthetic standards.

99 *7.5.7 Climate Change and Water Protection*

100 In addition to the aforementioned climate related water issues, climate change is likely to exacerbate the
101 groundwater scarcity problem facing Beale AFB. Reduced snowpack, faster snow melt, precipitation falling
102 as rain instead of snow, and increased number of intense rainfall events in the northern Sierra Nevada
103 Mountains that will cause snow to melt faster will likely put additional strain on water infrastructure
104 (California Emergency Management Agency [CEMA] and CNRA 2012; CNRA 2009). This will increase
105 the risk of flooding as well as make it more difficult to retain water for groundwater recharge or capture in
106 reservoirs. Anticipated longer dry periods paired with a greater reliance on groundwater systems during
107 drought conditions and increasing agricultural demands for water may increase groundwater pumping and
108 stress on groundwater levels in the future (CEMA and CNRA 2012).

109 Beale AFB should expect increased groundwater management efforts from state, regional, and local
110 management agencies and eventual restrictions on groundwater pumping (CNRA 2014). Creating a Water
111 Resource Management and Sustainment Plan will help Beale AFB be more resilient to the changes likely
112 to occur due to climate change. Planning should encourage greater reliance on local water sources, which
113 will help ensure a more reliable and sustainable water supply. Measures to increase reliance on local water
114 supplies include greater water use efficiency and conservation, minimizing reliance on imported water,
115 improved storm water capture and infiltration, and expanded water recycling. Due to the significant
116 presence of farmers in the area and the high demand for water in agriculture, coordinating efforts with
117 agricultural water suppliers and creating and/or solidifying water transfer agreements is advisable (CNRA
118 2014).

119 **7.6 Wetland Protection**

120 *Applicability Statement*

121 This section applies to USAF installations that have existing wetlands on USAF property. This section **IS**
122 applicable to this installation.

123 *Program Overview/Current Management Practices*

124 Aquatic natural resources, such as wetlands, vernal pools, and certain streams and drainages are WoUS and
125 are subject to USACE jurisdiction under Section 404 of the CWA. Aquatic resources on Beale AFB include
126 approximately 43 miles of major streams and drainages, as well as a total of approximately 3,000 acres of

127 wetlands and vernal pools (Figure 2-13 and Figure 2-14, Beale AFB and LRS). These resources are
128 managed jointly by the NRM and Storm Water Program Manager. The NRM deals primarily with wetland
129 and streambed protection and management, and the Storm Water Program Manager oversees water
130 pollution prevention (see Section 7.5, *Water Resource Protection*).

131 The CWA employs a variety of regulatory tools to protect surface water quality in the U.S., such as issuance
132 of permits under Sections 404 and 401 of the CWA. Section 404 establishes a program to regulate the
133 discharge of dredge and fill material into WoUS, including wetlands. Section 401 requires that anyone who
134 wishes to obtain a Section 404 permit must first obtain a state water quality certification to ensure that the
135 proposed project would comply with state water quality standards. In California, the Section 401 program
136 has been delegated to the California Regional Water Quality Control Board (RWQCB). Beale AFB contacts
137 the Central Valley RWQCB for Section 401 permitting needs. Impacts to water quality require a Water
138 Quality Certification that implements project-specific environmental protection measures to ensure state
139 standards are maintained.

140 7.6.1 *Existing and Pending Section 404 and 401 Permits*

141 The need for permits under Section 404 of the CWA and corresponding water quality certification under
142 Section 401 (404/401 permits) are determined on a project-by-project basis. Many of the routine
143 maintenance and construction activities conducted on Beale AFB are covered by the 2017 CWA 404
144 nationwide permits (NWP). The NWPs are issued for a five-year period and cover activities that have only
145 minimal individual and cumulative adverse environmental effects such as maintenance of previously
146 authorized bridge or culvert or riparian restoration that results in a net increase in aquatic function.
147 However, even if a project is covered by a nationwide permit, it is still necessary to determine if it exceeds
148 the Pre-Construction Notification threshold. Although many NWPs can proceed without notification of the
149 Corps, some actions will require notification to ensure that the Corps can determine if there will be only
150 minimal impact.

151 Section 404s pertain to wetlands as a habitat feature managed by the NRM; the Storm Water Program
152 Manager deals with the water within these features. Therefore, wetlands and the CWA 404 process are
153 primarily within the scope of natural resources management, coordinated with the Storm Water Program
154 Manager.

155 Future impacts on wetlands can, in most cases, be avoided through proper use of wetland delineation maps,
156 coordination with 9 CES/CEIEC, the installation's NRM, and good judgment by base planners. Base
157 planners will coordinate with 9 CES/CEIEC to ensure the environmental permitting process is completed
158 properly and impacts to natural resources are minimized. 9 CES/CEIE will increase outreach and education
159 to individual shops about the role that AF Forms 813 and 103 play in determining if projects may impact
160 WoUS and require a 404 permit and/or coordination with the NRM.

161 7.6.2 *Permitting Strategies*

162 It is not always possible to avoid impacts to WoUS, and filling and grading WoUS may be necessary in
163 order to conduct routine maintenance and construction activities. Beale AFB developed a Special Area
164 Management Plan (SAMP) to address these issues. The main goals and purpose of the SAMP were to
165 establish a watershed-wide aquatic resources management program, minimize individual and cumulative
166 impacts of future projects in these watersheds, establish a framework for impacts and compensation for
167 wetlands, and allow Beale AFB to implement and maintain a Clean Water Act Section 404 Regional
168 General Permit. The SAMP was based on areas identified for preservation and development in the Beale

169 AFB General Plan, now the IDP, and was intended to be a programmatic permitting solution for
 170 implementation of the base's future development plans. The SAMP process would have resulted in:

- 171 • Areas identified for protection and preservation (which already aligned with the General Plan/IDP)
- 172 • Areas identified for future mission development (from the General Plan/IDP)
- 173 • A strategy of prioritizing wetland avoidance
- 174 • 15 acres of wetland impacts (temporary and permanent)
- 175 • Four acres of stream impacts (temporary and permanent)
- 176 • Mitigation ratios that differed based on habitat quality

177 The SAMP strategy allowed development in any area of the base. Such development was subject to
 178 avoidance and minimization measures and mitigation ratios commensurate with the value of the resources
 179 (i.e. its quality and location on the landscape). At this time, the SAMP has been finalized and is used in this
 180 INRMP and by the Community Planner but was never used as a permitting strategy to obtain a Section 404
 181 Permit. The intent of this plan is to request a Regional General Permit from ACOE for a Section 404 permit
 182 and then a Section 401 permit from Regional Water Quality Control Board. Once this has been completed,
 183 it would supersede the HCMP. This process has been delayed but may be restarted.

184 This INRMP is updated with regard to the use of habitat quality and planned development information and
 185 its use in natural resources management decision-making. We intend to maximize the value of any
 186 management activities at Beale AFB by relying on sound science and focusing on areas that create the
 187 largest and longest lasting conservation benefit.

188 7.6.3 *Wetland Inventories and Delineations*

189 Over the years, Beale has conducted many project-specific wetland delineations. The following studies
 190 summarize the most current base-wide wetland delineation, stream surveys, and geospatial data used for
 191 planning purposes at Beale AFB.

- 192 • Light Detection and Ranging (LiDAR) Study, Wetland Delineation (Lichvar et al. 2006a).
- 193 • Floristic Quality of Vernal Pools at the Landscape Scale (Lichvar et al. 2006b).
- 194 • Assessment of Riparian Ecosystem Integrity (Smith and Klimas 2006).
- 195 • Lincoln Site Wetland Field Delineation (USACE 2007).

196 The LiDAR study wetland delineation is the basis for the Beale AFB Preliminary Jurisdictional
 197 Determination from the USACE, signed 11 Dec 2012 (Appendix K). The USACE concurred there are
 198 approximately 3,089 acres of wetlands, including vernal pools, and/or other water bodies present within the
 199 base that are potential WoUS, regulated under Section 404 of the CWA. This determination is intended to
 200 be used as a planning tool and is supplemented by project-specific information for permitting purposes.

201 7.6.4 *On-Base Wetland Restoration and Enhancement*

202 7.6.4.1 **Clean Water Act Section 404 and Endangered Species Act Mitigation at Beale AFB**

203 Due to construction and development at Beale AFB over the last 20 years, the base has maintained
 204 compliance with Section 404 of the CWA by implementing mitigation for impacts to wetlands and WoUS.
 205 Four compensation areas were established to implement the mitigation for vernal pool wetlands and riparian

206 stream zones (Figure 7-5). Mitigation of past project impacts to endangered species under the ESA consists
207 of both preserving and creating habitat for listed branchiopods. CWA monitoring data is used in part to
208 determine the suitability of preserved habitat and determine the success of created habitat to satisfy
209 compensatory mitigation requirements of Section 7 ESA consultations.

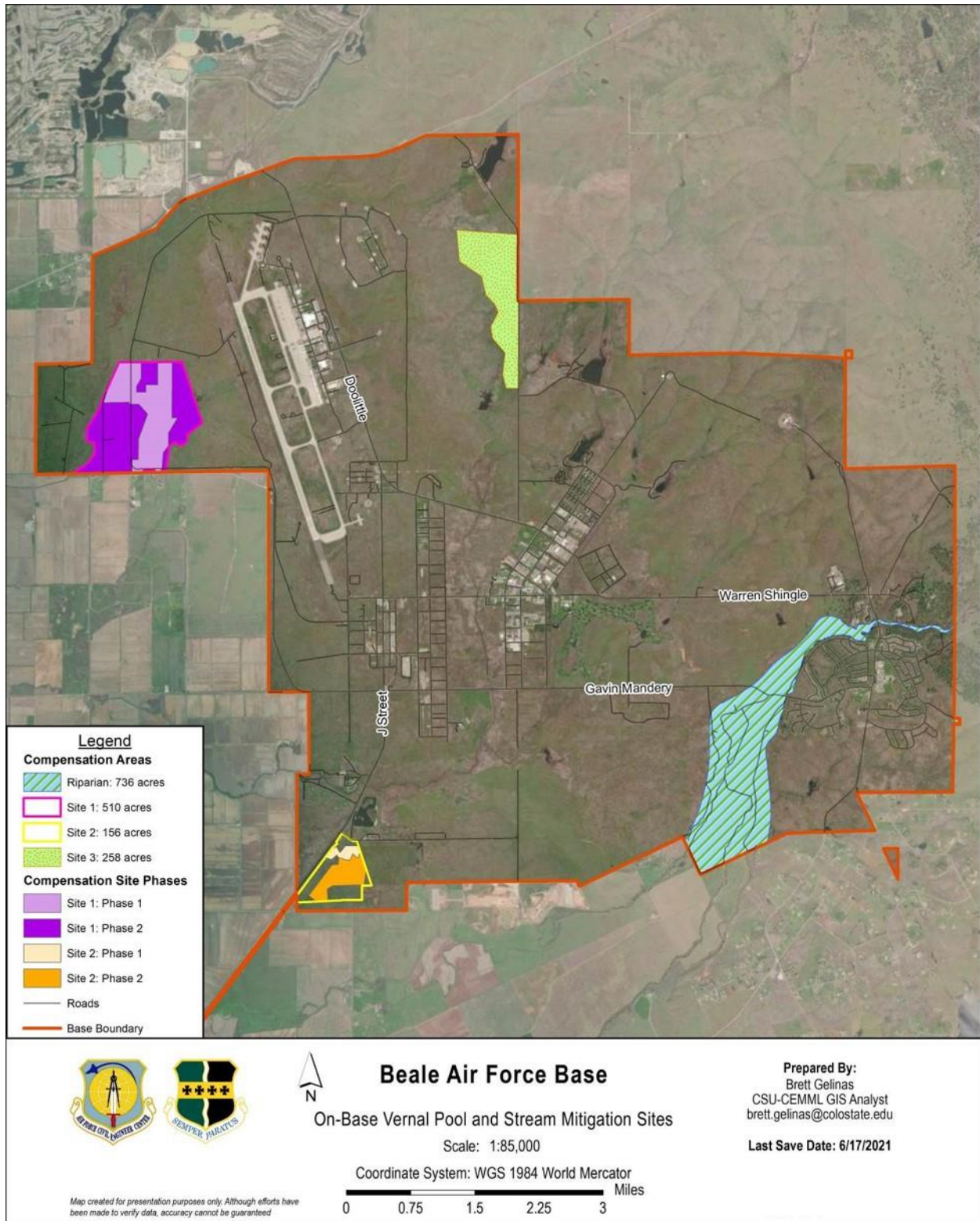
210 In 2002, restoration was initiated on-site at Beale AFB in areas where vernal pools historically occurred.
211 Restoration of these areas would re-establish vernal pools in grasslands that had been disturbed or
212 previously farmed. These restored vernal pool areas would be used for past project mitigation owed as well
213 as to establish credit for future project mitigation at Beale AFB. This would ensure the AF would maintain
214 the stewardship and long-term responsibility for the protected habitat. Three areas on base have been found
215 to be suitable for vernal pool restoration and one area for stream restoration (Figure 7-5). From 2002–2008,
216 vernal pool restoration was accomplished in two of the three designated areas of the base.

217 In 2020, an analysis of ESA mitigation needs and efforts compiled data on restored and preserved vernal
218 pool habitat, monitoring data from restoration, listed branchiopod survey data, all consultations relating to
219 listed branchiopods, and weather data. This was to determine (1) the amount of compensatory mitigation
220 area required by projects that had direct or indirect effects on listed branchiopod habitat, (2) the total amount
221 of habitat that Beale AFB has preserved or created, and (3) the difference between the area needed and the
222 area preserved/created. This difference represents “excess” compensation that could be used for mitigation
223 of future project impacts to listed branchiopod habitat (CEMML 2020a).

224 The total area of compensation required for listed branchiopod habitat beginning with projects in 1995 (the
225 year the species were listed) was 107.76 acres. The analysis derived the amount of created or preserved
226 areas by evaluating the quality of the habitat in created and preserved habitat and determined that 37.05
227 acres qualified as created habitat and 152.31 acres were preserved, for a total of 152.31 acres of
228 compensatory mitigation. Thus, Beale AFB has an extra 44.54 acres of compensatory mitigation that can
229 be used for future projects (Table 7-4).

230 Clean Water Act compensatory mitigation is required to offset unavoidable adverse impacts to WoUS that
231 remain after all avoidance and minimization measures have been taken. Compensatory mitigation can be in
232 the form of restoration, establishment, enhancement, or preservation of wetlands, streams, and other aquatic
233 features. These four categories of mitigation are defined by the EPA as follows.

- 234 • **Restoration** means the manipulation of the physical, chemical, or biological characteristics of a
235 site with the goal of returning natural/historic functions to a former or degraded aquatic resource.
236 For the purpose of tracking net gains in aquatic resource area, restoration is divided into two
237 categories: re-establishment and rehabilitation.
- 238 ◦ **Re-establishment** means the manipulation of the physical, chemical, or biological
239 characteristics of a site with the goal of returning natural/historic functions to a former aquatic
240 resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain
241 in aquatic resource area and functions.
- 242 ◦ **Rehabilitation** means the manipulation of the physical, chemical, or biological characteristics
243 of a site with the goal of repairing natural/historic functions to a degraded aquatic resource.
244 Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in
245 aquatic resource area.



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246

247 Figure 7-5. Mitigation sites for vernal pools and streams on Beale AFB (Beale AFB 2017c).

248

Table 7-4. Endangered Species Act compensatory mitigation acreages required and provided.

Compensation Type	Compensation Required	Compensation Provided	Excess Compensation
	Acres of Compensation		
Creation	31.9	37.05	5.15
Preservation	75.87	115.26	39.39
Total	107.77	152.31	44.54

- 249
- 250
- 251
- 252
- **Establishment** creation) means the manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area and functions.
- 253
- **Enhancement** means the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.
- 254
- 255
- 256
- 257
- **Preservation** means the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.
- 258
- 259
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- 261
- 262
- 263 The total acres of CWA wetland mitigation restoration owed from all Beale AFB projects over the last 20
- 264 years is 23.36 acres, while the total stream mitigation restoration owed is 0.424 acres. Table 7-5 and

Table 7-6. Stream mitigation for United States Army Corps of Engineers (USACE) 404 Clean Water Act permit (source: Ins Research 2017b).

265 list all the past Beale projects requiring wetland or stream mitigation for each regulatory permit under
266 Section 404 of the CWA. For areas that are counted towards preservation, Beale AFB needs an updated
267 MOU with the regulatory agency.

268 Mitigation areas at Beale AFB were established in 2001 (Site 1 Phase 1), 2005 (Site 1 Phase 2), 2008 (Site
269 2 Phase 1) and 2011 (Site 2 Phase 2). A total of 36.13 acres of vernal pools were restored with the intent to
270 utilize these areas for past and future individual and nationwide permit mitigation requirements.

271 These areas all had a 10-year monitoring period to determine the success of the vernal pools (Institute for
272 Ecohydrology Research 2012, 2013, 2014, 2015, 2016, 2017a, 2017b and previous reports mentioned
273 therein). Annual monitoring reports have been submitted to the USACE over the last 15 years. As of 2017,
274 two areas, Site 1 Phases 1 and 2, have completed the 10-year monitoring. Pools at Site 2 have not completed
275 the 10-year monitoring. Although they have not been monitored for 10 years, it is unlikely Site 2 Phase 1
276 pools will improve without remedial actions to improve their hydrology. Site 2 Phase 2 has consistently
277 improved over the monitoring period, and this site outperformed all other sites in hydrology and vegetation.
278 It is recommended the Site 2 Phase 2 vernal pools, which were at 100% of performance in 2016, be applied
279 for full mitigation credit. Of the acres restored, 30.56 were determined to be successful and can be submitted
280 for approval to the USACE and used for past compensation for vernal pools at Beale AFB (Table 7-7).
281 Mitigation acres currently available on-base are listed in Table 7-8.

Table 7-5. Projects and Wetland Mitigation for United States Army Corps of Engineers (USACE) 404 Clean Water Act permit (terminology and ratios have changed over the past 20 years; source: Institute for Ecohydrology Research 2017b.

Project Title	Year	USACE Project Number	Type of Permit	Impact Acreage	Preservation Acres (2:1) ¹	Restoration Acres (1:1) ¹	Total Acres (3:1) ¹	Mitigation Location
DGS-2	1997	Acreage impact assumed based on restoration		0.027	0.054	0.027	0.081	Site 1, Phase 2
Golf Course Expansion	1997	Acreage impact assumed based on restoration		0.016	0.402	0.016	0.418	Site 1, Phase 2
Landfill #2	1997	Acreage impact assumed based on restoration		0.034	0.068	0.034	0.092	Site 1, Phase 2
Flightline Fire Station	1999	199400832	NWP 26	0.084	0	0	0.681	N/A
Water Trough Repairs	1999	199900338	NWP 12	0.002	0.004	0.002	0.006	Site 1, Phase 2
Well Field Laterals	2000	200000011		0.33	0.66	0.33	0.99	Site 1, Phase 2
Vernal Pool Restoration Site 1 Phase 1	2001	No permit needed per conversation with Tom Cavanaugh	N/A ³	0	0	0	0	N/A
Vernal Pool Restoration Site 1 Phase 2	2005	No permit needed per conversation with Tom Cavanaugh	N/A	0	0	0	0	N/A
Wing Infrastructure Development Outlook	2005	200501022	NWP 39	0.31	0.63	0.31	0.94	Site 1, Phase 2
Anti-terrorism Force Protection Fence	2006	200501024	NWP	0.196*	60.88	22.29	84.21	Site 1, Phase 1 (12.84) Site 1, Phase 2 (9.45)

Table 7-5. Projects and Wetland Mitigation for United States Army Corps of Engineers (USACE) 404 Clean Water Act permit (terminology and ratios have changed over the past 20 years; source: Institute for Ecohydrology Research 2017b).

Project Title	Year	USACE Project Number	Type of Permit	Impact Acreage	Preservation Acres (2:1) ¹	Restoration Acres (1:1) ¹	Total Acres (3:1) ¹	Mitigation Location
Pheasant Farm Rd Widening	2005/2008	200300662	NWP 14	0.14	0.28	0.01	0.29	Site 1, Phase 2
PCB Transformer Utility Trench	2007	SPK-2007-858-SA		0.018	No mitigation was owed	N/A	N/A	N/A
Repair Four Bridges		200000558	NWP 3		Project did not occur	N/A	N/A	N/A
Repair Culverts on Warren Shingle Rd	2006	200600821	NWP 3	0.0375	No mitigation required in permit	N/A	N/A	N/A
GH Hangar Utility Trench	2006	200600905	NWP 12	0.0033	No mitigation required in permit	N/A	N/A	N/A
Golf Course Drainage Repair and Restoration	2009	SPK-2009-00141	NWP 3	0.5	No mitigation required in permit	N/A	N/A	N/A
Building 1200 Drainage Repair	2009	SPK-2009-00360	NWP 13	0.03402	No mitigation required in permit	N/A	N/A	N/A
A-Street Pond	2009	SPK-2008-00970	NWP 38	0.084	0.446	0.183	0.692	Site 1, Phase 2
Main Gate Improvements	2009	SPK-2009-00139	NWP 18	0.0006	0.0012	0.0006	0.0018	Site 1, Phase 2
Vernal Pool Hydrology Study	2009	SPK-2009-01326	NWP 5	0.000013	No mitigation required in permit		0	N/A
Culvert Repairs Project	2013	SPK-2013-00432	NWP 3	0.087	0	0.10	0.10	Site 2, Phase 1
Temporary Lodging Facility	2014	Ran past 45-day clock	NWP 29	0.048	Preservation only owed to USFWS	0.052	0.052	Site 2, Phase 1

Table 7-5. Projects and Wetland Mitigation for United States Army Corps of Engineers (USACE) 404 Clean Water Act permit (terminology and ratios have changed over the past 20 years; source: Institute for Ecohydrology Research 2017b).

Project Title	Year	USACE Project Number	Type of Permit	Impact Acreage	Preservation Acres (2:1)¹	Restoration Acres (1:1)¹	Total Acres (3:1)¹	Mitigation Location
Distributed Common Ground System	2014	Non-notifying	N/A	0.002	0	N/A	N/A	N/A
Wheatland Bridges Replacement	2017	SPK-2017-00540	NWP 8	0.002	No mitigation required in permit	N/A	N/A	N/A
Miller Dam Repair	2017	Emergency—no notification	N/A	unknown	N/A	N/A	N/A	N/A
Upper Blackwelder Dam Repair	2018	Emergency—no notification	N/A	unknown	N/A	N/A	N/A	N/A
Erle Road Bridge Replacement	2018	Emergency—no notification	N/A	unknown	N/A	N/A	N/A	N/A
Rail Road Bridge Replacement	2018	No permit number	NWP 14		N/A	N/A	N/A	N/A
TOTALS				1.953	63.43	23	88.55	

¹ Acreage of fence post holes placed in vernal pools; mitigation acreage is total acres of pools into which the poles were placed.

² NWP = Nationwide Permit.

³ N/A: Not Applicable.

Table 7-6. Stream mitigation for United States Army Corps of Engineers (USACE) 404 Clean Water Act permit (source: Institute for Ecohydrology Research 2017b).

Project Title	Year	USACE Project Number	Type of Permit	Impact Acreage	Preservation Acres (2:1)	Restoration Acres (1:1)	Total Acres (3:1)	Project Mitigation Location
Sewer Footings in Dry Creek	1999	199900303	NWP ¹ 3	None listed	No mitigation required in permit			Primary Riparian Restoration
Bridge 2627 Repair	2009	SPK-2009-00901	NWP 3	0.0467	0	0.203	0.203	Primary Riparian Restoration
A-Street Pond	2009	SPK-2008-00970	NWP 38	0.084	0	0.063	0.063	Primary Riparian Restoration
Main Gate Improvements	2009	SPK-2009-00139	NWP 18	0.0058	0	0.0058	0.0058	Primary Riparian Restoration
Personal Vehicle Car Wash	2009	SPK-2008-01790	NWP 39	Two culverts	No mitigation required in permit		0	Primary Riparian Restoration
Munitions Service Area Road	2010	SPK-2009-00740	NWP 14	0.469	No mitigation required in permit for heavily modified streams		0	Primary Riparian Restoration
Reeds Creek Restoration Project	2011	SPK-2011-00899	NWP 18	0.0062	No mitigation required in permit		0	Primary Riparian Restoration
Emergency Bridge Repairs	2013	SPK-2013-01062	RGP ² 60	0.06	0	0.06	0.06	Primary Riparian Restoration
Bridge Replacement-2710 and 2720	2014	Ran past 45-day clock	NWP 14	0.092	0	0.092	0.092	Primary Riparian Restoration
TOTALS				0.68	0	0.424	0.424	

¹ NWP = Nationwide Permit..

² RGP: Regional General Permit.

Table 7-7. Vernal pool mitigation acres passing and failing mitigation criteria based on hydrology and vegetation monitoring (source: Institute for Ecohydrology Research 2017b).

Site	Acres of Pools Passing	Acres of Pools Failing	Total Acres
Site 1 Phase 1	12.86*	0.3*	13.16*
Site 1 Phase 2	10.28	2.20	12.47
Site 2 Phase 1	1.92	1.96	3.88
Site 2 Phase 2	5.50	0	5.51
Total Acres	30.56	4.46	35.02

*Acres based on revised as-built conducted in 2017.

Table 7-8. Vernal pool and stream mitigation acres available (Source: Institute for Ecohydrology Research 2017b).

	Vernal Pool	Stream
Restored Acres	30.56	2.39
Owed Acres	23.36	0.424
Total Available Acres	7.2	1.97

7.6.4.2 Off-Base Mitigation Banking

When on-site mitigation does not align with mission goals, Beale AFB will pursue opportunities for wetland mitigation banking off-base as needed. Two projects in the recent years have utilized off-base mitigation banks to fulfill their endangered species mitigation (see Section 7.4 *Management of Threatened and Endangered Species, Species of Concern and Habitats*, Table 7-2). Future plans at Beale AFB would be to reduce on-base mitigation to ensure the flying mission is not constrained.

7.6.5 Long-Term Monitoring of Wetlands

During the 10-year mitigation monitoring period for the Site 1 and Site 2 pools, Beale AFB participated in an evaluation of new technologies that provide a more objective and accurate method of monitoring hydrology (Christopherson et al. 2012). The new method uses water level dataloggers to assess reference and restored vernal pools more accurately. Recently the USACE has changed the hydrology performance criteria, and this new performance criterion will be used for future monitoring. Future monitoring of restored pools that have not met performance criteria will be monitored and evaluated using the updated USACE performance criteria.

7.6.6 Wetland Protection Measures

Each project must comply with the wetland protection measures, included in Appendix L.

7.6.7 Climate Change and Wetland Protection

Climate change may alter the hydrology and functionality of the wetlands and vernal pools located at Beale AFB. Increased temperatures and carbon dioxide levels and alterations in the magnitude and seasonality of drought and flooding events have the potential to negatively impact wetland ecosystems, although it could create expanded vernal pool systems or increased connectivity between pools in some years (CEMML 2019). These changes could interfere with the vital ecosystem services wetlands perform, such as storing

carbon, improving water quality, and providing wildlife habitat and biodiversity support (Moomaw et al. 2018). Additionally, the majority of T&E plant species and a variety of T&E shrimp species are found in wetland and vernal pool habitats. Increases in temperature, shortening and shifting of the wet season, and drying of soils and pools threaten wetland plant species and elevate the threat of wetland alteration (CEMML 2019). Changes in climate may favor invasive species, making managing and restoring wetlands more difficult and threatening the continued survival of endemic wetland species (Moomaw et al. 2018).

In the face of a changing climate, halting the destruction of existing wetlands is a conservation priority as they are a vital carbon sink. Natural resource managers at Beale AFB working on wetland restoration should adopt best management practices that prioritize minimizing greenhouse gas (GHG) emissions. An important consideration in restoration is to avoid the loss of microbial communities and soil structure through disruption from heavy machinery and stockpiling. Instead, transplanting intact wetland soil or vegetation in wetland restoration sites is more likely to lead to the successful establishment of endemic wetland species and reduce GHG emissions (Moomaw et al. 2018). In addition, careful management of grazing can maintain pastures as carbon sinks rather than sources, drawing carbon out of the atmosphere and binding it in the soil column. Beale AFB already uses grazing as an important management tool in grassland and vernal pool systems, and continuing these efforts with carbon sequestration in mind would be beneficial.

Vernal pools are being modified, fragmented and destroyed due to habitat loss throughout their range in the western U.S. It is estimated that in California, 90% of vernal pool habitat has been eliminated (Shin and Kneitel 2019). Resolving land-use conflicts and preventing further habitat destruction are primary concerns for conservation and management agencies (Shin and Kneitel 2019). In addition to loss of habitat, climate change presents a considerable risk to vernal pool characteristics that are critical to supporting sensitive species uniquely adapted to live in them. Inundation duration and timing, both of which are likely to be altered by changes in temperature and precipitation patterns, play a crucial role in determining species composition in California vernal pools (Kneitel 2014). Warmer temperatures and later inundation lead to higher total species abundance but fewer endemic species in vernal pool communities, for instance (Shin and Kneitel 2019). Although the system is inherently resilient to variability in year-to-year conditions to some extent, careful monitoring will be required to maintain awareness of conditions and track trends.

Conservation and management efforts should consider how inundation duration and timing affect community composition to design approaches that effectively protect T&E species and anticipate future climate change and shifts in precipitation amount (Kneitel 2014; Shin and Kneitel 2019). Protecting vernal pools of various sizes and depths will help maintain variation in space and time and maximize species diversity and ecosystem function (Kneitel 2014).

7.7 Grounds Maintenance

Applicability Statement

This section applies to USAF installations that perform ground maintenance activities that could impact natural resources. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Grounds maintenance on Beale AFB is guided by the Beale AFB Design Compatibility Guide (ACC 2017) and the Grounds Maintenance PWS (Appendix M). These documents contain guidelines for maintaining landscaped areas at Beale, including information on watering, fertilizing, pruning, tree removal, and disease and pest control. When developing plans and contracts for landscape and grounds maintenance activities, the INRMP and applicable AFI DoDI policies will be consulted. In particular, grounds maintenance plans

should consider the use of native plants whenever possible. If addition of plants that support native pollinators will not attract species that could pose additional constraints, they should be considered for inclusion as well.

The goal for grounds maintenance is to enhance mission capability by improving the quality of life for base personnel and their families. Typical grounds maintenance activities, including mowing, pruning, fertilizing, managing pests, planting and pruning trees, disking and blading for firebreaks, and other related activities at Beale AFB, are conducted by an outside contractor. These activities are occasionally conducted by base residents through a self-help program and other forms of community participation. Most on-base yard maintenance is managed by the privatized housing company.

7.7.1 General Maintenance Issues

The base does not have a formalized water conservation program to minimize water used for land management purposes. Irrigation systems on the base are designed and installed on a project-by-project basis. The grounds maintenance contractor is responsible for irrigation in areas designated in the contract. In the housing area, the housing management contractor (Balfour Beatty) is responsible for irrigating lawns and common area landscaping. The golf course is irrigated with treated wastewater from the base WWTP. A program will be developed to evaluate quantities of water used for irrigation and to identify measures to improve water conservation. This program will follow the guidelines for irrigation in AFMAN 32-7003.

Removal of native and ornamental trees and shrubs requires the approval of the NRM. When removal of vegetation becomes necessary, trees and shrubs will be replaced with equivalent plants from the Beale AFB Landscape Design Plant List (Appendix O), followed by at least two years of maintenance (watering and weeding). Mitigation plantings will be coordinated with the NRM.

7.7.2 Non-Point Source Pollution from Grounds Maintenance

Under the current Grounds Maintenance PWS, approved nonselective herbicides are used to control vegetation only in landscaped areas. Additional areas must be approved by 9 CES/CEIEC prior to application. The grounds maintenance contract is reviewed by the base Pest Management Shop and NRM to assess the possibility of increasing the use of alternative weed control measures, such as mowing or mechanical trimming (weed whacking), to further reduce the use of herbicides applied for grounds maintenance purposes.

There is no program to monitor or report non-point source pollution associated with landscape maintenance at Beale AFB. The grounds maintenance contract contains basic guidelines for the storage and use of pesticides by contractors but very few application BMPs. The grounds maintenance contract for the base will be reviewed and modified to include additional BMPs that are consistent with the requirements of AFMAN 32-7003, such as those listed in Appendices T, *Weed Toolkit* and V, *General Measures and Monitoring for Proposed Projects*.

7.7.3 Solid Waste Programs Associated with Grounds Maintenance Activities

The Grounds Maintenance PWS addresses procedures for the disposal of solid and green waste generated by grounds maintenance activities. There is no plan to reuse green waste generated from landscape maintenance activities.

7.7.4 *Urban Forestry Program Management and Issues*

An Urban Forestry Management Plan was developed for Beale AFB (World Tree Inc. 1999) that identified overall status of the trees on base, as well as recommendations for future maintenance. In the past, tree species inappropriate for the environmental conditions have been planted at Beale AFB. Plantings in the Main Base are predominantly fruitless mulberry, Fremont's cottonwood, European olive, Lombardy poplar, true cedar and pine. Because many of these plants are short-lived and have weak wood and invasive root systems, ongoing maintenance problems have resulted. In addition, European olive is listed by the California Invasive Plant Council (Cal-IPC) as a Limited rank invasive species. The poor placement of many of these trees has resulted in clogged sewers, surface rooting, sidewalk damage and excessive pruning requirements. Many cottonwood trees in the housing area are hazards to homes, pavement and water lines. Anthracnose (a fungal disease that is not practically treatable) is also killing numerous trees in the housing areas. Weak and diseased branches and trees will be removed and replaced with tree species more appropriate for the location, preferably native species when possible. Trees and shrubs will be replaced with equivalent plants from the Beale AFB Landscape Design Plant List (Appendix O), followed by at least two years of maintenance (watering and weeding).

7.7.5 *Provision of Shade Trees in Developed Areas*

Because of the very high summer temperatures at the base, shade is greatly needed, especially in developed areas, playgrounds, parking lots, and along pedestrian walkways. Few shade trees or other forms of landscaping are present along pedestrian walkways in the housing, Main Base, and flightline areas, making foot travel extremely uncomfortable and unappealing during the summertime. Many playgrounds on the base lack shade, greatly limiting their use during summer. Most parking lots also lack shade. Large-canopy tree plantings are needed in these areas to provide shade. Trees planted for shade will be chosen from the Beale AFB Landscape Design Plant List (Appendix O).

7.7.6 *Enhancement of Visual Quality through Landscape Improvements*

The visual quality of developed areas of Beale AFB can be greatly enhanced through landscape improvements. Throughout the base, things such as utility systems, service yards, parking lots, industrial facilities, and security fencing could be screened by vegetation. Many of the buildings in the flightline and Main Base present vast expanses of walls with no tree or shrub plantings to provide visual variety. The use of plant material is limited in the flightline area due to BASH concerns. In addition, street trees are lacking in many areas within the developed portions of the base. Mulberry trees were planted along Gavin Mandery and Warren Shingle roads (significant road corridors) approximately 40 years ago but have become unhealthy due to poor soil conditions and lack of water. Flight psychologists have suggested that “greening up” Beale AFB will promote a sense of well-being for airmen. 9 SFS will be consulted before landscaping in these areas.

Beale AFB has a variety of ongoing construction projects that may impact existing landscaping within the Main Base. Any landscaping trees or shrubs that are removed by construction projects must be replaced with equivalent plants from the Beale AFB Landscape Design Plant List (Appendix O). Replacement plants will be planted in the same area from which they were removed. Those responsible for removing landscaping plants will coordinate with the NRM to ensure appropriate plants and planting sites are selected.

Future vegetation enhancements will use native plants as specified in the Beale AFB Landscape Design Plant List when outside of developed areas (e.g., Main Base). Planting native shrubs before or alongside

trees will help to provide quick fill-in of areas while supporting wildlife (e.g., pollinators) and acting as nursery plants for slower growing trees. Any base-wide landscape improvements will be coordinated with the NRM to ensure plantings comply with AFMAN 32-7003, the Beale AFB Landscape Design Plant List, and the 2018 USAF Pollinator Conservation Strategy. Consistent with law and the availability of appropriations, DoD will support habitat restoration projects for pollinators and direct military service installations to use, when possible, pollinator-friendly native landscaping and minimize use of pesticides harmful to pollinators through integrated vegetation and pest management practices. Future landscaping projects at Beale AFB will, to the maximum extent appropriate, use native plants beneficial to pollinators and wildlife when it does not create an additional BASH concern or constraint by attracting listed species. A list of plants beneficial to wildlife is included in Appendix P.

7.7.7 Protection of Native Oaks within Developed Areas

Portions of Beale AFB support oak woodlands and oak savanna. The dominant species in these areas are blue oaks and live oaks. Most of the oak woodlands and savanna occur on the foothills of the eastern portion of the base, in and around the clinic and family housing areas. Many of the oaks are deteriorating and dying from fungal diseases and other causes related to heavy lawn watering under tree canopies. The NRM will create a pamphlet to inform base residents about appropriate irrigation methods under mature native oaks. Landscaping and irrigation systems at the clinic will be modified to avoid watering under oaks.

Mature native oak trees (> 6 inches diameter at breast height [DBH]) that are removed during construction or maintenance projects will be replaced at a 3 to 1 ratio to ensure continued oak regeneration. Removal and replanting of native oaks must be coordinated through the NRM. Replacement oaks will be planted in the same vicinity of the removed tree. If the location is no longer suitable (e.g., developed), then replacement oaks will be planted in a natural area of the base with existing native oaks. The replacement trees shall be a minimum 15-gallon size and must be native oaks. Replacement oaks will be mulched, weeded, and watered for three years to promote establishment. Additional guidelines for native oak replacement and maintenance were adopted from Article 12.16 of the Placer County Code (Placer County 2003).

7.7.8 Review of Firebreak Plan

Currently, firebreaks are graded annually as part of the grounds maintenance contract. Grounds Maintenance coordinates with the NRM to ensure firebreaks avoid wetlands and other natural resources. Maps with the locations of firebreaks have not been revised to reflect changes made to be consistent with current and proposed land uses. Updated maps will be created and inserted into the INRMP as an appendix. A report was prepared that evaluated the location and methods of construction of firebreaks at Beale AFB and the use of alternatives, especially in sensitive wetlands and vernal pools (EM Assist 2006). This evaluation was prepared by natural resources and fire specialists with an interdisciplinary approach. The report and maps will be reviewed periodically by the NRM, the fire chief, and the grounds maintenance contract manager to assess the effectiveness of the firebreaks and resolve any potential conflicts with natural resources planning. GIS data for the firebreaks will be updated annually and the location of wetland indicator tags mapped.

7.7.9 Introduction and Spread of Nonnative Plants

A brochure has been developed for base residents to describe nonnative species issues. Base residents and employees will be better informed regarding the need to avoid the introduction and spread of nonnative plant species. More efforts to educate the public on the threat of invasive weeds will be developed.

Grounds maintenance activities are a primary vector for the spread of invasive plant species. The IPSMG provides BMPs for minimizing the spread of invasive plants through routine grounds maintenance activities (Appendix T). All landscaping and grounds maintenance activities must follow the IPMP and the IPSMG.

7.7.10 Planning and Design of Landscape Projects

Environmental conditions at Beale AFB present challenges for designing appropriate landscape projects. The region is hot and arid during summer. In addition, the soil conditions on most of the base prevent deep penetration of plant roots and good water dispersal. Plant species selected for landscape projects must be able to adapt to these climatic and soil conditions. To the maximum extent possible, Beale AFB will plant native plants within landscaped areas. A comprehensive set of landscape design guidelines has been developed for Beale AFB that will be used by project planners in selecting plant species that are appropriate for the base's climate and soils. Planting species classified under the Cal-IPC inventory of invasive or potentially invasive plants is prohibited. The appropriate planting sites and irrigation systems will be chosen to ensure the success of landscape projects. Providing a dependable and adequate water source for plantings is often vital to their survival in the first year of establishment.

The Urban Forest Plan (World Tree Inc. 1999) and the Design Compatibility Guide (ACC 2017) contain information regarding the planning and design of landscape projects at Beale AFB. A comprehensive set of grounds maintenance guidelines will assist base staff and contractors in identifying the appropriate watering, fertilizing, mowing, pruning, tree removal, and disease and pest control requirements for landscaped areas.

Recommended landscaping practices will benefit the environment and reduce long-term maintenance costs. The use of native plants not only protects biodiversity and provides wildlife habitat, but also reduces demand for irrigation, fertilizers, pesticides, and other maintenance-related costs. General recommendations to promote environmentally beneficial landscaping include:

- Ensure that 9 CES/CEIEC staff reviews landscape plans for compliance with the Grounds Maintenance PWS and Design Compatibility Guide and the below recommendations.
- To the maximum extent possible, use native plants in landscaping.
- When practical, preserve existing trees and shrubs, provided the vegetation is healthy and the root systems are not significantly impacted by construction.
- Design landscaping to be suitable to the specific site and appropriate for the uses and operations of the facility.
- When feasible, use plants that are beneficial to native pollinator species.
- Implement water-efficient practices, practice xeriscaping, and use efficient irrigation systems.
- Limit turf areas where practical to reduce water and maintenance requirements.
- Do not use seed-bearing or fruiting plants that provide food and habitat for wildlife in areas near the flightline or within the WEZ.
- Prevent expansion of nonnative plants by planting species in the Beale AFB Landscape Design Plant List.
- Plant trees around the borders of parking lots and near buildings to decrease energy use by buildings and to mitigate heat island effects of large parking lots.

- When landscaped trees other than oaks or shrubs are removed, they will be replaced 1:1 with an appropriate tree or shrub from the Beale Landscape Plant List.
- When mature oaks (> 6 inches DBH) must be removed, they will be replaced at a 3:1 ratio. Oaks will be a minimum size of 15-gallon pots. Oaks will be maintained for three years.

7.8 Forest Management

Applicability Statement

This section applies to USAF installations that maintain forested land on USAF property. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Beale AFB does not manage any of its forested habitat for timber production, but there is a firewood program that is overseen by the NRM. Forested habitats on the base include oak woodlands, riparian forest, and planted eucalyptus stands. The eucalyptus stands were originally planted as firewood, but they are not managed.

7.8.1 Firewood Program

The NRM is responsible for developing and managing the firewood program at Beale AFB. AFI 32-7064 Beale Supplement establishes the firewood cutting policy at the base. The policy states that only limited dead or downed wood may be cut on base and only in areas approved by the NRM.

Modifications to existing firewood program

AFI 32-7064 Beale Supplement establishes the firewood cutting policy at the base. Base-specific restrictions, procedures and responsibilities for the firewood cutting program need to be reviewed and revised to be consistent with the goals and objectives of the INRMP.

Starting in 1988, more than 4,000 eucalyptus trees were planted at three plots on the base as part of the firewood program. Plots are located near the fuel storage yard, the east side of Dry Creek and just outside the Schneider gate. Some of these areas have been discussed as future locations for parks or camping. Wood from these plots was available for purchase by base residents for firewood. Eucalyptus have not been planted on the base in many years, and the program was discontinued because the eucalyptus stands do not produce as much firewood as expected, and the stand requires maintenance. In addition, eucalyptus wood burns hot and can be dangerous due to a high oil content. The base will consider removing the eucalyptus groves for safety and removal of nonnative invasive species. Planting additional eucalyptus is strictly prohibited. Use of native trees will be given priority for planting in any future firewood plantations or wildland plantings.

Dead and downed wood provides habitat for a variety of wildlife species. It will be retained in native woodlands where it does not pose a significant fire or safety hazard to the base mission or residents. A template for the firewood permit is included in Appendix Q.

7.9 Wildland Fire Management

Applicability Statement

This section applies to USAF installations with unimproved lands that present a wildfire hazard and/or installations that utilize prescribed burns as a land management tool. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Beale AFB wildland fire management policy is formulated through review of other federal agency Wildland Fire Management Plans (WFMP), standards, and policies. Wildland fire management on Beale AFB is guided by AFMAN 32-7003 Section 3P, 3.78-3.84, AFI 32-2001, *Fire Emergency Services Program*; the Air Force Civil Engineer Center Environmental Operations Fire (AFCEC/CZOF) Playbook; and Federal Wildland Fire Management Policy. The program is implemented by 9 CES/FES and 9 CES/CEIEC. The Beale AFB WFMP was updated in 2017 to reflect current mission requirements and environmental conditions. The potential consequences to human safety and welfare, natural and cultural resources, and assets to be protected help determine the management response to wildfires. Human safety is the first consideration and is always the priority during every response to wildfires.

Beale AFB will implement improvements to its land and firefighting resources that will enhance the response and capabilities of firefighters. Chief among these is formally establishing 9 CES/FES as the primary initial attack responders, along with working to increase the operational qualifications of Fire and Emergency Services personnel. Focusing on preparedness and readiness actions are also major purposes of the WFMP. This WFMP is reviewed annually to ensure the latest information is consistently incorporated into AF wildfire prevention and suppression procedures.

7.9.1 WFMP Roles and Responsibilities

As per AFMAN 32-7003, Chapter 1 Roles and Responsibilities, “The WFMP designates a ... Wildland Fire Program Coordinator (WFPC), and defines the roles and responsibilities for wildland fire management on the installation.” The WFPC initiates, coordinates and ensures appropriate installation engagement and timely completion of the WFMP and serves as the primary installation POC for the AFCEC/CZOF fuels treatment implementation, data collection, large wildfire reporting and reporting of significant fires.

The Beale AFB 9 CES/FES is currently responsible for suppressing Wildland Urban Interface fires and supporting natural resource suppression efforts during wildfires and prescribed fires. The 9 CES/FES Fire Chief serves as the WFPC and shall be familiar with the provisions outlined in this plan and provide qualified personnel to support the Wildland Fire Management Program as necessary.

The Beale AFB NRM is involved with development of the WFMP to ensure that all planned actions in the WFMP that could affect natural resources are in line with, and directly supportive of, this INRMP and, conversely, that relevant natural resource goals and objectives are represented in the Wildland Fire Management Program. Related to this, the NRM will coordinate to ensure that the planned actions in the WFMP are reviewed under EIAP/NEPA. The locations and plans for all prescribed fires in support of the goals and objectives of this INRMP will be approved by the NRM. The NRM will set prescribed fire priorities on the installation for the purpose of meeting Natural Resources Program goals. Beale AFB recognizes that prescribed fire is a traditional Nisenan method of managing the landscape and contributes to the health of native plant and animal communities, a primary goal of Beale AFB’s Natural Resources program. The NRM will be consulted on all planned prescribed fire actions and will be notified of any wildfires impacting natural resources on the installation so that mitigating actions can be taken to avoid damage to sensitive natural resources. The WFMP includes a natural resources checklist:

- If possible, consult the CRM and NRM or their representative Resource Advisor prior to the usage of heavy equipment in firefighting operations. Inform the CRM of cultural sites discovered during wildland fire operations.
- Use Minimum Impact Suppression Techniques to the greatest extent possible in sensitive cultural areas and in or near wetlands, particularly vernal pools.
- Retardant will not be used within 300 feet of any drainage, wetland, vernal pool or other water source to the extent possible. The only exception to this rule will be for the protection of life or safety (public and firefighter). If retardant is dropped into any of the above, it will be reported to the NRM and Storm Water Program Manager.
- Repair ground disturbed by suppression activities to pre-incident condition.
- Natural recovery is the preferred choice following wildfires. However, when natural recovery is not likely, additional actions may be needed to prevent further degradation of cultural and natural resources in the burned area. Any seeding and planting will be done using the base-approved seed mix (Appendix N) and/or planting native trees or shrubs.

7.9.2 *Cohesive Wildland Fire Management Strategy*

The WFMP meets the direction of the National Strategy, the final phase in the Development of a National Cohesive Wildland Fire Management Strategy (National Cohesive Strategy). The National Cohesive Strategy sets broad, strategic and national-level direction as a foundation for implementation of actions across the nation and emphasizes the following primary goals:

- Restore and maintain landscapes: Landscapes across all jurisdictions are resilient to fire-related disturbances IAW management objectives.
- Fire-adapted communities: Human populations and infrastructure can withstand a wildfire without loss of life and property.
- Wildfire response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

7.9.3 *Fire History on Beale Air Force Base*

Wildfires are a regular occurrence on Beale AFB, with most occurring between May and September. Records show that there were 131 wildfires and a number of controlled burns between 1998 and 2017 (Figure 7-6). A fire occurred at LRS in summer 2016, but no written records for wildfires on LRS or Oroville NEXRAD Site are available. Nearly half (59) of the wildfires had an unknown cause. Of those with known causes, wildfires started by power lines (34) were most common, followed by AF mission (12), miscellaneous (12), cigarettes (9), escaped prescribed fire (3), Army mission (1), and fireworks (1). The Explosive Ordinance Disposal (EOD) area and M60 Range are responsible for frequent wildfires.

Implementation of the APP, in conjunction with power grid replacement projects across the base, will help reduce the number of wildfires caused by electrocuted birds (included in powerline-caused fires).

The Beale AFB Type 3 Wildfire Risk Assessment (Choleta 2018) analyzed 80 wildfires between 2008 and 2013 and found that most wildfire starts were associated with civilian causes, based on their proximity to the family housing area and roads, with all military training and power lines as secondary hazards. Most wildfire starts occurred between 1200 hours and 1800, with a peak around 1400 hours. Average fire size was 31 acres with a maximum size of 2,753 acres.

7.9.4 *Threats to the Mission and Natural Resources*

Safety of human personnel is the primary concern during any fire. Structures and infrastructure are present in several concentrated areas on Beale AFB, including the airfield area in the northwest portion of the installation; the munitions area in the north-central portion; the training area, Main Base, and golf course areas in the central portion; and the family housing area in the southeastern portion of Beale AFB. Primary values to protect include powerline poles, buildings, towers, munitions bunkers and above-ground fuel storage tanks. Of these, wooden powerline poles are most vulnerable due to the proximity to wildland fuels. Most other values will be adjacent to managed fuels, such as lawns, or unburnable fuels, such as pavement or bare ground. LRS and the Oroville NEXRAD site both contain similar buildings and/or infrastructure that could be negatively affected by fire.

The biologic natural resources of the installation are often considered to benefit from the effects of fire, as are the GSUs in most cases. This is especially true in the annual grassland/vernal pool areas, provided that firefighting actions do not result in physical impacts. Exceptions where fire may have negative effects include riparian forests and stream reaches that provide potential habitat for the Central Valley steelhead and VELB, both federally threatened species that need high quality habitat to survive. Minimal Impact Suppression Techniques will be used in and around vernal pools, streams, riparian woodlands, and oak woodlands to decrease the likelihood of damaging these sensitive wildlife habitats. In addition, Class A foam will not be used within 250 feet of any drainage, vernal pool or other water source.

Fire can negatively affect grazing operations by removing forage required by cows. The impact is temporary as fire can lead to better forage quality in the year or two following a fire and may provide invasive species control benefits that improve forage quality for the animals. In general, grazing and fire are landscape-level land management tools that are mutually supportive of natural resource goals in California annual grasslands and California vernal pool ecosystems. Firefighting actions such as maintaining annual firebreaks and wildfire response actions like fire lines often have negative effects on the fragile vernal pool ecosystems.

7.9.5 *Prescribed Fire History on Beale Air Force Base*

Beale AFB has an active prescribed fire program. Tabular and GIS data provided by the installation show that from 18 June 2001 through 27 July 2015, 70 prescribed fires were implemented at Beale AFB (Figure 7-6). The data show that Beale AFB has averaged 4.7 prescribed fires per year (range 1-18), with an average treated area of 622 acres (range 7-1,043 acres). All but four prescribed fires were completed during the months of May through September, with June through September being the primary prescribed fire season, accounting for all but eight fires. No records for prescribed fires on LRS or the Oroville NEXRAD site were available.

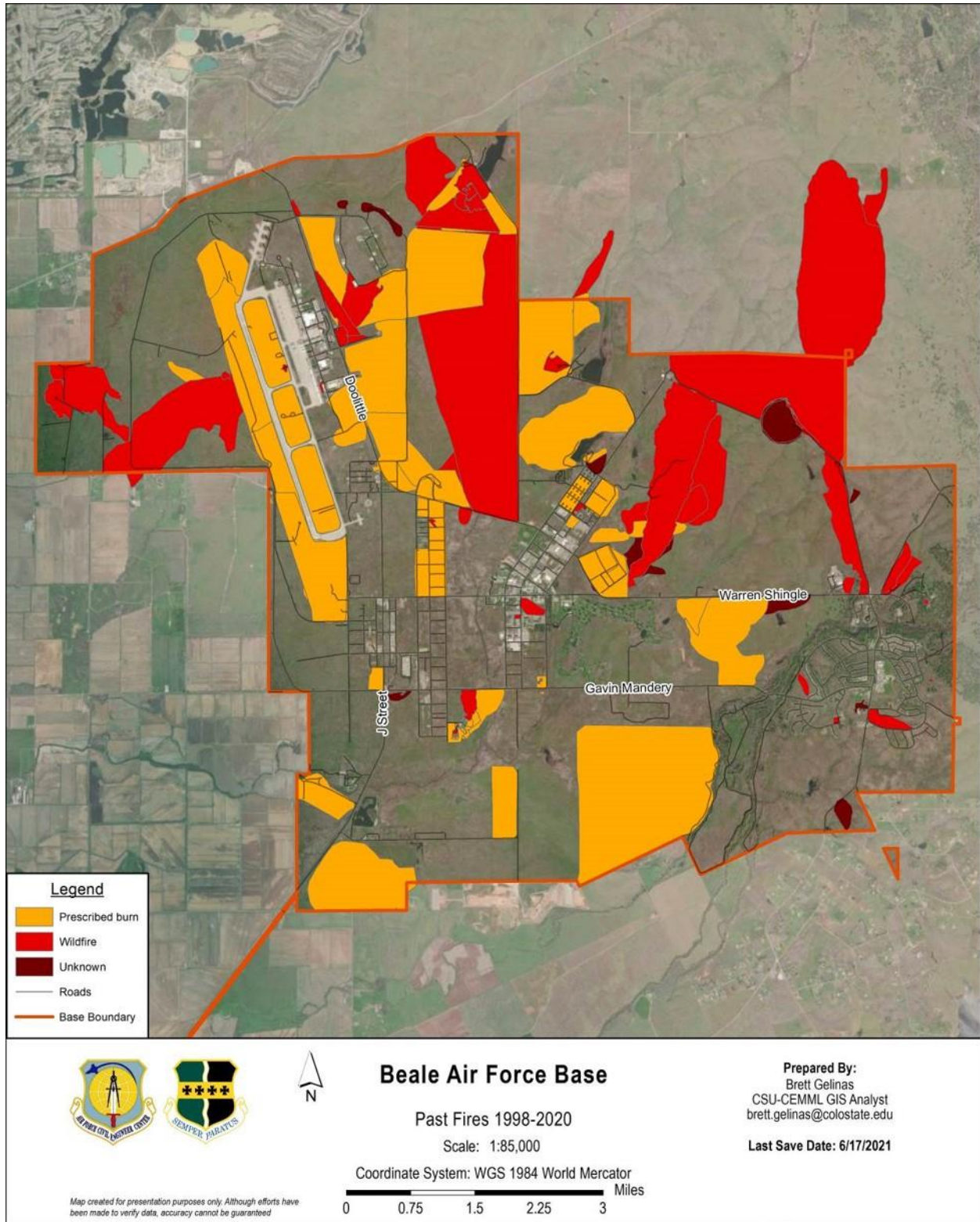


Figure 7-6. Past Fires on Beale AFB 1998-2017 (Beale AFB 2017c).

7.9.6 *Wildland Fire Management Unit (FMU) Outcomes*

There are two FMUs at Beale: the open grasslands (FMU 1) and the developed area (FMU 2). LRS is also part of FMU 1. Human safety and asset protection drive the WFMP. Additional drivers that accomplish natural resource objectives are listed below

- Suppress wildfires that may impact the limited values at risk on the FMUs. Wildfires not threatening safety, property, natural resources or cultural resources may be allowed to burn for ecological benefit.
- Use prescribed fire wherever appropriate as a tool to meet resource management objectives.
- Reduce the abundance of undesirable plant species base-wide.
- Use Minimum Impact Suppression Techniques tactics to minimize damage to natural and cultural resources.
- Perpetuate natural resources and processes as naturally influenced by fire.
- Promote desirable and native forage species in rangelands.
- Improve range conditions for cattle.
- Reduce the fuel load for wildfires.
- Improve vernal pool habitat and provide a conservation benefit to federally listed species by removing thatch layers of nonnative annual grasses.

7.9.7 *Wildland FMU Planned Fuels Treatments*

The Beale AFB WFMP consists of prescribed burns of available grazing land at least once every seven years. This would be accomplished by annually burning a minimum of 1,500 acres per year (three separate parcels of land approximately 500 acres each). Ungrazed lands may also be burned IAW the WFMP. Total acreage that may be burned in a given year is limited by a number of permitting and air quality factors. NRM, working with the WFMP Manager (Beale AFB 9 CES/FES Fire Chief), will determine the districts to be actively managed during the year.

The burn dates are pre-approved by 9 CES/CC, and the 9th Mission Support Group Deputy Commander (9 MSG/CD). The base holds an Agricultural Open Burn permit, with a total annual allotment of 993 acres. The Air Quality Manager is notified prior to a burn to ensure adequate acreage is available on the permit. The Air Quality Manager is responsible for contacting FRAQMD at least a week prior to the burn and the day of the burn to confirm approval/permission to burn and acquire the acreage to burn. The air district is given a daily prescribed burn acreage allotment, generally 200 acres. Since 2017, farmers have generally received preference when burn acreage is distributed, so the ability of the base to conduct controlled burns has been limited. Each air quality district requires its own permit, so the controlled burns at LRS require a separate permit. In some years, controlled burns are not allowed because they would contribute to already poor air quality caused by off-base wildfires.

The NRM determines the prescribed fire units to be burned each year with the purpose to target natural resource goals, while the 9 CES/FES Fire Chief determines the prescribed fire units to be burned each year with the purpose of targeting hazardous fuels reduction goals. As these goals may not always align, burns will be prioritized and funded based on their goal.

7.9.8 *Climate Change and Wildland Fire Management*

Increased temperature means and maxima were predicted in all climate change scenarios relative to historic values, with maximum temperatures increasing by two to six degrees °F throughout the year depending on the month and climate scenario (CEMML 2019). These increases in air temperature can be presumed to

decrease relative humidity and associated fuel moisture, making grasses more ignitable and fires more intense. Precipitation overall is expected to increase. In particular, November, December, and February are predicted to be substantially wetter than the historic average. The increased winter precipitation could reduce ignitions during or shortly after rainfall events, but this is outside of the fire season and is likely of little consequence in the overall assessment of future fire risk. The most consequential outcome of increased winter precipitation is likely to be higher than historic fuel loads, which will make wildfires more likely, more intense, and larger.

According to the EPA (2016), the average temperature in the northern Sacramento Valley has risen 1°F to 1.5°F in the last century. Climate change may result in altered fire regimes in California. Higher temperatures and drought are likely to increase the severity, frequency, and extent of wildfires, which could harm property, livelihoods, and human health. Increased wildfire smoke can reduce air quality and increase medical visits for chest pains, respiratory problems, and heart problems. Climate change may have effects on annual grasslands. Grass fuels are particularly susceptible to fire ignition and rapid fire spread because they have a high surface-area-to-volume ratio, which lowers the total amount of heat energy required to produce a sustained flame, as well as due to their continuity and their responsiveness to changes in humidity.

Increasing late spring moisture may increase the abundance and productivity of non-native annuals that thrive through late summer, including medusahead and barbed goatgrass, and non-native forbs like yellow star-thistle (Eskelinen and Harrison 2014; Eviner 2014). Overall, grassland species are largely adapted to seasonal summer drought characteristic of Mediterranean climates, but all grassland components are vulnerable to prolonged or severe drought (Reever Morghan et al. 2007). Warm spring temperatures typically increase annual grass growth rates and will likely favor increased exotic dominance in the future (Sandel and Dangremond 2012). Rising temperatures and longer dry periods will produce drier fuel conditions and decrease native vegetation community health, particularly in riparian forests and oak woodlands, increasing their susceptibility to pathogens and insects, changes which will increase susceptibility to wildland fire (CNRA 2009). Some grassland/vernal pool complexes may benefit from changes in precipitation and fire regime changes, at least in some years, but increased variability in conditions may challenge successful management.

Increases in wildland fire intensity and frequency may prevent the regrowth of burned vegetation and encourage changes in vegetation cover to brush or grasslands by preventing natural regeneration or repeatedly killing regeneration, particularly in oak woodland and riparian forest habitat. Grass and brush ignite easily and carry fire quickly across a landscape, further increasing wildland fire risk (CNRA 2009). Proper fuel management can reduce fire hazard and restore vegetation conditions that are less susceptible to wildfires. (CNRA 2009; US Forest Service [USFS] N.D.). Continued use of vegetation management, prescribed burning careful management of all ignitions, including allowing fires to burn where there is a resource benefit, will help sustain the military mission and soften the impact of the increased variability and changes in temperature and rainfall.

7.10 Agricultural Outleasing

Applicability Statement

This section applies to USAF installations that lease eligible USAF land for agricultural purposes. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

AFMAN 32-7003 permits agricultural outgrants “where feasible and compatible with the INRMP” and further states that the “overriding principles of ecosystem management ... apply to any outgrant of AF lands for agricultural uses”. Agricultural outleasing on Beale AFB is overseen by the 9 CES/CEIEC NRM and guided by AFMAN 32-7003, the 2011 Beale AFB INRMP, Section 6.9, *Agricultural Outleasing and Attachment 8, Supporting Information for the Agricultural Outleasing and Cropland Management Work Plan*; the 2011 Environmental Assessment (EA) of the grazing program; and the 2017 GMG (Hopkinson 2017b). Administration of the grazing outlease program is the responsibility of 9 CES/CEIEC and 9 CES/CEIA. The 9 CES/CEIEC, 9 CES/CEIA, 9 RW/JAG, and the 9th Contracting Squadron (9 CONS) cooperatively manage the Beale grazing program.

Grazing funds are used to support a Government Salary (GS) overhire Natural Resources Technician (NRT) position to manage day-to-day cattle operations. Grazing funds have also been allocated to a second GS NRT term position that will conduct annual grazing monitoring activities and other ranching related duties as assigned by the NRM.

7.10.1 Agricultural Uses

7.10.1.1 Cropland

Beale AFB lands have been used for grazing and crop production since the 1850s, prior to the acquisition of this land by the federal government in 1942 (Jones and Stokes 1997c). The first grazing and agricultural leases at Camp Beale were established in 1949. Dryland farming lease areas on Beale AFB were considered unprofitable by lessees and have not been leased since 1986 (Jones and Stokes 1997c). Areas once used for dryland farming have been converted to pasture for grazing cattle. The base also leased land for irrigated rice production in the Old Pheasant Farm area until the mid-1980s (RMAT 2000).

Historic olive and fig orchards exist near Lower Blackwelder Lake and the base running track. The orchards continue to be maintained as part of the Beale AFB grounds but are not managed for production due to age and type of olive. Historic fig orchards on the base have succumbed to the dry years after 2010; however, the olive groves remain mostly intact as of 2016. Since 1997, because of a lack of economic demand, no other commercial crop leases are ongoing or planned at Beale AFB. Both European olive and edible fig are invasive species, ranked Limited and Moderate on Cal-IPC’s invasiveness scale.

7.10.1.2 Rangeland

Beale AFB lands are managed to permit multiple uses of natural resources, including grazing domestic livestock. The grazing component of this multiple-use policy is based on the recognition that grazing is a way to maintain sound stewardship of public lands. Grazing livestock can be used to reduce fuel loads, control invasive plants, and improve wildlife habitat. Agricultural outleasing on the base is an economically self-sustaining program that enhances other aspects of natural resources management.

7.10.2 Grazing Program

The purpose of the Beale AFB grazing program is to support the mission by reducing fuel loads and fire risk, controlling invasive species and reducing BASH risks, maintaining open space, improving base security, and managing habitat for T&E species.

A Grazing and Cropland Management Plan was prepared in 1983 and updated in 1989. This plan governed grazing and other agricultural uses of these lands until the INRMP replaced this plan as the governing document for the grazing program. In 2000, a Range Management Assistance Team reviewed the Beale AFB grazing program and made recommendations for enhancing the program (RMAT 2000). In 2015, H.T. Harvey & Associates (2015a) outlined a strategy to expand the grazing program to meet management goals of maintaining firebreaks, controlling invasive plants, and protecting and enhancing resources. The 2017 GMG was developed to “help guide Beale AFB in their livestock grazing management activities and to meet the base’s natural resource management goals.” The desired outcomes of the grazing program and future management actions necessary to meet them are described in the GMG and Table 7-9. New NEPA analysis is expected for the proposed grazing expansion, new management actions, and lease updates in 2023.

7.10.2.1 Grazing Management Areas

Of the 12,789 acres in Beale’s grazing program, 12,632 are grazed by cattle and 157 acres are horse pastures. Grazing lands are divided into six management areas (Figure 7-7) ranging in size from 157 to 3,235 acres. Five areas are grazed by cattle and the sixth area is managed by the FSS for the Dry Creek Saddle Club as horse pasturage. Each management area is subdivided into smaller pastures. Acreage is subject to change based on military activities, construction of facilities, or other actions.

There are currently two new lease areas proposed for cattle grazing expansion. An Environmental Baseline Survey (EBS) has been conducted for the areas, and infrastructure development is in the planning stages. The potential for additional expansion of the grazing program was evaluated in 2015 (H. T. Harvey 2015a). It found that almost 3,200 acres in 34 proposed units (Figure 7-8) could be incorporated into the grazing program, a 25% increase over its current size. Most units would require fencing, water, and other infrastructure development before they could be grazed by cattle. The base plans to graze sheep and goats in the proposed pastures and in areas that require routine vegetation maintenance, such as dam faces and roadsides. Sheep and goats are typically herded and fenced in with mobile fencing and water sources, so they can be moved more easily than cattle and require less installation of permanent infrastructure (Hopkinson 2017b).

7.10.2.2 Grazing Suitability and Constraints

Grazing is a mechanism that can increase biodiversity and ecological functions in areas that have been degraded either naturally or by human-induced change (Marty 2015; Noy-Meir et al. 1989; Hayes and Holl 2003). Grazing can influence plant community structure, decrease fuel loads, and control invasive weeds (Marty 2005). However, grazing also can harm an area if improperly managed (Freilich et al. 2003). Annual productivity on each range site is dependent on soil characteristics, slope, and the timing and amount of rainfall. Certain habitats and physical characteristics may also impose constraints on the use of an area.

Table 7-9. Beale AFB desired grazing management outcomes, justification, and specific objectives (source: modified from Hopkinson 2017b).

Outcome	Justification	Objectives
1. Protect and enhance vernal pool ecosystem functions and processes.	Endangered Species Act (ESA; 16 United States Code (USC) 1531-1544) listed fauna protection	1.1 Graze vernal pool ecosystem to maintain or increase inundation periods within vernal pools to support breeding of vernal pool fairy shrimp and vernal pool tadpole shrimp, and vernal pool native plants. 1.2 Maintain residual dry matter (RDM) at recommended levels.
2. Protect and provide a conservation benefit for federal and state listed species, state species of concern, and other at-risk species including rare rangelands plants.	ESA 16 USC 1533 Section 4.(a)(B)(i) requirement to provide conservation benefit for listed species to achieve exemption from critical habitat; support of State Wildlife Action Plan and state wildlife laws; supports conservation value of rangelands.	2.1 General: Create a grassland habitat mosaic (grazed, lightly/rotationally grazed, ungrazed) to support multiple special-status species (and their prey) with varying requirements. 2.2 Monitor special-status native plant species in grazed and ungrazed plots to determine whether they benefit from a well-managed grazing program, need protection from grazing, or appear unaffected by livestock. 2.3 Conduct adaptive management study to provide site-specific information on appropriate <i>maximum</i> RDM targets for meeting wildlife habitat requirements, controlling invasive species, and minimizing fine fuel loads.
3. Maintain and improve rangeland ecosystem functions and processes	Enables achievement of Outcomes 1, 2, and 4.	3.1 Maintain RDM at recommended levels to minimize soil erosion. 3.2 Reduce cover of widespread invasive plant species.
4. Maintain or increase populations of native rangeland plants that contribute to floral and faunal biological diversity	Provides for the conservation and rehabilitation of natural resources and sustains the long-term ecological integrity of the resource base and the ecosystem services it provides.	4.1 Reduce cover of widespread invasive grass medusahead. 4.2 Reduce cover of widespread invasive species yellow star-thistle. 4.3 Eliminate incipient populations of new invasive species by implementing a rapid response protocol per the 2017 Beale AFB Invasive Plant Species Management Guidelines and associated Work Plans. 4.4 Monitor native species richness in grazed Management Areas. 4.5 Initiate blue oak protection and enhance regeneration on and around the Saddle Club.
5. Manage and improve rangeland vegetation to provide high quality livestock forage on a sustainable basis to maintain benefits received from livestock grazing leases.		5.1 Eliminate known populations of barbed goatgrass within five years, an invasive species unpalatable to livestock. 5.2 Maintain rangeland improvements (structural and nonstructural) to support grazing operations and improve the value of the lease. Implement Objective 4.1 above, as medusahead abundance reduces forage and livestock production.

Table 7-9. Beale AFB desired grazing management outcomes, justification, and specific objectives (source: modified from Hopkinson 2017b).

Outcome	Justification	Objectives
6. Meet BASH requirements and implement land management measures that discourage use by wildlife.		6.1 Maintain vegetation height between 7-14 inches. 6.2 Limit forb (wildflower) abundance. 6.3 Limit patches of bare ground. 6.4 Limit edge effects. Implement Objective 4.2 above.
7. Reduce wildland fire risk and its potential effects on base facilities and natural resources.	Protect mission infrastructure and human health and safety.	7.1 Reduce fine herbaceous fuels through managed livestock grazing. 7.2 Maintain wildland fire protection measures such as firebreaks, access roads for fire suppression, and use of gates for access instead of cutting fences.
8. Ensure no adverse impacts to cultural resources and maintain cultural heritage and value of grazed California rangeland.		8.1 Staff appropriate permits and documentation (AF Form 813 and AF Form 103) when moving or placing new grazing infrastructure. 8.2 Consult with the Beale Cultural Resources Manager to avoid placing salt licks and other attractants in culturally sensitive areas. 8.3 Provide opportunity to livestock operators to graze on land traditionally used for grazing in the pre-Camp Beale era when land is available for this purpose and compatible with Beale AFB’s mission.
9. Ensure no net loss in the capability of Beale AFB grazing program lands to support the military mission of the installation.	Requirement of the Sikes Act (16 USC 670a et seq.)	9.1 Maintain fencing integrity to avoid livestock in sensitive military areas. 9.2 Remove livestock carcasses from pasture units within 12 hours to reduce BASH risks. 9.3 Ensure ranching practices are flexible, and ranchers are available within 24 hours’ notice if livestock needs to be moved for mission priorities.
10. Ensure compliance with applicable federal and state laws and regulations related to natural resource protection.		10.1 Conduct grazing compliance surveys monthly to verify grazing lease and grazing land use regulations are properly implemented. 10.1 Comply with Grazing EA. 10.2 Complete EIAP and AF Form 332 and 103 processes. 10.3 Comply with base regulations.

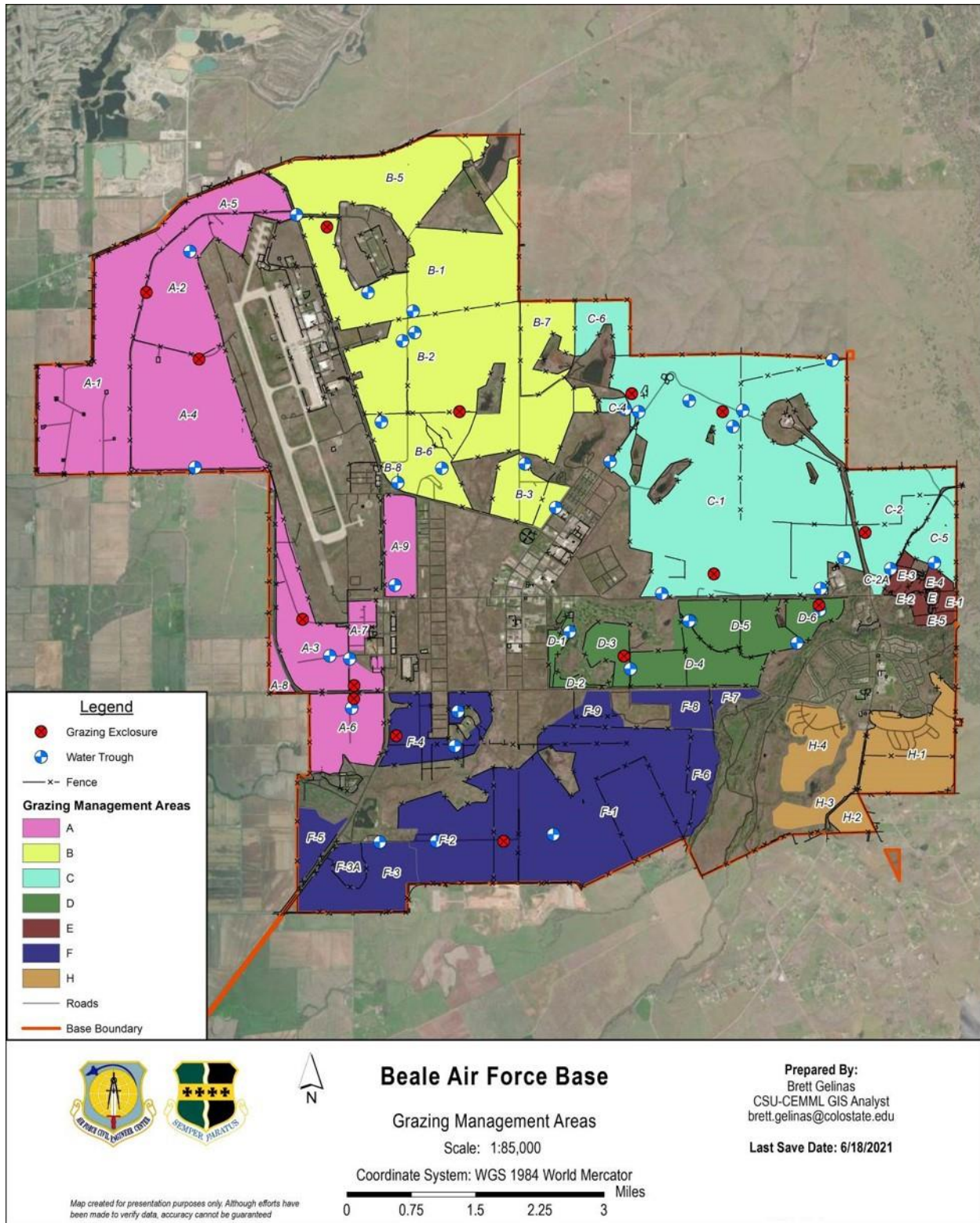


Figure 7-7. Grazing management areas (Beale AFB 2017c).

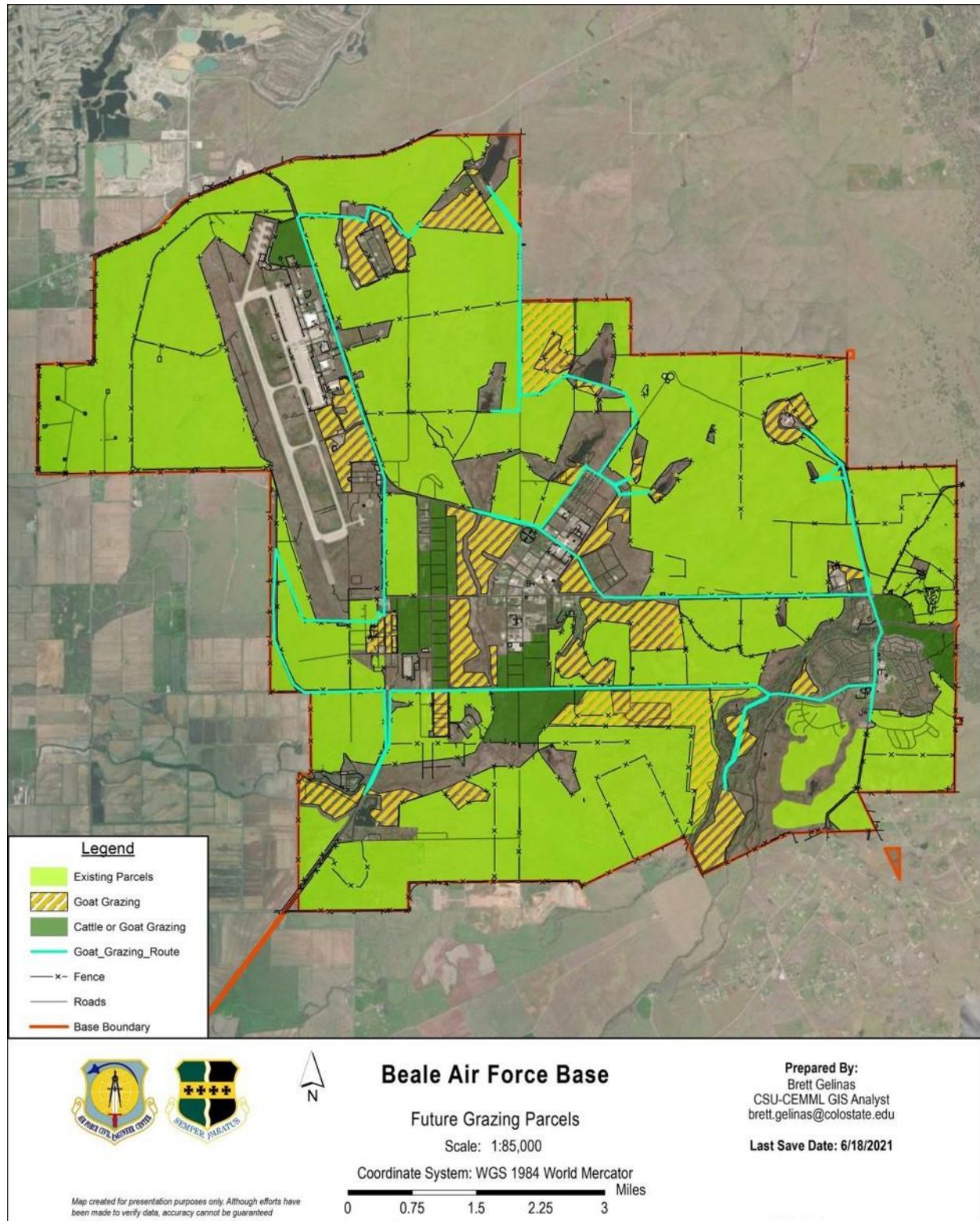


Figure 7-8. Future grazing parcels, goat grazing route, and wells (Beale AFB 2017c, ManTech International 2017b, Ayuda 2016).

Topography

The topography of the base is conducive to grazing. Flat grasslands with less than a 10% slope characterize 95% of the grazing area on Beale AFB, with low, rolling hills and blue oak woodlands present in the eastern portion of the base. There is little potential for erosion due to overgrazing or excessive use of sloped areas.

Soils

Soil stability is not a limiting factor in most grazing areas because of the flat or gently sloping topography, vegetative cover, and soil characteristics. The acreage of different soil types found on the base and the water erosion hazard are listed in Table 2-7.

Invasive Plant Species

The establishment and spread of invasive plant species are a major concern. Grazing can be used to control invasive plant species, but livestock can also be a vector for invasive plants. Weed containment and sanitation will be addressed in future management strategies. The principal rangeland weeds identified on the base include medusahead, yellow star-thistle, and barbed goatgrass. These species have limited palatability, and cattle or horse grazing is not a viable option for controlling them.

Medusahead is not desirable as forage due to stiff awns that cause injury to grazing animals and high silica content that reduces livestock palatability and slows decomposition. In addition, its fine texture supports fire and it outcompetes most other grassland species (Miller et al. 1999). Preliminary studies indicate that abundant medusahead causes loss of cattle productivity and therefore livestock market value (James et al. 2016).

Dense stands of yellow star-thistle act as a physical barrier to animal movement, including domestic livestock. In addition, yellow star-thistle is toxic to horses (chewing disease). Cattle and sheep will graze plants when they are young, and goats will eat yellow star-thistle, even at its spiny flowering stage.

Barbed goatgrass is unpalatable and avoided by livestock because of its taste. The barbs can get embedded in the nose, mouth, and eyes. Barbed goatgrass reduces forage for livestock up to 75% by crowding out desirable forage species (Peters et al. 1996). The spread of invasive weeds can be reduced by following the grazing BMPs taken from the IPSMG (Appendix T).

Water Availability

Water troughs are fed by the base water supply or water is trucked in. One water trough is connected to a solar well, and three more solar wells were installed in 2018. The Dry Creek riparian corridor and most impoundments on the base are fenced off from livestock. Some portions of Reeds and Hutchinson creeks are unfenced and used as water sources for livestock.

Infrastructure

Other constraints include the development of fences, gates, corrals and water sources (see Section 7.10.2.7, *Infrastructure*). Grazing revenues can be used for exterior fencing, interior division and boundary fences, gates, cattle guards, stock water troughs, water tanks, and more.

Grazing Removal

A frequent thought is that removing grazing pressure will support the return of native plants or improve land quality by some other means. However, elevation, soil texture, climate, and aspect are better predictors to explain patterns of community composition and species richness than grazing history in California annual

grasslands (Stromberg and Griffin 1996; Harrison 1999; Huntsinger et al. 2015). In addition, vernal pool systems have always likely exposed to disturbance including grazing by indigenous wildlife such as tule elk, pronghorn, and fossorial mammals and to burning by Native people (Minnich 2008). Consensus is building that properly managed grazing regimes are beneficial in vernal pool/grassland matrix ecosystems in the region around Beale AFB.

A study from just south of Beale AFB investigated grazing regimes by excluding grazing from whole pools during the wet season, during the dry season, year-round exclusion, and a control with continuous access for grazers (Marty 2005). The researcher measured plant diversity in the pool, at the edge, and in the upland; and monitored weekly inundation levels for three years. Ungrazed pools showed reduced native species diversity and their cover skewed towards more non-native grasses and fewer native forbs. Continuous and dry-season grazing kept the pools inundated longer than wet season or no grazing, with continuous grazing resulting in the longest hydroperiod. However, wet-season grazing, particularly the inputs of waste from grazers defecating in pools, may have detrimental effects on water quality for both invertebrates and vernal pool obligate plants (Croel and Kneitel 2011). This underscores the importance of monitoring as well as understanding the effects of grazing timing and duration at a highly local scale to determine the best management strategy for a particular property.

7.10.2.3 Sensitive Resources and Grazing

The effects of grazing on native plants and animals are complex, variable, and highly dependent upon both the intensity of grazing management and environmental factors. Grazing management on Beale AFB is typical season-long grazing with livestock moved on an as-needed basis. Since the primary goals of this type of grazing management are cattle weight gain and biomass removal, effects to native species are largely incidental. Forty special-status species occur on Beale AFB, and the GMG addresses the potential effects of grazing on all of these species. The potential effects of grazing on federal and state T&E species are summarized in Table 2-10.

Most habitat for steelhead, salmon, and VELB on the base is in the Dry Creek riparian corridor. Grazing is not permitted in this area, so these species are not affected by the grazing program. Elderberry plants are also found along Reeds Creek, which is not protected from grazing. To protect VELB host plants from browsing, exclosures were installed in November 2020 around elderberry plants along Reeds Creek and Mad Dog Lake outlets inside active cattle pastures. The exclosures will be monitored annually by grazing program staff to ensure proper maintenance. Five special-status plant species occur on the base. These species may be vulnerable to livestock grazing and trampling, but there is very little information describing livestock effects on these species (Hopkinson 2017b).

Changes in hydrology due to excessive use of an area by cattle can be beneficial or negative depending upon the species and extent of hydrological changes. The vernal pool mitigation areas described in Section 7.6, *Wetland Protection*, were not grazed for the first two to three years after construction. Grazing is now permitted in both areas, but grazing intensity and soil condition will be closely monitored during the grazing season to ensure that the pools are not being damaged.

Table 7-10. Potential effects of grazing on state and federally listed threatened and endangered (T&E) species known to occur on Beale Air Force Base (AFB) (source: 2017 GMG (Hopkinson 2017b)).

Species	Status	Habitat on Beale AFB	Potential Effects	Impact Assessment
Federally Listed T&E Species				
Steelhead—Central Valley DPS <i>(Oncorhynchus mykiss irideus)</i>	FT/--	Perennial and intermittent streams	Land use activities, including livestock grazing, have affected habitat by changing streambank and channel morphology, increasing water temperatures, and impairing water quality.	Grazing is not likely to affect species because habitat on base is found only in and adjacent to ungrazed Dry Creek riparian corridor.
Valley elderberry longhorn beetle <i>(Desmocerus californicus dimorphus)</i>	FT/--	Riparian and oak savannas habitats with elderberry (<i>Sambucus</i> spp.)	Cattle can consume new growth of host plant, reducing habitat availability but probably not crushing beetle young; grazing is not considered a widespread threat.	Grazing is not likely to affect species because habitat on base is found only in and adjacent to ungrazed Dry Creek riparian corridor.
Vernal pool fairy shrimp <i>(Branchinecta lynchi)</i>	FT/--	Vernal pools; ephemeral stock ponds	Livestock grazing may help maintain the necessary hydrological conditions for reproduction. USFWS states that cessation of grazing is a threat to the species, but overgrazing that modifies vernal pools by increasing sedimentation and nutrient inputs is likely to be a threat; livestock trampling may also crush shrimp cysts.	Light to moderate grazing likely beneficial; excessive grazing likely negative.
Vernal pool tadpole shrimp <i>(Lepidurus packardi)</i>	FE/--	Vernal pools; ephemeral stock ponds	Livestock grazing may help maintain the necessary hydrological conditions for reproduction. USFWS states that cessation of grazing is a threat to the species, but overgrazing that modifies vernal pools by increasing sedimentation and nutrient inputs is likely to be a threat; livestock trampling may also crush shrimp cysts.	Light to moderate grazing likely beneficial; excessive grazing likely negative.
California State Listed T&E Species				
California Black Rail <i>(Laterallus jamaicensis coturniculus)</i>	FP/ST	freshwater marshes at low elevations	In a study conducted primarily at Spenceville Wildlife Area, marsh habitat that received water primarily from irrigation inputs and had light to moderate winter/spring grazing had the highest levels of California black rail occupancy, possibly due to increased summer vegetative cover from summer inputs of water; marsh habitat that received water primarily from natural springs or streams and that was	Grazing in wetlands that receive water primarily from natural springs or streams probably negative; grazing in wetlands that receive water primarily from irrigation inputs possibly beneficial.

Table 7-10. Potential effects of grazing on state and federally listed threatened and endangered (T&E) species known to occur on Beale Air Force Base (AFB) (source: 2017 GMG (Hopkinson 2017b)).

Species	Status	Habitat on Beale AFB	Potential Effects	Impact Assessment
			winter/spring-grazed had the lowest levels of occupancy.	
Greater Sandhill Crane (<i>Antigone canadensis tabida</i>)	FP/ST	Summers in open terrain near shallow lakes or freshwater marshes; winters in plains and valleys near bodies of fresh water and agricultural fields	Heavy livestock use of wetlands can disrupt nesting and, by reducing vegetative cover, make nests more visible to predators.	Grazing in wetlands possibly negative during nesting season.
Swainson’s Hawk (<i>Buteo swainsoni</i>)	--/ST	Riparian habitats and isolated trees for nesting; grasslands and agricultural fields for foraging	Nests strongly associated with riparian vegetation; grasslands provide foraging habitat only; grazing may increase visibility of prey by reducing cover; in Central Valley, Swainson’s hawk strongly associated with grazed grasslands.	Grazing beneficial if not excessive.
Tricolored Blackbird (<i>Agelaius tricolor</i>)	--/ST	Breeds in freshwater marshes and blackberry thickets; cattail and tule marshes, and blackberry thickets, stands for nesting; grasslands, agricultural fields, irrigated pastures, and wetlands for foraging; known to forage up to 5 miles from nesting colony	Generally, breeds in freshwater marshes and agricultural fields; grazing vegetation to < 15 cm can improve foraging habitat.	Grazing probably beneficial in foraging areas.

Acronyms in table: FE = Federally Endangered; FP = Fully Protected; FR = species under review for federal listing; FT = Federally Threatened; LRS = Lincoln Receiver Site; SSC = Species of Special Concern; ST = State Threatened; USFWS = U.S. Fish and Wildlife Service

The application of properly managed grazing can reduce non-native plant cover and thatch accumulation, which in turn can increase the diversity of native plants in both vernal pool and upland habitats (Marty 2015). However, inappropriate intensity and timing of grazing can have a negative impact on native plant growth and recruitment (Jones & Stokes 1998b; Marty and Rice 2001). Inappropriate grazing is likely having a significant negative effect on vernal pools in pasture A-1, where a very high percentage of the codominant species found during a CRAM survey were nonnative plants typically grown for cattle forage (Wacker 2016). Livestock grazing has been excluded from the Dry Creek riparian area to improve recruitment of native oaks. Blue oak seedlings are particularly vulnerable to grazing, so protective measures were instituted in cattle grazing areas. In 2019, grazing program staff surveyed for blue oak seedlings and saplings in the eastern pastures. Exclusion fencing and tree tubes were installed to protect seedlings and saplings from browsing and trampling. Grazing program staff will continue to monitor blue oak seedlings to ensure continued efficacy of these protective measures. Oak protection measures are described in Section 7.1.2.2, Vegetation Community Enhancement. In general, a grazing program that maintains a mosaic of grazing timings and intensities over the landscape level may optimize native grass biodiversity (Huntsinger et al. 2007; D'Antonio et al. 2002).

7.10.2.4 Grazing Capacity and Stocking Rates

Grazing capacity is defined by California Range Managers as the estimated Animal Unit Months (AUMs) available in an average/normal rainfall year. On Beale AFB, livestock grazing begins in fall after enough rain has fallen for grasses to "green up," and it continues until grasses begin to cure in late May. Grazing occurs from 1 November to 1 June. The GMG (2017) estimates grazing capacity by Management Area (Table 7-11) for three rainfall levels: favorable, normal, and unfavorable, based on soil types and slopes (Hopkinson 2017b). These stocking rates are much higher than the current rates and are designed to maximize range productivity for cattle.

Livestock distribution will be monitored to obtain uniform range use, minimize sacrifice areas, and reduce overall fire hazards. When forage on any portion of the range is reduced to the minimum RDM, the lessee is required to move and restrict livestock to areas containing adequate forage or remove the livestock from the leased area. Stock water developments and salt blocks will be located strategically in coordination between the NRT and the ranchers to improve livestock distribution. Sacrifice areas will be identified and assessed to determine if livestock use has impacted or has the potential to impact nearby natural resources.

Average values for stocking rates have limited value in areas with extreme fluctuations in vegetative production such as in California where annual weather patterns are highly variable both in timing and amounts (see Section 2.2.1, *Climate*). In areas like Beale, stocking rates are adjusted to respond to variations in forage production and timing of use. Typically, reliable forage production is predicted in February or later; however, stocking decisions are made in the fall of the previous year based on RDM.

The prevention of over-use and meeting conservation goals is the purpose for using fall RDM-based rolling stocking rates. The NRM may decide to adjust stocking rates and even suspend grazing when forage production fails (Hopkinson 2017b). Grazing management at Beale AFB is reactive to extreme drought and requires lessees to include extreme drought contingency plans in their grazing plans. The RDM is a tool that can be used to evaluate grazing lease compliance (CNLM 2016).

RDM is measured at the beginning of the growing season (October) and is used to assess the previous season's forage production and use. Residual dry matter monitoring is a rangeland conservation data collection method used to determine the amount of forage present on the landscape. It is measured in pounds per acre, and standard amounts are often established to accomplish goals such as cattle productivity, natural

resource management, fuels reduction, etc. RDM is calculated by clipping vegetation at ground level in a pre-determined quantity of area, sorting it into categories of interest (such as preferred forage species, invasive species, etc.), drying it, then weighing it to attain a sample that can be extrapolated into pounds per acre. RDM can also be estimated visually after using the above method to calibrate the observer's estimation. The University of California Agriculture and Natural Resources (Bartolome et al. 2006) recommends an RDM of 500 lbs/acre less summer biomass decomposition loss (estimated at an average of 7% per month), or 169 lbs/acre for level to 10% sloped areas, which describes about 95% of Beale's grazing area. As slope increases, the minimum RDM value increases to protect soil resources and prevent erosion. The minimum RDM target of 500 lbs/acre may need to be adjusted as fall RDM monitoring data is collected and analyzed (Hopkinson 2017b). The 2017 Operating Agreement for Grazing Lease requires 800 lbs/acre remaining on all pastures at the end of the grazing season.

Table 7-11. Estimated grazing capacity based on precipitation levels, for Beale AFB and individual grazing management units (GMUs) (source: Adapted from GMG (Hopkinson 2017b).

Management Area	Acres	Animal Unit Month (AUM) ¹					
		Favorable		Normal		Unfavorable	
		AUM	AUM/acre	AUM	AUM/acre	AUM	AUM/acre
A	3,162	6,168	1.95	4,064	1.29	1,152	0.36
B	3,048	5,937	1.95	3,740	1.23	948	0.31
C	3,212	6,916	2.15	3,891	1.21	841	0.26
D	801	1,522	1.90	1,010	1.26	268	0.33
E	157	343	2.21	177	1.14	27	0.17
F	2,332	4,732	2.03	3,216	1.38	1,049	0.45
TOTALS	12,710	25,619	2.02	16,097	1.27	4,285	0.34

¹AUM for a mature horse is 1.25 compared to 1.0 for a mature cow and calf.

7.10.2.5 Forage Species

Annual grasslands are the predominant vegetation type on Beale AFB, principally composed of naturalized grass species with a few native perennial bunch grasses. Native and introduced forb species are intermixed with the grasses. Native grasses include purple needle grass, California melic, squirrel tail, and two native annual grasses, oldfield three-awn (*Aristida oligantha*) and Pacific fescue. Nonnative annual grass species include ripgut brome, rye grass, soft chess, medusahead, annual fescue, goatgrass and foxtail barley (*Hordeum jubatum* ssp. *jubatum*). A number of forbs, such as the non-native redstem filaree, are interspersed with the grasses and also provide forage.

7.10.2.6 Rangeland Monitoring

The monitoring program is based on 43 randomly established long-term monitoring plots located within various rangeland ecological sites (unique combinations of soils, geomorphology, and plant communities) in grazing units throughout the base. Three additional plots have been added since the program was initiated

for a total of 43 plots. Within the plots, several plant community attributes are sampled. Methodology has been consistent over the duration of the monitoring program to allow for comparisons across years (Wacker 2004). This set of monitoring tasks is based on recommendations from the Beale AFB Range Management Assistance Team (RMAT 2000). These tasks include sampling of invasive exotic plant species cover, plant composition, bare ground, grass height, and end of the season RDM to assess livestock utilization, biomass production, and grazing lease compliance.

The following monitoring methods are used currently:

- Spring Biomass monitoring is conducted in April or May, during the grazing season, in order to assess forage availability and range conditions to inform Natural Resources staff if any changes to grazing intensity need to be made prior to the end of season. Possible actions include a decrease in stocking levels due to measured overgrazing, or lease extensions in the event of excessive biomass levels. Monitoring is conducted with the same protocol utilized for the Fall RDM surveys.
- Fall RDM monitoring is conducted in September or October, for the purpose of maintaining adequate RDM levels to ensure soil health and to meet the rangeland ecological goals. Monitoring for both the Spring Biomass and Fall RDM components are conducted at 43 permanent monitoring plots established in the early 2000's (RMAT 2000). Each monitoring plot is roughly 100 feet in diameter and composed of four 50-foot transects, one in each cardinal direction (i.e., north, east, south, and west), with sample points located at the plot center, at each transect midpoint, and at each transect endpoint, for a total of nine subsample measurements per monitoring plot (replicate). At each sampled point biomass, grass height and percent bare ground is visually estimated via robel pole. A minimum of one calibration point is clipped and massed after drying at each of the 43 monitoring plots to assist with visual estimates.
- Vegetation monitoring is conducted in conjunction with the spring biomass surveys. Percent cover of the dominant graminoid species identified and forb cover are estimated and recorded as a single value for the entire plot. Estimates are made to the nearest 5% cover, and post-collection data is grouped into a Daubenmire cover class. Standard visual guides are used as needed to assist in determining cover class.
- Grazing exclosures are utilized to establish forage productivity estimates for the planned grazing expansion areas. A limited number of grazing exclosures are maintained in existing pastures for educational purposes. Five random samples are taken from within these exclosures, and five random samples are taken adjacent to the exclosures.

The 2017 GMG suggested that RDM monitoring be done by RDM mapping rather than the current methods. It is easy to learn and can require less time to complete. Sites with too little or too much fall RDM are quickly identified based on pounds per acre classes (e.g., 0-600 pounds per acre, 600-1,000 pounds per acre, etc.). With a map on paper or loaded into a global positioning system (GPS), RDM classes are visually estimated over several acres (quarter acre minimum). Visual estimates are calibrated as are traditional methods with clipping and weighing from representative plots. Cost-effective RDM mapping provides a picture of the spatial distribution of biomass. Other monitoring methods may be necessary to address specific questions concerning the effectiveness of the grazing program in meeting specific goals.

7.10.2.7 Infrastructure and Range Improvements

Infrastructure

Infrastructure includes fencing, gates, corrals, and water troughs (Figure 7-9). Beale AFB has been responsible for the installation and maintenance of infrastructure in the Livestock Lease Management Areas since the 1990s (Hopkinson 2017b). Some operational tasks are also the responsibility of the base (e.g., water hauling). Not all of the pasture units contain troughs, with some areas relying on seasonally available water (e.g., vernal pools, stock ponds and other surface waters). Some troughs are line-fed or well-fed, and others require water to be hauled or filled by hose. 9 CES/CEIEC uses grazing revenues to implement range improvements such as exterior fencing, interior division and boundary fences, gates, cattle guards, stock water troughs, water tanks, water pipelines, water impoundments and monitoring exclosures. The leases are no longer set up for accepting “in lieu” services, so all improvements must be made directly or by contract through the Natural Resources Program and NRT.

In 2017 a report was prepared for Beale AFB that suggested ways to improve cattle distribution through an improved distribution of water to influence the intensity of grazing on the landscape (ManTech SRS Technologies, Inc. 2017a). Three new wells were suggested to provide five additional water troughs. Four new trough locations within established grazing areas were identified along with trough/well locations in proposed expanded grazing areas (Figure 7-9). The suggested changes will help Beale attain long-term land management and conservation goals.

H-1 and H-2 proposed expansion areas were successfully installed in 2020, with the H-3 and H-4 units being contracted and slated for construction in 2021. The H-lease area will be included in the 2022 grazing lease renewal period.

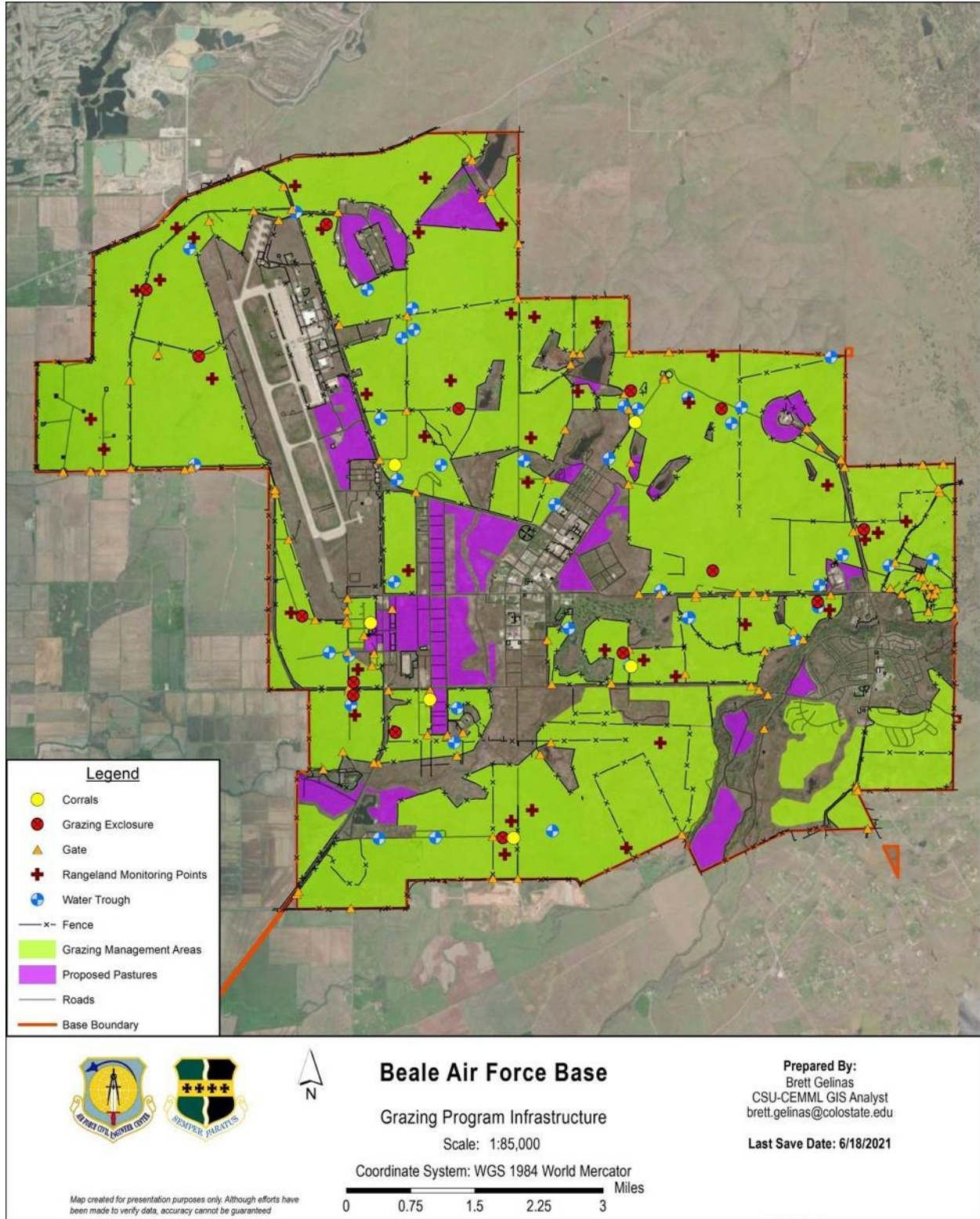
Improvements

Potential improvements include the addition of wildlife escape ramps to livestock watering systems, limiting vegetation around troughs for bat access, development of additional water sources, actions to reduce livestock impacts on naturally-occurring water resources (e.g., vernal pools), installation of solar wells and pumps, future well development, expanding the grazing program by increasing the number of units, establishing a “grassland bank” in one or more ungrazed units (area(s) held in reserve for intermittent grazing), and maintaining detailed records, including spatial and attribute data (Hopkinson 2017b).

Range improvements will be evaluated regularly to determine whether they are still necessary and if modifications will comply with new regulations or policies, improve their function, or facilitate the distribution of livestock. Additional range improvements may be required to protect facilities or cultural and natural resources. Facilities, such as water conveyance systems, will be protected as needed to prevent contamination of potable water sources by cattle. The design of these facilities will be coordinated between the NRM and NRT to ensure that new conflicts do not result from construction of these facilities.

7.10.2.8 Monies and Fees

AFMAN 32-7003 authorizes the use of agricultural outgrant revenue to support agricultural program expenses and installation natural resources management. Approved expenditures include civilian pay, administrative expenses, land improvements, vehicles, and equipment. Past support includes the overhire of a civilian range technician, grazing infrastructure, vegetation monitoring, wildlife surveys, and weed control activities and supplies. Future projects include the installation of solar wells, improved water distribution, and expansion of the grazing program.



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- 1
- 2 Figure 7-9. Grazing Program Infrastructure (Beale AFB 2017c, ManTech SRS Technologies, Inc. 2017b,
- 3 Ayuda 2016).

The Beale NRM develops and submits an annual spending plan to the AF Installation Support Section (ISS) SMS for approval. The use of reimbursable funds is guided by AFMAN 32-7003, Section 3.68, *Reimbursable Conservation Program Funds*. Funds cover the administrative expenses of agricultural leasing and finance natural resources management activities that implement an INRMP, including costs of normal operations or investment equipment. The grazing program is self-supporting with sufficient revenue to cover costs (Hopkinson 2017b). No Environmental Quality (EQ) funds are used for outlease land improvements or for civilian pay to persons providing direct support to the grazing program.

7.10.2.9 Grazing Leases and Land Use Rules

The 9 CES, 9 RW/JA, and 9 CONS have worked closely together to improve the lease and bidding process to select the "best value" rancher for the leases. Ranchers are selected not only on the bid price, but also based on past performance and their technical submission (grazing plan for the leased premises). A lease is for one year and then up to four subsequent years by consent of both parties. Five grazing leases were awarded in October 2017 to two ventures. One venture was awarded Parcel A, B, C, and F; and a second venture was awarded Parcel D.

In compliance with AFMAN 32-7003, Beale AFB's grazing leases include land use rules. The land use rules were revised in 2017 (Operating Agreement for Grazing Lease on Beale AFB, Appendix R). The Operating Agreement has six provisions. Major points are summarized below:

- Provision 1: Overview. The Lessee is subordinate to and must not interfere with the military mission; land use must comply with Beale AFB land use, conservation, and environmental concerns; and soil and vegetative cover must be protected (e.g., minimize erosion and prevent overgrazing, wildfire, noxious weed infestation, etc.).
- Provision 2: Supervision. The Lessee is subject to general supervision and approval of the 9 CES/CC, or his or her representatives; the Lessee shall furnish all equipment, labor and supplies and shall pay all expenses necessary and incident to compliance with these regulations; and grazing is coordinated with the 9 CES/CEIEC representative.
- Provision 3: Access to Beale AFB. Access includes obtaining entry passes, identification, accessible gates, communication, and emergency movement of cattle.
- Provision 4: Maintenance of Property. Minor repairs are assumed by the Lessee as part of their lease; damages caused by the Lessee, employees, or cattle; 9 CES/CEIEC repairs facilities damaged by the military or during firefighting activities.
- Provision 5: Resource Management. Grazing season is seven months; the grazing season can be curtailed if continued grazing is considered to be detrimental; the grazing season can be extended with permission; minimum RDM is 800 lbs. per acre at the end of the grazing season on all pastures; increases or decreases to grazing capacity may occur at any time with permission. Supplemental feeding is prohibited. Water is provided by the AF and will be metered and billed; and fenced water reservoirs may not be used by cattle.
- Provision 6: Livestock Management. Movement of livestock is during business hours; livestock will be confined at all times; strays will be collected and returned to the Leased Premises; individual animals will be moved by request of the 9 CES/CEIEC representative; and sacrifice areas and fire hazards must be reduced and livestock distributed over the Leased Premises.

7.10.2.10 Dry Creek Saddle Club

The Dry Creek Saddle Club is located on the eastern edge of the base and leases 157 acres for horse grazing. The riding stables program and club is currently managed by the FSS. The program operates IAW AFI 34-101, section 18.23, Riding Stables. Since the termination of the prior lease in 2019, the pastures are no longer utilized for grazing and now must only be used for trail riding and exercise paddocks. Horse owners are now required to provide certified weed-free feed to their horses.

7.11 Integrated Pest Management Program

Applicability Statement

This section applies to USAF installations that perform pest management activities in support of natural resources management (e.g., invasive species, forest pests, etc.). This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Pest management on Beale AFB is implemented by DoD Directive 4150.7, *DoD Pest Management Program*, AFI 32-1053, *Pest Management*, and the IPMP (Beale AFB 2018b). The primary focus of the IPMP is the effective control of pest species that endanger human health or negatively impact the mission such as insects, rodents, nuisance mammals, and weeds near the flightline. These procedures are efficient, economically feasible, and environmentally sound while emphasizing integrated pest management. Control efforts are coordinated through the Pest Management Shop within 9 CES/CEOI, 9 CES/CEIEC, the base veterinarian, and military public health sections.

The IPMP is carried out and reviewed by the Installation Pest Management Shop (also referred to as Entomology). The NRM must coordinate with Pest Management to ensure that the IPMP and INRMP are mutually supportive and not in conflict (Beale AFB 2018b). Control procedures are planned and accomplished IAW applicable laws and regulations. All euthanasia will be conducted IAW the American Veterinary Medical Association Guidelines for the Euthanasia of Animals (AVMA 2013), and any applicable Institutional Animal Care and Use Committee approved protocols or exemptions, and federal permits and licenses. A California scientific collection permit is not required for wildlife control on federal lands (see Section 1.3, *Authority*).

Pest Management inspects areas with current or potential pest problems, advises on control and prevention, and performs routine control activities. Routine activities include control of cockroaches, termites, mosquitoes, and other household/nuisance invertebrate pests. Non-chemical methods such as sanitation and mechanical traps are encouraged; chemical control is used as a last resort. Other wildlife species addressed in the pest management plan include skunks, rodents, and snakes. Pest Management is also responsible for reviewing the grounds maintenance contract, providing input on the use of pesticides, and monitoring the type and quantity of pesticides used for grounds maintenance and land management purposes.

7.11.1 Nuisance Wildlife Species Management

Encounters and conflicts between base personnel and residents and wildlife are relatively common at Beale AFB. Such animals include rattlesnakes, skunks, bobcats (*Lynx rufus*), coyotes, turkeys, and deer. Public education and increased awareness are provided regarding the appropriate response to wildlife encounters or conflicts (e.g., who to contact and how to prevent problems). CDFW has published informational brochures on some of these species. Information is also provided by 9 CES/CEIEC to all newcomers on base every week.

Nuisance wildlife are cooperatively managed by 9 CES/CEIEC, Pest Management, USDA APHIS WS, and veterinary services. 9 CES/CEIEC may assist any of the other parties if needed.

- Coyote control may be implemented when there are a high number of coyotes in rangeland being grazed by cattle and they are taking calves. If they become a nuisance, they will be dealt with on a case-by-case basis by the NRM. USDA APHIS WS is responsible for coyote control on the flightline. At this time hazing and lethal control are required, but there is a project planned to coyote-proof the flightline.
- Bobcats are very common on the base and are seen regularly in developed areas. If a bobcat becomes a problem, or unaccompanied cubs are encountered, it is dealt with by the NRM on a case-by-case basis.
- Black bears are occasionally seen on the base, including a mother and cub who were observed regularly in the housing area. Hazing, education and reduction of attractants are the first line of defense. The NRM will contact CDFW for assistance if there is a nuisance animal.
- Mountain lions (*Puma concolor*) are uncommon visitors to the base; any animals that become a nuisance or pose a safety risk are dealt with by the NRM on a case-by-case basis.
- Black-tailed Deer are abundant on the base and there are multiple car strikes each year. Deer are especially problematic along the stretch of road leading to the Wheatland Gate. Mowed areas along the road often have clover during the dry season. Herbicide application to remove green feed attracting the deer may reduce the problem. Reducing the speed along the stretch of road where the most strikes occur would reduce risks to human safety and damage to vehicles.
- Rattlesnakes are handled by 9 CES/CEIEC, Pest Management, or the volunteer game wardens. When rattlesnakes are reported, they are relocated, but education and avoidance are also emphasized. Rattlesnakes are captured and relocated to the closed landfills on base to augment rodent control on the capped sections.
- North American Beavers that routinely block waterways or destabilize dams are shot or trapped by the Hunting Program Manager or Pest Management shop using conibear traps. If the problem persists, pond levelers will be installed. All applicable permits and agencies consultations must be completed prior to installation.
- Nutria (*Myocastor coypus*) observed on base, nutria will be reported to the California Department of Wildlife and Fish at <https://wildlife.ca.gov/Conservation/Invasives/Species/Nutria/Infestation?>. Removal will be coordinated with Pest Management and the Base Cowboy.
- Bat exclusion and removal are generally done by Pest Management and will be coordinated with the NRM. It is done only by trained and vaccinated personnel. Only one-way exits will be used for exclusion and it will happen outside the winter hibernation and summer maternity seasons. Ideal windows are Aug-Oct/Nov, Feb/Mar-Apr unless surveys are completed to verify bats are not in torpor and young aren't present. Exclusion and/or removal will only be completed where there is a conflict with human use, if construction activities occur on the roosting structure, or if there is a BASH concern identified.
- Rodent control of rats, mice, ground squirrels, and pocket gophers are the responsibility of Pest Management. Rodent control will not take place in natural or open space areas without coordination with the NRM. Anticoagulants will not be used in natural or open spaces. Ground squirrel and pocket gopher burrows may be gassed when animals cause significant damage to landscaped areas.

Owl boxes were installed in the closed landfills on base to augment rodent control on the capped sections.

- Skunk control requires coordination with Pest Management, 9 CES/CEIEC, and the base veterinarian. Skunks are caught using live traps and euthanized by the base veterinarian IAW California law. Drowning shall not be used as a method of euthanasia at any time.
- Northern raccoons are common throughout the base, including around housing, the golf course and lodging. If northern raccoon activity has been determined a public health threat or property damage has occurred, hazing, education and reduction of attractants are the first line of defense. If the problem persists, Pest Management will live-trap all northern raccoons in the problem area. Northern raccoons are euthanized by the base veterinarian per California law.
- Stray or loose pets are the responsibility of 9 SFS. Animals are taken to the Sutter Animal Services Authority (Beale AFB 2017a). Sutter County Animal Control will not pick animals up from the base, so 9 CES/CEIEC may assist by transporting animals to Animal Services. There is currently no agreement in place for dealing with loose pets, but 9 SFS is looking into ways forward or updating an MOU/MOA with an appropriate agency or organization.
- Wildlife depredation on and near the flightline is the responsibility of the USDA APHIS WS employee under an interagency agreement to work with 9 RW/SEF, 9 OSS, and 9 CES for wildlife control. Depredation is done IAW AFI 91-212, *Bird/Wildlife Air Strike Hazard (BASH) Program Management*; the BASH Plan; and conditions stated in applicable depredation permits. Additional information on BASH reduction measures is in Section 7.12, *Bird/Wildlife Air Strike Hazard (BASH)*, and the BASH Plan.
- Injured or trapped birds will be reported to the NRM. Trapped native birds will be freed or exit holes created, and injured native birds will be taken to rehabilitation facilities by permitted 9 CES/CEIEC staff or the on-site USFWS FWO. Injured nonnative birds will be humanely euthanized IAW the AVMA Guidelines for the Euthanasia of Animals (AVMA 2013). Rehabilitated animals must be released off-base, but uninjured captured birds can be released to suitable locations on-base.
- If a disease occurs within the wild animal population or grazing animal population on base, affected parties will coordinate with the NRM. Rabies has been detected in animals on the base.

7.11.2 *Invasive Wildlife and Feral Animal Management*

Feral cats are present in low numbers on Main Base and were observed in the Dry Creek riparian prior to the closing of the trailer park housing section on base. If the mission or population on the base changes and semi-permanent housing is reestablished, feral cats could again become a nuisance. If the presence of feral cats in the Dry Creek area is confirmed (through direct observation, by hunters and 9 CES/CEIEC camera traps), trapping will be implemented in those areas to protect migratory and resident birds and other wildlife. Cats will be trapped using live traps and transported to the Sutter Animal Services Authority. Feral dogs have not been documented on Beale AFB.

Red-eared sliders, a nonnative species that competes for resources with the WPT, are present in all of the large water bodies on the base and appear to be increasing in number. The highest concentration is at Lower Blackwelder Lake, where hundreds of turtles can be seen basking during summer and fall. The nonnative, invasive American bullfrog is also ubiquitous in water bodies on Beale AFB. American bullfrogs are indiscriminant predators that will eat anything that can fit in their mouths, including small turtles. Bullfrogs

are also considered one of the main threats to the persistence of the CRLF, which is presumed extirpated from Beale AFB. CRLF have been found to co-exist with bullfrogs, but the presence of these predators in breeding habitat significantly decreases the survivability of tadpoles, metamorphs, and juveniles and, if allowed to persist, can wipe out an entire population within one breeding pool or stream (USFWS 2017c). This is likely at least one of the reasons for the absence of CRLF on Beale AFB.

A Red-eared Slider and American Bullfrog Control Plan (CEMML 2017c) outlines control methods and prioritizes areas for implementation. Priority areas for both turtle and bullfrog control include Dry Creek, Best Slough, Beale Lake, and Lower Blackwelder Lake. Upper Blackwelder, Miller, and Blackbird Basins were priority areas prior to dam replacement projects. The suitability for, and presence of, WPT will need to be reassessed after dam replacement projects are complete. Control activities have been conducted annually since 2016.

It is illegal to place, or cause to be placed, any aquatic plant or animal into the waters of the state of California (Fish and Game Code [FGC] sec. 6400). Red-eared sliders captured during control activities will not be given to base personnel as pets. Any nonnative turtles captured during WPT trapping efforts must be euthanized or turned over to 9 CES/CEIEC. Turtles and bullfrogs are euthanized in accordance the American Veterinary Medical Association Guidelines for the Euthanasia of Animals (AVMA 2013).

Red-eared sliders and feral cats are both the result of base residents abandoning or releasing pets. Educational materials will be disseminated to the base population. Signs or flyers explaining the harm caused by dumping pets will be posted at lakes and in housing.

7.11.3 Invasive Plant Management

7.11.3.1 Program Overview

Invasive plants are managed on base to reduce the potential threats they pose to the military mission and to manage habitat for T&E species. The IPMP states that invasive plant management in wildlands outside of the flightline is the responsibility of the NRM. Monitoring and control are done primarily under contract, although some work is performed by 9 CES/CEIEC personnel. Pest Management applies herbicide annually to yellow star-thistle along the flightline and does small-scale herbicide application in wildlands as directed by the NRM.

On Beale, a long-standing and entrenched suite of weed species (Jones & Stokes 1997b; RMAT 2000) threatens sensitive resources as well as accomplishment of military objectives and missions and quality of life for base residents. It is important for the base to have a long-term and thorough weed management strategy in order to meet management goals. Invasive weed control cannot be planned or conducted on a year-to-year basis, but must be incorporated into a cohesive, long-term land management strategy.

Projects to monitor and control invasive plants have been conducted for years, going back to at least 2002 (Table 9 in Appendix I). Comprehensive invasive plant mapping of the base was conducted in 2014-2016 (H.T. Harvey 2015b; CEMML 2016; Figure 7-10), and IPSMG (Hopkinson 2017a) were created for the base in 2017. Management and control are planned around the invasion curve, a concept in conservation biology which models the relationship between the time of residency for a given invasive species, the cost of controlling it as it expands, and the viable management strategy to address it (Figure 7-11). Using this framework, species are targeted for prevention, eradication, containment, or asset-based protection. Species categorized as “prevention” exist only on a watchlist and the property is monitored to ensure early detection. “Eradication” species are targeted for aggressive control with the goal of removing all infestations and where there is little chance of reintroduction. The term “Zero Density Management” is also used for this

stage, as eradication is understood to be an aspirational goal that would require region-wide coordination, while Zero Density Management is understood to be complete localized removal. “Containment” species are managed with the goal of preventing expansion outside of baseline infestations and reduction of cover within those known infestations. Eradication is likely not possible for these species, so planning for ongoing management is required. The last category, asset protection, is reserved for those species that are widely entrenched, usually with extensive regional infestations and persistent seed banks. They are managed only where they are in direct conflict with an asset (such as when they degrade desirable habitat) but control is not anticipated throughout the entire infestation on the property.

All weeds on Beale AFB have been assigned a category. The IPSMG and previous mapping efforts resulted in a holistic and base-wide review of the weed issue to ensure that all weed control activities are efficient and effective uses of government resources and that activities benefit explicit mission and/or conservation goals. Specific work plans were written (appendices to the IPSMG) which include BASH (for control around the flightline, to be implemented by Pest Management), Early Detection Rapid Response (EDRR) to address emergent species and a process for finding new introductions, Riparian Weed Control Work Plan to deal with riparian weeds, and a Goatgrass Work Plan to try and eradicate the species within the grazing pastures. General procedures to deal with weeds throughout the rest of the base are in the IPSMG itself. Non mission-critical projects recommended in the IPSMG will be implemented pending NEPA analysis and as funding becomes available.

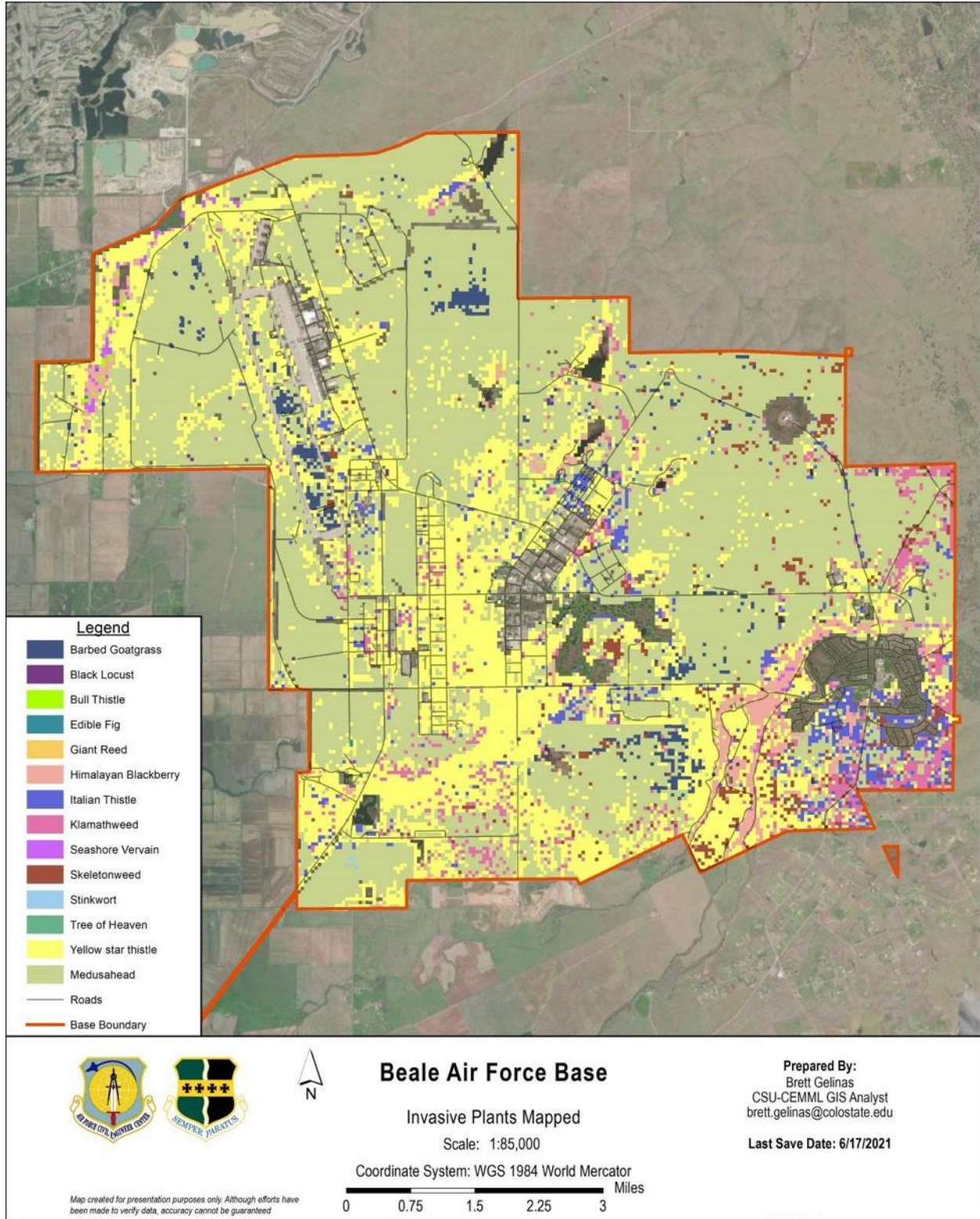
7.11.3.2 **Invasive Plant Species**

There are many invasive plant species on the base; a complete list is included in Appendix S. Table 7-12 lists high-priority species present on the base and the risks they pose to the mission and management goals. They differ in their infestation extent and threat to the mission. Many of the species are already being controlled in some areas or were part of a treatment effort at some time. The most significant threat to the mission from invasive plants is creating a BASH concern by providing habitat and forage for birds around the flightline. Other threats include increased fire risk, decrease of open spaces, creating the potential for flooding, and the degradation of habitat for T&E species. There are a few species of particular concern on the base including: barbed goatgrass, giant reed, Armenian blackberry, medusahead, and yellow star-thistle.

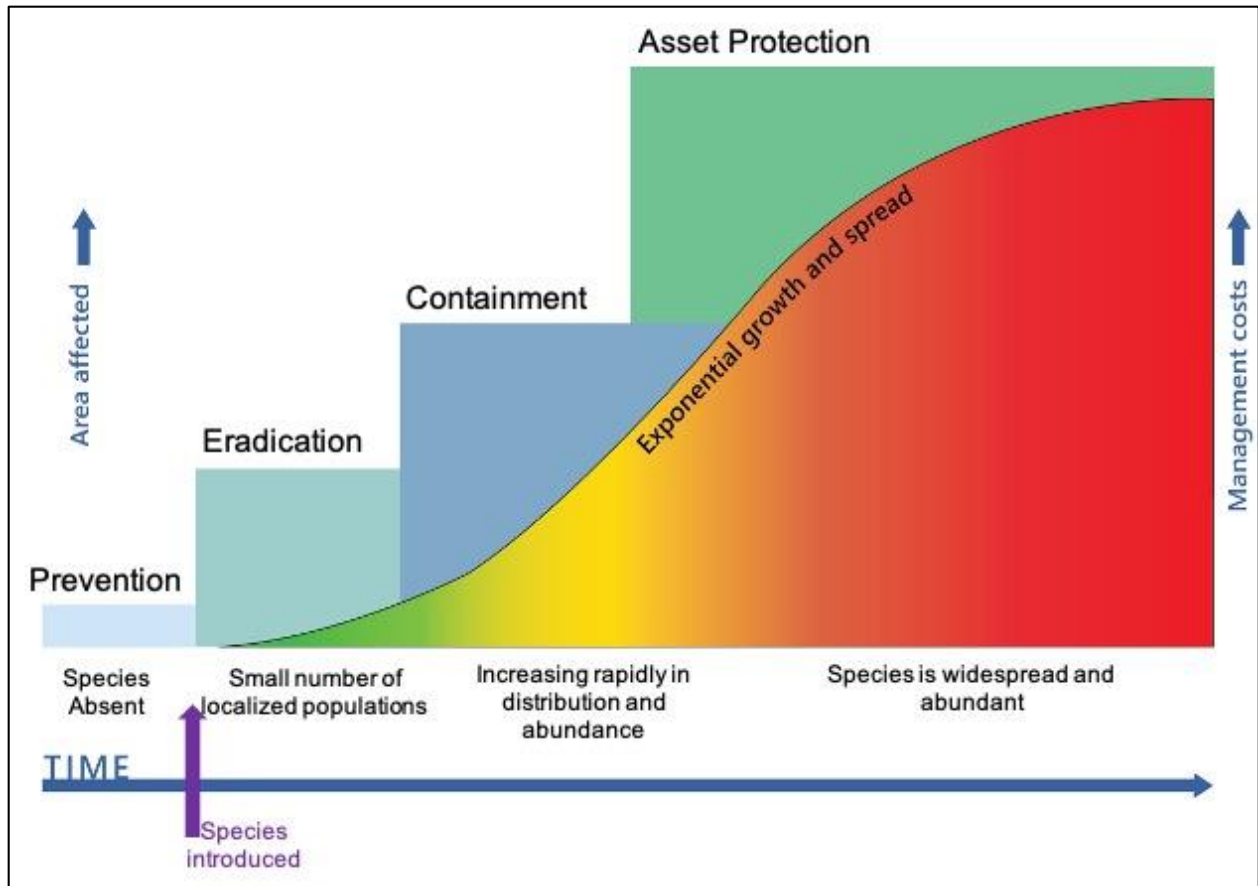
7.11.3.3 **Natural Resource Protection Measures**

Methods to control invasive plants include hand pulling, mowing, weed whacking, herbicide application, prescribed burns, and grazing. A base-wide EA for all methods of weed control is being prepared, but at this time, many weed control activities require individual NEPA analysis. Invasive weed control on the base is constrained by a number of factors including the presence of T&E species habitat, wetlands and waterways, and desirable native plant species. Activity-specific invasive weed concerns and prevention measures are discussed in Sections 7.7, *Grounds Maintenance*; 7.9, *Wildland Fire Management*; and 7.10, *Agricultural Outleasing*.

Prior to 2017, pesticide applicator information and pesticide usage tracking were done in the web-based Integrated Pest Management Information System (IPMIS). At this time, there is no replacement program so the base Pest Management shop tracks and reports all pesticide use on the base and maintains a record of Qualified Applicator Certificates/Licenses (QAC/L). All herbicide used on the base is reported to Pest Management, which reports it to the county.



1
 2 Figure 7-10. Invasive plants mapped on Beale AFB 2014-2016 (Beale AFB 2017c, CEMML 2017c, H.T.
 3 Harvey & Associates 2015b) .



4

5 Figure 7-11. Invasion curve conceptual model (Invasive.org.au).

6

Table 7-12. Invasive plant species present on Beale AFB and current status (source: 2017 IPSMG (Hopkinson 2017a).

Common Name	Scientific Name	Cal-IPC Rating	Threats to Mission	Past and Ongoing Control	Current Status ¹	Management Goal
Barbed goatgrass	<i>Aegilops triuncialis</i>	High	Increases the chance of fire, decreases forage, harmful to vernal pool habitat.	2017 weed whacking treatments west of flightline. 2019 weed whacking spot treatments in GMUs.	Total infested area on the base is 502 acres. Clumped distribution on the base. Invading cattle pastures. Work plan in place.	Reduce to <10% cover in treated areas after 2 years, monitor for and prevent spread into new areas.
Giant reed	<i>Arundo donax</i>	High	Can choke waterways causing flooding and blocking anadromous fish passage, highly flammable.	Treatments in 2013, 2017, and 2018. Treatments planned for Dry Creek.	Total infested area on the base in 13 acres. Infestations are located primarily in riparian corridors.	Zero density within 5 years.
Armenian blackberry	<i>Rubus armeniacus</i>	High	Creates habitat for birds, increasing BASH hazard.	Mowing/mastication in 2015. Chemical treatments in 2016, 2017, and 2019 along Reeds Creek	Total infested area on the base is approximately 600 acres. Infestations are primarily in riparian and wetland areas. Flowers during summer and is widely used by native pollinators. Targeted areas should be limited to Reeds Creek or other areas where it can be successfully replaced with native summer flowering plants.	Reduce to <5% cover in targeted areas, allow little/no fruit production and replace with a native pollinator equivalent.
Medusahead	<i>Elymus caput-medusae</i>	High	Increases the chance of fire, decreases forage, harmful to vernal pool habitat.	No active control measures. Biomass being passively controlled through grazing.	Infestations are widespread across the base with approximately 20,500 acres infested.	Reduce to <25% cover within 2 years in treated areas.
Parrotfeather	<i>Myriophyllum aquaticum</i>	High	Impedes water flow and interferes with recreational activities.	No current control.	Limited distribution on the base.	Zero density within 2 years in all identified locations.

Table 7-12. Invasive plant species present on Beale AFB and current status (source: 2017 IPSMG (Hopkinson 2017a).

Common Name	Scientific Name	Cal-IPC Rating	Threats to Mission	Past and Ongoing Control	Current Status ¹	Management Goal
Uruguayan primrose-willow	<i>Ludwigia hexapetala</i>	High	Degrades water quality, interferes with mosquito control, and reduces water flow in irrigation channels.	No active control being taken.	Presence on the base is unverified.	Zero density within 2 years.
Yellow star-thistle	<i>Centaurea solstitialis</i>	High	Increases the chance of fire, decreases forage, decrease suitability of open spaces for training, BASH hazard, harmful to vernal pool habitat.	Several treatments in the vicinity of the flightline since 2007. Mowing treatment in 2017 in the scar of a 2015 controlled burn.	Infestations are widespread across the base with approximately 6,800 acres infested.	Reduce to <20% cover within 3 years in areas where it is impacting resources or human activities. When removed, replace by other desirable species such as native bunchgrass where appropriate.
Black mustard	<i>Brassica nigra</i>	Moderate	Increases fire hazard, toxic to livestock.	No control measures taken.	Total infested area on the base is approximately 850 acres. Primarily located in riparian and wetland areas, generally at low cover.	Reduce to <5% cover in areas where it is impacting resources or human activities.
Bull thistle	<i>Cirsium vulgare</i>	Moderate	Reduces forage quality, BASH hazard.	Hand pulling/digging treatments conducted in 2017 and 2019 along Reeds Creek.	Total infested area on the base is approximately 50 acres.	Zero density within 4 years.
Edible fig	<i>Ficus carica</i>	Moderate	Fruit attracts birds and other wildlife, causes dermatitis.	No control measures taken.	Total infested area on the base is approximately 50 acres.	Zero density within 5+ years.
Italian thistle	<i>Carduus pycnocephalus</i> ssp. <i>pycnocephalus</i>	Moderate	Spines decrease forage quality.	No control measures taken.	Infestations are widespread across the base with approximately 2,600 acres infested.	Reduce to <5% cover in areas where it is impacting resources or human activities.

Table 7-12. Invasive plant species present on Beale AFB and current status (source: 2017 IPSMG (Hopkinson 2017a).

Common Name	Scientific Name	Cal-IPC Rating	Threats to Mission	Past and Ongoing Control	Current Status ¹	Management Goal
Klamathweed	<i>Hypericum perforatum</i> ssp. <i>perforatum</i>	Moderate	Causes sunburn in light-colored livestock.	No control measures taken.	Total infested area on the base is approximately 825 acres.	Reduce those sites with >10% cover to < 5% cover.
Russian knapweed	<i>Rhaponticum repens</i>	Moderate	Accumulates and deposits zinc on soil surface, toxic to horses, reduces forage quality.	No control measures taken, bio-control beetle present in the state.		Zero density within 3 years.
Skeletonweed	<i>Chondrilla juncea</i>	Moderate	To be determined.	No control measures taken.	Infestations found widely across the base with approximately 475 acres infested.	Reduce to 10% cover after 3 years.
Stinkwort	<i>Dittrichia graveolens</i>	Moderate	Causes contact dermatitis.	Hand pulling treatment conducted in 2017 along Reeds Creek and near the Wheatland Gate.		Zero density within 3 years.
Tree of heaven	<i>Ailanthus altissima</i>	Moderate	Can cause contact dermatitis in sensitive individuals; common allergen.	No control measures taken.	Total infested area on the base is approximately 13 acres.	Zero density within 5 years.
Black locust	<i>Robinia pseudoacacia</i>	Limited	Toxic to livestock.	No control measures taken.	Total infested area on the base is approximately 10 acres.	Zero density within 10+ years.
Blessed milk-thistle	<i>Silybum marianum</i>	Limited	Displaces native and forage species, spines can injure livestock.	No control measures taken.	Total infested area on the base is approximately 400 acres. Infestations are mostly found in riparian areas, and occasionally in uplands.	Reduce to <10% cover in upland areas.
India toothcup	<i>Rotala indica</i>	Unlisted	In some years, dominates cover in	No control measures taken.		Zero density but inadequate

Table 7-12. Invasive plant species present on Beale AFB and current status (source: 2017 IPSMG (Hopkinson 2017a)).

Common Name	Scientific Name	Cal-IPC Rating	Threats to Mission	Past and Ongoing Control	Current Status ¹	Management Goal
			some Beale AFB vernal pools.			information to determine time to goal.
Seashore verbena and/or Buenos Aires verbena	<i>Verbena litoralis</i> and/or <i>V. bonariensis</i>	Unlisted but on Cal-IPC Watchlist	Invades riparian areas.	Hand pulling treatment conducted in 2017 along Reeds Creek.	Total infested area on the base is approximately 150 acres. Infestations are primarily found in riparian areas at low cover.	Reduce to 0% cover in satellite populations and where previously treated.

Acronyms in table: AFB = Air Force Base, GMUs = Grazing Management Units, BASH = Bird/Aircraft Strike Hazard, Cal-IPC = California Invasive Plant Council.

¹ Total number of acres on which at least 1 plant of this species was mapped in 2016.

8 Prior to 2017, pesticide applicator information and pesticide usage tracking were done in the web-based
9 Integrated Pest Management Information System (IPMIS). At this time, there is no replacement program
10 so the base Pest Management shop tracks and reports all pesticide use on the base and maintains a record
11 of Qualified Applicator Certificates/Licenses (QAC/L). All herbicide used on the base is reported to Pest
12 Management, which reports it to the county.

13 BMPs for weed prevention, grazing, mowing, and herbicide application were developed as part of the
14 IPSMG (Appendix T). BMPs range from programmatic recommendations for how goals are accomplished
15 to specific protocols for executing tasks (Cal-IPC 2012, 2015b). Weed control BMPs can be recommended
16 to contractors or residents to guide their work and reduce the possibility that projects will introduce, spread,
17 or increase weed infestations. BMPs for weed prevention and herbicide application are also included in the
18 general project BMPs taken from the draft PBA (Appendix V). Herbicide and pesticide use require
19 consultation with USFWS when applied near sensitive areas.

20 Based on feedback gained during review of the 2019 INRMP, a new herbicide BMP will be implemented
21 across the base: No herbicide will be applied within 100 feet of known Native American cultural sites
22 without prior consultation with the base NRM/CRM and local tribes (MM-17 in Appendix V).

23 7.11.3.4 Coordination with Other Programs and Agencies

24 The IPMP states that the NRM will consult with USFWS prior to pest control activities that may impact
25 T&E species or their habitats. The NRM will coordinate with Pest Management to ensure that the IPMP
26 includes complete information on actions that may require additional permitting or environmental
27 protection measures. The NRM will also coordinate with the grounds maintenance contract manager in 9
28 CES/CEO to include applicable BMPs from the IPSMG in the Grounds Maintenance PWS. Implementation
29 of the BMPs will help protect natural resources during weed control activities and prevent the spread of
30 invasive weeds. The NRM will also identify and create maps of areas that require coordination prior to pest
31 management or landscaping activities, including special-status species habitats and “no-mow” areas where
32 mowing is likely to spread invasive plants.

33 The base will formalize communication with CDFW and other regional land managers and agencies
34 regarding the presence of existing and emerging invasive weed threats. This will help develop the
35 implementation of coordinated invasive weed control efforts among interested parties.

36 7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)

37 *Applicability Statement*

38 This section applies to USAF installations that maintain a BASH program to prevent and reduce wildlife-
39 related hazards to aircraft operations. This section **IS** applicable to this installation.

40 *Program Overview/Current Management Practices*

41 Bird/wildlife aircraft strikes are a very serious human health and safety concern, and it is critical to the
42 mission to prevent these incidents. Wildlife hazard control is the responsibility of the BASH Program
43 operated by 9 RW/SE. The associated BASH Plan (Beale AFB 2016a) is established IAW AFI 91-202,
44 *USAF Mishap Prevention Program*, and updated regularly to reflect new mission needs and wildlife control
45 measures. Most BASH risk abatement activities are performed by a USDA APHIS WS employee,
46 authorized under an MOU between the DoD and USDA APHIS WS.

47 The purpose of wildlife hazard control is to minimize risk to Beale AFB personnel and assets while
48 protecting and maintaining wildlife species populations and habitats. This is achieved by encouraging
49 wildlife to remain outside of the WEZ (Figure 7-12), in order to protect both wildlife and Beale AFB assets.
50 A WEZ is a locally defined, airfield-specific area of zero tolerance for wildlife, encompassing the aircraft
51 movement area, clear zones and any additional habitat attractants (e.g., water treatment facilities, golf
52 courses and athletic fields) in proximity to the airfield and low-level flight corridors (approach/departure).
53 Per AFI 91-212, the base must ensure that the WEZ is integrated into base mapping products such as
54 imaginary surfaces criteria, land use maps and operational constraint maps.

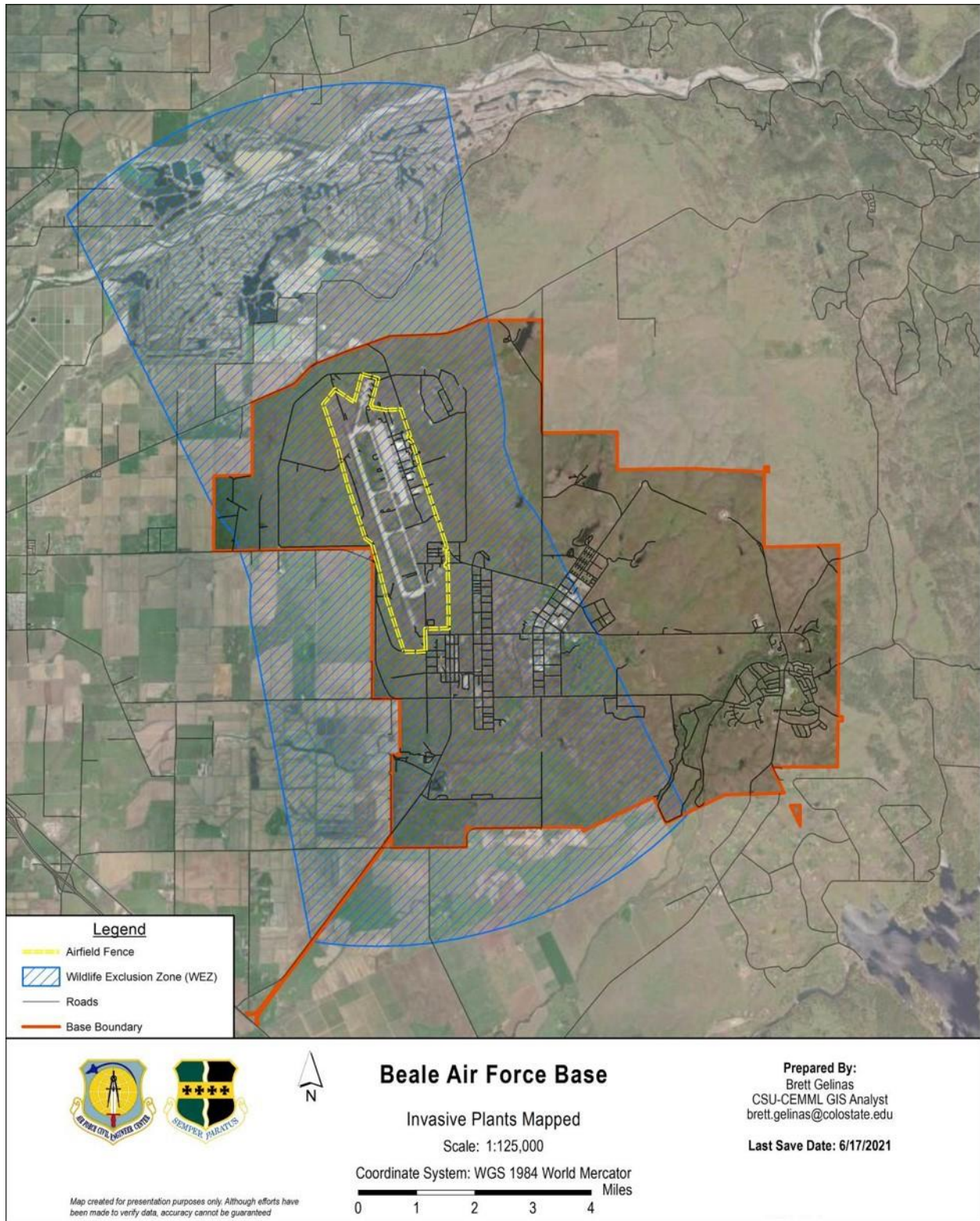
55 The BASH Program Manager is authorized to conduct active deterrence/removal under the base MBDP, a
56 BGEPA permit and this INRMP (see Section 7.1.3.1, *Migratory Birds*). Per AFI 32-7064, lethal control is
57 authorized only after all practical non-lethal control measures have been exhausted, provided that the
58 proposed actions are reviewed in EIAP procedures as stipulated in 32 CFR Part 989, *Environmental Impact*
59 *Analysis Process (EIAP)*; however, per 50 CFR 21.41, no permit is required merely to scare or herd
60 depredating migratory birds other than T&E species or bald or golden eagles. No species protected under
61 the federal ESA may be taken by lethal control or harassment. Per AFI 32-7064, conservation measures for
62 state protected species are implemented when not in direct conflict with the mission. A PBA has been
63 prepared titled Air Force Flight Operations, Multiple Installations CONUS. The PBA covers bird and bat
64 listed species strikes from flight operations. The base will be subject to the PBO compliance measures once
65 concurrence is received from USFWS.

66 7.12.1 Existing and Potential Wildlife Hazards

67 Beale AFB lies along the Pacific flyway, a migratory corridor used by millions of birds each year. Heavy
68 concentrations of these migratory birds make fall through spring a time period of particular concern for the
69 BASH program. Wetlands on the base, and surrounding agricultural areas act as major attractants to
70 waterfowl, wading birds, and gulls. Migrating waterfowl are particularly dangerous to flight safety due to
71 their large numbers and generally higher flight altitude. Grasslands surrounding the flightline provide
72 habitat for resident and wintering grassland birds including western meadowlarks, horned larks, American
73 pipits (*Anthus rubescens*), American goldfinches (*Spinus tristis*) and lesser goldfinches (*Spinus psaltria*).
74 The abundance and behavior these small species pose the greatest risk to aircraft during fall through spring.
75 During summer, western meadowlarks and cliff swallows (*Petrochelidon pyrrhonota*) pose the greatest
76 risk. Cliff swallows nest colonially in hangars and on towers. Nonnative species including rock pigeons
77 (*Columba livia*), European starlings, and house sparrows (*Passer domesticus*) also commonly nest in
78 artificial structures. Riparian and aquatic vegetation along Reeds Creek is nesting habitat for multiple
79 species of blackbird. Deer, cattle, coyote, and many smaller animals such as rabbits, are common on base
80 and make it onto the flightline occasionally. The larger size of deer and coyote make them especially
81 hazardous. There is a project currently in the planning stages to coyote-proof the flightline.

82 The majority of wildlife strikes are birds, with occasional bat or small mammal strikes. From October 2016
83 to September 2017, there were 27 bird/wildlife aircraft strikes documented, 16 of which were at Beale AFB
84 (Table 7-13). Of the 27 strikes, 25 were birds and two were bats. In general, waterfowl and grassland birds
85 are the most commonly struck, with horned larks accounting for 14 of the 27 strikes in 2017.

86 The USDA has developed an Integrated Wildlife Damage Management Plan and decision-making model
87 to preferentially utilize non-lethal methods to mitigate hazards posed by wildlife. In 2017, the USDA
88 continued a 99.8% harassment rate throughout the FY of all birds while conducting wildlife abatement
89 activities. The total number of birds taken varies dramatically by year. Table 7-14 lists BASH depredation
90 totals from 2005–2017.



91

92 Figure 7-12. Wildlife exclusion zone (Beale AFB GeoBase 2021, Beale AFB 2017c).

93 Table 7-13. Total bird/wildlife strikes for Beale Air Force Base, October 2016–September 2017 (source:
 94 Laughlin 2017).

Species	Number of Strikes on Beale AFB	Number of Strikes off Beale AFB	Strike Location Unknown	Total Number of Strikes	Cost of Damage
Horned lark	10	2	2	14	\$223,696
Cliff swallow	1	1	0	2	\$0
Brazilian free-tailed bat	1	0	1	2	\$0
Perching bird (species unknown)	1	1	0	2	\$0
Northern pintail	0	1	0	1	\$6,600
Northern shoveler	0	1	0	1	\$6,017
Swainson’s hawk	0	1	0	1	\$4,624
Barn owl	1	0	0	1	\$0
Rock pigeon	1	0	0	1	\$0
Tree swallow	0	1	0	1	\$0
Western meadowlark	1	0	0	1	\$0
TOTALS	16	8	3	27	\$240,937

95
 96

97 *7.12.2 Natural Resource BASH Program Support*

98 Per AFMAN 32-7003, INRMP activities must comply with the requirements of AFI 91-202, *Mishap*
 99 *Prevention Program*, AFI 91-204, *Safety Investigations and Reports*, and AFPAM 91-212, *BASH*
 100 *Management Techniques*. The natural resource program provides BASH Program support in various other
 101 ways. The NRM attends official BASH working group meetings. However, arranging smaller informal
 102 quarterly meetings between the NRM, BASH Program Manager, and 9 RW/SE are necessary to improve
 103 communication and coordination between the programs. The NRM will request an annual team meeting
 104 and the NRM will work with the team to improve quarterly pre-meeting coordination for the BASH Hazard
 105 Working Group presentation to the Wing. All BASH-related deliverables and communication between 9
 106 CES/CEIEC and the BASH Program Manager must be coordinated with the NRM.

107 **7.12.2.1 Responsibilities**

108 IAW AFMAN 32-7003, Section 7.12, *Integration with Other Installation Programs*, and Section 3L, the
 109 INRMP and the installation’s BASH Plan must be mutually supportive, consistent, and and not conflict.
 110 Natural resources activities will also comply with the requirements of AFI 91-202, *Mishap Prevention*
 111 *Program* and AFI 91-204, *Safety Investigations and Reports*. Responsibilities of 9 CES to support of the
 112 BASH Program are included in Section 1.4, *Wildlife Hazard Control* of the BASH Plan. The NRM will
 113 discuss with BASH Program Manager the need for permits and consultations for applicable projects and
 114 activities such as those listed in Table 7-15 and other actions carried out by the BASH Program. An EA for
 115 the BASH program was drafted in 2013 but needs updates and revisions.

Table 7-14. Record of BASH depredation on Beale AFB from 2005–2017 (source: 2018 excel sheet of depredation totals on 9 CES sharedrive).

Species	2005/06	2006/07	2007/08	2008/09	2009/10	May 2010– Dec 2011	2012	2013	2014	2015	Jan–May 2016	2016/17
Bat, Brazilian free-												1
Blackbird, Brewer’s	1		16	13	39							
Blackbird, mix				5								6
Blackbird, red-winged					46							
Coyote (harassed)	n.r. ¹	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	17
Coyote (removed)	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	9
Crow, American			2	4	7	1						
Dove, mourning				2	1	1		1				1
Duck, bufflehead				4								
Duck, wood				1								
Egret, great				2	2	5	1		2	1	1	1
Egret, snowy							1					
Finch, house				1	10							
Finch, house (nest)												
Goldfinch American				5	3	1	9		11		1	
Goldfinch, lesser					3	3		1				
Goose Canada				27	33	1		15	1	12	10	39
Goose Canada (egg)	n.r.	n.r.	n.r.	n.r.	74			55	85	35	44	30
Goose Canada (nest)	n.r.	n.r.	n.r.	n.r.	18			12	14	7	9	7
Gull, California						5	5		8	2	2	2
Gull, herring					1	5			2			2
Gull, Ring-billed						2	6		1	1		
Harrier, northern				7	8	5						
Harrier, Northern (re-located)												
Hawk, ferruginous				1	1	2		1	1	1	1	1
Hawk, Ferruginous (re-located)												
Hawk, Red-tailed				2	20	30	8	4	5	13	4	6

Table 7-14. Record of BASH depredation on Beale AFB from 2005–2017 (source: 2018 excel sheet of depredation totals on 9 CES sharedrive).

Species	2005/06	2006/07	2007/08	2008/09	2009/10	May 2010– Dec 2011	2012	2013	2014	2015	Jan–May 2016	2016/17
Hawk, Red-tailed (nest)								1		6		
Hawk, Red-tailed (re-located)												
Hawk, Rough-legged								3	2			
Hawk, Rough-legged (re-located)												
Hawk, Swainson’s						4				2		1
Hawk, Swainson’s (re-located)												
Heron, great blue					1		1			2		
Kestrel, American				3	9	9	2	1	3	2		1
Kestrel, American (re-located)											3	
Killdeer	5		1	17	27	12		7	5	4		1
Killdeer (egg)						8						
Killdeer (nest)						2		2				
Kingbird western			6		18			2	6			
Kingbird Western (nest)												
Kite, White-tailed					1							
Lark horned	32				2	9			1			4
Lark Horned (nest)												
Mallard			1	5	19	16	6	3	5	2	4	3
Mallard (nest)												1
Mammals (unspecified, harassment)	n.r.	n.r.	n.r.	17	6	13	n.r.	n.r.	n.r.	n.r.	n.r.	
Mammals (unspecified, removal)	n.r.	n.r.	n.r.	151	143	131	n.r.	n.r.	n.r.	n.r.	n.r.	152
Meadowlark western	1		2	1	39	29	11	4	2	1		2
Meadowlark Western												

Table 7-14. Record of BASH depredation on Beale AFB from 2005–2017 (source: 2018 excel sheet of depredation totals on 9 CES sharedrive).

Species	2005/06	2006/07	2007/08	2008/09	2009/10	May 2010– Dec 2011	2012	2013	2014	2015	Jan–May 2016	2016/17
Mockingbird, northern					1							
Owl, barn												1
Owl, Barn (nest)												
Owl, Barn (re-located)									6			
Owl, Great-horned				2								
Owl, Great-horned												
Owl, Great-horned (re-located)												
Phoebe, Say’s	9		1									
Pintail, northern												1
Pipit, American					1				1			3
Raven, common					1	5		1		4		18
Raven, Common (nest)										1	1	1
Shrike, loggerhead												
Skunk, striped												1
Sparrow, savannah												
Stilt, Black-necked					1							
Swallow, barn					2					5		
Swallow, Barn (nest)										3	7	
Swallow, cliff					1	2		1	3	3		6
Swallow, cliff (egg)						175						
Swallow, cliff (nest)						161		18	3	18	51	2
Teal, cinnamon					2							
Unknown (to be)												6
Vulture turkey	1		1	6	17	8	1	5	4	1		1
Yellowlegs, greater				3	4				1		3	
TOTALS	49²		30²	279	561	649	51²	137²	172²	126²	141²	322

¹ n.r. = not reported/data unavailable for this year.

² Total does not include mammals.

Table 7-15. Common species of BASH concern and control methods (Source: Section 4.4 of the BASH Plan (Beale AFB 2016b)).

Species/Group	Passive Control Methods	Active Control Methods
Waterfowl	Steep ditch and pond banks, aquatic vegetation removal, drain water sources, vegetation modification, scarecrows, effigies	Pyrotechnics, gas cannons,
Resident Canada geese nests (allowed under 50 Code of Federal Regulations [CFR] 21.50)		Nest destruction, egg oiling or addling
Gulls	Maintain grass height at 7–14 inches	Persistent harassment, any/all active control methods, live ammunition, insect poisoning
Herons and egrets	Steep ditch and pond banks, remove emergent vegetation	Pyrotechnics
Horned larks	Maintain thick, uniform, grass	Pyrotechnics, persistent harassment
Raptors	Carcass removal, rodent control, removal of potential perches, bird spikes	Trap and re-location, lethal take (as permitted, excludes eagles)
Swallows	Insect control	Harass and hose off mud during nest building, pyrotechnics
Pigeons and doves (rock and Eurasian collared-dove not protected)	Maintain grass at 7–14 inches, do not let grass seed, exclusion netting	Trapping, shooting
Herons and egrets	Steep ditch and pond banks, remove emergent vegetation	Pyrotechnics
Blackbirds (allowed under 50 CFR 21.43, excludes tri-color)	Remove or maintain attractive vegetation in Wildlife Exclusion Zone (especially Armenian blackberry)	Any/all active control
Coyote and foxes	Control prey animals, fence improvements	Pyrotechnics, shooting
Rabbits and hares	Grass management	Periodic rabbit hunts, poisoning
Rodents	Maintain grass height at 7–14 inches	Rodenticides (zinc phosphide)
Cattle	Keep gates closed	Notify 9th Civil Engineering I Environmental Conservation

117

118

119 It is the responsibility of the AF to ensure that airfield flight operations are not likely to jeopardize the
 120 continued existence of any T&E species. Therefore, the AF has undertaken to conduct formal consultations
 121 with the USFWS, IAW Section 7(a)(2) of the ESA. The intent of these consultations is to evaluate the
 122 potential effects of airfield flight operations and BASH program activities on species listed for protection
 123 under the ESA at AF installations in the continental United States.

124 The BASH contractor collects a variety of data and supplies it to the NRM monthly. This facilitates
 125 cooperation and ensures that the NRM can address any issues in a timely manner with the BASH team in
 126 order to best support the mission. The following data is collected by the contractor:

- 127 • Survey data that will provide a baseline estimate of wildlife species, numbers, and trends. The data
 128 will be used to compare trends among years.
- 129 • USDA conduct wildlife surveys at Pond 4, the wastewater treatment plan, the Wetland gate, and
 130 the landfill southeast of Beale AFB.
- 131 • USDA conducts monthly nocturnal spotlight surveys on the flight line. Each survey is conducted
 132 from a vehicle along the runway, taxiways, and flightline structures (e.g. office buildings and
 133 hangars) using a high-powered spotlight. Surveys are conducted from one to three hours after sunset
 134 and roadsides are scanned from within the vehicle out to approximately 500 feet while moving at
 135 5-10 miles per hour. All observed wildlife is recorded. One survey constitutes a complete loop of
 136 the airfield and takes approximately two hours.
- 137 • DNA and feather collections from all recorded strikes are submitted for identification.
- 138 • Documentation of every bird that is seen throughout daily duties.

139 **7.12.2.2 BASH Natural Resources Studies**

140 Several studies have been done directly in support of the BASH Program or associated with potential BASH
 141 risks. A study was done in 2012 of avian use of areas of interest, including vernal pools, ponding along
 142 Reeds Creek, Pond 4, and the Site 2 vernal pool restoration. The study found that larger bodies of standing
 143 water (including a repeatedly dammed “beaver pond” along Reeds Creek) did attract waterfowl (Valente
 144 and Fischer 2012). Vernal pool restoration Site 2 did not appear to be an attractant. A study of avian use of
 145 areas in and around the flightline was done by CSUS in 2001 (Cain et al. 2001). They found that blackbirds,
 146 waterfowl and grassland birds made up the majority of birds using the area.

147 **7.13 Coastal Zone and Marine Resources Management**

148 *Applicability Statement*

149 This section applies to USAF installations that are located along coasts and/or within coastal management
 150 zones. This section **IS NOT** applicable to this installation.

151 **7.14 Cultural Resources Protection**

152 *Applicability Statement*

153 This section applies to USAF installations that have cultural resources that may be impacted by natural
 154 resource management activities. This section **IS** applicable to this installation.

155 *Program Overview/Current Management Practices*

156 Archeological surveys have been conducted over 90% of Beale AFB. During these surveys, approximately
 157 127 prehistoric and historic era archeological sites have been recorded. The Cultural Resources Program is
 158 overseen by the CRM, guided by AFMAN 32-7003, *Cultural Resources Management*. As required by
 159 AFMAN 32-7003, *Cultural Resources Management*, an ICRMP (Beale AFB 2018a) has been prepared and
 160 is updated every year, with a major revision every five years. The implementation of the plan will protect
 161 cultural resources and integrate cultural resources management into the planning and implementation of

162 construction, training, and land use management at Beale AFB. The CRM coordinates with tribal entities
 163 when updating the ICRMP to ensure that Native American cultural and natural resources are adequately
 164 protected. The NRM/CRM will contact tribes if Native American cultural resources are uncovered or
 165 damaged in the course of natural resource management actions or from outdoor recreation as required by
 166 the Beale AFB ICRMP.

167 In support of the AF mission at Beale AFB and to assist in compliance with the National Historic
 168 Preservation Act (NHPA), the ICRMP cites the relevant historic preservation laws, which the AF must
 169 comply with, presents useful information for determining the significance of the installation's cultural
 170 resources, summarizes the base's inventory of known cultural resources, identifies the potential for
 171 discovery of additional significant resources, describes present and anticipated near-term land uses,
 172 identifies potential threats to cultural resources and activities, and provides standard operating procedures
 173 for cultural resources management.

174 The ICRMP and CRM shall be consulted for all actions and activities to initiate consultations. Consultations
 175 can take up to three months or longer if there are direct impacts, and mitigation measures, if required, could
 176 add additional costs to projects. However, as a natural resources management plan, the INRMP does not
 177 focus primarily on cultural resources. The CRM and the ICRMP will be considered the most comprehensive
 178 source for cultural resource information at Beale AFB.

179 Specific examples of necessary CRM coordination with INRMP implementation include:

- 180 • Fire management such as prescribed burning and firebreak construction.
- 181 • Cattle grazing operations infrastructure and management activities.
- 182 • Removal of natural and manmade materials.
- 183 • Restoration projects such as vernal pool restoration, tree planting, native grass planting.
- 184 • Construction of hunting blinds, earthen dams, and wildlife habitat improvement projects.

185 Beale AFB is considering establishment of gathering areas for traditional stewardship of sensitive cultural
 186 sites and native plants for use by associated tribes. Pesticide and herbicide use within such sites may not be
 187 allowed once established, per traditional management practices.

188 **7.15 Public Outreach**

189 *Applicability Statement*

190 This section applies to all USAF installations that maintain an INRMP. The installation is required to
 191 implement this element.

192 *Program Overview/Current Management Practices*

193 9 CES/CEIEC hosts or participates in several events annually to implement requirements of the Sikes Act
 194 and to provide information on numerous aspects of resource conservation.

- 195 • Earth Week (static displays, giveaway materials, educational materials, native tree plantings, vernal
 196 pool tours, nature hikes, and bird walks).
- 197 • Air shows (static displays, giveaway material).
- 198 • Air and Space Expo Environmental Table (static displays, giveaway material).

- 199 • National Public Lands Day (cleanups, fish ladder repair, tree plantings).
- 200 • Annual Audubon Society Christmas Bird Count.
- 201 • Natural resources awareness programs on the installation.
- 202 • Bird tour with the annual Marysville Swan Festival.
- 203 • Tours and classes with local colleges and elementary schools.
- 204 • Hunter briefings.
- 205 • Interviews and articles published through Public Affairs regarding wildlife safety/conservation and
- 206 natural resources.
- 207 • Volunteer wood duck and bluebird nest box monitoring and dove banding.
- 208 • Partners with USFWS to monitor nest boxes and band American kestrels.
- 209 • Provides access for research, studies, and projects beneficial to the base, AF, DoD, CDFW and
- 210 USFWS.
- 211 • Brochures, posters, videos, and other Natural Resources Program educational materials produced
- 212 and handed out regularly (including to all new base employees 3-4 times per week, every week).
- 213 • Brochures cover a variety of natural resource issues including wildlife safety, vernal pool
- 214 crustaceans, off-road driving safety and invasive species.

215 **7.16 Climate Change Vulnerabilities**

216 *Applicability Statement*

217 This section applies to USAF installations that have identified climate change risks, vulnerabilities, and
 218 adaptation strategies using authoritative region-specific climate science, climate projections, and existing
 219 tools. This section **IS** applicable to this installation.

220 *Program Overview/Current Management Practices*

221 Vulnerability to climate change refers to the extent to which a species, habitat, ecosystem, place, or project
 222 is susceptible to harm from climate change impacts (Stein et al. 2014). By this definition, species and
 223 systems that are more vulnerable will experience greater harm, while less vulnerable species and systems
 224 will be less affected or even benefit from climate change.

225 Several ecosystems on Beale AFB are vulnerable to the changes in climate expected on the installation.
 226 The average temperature at Beale AFB is expected to increase, as well as the number of days exceeding
 227 90°F, likely leading to an increase in the frequency, intensity, and duration of extreme heat events and heat
 228 waves. Beale AFB is also likely to experience both more extensive flooding and more frequent and
 229 persistent droughts because of changes in precipitation patterns caused by climate change (California
 230 Natural Resources Agency [CNRA] 2009; CEMML 2019). These shifts may result in changes in the
 231 composition, distribution, and abundance of grassland, oak woodland, and wetland vegetation on the
 232 installation, potentially altering habitat for fish and wildlife. The number and severity of wildland fires are
 233 projected to increase, further impacting vegetation cover, fish and wildlife species, and the military mission
 234 of Beale AFB (CEMML 2019). Climate change is also likely to increase demand for groundwater and
 235 decrease groundwater supply, intensifying the need for careful water management (CEMA and CNRA
 236 2012). These vulnerabilities are discussed in length in the corresponding sections of the INRMP.

237 Many current management activities are appropriate for increasing resilience or facilitating adaptation to
238 climate change. The ecosystem approach used on installations, which prioritizes functional diversity and
239 the maintenance of habitat, habitat variability, and habitat connectivity will likely help support species
240 adaptation or migration as environmental conditions shift. However, when approaching the uncertainty that
241 is inherent with climate change projections, additional analyses and planning are required.

242 Climate adaptation can focus on addressing changes as they occur (reactive strategies) or can seek to avoid
243 impacts of changes (proactive strategies). In the context of T&E species with limited habitats, it may be
244 prudent to focus on anticipatory actions to avoid losses that may hinder species recovery. Proactive
245 approaches that anticipate change can help extend the period when species adapt to changing climate, and
246 avoid catastrophic declines associated with stochastic events that act on an already stressed ecosystem.
247 However, if changes are already affecting priority species, a reactive approach may be best for long-term
248 survival.

249 Scenario planning and scenario-based assessment modelling have emerged to help decisionmakers take
250 proactive management actions despite uncertainty (Banuls & Salmeron 2007). Scenario planning and other
251 management actions may require new partnerships across installation boundaries to account for the broad
252 regional impacts of climate change.

253 ***7.17 Geographic Information Systems (GIS)***

254 *Applicability Statement*

255 This section applies to all USAF installations that maintain an INRMP, since all geospatial information
256 must be maintained within the USAF GeoBase system. The installation is required to implement this
257 element.

258 *Program Overview/Current Management Practices*

259 The AF Environmental GIS Program's mission is to collect, develop, and maintain spatial data included in
260 the Functional Data Sets (FDS) supporting the environmental programs. FDS spatial data will be
261 standardized to the Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE) 3.1 Air
262 Force Adaptation as developed IAW AFCEC SMEs and as approved by Defense Installation Spatial Data
263 Infrastructure as the standard for environmental spatial data.

264 By using GIS, a computer system that enables users to capture, develop, and maintain geographical features
265 that can be associated with tabular data, GIS analysts can help standardize the 69 data layers for the bases
266 supported by their respective ISS. GIS analysts can also assist with GIS support requested directly by
267 environmental programs within their respective ISS. A project Technical Support Center has been
268 established for management and reach-back support as directed by AFCEC/CZ.

269 **8.0 MANAGEMENT GOALS AND OBJECTIVES**

270 The installation establishes long term, expansive goals and supporting objectives to manage and protect
 271 natural resources while supporting the military mission. Goals express a vision for a desired condition for
 272 the installation's natural resources and are the primary focal points for INRMP implementation. Objectives
 273 indicate a management initiative or strategy for specific long or medium range outcomes and are supported
 274 by projects. Projects are specific actions that can be accomplished within a single year. Also, in cases where
 275 off-installation land uses may jeopardize USAF missions, this section may list specific goals and objectives
 276 aimed at eliminating, reducing, or mitigating the effects of encroachment on military missions. These
 277 natural resources management goals for the future have been formulated by the preparers of the INRMP
 278 from an assessment of the natural resources, current condition of those resources, mission requirements,
 279 and management issues previously identified. Below are the integrated goals for the entire natural resources
 280 program.

281 The installation goals and objectives are displayed in the 'Installation Supplement' section below in a
 282 format that facilitates an integrated approach to natural resource management. By using this approach,
 283 measurable objectives can be used to assess the attainment of goals. Individual work tasks support INRMP
 284 objectives. The projects are key elements of the annual work plans and are programmed into the
 285 conservation budget, as applicable.

286 *Installation Supplement—Management Goals and Objectives*

287 **GOAL 1: ENSURE COMPLIANCE WITH APPLICABLE FEDERAL AND STATE LAWS AND** 288 **REGULATIONS RELATED TO NATURAL RESOURCE PROTECTION.**

- 289 • OBJECTIVE 1.1: Identify areas of potential conflicts between projects and the protection of
 290 wetlands and special-status species using EIAP/NEPA and AF Form 103 permitting processes.
- 291 • OBJECTIVE 1.2: Coordinate with state and federal regulators on activities and projects as
 292 necessary.
- 293 • OBJECTIVE 1.3: Incorporate natural resource protection requirements into all stages of project
 294 planning and implementation.
- 295 • OBJECTIVE 1.4: Coordinate, negotiate, and manage all USFWS, CDFW, and NMFS related
 296 permitting, agreements, studies, surveys, and associated mitigation actions for base projects and
 297 management activities.
- 298 • OBJECTIVE 1.5: Educate base residents, visitors, employees/staff, and the public about base
 299 natural resource programs, protection, compliance, and permitting actions to promote coordination,
 300 transparency, and culture of understanding roles and requirements.
- 301 • OBJECTIVE 1.6: Maintain and update accurate natural resources GIS data layers.

302 **GOAL 2: MAINTAIN/INCREASE POPULATIONS OF SPECIAL-STATUS SPECIES AND** 303 **IMPROVE HABITAT CONDITIONS.**

- 304 • OBJECTIVE 2.1: Improve coordination between the NRM and other maintenance and
 305 management personnel to avoid effects to special-status species and their habitats.
- 306 • OBJECTIVE 2.2: Monitor, preserve, restore, and enhance special-status species, their habitats and
 307 areas under the terms of regulator agreements.

- 308 • OBJECTIVE 2.3: Control invasive species that may negatively affect special-status species'
309 habitat.
- 310 • OBJECTIVE 2.4: Improve habitat conditions for special-status species.
- 311 • OBJECTIVE 2.5: Manage livestock to ensure appropriate intensity and timing of grazing to meet
312 land management and habitat enhancement goals.
- 313 • OBJECTIVE 2.6: Locate additional areas where livestock grazing will benefit the base mission, to
314 include reduction in fuel load and invasive species control.

315 **GOAL 3: PROTECT AND MANAGE WETLANDS, FLOODPLAINS, AND RIPARIAN ZONES**
316 **IAW CURRENT LAWS, REGULATIONS, AND MITIGATION OBLIGATIONS.**

- 317 • OBJECTIVE 3.1: Preserve, restore, create, and monitor wetland areas in cooperation with USACE.
- 318 • OBJECTIVE 3.2: Preserve, restore, and enhance existing wetland-associated vegetation
319 communities (e.g., riparian forest, riparian scrub, tule marsh).
- 320 • OBJECTIVE 3.3: Monitor and maintain hydrological function in created vernal pools to ensure
321 they are meeting mitigation criteria under terms of agreements.
- 322 • OBJECTIVE 3.4: Reduce environmental contaminants and sediment in runoff from residential,
323 industrial and other developed areas.

324 **GOAL 4: IMPROVE MANAGEMENT PRACTICES AND ENHANCE HABITAT FOR FISH,**
325 **WILDLIFE, AND PLANT SPECIES ON BEALE AFB.**

- 326 • OBJECTIVE 4.1: Improve habitat for fish and game species to increase hunting and fishing
327 opportunities for the base population.
- 328 • OBJECTIVE 4.2: Monitor game populations on the base to determine if management and human
329 safety goals are being met.
- 330 • OBJECTIVE 4.3: Improve habitat for nongame wildlife species at Beale AFB.
- 331 • OBJECTIVE 4.4: Participate in the national Partners in Flight Neotropical migratory bird
332 monitoring program to assess neotropical migrant use of base habitats during migration and
333 breeding.
- 334 • OBJECTIVE 4.5: Coordinate with, and provide training for the electric shop and the rest of 9 CES
335 to implement the APP to prevent bird electrocutions and reduce power outages and fires.
- 336 • OBJECTIVE 4.6: Use grazing and prescribed fire to improve range conditions for native species,
337 reduce invasive plant species, and reduce hazardous fire fuel loads.
- 338 • OBJECTIVE 4.7: Create, maintain, and enhance habitat for native pollinator species.
- 339 • OBJECTIVE 4.8: Protect and restore native vegetative communities, increase coverage of native
340 vegetation base-wide, and improve connectivity with off-base habitat.
- 341 • OBJECTIVE 4.9: Improve coordination between the NRM and other maintenance and
342 management personnel to avoid impacts to fish and wildlife species and their habitats.

343 **GOAL 5: MAINTAIN, ENHANCE, AND EXPAND OUTDOOR RECREATIONAL**
344 **OPPORTUNITIES TO SERVE THE NEEDS OF THE BASE POPULATION.**

- 345 • OBJECTIVE 5.1: Manage and enhance existing facilities and provide new outdoor recreation
346 opportunities that are compatible with sensitive natural resources in and around recreation sites.
- 347 • OBJECTIVE 5.2: Develop educational trainings and workshops on natural resource and
348 conservation topics for the base population.
- 349 • OBJECTIVE 5.3: Create/maintain natural resource volunteer programs and opportunities for base
350 population.
- 351 • OBJECTIVE 5.4: Manage and update the base hunting and fishing program to be in compliance
352 with state regulations and AFMAN 32-7003, and the Beale Supplement to AFI 32-7064.
- 353 • OBJECTIVE 5.5: Improve tracking and accountability within the hunting and fishing, firewood,
354 and volunteer game warden programs.

355 **GOAL 6: MANAGE HABITAT TO REDUCE BASH AND WILDFIRE RISKS TO THE AF.**

- 356 • OBJECTIVE 6.1: Coordinate with BASH Program, Grounds Maintenance, and Pest Management
357 to implement land management measures around the airfield that discourage use by wildlife,
358 including a WEZ.
- 359 • OBJECTIVE 6.2: Minimize the risk of wildfire and its potential effects on base infrastructure and
360 natural resources; pursue improvements to firebreak processes and electrical utilities to enhance
361 fire, infrastructure, and mission protection and natural resource protection.
- 362 • OBJECTIVE 6.3: Manage livestock to ensure appropriate intensity and timing of grazing to meet
363 land management and habitat enhancement goals.
- 364 • OBJECTIVE 6.4: Locate additional areas where livestock grazing will benefit the base mission, to
365 include the reduction in fuel load, habitat enhancement, and invasive species control.
- 366 • OBJECTIVE 6.5 Maintain sufficient funding and staffing to complete INRMP projects and other
367 natural resource tasks.
- 368 • OBJECTIVE 6.6 Develop a cohesive working relationship between the NRM and the BASH team
369 through more regular communication and coordination.

370 **9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS**

371 ***9.1 Natural Resources Management Staffing and Implementation***

372 Responsibility for implementation of an INRMP may involve several installation organizations. Each
373 responsible organization and their associated planning, programming, budgeting, and execution programs
374 implement the INRMP.

- 375 • 9 CES/CEIEC is responsible for updates and routing the INRMP for signatures.
- 376 • 9 CES/CEIEC has the primary responsibility for execution and management of the INRMP and is
377 the Office of Primary Responsibility (OPR) for management, coordination, and negotiation of all
378 USFWS, CDFW, and NMFS related permitting, agreements, studies, surveys, and associated
379 mitigation actions for base projects and management activities.
- 380 • Other offices also have direct responsibility for execution of many programs including BASH, Pest
381 Management, Golf Course Management, Grounds Maintenance, Force Support Squadron, and
382 Security Forces.
- 383 • Natural resources management is managed directly by a GS 401-11 NRM/CRM program manager
384 holding a degree in the natural sciences per AFMAN 32-7003 Section 3.11 INRMP
385 Implementation. Implementation of day-to-day activities of the grazing and hunting programs is
386 conducted by two GS 404-09 positions; however, management of the grazing and hunting programs
387 resides with the Natural Resource Lead or Manager who holds a degree in the natural sciences.
- 388 • Funding, execution, and implementation of INRMP projects where OPR is identified as CEIEC
389 (Section 10, *Annual Work Plans*) occurs through contracts and cooperative agreements funded by
390 the EQ Operations & Maintenance (O&M) annual AF budget managed by AFCEC/CZOW.
- 391 • In accordance with Section 101(d)(2) of the Sikes Act, when acquiring services to implement and
392 enforce an INRMP, priority shall be given to Federal and State agencies that are responsible for
393 conserving or managing the fish and wildlife resources covered by the INRMP, provided those
394 agencies are interested in and capable of providing the services. If no federal or state agency
395 responsible for conserving or managing the fish and wildlife resources expresses an interest in
396 providing the needed implementation or enforcement service or meets evaluation criteria, the work
397 may be awarded using the competitive selection procedures outlined in Federal Acquisition
398 Regulations or DoD Grants and Agreements Regulations, as appropriate (Assistant Secretary of
399 Defense 2016). Beale AFB discusses upcoming projects with the USFWS and CDFW during their
400 Annual INRMP Review meeting to determine interest in executing projects. USFWS conducts
401 kestrel box monitoring in addition to its Section 7 and INRMP review related assistance. CDFW
402 does not conduct any projects or field work but does support INRMP reviews. Future work for
403 USFWS, as discussed recently, may include black rail, burrowing owl, and winter raptor surveys.

404 ***9.2 Monitoring INRMP Implementation***

405 Monitoring, coordination with regulators, and recordkeeping are the primary responsibility of the 9
406 CES/CEIE office. 9 CES/CEIEC is primarily responsible for INRMP updates and implementation.

- 407 • Natural resources management staffing—Annual updates and updates to the work plan are
408 managed by 9 CES/CEIE staff and other offices as needed.
- 409 • Five-year updates require review and analysis and require input from offices across the base,
410 regulators, and interested parties and signatures by USFWS and CDFW.

- 411 • 32 CFR 989.3(e)(7) states that EIAP is required on all base-level and MAJCOM-level plans. The
- 412 INRMP falls under categorical exclusion (CATEX) A2.3.5, which covers the preparation of
- 413 plans/permits in which no action would be taken. The EIAP will be programmed and completed
- 414 prior to the implementation of the actions proposed in this INRMP. This is initiated by submission
- 415 of AF Form 813. AF Form 813s and EAs for the Beale AFB Natural Resources Program are listed
- 416 in Table 9-1.

417 The 9 CES/CEIE Program Managers are SMEs that implement various portions of the INRMP individually
 418 and collaboratively. Programs include NEPA, Air Quality, Storm Water Monitoring, Cultural Resources
 419 Management, Hazardous Waste Management, Wastewater Management, and Tank Management. There are
 420 trainings that would benefit most, if not all, staff and program management:

- 421 • ArcGIS Training—Program managers would all be able to enter and manage spatial data and create
- 422 maps for their respective programs. Due to staffing limitations, there is no dedicated GIS analysis
- 423 assigned to support 9 CES/CEIEC. Maintaining a comprehensive, up-to-date natural resources GIS
- 424 geodatabase is crucial to the planning and implementation of natural resource management projects.
- 425 9 CES/CEIEC will coordinate with the GeoBase office to establish a POC or procedure for help
- 426 with natural resource spatial data.
- 427 • AFIT WENV 450 Environmental Impact Analysis Process (EIAP) Course—The objective of this
- 428 course is for each student to comprehend the AF Environmental Impact Analysis Process (EIAP)
- 429 and its procedures for determining, documenting and disclosing the environmental impacts for
- 430 proposed AF actions.
- 431 • Wetland Delineation Training—9 CES/CEIEC would benefit from having employees trained in
- 432 this area due to the large number of vernal pools on the base.
- 433 • Natural Resource Law Enforcement Training—All individuals who will be enforcing fish, wildlife
- 434 and natural resources laws must receive specialized, professional training on the enforcement of
- 435 fish, wildlife and natural resources in compliance with the Sikes Act. This training may be obtained
- 436 by successfully completing the LMPT (<http://www.fletc.gov/>). Project Managers overseeing the
- 437 hunting and fishing program would also benefit from conservation law enforcement specific
- 438 training.
- 439 • DoD Natural Resources Compliance—As required by AFI 32-7064, Section 18.1, *Natural*
- 440 *Resources Training*, all individuals assisting with natural resources management will complete
- 441 *DoD Natural Resources Compliance*, endorsed by the DoD Interservice Environmental Education
- 442 Review Board and offered for all DoD Components by the Naval School, CECOS. See
- 443 <http://www.netc.navy.mil/centers/csfe/cecos/> for CECOS course schedules and registration
- 444 information.
- 445

Table 9-1. Natural resource environmental assessments (EAs) and Air Force (AF) Form 813s (Source: AF Form 813s as of September 2018).

Document Type	Proponent	Title	Year	Proposed Action
EA		Managing Hazards to Aviation (Draft)	2011	Perform wildlife hazing and control activities, and maintain areas in the WEZ in a way that deters use by birds and other wildlife as part of the BASH Program.
EA		Reeds Creek Restoration	2012	The purpose of the Proposed Action is to reduce the flight hazard due to increased bird activity along Reeds Creek, by eliminating ponding created by North American beavers and natural deposits of sediment and debris.
EA	Civil Engineering (CEIEC)	Grazing Lease Program	2012	Grant new grazing leases and continue the managed grazing program at Beale Air Force Base (AFB).
AF Form 813 17.002	Natural Resources Manager (NRM)	Implement the Grazing Plan and the Integrated Natural Resources Management Plan.	2017	See 2012 Environmental Assessment of Beale AFB Grazing Lease Program.
AF Form 813 15.054	CEOHP	Blackberry Bush Removal	2015	Removal of blackberry bushes/vines north of Beale AFB runway with tractor mower, boom-mounted mower and excavator in areas identified while staying on designated paths of travel to prevent/minimize disturbance to environmentally sensitive areas.
AF Form 813 15.061	CEIEC	Herbicide Treatment of Blackberry Bushes along Reeds Creek	2015	As a follow-up to recent blackberry bush removal, regrowth must be treated with herbicides such as Garlon and Roundup to kill the plants to ensure they do not develop into large stands that attract nesting birds.
AF Form 813	CEIEC	Manage invasive species and Noxious Weeds Base-wide	2016	Develop an Installation Pest Management Plan and then execute it for species that interfere with AF missions.
AF Form 813 16.081	CEIE	BASH Weed Management Plan	2016	The project will conform with INRMP and BASH Plan, use adaptive management/integrated pest management, and include weed prevention, and education. Eradication including manual, biocontrol, and chemical methods will be included.

Table 9-1. Natural resource environmental assessments (EAs) and Air Force (AF) Form 813s (Source: AF Form 813s as of September 2018).

Document Type	Proponent	Title	Year	Proposed Action
AF Form 813 16.084	National Environmental Policy Act Manager	Implement Integrated Natural Resources Management Plan (INRMP) Projects	2016	9 RW must comply with complex environmental requirements. The compliance strategy must be determined jointly with the USFWS and California. 9 RW does not have a "no action" (no INRMP) alternative. Each project may have one.
Programmatic Environmental Assessment	NRM	Final Programmatic Environmental Assessment for the 2016-2017 Integrated Natural Resources Management Plan Beale Air Force Base (pending)	2016	Adopting the INRMP and implementing every project contained in the INRMP, with the exception of projects involving demolition, construction, or refurbishment of structures.
AF Form 813 17.024	NRM	Execute Integrated Natural Resources Management Plan (INRMP): Habitat Restoration on Beale AFB	2017	The proposed action is to execute the INRMP and to restore habitat for intended beneficial environmental effects.
AF Form 813 17.024	NRM	Habitat Restoration on Beale AFB	2017	Install and maintain native vegetation restoration sites on Beale AFB.
AF Form 813 17.031	NRM	INRMP: Arundo Removal and Solarization	2017	Control arundo in the housing area by Removing biomass and solarizing root system.
AF Form 813 16.109	Civil Engineering Operations (CEO)	Flight Safety Herbicide Treatment	2016	Vegetation that attracts birds needs to be reduced.
AF Form 813 18.211	CEO	Execute the Installation Pest Management Plan for Beale AFB (23 October 2012)	2018	Implement pest management actions. Pest management operations will be done in a manner which will cause no harm to personnel or the environment.

Table 9-1. Natural resource environmental assessments (EAs) and Air Force (AF) Form 813s (Source: AF Form 813s as of September 2018).

Document Type	Proponent	Title	Year	Proposed Action
AF Form 813	NRM	Solar Well Installation	2018	Install 3 solar wells for stock watering troughs.
EA	NRM	Beale Dry Creek Fish Habitat Improvements	2020	Modify/remove Beale Lake dam to facilitate fish passage.
EA	NRM	Tricolored Blackbird Habitat Mitigation	Pending	Restore Tricolored Blackbird nesting habitat at Blackbird Marsh and Blackbird Basins.
EA	NRM	Non-Native and Noxious Plant Species Management	2021	Vegetation management activities to include prescribed fire, weed control (manual, mechanical, chemical), grazing (cattle, horse, sheep, goat, all classes/kinds), and pest management activities as outlined in the INRMP, Beale Invasive Species Management Guidelines, Beale Invasive Species Control Work Plans (appendices to the IPSMG), Installation Pest Management Plan, and Wildland Fire Management Plan, and Potential Expanded Grazing Area Plan.

446

447 **9.3 Annual INRMP Review and Update Requirements**

448 The INRMP requires annual review IAW DoDI 4715.03, *Natural Resources Conservation Program*, and
 449 AFMAN 32-7003 to ensure the achievement of mission goals, verify the implementation of projects, and
 450 establish any necessary new management requirements. This process involves installation natural resources
 451 personnel and external agencies working in coordination to review the INRMP. If the installation mission
 452 or any of its natural resources management issues change significantly after the development of the original
 453 INRMP, a major revision to the INRMP is required. The need to accomplish a major revision is normally
 454 determined during the annual review with USFWS, the appropriate State agency, and NOAA/NMFS. The
 455 NRM/POC documents the findings of the annual review in an Annual INRMP Review Summary and
 456 obtains signatures from the coordinating agencies on review findings. By signing the Annual INRMP
 457 Review Summary, the collaborating agency representatives assert concurrence with the findings. If any
 458 agency declines to participate in an on-site annual review, the NRM submits the INRMP for review along
 459 with the Annual INRMP Review Summary document to the agency via official correspondence and request
 460 return correspondence with comments/concurrence.

461 AFMAN 32-7003 Section 3.8, Integrated Natural Resources Management Plan (INRMP) Annual Review
 462 and Coordination, states that the Annual INRMP Review Summary must include the following:

- 463 • The INRMP Annual Review Summary shall include a summary of specific INRMP
 464 accomplishments since the last INRMP annual review.
- 465 • The INRMP Annual Review Summary shall include an update of the Annual Work Plan for
 466 implementing the INRMP that includes the current year and at least four future fiscal years. The
 467 Annual Work Plan must include all projects and activities identified as essential for the successful

- 468 implementation of INRMP goals and objectives, and an implementation schedule that is realistic
 469 and practicable. The Annual Work Plan may include a consensus by the collaborating agencies on
 470 relative project priority for projects in the Annual Work Plan (e.g. High, Medium, or Low) based
 471 upon the significance of the project for attaining the INRMP goals and objectives.
- 472 ○ Projects rated as High in the Annual Work Plan are essential for achieving INRMP goals
 473 and objectives in the year they are programmed. Sikes Act cooperating agencies would
 474 consider the INRMP to not be implemented if the project is not accomplished in the year
 475 programmed.
 - 476 ○ Projects rated as Medium in the Annual Work Plan constitute actions that cooperating
 477 agencies agree to be important to achieve INRMP goals and objectives; but the projects
 478 may be deferred if not completed in programmed year.
 - 479 ○ Projects rated as Low in the Annual Work Plan support INRMP goals and objectives and
 480 enhance the natural resources program, but cooperating agency partners would agree that
 481 the activity is not deemed essential to implement INRMP goals and objectives.
- 482 ● The INRMP Annual Review Summary must include a statement indicating the projects in the
 483 Annual Work Plan for which the collaborating agencies have expressed an interest in participating
 484 in project execution. As indicated in the Sikes Act (16 USC § AFMAN32-7003 20 APRIL 2020 55
 485 670a(d)(2)), priority shall be given to Federal and state agencies having responsibility for
 486 conservation and management of fish and wildlife for execution of implementation and
 487 enforcement of INRMPs. If the collaborating agencies do not express an interest in executing
 488 projects in the Annual Work Plan, then shall include the following statement in the Annual INRMP
 489 Review Summary: “The execution strategy for the Annual Work Plan has been discussed with the
 490 participating agencies, and the agency representatives have not expressed an interest in
 491 participating in project execution, and agree that implementation will be performed through other
 492 authorized acquisition methods.”
 - 493 ● The INRMP Annual Review Summary shall include a statement asserting whether or not sufficient
 494 numbers of qualified natural resources management and enforcement personnel and resources are
 495 available to oversee implementation of projects and activities identified in the INRMP Work Plan.
 - 496 ● The INRMP Annual Review Summary shall include a summary of any required updates to the
 497 INRMP determined necessary to keep the INRMP current in operation and effect for the
 498 management of installation natural resources; or alternatively, a statement that significant changes
 499 to the installation mission or natural resources goals require an INRMP revision
 - 500 ● An INRMP Annual Review Summary may substitute for the more formal 5-year review for Sikes
 501 Act compliance, provided that the INRMP Annual Review Summary lists all updates made to the
 502 INRMP since the last review and the installation documents signatures by the installation
 503 commander (or designee) and the authorized signatory representatives of the USFWS and the state
 504 fish and wildlife agency.
 505

506 The Beale NRM, USFWS, CDFW, NMFS and AFCEC Travis ISS conduct an annual INRMP review
 507 meeting. This meeting takes place in person with respective representatives for each agency. Individuals
 508 may telephone or video call if they cannot attend in person. During this meeting, the NRM and/or ISS
 509 update the external stakeholders/parties with the end-of-the-year execution report and coordinate future
 510 work plans and any necessary changes to management methods etc. All parties review the INRMP and
 511 begin preliminary collaborative work on updating the INRMP (new policies, procedures, impacts,
 512 mitigations, etc.) as applicable. Following completion of annual updates, the INRMP is staffed for signature
 513 by the Installation Commander or delegate. The environmental program’s Signatory Authority Delegation
 514 Letter shall also be updated as needed. In order for the INRMP to remain in compliance with the Sikes Act,
 515 it must be signed at least once every five years by authorized signatories of the USFWS (Field Supervisors
 516 per Delegation Memo 22 June 2009), CDFW (Regional Manager per Department Bulletin, Hunting, 2014),

517 and the AF (Installation Commander or delegate). INRMP compliance with DoDI 4715.03 and AFMAN
518 32-7003 also require signature by NMFS (First-Line Supervisor for Technical Assistance Documents per
519 Stelle, 1 Oct 2013). The Installation Commander approves the INRMP prepared pursuant to the Sikes Act,
520 Section 101(a)(2). The installation commander may re-delegate signature authority to a lower level
521 provided that the signatory has control over all aspects and management objectives addressed within the
522 subject INRMP, but no lower than the Support Group commander. (AFMAN 32-7003, Section 1.14.8).

523 10.0 ANNUAL WORK PLANS

524 The INRMP Annual Work Plans are included in this section. These projects are listed by fiscal year,
525 including the current year and four succeeding years. For each project and activity, a specific timeframe for
526 implementation is provided (as applicable), as well as the appropriate funding source and priority for
527 implementation. The work plans provide all the necessary information for building a budget within the
528 USAF framework. Priorities are defined as follows:

- 529 • High: The INRMP signatories assert that if the project is not funded the INRMP is not being
530 implemented and the USAF is non-compliant with the Sikes Act; or that it is specifically tied to an
531 INRMP goal and objective and is part of a “Benefit of the Species” determination necessary for
532 Endangered Species Act (ESA) Sec 4(a)(3)(B)(i) critical habitat exemption.
- 533 • Medium: Project supports a specific INRMP goal and objective and is deemed by INRMP
534 signatories to be important for preventing non-compliance with a specific requirement within a
535 natural resources law or by EO 13112, *Exotic and Invasive Species*. However, the INRMP
536 signatories would not contend that the INRMP is not being implemented if not accomplished within
537 the programmed year due to other priorities.
- 538 • Low: Project supports a specific INRMP goal and objective, enhances conservation resources or
539 the integrity of the installation mission, and/or supports long-term compliance with specific
540 requirements within natural resources law; but is not directly tied to specific compliance within the
541 proposed year of execution.

Table 10-1. Project Work Plans.

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
GOAL 1: MINIMIZE CONSTRAINTS TO INSTALLATION PLANNING AND THE MISSION BY ENSURING COMPLIANCE WITH APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS RELATED TO NATURAL RESOURCE PROTECTION.							
OBJECTIVE 1.1: Identify areas of potential conflicts between projects and the protection of wetlands and special-status species using EIAP/NEPA and 103 permitting processes.							
Project 1.1.1: Conduct site-specific surveys as required to identify areas of potential conflict between mission projects and the protection of wetlands and special-status species.	CEIEC CTR / NRM	High	BAEYOS2130xx MGT, HABITAT, ESA LISTED SPECIES BO REQ				
Project 1.1.2: Add environmental project measures/BMPs to IPMP and Pest Shop operations.	NRM	High	x	x	x	x	x
Project 1.1.3: Add environmental project measures/BMPs to grounds maintenance planning and operations.	NRM	High	x	x	x	x	x
OBJECTIVE 1.2: Coordinate with state and federal regulators before commencing activities and projects.							
Project 1.2.1: Fund Sikes Act-driven USFWS interagency agreement to provide USFWS Sacramento Field Office with sufficient capability to complete Beale’s Section 7 Consultation and INRMP Review needs in a timely manner.	AFCEC ISS	High	BAEYOS2000xx INTERAGENCY / INTRAAGENCY, SIKES ACT, USFWS				
Project 1.2.2: Initiate Beale’s Programmatic Biological Opinion.	NRM	High	PBA Completed	x			

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 1.2.3: Implement conditions of BOs or NLAAs as agreed upon in consultation with USFWS.	NRM	High	x	x	x	x	x
Project 1.2.4: Conduct INRMP Annual Review and Coordination with cooperating agencies	NRM	High	x	x	x	x	x
OBJECTIVE 1.3: Incorporate natural resource protection requirements into all parts of project planning and implementation.							
Project 1.3.1: Conduct biological oversight and monitoring of routine mission activities and environmental awareness training for work crews.	CEIEC	High	BAEYOS2130xx MGT, HABITAT, ESA LISTED SPECIES BO REQ				
Project 1.3.2. Coordinate with contracting office to ensure environmental permit preparation, environmental monitors, and other resource protection requirements are included in project budgets.	CEIEC/CONS	High	x	x	x	x	x
Project 1.3.3: Monitor construction projects and sites for compliance with environmental regulations and construction Best Management Practices.	CEIEC CTR	High	BAEYOS2130xx MGT, HABITAT, ESA LISTED SPECIES BO REQ				
Project 1.3.4: Provide training to contracting officials about environmental permitting and monitoring requirements.	CEIEC	High	x	x	x	x	x
OBJECTIVE 1.4: Coordinate, negotiate, and manage all USFWS, CDFW, and NMFS related permitting, agreements, studies, surveys, and associated mitigation actions for base projects and management activities.							
Project 1.5.1: Assist Pest Management (CEOI) with any NEPA planning, EAs, and permits	CEIEC	High	x	x	x	x	x

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
needed to conduct routine pest management activities.							
Project 1.5.2: Review and evaluate MBTA Depredation Permits held by Flight Safety before submission to USFWS.	NRM	High	x	x	x	x	x
OBJECTIVE 1.5: Educate base residents, visitors, employees/staff, and the public about base natural resource programs, protection, compliance and permitting actions to promote coordination, transparency, and culture of understanding roles and requirements.							
Project 1.5.1: Support research funded by outside sources on Beale AFB where it does not impact the military mission. All approved projects shall submit all data and a short report to the NRM within 60 days of field work or at least annually.	NRM	Low	x	x	x	x	x
Project 1.5.2: Develop educational materials for base residents and employees/staff on ways to avoid impacts to sensitive natural resources.	CEIEC	Low					
Project 1.5.3: Present information about natural resources programs and environmental protection measures at Newcomer’s Briefings.	CEIE	Low	x	x	x	x	x
OBJECTIVE 1.4: Maintain and update accurate natural resources GIS data layers.							
Project 1.6.1: Perform maintenance on GIS files, ensuring consistent file organization and naming conventions.	CEIEC CTR	Med	BAEYOS2130xx MGT, HABITAT, ESA LISTED SPECIES BO REQ				
Project 1.6.2: As new natural resources data are available, update existing layers.	CEIEC CTR	Med	BAEYOS2130xx MGT, HABITAT, ESA LISTED SPECIES BO REQ				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 1.6.3: Train resource management staff in the use of ArcGIS software.	AFCEC GIS Support	Low	x	x	x	x	x
Project 1.6.4: Convert and maintain all data to current SDSFIE (Spatial Data Standards for Facilities, Infrastructure, and Environment) standards.	AFCEC GIS Support	High	x	x	x	x	x
GOAL 2: MAINTAIN/INCREASE POPULATIONS OF SPECIAL-STATUS SPECIES AND IMPROVE HABITAT CONDITIONS.							
OBJECTIVE 2.1: Improve coordination between the natural resources manager and other maintenance and management personnel to avoid effects to special-status species and their habitats.							
Project 2.1.1: Perform annual environmental awareness training to users of off-road vehicles (e.g., Security Forces).	CEIEC	Med	BAEYOS2130xx MGT, HABITAT, ESA LISTED SPECIES BO REQ				
OBJECTIVE 2.2: Monitor, preserve, restore, and enhance special-status species, their habitats, and areas under regulator agreement.							
Project 2.2.1: Conduct monitoring of restored or created vernal pools IAW requirements/agreements.	CEIEC CTR	High	BAEYOS2100xx MONITOR, WETLANDS				
Project 2.2.2: Manage/maintain pond leveler/modifications and monitor/manage North American beaver populations in Reed's Creek.	CEIEC CTR	High	BAEYOS2030xx MGT, NUISANCE WILDLIFE				
Project 2.2.3: Monitor each federally listed species as required under law or agreement and	CEIEC CTR	High	BAEYOS2110xx MGT, SPECIES, ESA LISTED SPECIES				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
for every project that may impact federally listed species.							
Project 2.2.4: Monitor each state listed and other special-status migratory bird (e.g. western burrowing owl, California black rail, Swainson’s hawk, and tricolored blackbird) as required under law or agreement and for every project that may impact state listed species.	CEIEC CTR/ USFWS	Med	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 2.2.5: Monitor each state listed and other special-status species (e.g. fall-run Chinook salmon, WST, WPT, bats, legenera, stinkbells) as required under law or agreement and for every project that may impact state listed species.	CEIEC CTR	Med	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				
Project 2.2.6: Conduct monitoring on 2019/2020 TRBL habitat mitigation project to determine success. Complete annual reports for six years (~2019-2024) and submit to the USFWS.	CEIEC CTR	High	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 2.2.7: Conduct surveys for WYBC annually for five years to establish population baselines.	CEIEC CTR	High	BAEYOS2110xx MGT, SPECIES, ESA LISTED SPECIES				
Project 2.2.8: Survey valley elderberry every three years for presence of VELB. Investigate threats to habitat and potential protection and improvement measures.	CEIEC CTR	High	BAEYOS2110xx MGT, SPECIES, ESA LISTED SPECIES				
Project 2.2.9: Conduct assessment to determine threats to known stinkbell populations.	CEIEC CTR	Low	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Implement steps to protect stinkbells if necessary, to preserve populations.							
Project 2.2.10: Update habitat suitability maps for California black rail. Conduct further assessments at Goose Lake, PAVE PAWS and CATM ponds needed to determine if further modifications are possible to improve/protect habitat (Section 7.4.2.12).	CEIEC CTR/ USFWS	Med	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 2.2.11: Make efforts to address significant management concerns (Section 7.4.6).	CEIEC	High	BAEYOS2110xx MGT, SPECIES, ESA LISTED SPECIES BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 2.2.12: Make annual efforts to implement survey and monitoring needs for federally listed and at-risk species as outlined in Section 7.4.2.	CEIEC	Med	BAEYOS2110xx MGT, SPECIES, ESA LISTED SPECIES BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES, BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 2.2.13: Climate adaptation/mitigation study in partnership with USFWS.	CEIEC/USFW S						Planning
Project 2.2.14: Carbon sequestration/storage study in partnership with USFWS.	CEIEC/USFW S						Planning
OBJECTIVE 2.3: Control invasive species that may negatively affect special-status species' habitat.							
Project 2.3.1: Control giant reed in Dry Creek to remove blockage to anadromous fish passage and prevent further spread of the plant.	CEIEC CTR	High	BAEYOS2035xx MGT, INVASIVE SPECIES				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 2.3.2: Manage and control other invasive species (yellow star-thistle, tree of heaven, etc.) IAW the Invasive Species Management Guidelines.	CEIEC CTR / CEOI	High	BAEYOS2035xx MGT, INVASIVE SPECIES BAEYOS2030xx MGT, NUISANCE WILDLIFE				
Project 2.3.3: Develop and implement management recommendations for the control of nonnative aquatic wildlife in conjunction with habitat improvements for the WPT.	CEIEC CTR	Med	BAEYOS2030xx MGT, NUISANCE WILDLIFE				
Project 2.3.4: Coordinate with CEOH to implement the grounds maintenance BMP in the 2017 IPSMG.	CEIEC/CEOH	Med	x	x	x	x	x
Project 2.3.5: Increase awareness of base residents and employees regarding proper management of native vegetation and the need to avoid the introduction and spread of nonnative plant species.	CEIEC/ CEIH	Med	BAEYOS2035xx MGT, INVASIVE SPECIES				
Project 2.3.6: Increase awareness of base residents and employees regarding risks posed by invasive wildlife and abandoned/feral pets.	CEIEC/ CEIH	Med	BAEYOS2035xx MGT, INVASIVE SPECIES				
Project 2.3.7: Formalize communication with CDFW and regional land managers on emerging weed threats.	NRM	Med	x	x	x	x	x
Project 2.3.8: Eliminate incipient populations of new invasive species by implementing a rapid response protocol per the Invasive Species Management Plan and new work plans.	CEIEC CTR	High	NEPA Pending	BAEYOS2035xx MGT, INVASIVE SPECIES			
OBJECTIVE 2.4: Improve habitat conditions for special-status species.							

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 2.4.1: Participate in regional planning and restoration efforts for Dry Creek to enhance habitat conditions for Central Valley steelhead and other fish and wildlife species.	CEIEC / USFWS	High	BAEY 203518	BAEY 203519			
Project 2.4.2: Remove anadromous fish passage impediments in Dry Creek on the base (fish ladder, Beale Dam, and upstream end of Beale Lake) and downstream of the base.	CEIEC / USFWS	High	BAEY 203518	BAEY 203519			
Project 2.4.3: Create additional spawning habitat for anadromous fish in Dry Creek through gravel injection on the base and upstream of the base after downstream barriers have been removed. Survey every three years or after major flood events to check gravel availability.	CEIEC / USFWS	High	BAEY 203518	BAEY 203519			
Project 2.4.4: Protect fish/aquatic habitat through a mixture of improved road engineering (such as rolling dips) and administrative use-only and seasonal road closures.	CEIEC/ CEO	Med					
Project 2.4.5: Manage anadromous fish on base by capture/relocation in watersheds where they cannot spawn to Dry Creek/Best Slough.	CEIEC CTR	Med	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				
Project 2.4.6: Re-locate WPTs and other native aquatic species from impoundments that will be drained during dam replacement or repair projects.	CEIEC CTR	High	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				
Project 2.4.7: Survey Dry Creek for Central Valley steelhead and fall-run chinook salmon	CEIEC CTR	High	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
above and below Beale Lake for five years after Beale Lake dam removal.							
Project 2.4.8: Monitor WPTs at known locations after base-wide dam replacement and repair projects have been completed. Survey every other year for five years to determine response to modifications and re-location.	CEIEC CTR	Med	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				
Project 2.4.10: Survey for presence of TRBLs at locations identified as suitable habitat in the 2017 CIRE assessment.	CEIEC CTR	Med	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 2.4.11: Determine if exclosures are needed around blue elderberry plants in areas grazed by cattle, and install if needed.	CEIEC NRM & GS Range Tech	Med	x	x	x	x	x
Project 2.4.12: Improve climate change analysis results to focus on California and Beale specific data.	CEIEC CTR	Low					
Project 2.4.13: Based on improved climate change impacts, conduct review of current management strategies and how and whether adaptation is needed for sensitive resources, clearly illustrating thought processes and assumptions. Repeat every 10 years or as climate information changes.	CEIEC NRM	Low					
GOAL 3: PROTECT AND MANAGE WETLANDS, FLOODPLAINS AND RIPARIAN ZONES IAW CURRENT LAWS, REGULATIONS, AND MITIGATION OBLIGATIONS.							
OBJECTIVE 3.1: Preserve, restore, create, and monitor wetland areas in cooperation with USACE.							

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 3.1.1: Implement vernal pool/seasonal wetland restoration and creation when compensatory mitigation is required on base under the CWA (i.e., to meet Vernal Pool Recovery Plan Core Recovery Area requirements or when a mitigation bank is not available off-base).	CEIEC CTR / Proponent	High As needed	BAEYOS2100xx MONITOR, WETLANDS				
Project 3.1.2: Minimize potential impacts on wetlands resulting from routine land management activities (e.g., firebreak disking, prescribed burning).	CEIEC/ CEF/ CEO	Med	BAEYOS2100xx MONITOR, WETLANDS				
Project 3.1.3: Provide training to 9 CES/CEIE staff on the CWA and associated permits.	NRM	Med	x	x	x	x	x
See Project 2.2.11							
OBJECTIVE 3.2: Preserve, restore, and enhance existing wetland-associated vegetation communities (e.g., riparian forest, riparian scrub, tule marsh)							
Project 3.2.1: Develop and implement drainage-associated riparian restoration design when needed as compensatory mitigation under 404 CWA permits.	CEIEC CTR	High/as needed	BAEYOS2100xx MONITOR, WETLANDS				
Project 3.2.2: Conduct tree plantings and follow-on maintenance and monitoring; ensure all projects are IAW the Riparian Restoration Conceptual Design Plan.	CEIEC CTR	Med	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
Project 3.2.3: Implement required compensatory mitigation and monitoring plan required under 404 Permit # xxxxx for the	CEIEC CTR	High	BAEYOS2100xx MONITOR, WETLANDS				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Salmonid Creek Restoration Project (FY2019-2023 only).							
Project 3.2.4: Conduct stream bed restoration in areas where it will improve flood control.	CEIEC	Low					x
OBJECTIVE 3.3: Monitor and maintain hydrological function in created vernal pools to ensure they are meeting mitigation criteria.							
Project 3.3.1: Complete further investigation and implement upgrades to existing created vernal pools to increase acreage that meets ACOE criteria (Site #2 near Wheatland Gate). Additional acres will be used to off-set future CWA 404 permits mitigation requirements.	CEIEC CTR	High		BAEY 197030 WETLAND S			
Project 3.3.2: In partnership with the USFWS, participate in U.S. EPA study of pesticides in vernal pools.	CEIEC/USFW S					Planning	Implement Plan
OBJECTIVE 3.4: Reduce environmental contaminants and sediment in runoff from residential, industrial and other developed areas.							
Project 3.4.1: Coordinate with the Grounds Maintenance Shop to minimize the use of treated drinking water for land management activities.	CEIEC/CEOH	Low					
Project 3.4.2: Prevent sediment movement and deposition resulting from past and present construction and maintenance activities.	CEIE	Low					
Project 3.4.3: Prevent illegal soil movement and dumping and remove non-reusable existing soil piles.	CEIE	Low					

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 3.4.4: Ensure temporary, re-usable soil piles are secured so as not to contaminate surrounding area and not stored for more than six months.	CEIE	Low					
Project 3.4.5: Select pesticides/herbicides that have the lowest possible toxicity, degrade rapidly in the environment, minimize exposure to non-target organisms, and do not contribute to nonpoint-source pollution.	CEIEC/ CEOI/ CEOH	Med	IPMC and BAEYOS2035xx MGT, INVASIVE SPECIES				
Project 3.4.6: Establish guidelines for use of pesticides along roadsides and other areas near natural aquatic resources.	CEIEC/ CEOI/ CEOH	High	Complete. See IPSMG 2017				
Project 3.4.7: Evaluate storm water impacts and mitigation in partnership with USFWS.	CEIEC/USFW S						Planning
GOAL 4: IMPROVE MANAGEMENT PRACTICES AND ENHANCE HABITAT FOR FISH, WILDLIFE AND PLANT SPECIES ON BEALE AFB.							
OBJECTIVE 4.1: Improve habitat to increase hunting and fishing opportunities.							
Project 4.1.1: Replace and maintain wood duck boxes.	CEIEC CTR	Low	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
Project 4.1.2: Install, maintain, and monitor fish and wildlife habitat structures (e.g., quail roosts, dove nesting cones, and the fish ladder at Dry Creek).	CEIEC CTR	Low	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
Project 4.1.3: Complete Dry Creek and Best Slough salmonid habitat assessment with	CEIEC/USFW S/NMFS	High	Complete				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
USFWS and NMFS to determine the potential for fisheries habitat improvements.							
Project 4.1.4: Implement fish passage improvements in Dry Creek/Best Slough based on USFWS Habitat Assessment recommendations.	CEIEC CTR/ USFWS	High	In Progress				
Project 4.1.5: Initiate blue oak protection and enhance regeneration on and around the Saddle Club.	CEIEC GS Range Techs	High	x	x	x	x	x
OBJECTIVE 4.2: Monitor game populations to determine if management and human safety goals are being met.							
Project 4.2.1: Monitor drainages west of flightline for salmonids, and identify methods that can be used to prevent fish from entering artificial water channels onto the base.	CEIEC	Med	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				
Project 4.2.2: Monitor deer population and determine management actions to reduce the number of deer/car strikes and need/interest in increasing the number of deer tags issued to the base by CDFW.	CEIEC CTR	Low					
Project 4.2.3: Monitor wintering waterfowl on the base to help determine availability of hunting opportunities and identify areas that pose a heightened BASH concern.	CEIEC	Low					
Project 4.2.4: Monitor fish numbers in Miller Lake for three to five years after 2018 fish stocking.							

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
OBJECTIVE 4.3: Improve habitat for nongame wildlife species.							
Project 4.3.1: Install, maintain, and monitor wildlife habitat enhancement structures (e.g., raptor perches, artificial burrowing owl burrows, kestrel boxes and barn owl boxes) in areas where they will not increase BASH risk.	CEIEC CTR / USFWS	Low	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 4.3.2: Install, maintain, and monitor wildlife habitat enhancement structures for bats in areas where they will not increase BASH risk.	CEIEC CTR	Low	BAEYOS2120xx MGT, SPECIES, SENSITIVE SPECIES				
Project 4.3.3: Develop a plan and design for TRBL habitat enhancement on the east side of the base; request approval from the USFWS.	CEIEC CTR	High	In Progress				
Project 4.3.4: Implement TRBL habitat enhancement plan and design.	CEIEC CTR	High	BAEY 201018				
OBJECTIVE 4.4: Participate in the national Partners in Flight neotropical migratory bird monitoring program to assess neotropical migrant use of base habitats during migration and breeding.							
Project 4.4.1: Re-locate the MAPS banding station and conduct mist netting during the migratory bird breeding season. Contact the Institute for Bird Populations to obtain missing MAPS data from prior years.	CEIEC CTR	Med	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 4.4.2: Conduct breeding bird surveys using the USGS Breeding Bird Survey protocol.	TBD	Low					
OBJECTIVE 4.5: Coordinate with, and provide training for, the electric shop and the rest of 9 CES to implement the Avian Protection Plan.							
Project 4.5.1: Monitor avian electrocutions, perform study to prioritize poles needing	CEIEC CTR	High	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
retrofit, purchase retrofit materials, and coordinate work with base Electric Shop.							
Project 4.5.2: Provide updated training to the base Electric Shop at least once every two years.	CEIEC CTR	High	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
Project 4.5.3 Apply for a MBTA Special Purpose Utility Permit (SPUT). Fund rehab costs associated with injured birds taken to authorized rehab facility as required by SPUT. Complete annual reporting requirement.	NRM / CEIEC CTR	High	BAEYOS2080xx MGT, SPECIES, MIGRATORY BIRDS				
OBJECTIVE 4.6: Use grazing and prescribed fire to improve range conditions for native species, reduce invasive plant species, and reduce hazardous fire fuel loads.							
Project 4.6.1: Collaborate with Fire Department and Air Quality Manager to conduct prescribed burns IAW the Wildland Fire Management Plan.	NRM/ AFCEC Fire Branch /FES	Med	x	x	x	x	x
OBJECTIVE 4.7: Create, maintain, and enhance habitat for native pollinator species.							
Project 4.7.1: Continue to identify and implement vegetation enhancement projects in improved and semi- improved areas of the base to improve habitat for native plant and wildlife species.	NRM/ CEN/ CEOI	Low	x	x	x	x	x
Project 4.7.2: Enhance wildlife and pollinator habitat values of landscaping.	NRM/ CEN/ CEOI	Low	x	x	x	x	x
Project 4.7.3: Complete habitat assessments for monarch butterfly and western bumblebee.	DoD	High	x	x	x		

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 4.7.4: Participate in DoD monarch butterfly legacy project.	DoD	Med	x	x	x		
Project 4.7.5: Expand the clinic restoration planting site using plants that are high value for pollinators.	CEIEC CTR	Low	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
Project 4.7.6: Monitor all restoration projects for three to five years to measure success of plantings and use by target wildlife (e.g. pollinators, monarchs). Incorporate lessons learned into future efforts.	CEIEC CTR	Low	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
OBJECTIVE 4.8: Protect and restore native vegetative communities, increase coverage of native vegetation base-wide, and connectivity with off-base habitat.							
Project 4.8.1: Continue to expand valley oak riparian woodland restoration efforts along the base creeks IAW riparian restoration plan and oak restoration plan.	CEIEC CTR	Low	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
Project 4.8.2: Initiate blue oak restoration and enhancement efforts on and around the saddle club, and other applicable places across base.	CEIEC CTR	Low	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
Project 4.8.3: Enhance shaded riverine aquatic habitat along Dry Creek/Best Slough.	CEIEC CTR	Low	BAEYOS2090xx MGT, HABITAT, RIPARIAN				
Project 4.8.4: Coordinate with Grounds Maintenance and community planner to get new base landscaping list (Appendix O) inserted into the DCG, IDP, and grounds maintenance PWS.	NRM/ CEN/ CEOI	High	x				
Project 4.8.5: Develop and implement a water conservation education program to minimize	NRM	Low		x			

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
the use of water in land management activities, especially irrigation of landscaped areas.							
Project 4.8.6: Within developed areas of the base, identify turf areas that can be converted to non-turf groundcovers, wildflower plantings, and other plant materials that require minimal irrigation and maintenance.	CEOI/ CEIEC	Low	x	x	x	x	x
Project 4.8.7: Review and revise base-specific restrictions, procedures, and responsibilities for the firewood cutting program to be consistent with the goals and objectives of the INRMP.	NRM	Low		x			
OBJECTIVE 4.9: Improve coordination between the NRM and other maintenance and management personnel to avoid effects to fish and wildlife species and their habitats.							
GOAL 5: MAINTAIN, ENHANCE, AND EXPAND OUTDOOR RECREATIONAL OPPORTUNITIES TO SERVE THE NEEDS OF THE BASE POPULATION.							
OBJECTIVE 5.1: Manage and enhance existing facilities and provide new outdoor recreation opportunities that are compatible with sensitive natural resources in and around recreation sites.							
Project 5.1.1: Develop/distribute, and update an outdoor recreation brochure.	CEIEC	Med		BAEYOS10 02xx OUTREAC H			
Project 5.1.2: Plan and implement nature trail renovation and expansion along Dry Creek and at Candy Cane Park (Section 7.2.3.2).	NRM/ CTR	Low					

Project	OPR	Priority Level	2018	2019	2020	2021	2022+	
Project 5.1.3: Improve accessibility to recreational opportunities and programs for people with disabilities.	CEIEC/ TBD	Low	x	x	x	x	x	
Project 5.1.4: Provide recreational opportunities, whenever possible, for organized civilian groups from surrounding communities while maintaining the strict security requirement demanded by the nature of Beale AFB's mission	NRM/ FSS	High	x	x	x	x	x	
Project 5.1.5: Minimize the effects of outdoor recreation activities on the base's natural resources.	CEIEC/ CLEO	High	x	x	x	x	x	
Project 5.1.6: Identify OPRs for maintenance of existing recreation facilities and funding sources for creation of new recreation facilities.	NRM	Low	x	x				
Project 5.1.7: Assess recreation demand (Section 7.2.5).	NRM	Low	x	x	x			
OBJECTIVE 5.2: Develop educational trainings and workshops on natural resource and conservation topics for the Base population.								
Project 5.2.1: Publish articles through the base public affairs office, and use educational fliers at outreach events and on eDASH (intranet) to educate the public.	CEIEC NRM	Med	BAEYOS1002xx OUTREACH					
Project 5.2.2: Increase public awareness on how to respond to wildlife encounters or conflicts with pests or potentially dangerous wildlife species (e.g., rattlesnakes, skunks, pumas, coyotes, and deer).	CEIEC	Low	x	x	x	x	x	

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 5.2.3: Educate base population about the benefits of using regionally native plants for landscaping and the threats of invasive species (Section 7.7.10 and 11).	CEIEC/ CEIE	Low	x	x	x	x	x
Project 5.2.4: Create educational materials on how to avoid impacts to sensitive species and habitat.	CEIEC	Med	x	x	x	x	x
OBJECTIVE 5.3: Create/maintain natural resource volunteer programs and opportunities for base population.							
Project 5.3.1: Increase programs that use volunteers to construct and maintain recreation facilities wherever possible to promote pride in the area and to reduce costs.	CEIEC	Low	x	x	x	x	x
Project 5.3.2: Use volunteers to monitor wood duck boxes.	CEIEC	Low	x	x	x	x	x
OBJECTIVE 5.4: Manage and update the base hunting & fishing program to be in compliance with state regulations and AFI 32-7064.							
Project 5.4.1: Program and support position to conduct Conservation Law Enforcement duties as required by AFI32-7064.	CEIEC/AFCE C	High	x	x	x	x	x
Project 5.4.2: Review duck blind policies to ensure they provide sufficient natural resource protection.	CEIEC NRM	Low	x	x	x		
OBJECTIVE 5.5: Improve tracking and accountability within the hunting & fishing, firewood, and volunteer game warden programs							
Project 5.5.1: Improve tracking of license fees, hunter education, duck blind locations, and other elements associated with the hunting and	AFCEC ISS/ CEIEC	Med	AFCE 200218 (Funding	x	x	x	x

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
fishing program. Reconsider use of an online electronic permit management system.			Declined by Beale)				
Project 5.5.2: Engage hunters and fishermen to determine interest and need for improvements, access, outreach and expansion of hunting and fishing opportunities.	CEIEC NRM	Low	x	x			
GOAL 6: MANAGE HABITAT TO REDUCE BASH AND WILDFIRE RISKS TO THE AF.							
OBJECTIVE 6.1: Coordinate with USDA, SEG and Pest Management to implement land management measures around the airfield that discourage use by wildlife, including a Wildlife Exclusion Zone.							
Project 6.1.1: Continue to manage and control pest wildlife species through close coordination between the pest management section and the natural resources manager and implementation of the Beale AFB Pest Management Plan.	CEIEC/CEOI	Med	x	x	x	x	x
Project 6.1.2: Reduce or eliminate yellow star-thistle around the airfield and Armenian blackberry around Reeds Creek.	CEOI/CEIEC	High	IPMC and/or BAEYOS2030xx MGT, NUISANCE WILDLIFE				
Project 6.1.3: Remove attractants in the airfield, approaches, or WEZ that are attractive to wildlife or pose a BASH hazard. Sites include the islands in Pond 4, trees along the approach, and beaver ponds in Reeds Creek.	CEIEC/ CEO	High	BAEYOS2030xx MGT, NUISANCE WILDLIFE				
Project 6.1.4: Organize re-occurring meetings outside of the BHWG between the NRM,	CEIEC/USDA / SEG	Med	x	x	x	x	x

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
USDA APHIS WS, and SEG to address needs and concerns related to the BASH Program.							
Project 6.1.5: Band breeding birds that are using base next boxes in support of the BASH Program.	CEIEC CTR	Low					
OBJECTIVE 6.2: Minimize the risk of wildfire and its potential effects on base infrastructure and natural resources; pursue improvements to firebreak processes and electrical utilities to enhance fire, infrastructure, and mission protection and natural resource protection.							
Project 6.2.1: Continue to use a combination of firebreaks, mowing, and grazing to reduce the risk of damage from wildfire.	CEO/ CEF/ CEIEC	High	x	x	x	x	x
Project 6.2.2: Review firebreak maps and plans every five years (2018, 2023, 2028).	CEIEC	Med		BAEY 197124			
Project 6.2.3: Use prescribed fire to meet conservation goals (EQ funded) or reduce fuel loading (CEO funded) in areas where it is compatible with smoke management or other guidelines.	CEF/ CEIEC/AFCE C Fire Branch	Med	CZOF Title: INTERAGENCY/INTRAAGENCY, GOVERNMENT, SIKES ACT, AFWFC-MULTI, CZOF Title: MGT, WILDLAND FIRE, BAEYOS2070xx MGT, HABITAT, POST FIRE REHAB				
Project 6.2.4: Conduct a Burned Area Emergency Response (BAER) analysis after all wildfires and planned prescribed burns (if needed) and implement recommendations to minimize negative effects of wildland fire on water quality, wetland habitat, federally listed species, soil erosion, and invasive species cover after wildland fires. Complete follow-up treatments on historic wildland fire	CTR	Med	BAEYOS2070xx MGT, HABITAT, POST FIRE REHAB				

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
prescriptions, where needed, to address long-term damage from weeds or erosion.							
Project 6.2.5: Create a pre- and post-prescribed fire monitoring protocol that targets and measures management goals/objectives. Conduct pre- and post- monitoring per protocol to measure success of prescribed burns. Conduct annual adaptive management review process of monitoring results to incorporate lessons-learned/data into prescribed burn plans, WFMP, fire monitoring protocol, and INRMP.	CTR	Med	BAEYOS2070xx MGT, HABITAT, POST FIRE REHAB				
Project 6.2.6: Conduct annual check of firebreak wetland indicator tags before annual grading activity. Collect GIS data for wetland indicator tags (Section 7.7.9).	CTR	High	BAEYOS2070xx MGT, HABITAT, POST FIRE REHAB				
OBJECTIVE 6.3: Manage livestock to ensure appropriate intensity and timing of grazing to meet land management and habitat enhancement goals.							
Project 6.3.1: Continue to identify and implement measures to minimize the effects of grazing and firewood cutting on native vegetation.	CEIEC NRM/ GS Range Techs	Low	x	x	x	x	x
Project 6.3.2: Monitor utilization standards (RDM) to ensure that stocking levels do not exceed allowable use.	CEIEC NRM/ GS Range Techs	High	x	x	x	x	x
Project 6.3.3: Enhance the distribution and abundance of desirable forage species.	CEIEC NRM/ GS Range Techs	Low	x	x	x	x	x

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
Project 6.3.4: Monitor grazing intensities throughout the wet season to minimize impacts on sensitive resources.	CEIEC NRM/ GS Range Techs	High	x	x	x	x	x
Project 6.3.5: Monitor special-status native plant species in grazed and ungrazed plots to determine whether they benefit from a well-managed grazing program, need protection from grazing, or appear unaffected by livestock (Source: 2017 GMG Table 8-1).	CEIEC NRM/ GS Range Techs	Med	x	x	x	x	x
Project 6.3.6: Conduct adaptive management study to provide site-specific information on appropriate maximum RDM targets for meeting wildlife habitat requirements, controlling invasive species, and minimizing fine fuel loads (Source: 2017 GMG Table 8-1).	CEIEC NRM/ GS Range Techs	Med	x	x	x	x	x
Project 6.3.7: Maintain rangeland improvements (structural and nonstructural) to support grazing operations and improve the value of the lease (Source: 2017 GMG Table 8-1).	CEIEC NRM/ GS Range Techs	Med	x	x	x	x	x
Project 6.3.8: Staff appropriate permits (332/813/103s) when moving or placing new grazing infrastructure (e.g., fencing, water, corrals) (Source: 2017 GMG Table 8-1).	CEIEC NRM/ GS Range Techs	Med	x	x	x	x	x
Project 6.3.9: Conduct grazing compliance surveys monthly to verify grazing lease and grazing land use regulations are properly implemented (Source: 2017 GMG Table 8-1).	CEIEC NRM/ GS Range Techs	Med	x	x	x	x	x

Project	OPR	Priority Level	2018	2019	2020	2021	2022+
OBJECTIVE 6.4: Locate additional areas where livestock grazing will benefit the base mission, to include reduction in fuel load, habitat enhancement and invasive species control.							
Project 6.4.1: Evaluate and implement opportunities to expand grazing operations to generate revenue and support conservation goals.	CEIEC (Grazing Funds)	Med	x	AFCE 777719	x	x	x
Project 6.4.2: Conduct pre- and post-monitoring program when grazing management prescriptions are put in place to address natural resource goals/objectives. Conduct adaptive management review process of monitoring results to incorporate lessons-learned/data into grazing management section of the INRMP and established monitoring protocols.	CEIEC (Grazing Funds)	Med	x	x	x	x	x
OBJECTIVE 6.5 Maintain sufficient funding and staffing to complete INRMP projects and other natural resource tasks.							
Project 6.5.1: Fund maintenance and purchase of equipment and materials as needed to do in-house natural resource projects described in this INRMP.	AFCEC ISS	High	BAEYOS2050xx SUPPLIES, CN BAEYOS2040xx EQUIPMENT PURCHASE / MAINTAIN, CN				
Project 6.5.2: Organize the 9 CEIE sharedrive to comply with AF standards and improve program management.	CEIEC	Med		x			

11.0 REFERENCES

11.1 Standard References (Applicable to all USAF installations)

- [AFMAN 32-7003, Environmental Conservation](#)
- [Sikes Act](#)
- [eDASH Natural Resources Program Page](#)
- [Natural Resources Playbook](#)
- [DoDI 4715.03, Natural Resources Conservation Program](#)
- [AFI 32-1015, Integrated Installation Planning](#)
- [AFI 32-10112, Installation Geospatial Information and Services \(IGI&S\)](#)

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12.0 ACRONYMS

12.1 Standard Acronyms (Applicable to all USAF installations)

- [eDASH Acronym Library](#)
- [Natural Resources Playbook—Acronym Section](#)
- [U.S. EPA Terms & Acronyms](#)

12.2 Installation Acronyms

°C	Degrees Celsius
°F	Degrees Fahrenheit
7 SWS	7th Space Warning Squadron
9 CES	9th Civil Engineer Squadron
9 CES/CD	9th Civil Engineer Squadron Deputy Civil Engineer
9 CES/CEIA	9th Civil Engineer Squadron Installation Assets and Accountability
9 CES/CEIE	9th Civil Engineer Squadron Installation Management Flight
9 CES/CEIEC	9th Civil Engineer Squadron Installation Environmental Conservation and Compliance
9 CES/CEIER	9th Civil Engineer Squadron Installation Environmental Remediation
9 CES/CENP	9th Civil Engineer Squadron Engineering Flight Planning
9 CES/CEO	9th Civil Engineer Squadron Facilities, Operations and Maintenance Flight
9 CES/CEOF	9th Civil Engineer Squadron Operations Facilities
9 CES/CEOI	9th Civil Engineer Squadron Operations Infrastructure
9 CES/FES	9th Civil Engineer Squadron Fire Emergency Services Flight
9 CONS	9th Contracting Squadron
9 FSS/FSW	9th Force Support Squadron Community Services Flight
9 FSS/FSWG	9th Force Support Squadron Community Services Flight Golf Course
9 FSS/FSWO	9th Force Support Squadron Community Services Flight Outdoor Recreation
9 FSS/FSWR	9th Force Support Squadron Community Services Flight Rod-and-Gun Club
9 MSG	9th Mission Support Group
9 OSS	9th Operations Support Squadron
9 OSS/OSW	9th Operations Support Squadron Weather Flight
9 RW	9th Reconnaissance Wing
9 RW/CC	9th Reconnaissance Wing Commander
9 RW/JAG	9th Reconnaissance Wing office of the Judge Advocate General
9 RW/PA	9th Reconnaissance Wing Public Affairs
9 RW/SE	9th Reconnaissance Wing Safety Office
9 RW/SEF	9th Reconnaissance Wing Flight Safety
9 SFS	9th Security Forces Squadron
13 RS	13th Reconnaissance Squadron Patch
53 TEG Det 2	53rd Test and Evaluation Group Detachment 2
372 DS Det 21	372nd Training Squadron Detachment 21
548 ISR GP	548th Intelligence, Surveillance and Reconnaissance Group
713 COS	713th Combat Operations Squadron Patch
940 ARW	940th Air Refueling Wing
ACC	Air Combat Command
ACC TRSS Det 11	Air Combat Command Training Support Squadron Detachment 11
AF	Air Force
AFB	Air Force Base

AFCEC	Air Force Civil Engineer Center
AFCEC/CZ	Air Force Civil Engineer Center Environmental Operations
AFCEC/CZOF	Air Force Civil Engineer Center Environmental Operations Fire
AFCEC/CZOW	Air Force Civil Engineer Center Environmental Operations West Region
AFFF	Aqueous Film-Forming Foam
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSI Det 218	Air Force Office of Special Investigations Detachment 218
AFPD	Air Force Policy Directive
AFRIMS	Air Force Records Management System
AFTO	Air Force Technical Order
AICUZ	Air Installation Compatible Use Zone
ANG	Air National Guard
AOU	American Ornithological Union
APAP	Aquatic Pesticide Application Plan
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
AT/FP	Anti-terrorism Force Protection
ATV	All-Terrain Vehicle
AUM	Animal Unit Month
BA	Biological Assessment
BASH	Bird/Wildlife Aircraft Strike Hazard
BCC	U.S. Fish and Wildlife Bird of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BHWG	Bird Hazard Working Group
BMP	Best Management Practice
BO	Biological Opinion
BRD	USGS Biological Resources Division (now called WERC)
Cal-IPC	California Invasive Plant Council
CAP	Central Accumulation Point
CATEX	Categorical Exclusion
CATM	Combat Arms Training and Maintenance
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CECOS	Civil Engineer Corps Officers School
CEMML	Center for Environmental Management of Military Lands
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CES	Civil Engineering Squadron
CESA	California Endangered Species Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CIRE	Center for Integrated Research on the Environment
CLEO	Conservation Law Enforcement Officer
CLEP	Conservation Law Enforcement Program
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO2	Carbon Dioxide
CRAM	California Rapid Assessment Method
CRLF	California Red-legged Frog
CRM	Cultural Resource Manager

CRPR	California Rare Plant Rank
CSU	California State University
CSUS	California State University Sacramento
CTR	Contractor
CWA	Clean Water Act
dB	Decibel
DBH	Diameter at Breast Height
DCGS	New Distributed Common Ground System
DDT	Dichlorodiphenyltrichloroethane
DGS-2	Deployable Ground Station-2
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOI	Department of Interior
DPS	Distinct Population Segment
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EBS	Environmental Baseline Survey
eDNA	Environmental DNA
EDRR	Early Detection Rapid Response
EIAP	Environmental Impact Analysis Process
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Executive Order
EOD	Explosive Ordinance Disposal
EPA	U.S. Environmental Protection Agency
EQ	Environmental Quality
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESOH	Environmental Safety and Occupational Health
ESU	Evolutionarily Significant Unit
FD	Federally Delisted
FDS	Functional Data Sets
FE	Federally Endangered
FEMA	Federal Emergency Management Agency
FGC	(California) Fish and Game Code
FGS	Final Governing Standards
FLETC	Federal Law Enforcement Training Center
FMU	(wildland) Fire Management Unit
FP	Fully Protected
FPCON	Force Protection Conditions
FR	Federal Register or species proposed as candidate for federal listing
FRAQMD	Feather River Air Quality Management District
FT	Federally Threatened
FY	Fiscal Year
FYLF	Foothill Yellow-legged Frog
GATR	Ground Air Transmitter and Receiver
GDD	Average annual growing degree days with a base temperature of 50 °F
GGs	Giant Gartersnake
GCI	Ground-Control Intercept
GEM	Golf Course Environmental Management
GIS	Geographic Information System

GMG	Grazing Management Guidelines
GP	General Plan
GPS	Global Positioning System
GS	Government Salary
GSU	Geographically Separated Units
HazMat	Hazardous Materials
HF	High Frequency
HPM	Hunting and fishing Program Manager
hrs	hours
HWMP	Hazardous Waste Management Plan
IA	Interagency Agreement
IAP	Initial Accumulation Point
IAW	In Accordance With
ICEMAP	Installation Complex Encroachment Management Action Plan
ICRMP	Integrated Cultural Resources Management Plan
ID	Identification
IDP	Installation Development Plan
INRMP	Integrated Natural Resources Management Plan
IPMIS	Integrated Pest Management Information System
IPMP	Installation Pest Management Plan
IPSMG	Invasive Plant Species Management Guidelines
ISS	Installation Support Section
IST	Installation Support Team
JA	Judge Advocate
lbs	pounds
LiDAR	Light Detection and Ranging
LMPT	Land Management Police Training
LRS	Lincoln Receiver Site
LUFT	Leaking Underground Fuel Tank
MAPS	Monitoring Avian Productivity and Survival
MBDP	Migratory Bird Depredation Permit
MBTA	Migratory Bird Treaty Act
MFR	Memorandum for the Record
MGD	Million Gallons Per Day
MMRP	Munitions Response Program
MMRS	Munitions Response Sites
MOU	Memorandum of Understanding
MSPBS	Mission-Sensitive Priority Bird Species
N/A	Not Applicable
NEPA	National Environmental Policy Act
NEXRAD	Next Generation Radar
NHPA	National Historic Preservation Act
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO _x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NR	Natural Resources
NRCS	U.S. Natural Resource Conservation Service
NRM	Natural Resource Manager
NRT	Natural Resources Technician

NWP	Nationwide Permit
NWPR	Navigable Waters Protection Rule
O&M	Operations & Maintenance
OAC	Outdoor Adventure Center
OPR	Office of Primary Responsibility
ORV	Off-Road Vehicle
PAVE PAWS	Precision Acquisition Vehicle Entry Phased Array Warning System
PEA	Programmatic Environmental Assessment
PBA	Programmatic Biological Assessment
PBO	Programmatic Biological Opinion
Pd	<i>Pseudogymnoascus destructans</i>
PIF	Partners in Flight
PL	Public Law
PLR CAP Det 8	Pacific Liaison Region Civil Air Patrol Detachment 8
PM2.5	Particulate Matter Smaller Than or Equal to 2.5 Microns in Diameter
POC	Point of Contact
POL	Petroleum, Oil and Lubricants
PWS	Performance Work Statement
QAC/L	Qualified Applicator Certificate/License
RCP	Representative Concentration Pathway
RCRA	Resource Conservation and Recovery Act
RDM	Residual Dry Matter
RDS	Records Disposal Schedule
REPI	Readiness and Environmental Protection Integration
RGP	Regional General Permit
RHD	Rabbit Hemorrhagic Disease
RV	Recreational Vehicle
RW	Reconnaissance Wing
RWQCB	
SAIA	Sikes Act Improvement Amendment
SAMP	Special Area Management Plan
SC	State Candidate for listing
SD	State Delisted
SDSFIE	Spatial Data Standards for Facilities, Infrastructure and Environment
SE	State Endangered
SME	Subject Matter Expert
SMS	Subject Matter Specialist
SO	Solicitors Opinion
SoC	Species of Concern
SOW	Scope of Work
SRW	Strategic Reconnaissance Wing
SSC	Species of Special Concern
ST	State Threatened
SWA	Spenceville Wildlife Area
SWAP	State Wildlife Action Plan
SWB	Storm Water Basin
SWPPP	Storm Water Pollution Prevention Plan
T&E	Threatened and Endangered
TBD	To Be Determined
TDS	Total Dissolved Solids
TNC	The Nature Conservancy

TRBL	Tricolored Blackbird
UEC	Unit Environmental Coordinator
UIF	Unfavorable Information File
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USGS	U.S. Geologic Service
USC	U.S. Code
USDA APHIS WS	U.S. Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services
USFWS	U.S. Fish and Wildlife Service
VELB	Valley Elderberry Longhorn Beetle
VIP	Very Important Person
VOC	Volatile Organic Carbons
VPFS	Vernal Pool Fairy Shrimp
VPTS	Vernal Pool Tadpole Shrimp
WBB	Western Bumble Bee
WBWG	Western Bat Working Group
WERC	Western Ecological Research Center
WEZ	Wildlife Exclusion Zone
WFMP	Wildland Fire Management Plan
WFPC	Wildland Fire Program Coordinator
WINDO	Wing Infrastructure Development Outlook
WL	Watch List
WoUS	Waters of the U.S.
WPT	Western Pond Turtle
WS	Wildlife Services
WST	Western Spadefoot
WWTP	Wastewater Treatment Plant
WYBC	Western Yellow-Billed Cuckoo

13.0 DEFINITIONS

13.1 Standard Definitions (Applicable to all USAF installations)

- [Natural Resources Playbook—Definitions Section](#)

13.2 Installation Definitions

14.0 APPENDICES

14.1 Standard Appendices

14.1.1 Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP

Federal Public Laws and Executive Orders	
National Defense Authorization Act of 1989, Public Law (P.L.) 101-189; Volunteer Partnership Cost-Share Program	Amends two Acts and establishes volunteer and partnership programs for natural and cultural resources management on DoD lands.
Defense Appropriations Act of 1991, P.L. 101-511; Legacy Resource Management Program	Establishes the “Legacy Resource Management Program” for natural and cultural resources. Program emphasis is on inventory and stewardship responsibilities of biological, geophysical, cultural, and historic resources on DoD lands, including restoration of degraded or altered habitats.
EO 11514, <i>Protection and Enhancement of Environmental Quality</i>	Federal agencies shall initiate measures needed to direct their policies, plans, and programs to meet national environmental goals. They shall monitor, evaluate, and control agency activities to protect and enhance the quality of the environment.
EO 11593, <i>Protection and Enhancement of the Cultural Environment</i>	All Federal agencies are required to locate, identify, and record all cultural resources. Cultural resources include sites of archaeological, historical, or architectural significance.
EO 11987, <i>Exotic Organisms</i>	Agencies shall restrict the introduction of exotic species into the natural ecosystems on lands and waters which they administer.
EO 11988, <i>Floodplain Management</i>	Provides direction regarding actions of Federal agencies in floodplains, and requires permits from state, territory and Federal review agencies for any construction within a 100-year floodplain and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for acquiring, managing and disposing of Federal lands and facilities.
EO 11989, <i>Off-Road vehicles on Public Lands</i>	Installations permitting off-road vehicles to designate and mark specific areas/trails to minimize damage and conflicts, publish information including maps, and monitor the effects of their use. Installations may close areas if adverse effects on natural, cultural, or historic resources are observed.
EO 11990, <i>Protection of Wetlands</i>	Requires Federal agencies to avoid undertaking or providing assistance for new construction in wetlands unless there is no practicable alternative, and all practicable measures to minimize harm to wetlands have been implemented and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Federal Public Laws and Executive Orders	
EO 12088, <i>Federal Compliance with Pollution Control Standards</i>	This EO delegates responsibility to the head of each executive agency for ensuring all necessary actions are taken for the prevention, control, and abatement of environmental pollution. This order gives the U.S. Environmental Protection Agency (US EPA) authority to conduct reviews and inspections to monitor federal facility compliance with pollution control standards.
EO 12898, <i>Environmental Justice</i>	This EO requires certain federal agencies, including the DoD, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.
EO 13112, <i>Invasive Species</i>	To prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
EO 13186, <i>Responsibilities of Federal Agencies to Protect Migratory Birds</i>	The USFWS has the responsibility to administer, oversee, and enforce the conservation provisions of the Migratory Bird Treaty Act, which includes responsibility for population management (e.g., monitoring), habitat protection (e.g., acquisition, enhancement, and modification), international coordination, and regulations development and enforcement.
United States Code	
Animal Damage Control Act (7 U.S.C. § 426-426b, 47 Stat. 1468)	Provides authority to the Secretary of Agriculture for investigation and control of mammalian predators, rodents, and birds. DoD installations may enter into cooperative agreements to conduct animal control projects.
Bald and Golden Eagle Protection Act of 1940, as amended; 16 U.S.C. 668-668c	This law provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
Clean Air Act, (42 U.S.C. § 7401– 7671q, July 14, 1955, as amended)	This Act, as amended, is known as the Clean Air Act of 1970. The amendments made in 1970 established the core of the clean air program. The primary objective is to establish Federal standards for air pollutants. It is designed to improve air quality in areas of the country which do not meet federal standards and to prevent significant deterioration in areas where air quality exceeds those standards.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (Superfund) (26 U.S.C. § 4611–4682, P.L. 96-510, 94 Stat. 2797), as amended	Authorizes and administers a program to assess damage, respond to releases of hazardous substances, fund cleanup, establish clean-up standards, assign liability, and other efforts to address environmental contaminants. Installation Restoration Program guides cleanups at DoD installations.

Federal Public Laws and Executive Orders	
Endangered Species Act (ESA) of 1973, as amended; P.L. 93-205, 16 U.S.C. § 1531 et seq.	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Under this law, no federal action is allowed to jeopardize the continued existence of an endangered or threatened species. The ESA requires consultation with the USFWS and the NOAA /NMFS and the preparation of a biological evaluation or a biological assessment may be required when such species are present in an area affected by government activities.
Federal Aid in Wildlife Restoration Act of 1937 (16 U.S.C. § 669–669i; 50 Stat. 917) (Pittman-Robertson Act)	Provides federal aid to states and territories for management and restoration of wildlife. Fund derives from sports tax on arms and ammunition. Projects include acquisition of wildlife habitat, wildlife research surveys, development of access facilities, and hunter education.
Federal Environmental Pesticide Act of 1972	Requires installations to ensure pesticides are used only in accordance with their label registrations and restricted-use pesticides are applied only by certified applicators.
Federal Land Use Policy and Management Act, 43 U.S.C. § 1701–1782	Requires management of public lands to protect the quality of scientific, scenic, historical, ecological, environmental, and archaeological resources and values; as well as to preserve and protect certain lands in their natural condition for fish and wildlife habitat. This Act also requires consideration of commodity production such as timbering.
Federal Noxious Weed Act of 1974, 7 U.S.C. § 2801–2814	The Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.
Federal Water Pollution Control Act (Clean Water Act [CWA]), 33 U.S.C. §1251–1387	The CWA is a comprehensive statute aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation’s waters. Primary authority for the implementation and enforcement rests with the US EPA.
Fish and Wildlife Conservation Act (16 U.S.C. § 2901–2911; 94 Stat. 1322, PL 96-366)	Installations encouraged to use their authority to conserve and promote conservation of nongame fish and wildlife in their habitats.
Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.)	Directs installations to consult with the USFWS, or state or territorial agencies to ascertain means to protect fish and wildlife resources related to actions resulting in the control or structural modification of any natural stream or body of water. Includes provisions for mitigation and reporting.
Lacey Act of 1900 (16 U.S.C. § 701, 702, 32 Stat. 187, 32 Stat. 285)	Prohibits the importation of wild animals or birds or parts thereof, taken, possessed, or exported in violation of the laws of the country or territory of origin. Provides enforcement and penalties for violation of wildlife related Acts or regulations.
Leases: Non-excess Property of Military Departments, 10 U.S.C. § 2667, as amended	Authorizes DoD to lease to commercial enterprises Federal land not currently needed for public use. Covers agricultural outleasing program.
Migratory Bird Treaty Act 16 U.S.C. § 703–712	The Act implements various treaties for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful without a valid permit.

Federal Public Laws and Executive Orders	
National Environmental Policy Act of 1969 (NEPA), as amended; P.L. 91-190, 42 U.S.C. § 4321 et seq.	Requires federal agencies to utilize a systematic approach when assessing environmental impacts of government activities. Establishes the use of environmental impact statements. NEPA proposes an interdisciplinary approach in a decision-making process designed to identify unacceptable or unnecessary impacts on the environment. The Council of Environmental Quality (CEQ) created Regulations for Implementing the National Environmental Policy Act [40 Code of Federal Regulations (CFR) Parts 1500– 1508], which provide regulations applicable to and binding on all Federal agencies for implementing the procedural provisions of NEPA, as amended.
National Historic Preservation Act, 16 U.S.C. § 470 et seq.	Requires federal agencies to take account of the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). Provides for the nomination, identification (through listing on the NRHP), and protection of historical and cultural properties of significance.
National Trails Systems Act (16 U.S.C. § 1241–1249)	Provides for the establishment of recreation and scenic trails.
National Wildlife Refuge Acts	Provides for establishment of National Wildlife Refuges through purchase, land transfer, donation, cooperative agreements, and other means.
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd–668ee)	Provides guidelines and instructions for the administration of Wildlife Refuges and other conservation areas.
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001–13; 104 Stat. 3042), as amended	Established requirements for the treatment of Native American human remains and sacred or cultural objects found on Federal lands. Includes requirements on inventory, and notification.
Rivers and Harbors Act of 1899 (33 U.S.C. § 401 et seq.)	Makes it unlawful for the USAF to conduct any work or activity in navigable waters of the United States without a federal permit. Installations should coordinate with the U.S. Army Corps of Engineers (USACE) to obtain permits for the discharge of refuse affecting navigable waters under National Pollutant Discharge Elimination System (NPDES) and should coordinate with the USFWS to review effects on fish and wildlife of work and activities to be undertaken as permitted by the USACE.
Sale of certain interests in land, 10 U.S.C. § 2665	Authorizes sale of forest products and reimbursement of the costs of management of forest resources.
Soil and Water Conservation Act (16 U.S.C. § 2001, P.L. 95-193)	Installations shall coordinate with the Secretary of Agriculture to appraise, on a continual basis, soil/water-related resources. Installations will develop and update a program for furthering the conservation, protection, and enhancement of these resources consistent with other federal and local programs.

Federal Public Laws and Executive Orders	
<p>Sikes Act (16 U.S.C. § 670a–670l, 74 Stat. 1052), as amended</p>	<p>Provides for the cooperation of DoD, the Departments of the Interior (USFWS), and the State Fish and Game Department in planning, developing, and maintaining fish and wildlife resources on a military installation. Requires development of an INRMP and public access to natural resources and allows collection of nominal hunting and fishing fees.</p> <p>NOTE: AFI 32-7064 sec 3.9. Staffing. As defined in DoDI 4715.03, use professionally trained natural resources management personnel with a degree in the natural sciences to develop and implement the installation INRMP. (T-0). 3.9.1. Outsourcing Natural Resources Management. As stipulated in the Sikes Act, 16 U.S.C. § 670 et. seq., the Office of Management and Budget Circular No. A-76, Performance of Commercial Activities, August 4, 1983 (Revised May 29, 2003) does not apply to the development, implementation and enforcement of INRMPs. Activities that require the exercise of discretion in making decisions regarding the management and disposition of government owned natural resources are inherently governmental. When it is not practicable to utilize DoD personnel to perform inherently governmental natural resources management duties, obtain these services from federal agencies having responsibilities for the conservation and management of natural resources.</p>
DoD Policy, Directives, and Instructions	
<p>DoD Instruction 4150.07 <i>DoD Pest Management Program</i> dated 29 May 2008</p>	<p>Implements policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program.</p>
<p>DoD Instruction 4715.1, <i>Environmental Security</i></p>	<p>Establishes policy for protecting, preserving, and (when required) restoring and enhancing the quality of the environment. This instruction also ensures environmental factors are integrated into DoD decision-making processes that could impact the environment, and are given appropriate consideration along with other relevant factors.</p>
<p>DoD Instruction (DoDI) 4715.03, <i>Natural Resources Conservation Program</i></p>	<p>Implements policy, assigns responsibility, and prescribes procedures under DoDI 4715.1 for the integrated management of natural and cultural resources on property under DoD control.</p>
<p>OSD Policy Memorandum, 17 May 2005—<i>Implementation of Sikes Act Improvement Amendments: Supplemental Guidance Concerning Leased Lands</i></p>	<p>Provides supplemental guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission. INRMPs must address the resource management on all lands for which the subject installation has real property accountability, including leased lands. Installation commanders may require tenants to accept responsibility for performing appropriate natural resource management actions as a condition of their occupancy or use, but this does not preclude the requirement to address the natural resource management needs of these lands in the installation INRMP.</p>

Federal Public Laws and Executive Orders	
OSD Policy Memorandum, 1 November 2004— <i>Implementation of Sikes Act Improvement Act Amendments: Supplemental Guidance Concerning INRMP Reviews</i>	Emphasizes implementing and improving the overall INRMP coordination process. Provides policy on scope of INRMP review, and public comment on INRMP review.
OSD Policy Memorandum, 10 October 2002— <i>Implementation of Sikes Act Improvement Act: Updated Guidance</i>	Provides guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD and replaces the 21 September 1998 guidance <i>Implementation of the Sikes Act Improvement Amendments</i> . Emphasizes implementing and improving the overall INRMP coordination process and focuses on coordinating with stakeholders, reporting requirements and metrics, budgeting for INRMP projects, using the INRMP as a substitute for critical habitat designation, supporting military training and testing needs, and facilitating the INRMP review process.
USAF Instructions and Directives	
32 CFR Part 989, as amended, and AFI 32-7061, Environmental Impact Analysis Process (EIAP)	Provides guidance and responsibilities in the EIAP for implementing INRMPs. Implementation of an INRMP constitutes a major federal action and therefore is subject to evaluation through an Environmental Assessment or an Environmental Impact Statement.
AFI 32-1015, <i>Integrated Installation Planning</i>	This publication establishes a comprehensive and integrated planning framework for development/redevelopment of Air Force installations.
AFMAN 32-7003, <i>Environmental Conservation</i>	Implements AFPD 32-70, <i>Environmental Quality</i> ; DoDI 4715.03, <i>Natural Resources Conservation Program</i> ; and DoDI 7310.5, <i>Accounting for Sale of Forest Products</i> . It explains how to manage natural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFMAN 32-7003, <i>Environmental Conservation</i>	This Manual implements AFPD 32-70 and DoDI 4710.1, <i>Archaeological and Historic Resources Management</i> . It explains how to manage cultural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFI 32-10112 <i>Installation Geospatial Information and Services (IGI&S)</i>	This instruction implements Department of Defense Instruction (DoDI) 8130.01, <i>Installation Geospatial Information and Services (IGI&S)</i> by identifying the requirements to implement and maintain an Air Force Installation Geospatial Information and Services program and Air Force Policy Directive (AFPD) 32-10 <i>Installations and Facilities</i> .
AFPD 32-70, <i>Environmental Quality</i>	Outlines the USAF mission to achieve and maintain environmental quality on all USAF lands by cleaning up environmental damage resulting from past activities, meeting all environmental standards applicable to present operations, planning its future activities to minimize environmental impacts, managing responsibly the irreplaceable natural and cultural resources it holds in public trust and eliminating pollution from its activities wherever possible. AFPD 32-70 also establishes policies to carry out these objectives.

Federal Public Laws and Executive Orders	
Policy Memo for Implementation of Sikes Act Improvement Amendments, HQ USAF Environmental Office (USAF/ILEV) on January 29, 1999	Outlines the USAF interpretation and explanation of the Sikes Act and Improvement Act of 1997.

14.2 Installation Appendices

See PDF version for Appendices B - V

Appendix B
Summary of Historic Beale AFB
Management Plans

Summary of Historic Plans and Guidance Documents

Base Comprehensive Plan (BCP) – preparation of the BCP began before the 1999 INRMP was initiated. The BCP for Beale AFB was being developed in response to Air Force guidance requiring installations to prepare BCPs to serve as land use planning documents, guiding future growth and development at each installation. AF guidance on land use planning was modified before the BCP could be completed. BCPs were replaced by GPs. The BCP for Beale AFB was abandoned, although it provided a starting point for the INRMP and the development of a GP.

Environmental Study of Growth Scenarios (Harding Lawson Associates 1997) – Before the BCP was abandoned, a National Environmental Policy Act (NEPA) analysis was conducted on the executive summary of the BCP and the associated development areas map. An environmental assessment (EA) was prepared that analyzed the environmental effects of three alternatives: a 3,000-military personnel alternative (current population), a 7,000- military personnel alternative, and a 12,000-military personnel alternative. Because of several factors, including the replacement of the BCP by the GP, the EA was never approved and signed. Because the EA was never signed, it is not identified as an EA in the INRMP but is referred to as an Environmental Study of Growth Scenarios (Harding Lawson Associates 1997). Although not signed and approved, the EA still provides a valuable analysis of the potential effects of various growth scenarios at Beale AFB. This plan was never implemented.

Habitat and Conservation Management Plan (HCMP) – was created in the late 1990's to provide a comprehensive multi-habitat and multi-species approach to natural resource conservation at Beale AFB, including predetermined mitigation for impacts on sensitive natural resources in specified General Plan Development Areas. The HCMP was intended to serve as a biological assessment under Section 7 of the ESA and provide sufficient information to initiate consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). The HCMP would also have served as the agency-approved mitigation plan necessary for the U.S. Army Corps of Engineers. Due to legal issues concerning designation of preservation areas “in perpetuity” it was never signed or implemented.

Special Area Management Plan (SAMP) – is no longer being implemented, but was consulted during the development of multiple base plans including the 2015 IDP and ICEMAP. The focus of the SAMP was to be a programmatic analysis tool to streamline analysis of certain types of projects, in particular, habitats on base. A Programmatic Biological Opinion (PBO) was completed for this plan in 2011 and has since expired. Until a completed EA or environmental impact statement (EIS) is completed, the SAMP is conceptual. However, the PBO may be used for project analysis as a planning tool, provided the USFWS continues to concur with that methodology.

General Plan (GP) – was prepared in response to the Air Combat Command (ACC) commitment to manage AF resources effectively and to protect the environment. The GP is the capstone of the comprehensive planning process. It provides the Commander, 9th Reconnaissance Wing (RW); Commander, 7 SWS; 548th Intelligence Group (IG), and subordinate leaders with a synopsis of those factors affecting the development of Beale AFB. This plan has been replaced by the IDP. This plan was implemented by Base Planning (9 CES/CENP).

The INRMP and Previous Individual Natural Resources Plans – In accordance with AFI 32-7064, the INRMP (including its associated appendices) updates and replaces various stand-alone plans related to individual natural resource management topics. Existing plans that have been replaced by the INRMP include the Fish and Wildlife Management Plan (1991), Woodland Management Plan (1989), and the Outdoor Recreation and Management Plan (1987). Portions of the 1997 Pest Management Plan and the 1997 Urban Forestry Plan (which replaced the 1992 Community Forest Master Plan) are also replaced by the INRMP. Replacing stand-alone plans with the INRMP eliminates duplicate information and facilitates integration of all topical areas related to natural resource and ecosystems management into one master document.

Appendix C

Beale AFB Plant List

List of Plants found on Beale Air Force Base

Common Name	Species	Family Name	Species Acronym
box elder	<i>Acer negundo</i>	Sapindaceae	ACNE2
common yarrow	<i>Achillea millefolium</i>	Asteraceae	ACMI2
blow wives	<i>Achyrachaena mollis</i>	Asteraceae	ACMO2
foothill deervetch	<i>Acmispon brachycarpus</i>	Fabaceae	LOHU2
desert deervetch	<i>Acmispon parviflorus</i>	Fabaceae	LOMI
buckeye	<i>Aesculus californica</i>	Hippocastanaceae	AECA
pacific bentgrass	<i>Agrostis avenacea</i>	Poaceae	AGAV
small-leaf bentgrass	<i>Agrostis microphylla</i>	Poaceae	AGMI3
tree of heaven	<i>Ailanthus altissima</i>	Simaroubaceae	AIAL
silver hairgrass	<i>Aira caryophyllea</i>	Poaceae	AICA
narrowleaf water plantain	<i>Alisma gramineum var. graminifolia</i>	Alismataceae	ALGR63
broadleaf water plantain	<i>Alisma triviale</i>	Alismataceae	ALTR7
narrowleaf onion	<i>Allium amplexans Torr.</i>	Liliaceae	ALAM2
foothill onion	<i>Allium hyalinum</i>	Liliaceae	ALHY
white alder	<i>Alnus rhombifolia</i>	Betulaceae	ALRH2
short-awn foxtail	<i>Alopecurus aequalis</i>	Poaceae	ALAE
pacific foxtail	<i>Alopecurus saccatus</i>	Poaceae	ALSA3
prostate amaranth	<i>Amaranthus blitoides</i>	Amaranthaceae	AMBL
rancher's fire	<i>Amsinckia menziesii var. intermedia</i>	Boraginaceae	AMME12
common fiddleneck	<i>Amsinckia menziesii var. mensiesii</i>	Boraginaceae	AMMEM2
Menzies' fiddleneck	<i>Amsinckia menziesii (Lehm.)</i>	Boraginaceae	AMME
broomsedge bluestem	<i>Andropogon virginicus L</i>	Poaceae	ANVI2
mayweed	<i>Anthemis cotula</i>	Asteraceae	ANCO2
western lady's mantle	<i>Aphanes occidentalis</i>	Rosaceae	APOC
sticky whiteleaf manzanita	<i>Arctostaphylos viscida</i>	Ericaceae	
commen three-awn	<i>Aristida oligantha</i>	Poaceae	AROL
hook thee-awned grass	<i>Aristida ternipes var. hamulosa</i>	Poaceae	ARTEH
giant reed	<i>Arundo donax</i>	Poaceae	ARDO4
Indian milkweed	<i>Asclepias eriocarpa</i>	Asclepiadaceae	ASER
Mexican whorled milkweed	<i>Asclepias fascicularis Dcne.</i>	Asclepiadaceae	ASFA
slender wild oat	<i>Avena barbata</i>	Poaceae	AVBA
wild oat	<i>Avena fatua</i>	Poaceae	AVFA
coyote brush	<i>Baccharis pilularis</i>	Asteraceae	BAPI
mule-fat	<i>Baccharis salicifolia</i>	Asteraceae	BASA4
devil's beggars-tick	<i>Bidens frondosa</i>	Asteraceae	BIFR
yello carpet	<i>Blennosperma nanum</i>	Asteraceae	BLNA
black mustard	<i>Brassica nigra</i>	Brassicaceae	BRNI
black mustard	<i>Brassica nigra (L.) W.D.J. Koch</i>	Brassicaceae	BRNI
big quakinggrass	<i>Briza maxima L</i>	Poaceae	BRMA
little quakinggrass	<i>Briza minor</i>	Poaceae	BRMI2
appendaged brodiaea	<i>Brodiaea appendiculata</i>	Liliaceae	BRAP
california brodiaea	<i>Brodiaea californica</i>	Liliaceae	BRCA4
harvest brodiaea	<i>Brodiaea coronaria</i>	Liliaceae	BRCO3
elegant harvest brodiaea	<i>Brodiaea elegans</i>	Liliaceae	BREL
vernal pool brodiaea	<i>Brodiaea minor</i>	Liliaceae	BRMI3
purdy's brodiaea	<i>Brodiaea purdyi</i>	Liliaceae	BRPU16
ripgut brome	<i>Bromus diandrus</i>	Poaceae	BRDI3
soft chess	<i>Bromus hordeaceus</i>	Poaceae	BRHO2

Common Name	Species	Family Name	Species Acronym
smooth brome	<i>Bromus inermis ssp. Rubens</i>	Poaceae	BRMA3
compact brome	<i>Bromus madritensis L.</i>	Poaceae	BRMA3
red maids	<i>Calandrinia ciliata var. menziensis</i>	Portulacaceae	CACIM
Bolander's water-starwort	<i>Callitriche heterophylla</i>	Callitrichaceae	CAHE3
California water-starwort	<i>Callitriche marginata</i>	Callitrichaceae	CAMA3
gold nuggets	<i>Calochortus luteus</i>	Liliaceae	CALU9
few-seeded bittercress	<i>Cardamine oligosperma</i>	Brassicaceae	CAOL
Santa Barbara sedge	<i>Carex barbarae</i>	Cyperaceae	CABA4
dense sedge	<i>Carex densa</i>	Cyperaceae	CADE8
clustered field sedge	<i>Carex praegracilis</i>	Cyperaceae	CAPR5
valley tassels	<i>Castilleja attenuata</i>	Scrophulariaceae	CAAT25
field owl's-clover	<i>Castilleja campestris</i>	Scrophulariaceae	CACA79
hispid owl's-clover	<i>Castilleja tenuis</i>	Scrophulariaceae	CATE26
buck brush	<i>Ceanothus cuneatus</i>	Rhamnaceae	CECU
yellow star-thistle	<i>Centaurea solstitialis</i>	Asteraceae	CESO3
centaury	<i>Centaurium Hill</i>	Gentianaceae	CENTA2
June centaury	<i>Centaurium muehlenbergii</i>	Gentianaceae	CEMU2
beautiful centaury	<i>Centaurium venustum</i>	Gentianaceae	CEVE3
Fitch's spikeweed	<i>Centromadia fitchii</i>	Asteraceae	HEFI
chaffweed	<i>Centunculus minimus</i>	Gentianaceae	CEMI
common buttonbush	<i>Cephalanthus occidentalis</i>	Rubiaceae	CEOC2
mouse-ear chickweed	<i>Cerastium arvense</i>	Caryophyllaceae	CEAR4
common chickweed	<i>Cerastium fontanum var. vulgare</i>	Caryophyllaceae	CEFOV2
mouse-ear chickweed	<i>Cerastium glomeratum</i>	Caryophyllaceae	CeGL2
Western redbud	<i>Cercis occidentalis</i>	Fabaceae	CECAT
narrowleaf soap plant	<i>Chlorogalum angustifolium Kellogg</i>	Liliaceae	CHAN2
soaproot	<i>Chlorogalum pomeridianum</i>	Liliaceae	CHPO3
timwort	<i>Cicendia quadrangularis</i>	Gentianaceae	CIQU3
bull thistle	<i>Cirsium vulgare</i>	Asteraceae	CIVU
clarkia	<i>Clarkia purpurea ssp. purpurea</i>	Onagraceae	CLPUP
poison hemlock	<i>Conium maculatum</i>	Apiaceae	COMA2
field bindweed	<i>Convolvulus arvensis</i>	Convolvulaceae	COAR4
water pygmy-weed	<i>Crassula aquatica</i>	Crassulaceae	CRAQ
pygmy stonecrop	<i>Crassula connata</i>	Crassulaceae	CRCO3
moss-pygmy stonecrop	<i>Crassula tillaea</i>	Crassulaceae	CRTI
doveweed/turkey mullein	<i>Croton setiger</i>	Euphorbiaceae	CRSE11
narrowleaf crucianella	<i>Crucianella angustifolia L.</i>	Rubiaceae	CRAN11
California dodder	<i>Cuscuta californica var. papillosa</i>	Cuscutaceae	CUCAP
Bogg's lake dodder	<i>Cuscuta howelliana</i>	Cuscutaceae	CUHO
Bermuda gras	<i>Cynodon dactylon</i>	Poaceae	CYDA
bristly dogstail grass	<i>Cynosurus echinatus L.</i>	Poaceae	CYEC
variable nutsedge	<i>Cyperus difformis</i>	Cyperaceae	CYDI4
umbrella sedge	<i>Cyperus eragrostis</i>	Cyperaceae	CYER
black nutsedge	<i>Cyperus niger</i>	Cyperaceae	CYNI2
damasonium	<i>Damasonium californicum</i>	Alisataceae	DACA12
Jimson weed	<i>Datura stramonium</i>	Solanaceae	DAST
royal larkspur	<i>Delphinium variegaum</i>	Ranunculaceae	DEVA
annual hairgrass	<i>Deschampsia danthonioides</i>	Poaceae	DEDA
blue-dicks	<i>Dichelostemma capitatum</i>	Lilaceae	DICA14
wild hyacinth	<i>Dichelostemma multiflorum</i>	Lilaceae	DIMU
salt grass	<i>Distichlis spicata</i>	Poaceae	DISP

Common Name	Species	Family Name	Species Acronym
Stinkwort	<i>Dittrichia graveolens</i>	Asteraceae	DIGR3
ornate downingia	<i>Downingia arnatissima</i>	Campunulaceae	DOOR
Hoover's Downingia	<i>Downingia bicornuta</i>	Campunulaceae	DOBI
toothed downingia	<i>Downingia cuspidata</i>	Campunulaceae	DOCU
folded calicoflower	<i>Downingia ornatissima Greene</i>	Campanulaceae	DOOR
valley downingia	<i>Downingia pulchella</i>	Campunulaceae	DOPU2
dwarf downingia	<i>Downingia pusilla</i>	Campunulaceae	DOPU3
spring whitlow grass	<i>Draba verna</i>	Brassicaceae	DRVE2
barnyard grass	<i>Echinochloa crus-galli</i>	Poaceae	ECCR
short-seed waterwort	<i>Elatine brachysperma</i>	Elatinaceae	ELBR5
California waterwort	<i>Elatine californica</i>	Elatinaceae	ELCA
least rush	<i>Eleocharis acicularis</i>	Cyperaceae	ELAC
common spikerush	<i>Eleocharis macrostachya</i>	Cyperaceae	ELMA5
Engelmann's spikerush	<i>Eleocharis obsusa var. engelmannii</i>	Cyperaceae	ELOBE
black sand spikerush	<i>Eleocharis pachycarpa Desv.</i>	Cyperaceae	ELPA
fewflower spikerush	<i>Eleocharis pauciflora (Lightf.)</i>	Cyperaceae	ELQU2
spikerush	<i>Eleocharis R. Br.</i>	Cyperaceae	ELEOC
Western waterweed	<i>Elodea nuttallii</i>	Hydrocharitaceae	ELNU2
Medusahead grass	<i>Elymus caput-medusae</i>	Poaceae	TACA8
blue wildrye	<i>Elymus glaucus</i>	Poaceae	ELGL
tall wheat grass	<i>Elymus ponticus</i>	Poaceae	NL
pannicled willow-herb	<i>Epilobium brachycarpum</i>	Onagraceae	EPBR3
Smooth boisduvalia	<i>Epilobium campestre</i>	Onagraceae	EPCA
northern willow-herb	<i>Epilobium ciliatum</i>	Onagraceae	EPCI
dense-flowered spike-primrose	<i>Epilobium densiflorum</i>	Onagraceae	EPDE4
willowherb	<i>Epilobium L.</i>	Onagraceae	EPILO
smooth spike-primrose	<i>Epilobium campestre</i>	Onagraceae	EPCA
stiff spike-primrose	<i>Epilobium torreyi</i>	Onagraceae	EPTO4
lovegrass	<i>Eragrostis sp.</i>	Poaceae	ER
barestem buckwheat	<i>Eriogonum nudum</i>	Polygonaceae	ERNU3
long-beaked filaree	<i>Erodium botrys</i>	Geraniaceae	ERBO
early filaree	<i>Erodium brachycarpum</i>	Geraniaceae	ERBR14
red-stemmed filaree	<i>Erodium cicutarium</i>	Geraniaceae	ERIC6
white-stemmed filaree	<i>Erodium moschatum</i>	Geraniaceae	ERM07
coyote-thistle	<i>Eryngium castrense</i>	Apiaceae	ERCA33
California poppy	<i>Eschscholzia californica</i>	Papaveraceae	ESCA2
frying pan poppy	<i>Eschscholzia lobbii</i>	Papaveraceae	ESLO
eucalyptus sp.	<i>Eucalyptus sp.</i>	Myrtaceae	
beetle spurge	<i>Euphorbia crenulata</i>	Euphorbiaceae	EUCR2
thyme-leafed spurge	<i>Euphorbia serpyllifolia</i>	Euphorbiaceae	EUSEH
foxtail fescue	<i>Festuca bromoides</i>	Poaceae	VUBR
Pacific fescue	<i>Festuca microstachys var. ciliata</i>	Poaceae	VUMIC
rattail fescue	<i>Festuca myuros</i>	Poaceae	VUMY
sixweeks fescue	<i>Festuca octoflora (Walt.) Rydb.</i>	Poaceae	VUOC
common fig	<i>Ficus carica</i>	Moraceae	FICA
California coffeeberry	<i>Frangula californica</i>	Rhamnaceae	FRCA12
Oregon ash	<i>Fraxinus latifolia</i>	Oleaceae	FRLA
stinkbells	<i>Fritillaria agrestis Greene</i>	Liliaceae	FRAG
catchweed bedstraw	<i>Galium aparine</i>	Rubiaceae	GAAP2
tiny bedstraw	<i>Galium murale</i>	Rubiaceae	GAMU4
wall bedstraw	<i>Galium parisiense</i>	Rubiaceae	gaPA5

Common Name	Species	Family Name	Species Acronym
nit grass	<i>Gastridium phleoides</i>	Poaceae	GAVE3
cutleaf geranium	<i>Geranium dissectum L.</i>	Geraniaceae	GEDI
annual cranesbill	<i>Geranium molle</i>	Geraniaceae	GEMO
mana-grass	<i>Glyceria declinata</i>	Poaceae	GLDE
western mana-grass	<i>Glyceria occidentalis</i>	Poaceae	GLOC
western marsh cudweed	<i>Gnaphalium palustre Nutt.</i>	Asteraceae	GNPA
bractless hedge-hyssop	<i>Gratiola ebracteata</i>	Scrophulariaceae	GREB
Great Valley gumplant	<i>Grindelia camporum</i>	Asteraceae	GRCA
dwarf dwarf-cudweed	<i>Hesperevax caulescens (Benth.) Gray</i>	Asteraceae	HECA30
hog-wallow starfish	<i>Hesperevax sp.</i>	Asteraceae	HEsp.
heterocodon	<i>Heterocodon rariflorum</i>	Campunulaceae	HERA3
virgate tarweed	<i>Holocarpha virgata</i>	Asteraceae	HOVI
holozonia	<i>Holozonia filipes</i>	Asteraceae	HOFI
meadow barley	<i>Hordeum brachyantherum</i>	Poaceae	HOB2
low barley	<i>Hordeum depressum</i>	Poaceae	HODE
Mediterranean barley	<i>Hordeum marinum Huds. ssp. gussonianum</i>	Poaceae	HOMAG
mediterranean barley	<i>Hordeum marinum ssp gussoneanum</i>	Poaceae	HOMAG
hare barley	<i>Hordeum murinum ssp leporinum</i>	Poaceae	HOMUL
goldwire	<i>Hypericum concinnum Benth.</i>	Clusiaceae	HYCO3
Klamath weed	<i>Hypericum perforatum</i>	Hypericaceae	HYPE
smooth cat's-ear	<i>Hypochaeris glabra</i>	Asteraceae	HYGL2
hairy cat's ear	<i>Hypochaeris radicata</i>	Asteraceae	HyRA3
Howell's quillwort	<i>Isoetes howellii</i>	Isoetaceae	ISHO
quillwort	<i>Isoetes L.</i>	Isoetaceae	ISOET
Buttall's quillwort	<i>Isoetes nutallii</i>	Isoetaceae	ISNU
Orcutt's quillwort	<i>Isoetes orcuttii</i>	Isoetaceae	ISOR
Northern California black walnut	<i>Juglans hindsii</i>	Juglandaceae	JUHI
English walnut	<i>Juglans regia</i>	Juglandaceae	JURE80
sharp-fruited or taper-tip rush	<i>Juncus acuminatus</i>	Juncaceae	JUAC
baltic rush	<i>Juncus balticus</i>	Juncaceae	JUBA
toad rush	<i>Juncus bufonius</i>	Juncaceae	JUBA
capped rush	<i>Juncus capitatus</i>	Juncaceae	JUCA5
soft rush	<i>Juncus effusus</i>	Juncaceae	JUEF
rush	<i>Juncus sp.</i>	Juncaceae	JUNCU
mexican rush	<i>Juncus mexicanus</i>	Juncaceae	JUHE
spreading rush	<i>Juncus patens</i>	Juncaceae	JUPA2
slender rush	<i>Juncus tenuis</i>	Juncaceae	JUTE
inch-high rush	<i>Juncus uncialis</i>	Juncaceae	JUUN
iris-leaved rush	<i>Juncus xiphioides</i>	Juncaceae	JUXI
bushbeard tongue	<i>Keckiella breviflora</i>	Plantaginaceae	KEBE
prickly lettuce	<i>Lactuca serriola</i>	Asteraceae	LASE
glandular harleaf	<i>Lagophylla glandulosa</i>	Asteraceae	LAGL
California goldfields	<i>Lasthenia californica</i>	Asteraceae	LACA7
Fremont's goldfields	<i>Lasthenia fremontii</i>	Asteraceae	LAFR4
smooth goldfields	<i>Lasthenia glaberrima DC.</i>	Asteraceae	LAGL3
alkali goldfields	<i>Lasthenia platycarpa</i>	Asteraceae	LAPL2
angled pea	<i>Lathyrus angulatus L.</i>	Fabaceae	LAAN3
chrysanthemum tidy tips	<i>Layia chrysanthemoides</i>	Asteraceae	LACH

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Fremont's tidy tips	<i>Layia fremontii</i>	Asteraceae	LAFR2
legenere	<i>Legenere limosa</i>	Campunulaceae	LELI
hairy hawkbit	<i>Leontodon taraxacoides</i>	Asteraceae	LETA
veiny peppergrass	<i>Lepidium dictyotum</i>	Brassicaceae	LEDI2
shiny peppergrass	<i>Lepidium nitidum</i>	Brassicaceae	LENI
narrow peppergrass	<i>Lepidium strictum</i>	Brassicaceae	LEST2
bearded sprangletop	<i>Leptochloa fascicularis</i>	Poaceae	LEFA
virgate lessingia/wand lessingia	<i>Lessingia virgata</i>	Asteraceae	LEV18
creeping wild rye	<i>Leymus triticoides</i>	Poaceae	LETR5
white meadowfoam	<i>Limnanthes alba</i>	Limnanthaceae	LIAL3
Douglas' meadowfoam	<i>Limnanthes douglasii</i>	Limnanthaceae	LIDO2
common meadowfoam	<i>Limnanthes douglasii ssp nivea</i>	Limnanthaceae	LIDON2
Douglas rose meadowfoam	<i>Limnanthes douglasii ssp rosea</i>	Limnanthaceae	LIDOR2
northern mudwort	<i>Limosella aquatica</i>	Scrophulariaceae	LIAQ
true babystars	<i>Linanthus bicolor (Nutt.) Greene</i>	Polemoniaceae	LIBI
common flax	<i>Linum usitatissimum L.</i>	Linaceae	LIUS
narrowleaf cottonrose	<i>Logfia gallica</i>	Asteraceae	LOGA2
Italian ryegrass	<i>Lolium multiflorum</i>	Poaceae	LOMU
perennial ryegrass	<i>Lolium perenne</i>	Poaceae	LOPE
alkali desertparsley	<i>Lomatium caruifolium (Hook. & Arn.)</i>	Apiaceae	LOCA5
Sacramento Valley lomatium	<i>Lomatium caruifolium var. denticulatum</i>	Apiaceae	LOCAD
bird's-foot trefoil	<i>Lotus coniculatus</i>	Fabaceae	LOCO6
trefoil	<i>Lotus sp.</i>	Fabaceae	LOTUS
Chilean bird's-foot trefoil	<i>Lotus wrangelianus</i>	Fabaceae	LOWR2
marsh seedbox	<i>Ludwigia palustris</i>	Onagraceae	LUPA
floating seedbox	<i>Ludwigia peploides</i>	Onagraceae	LUPE
miniature lipine	<i>Lupinus bicolor</i>	Fabaceae	LUBT
sky lupine	<i>Lupinus nanus</i>	Fabaceae	LUNA3
arroya lupine	<i>Lupinus succulentus</i>	Fabaceae	LUSU3
scarlet pimpernel	<i>Lysimachia arvensis</i>	Primulaceae	ANAR
hyssop loosestrife	<i>Lythrum hyssopifolium</i>	Lythraceae	LYHY2
purslane loosestrife	<i>Lythrum portula</i>	Lythraceae	LYPOE
Osage orange	<i>Maclura pomifera</i>	Moraceae	MAPO
spring madia	<i>Madia elegans D. Don ex Lindl.</i>	Asteraceae	MAELV
water chickweed	<i>Mantia fontana (M.verna)</i>	Asteraceae	MOFO
hairy water fern	<i>Marsilea vestita</i>	Marsileaceae	MAVE2
Pinapple weed	<i>Matricaria discoidea</i>	Asteraceae	MAIDI6
bur-clover	<i>Medicago polymorpha</i>	Fabaceae	MEPO3
California onion-grass	<i>Melica californica</i>	Poaceae	MECA2
Wild mint	<i>Mentha canadensis</i>	Lamiaceae	MEAR4
Pennyroyal	<i>Mentha pulegium</i>	Lamiaceae	MEPU
q-tips	<i>Micropus californicus</i>	Asteraceae	MICA
sierra foothills microseris	<i>Microseris acuminata</i>	Asteraceae	MIAC
Douglas' microseris	<i>Microseris douglasii</i>	Asteraceae	MIDO
bicolor monkeyflower	<i>Mimulus bicolor</i>	Phrymaceae	MIB4
cardinal monkey flower	<i>Mimulus cardinalis</i>	Phrymaceae	MIEA
seep-spring monkeyflower	<i>Mimulus guttatus</i>	Phrymaceae	MIGU
tricolor moneyflower	<i>Mimulus tricolor</i>	Phrymaceae	MITR3

Common Name	Species	Family Name	Species Acronym
California stitchwort	<i>Minuartia californica</i>	Caryophyllaceae	MICA7
Douglas' stitchwort	<i>Minuartia douglasii</i>	Caryophyllaceae	MIDO3
green carpet-weed	<i>Mollugo verticillata</i>	Molluginaceae	MOVE
annual water minerslettuce	<i>Montia fontana L.</i>	Portulacaceae	MOFO
White mulberry	<i>Morus alba</i>	Moraceae	MOAL
deergrass	<i>Muhlenbergia rigens</i>	Poaceae	MURI2
changing forget-me-not	<i>Myosotis discolor Pers.</i>	Boraginaceae	MYDI
mouse-tail	<i>Myosurus minimus</i>	Ranunculaceae	MYMI2
parrot's feather	<i>Myriophyllum sp.</i>	Haloragaceae	MYsp.
Tehama pincushionplant	<i>Navarretia heterandra Mason</i>	Polemoniaceae	NAHE
needle-leaved navarretia	<i>Navarretia intertexta</i>	Polemoniaceae	NAIN2
white-headed navarretia	<i>Navarretia leucocephala</i>	Polemoniaceae	NALE
downy navarretia	<i>Navarretia pubescens</i>	Polemoniaceae	NAPU2
pincushionplant	<i>Navarretia Ruiz & Pavón</i>	Polemoniaceae	NAVAR
marigold navarretia	<i>Navarretia tagetina</i>	Polemoniaceae	NATA3
fivespot	<i>Nemophila maculata Benth. ex Lindl.</i>	Hydrophyllaceae	NEMA
meadow nemophila	<i>Nemophila pedunculata</i>	Hydrophyllaceae	NEPE
oleander	<i>Nerium oleander</i>	Apocynaceae	NEOL
Hartweg's odontostomum	<i>Odontostomum hartwegii</i>	Liliaceae	ODHA
Olive	<i>Olea europaea</i>	Oleaceae	OLEU
witch grass	<i>Panicum capillare</i>	Poaceae	PACA6
pigmy stonecrop	<i>Parvisedum pumilum</i>	Crassulaceae	PAPU10
dallis grass	<i>Paspalum dilatatum</i>	Poaceae	PADI3
ditch grass	<i>Paspalum distichum</i>	Poaceae	PADI6
grass pink	<i>Petrohogia dubia</i>	Caryophyllaceae	PEDU
hood canarygrass	<i>Phalaris paradoxa L.</i>	Poaceae	PHPA5
common frog-fruit	<i>Phyla nodiflora</i>	Verbenaceae	PHNO2
American pillwort	<i>Pilularia americana</i>	Marsileaceae	PIAM
adobe popcornflower	<i>Plagiobothrys acanthocarpus</i>	Boraginaceae	PLAC
bracted popcornflower	<i>Plagiobothrys bracteatus</i>	Boraginaceae	PLBR
common popcornflower	<i>Plagiobothrys fulvus</i>	Boraginaceae	PLPU
sculptured popcornflower	<i>Plagiobothrys glyptocarpus</i>	Boraginaceae	PLGL2
Greene's popcornflower	<i>Plagiobothrys greenei</i>	Boraginaceae	PLGR
alkali popcornflower	<i>Plagiobothrys leptocladus</i>	Boraginaceae	PLLE
dye popcornflower	<i>Plagiobothrys nothofulvus</i>	Boraginaceae	PLNO
Shasta popcornflower	<i>Plagiobothrys shastensis</i>	Boraginaceae	PLSH
small-flowered popcornflower	<i>Plagiobothrys stipitatus var. micranthus</i>	Boraginaceae	PLSTM
stipitate popcornflower	<i>Plagiobothrys stipitatus var. stipitatus</i>	Boraginaceae	PLSTS
undulate popcornflower	<i>Plagiobothrys undulatus</i>	Boraginaceae	PLUN2
cutleaf plantain	<i>Plantago coronopus</i>	Plantaginaceae	PLCO3
annual coast plantain	<i>Plantago elongata</i>	Plantaginaceae	PLEL
California plantain	<i>Plantago erecta</i>	Plantaginaceae	PLER3
narrowleaf plantain	<i>Plantago lanceolata</i>	Plantaginaceae	PLLA
California sycamore	<i>Platanus racemosa</i>	Platanaceae	PLRA
California semaphore grass	<i>Pleuropogon californicus</i>	Poaceae	PLCA6
gray pine	<i>Pinus sabiniana</i>	Pinaceae	PISA2
annual bluegrass	<i>Poa annua</i>	Poaceae	POAN
bulbous bluegrass	<i>Poa bulbosa</i>	Poaceae	POBU

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Sacramento mesamint	<i>Pogogyne zizyphoroides</i>	Lamiaceae	POZI
common knotweed	<i>Polygonum arenastrum</i>	Polygonaceae	POAR11
waterpepper	<i>Polygonum hydropiper</i>	Polygonaceae	POHY
rabbit's-foot grass	<i>Polypogon monspeliensis</i>	Poaceae	POMO5
Fremont cotton wood	<i>Populus fremontii</i>	Salicaceae	POFR2
pondweed	<i>Potamogeton sp.</i>	Potamogetonaceae	Posp.
Padre's shooting star	<i>Primula clevelandii var. patula</i>	Primulaceae	NL
woolly-marbles	<i>Psilocarphus brevissimus</i>	Asteraceae	PSBR
Oregon woolly-heads	<i>Psilocarphus oregonus</i>	Asteraceae	PSOR
slender woolly-heads	<i>Psilocarphus tenellus</i>	Asteraceae	PSTE
blue oak	<i>Quercus douglasii</i>	Fagaceae	QUDO
valley oak	<i>Quercus lobata</i>	Fagaceae	QULO
interior live oak	<i>Quercus wislizenii</i>	Fagaceae	QUWI2
hispid water buttercup	<i>Ranunculus aquatilis var. hispidulus</i>	Ranunculaceae	RAAQH
Carter's buttercup	<i>Ranunculus bonariensis var. trisepalus</i>	Ranunculaceae	RABOT
California buttercup	<i>Ranunculus californicus</i>	Ranunculaceae	RACA2
prickle-fruited buttercup	<i>Ranunculus muricatus</i>	Ranunculaceae	RAMU2
western buttercup	<i>Ranunculus occidentalis</i>	Ranunculaceae	RAOC
celery-leaf buttercup	<i>Ranunculus sceleratus</i>	Ranunculaceae	RASC3
yellow wild radish	<i>Raphanus raphanistrum</i>	Brassicaceae	RARA2
Black locust	<i>Robina pseudoacacia</i>	Fabaceae	ROSP
curve-pod yellow-cress	<i>Rorippa curvisiliqua</i>	Brassicaceae	ROCU
western-yellow-cress	<i>Rorippa curvisiliqua var. occidentalis</i>	Brassicaceae	ROCUO
watercress	<i>Rorippa nasturtium-aquaticum (L.) Hayek</i>	Brassicaceae	RONA2
California wildrose	<i>Rosa californica</i>	Rosaceae	ROCA2
Himalayan blackberry	<i>Rubus armeniacus</i>	Rosaceae	RUAR9
curly dock	<i>Rumex crispus</i>	Polygonaceae	RUCR
dock	<i>Rumex L.</i>	Polygonaceae	RUMEX
fiddle dock	<i>Rumex plucher</i>	Polygonaceae	RUPU3
Crow	<i>Sagina decumbens ssp. occidentalis</i>	Caryophyllaceae	SADEO
western pearlwort			
sandbar willow	<i>Salix exigua</i>	Salicaceae	SAEX
Goodding's black willow	<i>Salix gooddingii</i>	Salicaceae	SAGO
red willow	<i>Salix laevigata</i>	Salicaceae	SALA3
arroyo willow	<i>Salix lasiolepis</i>	Salicaceae	SALA6
blue elberberry	<i>Sambucus mexicana</i>	Caprifoliaceae	SAME5
sanicle	<i>Sanicula bipinnata</i>	Apiaceae	SABI2
purple sanicle	<i>Sanicula bipinnatifida</i>	Apiaceae	SABI3
viscid tule	<i>Scirpus acutus</i>	Cyperaceae	SCOC5
bullrush or tule	<i>Scirpus acutus var. occidentalis</i>	Cyperaceae	SCACO4
tuberous bullrush	<i>Scirpus tuberosus</i>	Cyperaceae	SCTU
German knotgrass	<i>Scleranthus annuus L.</i>	Caryophyllaceae	SCAN2
Bolander's scribneria	<i>Scribneria bolanderi</i>	Poaceae	SCBO
common groundsel	<i>Senecio vulgaris</i>	Asteraceae	SEVU
knotroot bristlegrass	<i>Setaria parviflora</i>	Poaceae	SEPA10
field madder	<i>Sherardia arvensis</i>	Rubiaceae	SHAR
annual checker-mallow	<i>Sidalcea calycosa ssp calycosa</i>	Malvaceae	SICAC3
fringed sidalcea	<i>Sidalcea diploscypha</i>	Malvaceae	SIDA

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Hartweg's Checkerbloom	<i>Sidalcea hartwegii</i>	Malvaceae	SIHA
hairy checkerbloom	<i>Sidalcea hirsuta</i>	Malvaceae	SIHI2
windmill pink	<i>Silene gallica</i>	Caryophyllaceae	SIGA
milk thistle	<i>Silybum marianum</i>	Asteraceae	SIMA3
small-flowered nightshade	<i>Solanum americanum</i>	Solanaceae	SOAH
California goldenrod	<i>Solidago velutina ssp. californica</i>	Asteraceae	NL
lawn burrweed	<i>Soliva sessilis</i>	Asteraceae	SOSE2
common sow-thistle	<i>Sonchus oleraceus</i>	Asteraceae	SOOL
purple sandspurry	<i>Spergularia rubra</i>	Caryophyllaceae	SpRU
common chickweed	<i>Stellaria media</i>	Caryophyllaceae	STME2
foothill needlegrass	<i>Stipa lepida</i>	Poaceae	
purple nedlegrass	<i>Stipa pulchra</i>	Poaceae	
California aster	<i>Symphyotrichum chilense</i>	Asteraceae	SYCH4
lace pod	<i>Thysanocarpus curvipes</i>	Brassicaceae	THCU
spoke pod	<i>Thysanocarpus radians</i>	Brassicaceae	THRA
Poison oak	<i>Toxicodendron diversilobum</i>	Anacardiaceae	TODI
Puncture vine	<i>Tribulus terrestris</i>	Zygophyllaceae	TRTE
vinegar weed	<i>Trichostema lanceolatum</i>	Lamiaceae	TRLAY
whitetip clover	<i>Trifolium albopurpureum</i>	Fabaceae	TRAL5
bifid clover	<i>Trifolium bifidum</i>	Fabaceae	TRBI
hop clover	<i>Trifolium campestre</i>	Fabaceae	TRCA5
tree clover	<i>Trifolium ciliolatum</i>	Fabaceae	TRCI
pale sac clover	<i>Trifolium depauperatum var. amplectens</i>	Fabaceae	TRDEA
dwarf sac clover	<i>Trifolium depauperatum var. depauperatum</i>	Fabaceae	TRDED
shamrock	<i>Trifolium dubium</i>	Fabaceae	TRDU
rose clover	<i>Trifolium hirtum</i>	Fabaceae	TRHI4
crimson clover	<i>Trifolium incarnatum L.</i>	Fabaceae	TRIN3
small-headed clover	<i>Trifolium microcephalum</i>	Fabaceae	TRMI4
white clover	<i>Trifolium repens</i>	Fabaceae	TRRE3
subterranean clover	<i>Trifolium subterraneum</i>	Fabaceae	TRSU3
white-topped clover	<i>Trifolium variegatum</i>	Fabaceae	TRVA
tomcat clover	<i>Trifolium willdenowii</i>	Fabaceae	TRWI
cow clover	<i>Trifolium womskioldii</i>	Fabaceae	TRWO
flowering quillwort	<i>Triglochin scilloides</i>	Juncaginaceae	LISC4
Johnny-tuck	<i>Triphysaria eriantha</i>	Scrophulariaceae	TRER6
dwarf owl's-clover	<i>Triphysaria pusilla</i>	Scrophulariaceae	TRPU16
white brodiaea	<i>Triteleia hyacinthina</i>	Liliaceae	TRHY3
lthuriel's spear	<i>Triteleia laxa</i>	Liliaceae	TRLM6
narrow-leaved cattail	<i>Typha angustifolia</i>	Typhaceae	TYAN
broadleaved cattail	<i>Typha latifolia</i>	Typhaceae	TYLA
stinging nettle	<i>Urtica dioica</i>	Urticaceae	URDI
moth mullein	<i>Verbascum blattaria</i>	Scrophulariaceae	VEBL
woolly mullein	<i>Verbascum thapsus</i>	Scrophulariaceae	VETH
B lue vervain	<i>Verbena hastata</i>	Verbenaceae	VEHA2
water speedwell	<i>Veronica anagallis-aquatica L.</i>	Scrophulariaceae	VEAN2
purslane speedwell	<i>Veronica peregrina ssp peregrina xalapensis</i>	Scrophulariaceae	VEPEX2
common vetch	<i>Vicia sativa</i>	Fabaceae	VISA
winter vetch	<i>Vicia villosa</i>	Fabaceae	VIVA
winter vetch	<i>Vicia villosa Roth</i>	Fabaceae	VIVI

Common Name	Species	Family Name	Species Acronym
California compassplant	<i>Wyethia angustifolia (DC.) Nutt.</i>	Asteraceae	WYAN
cockleburr	<i>Xanthium strumarium</i>	Asteraceae	XAST

Appendix D
Beale AFB Wildlife List

Vertebrate Wildlife Species Observed at Beale Air Force Base

Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Birds								
Greater white-fronted goose <i>Anser albifrons</i>				1	1	3	Native	Fall, winter
Snow goose <i>Chen caerulescens</i>				1	1	3	Native	Fall, winter
Ross's goose <i>Chen rossii</i>				1	1	3	Native	Fall, winter
Canada goose <i>Branta canadensis</i>				1	1	3	Native	Spring, fall, winter
Cackling Goose <i>Branta hutchinsii</i>				1	1	3	Native	Winter
Tundra swan <i>Cygnus columbianus</i>				1	1	3	Native	Fall, winter
Mute Swan <i>Cygnus olor</i>				1	1	2	Non-native	Fall
Wood duck <i>Aix sponsa</i>			1	2	2	2	Native	Year-round resident
Gadwall <i>Anas strepera</i>				1	1	2	Native	Year-round resident
American wigeon <i>Anas americana</i>				1	1	2	Native	Fall, winter
Mallard <i>Anas platyrhynchos</i>				1	1	2	Native	Year-round resident
Blue-winged teal <i>Anas discors</i>				1	1	2	Native	Fall, winter
Cinnamon teal <i>Anas cyanoptera</i>				1	1	2	Native	Spring, fall, winter
Northern shoveler <i>Anas clypeata</i>				1	1	3	Native	Fall, winter
Northern pintail <i>Anas acuta</i>				1	1	3	Native	Fall, winter
Green-winged teal <i>Anas crecca</i>				1	1	2	Native	Fall, winter

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Canvasback <i>Aythya valisineria</i>				1	1	3	Native	Fall, winter
Ring-necked duck <i>Aythya collaris</i>				1	1	3	Native	Fall, winter
Long-Tailed Duck <i>Clangula hyemalis</i>					1		Native	Winter
Lesser scaup <i>Aythya affinis</i>				1	1	2	Native	Fall, winter
Bufflehead <i>Bucephala albeola</i>				1	1	2	Native	Fall, winter
Common goldeneye <i>Bucephala clangula</i>				1	1	1	Native	Fall, winter
Hooded merganser <i>Lophodytes cucullatus</i>				1	1	1	Native	Fall, winter
Common merganser <i>Mergus merganser</i>				1	1	1	Native	Spring, fall, winter
Ruddy duck <i>Oxyura jamaicensis</i>				1	1	2	Native	Year-round resident
Ring-necked pheasant <i>Phasianus colchicus</i>	1	2	3				Non-native	Year-round resident
Common peafowl <i>Pavo cristatus</i>							Non-native	Year-round resident
Wild turkey <i>Meleagris gallopavo</i>	2	1	1				Native	Year-round resident
California quail <i>Callipepla californica</i>		1	2				Native	Year-round resident
Pied-billed grebe <i>Podilymbus podiceps</i>				2	1	1	Native	Year-round resident
Eared grebe <i>Podiceps nigricollis</i>					1	1	Native	Year-round resident
Western grebe <i>Aechmophorus occidentalis</i>				2 ^b	1	1	Native	Spring, summer
Rednecked grebe <i>Podiceps grisegena</i>					1	1	Native	Winter
American white pelican <i>Pelecanus erythrorhynchos</i>				3	2	1	Native	Winter

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Double-crested cormorant <i>Phalacrocorax auritus</i>			3		1	1	Native	Year-round resident
American bittern <i>Botaurus lentiginosus</i>				2	1		Native	Year-round resident
Great blue heron <i>Ardea herodias</i>			3	1	1	1	Native	Year-round resident
Great egret <i>Ardea alba</i>			3	1	1	1	Native	Year-round resident
Snowy egret <i>Egretta thula</i>			2	1	1	2	Native	Spring, fall (rare)
Cattle egret <i>Bubulcus ibis</i>	1		3	1	1	2	Non-native	Year-round resident
Green heron <i>Butorides virescens</i>				2	1	1	Native	Spring, summer, fall
Black-crowned night heron <i>Nycticorax nycticorax</i>				2	1	1	Native	Year-round resident
White-faced ibis <i>Plegadis chihi</i>				1	1	2	Native	Year-round resident
Turkey vulture <i>Cathartes aura</i>	1	1	2	3			Native	Year-round resident
Osprey <i>Pandion haliaetus</i>			1		1	1	Native	Spring, summer
White-tailed kite <i>Elanus leucurus</i>	1	1	1	3			Native	Year-round resident
Bald eagle <i>Haliaeetus leucocephalus</i>			2			2	Native	Fall, winter
Northern harrier <i>Circus cyaneus</i>	1			2			Native	Year-round resident
Sharp-shinned hawk <i>Accipiter striatus</i>		2	1				Native	Fall, winter
Cooper's hawk <i>Accipiter cooperii</i>		2	1				Native	Year-round resident
Red-shouldered hawk <i>Buteo lineatus</i>		2	1				Native	Year-round resident
Swainson's hawk <i>Buteo swainsoni</i>	1	2	2				Native	Spring, summer

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Red-tailed hawk <i>Buteo jamaicensis</i>	1	1	1				Native	Year-round resident
Ferruginous hawk <i>Buteo regalis</i>	1	2	2				Native	Fall, winter
Rough-legged hawk <i>Buteo lagopus</i>	1	2	2				Native	Fall, winter
Golden eagle <i>Aquila chrysaetos</i>	1	1	2	3			Native	Year-round resident
American kestrel <i>Falco sparverius</i>	1	1	1				Native	Year-round resident
Merlin <i>Falco columbarius</i>	1	1	1				Native	Fall, winter
Peregrine falcon <i>Falco peregrinus</i>	2	3	3	1		3	Native	Fall, winter
Prairie falcon <i>Falco mexicanus</i>	1	3					Native	Fall, winter
California black rail <i>Laterallus jamaicensis</i>	3			2	1		Native	Year-round resident
Virginia rail <i>Rallus limicola</i>				2	1		Native	Year-round resident
Sora <i>Porzana carolina</i>				2	1		Native	Year-round resident
Common moorhen <i>Gallinula chloropus</i>				1	1	2	Native	Year-round resident
American coot <i>Fulica americana</i>				1	1	2	Native	Year-round resident
Sandhill crane <i>Grus canadensis</i>	2			1	3		Native	winter
Black-bellied plover <i>Pluvialis squatarola</i>				1	2	3	Native	Winter
Killdeer <i>Charadrius vociferus</i>	3			1	2	3	Native	Year-round resident
Snowy Plover <i>Charadrius alexandrinus</i>	2			2			Native	Spring
Mountain Plover <i>Charadrius montanus</i>	1						Native	Winter

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Black-necked stilt <i>Himantopus mexicanus</i>				1	2	3	Native	Year-round resident
American avocet <i>Recurvirostra americana</i>				1	2	3	Native	Year-round resident
Lesser Yellowlegs <i>Tringa flavipes</i>				1	2	3	Native	Spring
Greater yellowlegs <i>Tringa melanoleuca</i>				1	2	3	Native	Spring, fall, winter
Long-billed curlew <i>Numenius americanus</i>				1	2	3	Native	Spring, fall, winter
Dunlin <i>Calidris alpina</i>				1	2	3	Native	Spring
Western sandpiper <i>Calidris mauri</i>				1	2	3	Native	Fall, winter
Least sandpiper <i>Calidris minutilla</i>				1	2	3	Native	Fall, winter
Long-billed dowitcher <i>Limnodromus scolopaceus</i>				1	2	3	Native	Spring, fall, winter
Wilson's snipe <i>Gallinago delicata</i>				1	1	2	Native	Spring, fall, winter
Ring-billed gull <i>Larus delawarensis</i>				1	1	2	Native	Spring, fall, winter
California gull <i>Larus californicus</i>				1	1	2	Native	Spring, fall, winter
Herring gull <i>Larus argentatus</i>				3	2	1	Native	winter
Glaucous-Winged gull <i>Larus glaucescens</i>	2			3	2	1	Native	Fall, Winter
Caspian tern <i>Sterna caspia</i>					2	1	Native	Spring, summer
Forster's tern <i>Sterna forsteri</i>					2	1	Native	Rare (identification uncertain)
Black tern <i>Chlidonias niger</i>					2	1	Native	Spring, summer (rare)

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Rock pigeon <i>Columba livia</i>	1	2	3				Non-native	Year-round resident
Band-tailed pigeon <i>Patagioenas fasciata</i>		1	2				Native	Year-round resident
Eurasian Collard Dove <i>Streptopelia decaocto</i>	2	1	1				Non-native	Year-round resident
Mourning dove <i>Zenaida macroura</i>	1	1	2				Native	Year-round resident
Barn owl <i>Tyto alba</i>	1	1	1	2			Native	Year-round resident
Western screech-owl <i>Megascops kennicottii</i>		2	1				Native	Year-round resident
Great-horned owl <i>Bubo virginianus</i>	1	1	1	2			Native	Year-round resident
Burrowing owl <i>Athene cunicularia</i>	1	3					Native	Year-round resident
Short-eared owl <i>Asio flammeus</i>	2			1	3		Native	Year-round resident
Northern saw-whet owl <i>Aegolius acadicus</i>		3	1				Native	Rare
Lesser nighthawk <i>Chordeiles acutipennis</i>	2						Native	Spring, summer
Common nighthawk <i>Chordeiles minor</i>	2			3			Native	Spring, summer
White-throated Swift <i>Aeronautes saxatalis</i>			1				Native	Spring
Black-chinned hummingbird <i>Archilochus alexandri</i>			2				Native	Summer
Anna's hummingbird <i>Calypte anna</i>		1	1				Native	Year-round resident
Rufous Hummingbird <i>Selasphorus rufus</i>			2				Native	Spring
Calliope Hummingbird <i>Stellula calliope</i>			2				Native	Spring
Belted kingfisher <i>Ceryle alcyon</i>			2			1	Native	Year-round resident

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Red-breasted Sapsucker <i>Sphyrapicus ruber</i>		1	1				Native	Winter
Acorn woodpecker <i>Melanerpes formicivorus</i>		1	2				Native	Year-round resident
Nuttall's woodpecker <i>Picoides nuttallii</i>		1	1				Native	Year-round resident
Downy woodpecker <i>Picoides pubescens</i>		2	1				Native	Year-round resident
Hairy woodpecker <i>Picoides villosus</i>		1	1				Native	Year-round resident
Lewis' Woodpecker <i>Melanerpes lewis</i>		1	1				Native	Winter
Northern flicker <i>Colaptes auratus</i>		1	1				Native	Year-round resident
Olive-sided flycatcher <i>Contopus cooperi</i>		2	1				Native	Spring, fall
Scissor-tailed flycatcher <i>Tyrannus forficatus</i>	1						Native	Spring, Fall
Western wood-peewee <i>Contopus sordidulus</i>		2	1				Native	Spring, fall
Willow flycatcher <i>Empidonax traillii</i>			1	2	2		Native	Spring, fall
Dusky flycatcher <i>Empidonax oberholseri</i>			1				Native	Spring, fall
Pacific-slope flycatcher <i>Empidonax difficilis</i>		2	1				Native	Spring, summer
Black phoebe <i>Sayornis nigricans</i>	2			1	1		Native	Year-round resident
Say's phoebe <i>Sayornis saya</i>	1			2			Native	Winter, spring
Ash-throated flycatcher <i>Myiarchus cinerascens</i>	2	1	1				Native	Spring, summer
Western kingbird <i>Tyrannus verticalis</i>	1	2	2				Native	Spring, summer
Loggerhead shrike <i>Lanius ludovicianus</i>	1	2	2	2			Native	Year-round resident

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Northern shrike <i>Lanius excubitor</i>		2					Native	Winter
Western scrub-jay <i>Aphelocoma californica</i>		1	1				Native	Year-round resident
Yellow-billed magpie <i>Pica nuttalli</i>	2	1	2				Native	Year-round resident
American crow <i>Corvus brachyrhynchos</i>	1	1	1				Native	Year-round resident
Common raven <i>Corvus corax</i>							Native	Year-round resident
Horned lark <i>Eremophila alpestris</i>	1			2			Native	Year-round resident
Tree swallow <i>Tachycineta bicolor</i>	2	1	1				Native	Year-round resident
Violet-green swallow <i>Tachycineta thalassina</i>	2	1	1				Native	Spring, summer
Northern rough-winged swallow <i>Stelgidopteryx serripennis</i>	1			2			Native	Spring, summer
Cliff swallow <i>Petrochelidon pyrrhonota</i>	1			2			Native	Spring, summer
Barn swallow <i>Hirundo rustica</i>	1			2			Native	Spring, summer
Oak titmouse <i>Baeolophus inornatus</i>		1	2				Native	Year-round resident
Bushtit <i>Psaltriparus minimus</i>		1	1				Native	Year-round resident
White-breasted nuthatch <i>Sitta carolinensis</i>		1	1				Native	Year-round resident
Pygmy nuthatch <i>Sitta pygmaea</i>		1	1				Native	Year-round resident (rare)
Brown Creeper <i>Certhia americana</i>			1				Native	Winter

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Rock wren <i>Salpinctes obsoletus</i>	3						Native	Winter (rare)
Bewick's wren <i>Thryomanes bewickii</i>		1	1				Native	Year-round resident
House wren <i>Troglodytes aedon</i>		2	1				Native	Spring, summer, fall
Pacific wren <i>Troglodytes troglodytes</i>		2	2				Native	Rare
Marsh wren <i>Cistothorus palustris</i>			3	2	1		Native	Year-round resident
Golden-crowned kinglet <i>Regulus satrapa</i>		2	1				Native	Fall, winter
Ruby-crowned kinglet <i>Regulus calendula</i>		1	1				Native	Fall, winter
Western bluebird <i>Sialia mexicana</i>	2	1	1	2			Native	Year-round resident
Mountain bluebird <i>Sialia currucoides</i>	1	1	2				Native	Spring, fall, winter
Hermit thrush <i>Catharus guttatus</i>		1	1				Native	Spring, fall, winter
American robin <i>Turdus migratorius</i>	2	1	2	3			Native	Year-round resident
Varied thrush <i>Ixoreus naevius</i>		1	1				Native	Fall, winter
Northern mockingbird <i>Mimus polyglottos</i>		1	1				Native	Year-round resident
European starling <i>Sturnus vulgaris</i>	2	1	1	2			Non-native	Year-round resident
American pipit <i>Anthus rubescens</i>	3			1			Native	Fall, winter
Cedar waxwing <i>Bombycilla cedrorum</i>		1	2				Native	winter
Orange-crowned warbler <i>Vermivora celata</i>		2	1				Native	Spring, summer
Nashville Warbler <i>Oreothlypis ruficapilla</i>		2	1				Native	Spring
Yellow warbler <i>Dendroica petechia</i>		2	1				Native	Summer

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Yellow-rumped warbler <i>Dendroica coronata</i>		1	1				Native	Spring, fall, winter
Black-throated gray warbler <i>Dendroica nigrescens</i>		2	1				Native	Spring, fall, winter
Common yellowthroat <i>Geothlypis trichas</i>		2	1				Native	Year-round resident
Wilson's warbler <i>Wilsonia pusilla</i>		2	1				Native	Spring, fall
Yellow-breasted chat <i>Icteria virens</i>		3	1				Native	Spring, summer
Western tanager <i>Piranga ludoviciana</i>		2	2				Native	Spring, fall
Spotted towhee <i>Pipilo maculatus</i>		2	1				Native	Year-round resident
California towhee <i>Pipilo crissalis</i>	3	1	2				Native	Year-round resident
Chipping Sparrow <i>Spizella passerina</i>	1	2					Native	Fall
Vesper sparrow <i>Pooecetes gramineus</i>	1						Native	Fall, winter
Savannah sparrow <i>Passerculus sandwichensis</i>	1	3		2			Native	Year-round resident
Grasshopper Sparrow <i>Ammodramus savannarum</i>	1						Native	Summer
Fox sparrow <i>Passerella iliaca</i>		2	1				Native	Fall, winter
Song sparrow <i>Melospiza melodia</i>		3	1	2	2		Native	Year-round resident
Lincoln's sparrow <i>Melospiza lincolnii</i>	1	3		1	3		Native	Fall, winter
Dark-eyed junco <i>Junco hyemalis</i>	3	1	1				Native	Fall, winter
White-crowned sparrow <i>Zonotrichia leucophrys</i>	3	1	1	3	3		Native	Fall, winter
Golden-crowned sparrow <i>Zonotrichia atricapilla</i>		1	1				Native	Fall, winter

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Lark sparrow <i>Chondestes grammacus</i>	1						Native	Year-round resident
Black-headed grosbeak <i>Pheucticus melanocephalus</i>		1	1				Native	Spring, summer, fall
Blue grosbeak <i>Passerina caerulea</i>		2	1				Native	Summer
Lazuli bunting <i>Passerina amoena</i>		2	1				Native	Summer
Red-winged blackbird <i>Agelaius phoeniceus</i>	1	3	3	2	1		Native	Year-round resident
Tricolored blackbird <i>Agelaius tricolor</i>	1	3	3	2	1		Native	Year-round resident
Western meadowlark <i>Sturnella neglecta</i>	1	3		2			Native	Year-round resident
Yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>				3	1		Native	Spring, summer
Brewer's blackbird <i>Euphagus cyanocephalus</i>	1	1	3	2	3		Native	Year-round resident
Great-tailed Grackle <i>Quiscalus mexicanus</i>							Native	Spring, summer
Brown-headed cowbird <i>Molothrus ater</i>	1	1	2	2	3		Native	Year-round resident
Bullock's oriole <i>Icterus bullockii</i>		1	1				Native	Spring, summer
House finch <i>Carpodacus mexicanus</i>	2	2	2	3			Native	Year-round resident
Lesser goldfinch <i>Carduelis psaltria</i>	2	1	2	3			Native	Year-round resident
American goldfinch <i>Carduelis tristis</i>	2	1	2	3			Native	Year-round resident
House sparrow <i>Passer domesticus</i>	2	2	2	3			Non-native	Year-round resident
Mammals								
California myotis <i>Myotis californicus</i>							Native	Summer, fall

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Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Western small-footed myotis <i>Myotis ciliolabrum</i>							Native	Summer, fall
Little brown myotis <i>Myotis lucifugus</i>							Native	Summer, fall
Long-legged bat <i>Myotis volans</i>							Native	Summer, fall
Yuma bat <i>Myotis yumanensis</i>							Native	Summer, fall
Western pipstrelle <i>Pipstrellus hesperus</i>							Native	Summer, fall
Big brown bat <i>Eptesicus fuscus</i>							Native	Summer, fall
Western red bat <i>Lasiurus blossevillii</i>							Native	Summer, fall
Hoary bat <i>Lasiurus cinereus</i>							Native	Fall
Townsend's big-eared bat <i>Corynorhinus townsendii</i>							Native	Not detected, but presence very likely
Pallid bat <i>Antrozous pallidus</i>							Native	Summer
Mexican free-tailed bat <i>Tadarida brasiliensis</i>							Native	Summer, fall
Desert cottontail <i>Sylvilagus audubonii</i>		2	1				Native	Year-round resident
Black-tailed jackrabbit <i>Lepus californicus</i>	1	2	3	3			Native	Year-round resident
Beaver <i>Castor canadensis</i>			1			1	Native	Year-round resident
Porcupine <i>Erethizon dorsatum</i>		1	2				Native	Year-round resident
Botta's pocket gopher <i>Thomomys bottae</i>	1	2	3				Native	Year-round resident
California ground squirrel <i>Spermophilus beecheyi</i>	1	1	3	3			Native	Year-round resident
Western gray squirrel <i>Sciurus griscus</i>		1	1				Native	Year-round resident

Appendix D

Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Western harvest mouse <i>Reithrodontomys megalotis</i>	1	2	3	2			Native	Year-round resident
Deer mouse <i>Peromyscus maniculatus</i>	2	2	2				Native	Year-round resident
California vole <i>Microtus californicus</i>	1	2	2	2			Native	Year-round resident
Muskrat <i>Ondatra zibethicus</i>			1		1	1	Native	Year-round resident
Norway rat <i>Rattus norvegicus</i>		3	1				Non-native	Year-round resident
Black rat <i>Rattus rattus</i>	3		1		1		Non-native	Year-round resident
House mouse <i>Mus musculus</i>	1	2	2				Non-native	Year-round resident
Coyote <i>Canis latrans</i>	1	2	3	3			Native	Year-round resident
Gray fox <i>Urocyon cinereoargenteus</i>	2	1	1				Native	Year-round resident
Red fox <i>Vulpes vulpes</i>	2	1	1				Non-native	Year-round resident
Ringtail <i>Bassariscus astutus</i>			2				Native	Year-round resident
Raccoon <i>Procyon lotor</i>			1	1	2		Native	Year-round resident
Striped skunk <i>Mephitis mephitis</i>		2	1				Native	Year-round resident
River otter <i>Lutra canadensis</i>					2	1	Native	Year-round resident
Mountain lion <i>Felis concolor</i>		1	2				Native	Year-round resident
Bobcat <i>Lynx rufus</i>	2	1	2				Native	Year-round resident
Mule (Black-tailed) deer <i>Odocoileus hemionus</i>	2	1	1				Native	Year-round resident and migratory herd

Appendix D

Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
Reptiles								
Western pond turtle <i>Actinemys marmorata</i>	2	3			1	1	Native	Year-round resident
Gilbert's skink <i>Plestiodon gilbertii</i>	2	1	2				Native	Year-round resident
Western fence lizard <i>Sceloporus occidentalis</i>	3	1	2				Native	Year-round resident
Southern alligator lizard <i>Elgaria multicarinata</i>	3	1	2				Native	Year-round resident
Rubber boa <i>Charina bottae</i>		3	3				Native	Year-round resident
Western yellow-bellied Racer <i>Coluber constrictor</i>	1	2	2				Native	Year-round resident
California kingsnake <i>Lampropeltis californiae</i>	1	1	2				Native	Year-round resident
Pacific gopher snake <i>Pituophis catenifer catenifer</i>	1	1	2				Native	Year-round resident
Sierra garter snake <i>Thamnophis couchi</i>			2	2			Native	Year-round resident
Valley gartersnake <i>Thamnophis sirtalis fitchii</i>	2	2	1	2	1		Native	Year-round resident
Mountain gartersnake <i>Thamnophis elegans elegans</i>	1	2	3	2	1		Native	Year round resident
Northern Pacific rattlesnake <i>Crutalus oreganus</i>	1	1	2				Native	Year-round resident
Amphibians								
Sierra chorus frog <i>Psuedacris sierrae</i>	3	2	2	1	1	1	Native	Year-round resident

Appendix D

Common and Scientific Name	Habitat Association ^a						Native or Non-native species	Seasonal Occurrence at Beale Air Force Base
	Annual Grassland	Oak Woodland	Riparian	Seasonal Wetlands	Permanent Wetland	Aquatic		
American Bullfrog <i>Lithobates catesbeiana</i>			2	2	1	1	Non-native	Year-round resident
Western Toad <i>Anaxyrus boreas</i>	2	1	3	2			Native	Year-round resident
Western Spadefoot <i>Spea hammondi</i>	1	3		1			Native	Year-round resident

^a Habitats reflect those described in the Beale Air Force Base Ecosystem Study (Jones & Stokes Associates 1996a). Some classification types include several habitats as described below.
 Riparian includes riparian scrub and riparian forest
 Permanent wetland includes cattail marsh, tule marsh, and mixed marsh
 Seasonal wetland includes vernal pool, swale, other seasonal wetlands, and disturbed seasonal wetlands
 Aquatic includes ephemeral/intermittent drainage, perennial drainage, artificial drainage, and ponds/lakes/reservoirs

^b Habitat Suitability (based on Beale Air Force Base Ecosystem Study). If blank, species occurrence is based on another source (see sources below) and habitat suitability not reported.

1. Optimum Habitat
2. Suitable Habitat
3. Marginal Habitat

^c Seasonal Occurrence:

- Spring = March 21 - June 20
- Summer = June 21 - September 22
- Fall = September 23 - December 20
- Winter = December 22 - March 20

Sources include: Beale Air Force Base Ecosystem Study, CSUS Bird Study (1998, 2001), Christmas Bird Count 2000, USDA Annual BASH Report for Beale AFB 2017, and Beale AFB staff anecdotal observations (current as of 2018).

Appendix E

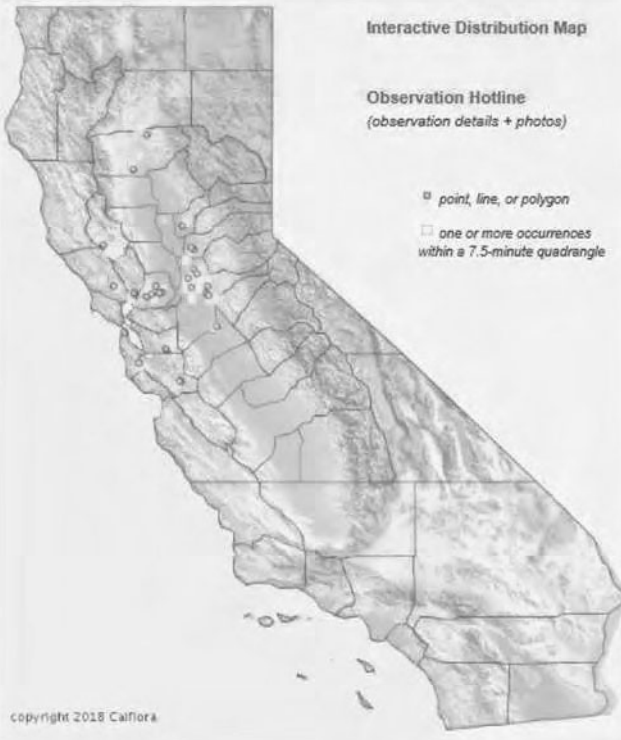
Profiles of Special Status Plant Known or Likely to Occur on Beale AFB and Lincoln Receiver Site

Sensitive Plants Known or Likely to Occur on Beale AFB and Lincoln Receiver Site All information taken from Calflora database website on 9-15-18 (<http://www.calflora.org>)

Calflora Taxon Report 4653

Legenere limosa (Greene) McVaugh
False venus' looking glass, Legenere

Legenere limosa, a dicot, is an annual herb that is native to California, is endemic (limited) to California.
CNPS Rare Plant Rank: 1B.1 (rare, threatened, or endangered in CA and elsewhere). 8th Edition




Interactive Distribution Map
Observation Hotline
(observation details + photos)


- point, line, or polygon
- one or more occurrences within a 7.5-minute quadrangle

copyright 2018 Calflora


Plant Characteristics and Associations




Bloom Period




© 2013 Aaron Arthur



© 2004 Jarell Hillman
More photos from CalPhotos / Calflora



© 1993 Dean Wm. Taylor



© 2015 Doug Witz

Family: CAMPANULACEAE
Genus: Legenere

Communities: Valley Grassland, Freshwater Wetlands, wetland-riparian
Habitat: vernal-pools
Wetlands: Occurs in wetlands

Distribution by County
Add an Observation of Legenere limosa
Location Suitability

Name Status:
Accepted by JEF + CNPS + PLANTS + JM93

Alternate Names:
(according to)
ICPN: Howellia limosa

 California Taxon Report 11875

Monardella venosa (Torr.) A.C. Sanders & Elvin
Veiny monardella

Monardella venosa, a dicot, is an annual herb that is native to California, is endemic (limited) to California.
 also called Monardella douglasii ssp. venosa
 CNPS Rare Plant Rank: 1B.1 (rare, threatened, or endangered in CA and elsewhere). 8th Edition



Interactive Distribution Map

Observation Hotline
(observation details + photos)

- point, line, or polygon
- one or more occurrences within a 7.5-minute quadrangle

copyright 2018 Calflora

Plant Characteristics and Associations



Bloom Period



© 1998 Dean Wm. Taylor

Family: LAMIACEAE
Genus: **Monardella**
Community: Valley Grassland

Distribution by County
Add an Observation of Monardella venosa
Location Suitability



© 2007 George W. Hartwell

More photos from
CalPhotos / Calflora




© 2007 George W. Hartwell



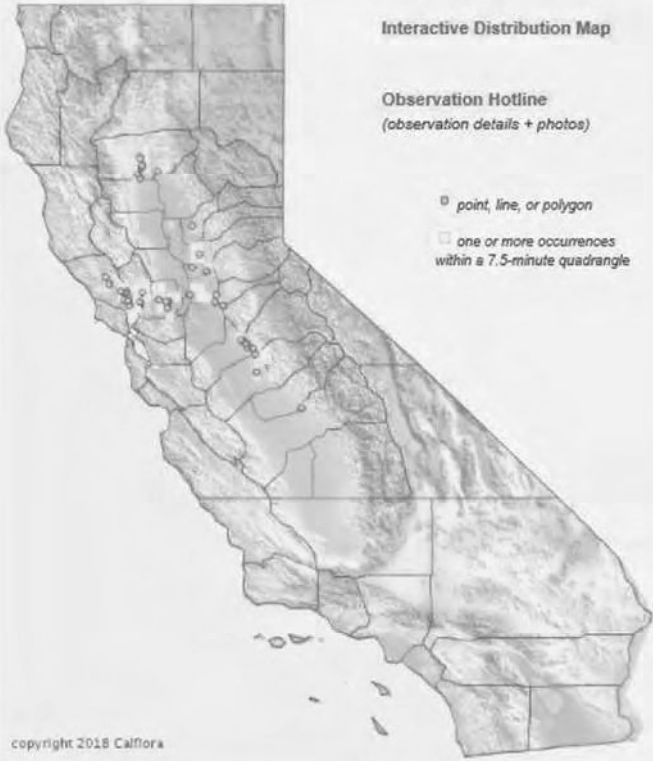
© 2007 George W. Hartwell

<p>Name Status: Accepted by JEF + CNPS</p>	<p>Alternate Names: (according to)</p> <p>ICPN: Monardella candicans var. venosa ICPN: Monardella douglasii var. parryi ICPN: Monardella douglasii var. venosa ICPN + CNPS: Monardella douglasii ssp. venosa</p>
--	--

 California Taxon Report 2783

Downingia pusilla (G. Don ex A. DC.) Torr.
Dwarf calicoflower, Dwarf downingia

Downingia pusilla, a dicot, is an **annual herb** that is **native** to California, is also found elsewhere in North America and beyond, **South America**.
also called Downingia humilis
CNPS Rare Plant Rank: 2B.2 (rare, threatened, or endangered in CA; common elsewhere). 8th Edition




Interactive Distribution Map

Observation Hotline
(observation details + photos)


- point, line, or polygon
- one or more occurrences within a 7.5-minute quadrangle

copyright 2018 California

Plant Characteristics and Associations



Bloom Period



© 2009 Doug Wirtz


Family: CAMPANULACEAE
Genus: Downingia

Communities: Foothill Woodland, Valley Grassland, Freshwater Wetlands, wetland-riparian
Habitat: vernal-pools
Wetlands: Occurs in wetlands

Distribution by County


Add an Observation of Downingia pusilla

Location Suitability




© 2004 Carol W. Witham

More photos from CalPhotos / Calflora




© 2010 Vernon Smith



© 2011 Dylan Neubauer

Name Status:
 Accepted by JEF + CNPS + PLANTS + JM93

Alternate Names:
 (according to)
 CNPS + PLANTS: Downingia humilis
 ICPN: Bolelia humilis


California Taxon Report 8347

Wolffia brasiliensis Wedd.
Brazilian watermeal, South American water meal

Wolffia brasiliensis, a monocot, is a perennial herb that is native to California.
 CNPS Rare Plant Rank: 2B.3 (rare, threatened, or endangered in CA; common elsewhere). 8th Edition




Interactive Distribution Map

Observation Hotline
(observation details + photos)

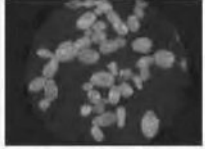
point, line, or polygon
 one or more occurrences within a 7.5-minute quadrangle

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Plant Characteristics and Associations



Bloom Period



© 2014 Jeff Greenhouse

Family: ARACEAE
(PLANTS: LEMNACEAE)

Genus: Wolffia

Community: wetland-riparian

Wetlands: Occurs in wetlands

Distribution by County

Add an Observation of Wolffia brasiliensis

Location Suitability



© Jeff Greenhouse

More photos from
CalPhotos / Calflora

<p>Name Status: Accepted by JEF + CNPS + PLANTS + JM93</p>	<p>Alternate Names: (according to)</p> <p>PLANTS: Bruniera punctata PLANTS: Wolffia papuifera PLANTS: Wolffia punctata</p>
---	---


Calflora Taxon Report 3626

Fritillaria agrestis Greene
Stinkbells

Fritillaria agrestis, a **monocot**, is a **perennial herb (bulb)** that is **native to California**, is **endemic (limited)** to California.
CNPS Rare Plant Rank: 4.2 (limited distribution). 8th Edition



Interactive Distribution Map

Observation Hotline
(observation details + photos)

- point, line, or polygon
- one or more occurrences within a 7.5-minute quadrangle

copyright 2018 Calflora

Plant Characteristics and Associations



Bloom Period



© 2015 John Doyen



© 2009 Aaron Schusteff



© 1998 John Gamie

More photos from CalPhotos / Calflora

Family: LILIACEAE
Genus: **Fritillaria**

Communities: Chaparral, Valley Grassland, Foothill Woodland, wetland-riparian
Wetlands: Equally likely to occur in wetlands and non wetlands
AFFINITY to serpentine soil: 2.7 (strong indicator) [Safford et al 2005]


Distribution by County

Add an Observation of *Fritillaria agrestis*

Location Suitability

Name Status:
Accepted by JEF + CNPS + PLANTS + JMG3

Alternate Names:
 (according to)
PLANTS: *Fritillaria succulenta*

 California Taxon Report 8899

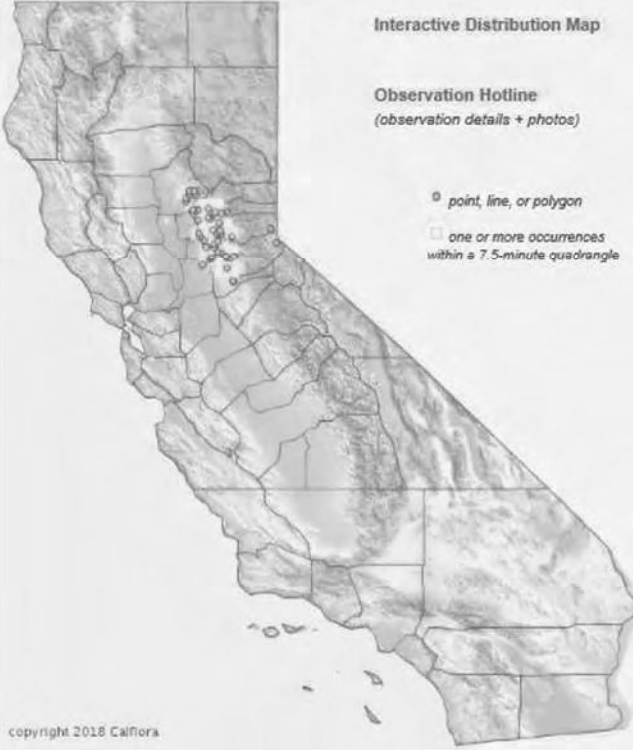
Clarkia biloba (Durand) A. Nelson & J. F. Macbr. ssp. *brandegeae* (Jeps.) H. Lewis & M. Lewis
Brandegee's clarkia

Clarkia biloba ssp. brandegeae, a dicot, is an annual herb that is native to California.
 CNPS Rare Plant Rank: 4.2 (limited distribution). 8th Edition

Interactive Distribution Map


Observation Hotline
(observation details + photos)

point, line, or polygon
 one or more occurrences within a 7.5-minute quadrangle




copyright 2018 California

Plant Characteristics and Associations




Bloom Period




© 2015 John Doyen

Family: ONAGRACEAE
Genus: Clarkia
Parent Record: Clarkia biloba
Communities: Foothill Woodland, Yellow Pine Forest, Chaparral
Distribution by County
Add an Observation of Clarkia biloba ssp. brandegeae
Location Suitability




© 2011 Steven Perry

More photos from CalPhotos / Calflora



© 2006 Dean Wm. Taylor



© 2008 Virginia Moran

Name Status:
 Accepted by JEF + CNPS + PLANTS + JM93

Alternate Names:
 (according to)
PLANTS: Godetia dudleyana var. brandegeae
ICPN: Clarkia biloba ssp. brandegeae


Calflora Taxon Report 4110

Hesperevax caulescens (Benth.) A. Gray
Dwarf dwarf cudweed, Hogwallow starfish

Hesperevax caulescens, a dicot, is an annual herb that is native to California.
 CNPS Rare Plant Rank: 4.2 (*limited distribution*), 8th Edition



© 2007 Daria Sluder

More photos from CalPhotos / Calflora

Interactive Distribution Map

Observation Hotline
 (observation details + photos)

point, line, or polygon
 one or more occurrences within a 7.5-minute quadrangle



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Plant Characteristics and Associations



Bloom Period



© 2010 George W. Hartwell



© 2002 Jaymee Marly



© 2009 Barry Rice

Family: ASTERACEAE
Genus: Hesperevax

Communities: Valley Grassland, Foothill Woodland, wetland-riparian
Wetlands: Occurs in wetlands

Distribution by County

Add an Observation of Hesperevax caulescens

Location Suitability

Name Status:
 Accepted by JEF + CNPS + PLANTS + JM03

Alternate Names:
 (according to)

PLANTS: Evax acaulis
 PLANTS: Evax caulescens var. humilis
 PLANTS: Evax caulescens var. petiolata
 ICPN + PLANTS: Evax involucreta

Appendix F

AFI 32-7064 Base Supplements

Appendix F1. 2000 Beale AFB AFI 32-7064 Base Supplement

**BY ORDER OF THE COMMANDER
BEALE AIR FORCE BASE, CALIFORNIA**

**AIR FORCE INSTRUCTION 32-7064
1 AUGUST 1997**

**Beale Air Force Base
Supplement 1
31 August 2000**

**INTEGRATED NATURAL RESOURCES MANAGEMENT
COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

OPR: 9 CES/CEV (Ms. K. Christopherson) Certified by: 9 RW/CC (Brig Gen Stanley Gorenc)
Pages: 21

Supersedes: None

Distribution: F

SUMMARY OF REVISIONS

This establishes the Beale Air Force Base Supplement to AFI 32-7064.

Chapter 1

HOW TO USE THIS INSTRUCTION

1.2.8. (Added) Base Civil Engineer (BCE):

1.2.8.1. (Added) Supervises, controls, and manages the natural resources program at Beale AFB to ensure the program complies with all applicable federal, state and local laws. This includes managing all aspects of the installation's fish and wildlife program, including habitat improvement, conservation and rehabilitation, and hunting and fishing programs.

1.2.8.2. (Added) Prepares, coordinates, and implements all natural resources plans and cooperative agreements at Beale AFB.

1.2.8.3. (Added) Sets access policies for hunting, fishing, and 9th Civil Engineer Squadron managed outdoor recreation programs, and determines degree of use.

1.2.8.4. (Added) Reviews all BCE work requests (AF Form 332), for approval/disapproval prior to starting projects. This policy is necessary to ensure that the BCE can properly allocate and schedule resources.

1.2.8.5. (Added) Is designated OPR to administer funds for hunting/fishing user permit sales.

1.2.8.6. (Added) Prescribes operating conditions of off-road vehicles that are designed to protect resource values, preserve public health and welfare, and minimize use conflicts.

1.2.8.7. (Added) The BCE (or designated substitute) is designated OPR to monitor all conservation activities and maintain status and minutes of meetings.

1.2.9. (Added) Fish and Wildlife Committee (FWC):

1.2.9.1. (Added) The FWC is primarily concerned with reviewing the fish and wildlife and outdoor recreation resources on Beale AFB and is comprised of but not limited to representatives of the following: 9 MSG/CD, 9 CES/CEVA, Chief Game Warden, 9 SFS/SFO, 9 R W/SEG (Ground Safety), 9 FSS/FSCO (Outdoor Adventure Center), and 9 FSS/FSCV (Veterinary Clinic), and the First Sergeants.

1.2.9.2. (Added) FWC meetings will occur at least twice each calendar year.

1.2.9.3. (Added) The FWC will monitor base programs to ensure implementation of the Integrated Natural Resources Management Plan.

1.2.10. (Added) Beale AFB Volunteer Game Wardens (Game Wardens):

1.2.10.1. (Added) Game wardens are authorized to enforce applicable federal, state, and Beale AFB fish and game laws on Beale AFB.

1.2.10.2. (Added) Special wildlife areas will be closely monitored by game wardens.

1.2.10.3. (Added) Additional game warden duties may include volunteer assistance to 9 CES managed conservation programs and projects. When performing conservation duties, they will be supervised by the Natural Resources Manager (NRM), 9 CES/CEVA.

1.2.10.4. (Added) The game wardens are delegated to fill out and maintain the following forms: AF Form 52, Evidence Tag; AF Form 1668, Field Interview; DD Form 1805, Court Violation Notice. The 9th Security Forces Squadron provides training to the wardens on proper use of forms.

Chapter 6

FISH AND WILDLIFE MANAGEMENT

6.3.1. (Added) Game Warden Program:

6.3.1.1. (Added) 9 SFS/SFO: 9 SFS/SFO may be involved in enforcement of fish and game laws through the game wardens on Beale AFB. 9 SFS may become involved when notified by a game warden that a violation has occurred.

6.3.1.2. (Added) Chief Game Warden: The 9th Support Group Commander (9 MSG/CC) will

appoint the chief game warden. The chief game warden will be appointed for a period of two years, at which time the FWC will make a decision to retain, or appoint another chief game warden. The chief game warden will be responsible to 9 CES/CEVA, 9 SFS, and 9 MSG/CD respectively.

6.3.1.3. (Added) Game wardens: The game wardens will work under the direction of the chief game warden and provide enforcement of fish and game laws in the field.

6.3.1.3.1. (Added) A board comprised of the support group commander, chief of security forces, and chief game warden will review all applications and appointments of game wardens and reserve game wardens. This board will review all applications for reinstatement of lost hunting privileges for violations of federal, state, and/or Beale AFB game and conservation laws.

6.3.1.3.2. (Added) Positions for game wardens or reserve wardens and criteria will be advertised as needed on the Beale Cable Channel 34 and the base newspaper. The selection criteria will be as follows:

6.3.1.3.2.1. (Added) Minimum of a 4 on Enlisted Performance Report (EPR) on the applicant's last two EPRs and no active Unfavorable Information File (UIF).

6.3.1.3.2.2. (Added) Supervisor/Commander's recommendation.

6.3.1.3.2.3. (Added) No significant disciplinary action within the year proceeding the application date.

6.3.1.3.2.4. (Added) Shall be a staff sergeant (E-5) or above to hold the position of game warden.

6.3.1.3.3. (Added) Applications will be issued by the chief or assistant chief game wardens.

6.3.1.3.4. (Added) The applicant's AF Form 110, Individual Incident Reference Record, AF Form 1313, Driver Record, will be screened for any prior significant violations.

6.3.1.3.5. (Added) Once reviewed, the applications will be forwarded to the 9 MSG/CD, chief game warden, and 9 SFS and a determination will be made.

6.3.1.3.6. (Added) If denied the privilege to become a game warden, the application will be returned to the individual, with specific reasons indicated.

6.3.1.4. (Added) Game wardens are authorized to operate private vehicles off roads only when necessary to perform game warden duties. (Vehicles equipped with catalytic converters will avoid fire risk areas.).

6.3.1.5 (Added) Game wardens are authorized to wear a special uniform purchased by 9 CES. This uniform serves to identify these individuals to hunters and fisherman to assist in enforcing the rules set forth by this supplement. Uniforms must be returned to 9 CES when a game warden leaves the program.

6.3.1.5.1. (Added) The approved game warden uniform consists of a tan-colored, short-sleeved shirt and a tan-colored hat. The shirt has game warden patches on the left front side and a 9 CES patch on the right side. Game wardens may purchase their own name patches for the uniform, which will be placed on the right side of the shirt underneath the 9 CES patch. The uniform also includes a tan hat with a fish and game patch on the front. The left sleeve has a Beale game warden patch, and the right sleeve has an U.S. flag patch.

6.3.1.6. (Added) Projects may include, but are not limited to, fish stocking, wildlife food and cover establishment and habitat improvement projects in accordance with approved Natural Resources Plans.

6.3.1.7. (Added) Game wardens will be required to submit to 9 CES/CEV information on fish and wildlife resources acquired while performing game warden duties. This information will include, but is not limited to the following: deer fatality (age, weight, sex, location, cause of death), fatality date of other species. Information should be documented and provided to 9 CES/CEVA within a reasonable period.

6.3.1.8. (Added) Because predator hunting is prohibited on Beale AFB, problem animals will be dealt with on a case-by-case basis after coordination with the 9 CES Environmental Section.

6.3.1.9. (Added) The reporting of incidents involving deer kills by automobiles or other causes will be handled in the following manner:

6.3.1.9.1. (Added) If a citizen's complaint is received, the security forces desk sergeant will make a determination whether or not to dispatch a patrol to investigate the incident. In addition, a base game warden may be notified to respond to help terminate the animal (if determined necessary).

6.3.1.9.2. (Added) If the incident is reported directly to a base game warden, the warden will notify the 9th Security Forces Control Center (634-2131) and advise them of the incident as soon as possible. If necessary, Security Forces personnel may be dispatched to assist and record the circumstances.

6.3.1.9.3. (Added) If the animal is terminated, it will be transported to the Animal Burial Pit by an authorized game warden or 9 CES/CEVA personnel for proper disposition or to the Twin Cities Rescue Mission in Marysville, California.

6.3.1.9.4. (Added) In these circumstances game warden personnel will complete Beale Form 68, Part B. The form will indicate all circumstances surrounding the incident to include the age, sex, weight, and condition of the animal. The form will be filed for a period of one year in the 9 CES/CEVA office.

6.3.1.10. (Added) Reserve Game wardens: Active duty military, military dependants over age 18, and DOD civilian personnel will be eligible to hold the position of reserve game warden. Reserve game wardens will be utilized as assistants to the base game wardens. Only active duty reserve game wardens may train to the position of game warden.

6.3.2. (Added) Hunting and Fishing. Hunting and fishing will be in accordance with Title 14 of the California Administrative Code as adopted by the Fish and Game Commission. See the California Hunting Regulations for more detailed information. This regulation will take precedence where it imposes requirements more stringent than California law.

6.3.2.1. (Added) All hunters and fishermen must have a California state license to hunt or fish on Beale AFB and a Beale hunting and/or fishing card.

6.3.2.2. (Added) Hunting and fishing privileges will be available to the following:

6.3.2.2.1. (Added) All active duty military and their family members.

6.3.2.2.2. (Added) All retired military and their family members.

6.3.2.2.3. (Added) All federal civil service personnel employed on Beale AFB.

6.3.2.2.4. (Added) Family members of federal civil service employees, accompanied by a sponsor who is authorized to hunt or fish.

6.3.2.2.5. (Added) Guests of the above only while accompanied by the sponsoring active duty member and/or their dependants, retired military member or federal civil service personnel employee. No more than two (2) guests may be sponsored during each hunting visit on base. Guests must have proper state license in their possession and a Beale hunting card. Cards are not required for pheasant farm hunters.

6.3.2.3. (Added) Hunting and fishing permits are valid for a limited period of time, as specified on the permits. Permits will be filled out and authenticated in ink prior to hunting or fishing and rendered invalid if amended or altered in any fashion.

6.3.2.4. (Added) Annual Beale hunting and fishing cards are required for all individuals hunting and/or fishing on Beale AFB. A valid California hunting and/or fishing license must be obtained prior to issuance of a base-hunting card. Both must be in possession while hunting and fishing on Beale AFB. The hunting card is valid 1 July-30 June, while the fishing card is valid 1 January-31 December.

6.3.2.4.1. (Added) Beginning in January 2001, hunters and fishermen will be required to attend a Safety Course sponsored by 9 CES and the game wardens. Once hunters have successfully completed the course, they will be given a Safety Course Authorization Form signed by 9 CES/CEVA personnel or an active game warden. This form can be used to purchase hunting and

fishing cards at the Outdoor Adventure Center and is valid for 2 hunting/fishing years.

6.3.2.4.2. (Added) S pecial arrangements can be made to accommodate distinguished visitors wishing to hunt or fish during their stay on base.

6.3.2.5. (Added) Hunting and fishing cards are sold under the authority of the Beale FWC. All fees collected, in their entirety, must be deposited with the installation Accounting and Finance Office to the credit of special account 57X5095. Hunting and fishing cards will be managed by 9 CES/CEV, Natural Resources Manager, and cards will be or can be issued to the Base Exchange, the Rod and Gun Club, and the Outdoor Adventure Center for sale. Funds collected from the card are used for fish and wildlife protection, conservation and management according to the Integrated Natural Resources Management Plan.

6.3.2.6. (Added) The fees are set by the Base FWC and are subject to change. Current fees will be published in local publications as required.

6.3.2.7. (Added) Special areas with limited entry may be established with a daily use fee set by the committee, collected during the issuance of a special permit and deposited to the account of 57X5095.

6.3.2.8. (Added) All hunting and fishing will be controlled and held within manageable quotas depending on the extent of the natural resources on base. Opportunities for recreational purposes will be equitably distributed by impartial selection by such procedures as drawings or lotteries, or on a first-come, first-served basis. In these cases, an impartial party not associated with the enforcement of fish and game laws will be appointed to make any drawings.

6.3.3. (Added) Hunting Procedures.

6.3.3.1. (Added) Identification and License Requirements: California Department of Fish and Game (DFG) laws and regulations apply at Beale AFB. While hunting on Beale AFB, hunters, 16 years and older will have in their possession, a valid identification card, state hunting license with appropriate stamps, and a Beale hunting card. Hunters under the age of 16 years will be accompanied by a military member and/or a person 18 years or older with a applicable valid identification card.

6.3.3.1.2. (Added) Hunters will wear a conspicuous outer garment no less than 100 square inches in material in one of the following colors while hunting: red, yellow, or orange. Hunters of migratory birds and/or turkeys may use camouflaged clothing.

6.3.3.1.3. (Added) Hunters are required to know and use safe firearm practices and procedures at all times.

6.3.3.1.4. (Added) Hunters are urged to use extreme caution when hunting and fishing seasons overlap.

6.3.3.1.5. (Added) Trapping of wildlife on Beale AFB is prohibited except when carried out by the APHIS trapper or under special authorization by 9 CES/CEV.

6.3.3.1.6. (Added) Predator hunting is prohibited unless certain predators are determined to be nuisance animals, or in an emergency requiring on-site removal of animals.

6.3.3.2. (Added) Hunting is not authorized under the following conditions:

6.3.3.2.1. (Added) From any roadway, shoulder of roadway, or across any roadway.

6.3.3.2.2. (Added) Within 200 yards of congested areas or occupied buildings, except for authorized ranges.

6.3.3.2.3. (Added) Within 200 yards of runways, taxiways, aircraft ramps, and fuel areas.

6.3.3.2.4. (Added) Within 200 yards of any designated picnic areas.

6.3.3.2.5. (Added) From any vehicle, moving or parked.

6.3.3.2.6. (Added) At overhead wires or telephone cables.

6.3.3.2.7. (Added) In areas designated as “NO HUNTING OR SHOOTING”

6.3.3.2.8. (Added) Within the Explosive Ordnance Disposal (EOD) Range.

6.3.3.3. (Added) Weapons Not Authorized:

6.3.3.3.1. (Added) Rifles, air and/or spring powered weapons will not be used for hunting.

6.3.3.3.2. (Added) Resident small game, game birds, and waterfowl will be taken by shotgun, 410 through 10 gauge, BB shot or smaller with a weapon capable of holding not more than three shells, in accordance with California State laws. Steel shot only for waterfowl up to and no larger than “T” shot for geese. Turkey, no larger than number two (2) shot permitted.

6.3.3.3.3. (Added) No one may have a pistol in their possession while hunting or fishing.

6.3.3.3.4. (Added) All weapons propelling a single projectile are prohibited from use except under the following circumstances:

6.3.3.3.4.1. (Added) Supervised approved firing at the small arms ranges..

6.3.3.3.4.2. (Added) Authorized animal and pest control.

6.3.3.3.4.3. (Added) Bows and arrows are authorized for pheasant hunting with flu fletching.

6.3.3.3.4.4. (Added) Buckshot is prohibited from use except by authorized personnel.

6.3.3.3.5. (Added) Hunters may not carry a loaded firearm in a vehicle or shoot from, within, or upon any vehicle, whether moving or parked. For the purpose of this regulation, a loaded firearm is defined as any weapon with a round in the chamber or magazine in the weapon.

6.3.3.4. (Added) Under Title 14, CCR, section 360(c), the California Fish and Game Commission annually allocates to Beale AFB a specific number of deer tags based on the size of its local deer population. These tags are then distributed through a lottery system. The annual deer hunt serves as a tool for controlling the resident deer herd. Positive benefits of this activity include helping to lower the probability of a car/deer collision and assistance to DFG's game management program. Deer hunting is allowed on Beale AFB only during the season designated by the California Department of Fish and Game.

6.3.3.4.1. (Added) Natural Resources (9 CES/CEVA): The Natural Resources Manager (634-2643) and Natural Resources Technician (634-4398) are the points of contact for the deer hunt. These individuals are responsible for administering the hunting program and answering questions about the deer hunt. Other duties include the following:

6.3.3.4.1.1. (Added) Advertising: A preliminary notice will be entered in the base paper, "The High Flyer," at least four (4) months prior to the lottery. This advertisement will serve as a reminder to personnel who may be TDY in the months immediately preceding the drawing. The lottery and associated hunt will be advertised in the Base paper, "The High Flyer," at least two (2) weeks prior to the tag drawing.

6.3.3.4.1.2. (Added) Deer Tag Lottery: The lottery will be held at least two (2) weeks prior to the DFG's application deadline. Names will be drawn randomly by Environmental Flight personnel (9 CES/CEV). The Natural Resources staff will record the names of selected hunters as well as non-selectees. Applicants not attending the drawing will be notified of their status within one (1) week. The Natural Resources staff will forward the selected tags to the DFG License and Revenue Branch at least one (1) week before their application deadline.

6.3.3.4.1.3. (Added) Deer Hunt Orientation: This mandatory briefing allows the natural resources staff and base game wardens to provide critical information to the deer hunters including Beale AFB hunting procedures, safety requirements, Deer Kill Data form information, and game warden contact information.

6.3.3.4.2. (Added) Public Affairs (9 RW/PA): PA assists the Natural Resources staff in placing the advertisements in the base paper. Information for inclusion into the base newspaper must reach the PA staff office by noon on the Thursday one week prior to publication.

6.3.3.4.3. (Added) 9th Services Squadron (9 FSS/FSCO): The Outdoor Adventure Center (634-2054) sells Beale Hunting Cards and Deer Tag Applications and will hand out general information about the deer hunt provided to them by 9 CES/CEV.

6.3.3.4.4. (Added) Deer hunting privileges will be available to the following: Active duty military personnel and dependents; retired military personnel and dependents; and federal civil service personnel employed at Beale AFB. Guests of the above are not eligible to enter the deer tag lottery.

6.3.3.4.5. (Added) Prospective hunters must possess a current California Hunting License and a Beale Hunting Card, both of which are available at the Outdoor Adventure Center. Deer tag applications are available at the Outdoor Adventure Center and most sporting goods stores. Applications must be submitted to the Natural Resources staff in the Environmental Flight Office at 6601 B Street (building 2561) no later than one (1) hour before the lottery drawing.

6.3.3.4.6. (Added) Non-selected applications will be returned to the individuals, who will be responsible for submitting their applications directly to DFG to be eligible for alternate hunting locations.

6.3.3.5. (Added) Waterfowl Hunting Requirements.

6.3.3.5.1. (Added) Blinds will be registered with 9 CES/CEV at least two weeks prior to the waterfowl hunting season.

6.3.3.5.2. (Added) Blinds will not be placed within 150 yards of existing blinds or decoys in place.

6.3.3.5.3. (Added) Blinds will be of the type that blend in with the surrounding environment and do not detract from the overall appearance of the area.

6.3.3.5.4. (Added) Removable “net” like blinds will be used in areas where there is little shrub and tree growth and where permanent blind placement is not allowed.

6.3.3.5.5. (Added) Floating blinds are unauthorized.

6.3.3.5.6. (Added) Digging or the removal of natural vegetation for the construction of blinds will not be permitted.

6.3.3.5.7. (Added) Blinds will not be allowed in areas considered wetlands by 9 CES/CEV.

6.3.3.5.8. (Added) Decoys will be removed when leaving the area.

6.3.3.5.9. (Added) Blinds constructed by hunters and left for the duration of the waterfowl-hunting season will have the builder’s name, home phone number, and work phone number conspicuously posted. These blinds, once constructed, will be available to others when coordinated with the blind builder. Each waterfowl hunter is limited to one blind.

6.3.3.5.10. (Added) Lead shot is NOT to be in possession while waterfowl hunting.

6.3.3.6. (Added) Resident, Migratory, and Upland Game Bird Hunting Requirements:

6.3.3.6.1. (Added) Resident small game birds include the following species: California quail, ring-necked pheasant, and wild turkeys.

6.3.3.6.2. (Added) Migratory game birds include the following species: mourning dove, band-tailed pigeon, common snipe, American coot, common moorhen, and waterfowl.

6.3.3.6.3. (Added) A current upland game bird stamp must be affixed to the state hunting license of all adults wishing to hunt upland game birds (pheasant, turkey, dove, band-tailed pigeon, common snipe, grouse, ptarmigan, quail, partridge, and chukar).

6.3.3.6.4. (Added) No game birds may be pursued, herded, or taken from a moving or parked vehicle of any kind.

6.3.3.6.5. (Added) No game birds may be intentionally harassed, herded, or driven to disrupt their normal behavior patterns.

6.3.3.6.6. (Added) No game birds may be taken within 400 yards of a baited area except in the case of domestically reared and released game birds on the licensed pheasant club.

6.3.3.6.7. (Added) Only the following will be used to take resident small game and migratory game birds: Shotguns 10 gauge or smaller using shot shells only; muzzle-loading shotguns; falconry; bow and arrow; rifles; and/or hunting dogs

6.3.3.6.8. (Added) The use of live decoys is prohibited.

6.3.4 (Added) Fishing Procedures.

6.3.4.1. (Added) Fishing is permitted by authorized personnel year-round in any lake or pond excluding Dry Creek and Beale Lake unless otherwise posted.

6.3.4.2. (Added) While fishing on Beale AFB, fishers, 16 years or older, will have in their possession, a valid identification card, state fishing license with appropriate stamps, and a Beale fishing card. Children 12 years of age, but less than 16, need a valid identification card in their possession to fish.

6.3.4.3. (Added) Hunters and fishers are urged to use extreme caution when fishing and hunting seasons overlap.

6.3.4.4. (Added) All fishing tournaments or derbys must be coordinated/approved by the base Natural Resources Manager and Chief Game Warden.

6.3.4.5. (Added) Fishing Restrictions.

6.3.4.5.1. (Added) No one may use a gasoline engine to propel either a boat or raft on Beale AFB lakes, except as authorized by 9 CES/CEV. Electric motors are acceptable.

6.3.4.5.2. (Added) Boats and rafts are prohibited on Beale Lake, and homemade rafts are prohibited on all lakes.

6.3.4.5.3. (Added) No one may have a pistol in their possession while fishing.

6.3.4.5.4. (Added) Fishing by bow and arrow is permitted for the take of carp, goldfish, and suckers subject to the following restrictions:

6.3.4.5.5. (Added) Bows utilized in the taking of carp, goldfish, and suckers must have a minimum draw weight of 45 pounds.

6.3.4.5.6. (Added) Arrows utilized in the taking of carp, goldfish, and suckers will be of the harpoon type only. The length of the arrow will not exceed 36 inches. The arrow will be attached to the bow by line, preferably braided nylon, with minimum test strength of 40 pounds and a maximum length of 100 feet.

6.3.4.5.7. (Added) There are no sizes or possession limits on carp, goldfish, and suckers; however; carp, goldfish, and suckers taken must be removed by bow fishers. Fishermen should not release carp, goldfish, and suckers back into the waterways.

6.3.4.5.8. (Added) No one may transport live game fish for purposes of transplantation to and from any Beale AFB lake, stream, or impoundment except for stocking by authorized personnel.

6.3.4.5.9. (Added) Base lakes are closed to fishing until 11 a.m. during waterfowl season.

6.3.4.5.10. (Added) Beale Lake is closed to fishing one-half hour after official sunset to sunrise.

6.3.4.5.11. (Added) Fishing is prohibited within 250 feet below Beale Dam

6.3.4.5.12. (Added) Fishing in Frisky and Parks Lakes is catch and release only.

6.3.4.5.13. (Added) Fishing in Dry Creek and Beale Lake is only permitted from 1 May through 15 October to protect the adult Central Valley steelhead, a federally listed threatened species. Other restrictions in these locations include the following:

6.3.4.5.13.1. (Added) Only artificial flies and lures will be used.

6.3.4.5.13.2. (Added) No treble hooks will be used.

6.3.4.5.13.3. (Added) On single barbless hooks, there must be at least a 7/16" hook gap size.

6.3.4.5.13.4. (Added) No one will be permitted on Beale Dam or the fish ladder at any time.

6.3.4.5.13.5. (Added) Fish Creel and Size Limits:

6.3.4.5.13.6. (Added) Bass limit is three (3) per day, per person, minimum size is 15 inches.

6.3.4.5.13.7. (Added) Crappie limit is 20 per day, per person, no size limit.

6.3.4.5.13.8. (Added) Channel catfish limit is five per day, per person, and fish must be 12 inches or over. Bullheads have no creel limit.

6.3.4.5.13.9. (Added) Bluegill, Redear Sunfish, and Shiners, no limit.

6.3.4.5.13.10. (Added) Trout, Steelhead, and Salmon are catch and release only due to protection under federal law.

6.3.5. (Added) Hunting and Fishing Violations:

6.3.5.1. (Added) Anyone who violates any of the provisions of this regulation, or any acts inconsistent with good safety practices, which results in injury or damage to persons or property, may have any hunting and/or fishing privileges withdrawn. This action will be taken independently of other punitive and administrative action. Violators may be required to surrender their hunting and fishing permits, cards, and/or license on an AF Form 52 to a game warden. The game warden would provide a witness report to the 9th Security Forces Squadron.

6.3.5.2. (Added) Civilians who are caught violating the federal, state, and/or Beale AFB Fish and Game regulations may be escorted from the base and/or issued a letter of debarment by the 9th RW Commander and prosecuted under Federal Law 10 USC 2671 before a U. S. Magistrate. AF Form 52 will be utilized for control of evidence. Civilians may be cited violations with DD Form 1805 pursuant to AFR 110-15/BAFB Supplement 1. Violators may be prosecuted under Federal Law 10 USC 2671 before an U. S. Magistrate or before the Municipal Court under the Fish and Game Code/Title 14, Administrative Code.

6.3.5.3. (Added) Violations by military personnel which are minor in nature, (e.g., no Beale card in possession), may be recorded on AF Form 1668, Field Interview. This form will be maintained under the game warden program in 9 CES/CEVA. Game wardens will check the AF Forms 1668 maintained on the law enforcement desk when confronting a military member committing a violation. AF Forms 1668 will be maintained in accordance with Air Force regulations.

6.3.5.4. (Added) Violations by military personnel which are major in nature, (e.g., poaching) will lose hunting and fishing privileges for a minimum of one year. This determination will be made by the 9th Support Group Commander.

Chapter 8

FOREST MANAGEMENT

8.11. (Added) Firewood Cutting Program.

8.11.1. (Added) Purpose: The purpose of this program is to reduce the accumulation of wood residues and deadfall, thus improving the appearance of the base in general and reducing potential fire hazards and disposal of fuel wood products.

8.11.2. (Added) Scope: All military, retired military, and civilian employees of Beale AFB are eligible to obtain fuel wood products.

8.11.3. (Added) Policy.

8.11.3.1. (Added) Fuel wood is defined as wood that is dead or dead and down. Fuel wood shall be available from the following sources: deadfall, wood obtainable from designated areas throughout the installation, diseased trees living or dead when specifically authorized by the NRM, and wood removed from plantations. The NRM may defer the issuance of fuel wood permits for indefinite periods should fuel wood sources become depleted.

8.11.3.2. (Added) The cost of fuel wood permits is \$25.00 per one cord, but the price is subject to change. A permit is required for each cord of fuel wood products removed from the installation and must accompany the fuel wood products upon removal from the installation. A cord is defined as a stack of wood four feet high, four feet wide, and eight feet long, or 128 cubic feet. The Natural Resources Office or a designated representative issues the permit. Fuel wood that is available in the 9 CES/CEV yard can be purchased and picked up at any time of the year. If there is fuel wood available in the environmental yard, that wood will be only sold until exhausted.

8.11.3.3. (Added) The sale of these permits will be restricted to the selected month, after which the permit becomes null and void. The fuel wood permit shall be valid only in cutting and removing one (1) cord load of fuel wood materials. All permits, for any reason, are nonrefundable.

8.11.3.4. (Added) In rare cases, fuel wood products may be obtainable in areas approved by the NRM or designated representative, who will select the tree or trees to be cut. All labor and equipment is to be supplied by the buyer. The removal of fuel wood products is limited to daylight hours (sunlight to sunset). No off-road vehicular travel will be permitted. All trash and refuse will be picked up by the buyer. Brush from cutting fuel wood products less than three inches in diameter will be piled for wildlife.

8.11.3.5. (Added) Checking out with the Natural Resources Office upon leaving the installation is not required. The permit will be shown to the Security Forces personnel, base game wardens, or other official personnel upon request.

8.11.3.6. (Added) The sale of permits will be limited to five (5) cords per qualified permittee, per year. The sale of fuel wood permits is intended for personal use and not for resale.

8.11.4. (Added) Accountability and Responsibilities.

8.11.4.1. (Added) Fuel wood product permits are numbered and issued consecutively in the Natural Resources Office. Permits must be paid for upon issuance of permit. Only personal checks will be accepted for permit payments. Checks are made payable to Beale Accounting and Finance. No cash or credit cards will be accepted for payment. The NRM or designated representative will fill out a cash collection voucher and turn in all collected fuel wood monies to designated account 57F3875.000* (* indicates fiscal year number) in the Accounting and Finance Office.

8.11.4.2. (Added) Violations of firewood policy will be dealt with using comparable disciplinary action as listed in paragraph 6.3.5 (Hunting and Fishing Violations) of this supplement.

Chapter 9

AGRICULTURAL OUTLEASING

9.1.1. (Added) Grazing program management is accomplished through the effort of many different offices on the base (See attachment 1).

9.1.2. (Added) The NRM is responsible for land management and field oversight. When the cattle are on-site, the NRM must ensure that the lessee is following all rules set forth in the Land Use Regulations (LUR), which are a part of the signed lease. If problems arise, the NRM will notify the real estate element, who will send an enforcement letter to the lessee. The NRM will report to HQ ACC/CEO.

9.5.1.1. (Added) Adherence to this instruction is considered essential to the success and vitality of the grazing program. Revenues generated from this program are eventually returned to the installation and benefit the natural resources program.

9.5.2.2. (Added) Grazing Lease Request (GLR): A document prepared by the Environmental Flight for the real estate element which provides the necessary information required to assemble a bid package (e.g., units, acreage, and animal unit months (AUMs) available for bid).

9.5.2.3. (Added) Environmental Baseline Survey (EBS): A necessary document required in all real estate transactions which is provided by the Environmental Flight to the real estate element. Its purpose is to document the condition of the land and determine if contaminants are present. The Environmental Flight has previously obtained an EBS waiver from the chairperson of the base Environmental Leadership Council for the grazing lease program. The authorization for this waiver is allowed under AFI 32-7066, Section 1.5.

9.5.2.4. (Added) Pre-Lease Meeting: A meeting held by the real estate element with the lessee(s) to sign any new grazing leases and answer any lessee questions. Other attendees include representatives from 9 CES/CEV and 9 RW/JA.

9.6.1.1. (Added) The NRM is responsible for updating the LUR as needed and the Environmental Baseline Survey (EBS) or appropriate waiver. The NRM must also submit a grazing lease request to the real estate element to initiate the bidding process. The NRM will advertise the lease opening using funds from the grazing program. Local area stockmen journals, newspapers, and other media will be used to give the widest dissemination to potentially interested parties. The NRM attends the pre-lease and pre-grazing meetings.

9.6.1.2. (Added) Real Estate (9 CES/CECR): The real estate element's (634-2670/DSN 368-2670) primary duty is to manage the solicitation, administration, and payment collection for the cattle grazing leases. The real estate element attends the pre-lease and pre-grazing meetings.

9.6.1.2.1. (Added) When a lease area is available for bid, the real estate element prepares a grazing lease bid package. Bid packages are sent out to prospective bidders, and sealed bids are received.

Once the bid has been awarded, the real estate element finalizes the lease for signature. Three original signed copies of the lease are needed for distribution to the real estate element, the lessee, and the HQ Air Combat Command Grazing and Cropland Program Manager (HQ ACC/CEO). The real estate element will then prepare needed paper work for the lease to be reviewed and approved by 9 CES/CC, the wing legal office (9 RW/JA), 9 MSG/CC, and finally reviewed, approved, and signed by 9 RW/CC. The real estate element oversees the pre-lease meeting.

9.6.1.2.2. (Added) Contracting (9 CONS/LGC): An authorized government contracting officer will oversee the bid opening and open all bids.

9.6.1.2.3. (Added) Financial Management (9 RW/FM): Financial Management receives the voucher payment from the real estate element and provides a receipt.

9.6.1.2.4. (Added) Legal Office: The legal office reviews all pertinent documents, coordinates on the grazing lease, and attends the pre-lease meeting.

9.6.1.2.5. (Added) Installation Wing Commander (9 RW/CC): The 9th Reconnaissance Wing Commander signs the grazing lease.

9.6.1.2.6. (Added) The lessee is required to abide by all rules set forth by the LUR and the grazing lease.

9.6.1.3. (Added) Pre-Grazing Meeting: An annual meeting held by the natural resources section with the lessee(s), approximately 1 month before the cattle return to the base. The real estate element also attends. The purpose of the meeting is to discuss changes in the lease or its administration and to listen to recommendations from the lessees on improvements to the grazing program.

9.7.3.1. (Added) A burn plan has been established for the base for the purposes of reducing the abundance of undesirable species base wide, promoting desirable and native forage species in rangelands, improving range conditions for cattle, and reducing the fuel load for wildfires.

9.7.3.2. (Added) The burn plan for Beale Air Force Base consists of burning most or all available grazing land at least once every seven years. Ungrazed lands may also be burned depending on time and staff availability of the Fire Department (9 CES/CEF).

9.7.3.2.1. (Added) This will be accomplished by annually burning a minimum of 1500 acres per year (3 separate parcels of land approximately 500 acres each).

9.7.3.2.2. (Added) Sites will be chosen by the base Environmental Flight (9 CES/CEVA) in coordination with the base Fire Department based on natural breaks in vegetation or firebreaks cut under the Grounds Maintenance Contract.

9.7.3.2.3. (Added) The base Fire Department will be in command of all burns although other

agencies may participate for training purposes (i.e., California Department of Forestry and Fire Protection (CDF), and other local fire departments).

9.7.3.2.4. (Added) If additional funding is required in direct support of the prescribed burns (i.e., for blacklining or other equipment needs), funds will be used from the Grazing Program.

9.7.3.3. (Added) Burn dates will be coordinated through the Feather River Air Quality Management District in accordance with the air permit.

9.7.3.4. (Added) Burning will be conducted only on days that meet the following conditions: Winds will be no more than 5 Knots (6 MPH). Burning will not be conducted on state red flag days (wind, temperature and humidity makes conditions too severe to conduct burning).

9.7.3.5. (Added) The burn schedule may vary depending on other activities that may occur in these areas. An approximate burn schedule is as follows:

Year Number	Approximate Location (Grazing Pasture Units)	Approximate Acreage
1	D-1, D-2, C-7, C-8, F-1 (portion)	1750
2	B-7, C-3, C-4, C-5, C-6, C-1 (portion)	1660
3	A-3, A-6, A-7, A-9, F-4, F-1 (portion)	1620
4	B-2, B-6, B-3, B-1 (portion)	1880
5	A-2, A-5, B-5, B-1 (portion)	1930
6	A-1, A-4	1485
7	D-3, C-2, C-1 (portion)	1980

9.7.3.6. (Added) Lessees will be notified of the burning schedule each year before their pasture is burned. The Grazing leases and associated Land Use Regulations describe provisions for possible Animal Unit Month (AUM) reductions as a result of prescribed burning.

9.8.1.1. (Added) The Natural Resources Technician (NRT) provides general field support to assist the NRM in managing the program. This includes, but is not limited to inspection, maintenance, and installation of corrals, cattle guards, fences, gates, posts, and unimproved roads. Additionally, the NRT supports the NRM in tracking the number and location of cattle. The NRT often is asked by the 9th Security Forces Squadron (9 SFS) to respond to reports of loose cattle or other emergencies involving the program. However, the ultimate responsibility for the cattle is the lessee as stated in the LUR.

Chapter 10

OUTDOOR RECREATION MANAGEMENT

10.6.1.1. (Added) Vehicle access to outdoor recreation areas will be limited to designated roads. Large areas of the base are fenced and leased for cattle and horse grazing. Users will leave gates closed or will lose access to the area. Cattle or horses may not be unduly disturbed or harassed by the vehicles.

10.6.1.2. (Added) Users may park in designated parking areas only. Signs will mark these areas. If signs are not posted, then the vehicles shall be parked no more than eight feet from the road shoulders. Vehicles will not be permitted on firebreaks, old jeep trails, or roadways created by contractor's for their entry to work sites.

10.6.1.3. (Added) Definitions regarding use and control of Off-Road Vehicles:

10.6.1.3.1. (Added) Damage to terrain: Any rutting of earth or its protective cover, crushing or compressing vegetation, breaking or dislodging trees or shrubs, or altering the surface in any way which inhibits growth or causes erosion.

10.6.1.3.2. (Added) Harassment of wildlife: Herding, chasing, disturbing, or in any manner causing disruption of normal wildlife activities.

10.6.1.3.3. (Added) Definition of ORV:

10.6.1.3.3.1. (Added) Four-wheeled vehicles: Automobiles, trucks, four-wheeled drive trucks, buses, jeeps, vans, recreation campers, and any truck with more than four wheels, designed to operate with a tire pressure of 28 PSI or greater. Any vehicles designed to operate on low-pressure tires and are not licensed to operate on public roads are excluded.

10.6.1.3.3.2. (Added) All-terrain vehicles (ATV/OHV's): Vehicles with three or more low-pressure flotation type tires pressure of 28 PSI or greater. Any vehicle designed to operate on low-pressure tires and not licensed to operate on public roads are excluded.

10.6.1.3.3.3. (Added) Two-wheeled vehicles: Motorcycles, motor scooters, motor bikes, trail bikes, mini bikes, dirt bikes, and three-wheeled vehicles which operate on tire pressure over 10 PSI and not defined as ATV/OHV's.

10.6.1.3.3.4. (Added) Trail bikes: Any two wheeled motorized vehicle not meeting the requirements for on-street operation.

10.6.1.3.4. (Added) Five-brake horsepower: The horsepower delivered by an engine with approximately 150 cubic centimeters of displacement.

10.6.1.3.5. (Added) Direct supervision: Riding the same ORV/OHV or another ORV/OHV in close proximity to the person requiring direct supervision. (38503 CVC)

10.6.1.4. (Added) The Environmental Flight (9 CES/CEV) (Natural Resource Manager) provides technical assistance to the Base Civil Engineer for the operating conditions of ORV/OHVs to make certain the protection of soils, water, and wildlife resources. Responsible for maintaining appropriate signs and barricades to delineate and protect trails and special use areas, for monitoring the effects of ORV/OHV use and modifying installation regulations to make sure of adequate control and protection.

10.6.1.5. (Added) Security forces (9 SFS) is the agency that provides enforcement of the polices regarding ORV/OHV use through Law Enforcement (LE) patrols and through assistance of the base game wardens. They will handle violations according to applicable military directives, state, and federal laws. The Security Forces register all privately owned ORV/OHVs that are not registered as street vehicles under a separate local system.

10.6.1.6. (Added) Wing Safety (9 RW/SE) is the agency that defines the necessary vehicular and operator equipment, and operational requirements related to safety and mishap prevention.

10.6.1.7. (Added) All persons operating vehicles that are subject to requirements of this regulation will operate according to all paragraphs of section 10.6 of this supplement. The ORV/OHV rider will have in possession either an AF Form 483, Certificate of Competency or a State of California "Safety Certificate" prior to operating any vehicle described in section 10.6.1.3.3. of this supplement (38501 CVC).

10.6.1.8. All privately owned ORV/OHVs that are not registered as street vehicles must be registered with Security Forces before operation on Beale AFB, under a separate local system prior to operation on Beale AFB. If an ORV/OHV is parked next to quarters, dwellings, barracks, etc., it is assumed that it is in operating condition and must be registered with Security Forces.

10.6.1.8.1. (Added) To register an ORV/OHV, the owner must present proof of ownership.

10.6.1.8.2. (Added) Pass and ID will complete an AF Form 533, Vehicle Registration card and issue a DD Form 2219, Installation Tab and a DD Form 2220, Vehicle Decal with a year tab. The vehicle decal will be affixed to the ORV/OHV in a conspicuous location. Information from the AF Form 533, will be recorded and maintained by the Law Enforcement Desk, as a cross reference to track the registered owner, stolen or abandon OHR/ORV's. Personnel, who separate or depart PCS, will deregister their ORV/OHVs prior to out-processing Beale AFB.

10.6.1.8.3. (Added) ORV/OHVs must be registered within three days of purchase.

10.6.1.8.4 (Added) Security forces will give the appropriate ORV/OHV handout supplied by 9 CES/CEV (Natural Resources) to each person registering an ORV/OHV.

10.6.1.8.5. (Added) State Law: ORV/OHVs will be registered in accordance with California State law that requires:

10.6.1.8.5.1. (Added) The ORV/OHV will be identified by the Department of Motor Vehicles (DMV) which will issue an off-highway identification certificate and a special sticker upon payment of registration fee.

10.6.1.8.5.2. (Added) The certificate (of facsimile) must be kept in the vehicle when it is operated or transported, and the identification sticker must be clearly displayed whenever the vehicle is operated or transported.

10.6.1.8.6. (Added) There are no insurance requirements for ORV/OHVs not licensed as street vehicles; however, personnel are encouraged to carry personal and property liability insurance for their own protection.

10.6.1.8.7. (Added) All ORV/OHVs must abide by the following equipment standards:

10.6.1.8.7.1. (Added) Working brakes.

10.6.1.8.7.2. (Added) Complete factory installed exhaust system, in good working order and in constant operation and no vehicle may have a muffler cutout, bypass, burned out muffler, or similar device. No ORV/OHV will produce unusual or excessive noise or pollutants.

10.6.1.8.7.2.1. (Added) Spark arrester: No person will operate an ORV/OHV on any forest-covered land, brush-covered land or grass-covered land unless the vehicle is equipped with an approval spark arrester muffler. (38366 CVC)

10.6.1.8.7.2.2. (Added) Noise limits: No vehicle will be allowed to operate with level measured from a distance of fifty (50) feet for the year of manufacture: (38370 CVC)

10.6.1.8.7.2.2.1. (Added) Vehicles manufactured prior to January 1973 have a noise limit of 92 dba.

10.6.1.8.7.2.2.2. (Added) Vehicles manufactured on or after January 1973 and before January 1975 have a noise limit of 99 dba.

10.6.1.8.7.2.2.3. (Added) Vehicles manufactured on or after January 1975 and before January 1986 have a noise limit of 82 dba.

10.6.1.8.7.3. (Added) If operated at dusk, dawn, or nighttime hours, will have working headlights and taillight, and the light will be turned on.

10.6.1.8.8. (Added) The following safety requirements are applicable to all ORV/OHVs:

10.6.1.8.8.1. (Added) The manufacturer's designed seating capacity will not be exceeded.

10.6.1.8.8.2. (Added) All racing and competition events are prohibited on Beale AFB except as authorized by 9 RW/CC. Submit all requests to have races or competition events to 9 RW/CC, through 9 CES/CEV and Wing Safety.

10.6.1.8.8.3. (Added) Protection helmets meeting DOT, ANSI Z90.1, or Snell Memorial Foundation Standards will be worn by all persons when operating, or as a passenger on, two-wheeled, three-wheeled, and four wheeled vehicles.

10.6.1.8.8.4. (Added) Prior to operating ORV/OHVs the person must first complete a driver's safety course applicable to the use and operation of the vehicle being used. Operators will have in their possession a certificate indicating course completion. (38501 CVC)

10.6.1.8.8.5. (Added) Eye protection: Eye protection is mandatory for ORV/OHV operators and passengers. This protection will be a face shield or goggles made of shatter resistant, transparent material. Glasses and sunglasses are not approved eye protection.

10.6.1.8.9. (Added) Only those ORV/OHVs as defined in section 10.6.1.3.3 of this supplement will be operated on Beale AFB.

10.6.1.8.9.1. (Added) No person will operate an ORV/OHV on Beale AFB lands 1) in a reckless, careless, or negligent manner, 2) under the influence of alcohol or drugs, 3) in a manner likely to cause damage or disturbance to the land, wildlife, or vegetation, or 4) in a manner likely to cause damage or destruction of government or private property. Personnel with more than two warnings/citations, will be referred to the base commander for revocation of their ORV/OHV operation privileges.

10.6.1.8.10. (Added) Persons under 18 years of age must be under the direct supervision of an adult (someone 18 years or older) when operating an ORV/OHV defined in paragraphs 10.6.1.3.3.2, 10.6.1.3.3.3, and 10.6.1.3.3.4 of this regulation. (38503 CVC)

10.6.1.8.11. (Added) Those ORV/OHVs not meeting the requirements for a on-street operation will not be operated on any paved road or gravel/dirt roads or parking areas maintained by the Base Civil Engineer.

10.6.1.8.12. (Added) ORV/OHV use is prohibited in any area where military training is being conducted.

10.6.1.8.13. (Added) ORV/OHV use is prohibited during base hunting seasons and during the rainy season, 1 Nov – 15 Apr, or as otherwise determined and announced by the 9 CES/CEV Natural Resources Manager.

10.6.1.8.14. (Added) All ORV/OHV use will be limited to existing trails. Vehicles may not leave trails.

10.6.1.8.15. (Added) ORV/OHV use will be limited to area indicated in ORV/OHV use guideline handout. Signs designating the authorized riding area are also posted.

10.6.1.8.16. (Added) All ORV/OHV users will obey posted signs.

10.6.1.8.17. (Added) Construction of soil/dirt or structural jumps is prohibited. Moving of soil/dirt for creation of track berms is prohibited. Moving soil to refill ruts, holes or other hazards to safe riding will be permitted, but only to the existing track layout.

10.6.1.8.18. (Added) No vegetation will be removed or damaged for track expansion. Only trees/shrubs that obstruct passage on existing trails may be removed.

10.6.1.8.19. (Added) The entire ORV/OHV area is subject to indefinite closure if the 9 CES/CEV Natural Resources Manager determines that soil and vegetation damage is too severe.

10.6.1.8.20. (Added) ORV/OHV users will not harass wildlife, as defined in paragraph 10.6.1.3.2. of this supplement.

10.6.1.8.21. (Added) ORV/OHVs may gain access to ORV/OHV area via firebreaks and unpaved trails. Trails and firebreaks may only be used for ingress and egress to area. Speed on access trails and firebreaks shall not exceed 15 mph.

10.6.1.9. (Added) The privilege of ORV/OHV use on Beale AFB will not be granted to the general public. Authorized guests may participate in scheduled base events if sponsored by an active duty or retired military person.

10.6.1.10. (Added) Government owned ORV/OHVs and privately owned ORV/OHVs of base game wardens are exempt from this regulation. The base game warden may utilize a privately owned ORV/OHV to perform official game warden duties, during the year for special projects, surveys and other duties approved by 9 CES/CEV, Natural Resources Manager, or any part of the installation.

10.7. (Added) Swimming Restrictions: Swimming is prohibited on all lakes and streams. Wading is permitted while fishing or hunting waterfowl.

10.8. (Added) Fire Prevention: Due to fire hazards on Beale AFB, prevention procedures will be in effect at all times. No one may start open fires without written approval of the base fire department (9 CES/CEF).

STANLEY GORENC, Brig Gen, USAF
Commander, 9th Reconnaissance Wing

Appendix F2. 2016 Beale AFB AFI 32-7064 DRAFT Base Supplement

BY ORDER OF THE COMMANDER
BEALE AIR FORCE BASE

AIR FORCE INSTRUCTION 32-7064

Beale Air Force Base
DRAFT Supplement 1

Civil Engineer

INTEGRATED NATURAL RESOURCES MANAGEMENT

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the Beale Publishing website for download.

RELEASABILITY: There are no releasability restrictions on the publication.

OPR: 9 CES/CEIE

Certified by: 9 RW/CC

(Col Larry R. Broadwell)
Pages: 20

Supersedes: AFI 32-7064 Beale Supplement 1, 31 August 2000

AFI 32-7064, *Integrated Natural Resources Management*, 31 October 2016 is supplemented as follows. This supplement provides guidance and procedures for all Beale AFB active duty units and tenant units. Send comments and suggested changes on AF Form 847;

Recommendation for Change of Publication, through channels to 9 CES/CEIE, 6601 B Street, Beale AFB CA 95903. Ensure that all records created as a result of processes prescribed in AFMAN 33-363 are maintained in accordance with this manual, and are disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at <https://afirms.amc.af.mil>. Contact supporting records managers as required. The content of this supplement applies to all activities and individuals working, residing or otherwise conducting activity on this installation, and will be implemented to the maximum extent possible.

This publication has been revised and must be completely reviewed. Chapter 1, How to Use This Instruction, identifies responsibilities of base agencies in implementing Natural Resource programs. In Chapter 6, Fish and Wildlife Management, this supplement clarifies the hunting procedures to reflect State of California game management laws, Beale AFB-specific policies, and during heightened security conditions. Chapter 6 also provides powerline management requirements for wildlife protection. Chapter 8, Forestry Management, the price of firewood permits was set at \$40 per cord and provides management policies for fuelwood cutting. In Chapter 9, Agricultural Outleasing, the cattle grazing program procedures were changed so that

the 9th Contracting Squadron and 9 RW/JA now oversee the grazing lease bid solicitation process. Billing and receiving procedures are also clarified. Many changes were made to Chapter 10, Outdoor Recreation Management, to clarify that the use of vehicles off-road is not allowed on base property, except by authorized individuals performing official duties. Chapter 12 refers to guidance for the wildland prescribed fire program. Chapter 13 provides guidance on management of invasive species. Chapter 14 refers to the Beale AFB Bird Air Strike Hazard (BASH) program.

1.2.8. (Added) Base Civil Engineer (or designated substitute):

1.2.8.1. (Added) Supervises, controls, and manages the Natural Resources program at Beale AFB to ensure the program complies with all applicable federal, state and local laws. This includes managing all aspects of the installation's fish and wildlife program, including habitat improvement, conservation and rehabilitation, and hunting and fishing programs.

1.2.8.2. (Added) Prepares, coordinates, and implements all natural resources plans and cooperative agreements at Beale AFB. Performs all consultations with environmental regulating agencies including but not limited to US Army Corps of Engineers, US Fish and Wildlife Service, and California Department of Fish and Wildlife, for all 9 RW actions.

1.2.8.3. (Added) Sets access policies for hunting, fishing, and 9th Civil Engineer Squadron managed outdoor recreation programs, and determines extent of use.

1.2.8.4. (Added) Reviews all BCE (or designated substitute) work requests (AF Form 332), for approval/disapproval prior to starting projects. This policy is necessary to ensure that the BCE (or designated substitute) can properly allocate and schedule resources, and ensure environmental compliance.

1.2.8.5. (Added) Is designated OPR to administer funds for hunting/fishing user permit sales.

1.2.8.6. (Added) The BCE (or designated substitute) is designated OPR to monitor all conservation activities and maintain status and minutes of meetings.

1.2.9. (Added) Fish and Wildlife Committee (FWC):

1.2.9.1. (Added) The FWC is primarily concerned with reviewing the fish and wildlife and outdoor recreation resources on Beale AFB and is comprised of but not limited to representatives of the following: 9 MSG/CD, 9 CES/CEIE, Chief Game Warden, 9 SFS/SFO, 9 RW/JA, 9 FSS (Outdoor Adventure Center).

1.2.9.2. (Added) FWC meetings will occur as required; with one annual meeting at the end of the hunt season, typically late spring in coordination with the quarterly Environmental Cross Function Team meeting.

1.2.9.3. (Added) The FWC will monitor base programs to ensure implementation of the hunting and fishing programs under Integrated Natural Resources Management Plan.

1.2.10. (Added) Beale AFB Volunteer Game Wardens (Game Wardens):

1.2.10.1. (Added) Game wardens are authorized to enforce applicable federal and state fish and game laws, and Beale AFB rules and regulations (as described in this Instruction) on Beale AFB property.

1.2.10.2. (Added) Special wildlife areas will be closely monitored by game wardens.

1.2.10.3. (Added) Game Warden supervision will primarily be performed by Hunting Program Manager (HPM) for Game Warden duties, Natural Resources Manager (NRM) for conservation duties, 9 CES/CEIE Chief, and Chief Game Warden.

6.2.4. (Added) Hunting and Fishing. Hunting and fishing will be in accordance with Title 14 of the California Administrative Code as adopted by the Fish and Game Commission. See the California Hunting Regulations for more detailed information. This supplement will take precedence where it imposes requirements more stringent than California law, generally for the safety for users on base and to meet other conservation requirements.

6.2.4.1. (Added) All hunters and fishermen must have a California state license to hunt or fish on Beale AFB and a Beale hunting and/or fishing card for the current year.

6.2.4.2. (Added) Hunting and fishing must be limited to ensure safety and a sustainable level of fish and game is preserved for future seasons. Therefore, privileges will be limited to the following:

6.2.4.2.1. (Added) All active duty military and their dependent family members with military ID cards.

6.2.4.2.2. (Added) All retired military and their dependent family members with military ID cards.

6.2.4.2.3. (Added) All active reservists assigned to Beale AFB.

6.2.4.2.4. (Added) All federal civil service personnel employed on Beale AFB.

6.2.4.2.5. (Added) Family members of federal civil service employees, accompanied by a sponsor who is authorized to hunt or fish.

6.2.4.2.6. (Added) Guests of the above only while accompanied by the sponsoring authorized hunter. No more than two (2) guests may be sponsored during each hunting visit on base. Guests must have proper state license and a Beale hunting card in their possession. Guests are not authorized to take place in the lottery hunts (deer or others). 9 MSG/CD may choose to revoke the guest policy under certain Force Protection Conditions.

6.2.4.2.7. (Added) Recreational hunting access may be restricted during heightened Force Protection Condition at the discretion of 9 SFS and coordinated with 9 MSG/CD, HPM - 9 CES/CEIE, and the Chief Game Warden: during condition Alpha Condition, no hunting restrictions; during Bravo Condition hunting is restricted to categories 6.2.4.2.1-6.2.4.2.4 (guests will not be allowed); during Charlie and Delta Conditions recreational hunting will not be authorized.

6.2.4.3. (Added) Hunting and fishing permits are valid for a limited period of time, as specified on the permits. Permits will be filled out and authenticated in ink prior to hunting or fishing and rendered invalid if amended or altered in any fashion.

6.2.4.4. (Added) Annual Beale hunting and fishing cards are required for all individuals hunting and/or fishing on Beale AFB. A valid California hunting and/or fishing license must be obtained prior to issuance of a base-hunting card. Both must be in possession while hunting and fishing on Beale AFB. The hunting card is valid 1 July-30 June, while the fishing card is valid 1 January-31 December.

6.2.4.4.1. (Added) All personnel interested in hunting on Beale AFB will be required to attend briefings/courses regarding hunting/outdoor use rules for Beale AFB to ensure safe outdoor practices in accordance with this regulation. These briefings/courses will be implemented based on current Force Protection conditions and the requirement for safety of all in the field. The HPM - 9 CES/CEIE in coordination with the Chief Game Warden will determine when such briefings are appropriate.

6.2.4.4.2. (Added) Special arrangements can be made through 9 MSG/CD to accommodate distinguished visitors wishing to hunt or fish during their stay on Beale.

6.2.4.5. (Added) Hunting and fishing cards are sold under the authority of the Beale FWC. All fee monies collected must be deposited with the installation Accounting and Finance Office to the credit of special account 57X5095. Hunting and fishing cards will be managed by 9 CES/CEIE, HPM, and cards may be issued through the Outdoor Adventure Center or Rod and Gun Club for sale. These offices may retain an administrative fee of \$1.50 for each card sold. The remainder of funds collected from the cards is used for fish and wildlife management, according to the Integrated Natural Resources Management Plan.

6.2.4.6. (Added) The fees are set by the Base FWC and are subject to change. Current fees will be published in local publications as required.

6.2.4.7. (Added) All hunting and fishing will be controlled and held within manageable quotas depending on the extent of the natural resources on base. Opportunities for recreational purposes will be equitably distributed by impartial selection by such procedures as drawings or lotteries, or on a first-come, first-served basis, following the precedence outlined in 6.2.5.4.

6.2.5. (Added) Hunting Procedures. Hunting is only allowed on Beale AFB as described below. No other hunting activities are permitted.

6.2.5.1. (Added) Identification and License Requirements: California Department of Fish and Wildlife (DFW) laws and regulations apply at Beale AFB unless superseded by this supplement. While hunting on Beale AFB, hunters 16 years and older will have in their possession, a valid identification card, state hunting license with appropriate stamps, and a Beale hunting card. Hunters under the age of 16 years will be accompanied by a military member and/or a person 18 years or older with applicable valid identification card. Any hunter planning to hunt migratory game birds (ducks, geese, coots, dove, band-tailed pigeon, snipe, gallinules or black brant) must complete a Harvest Information Program (HIP) survey and affix a HIP Stamp to their California Hunting License. HIP surveys and stamps are available at some license agents and at most DFG license sales offices. Hunters may be cited for hunting migratory game birds without a HIP stamp affixed to their license.

6.2.5.1.1. (Added) Hunters will wear a conspicuous outer garment no less than 100 square inches in material in one of the following colors while hunting: red, yellow, or orange. Hunters of migratory birds and/or turkeys may use camouflaged clothing. Camouflaged clothing is allowed when hunting deer during archery season.

6.2.5.1.2. (Added) Hunters are required to know and use safe firearm practices and procedures at all times.

6.2.5.1.3. (Added) Hunters are urged to use extreme caution when hunting and fishing seasons overlap. Base lakes are closed to fishing until 11 a.m. during waterfowl season.

6.2.5.1.4. (Added) Trapping of wildlife on Beale AFB is prohibited except when carried out under special authorization by 9 CES/CEIE.

6.2.5.1.5. (Added) USDA Wildlife Services will conduct wildlife control near the runway and taxiways. Carcasses of depredated animals will be destroyed or buried in approved burial locations unless other arrangements are coordinated through the 9 CES/CEIE Chief or Natural Resources Manager.

6.2.5.1.6. (Added) Lethal depredation will only occur as permitted by outside agency or in emergencies in coordination with the NRM (excluding Pest Management). This includes depredation through weapons, baiting, traps, etc.

6.2.5.2. (Added) Hunting is only authorized in areas identified on the current base hunting map, produced annually by the FWC and 9 CES/CEIE. Hunting is prohibited under the following conditions:

6.2.5.2.1. (Added) From any roadway, shoulder of roadway, or across any roadway.

6.2.5.2.2. (Added) Within 200 yards of congested areas or occupied buildings, except for authorized ranges.

6.2.5.2.3. (Added) Within 200 yards of runways, taxiways, aircraft ramps, and fuel areas.

6.2.5.2.4. (Added) Within 200 yards of any designated picnic area.

6.2.5.2.5. (Added) From any vehicle, moving or parked.

6.2.5.2.6. (Added) At overhead wires or telephone cables.

6.2.5.2.7. (Added) In areas designated as “NO HUNTING OR SHOOTING”.

6.2.5.2.8. (Added) Within the Explosive Ordnance Disposal (EOD) Range.

6.2.5.2.8 (Added) Within 400 yards of any baited area. “Baited area” shall mean any area where shelled, shucked or unshucked corn, wheat or other grains, salt, or other feed whatsoever capable of luring, attracting, or enticing such birds or mammals is directly or indirectly placed, exposed, deposited, distributed, or scattered, and such area shall remain a baited area for ten days following complete removal of all such corn, wheat or other grains, salt, or other feed.

6.2.5.3. (Added) Weapons:

6.2.5.3.1. (Added) Rifles, air and/or spring powered weapons will not be used for hunting.

6.2.5.3.2. (Added) Resident small game, game birds, and waterfowl will be taken by shotgun, 410 through 10 gauge, BB shot or smaller with a weapon capable of holding not more than three shells, in accordance with California State laws. Waterfowl may only be hunted with steel shot or nontoxic shot approved by the U.S. Fish and Wildlife Service. Geese may only be hunted with shot no larger than ‘T’. Turkey, no larger than number two (2) shot permitted.

6.2.5.3.3. (Added) No one may have a pistol in their possession while hunting or fishing.

6.2.5.3.4. (Added) All weapons propelling a single projectile are prohibited from use except for shotgun slugs or muzzle-loading rifle used only for deer hunting, or under the following circumstances:

6.2.5.3.4.1. (Added) Supervised approved firing at the small arms ranges.

6.2.5.3.4.2. (Added) Authorized animal/pest control, Security Forces personnel, Natural Resources and Game Warden personnel, when approved by 9 CES/CEIE or for imminent human health and safety hazards. USDA will typically perform wildlife damage control to ensure safe airfield operations.

6.2.5.3.4.3. (Added) Buckshot is prohibited from use except by authorized personnel.

6.2.5.3.4.4. (Added) Hunters may not carry a loaded firearm in a vehicle or shoot from, within, or upon any vehicle, whether moving or parked. For the purpose of this regulation, a loaded firearm is defined as any weapon with a round in the chamber or magazine in the weapon. A muzzle-loader firearm shall be deemed to be loaded when it is capped or primed *and* has a powder charge and ball or shot in the barrel or cylinder.

6.2.5.3.4.5. (Added) In addition to lead free ammunition rules within the State of California, recreational hunting ammunition used on Beale AFB will be free from lead at the beginning of the 2017 hunting season.

6.2.5.3.4.6. (Added) Prior to participating in archery or crossbow hunts, each hunter must demonstrate proficiency on a 3-D target. Demonstration will be administered by a game warden.

6.2.5.4. (Added) Under Title 14, CCR, section 360(c), the California Fish and Game Commission annually allocates to Beale AFB a maximum number of deer tags based on the size of its local deer population. The Beale HPM and NRM in coordination with the DFW set the number of deer tags to be distributed through a lottery system. The number of tags will be set at least 2 weeks before the lottery drawing. The annual deer hunt serves as a tool for controlling the resident deer herd; the number of tags may vary from year to year based on field surveys. This activity helps lower the probability of car/deer collisions, and assists DFW's game management program. Deer hunting is allowed on Beale AFB only during the season designated by the California Department of Fish and Wildlife.

6.2.5.5. (Added) Natural Resources (9 CES/CEIE): The Hunt Program Manager (634-2832) is the point of contact for the deer hunt, and is responsible for administering the hunting program and answering questions about the deer hunt. Other duties include the following:

6.2.5.5.1. (Added) Advertising: A preliminary notice will be entered on the base web site at or other base outreach media least four (2) months prior to the lottery. This advertisement will serve as a reminder to personnel who may be absent in the months immediately preceding the drawing. The lottery and associated hunt will be advertised on the base web site at least two (2) weeks prior to the tag drawing.

6.2.5.5.2. (Added) Deer Tag Lottery: The lottery will be held at least two (2) weeks prior to the DFW's application deadline. Names will be drawn randomly by Environmental Element personnel (9 CES/CEIE). The Natural Resources staff will record the names of selected hunters as well as non-selectees. Applicants not attending the drawing will be notified of their status within one (1) week. The HPM will forward the selected tags to the DFW License and Revenue Branch at least one (1) week before their application deadline.

6.2.5.5.3. (Added) Deer Hunt Orientation: This mandatory briefing allows the HPM and base Game Wardens to provide critical information to the deer hunters including Beale AFB hunting procedures, safety requirements, Deer Kill Data form information, and Game Warden contact information.

6.2.5.5.4. (Added) Public Affairs (9 RW/PA): PA assists the Natural Resources staff in placing the advertisements on the base web site.

6.2.5.5.5. (Added/Change) Selected personnel who have been drawn to deer hunt on base by the lottery system can purchase their Beale hunting card after they have received their mandatory deer hunting briefing. Rod and Gun Club staff are the authorized points of contact.

6.2.5.5.6. (Added) Prospective hunters must possess a current California Hunting License and a Beale Hunting Card. Deer tag applications are available at most sporting goods stores. Applications must be submitted to the Natural Resources staff in the Environmental Element Office at 6601 B Street (building 2561) no later than one (1) hour before the lottery drawing.

6.2.5.5.7. (Added) Non-selected applications will be returned to the individuals, who may submit their applications directly to DFW to be eligible for alternate hunting locations.

6.2.5.5.8. (Added) Appropriate weapons and ammunition for the deer hunt are as follows: Shotguns, slugs only (3 rounds maximum in gun), muzzle-loading rifles, and bow & arrow (see California Fish and Wildlife Code for definitions of these terms).

6.2.5.6. (Added) Waterfowl Hunting Requirements.

6.2.5.6.1. (Added) Blinds will be registered with the HPM - CES/CEIE and the Game Wardens.

6.2.5.6.2. (Added) Blinds will not be placed within 200 yards of existing blinds or decoys in place.

6.2.5.6.3. (Added) Blinds will blend in with the surrounding environment and not detract from the overall appearance of the area. Blinds that fall into disrepair or accumulate garbage (including accumulations of spent shells) will be required to be removed.

6.2.5.6.4. (Added) Removable or “net-like” blinds may be used in areas where there is little shrub and tree growth and where permanent blind placement is not allowed.

6.2.5.6.5. (Added) Floating blinds are not authorized, except for boats for use in waterfowl hunting, in accordance with California Fish and Wildlife laws.

6.2.5.6.6. (Added) Digging or the removal of natural vegetation for the construction of blinds is prohibited.

6.2.5.6.7. (Added) Blinds will not be allowed in areas considered sensitive wetlands by 9 CES/CEIE.

6.2.5.6.8. (Added) Decoys will be removed when the hunter leaves the area after each hunting session. Decoys may be stored in a box or bag inside the blind between hunts.

6.2.5.6.8.1 (Added) Prohibition on Electronic or Mechanically-operated Devices. Electronic or mechanically-operated calling or sound-reproducing devices are prohibited when attempting to take migratory game birds. It is unlawful to use electronic or mechanically-operated spinning blade devices or spinning wing decoys when attempting to take waterfowl between the start of waterfowl season and November 30. For the purposes of this regulation, wind-powered spinning blade devices and kites are not prohibited.

6.2.5.6.9. (Added) Blinds constructed by hunters and left for the duration of the waterfowl-hunting season will have the builder's name, home/cell phone number, and work phone number conspicuously posted. These blinds, once constructed, will be available to others when coordinated with the blind builder. Each waterfowl hunter is limited to one blind.

6.2.5.6.10. (Added) Lead shot is NOT to be in possession while waterfowl hunting. While lead shot is allowed for some upland game hunting, this will change in the future as state or DoD guidance dictates.

6.2.5.7. (Added) Resident, Migratory, and Upland Game Bird Hunting Requirements:

6.2.5.7.1. (Added) Resident upland game birds include the following species: California quail, ring-necked pheasant, and wild turkeys.

6.2.5.7.2. (Added) Migratory game birds include the following species: mourning dove, band-tailed pigeon, common snipe, American coot, common moorhen and waterfowl.

6.2.5.7.3. (Added) A current upland game bird stamp must be affixed to the state hunting license of all adults wishing to hunt upland game birds (pheasant, turkey, dove, band-tailed pigeon, common snipe, grouse, ptarmigan, quail, partridge, and chukar).

6.2.5.7.4. (Added) No game birds may be pursued, herded, or taken from a moving or parked vehicle of any kind.

6.2.5.7.5. (Added) No game birds may be intentionally harassed, herded, or driven to disrupt their normal behavior patterns.

6.2.5.7.6. (Added) No game birds may be taken within 400 yards of a baited area.

6.2.5.7.7. (Added) Only the following will be used to take resident small game and migratory game birds: Shotguns 10 gauge or smaller using shot shells only; falconry; and/or hunting dogs. Bow and arrow/crossbow may be used for deer or turkey hunting.

6.2.5.7.8. (Added) The use of live decoys is prohibited.

6.2.5.7.9. (Added) Hunting on base is a privilege regulated by the MSG/CD with input from various sources (refer to section 6.2.4.2.7.). The 9 MSG/CD reserves the right to terminate, restrict or add additional regulations and procedures based on safety and Force Protection issues facing the base. The HPM and Chief Game Warden will work closely with the 9th Security Forces to ensure hunting on base is regulated in accordance with the desires of the MSG/CD to include restricting, regulating or termination of all hunting on base, dependent on the Force Protection conditions. It is the responsibility of all hunters to check in for each hunt at the Three Bridges area sign-in book. Hunters must also be aware of current Force Protection levels prior to entering the field by calling the Law Enforcement desk or asking Law Enforcement personnel when entering the base.

6.2.6. (Added) Fishing Procedures.

6.2.6.1. (Added) Fishing is permitted by authorized personnel year-round in any lake or pond excluding Dry Creek and Beale Lake unless otherwise posted.

6.2.6.2. (Added) While fishing on Beale AFB, anglers 16 years or older will have in their possession a valid identification card, state fishing license with appropriate stamps, and a Beale fishing card. Children 12 years of age, but less than 16, need a valid identification card in their possession to fish.

6.2.6.3. (Added) Hunters and anglers are urged to use extreme caution when fishing and hunting seasons overlap.

6.2.6.4. (Added) All fishing tournaments or derbies must be coordinated/approved by 9 CES/CEIE and Chief Game Warden.

6.2.6.5. (Added) Fishing Restrictions.

6.2.6.5.1. (Added) No one may use a gasoline engine to propel either a boat or raft on Beale AFB lakes, except as authorized by 9 CES/CEIE (generally for administrative purposes) Electric motors are acceptable.

6.2.6.5.2. (Added) Boats and rafts are prohibited on Beale Lake (except for administrative purposes), and homemade rafts are prohibited on all lakes. Prior to placing any boat into Beale AFB water, the boat operator must inspect and remove any debris from other waterways on the boat to prevent introduction of invasive species.

6.2.6.5.3. (Added) No one may have a pistol in their possession while fishing.

6.2.6.5.4. (Added) Fishing by bow and arrow is permitted for the take of carp, goldfish, and suckers subject to the following restrictions:

6.2.6.5.4.1. (Added) Bows utilized in the taking of carp, goldfish, and suckers must have a minimum draw weight of 45 pounds.

6.2.6.5.4.2. (Added) Arrows utilized in the taking of carp, goldfish, and suckers will be of the harpoon type only. The length of the arrow will not exceed 36 inches. The arrow will be attached to the bow by line, preferably braided nylon, with minimum test strength of 40 pounds and a maximum length of 100 feet.

6.2.6.5.5. (Added) There are no size or possession limits on carp, goldfish, and suckers. All fisherman and bow fisherman shall remove all carp and goldfish that are taken or caught without releasing them into the waterways.

6.2.6.5.6. (Added) No one may transport live game fish for purposes of transplantation to and from any Beale AFB lake, stream, or impoundment except for stocking by authorized 9 CES personnel.

6.2.6.5.7. (Added) Base lakes are closed to fishing until 11 a.m. during waterfowl season.

6.2.6.5.8. (Added) Beale Lake is closed to fishing one-half hour after official sunset to sunrise.

6.2.6.5.9. (Added) Fishing is prohibited within 250 feet below Beale Dam.

6.2.6.5.10. (Added) Fishing in Frisky Lake is catch and release only.

6.2.6.5.11. (Added) Fishing in Dry Creek and Beale Lake is only permitted from 1 May through 15 October to protect the adult Central Valley Steelhead, a federally listed threatened species. Other restrictions in only these locations include the following:

6.2.6.5.11.1. (Added) Only artificial flies and lures will be used.

6.2.6.5.11.2. (Added) No treble hooks will be used.

6.2.6.5.11.3. (Added) On single barbless hooks, there must be at least a 7/16" hook gap size.

6.2.6.5.11.4. (Added) No one will be permitted on Beale Dam or the fish ladder at any time.

6.2.6.5.11.5. (Added) Dry Creek and Beale Lake are catch-and-release only .

6.2.6.5.12. (Added) Base Fish Creel and Size Limits (Except Beale Lake and Dry Creek):

6.2.6.5.12.1. (Added) Bass limit is three (3) per day, per person, minimum size is 15 inches.

6.2.6.5.12.2. (Added) Crappie limit is 20 per day, per person, no size limit.

6.2.6.5.12.3. (Added) Channel catfish limit is five per day, per person, and fish must be 12 inches or over. Bullheads have no creel limit.

6.2.6.5.12.4. (Added) Bluegill, Redear Sunfish, and Shiners, no limit.

6.2.6.5.12.5. (Added) It is illegal to fish for, possess, or take anadromous fish on Beale AFB including salmon and steelhead. Salmon have been observed in several places on base where they cannot spawn. All observations of anadromous fish and carcasses should be reported to 9 CES/CEIE or a Game Warden.

6.3.5. (Added) Hunting and Fishing Violations:

6.3.5.1. (Added) Anyone who violates any of the provisions of this regulation, or commits any acts inconsistent with good safety practices, which results in injury or damage to persons or

property (including ruts from offroad driving), may have any hunting and/or fishing privileges withdrawn. This action will be taken independently of other punitive and administrative action. Additionally, the Base Magistrate, 9 MSG/CD may withdraw hunting and fishing privileges for any actions inconsistent with security, order or hunting equity. Violators may be required to surrender their hunting and fishing permits, cards, and/or license to a game warden. The game warden will provide an AF Form 1168 to the 9th Security Forces Squadron.

6.3.5.2. (Added) Civilians who are caught violating the federal, state, and/or Beale AFB Fish and Wildlife regulations may be escorted from the base and/or issued a letter of debarment by the 9th RW Commander and prosecuted under Federal Law 10 USC 2671 before a U. S. Magistrate. Violators may be prosecuted under Federal Law 10 USC 2671 before an U. S. Magistrate or before the Municipal Court under the Fish and Game Code/Title 14, Administrative Code. Violators may also be prosecuted under California Fish and Game laws.

6.3.5.3. (Added) Violations by military personnel will result in lost hunting and fishing privileges for a minimum of one (or more) year. If the violation is major in nature the 9 MSG/CD may refer the case to the Judge Advocate. This determination will be made by the 9th Mission Support Group Deputy Commander in consultation with 9 CES/CEIE and the Chief Game Warden.

6.4.3. (Added) Game Warden Program. AFI 32-7064 directs bases to establish a Conservation Law Enforcement Officer (CLEO) either as a permanent staff member or under an agreement with a law enforcement program that manages conservation work (e.g. USFWS Officer or State Fish and Wildlife Warden. Due to funding and other legal barriers, this has not been possible at Beale AFB. Until a permanent warden is on staff, the following procedures will remain in effect:

6.4.3.1. (Added) 9 SFS/S3O: 9 SFS/S3O may be involved in enforcement of fish and game laws through the Game Wardens on Beale AFB. 9 SFS may become involved when notified by a game warden that a violation has occurred which will require oversight for significant violations or coordination on violations when both fish and game laws and other laws have been violated.

6.4.3.2. (Added) Chief Game Warden: The 9th Mission Support Group Deputy Commander (9 MSG/CD), who is also the Base Magistrate, will appoint the chief game warden. The chief game warden will be a Technical Sergeant or higher. The Chief Game Warden will be responsible to 9 CES/CEIE, 9 SFS, and 9 MSG/CD respectively. The Chief Game Warden will actively monitor the warden program to coordinate duty schedules, training and all other Warden activities for Game Wardens. Chief Game Warden will ensure complete and accurate records of all warden activities are maintained and forwarded to the HPM at least monthly.

6.4.3.3. (Added) Game Wardens: The Game Wardens will work under the direction of the Natural Resources manager and Chief Game Warden, and provide enforcement of conservation laws and regulations. Any warden activities besides hunter training and conservation law enforcement will be coordinated in advance with 9 CES/CEIE. Volunteer Game Wardens may be removed from the warden program at the discretion of the Natural Resources Manager. Removal will be documented in writing with reason stated.

6.4.3.3.1. (Added) The Chief Game Warden and Natural Resources Manager will review all applications and appointments of Game Wardens and Reserve Game Wardens. Active Game Warden status will be reviewed yearly by the Chief Game Warden by communicating with the appropriate First Sergeant or Commander to ensure no disciplinary actions or other administrative actions have been taken that would question the reliability of personnel acting in these positions.

6.4.3.3.2. (Added) The selection criteria for Volunteer Game Wardens is as follows:

6.4.3.3.2.1. (Added) Minimum of a 4 on Enlisted Performance Report (EPR) on the applicant's last two EPRs and no active Unfavorable Information File (UIF).

6.4.3.3.2.2. (Added) Supervisor/Commander's recommendation.

6.4.3.3.2.3. (Added) No significant disciplinary action within the year preceding the application date.

6.4.3.3.2.4. (Added) Shall be a staff sergeant (E-5) or above to hold the position of game warden.

6.4.3.3.3. (Added) Applications will be issued by the HPM or Chief Game Warden.

6.4.3.3.4. (Added) The applicant's AF Form 110, Individual Incident Reference Record, AF-Form 1313, Driver Record, will be screened for any prior significant violations.

6.4.3.3.5. (Added) Once reviewed, the applications will be forwarded to the 9 MSG/CD, Chief Game Warden, and 9 SFS and a determination will be made.

6.4.3.3.6. (Added) If denied the privilege to become a Game Warden, the application will be returned to the individual, with specific reasons indicated.

6.4.3.4. (Added) Game wardens are authorized to operate private vehicles off roads only when necessary to perform essential game warden duties. Off road travel will be minimized and limited to established roads as much as possible. When off-road travel is necessary, wardens will ensure the ground is firm enough to prevent rutting before leaving established roads. (Vehicles equipped with catalytic converters will avoid fire risk areas.)

6.4.3.5. (Added) Game wardens must maintain a current and complete log of warden activities to submit to 9 CES/CEIE. This information will include, but is not limited to the following: patrols conducted, calls received, deer fatality (age, weight, sex, location, cause of death), fatality date of other species. Information should be documented and provided to 9 CES/CEIE within one week.

6.4.3.6 Game Wardens are authorized free hunting and fishing permits for Beale AFB. No other special privileges are authorized based solely on status as a Game Warden.

6.4.3.7. (Added) Reporting of vehicle/deer strikes is essential to the deer management program. Deer fatalities should be reported as soon as possible 9 CES/CEIE - HPM The reporting of incidents involving deer kills by automobiles or other causes will be handled in the following manner:

6.4.3.7.1. (Added) If a citizen's complaint is received, the Security Forces desk sergeant will make a determination whether or not to dispatch a patrol to investigate the incident. In addition, a base Game Warden may be notified to respond to assess the situation and terminate the animal if necessary.

6.4.3.7.2. (Added) If the incident is reported directly to a base Game Warden, the warden will notify the 9th Security Forces Law Enforcement Desk (634-2131) and advise them of the incident as soon as possible. If necessary, Security Forces personnel may be dispatched to assist and record the circumstances.

6.4.3.8 (Added) Pest management responses, including snakes, will be the responsibility of the Civil Engineer Pest Management Shop or Military Family Housing Maintenance. If these are unavailable, game wardens and 90 CEIE/CEIE personnel may respond if properly trained and equipped for the situation.

6.5.1. (Added) Wildlife protection on power lines.

6.5.1.1. (Added) Power lines will be designed, constructed, and maintained in accordance with raptor protection standards shown in **Suggested Practices for Avian Protection**. From: Avian Power Line Interaction Committee (APLIC). 2006. Edison Electric Institute and the Raptor Research Foundation. Washington, D.C., which is available at: www.aplic.org

6.5.1.2. (Added) Electrical workers and the Natural Resources Office will cooperate in gathering and compiling avian electrocution data. Data will be used to identify hazardous poles and prioritize corrective action.

6.5.1.3. (Added) Whenever feasible, overhead power lines will be designed and constructed to allow 60 inches of clearance between any two high voltage phases, and between any high voltage phase and any grounded object. When any major modification is made to a power line construction, 60 inch clearance will be provided if feasible.

6.5.1.4. (Added) When it is not practical to modify structures to allow 60 inches of clearance, the structure will be fitted with insulated jumper wires, transformer bushing covers, cutout covers and internal-gap lightning arresters in order to improve system reliability, prevent wildfires, and minimize the hazard to wildlife.

8.6. (Added) Firewood Cutting Program.

8.6.1. (Added) Purpose: The purpose of this program is to reduce the accumulation of wood residues and deadfall, thus improving the appearance of the base in general and reducing potential fire hazards and disposal of fuel wood products, particularly in developed areas.

8.6.2. (Added) Scope: All military, retired military, and civilian employees of Beale AFB are eligible to obtain fuel wood products.

8.6.3. (Added) Policy.

8.6.3.1. (Added) Fuel wood is defined as wood that is dead or dead and down. Fuel wood shall be available from the following sources: deadfall, wood obtainable from designated areas throughout the installation, diseased trees living or dead when specifically authorized by the NRM, wood removed from plantations, and wood removed in support of construction projects. Wood may be collected by 9 CES or the Ground Maintenance Contractor and placed in the 9 CES/CEIE storage yard. The NRM may defer the issuance of fuel wood permits for indefinite periods should fuel wood sources become depleted.

8.6.3.2. (Added) The cost of fuel wood permits is \$40.00 per cord, but the price is subject to change. A permit is required for each cord of fuel wood products removed from the installation and must accompany the fuel wood products upon removal from the installation. A cord is defined as a stack of wood four feet high, four feet wide, and eight feet long, or 128 cubic feet. The NRM, HPM, or a designated representative issues the permit. If fuel wood available in the 9 CES/CEIE yard, it can be purchased and picked up at any time of the year.

8.6.3.3. (Added) The sale of these permits will be restricted to the selected month, after which the permit becomes null and void. The fuel wood permit shall be valid only in removing one (1) cord load of fuel wood materials. All permits, for any reason, are nonrefundable.

8.6.3.4. (Added) Checking out with the 9 CES/CEIE Office upon leaving the installation is not required. The permit will be shown to the Security Forces' personnel, base game wardens, or other official personnel upon request.

8.6.3.5. (Added) The sale of permits will be limited to five (5) cords per qualified permittee, per year. The sale of fuel wood permits is intended for personal use and not for resale. Permits will be issued equitably, using a waiting list and equal access for all eligible personnel.

8.6.3.6. All saleable firewood removed for any reason will be handed over to 9 CES/CEIE for sale under the firewood program. This includes in-house work as well as contracted projects.

8.6.4. (Added) Accountability and Responsibilities.

8.6.4.1. (Added) Fuel wood product permits are numbered and issued consecutively in the 9 CES/CEIE office. Permits must be paid for upon issuance of permit. Only personal checks will be accepted for permit payments. Checks are made payable to Beale Accounting and Finance. No cash or credit cards will be accepted for payment. The NRM, HPM, or designated representative will fill out a cash collection voucher and turn in all collected fuel wood monies to

designated account 57F3875.00** 45333(** indicates last 2 digits of fiscal year) in the Accounting and Finance Office.

8.6.4.3. (Added) Fuelwood cutting must not cause excessive damage to the environment including from offroad access. Chainsaws must have a spark arrestor; a charged fire extinguisher and shovel must be available at the cutting site. Uncut material must be piled and left out of the way of roads and wetlands.

8.6.4.3. (Added) Violations of firewood policy will be dealt with using comparable disciplinary action as listed in paragraph 6.2.7.2 – 6.2.7.4 (Hunting and Fishing Violations) of this supplement.

Grazing Program

9.1.3. (Added) Adherence to this instruction is considered essential to the success and vitality of the grazing program. Revenues generated from this program are eventually returned to the installation and benefit the grazing and natural resources programs, in accordance with DoD Instruction 4715.3, paragraph 6.2.4.

9.2.1.1. (Added) The Environmental Baseline Survey (EBS): is a necessary document required in all real estate transactions, and is prepared by 9 CES/CEIE. Its purpose is to document the condition of the land and determine if contaminants are present. The Asset Management Flight (9 CES/CEIA) requires an EBS before each new lease is signed or can obtain an EBS waiver from the chairperson of the base Environmental Safety and Occupational Health Council for the grazing lease program. The authorization for this waiver is allowed under AFI 32-7066, Section 1.5.

9.2.1.2. (Added) Pre-Lease Meeting: A meeting held by 9 CES/CEIA with the lessee(s) to sign any new grazing leases and answer any lessee questions. Other attendees include representatives from 9 CES/CEIE and 9 RW/JA.

9.2.1.3. (Added) When a lease area is available for bid, the Contracting office prepares a grazing lease bid package in cooperation with the Grazing Program Manager (GPM), NRM, 9 CES/CEIA, and the legal office. Once the bid has been awarded, 9 CES/CEIA finalizes the lease for signature. Three original signed copies of the lease are needed for distribution to the 9 CES/CEIA, the lessee, and the HQ Air Combat Command Grazing and Cropland Program Manager (HQ ACC/CEO). The 9 CES/CEIA will then prepare needed paper work for the lease to be reviewed and approved by 9 CES/CC, the wing legal office (9 RW/JA), and reviewed, approved, and signed by 9 MSG/CC. 9 CES/CEIA oversees the pre-lease meeting.

9.2.1.4. (Added) Pre-Grazing Meeting: An annual meeting held by the natural resources section with the lessee(s), approximately 1 month before the cattle return to the base. The Real Property Officer and a representative of the Security Forces Squadron (SFS) also attend. The purpose of the meeting is to discuss changes in the lease or its administration and to listen to recommendations from the lessees on improvements to the grazing program. In addition, the SFS representative will give lessees an antiterrorism/force protection briefing.

9.2.1.5. (Added) Lessees will be notified of the burning schedule each year before their pasture is burned. The Grazing leases and associated Operating Agreement (OA) describe provisions for possible Animal Unit Month (AUM) reductions as a result of prescribed burning.

9.2.8 Responsibilities

9.2.8.1. (Added) The GPM is responsible for land management and field oversight. When the cattle are on-site, the GPM must ensure that the lessee is following all rules set forth in the Operating Agreement, which are a part of the signed lease. A checklist will be performed at least two times throughout the grazing season to document lessee performance. If problems arise, the GPM will notify the 9 CES/CEIA, who will send an enforcement letter to the lessee. The GPM will report to HQ ACC/A700.

9.2.8.2. (Added) The GPM is responsible for updating the OA as needed and the Environmental Baseline Survey (EBS) or appropriate waiver. The GPM will advertise the lease opening using funds from the grazing program. Local area stockmen journals, newspapers, and other media will be used to give the widest dissemination to potentially interested parties. The GPM and NRM attend the pre-lease and pre-grazing meetings.

9.2.8.3 (Added) Real Estate (9 CES/CEIA): The 9 CES/CEIA's primary duty is to manage the administration and payment collection for the cattle grazing leases. The real estate element attends the pre-lease and pre-grazing meetings.

9.2.8.4. (Added) Contracting (9 CONS/LGC): An authorized government contracting officer will oversee the solicitation and award of bids.

9.2.8.5. (Added) Financial Management (9 RW/FM): Financial Management receives the voucher payment from the 9 CES/CEIA and provides a receipt.

9.2.8.6. (Added) Legal Office: The legal office reviews all pertinent documents and coordinates on the grazing lease. The legal office will review all bid package materials before they are advertised and all award documentation before lease awards are announced.

9.2.8.7. (Added) Installation Wing Commander (9 RW/CC): The 9th Reconnaissance Wing Commander signs the grazing lease or can delegate this responsibility to the Mission Support Group Commander (9 MSG/CC).

9.2.8.8. (Added) The Grazing Program Manager (GPM) provides general field support to assist the NRM in managing the program. This includes, but is not limited to inspection, maintenance, and installation of corrals, cattle guards, fences, gates, posts, and unimproved roads. Additionally, the NRT supports the NRM in tracking the number and location of cattle. The NRT often is asked by the 9th Security Forces Squadron (9 SFS) to respond to reports of loose cattle or other emergencies involving the grazing program. However, the ultimate responsibility for the cattle is the lessee as stated in the OA.

9.2.8.9. (Added) The lessee is required to abide by all rules set forth by the OA and the grazing lease.

9.6.2.1. (Added) A Wildland Fire Management Plan, described in Chapter 12, has been established for the purposes of reducing the abundance of undesirable species basewide, promoting desirable and native forage species in rangelands, improving range conditions for cattle, and reducing the fuel load for wildfires. See Chapter 12.

Off-Road Vehicle Use

10.3.1.1. (Added) Vehicle access to outdoor recreation areas will be limited to designated roads. Large areas of the base are fenced and leased for cattle and horse grazing. Users will leave gates closed or will lose access to the area. Cattle or horses may not be unduly disturbed or harassed by the vehicles.

10.3.1.2. (Added) Users may park in designated parking areas only. Signs will mark these areas. If signs are not posted, then the vehicles shall be parked within eight feet of the road shoulders. Vehicles will not be permitted on firebreaks, old jeep trails, or roadways created by contractors for their entry to work sites.

10.3.1.3. (Added) Off-Road Vehicles (ORVs) are not approved for recreational use on the base property. Government employees, approved government contractors, and volunteer game wardens may only use these vehicles on base property while performing their official duties. Prior to driving off-road with an ORV for official duty DURING THE WET SEASON (Dec-May), vehicle operators must walk the area to ensure ground is firm enough to support the vehicle to prevent rutting and erosion. Whenever possible, ORV operators must avoid areas with standing water.

10.3.1.4. (Added) While using ORVs on base property, all government employees, approved government contractors, and volunteer game wardens are required to follow all safety restrictions in this Chapter, such as speed limits, helmet use, eye protection, and completion of safety courses. The base game warden may utilize a privately owned vehicle to perform official game warden duties approved by 9 CES/CEIE, HPM, or NRM.

10.3.1.4.1. (Added) Prior to operating ORVs the person must first complete a driver's safety course applicable to the use and operation of the vehicle being used. Operators will have in their possession a certificate indicating course completion. (38501 CVC)

10.3.1.4.2. (Added) No person will operate an ORV on Beale AFB lands 1) in a reckless, careless, or negligent manner, 2) under the influence of alcohol or drugs, 3) in a manner likely to cause damage or disturbance to the land, wildlife, or vegetation, or 4) in a manner likely to cause damage or destroy government or private property.

10.3.1.4.3. (Added) Speed on access trails and firebreaks shall not exceed 15 mph.

10.3.1.4.6. (Added) For units that use ORV's for official duties, annual training should be scheduled with 9 CES or the individual's unit. Training for official ORV use shall be in designated areas only, as identified by the Base Planner and 9 CES/CEIE.

10.3.1.4.7. (Added) Anyone who creates damage to soils or vegetation will be required to repair the damage, as directed by 9 CES/CEIE. Environmental violations from a regulatory agency that may arise as a result may become the responsibility of the operator

10.5. (Added) Swimming Restrictions: Swimming is prohibited on all lakes and streams. Wading is permitted while fishing or hunting waterfowl.

10.6 (Added) Use of metal detectors (with or without digging), and gold panning or gold mining are prohibited on Beale AFB.

11.7. (Added) Dumping of any material on base is prohibited. Construction and demolition debris, soil, asphalt, concrete, yard waste/green waste, and household garbage must be deposited in appropriate containers or hauled off base to an appropriate waste management facility. For information on appropriate disposal, contact 9 CES/CEIE.

12.6.2.1. (Added) Prescribed burns are conducted on Beale AFB to reduce abundance of undesirable plants base-wide, promote desirable and native forage species in rangelands, improve conditions for cattle grazing and reduce fuel loads for wildfires. The burn plan for Beale Air Force Base consists of burning most or all available grazing land at least once every seven years. Ungrazed lands may also be burned depending on time and staff availability of the Fire Department.

12.6.2.2. All burning and burn preparation will take place during the dry season (May-October) . In abnormal rain years, burning can be conducted outside this time period in two cases: 1) If little to no rain has occurred in November and wetland vegetation in the burn area has not germinated, burning may be accomplished at the discretion of the Natural Resource Manager, and 2) If rain has subsided early enough in the spring that all wetland vegetation in the burn area has senesced, burning may be accomplished at the discretion of the Natural Resource Manager. Burning will be conducted only on days that meet the following conditions: Winds will be no more than 5 Knots (6 MPH). Burning will not be conducted on state red flag days (wind, temperature and humidity makes conditions too severe to conduct burning). All prescribed burns will be coordinated in advance with the 9 CES Air Quality Manager (9 CES/CEIE, 4-2645).

12.6.2.3. Beale AFB Fire Department will be in command of all burns although other agencies may participate for training purposes (i.e. California Department of Forestry and other local fire departments).

12.6.2.4. (Added) Fire Prevention: Due to fire hazards on Beale AFB, prevention procedures will be in effect at all times. No one may start open fires without written approval of the base fire department (9 CES/CEF).

12.6.2.5. Appropriate ignition techniques (e.g. flanking fires, strip head fires) will be used to reduce the amount of smoke emitted during the burn operation. On the day of the burn, 9 CES/CEF will evaluate the atmospheric and weather conditions to ensure that they are consistent with good smoke dispersal. Burn dates will be coordinated through the Feather River Air Quality Management District by 9 CES Air Quality Manager in accordance with the air permit. No more than 200 acres will burn each day based on the Feather River Air Quality Management District Air Permit.

12.6.2.6 (Added) The prescribed burn program will be accomplished by annually burning approximately 1,500 acres. Sites will be chosen by the base Environmental Section (9 CES/CEIE) in coordination with the base Fire Department.

13.2.1. (Added) Undesirable plant species identified as priority for management are barbed goatgrass, tree of heaven, giant reed, yellow starthistle, Himalayan blackberry, medusahead, and vervain. Others may become a priority if they spread or become introduced.

13.3. (Added) Procedures will be developed to prevent introduction/re-introduction of invasive species. All sources confirmed or suspected shall be sealed off.

13.3.1. (Added) All invasive species shall be managed or eradicated using tested and approved environmentally friendly methods under a phased eradication program. Such methods may include (but not limited to) barriers, mechanical removal by hand pulling, mowing, burning, use of biological control agents, interference with the reproductive cycle, and herbicides.

13.6. (Added) Restoration. Executive Order 13112 requires federal agencies to provide for restoration of native species and habitat conditions in ecosystems that have been invaded. Without restoration, areas may become re-infested by the same or new invasive species. Under this plan, a selection of native species shall be planted in the formerly invaded habitats, and their establishment shall be consistently monitored.

14.2. OPLAN 91-212, Beale AFB California Bird Air Strike Hazard (BASH) Plan, and the Integrated natural Resources Management Plan detail the 9 RW policy for bird and wildlife hazard management.

Larry R. Broadwell
Colonel, USAF
Commander, 9th Reconnaissance Wing

Appendix G
Nest Boxes and Plans
and Monitoring Information



Unifying citizen and professional scientists to advance conservation of the American Kestrel

american
kestrel
partnership

a project of The Peregrine Fund

Monitoring Instructions

Updated 2017

1. Install nest boxes

*Look for open, grassy areas. Avoid heavy roads, places with pets, or similar disturbances. Avoid heavily forested areas. **Please only install nest boxes if you intend to monitor them.***

- Place nest box at least 8-10ft off the ground. Remember: safety first! If a nest box can't be safely accessed, it is not useful for monitoring. In the Northern Hemisphere, northern-facing nest boxes should be avoided when possible.
- Install nest boxes between August and January to increase the chances of use by kestrels in the spring.
- Assign nest box a unique ID, record nest box characteristics according to this data sheet (on back), and register the nest box on our website.

2. Monitor throughout spring and into summer

*Nesting begins at different times in different regions. In general, if you begin checking around early March (Northern Hemisphere) you should catch the entire nesting season. Disturbance is unlikely to cause nest abandonment once eggs are laid. (See Smallwood 2009) **It is illegal to touch or possess any part of an American Kestrel (including feathers and eggs) without proper permits.***

- **At minimum**, please monitor once there are eggs, and then check again within 30 days for nestlings.
- **Our preferred protocol is for partners to check nests once every other week beginning in early March.** Do not monitor more than once a week to avoid stressing the kestrels.
- If possible, take a digital photo of the nest box interior during each visit. Photos will provide you with back-up and verification in case data are lost or mixed up.

3. Enter your nest record and observation data into the AKP website

Please enter your data the same day you collect it whenever possible! Hard work collecting data in the field is often wasted by postponing entry of the data and then losing it.

- Login to your profile on kestrel.peregrinefund.org.
- Under the 'Research' tab, click **Nests** or **Observations** to enter nest record and observation data.

4. Maintain nest boxes

- In the fall or winter, repair nest boxes, scrape the insides clean with a putty knife, sweep out with a hand broom, and replace bedding.

For assistance with anything, see our FAQ, post questions to our discussion forum, or email us directly at: kestrelpartnership@peregrinefund.org

***** Zero is a valuable number *****

Monitor even if no kestrels use your box!

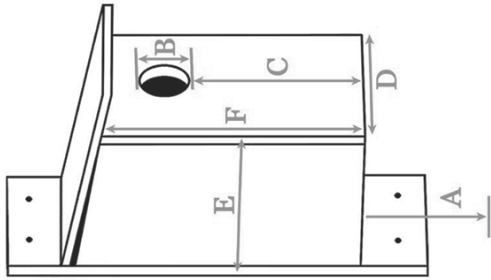
This is absolutely critical. We need to understand why kestrels use some boxes but not others, so from a data context, an empty box is just as important as an occupied one.

Visit us: kestrel.peregrinefund.org



Nestbox ID:

Data Sheet



Nestbox characteristics (required for box registration):

Geographic coordinates
or descriptive location:

Month/year installed:

Dimensions: in. or cm. (circle one)

A (height from ground):

B: C: D: E: F:

Mounting surface (pole, wall, etc.):

Type of interior bedding:

Entrance orientation (N, SE, etc.):

Interior cleaned annually? Yes / No

Type of predator deterrent, if using:

If possible, take a photo of box contents at each visit.

Visit	Date	Year	Time	# Kestrel Adults ¹	# Kestrel Eggs	#Kestrel Nestlings		Nestling age ²	Other species using box? ³			
						♂ Live	♀ Live		Dead	Yes/No	Species	Removed?
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

***** Zero is a valuable number! *** Record data during every visit, even if there is no activity at the box.**

¹Count only adults on, or flushed from, the nest.
²Approximate age of oldest nestling. Use Klucas and Rushludt's nestling aging guide, available under partnership documents at kestrel.peregrinefund.org
³Evidence of other species includes nest materials, eggs, chicks.

Reminder: It is illegal to touch or possess any part of an American Kestrel (including feathers and eggs) without proper permits.



American Kestrel Nest Box Plan

Art Gingert
PO Box 185
West Cornwall CT 06796

Updated Spring 2015



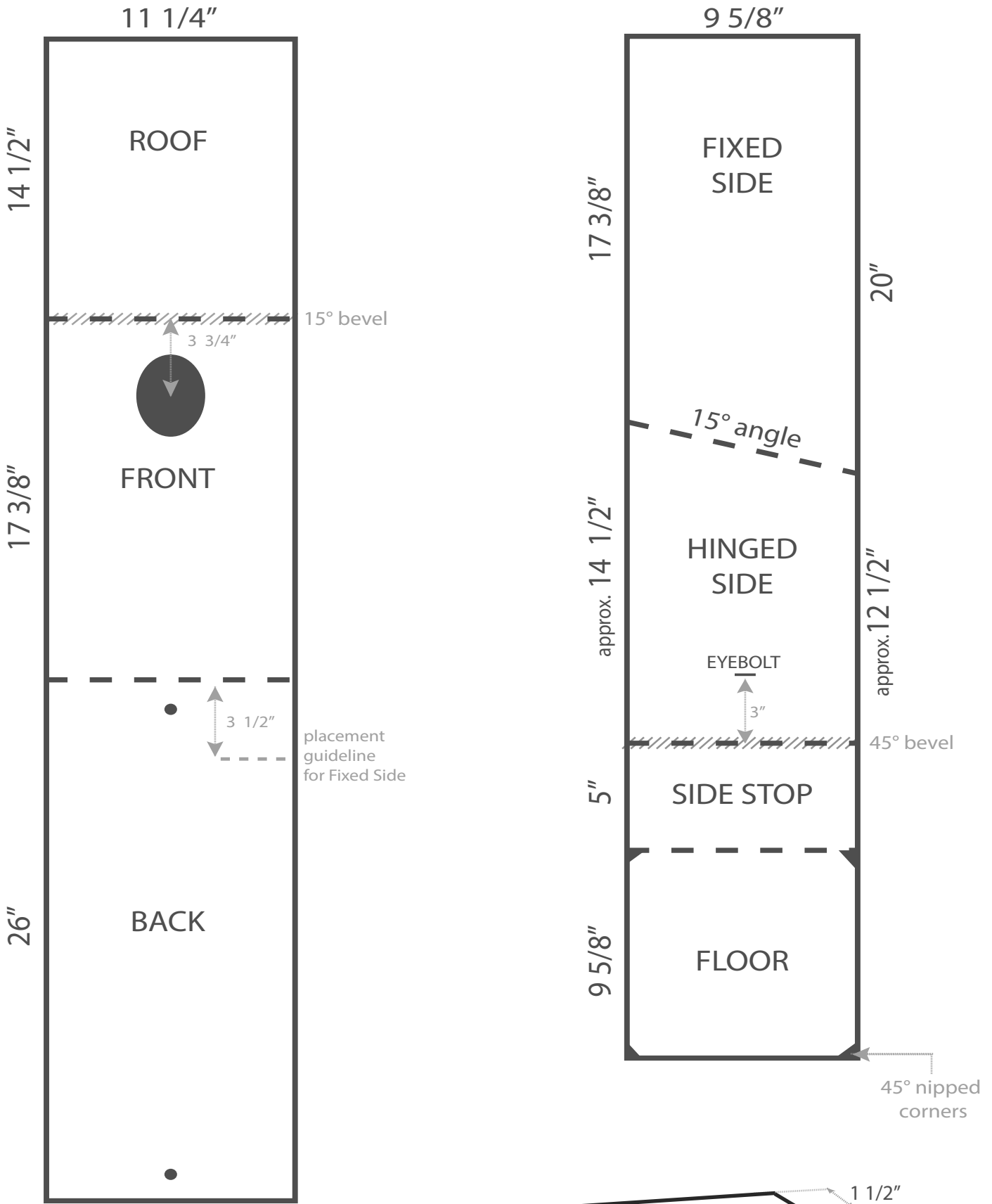
These plans for the construction of an American Kestrel (*Falco sparverius*) nest box are based on experience gained during more than thirty years of field work in northwest and north-central Connecticut (National Audubon Society and individually) with a now successful, well-established population of kestrels. It is hoped that the information will be used by raptor enthusiasts elsewhere who are interested in the welfare of this open country falcon, whose numbers continue to decline in several regions of North America.

Notes on Design

- The **side-opening design** of the nest box -- with fixed Side Stop -- serves a number of practical purposes. The box is much safer to monitor than if it were top-opening; wood shavings, eggs and nestlings are secure; and adult birds and nestlings are easier to capture for banding and research work.
- The **floor size** for this nest box design provides almost 93 square inches, which is close to 50% larger than the 8"x 8" floors recommended in the majority of American Kestrel nest box designs available in the literature or online. Having observed breeding kestrels using wood duck boxes in drained beaver swamps years ago, I realized that more living space was significantly advantageous for broods of five or six nestlings which spend up to a month in the nest boxes.
- Though a 3" diameter entrance hole is standard on many plans, a **3"x 4" vertical oval hole** provides more room for older nestlings looking outwards from the inside Perch, and may also offer a place for adult male pair-bonding display early in the breeding season.

Further notes regarding *Nest Box Sites and Installation* (choosing good American Kestrel breeding habitat, selecting ideal box locations, and options for safely erecting and monitoring a kestrel box) will be available. Good luck with your own efforts in assisting these beautiful raptors, and I welcome inquiries regarding wildlife management work with American Kestrels.

American Kestrel Nest Box Plan



free to distribute with credit to author

Art Gingert
PO Box 185
West Cornwall CT 06796

Notes on Materials

- A great choice for lumber is Type EWP, 1x12 “rough one side” white pine, which is not only easy to work with, lightweight and quite aesthetic, but also inexpensive. It is most often found in a thickness of 13/16”. Approximately 10’ of 1x12 EWP lumber is needed per box, allowing for minimal waste and avoidance of knots, cracks, etc. Average 2015 prices are \$1.50 per lineal foot. Cedar is also a good choice, but pricier, and oak, though durable, is heavier than needed. Avoid using 1” rough-cut sawmill pine, which is much harder to work with and creates a heavy, unwieldy nest box which can be unsafe to deal with during installation on post, tree, or building.
- For fasteners, Torx-head GRK screws (2” x #8 **Trimhead type) are superb. They are strong, easy to use with a cordless drill, look good, and most importantly, they will not split the lumber near the ends of pieces (which may happen with standard GRKs, decking screws or nails). Approximately 35 screws per box.
- The use of a light bead of high quality PL Premium construction adhesive on all joined edges guarantees a strong, weatherproof nest box with tight joints.
- Do not paint or otherwise treat with a wood preservative. The EWP pine will weather to a warm gray color naturally and last in all weathers and seasons for several decades, if well constructed.
- Approximate cost for lumber & hardware materials is \$ 20.00 per nest box, at 2015 prices.

Assembly Sequence:

1. Attach Back to Fixed Side, then secure Floor to Back and Fixed Side.
2. Attach Front (with oval entrance hole and inside Perch) to Fixed Side and Floor.
3. Attach Roof to Fixed Side, Front and Back.
4. Cut 45° bevel across Hinged Side, check fit, and secure Side Stop to Back, Front and Floor.
5. Finally, attach Hinged Side using hinge nails.



©Art Gingert/Wildlands Photography

Construction Notes

- Quality carpentry in construction is important for many reasons -- for durability, appearance, weather “tightness” and ultimately the safety of the bird species which may use the box.
- A miter or radial arm saw is quite useful for cutting out nest box pieces, especially for the bevel and angle cuts, and for incidental trimming. Use a table saw to trim some of the 1x12 EWP boards to 9 5/8” as needed (see Nest Box Plan).
- If a number of boxes are needed, it is helpful to make a “jig” with support rails to assist in securing the Back of the box to the Fixed Side, which is the first step in construction. Drawing a short guideline 3 1/2” down from the top of the Back is helpful for positioning these two pieces, which ensures adequate space (2 1/2”) at the top and bottom of the Back for the lag screws used when mounting the box. The Fixed Side can be installed on either the right or left side of the nest box, depending on the terrain at a prospective site or personal preference when monitoring.
- The Floor piece is inset upwards 1/8” in order to keep rainwater from seeping into the joints. Be sure to test the fit of this piece against the two sides, for both width and depth, since it may need to be trimmed slightly. Nip off small 3/8” sided triangles from each corner before securing the Floor. This ensures that however the box is mounted, any rainwater entering the box will find its way out at the lowest corner and drainage hole.
- A pattern can be made for the 3” x 4” oval entrance hole from wood, cardboard or plastic. A jigsaw can be used to cut out the oval, and 80 grit sandpaper wrapped around a 1” diameter dowel works well as a tool for smoothing the raw edges.
- A small Perch piece is very useful, secured horizontally inside the box, centered 2” below the base of the entrance hole. A bead of construction adhesive on the Perch helps it stay in place while the Front is turned over, braced, and the Perch screwed in place from the outside (using 2 screws, approximately 8” down from the roof, and 4” in from each side of box).
- When securing the Front, carefully align it with the Fixed Side. Trim bottom edge of Front if necessary.
- Cut the 45° bevel across the Hinged Side, with the cut edge of the upper part overlapping the lower part (shingle-like). Check for good fit with both pieces, leaving a 3/8” space below the top edge of the Front to allow for “hinging” & ventilation. If the Hinged Side is tight and needs trimming along one of its vertical edges, use a pencil with one’s hand inside the entrance hole to mark it. One can also trim the lower edge of the Side Stop if needed. Secure the Side Stop piece to the Front, Back and Floor. ** It is helpful to drill small-diameter pilot holes before installing two or three screws to attach the Side Stop to the Floor. This usually prevents any splitting of the Side Stop as drying occurs over time. (Alternately, the Side Stop can be made from an additional piece of wood, orienting the grain so it is perpendicular to that of the Hinged Side.)
- The “hinge nails” for the Hinged Side are placed exactly in line with each other – use a combination square to mark the locations. Start with a mark for the nail on the Front, 2” down from the top. Use a thin wood shim to hold the Hinged Side exactly in place, and a thin drill bit to make pilot holes for two 8 penny galvanized common nails before hammering them home in turn.

- Select a clear piece of wood when cutting out the Roof -- or one with few imperfections -- which will help with durability. The Roof is best secured by working from the back of the box. Apply a thick bead of construction adhesive to the beveled edge of the Roof and use some force to squeeze the Roof tightly against the Back, creating a totally weatherproof seal which is quite durable in the field. A high quality caulk (like clear Lexel) could also be used with this step. Start by securing the Roof to the Fixed Side, and then to the Front. Make sure to put several screws through the Back and into the rear edge of the Roof to ensure a tight, waterproof joint.
- A 5/16" x 2 1/2" zinc-plated (or stainless steel) eye bolt (Stanley Tool Co. #N221-150) provides a strong purchase for opening the Hinged Side, which may be tight in humid weather. Secure the eye bolt with a flat washer and lock nut on the inside of the Hinged Side, 3" up from the bevel cut. A 1 1/4" wooden cabinet knob is a nice-looking alternative, though it can dry out and split over time.
- To fasten the Hinged Side securely, one can use two 1 1/4" galvanized Screen & Storm series Half-Turn Buttons (Stanley Tool Co. #38-0010) at the top of the Side Stop, each placed 2" in from the edges of the box.
- Mark locations for two, 5/16" box mounting holes at the top and bottom of the Back piece – centered, and 1 1/2" in from the edges – and drill them. It is suggested that two 5/16" x 3 1/2" galvanized lag screws and washers be used for mounting (use shorter lags for utility poles or barn sides).
- A single 8 penny galvanized common nail (use thin pilot hole) can be driven into the lower edge of the Back piece, near the base of the Fixed Side. Leaving only 1/2" of the nailhead showing provides a very useful place to hang a small bucket (or stuff sack filled with wood shavings) when visiting the nest box for monitoring purposes.
- As the last step in assembly, either PL Premium construction adhesive or clear Lexel caulk can be used to seal any exposed end grain. This is very effective in limiting weathering in these susceptible areas, and will measurably extend the life of the nest box. Thin latex or vinyl gloves can be worn while using a 1" wide putty knife (or fingers) to apply and spread a protective coating on the following:
 - Top and bottom edges of Back and front edge of Roof
 - Bottom edges of Front and Fixed Side
 - Top and bottom edges of the Hinged Side and Side Stop

It is also a good practice to seal the exposed edges of the entrance hole, where splitting can occur. Making a quick swipe with the sealant over any knots or small cracks is also recommended.

- Using EWP pine lumber and GRK Trimhead screws, the completed nest box will weigh 12 to 13 pounds.
- The name or identifying logo of a sponsoring organization can be applied to the Fixed Side of the box if desired.

Barn Owl Nest Box

Original Design by Steve Simmons

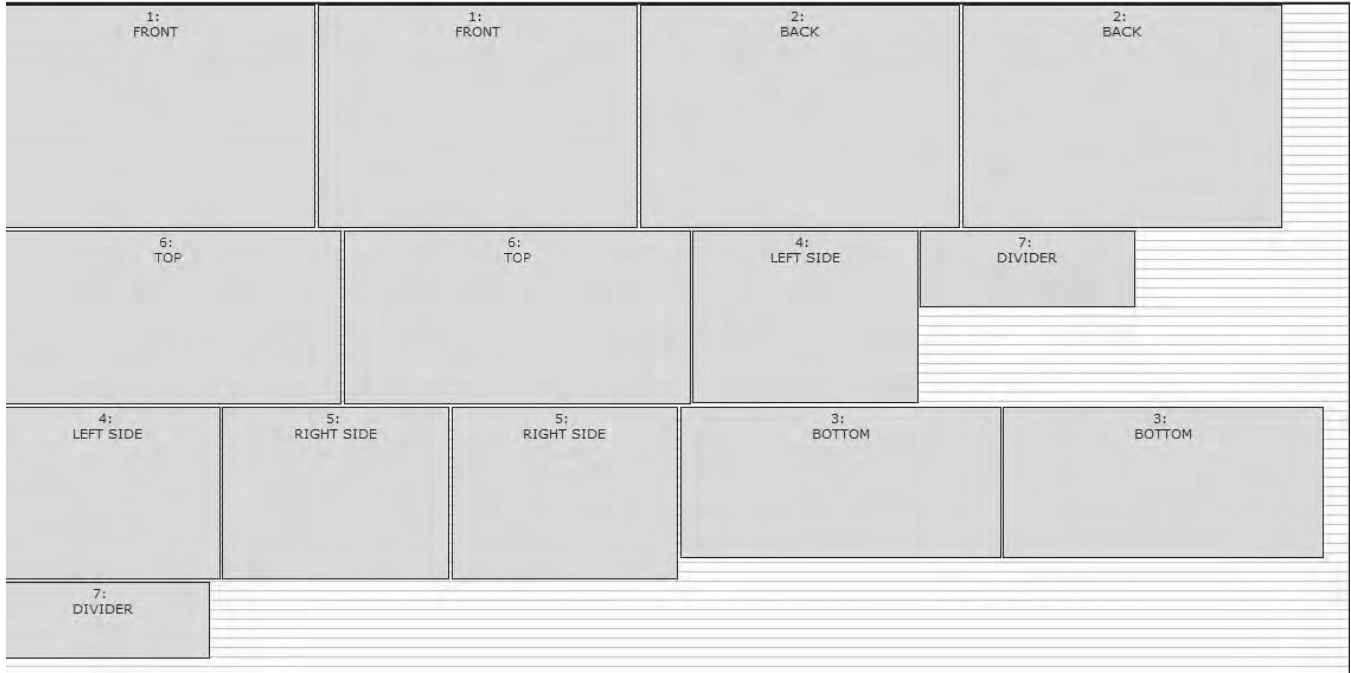
[View detailed instructions](#)



Materials List to Build Two Nest Boxes

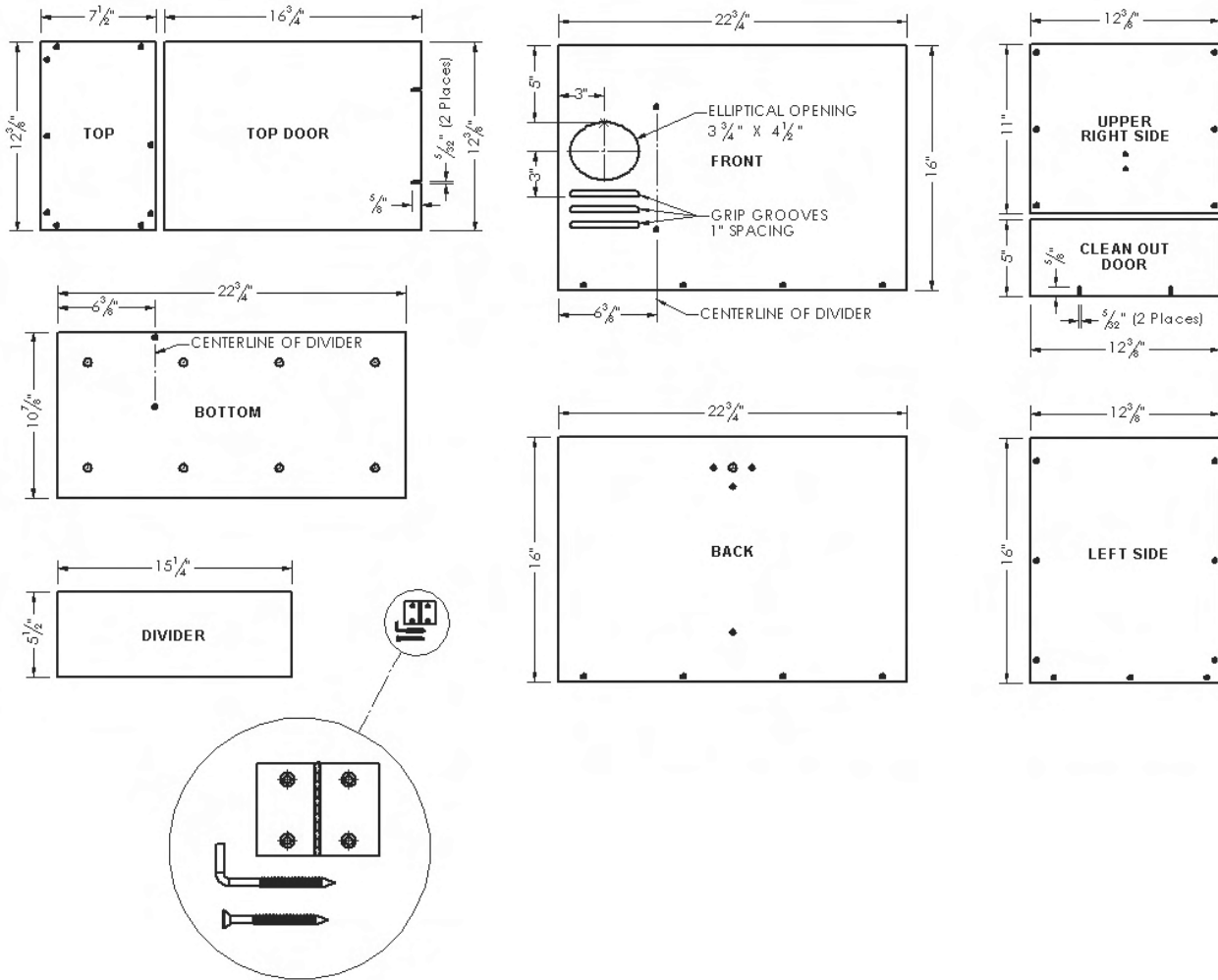
- 1 sheet 3/4" x 4' x 8' exterior grade plywood
- 68 each 1 5/8" #8 Deck Screws
- 8 each 1 3/4" long L-Screws (sometimes called right angle screws or square bend screw hooks)
- 4 pair 1.5" x 1.5" nickel plated, non-removable pin hinges with screws
- Exterior grade glue such as Titebond II or Titebond III
- 2 each 1/2" wide metal glue brushes (typically sold as flux brushes).

Cutlist for Two Nest Boxes

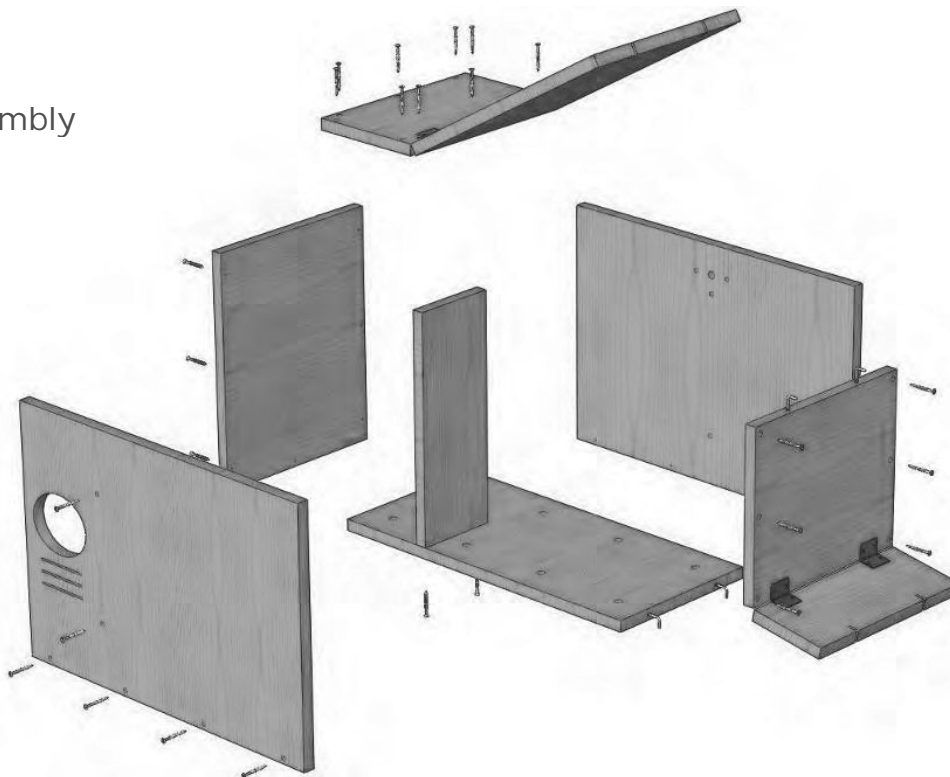


The **Cornell** Lab 
NestWatch
 Report your nesting birds to
NestWatch.org

Parts for One Nest Box



Assembly

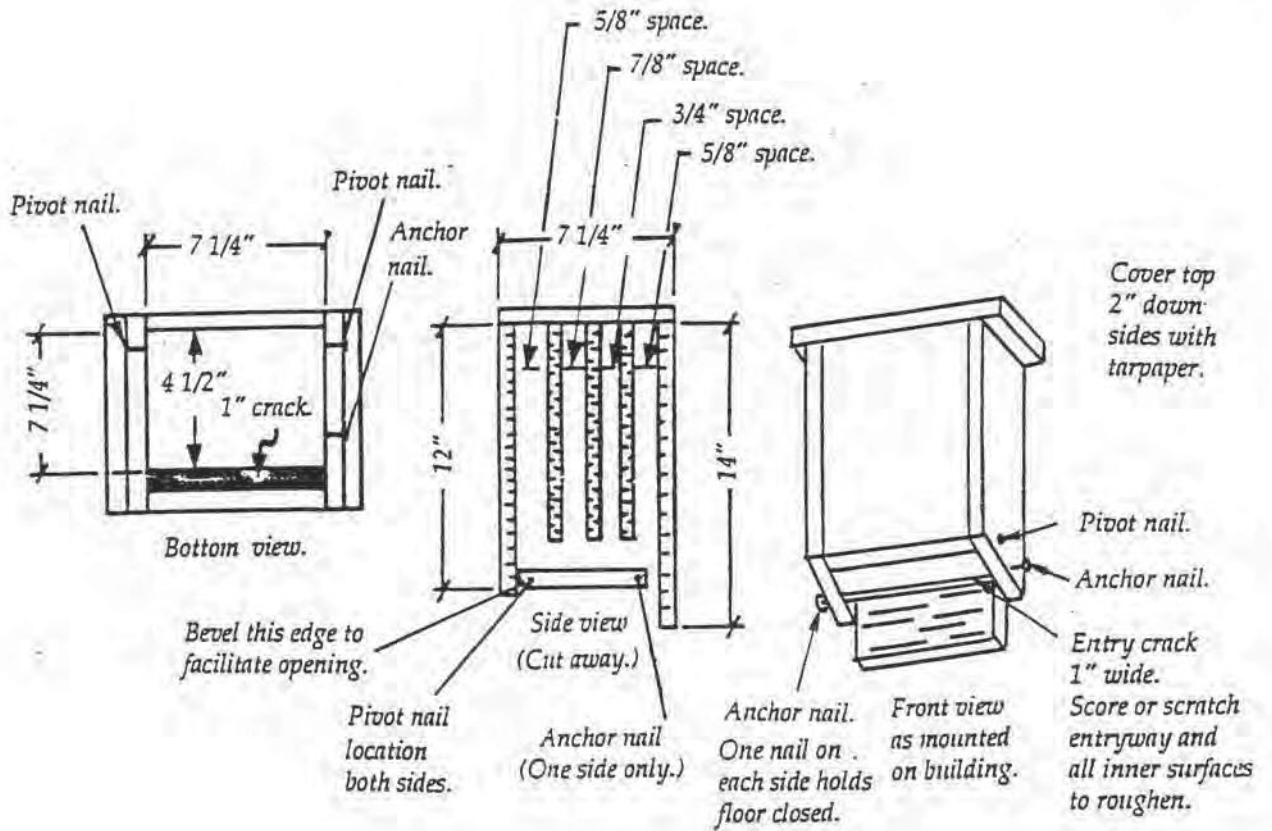


The **Cornell** Lab
NestWatch
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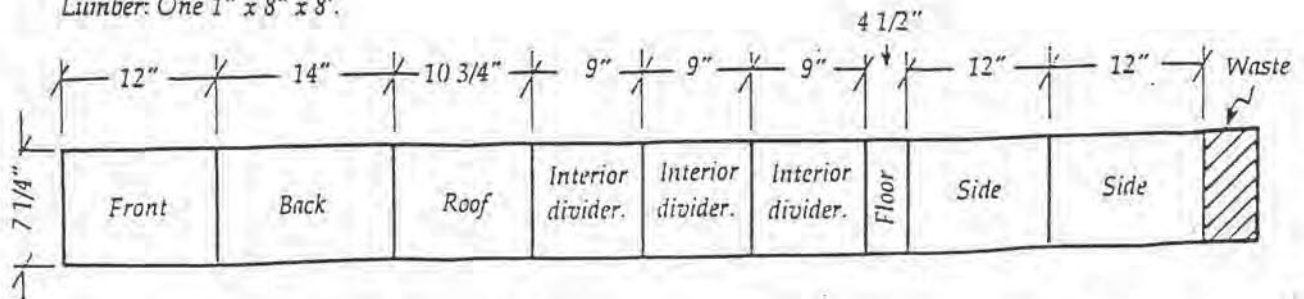
Appendix G3. Bat Box Plans

Specifications for a Small Bat House

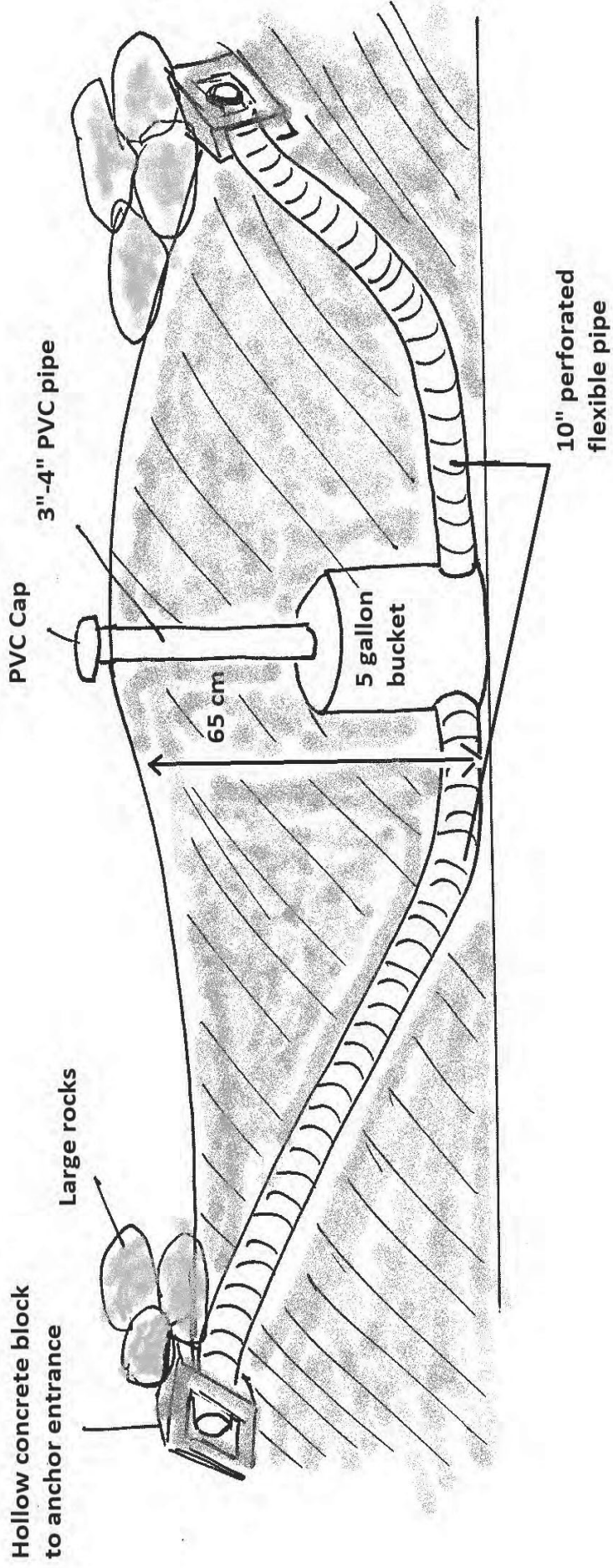
Figure 10
Small Bat House

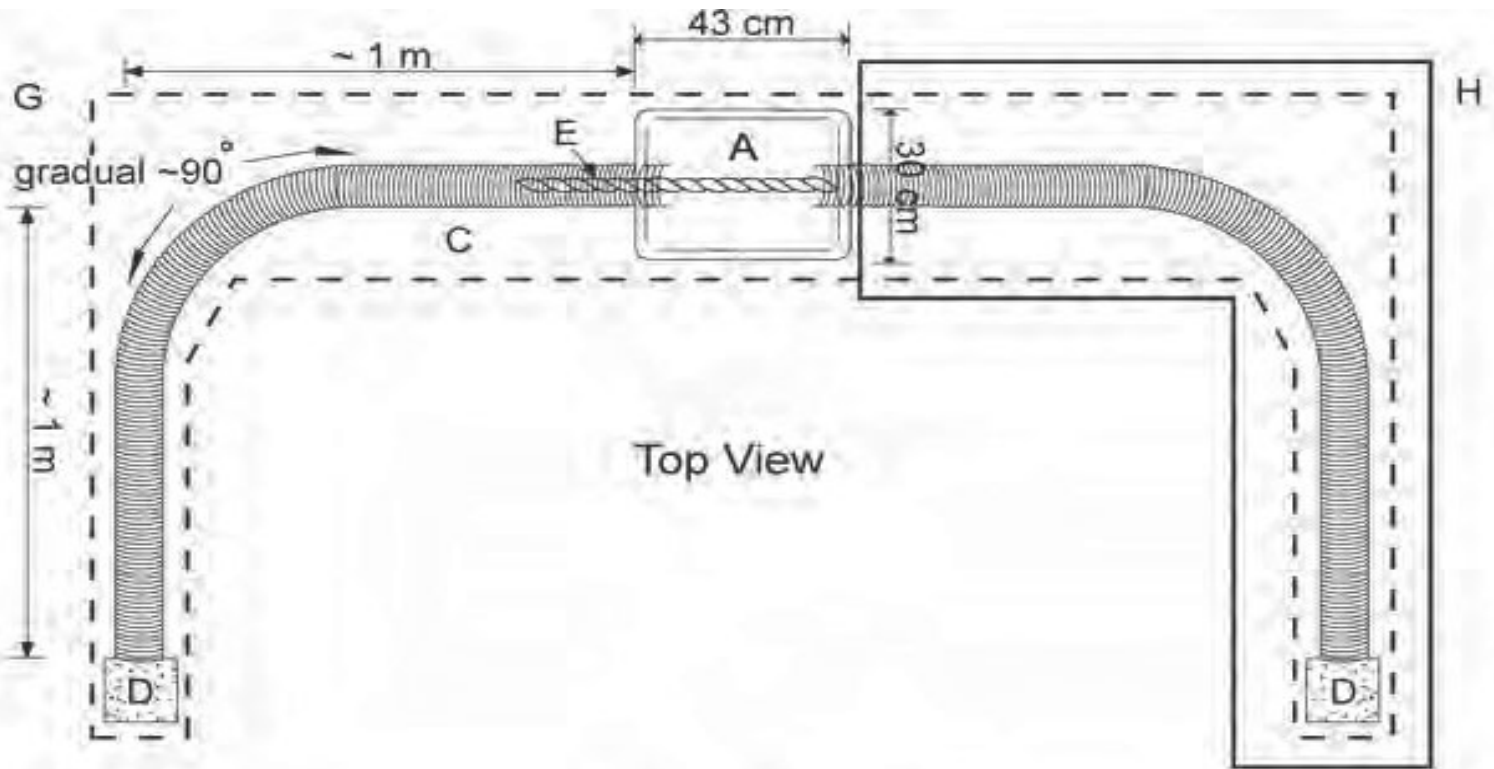


Lumber: One 1" x 8" x 8'.

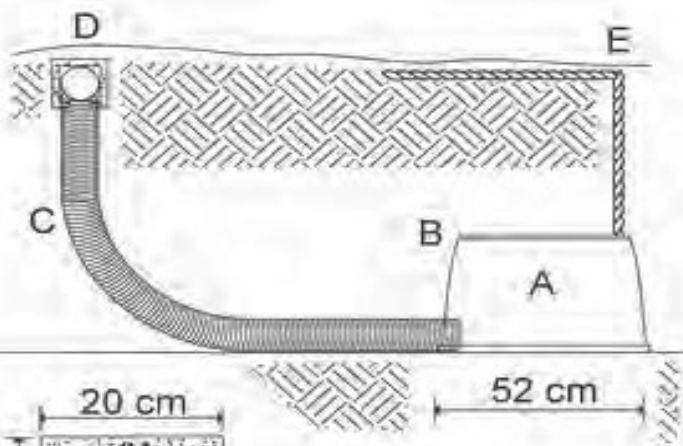


Artificial Burrow Design with Monitoring Pipe

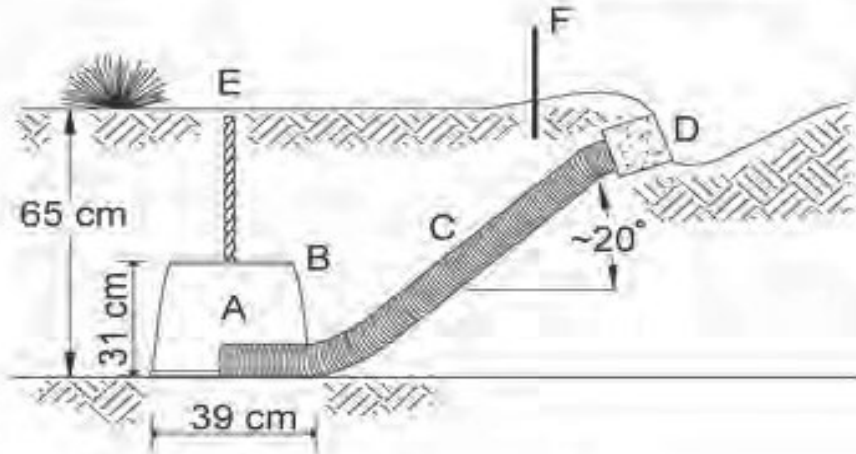




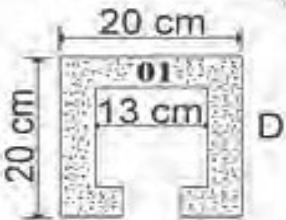
Top View



Front View



Side View



- A - Plastic irrigation valve box, 48 cm long x 35 cm wide x 27 cm high (inside dimensions)
- B - Removable lid
- C - Ca. 2 m of 10-cm diameter perforated flexible plastic pipe
- D - 20 x 20 x 15 cm hollow concrete block
- E - Plastic rope or chain marking location of nest chamber on ground surface
- F - 0.5 m perch post (optional)
- G - Excavation footprint for installation - - -
- H - Optional second entrance



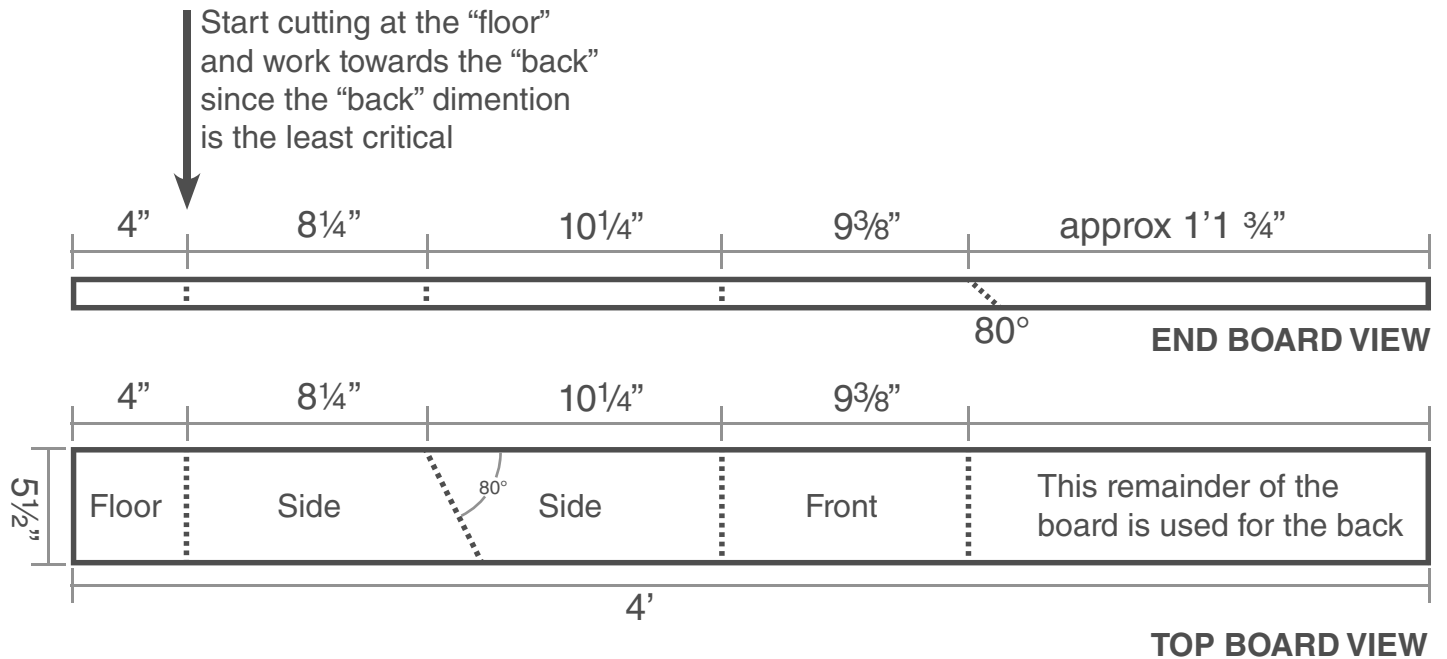
This Document provide by
North American Bluebird Society
 www.nabluebirdsociety.com

Eastern or Western Bluebird Nestbox

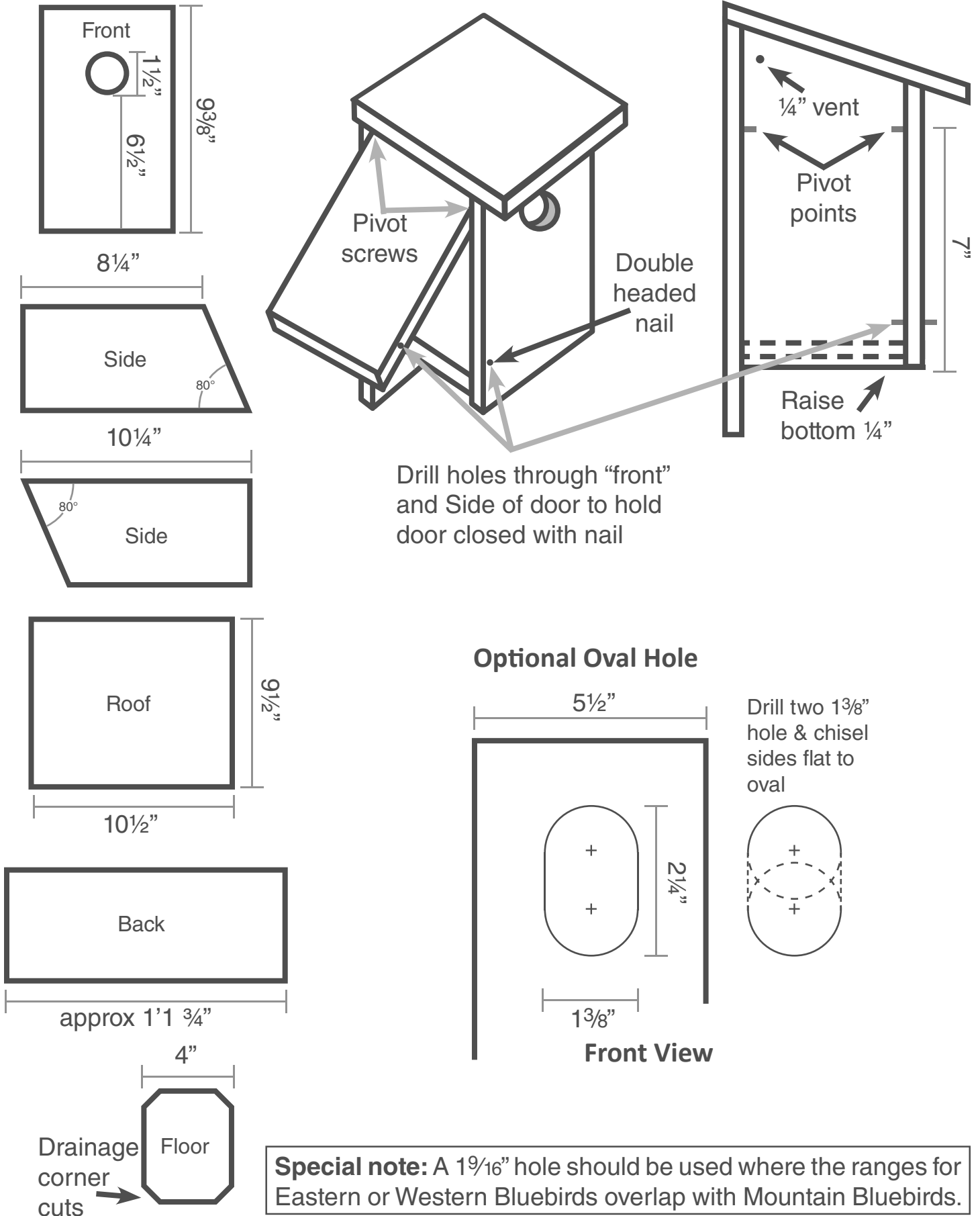
MATERIALS LIST

- Standard board 1" x 6" x 4' long
- Standard Board 1" x 10" x 10 1/2" long (for roof)
- 1-3/4" galvanized nails or screws - approx. 20
- 1-3/4" galvanized screw or nail for pivot point - 2
- Double-headed nail for holding door closed - 1

Board Diagram



Construction Plan



NABS Factsheet

Monitoring Bluebird Nestboxes

WHY MONITOR YOUR NESTBOX?

It is very important that bluebird nestboxes be actively monitored (checked) at least once a week. Bluebirds are tolerant of humans, and will not abandon a nestbox that is properly monitored. All bluebird boxes should be built so that they can be opened either from the side, front, or top.

A box that is not monitored may do more harm to bluebirds than good. Monitoring increases the chances of success for bluebirds using the box. When good records are kept, it is also valuable for determining population trends.

Monitoring nestboxes will alert you to problems birds may be having with predators and competitors. **House Sparrows** (sometimes called English Sparrows) and **European Starlings** are non-native species introduced from Europe. Their aggressive seizure of cavity nest sites is a primary reason for declines in bluebird populations. Starlings nest in many of the natural nest sites but can be excluded from nestboxes by using $1\frac{1}{2}$ or $1\frac{3}{8}$ inch entrance holes. House Sparrows are smaller, so they can readily enter bluebird nestboxes. They frequently kill adult and nestling bluebirds, destroy their eggs, or drive them from their nests. At no time should they be allowed to successfully nest in bluebird boxes. Doing so will increase the House Sparrow population and further reduce the number of bluebirds. See the NABS factsheet on [House Sparrow Control](#) (available on our website at www.nabluebirdsociety.org/bluebirdfacts.htm).



David Kinneer

A **paper wasp** or **mouse** nest will drive nesting birds away from the box, and should be removed. Take appropriate precautions to avoid breathing the dust from a mouse nest.

Knowing what species is using the box is also beneficial. Bluebird societies would like you to monitor and report all species using your nestboxes, not just bluebirds. Tree Swallows, titmice, chickadees, Carolina and House Wrens and nuthatches are all native, beneficial birds. Remember: It is illegal to remove an active nest of any *native* cavity-nesting bird. Keeping records on a weekly basis, and sending survey forms in at the end of the nesting season increases our knowledge of cavity-nesting birds.



Bet Zimmerman

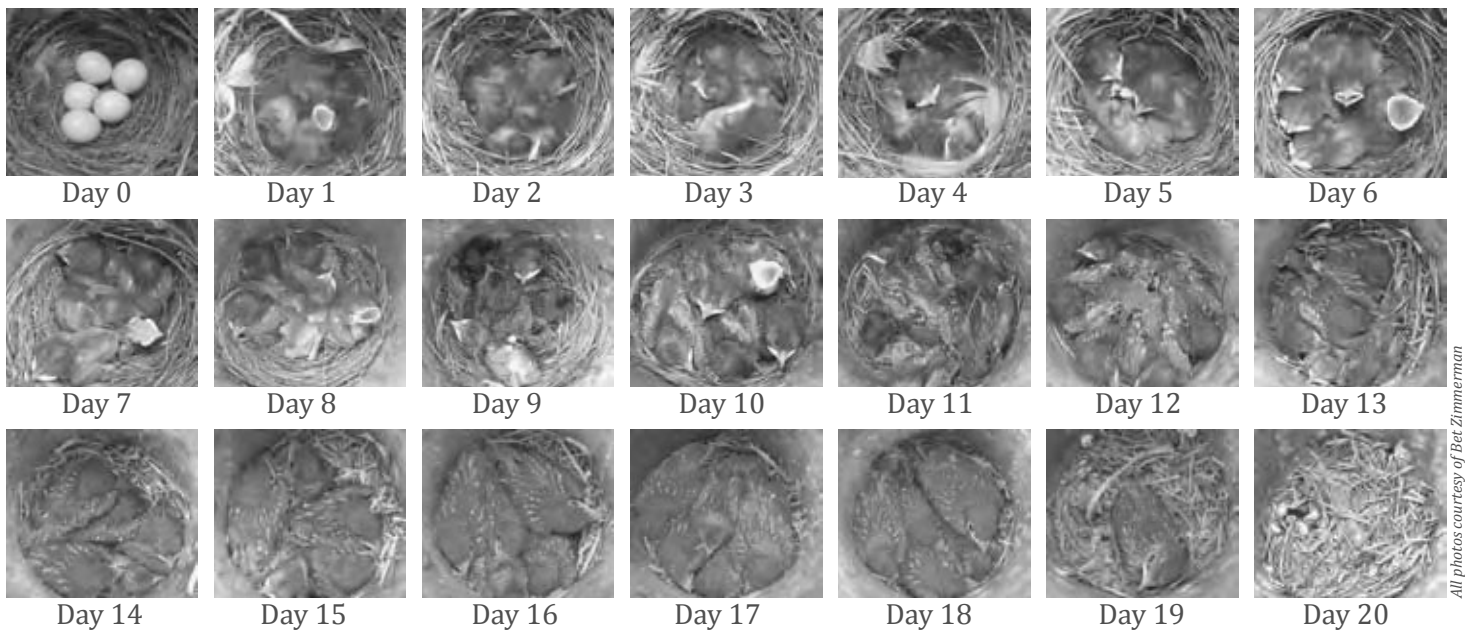
After any nesting effort has ended, either due to nest failure or successful fledging of the young, remove the used nest from the box. When a bluebird nest is successful, re-nesting in the same box may be encouraged if the first nest is removed. This can be done as soon as all chicks have left the nest. Females usually build a new nest.

WHAT TO MONITOR

When you monitor a box, determine which species is using it by examining nesting material and eggs. Record the date and the number of eggs or young observed. Knowing when the eggs were laid will help you determine if they are infertile, or when they should hatch and when the young would be expected to leave the nest. In the case of most cavity nesters, one egg is laid one each day until the entire clutch is complete. Incubation will then begin. For bluebirds, incubation typically lasts approximately 12–14 days. After hatching, the chicks will remain in the nest for about 17–21 days. Your monitoring should be limited to viewing from a distance after the 12–13th day, or the chicks might jump or fly from the box prematurely.



Eastern Bluebird Daily Growth



All photos courtesy of Bet Zimmerman

HOW TO MONITOR

Nest monitoring should only be done during calm, mild, and dry weather conditions to reduce the chance of chilling chicks or eggs. Open the nestbox carefully, and do not to allow the eggs to fall out or chicks to jump out. Songbirds have a poor sense of smell and will not abandon the nest due to monitoring the nest, eggs, or chicks. Even so, you should avoid touching eggs or nestlings.

Complete monitoring as quickly and quietly as possible to minimize disturbance. Avoid disposing of used nest material near the nest site as it may attract predators—instead put it in a paper or plastic bag and dispose of it in the trash far from the nestbox. Always be certain to close the box door securely before leaving. Record what you observed.

HOW TO IDENTIFY NESTS AND EGGS BY SPECIES

Bluebird: The 1–4 inch tall, relatively neat nest is built with fine grasses or pine needles with a fairly deep nest cup. Eggs (4–6) are powder blue or occasionally white. Mountain and Western Bluebird nests may contain bits of trash or feathers.



Bet Zimmerman



Marion Ball

Bet Zimmerman



Jim Williams

Eastern Bluebirds



George Gentry - USFWS

Western Bluebirds



Alan & Elaine Wilson

Mountain Bluebirds



Tree and Violet-green Swallow: Their nest is also made of grasses but they may use somewhat coarser fibers than a bluebird. It generally has a flatter cup than the bluebird's and is usually lined with many feathers. Eggs (5–7) are white, pointy on one end, and smaller than those of a bluebird.



Jim Williams



Bet Zimmerman



Marion Ball

Tree Swallows

House Wren: House Wrens fill a nestbox with sticks and then line the deep nest cup with fine plant fibers or feathers. “Dummy nests” without the nest cup are often built in other cavities within the male House Wren’s territory to reduce competition for resources. The tiny eggs (6–8) are glossy white/tan, heavily speckled with pinkish-brown spots.



David Mitchell



Bet Zimmerman



Marion Ball

Chickadee: Chickadees build a nest of moss and plant down, with a small, deep nest cup lined with hair, fur or plant down. They lay 5–8 white or cream non-glossy, tiny eggs that are covered with reddish-brown speckles. Eggs are often covered with a plug of hair or fur when the female leaves the box.



Marion Ball



Marion Ball



Marion Ball

House Sparrow: House Sparrows build a tall, sloppy nest of coarse grasses (usually with seed heads), often with feathers and pieces of scrap paper, cloth, cellophane, or other garbage. The nest in a large box or in the open forms a canopy with a tunnel-like entrance. The 5–7 cream- or greenish-colored, non-glossy eggs have heavy brown markings.



Adam Kumsisza

J.M. Garg



Bet Zimmerman



Bet Zimmerman



Tufted Titmouse: The nest of moss, fur, and soft plant fibers is similar to that of chickadees; may be made primarily of crumpled dried leaves with grass, also bits of snakeskin, cellophane, and bark strips. The cup may be padded with hair, fur, bits of string, or cloth. The eggs are similar to the House Wren's but larger and less heavily marked.



Ken Thomas

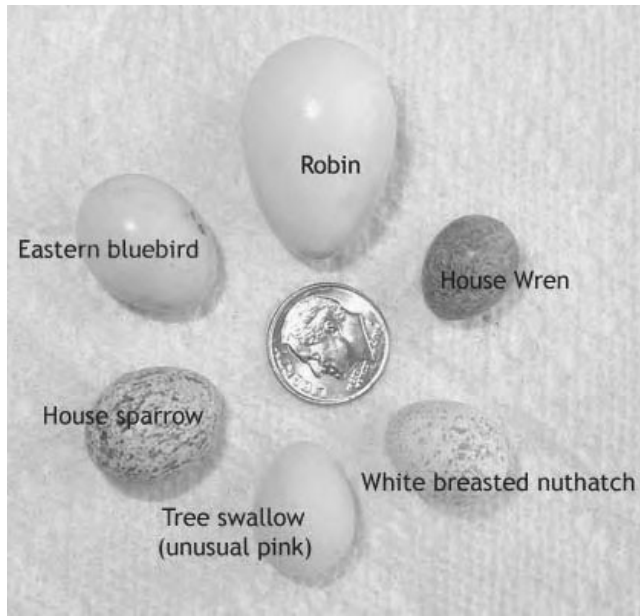


Bet Zimmerman



Bet Zimmerman

Some Common Cavity-Nester Eggs

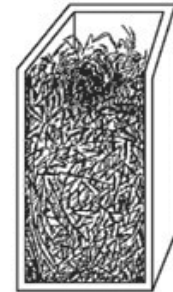


Bet Zimmerman

Cutaway Views of Nestboxes



Eastern Bluebird nest



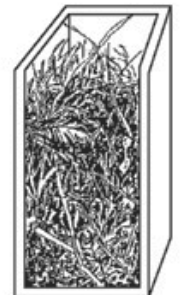
House Wren nest



Tree Swallow nest



Carolina Chickadee nest



House Sparrow nest

Other nests sometimes found in bluebird nestboxes (depending on the area) include those of Ash-throated Flycatchers, Bewick's Wrens, Carolina Wrens, Eurasian Tree Sparrows, Great Crested Flycatchers, House Finches, nuthatches, titmice, and Prothonotary Warblers.

Revised May 2012

The North American Bluebird Society, Inc. is a non-profit education, conservation, and research organization that promotes the recovery of bluebirds and other native cavity-nesting bird species in North America.

www.nabluebirdsociety.org



Bluebird Nest Box Monitoring Sheet page 2 of 2
 Notes Continued

Box #	Notes

Data Codes

Nest Status Codes	Young Status Codes	Adult Activity Codes
NO No nest	NO No young present	NO No adults seen or heard
AN New avian nest found	HY Hatching young	AA At/on nest, then flushed from nest
CN Completed nest	NY Naked young	BA Building nest or carrying materials
DN Damaged nest	PY Partially feathered young	DA Dead adult
FN Flattened nest	FY Feathered young	FA Feeding young at nest
IN Incomplete nest	VY Vocal young, heard only	RA Remained on nest
NN Non-avian nest	Management Codes	VA Remained in vicinity
RN Nest removed, remover unknown	NO No management activity	
General	AM Avian competitor nest/eggs/young removed	
L Live	BM Banded adults or young at nest	
D Dead	EM Unhatched host eggs removed	
Brood # 1 st , 2 nd or 3 rd nesting attempt in this box	NM Nest box management	
	PM Pest management	

For data entry and additional info visit: <https://nestwatch.org/>



WOOD DUCK NEST BOX CARD INSTRUCTIONS

Proper data collection and recording is an important aspect of the California Wood Duck Program. Information concerning box use and reproductive success is important for wood duck management and provides valuable feed back about box placement. These data also provide insight into the biology of western wood ducks.

Nest box cards provide a simple and organized means to record data. Cards also insure consistent data between project locations and among program participants, making data summaries and comparisons feasible. These cards contain two sections: project information and maintenance records. It is extremely important that all project information spaces are filled in for every card. Each card should contain information for one box and cover one nesting season.

The following data recording guidelines are provided to insure consistency by clarifying potentially confusing areas. Headings correspond to those used on cards.

PROJECT INFORMATION

Project Number: This is the five digit number assigned to your project. All information regarding your project will be cross referenced using this number.

If you are unsure of your number, or have not been assigned a number, call the California Waterfowl office (916) 648-1406.

Landowner / Property: Provide the landowner or property name. If your project is on public land, provide us with the appropriate and descriptive name possible (eg. Pyramid Cove/Lake Sponsa). Also, please indicate if the land is government affiliated (ie., BLM, USFWS, etc.)

Project Name: Invent a project name or simply use the landowner's (or your) last name (eg. Smith Wood Duck Project). Most importantly, be consistent from one year to the next. Provide CWA with a general map of the area, and a more detailed map that identifies the project location (eg. Photocopy of the area on 7.5 quad topo map).

Contact Name: Provide the name of the individual who coordinates data collection for the project. **Contact Phone:** Home and work phone number of the coordinator. If you have an e-mail address, provide this in addition to phone numbers.

Mount Type: This is self explanatory. Whether it is “on land” or “over water” depends on where the base of the tree or pole is, not whether the box hangs over land or water.

Type of Water Nearby: Ditches or canals refer to artificial waterways developed for agriculture or other purposes. Rivers and streams (also include sloughs) are free flowing, but may have been channelized and/or leveed.

Box Number: Each box should have a unique number and its own nest card. If a box relocated for some reason, clearly indicate it in the ‘maintenance records’ section of the old box card and begin a new card. It is important to use a new card because habitat information will likely change when the box is moved.

Date Box Established: The date the box was installed, or the date the box was moved to a new location (start a new card when box is moved).

Box Height: Distance (in feet) from box to ground/water directly below box.

Distance to Water: Distance (in feet) from point directly under box to nearest water. If the box is located over water this measurement is zero (“0”).

MAINTENANCE RECORDS

Observer: This should be the person looking in the box, not the person taking notes. Use full name for first entry and initials thereafter.

Date: Use month/ day / year.

Time: Be sure to indicate AM or PM.

Species: Use this column to record any wildlife (bees and mammals too) found in boxes during box checks. If eggs 2 bird species are present (eg. woodies and starlings), divide the row for that date in half and record data for each species (see sample card). Be sure to record the outcome of non-wood duck nests in the comments section (eg. Hatched, starling eggs removed, etc.)

Hen Status: Enter the status code from the key on the bottom of the card. Be sure to check for bands on dead hens. Record the band number for live and dead hens in the comments section.

Number of Eggs: Record number of whole, hatched, and predated eggs in the box and then total the amount. Missing eggs (before the hatched date) are considered predated.

The presence of flattened shell membranes is the best evidence that eggs hatched. The number of eggs hatched is equal to the number of eggs present the previous box check (assuming a full clutch was present) minus the number of whole eggs (dead/infertile) found. If the last egg count occurred before laying was complete, count the number of membranes to determine the number hatched.

Box Status: Enter status code from the key at the bottom of the card. There is often confusion about differentiating between an abandoned nest and a nest with a hen on recess. Wood duck hens typically take 2 nest recesses; one in the early morning (before 8:00 am) and another in the afternoon (after 3:00pm). Afternoon recess times are highly variable. Egg temperature and time of day are the best ways to differentiate. If eggs are warm and down feathers cover them, she is likely on a recess. If eggs are cold, the nest is likely abandoned.

Number of Dead Ducklings: Record the number of dead ducklings found.

Comments: Use this space to record any comments that may be useful to interpret data. This space should also be used to record band numbers if you are banding or recapture previously banded hens. Be sure to indicate it is a recaptured bird by writing “recap” next to the band number. Nest box maintenance (eg. Lid needed, shavings replaced) should also be documented in this section. Use the back of the card if necessary (include the date with your comments).

**Last, but not least please print clearly.
Non-legible data is lost data!**

Thank you for your efforts!

California Wood Duck Program - Nest Box Card

PROJECT # YEAR

LANDOWNER/PROPERTY _____

PROJECT NAME _____

CONTACT NAME _____

CONTACT PHONE # () _____

Box placement same as last year

MOUNT TYPE TYPE OF WATER

GPS COORDINATE _____ N _____ W _____

BOX # _____

(1) tree on land (1) ditch/canal DATE BOX ESTABLISHED _____

(2) pole on land (2) permanent pond/lake BOX HEIGHT _____

(3) tree over water (3) river/stream DISTANCE TO WATER _____

(4) pole over water (4) temporary pond/marsh PREDATOR GUARD? Y / N

MAINTENANCE/MONITORING RECORDS

OBSERVER	DATE	TIME (AM/PM)	SPECIES	HEN STATUS (See Below)	NUMBER OF EGGS			BOX STATUS (See Below)	# DEAD DUCKLINGS	COMMENTS
					Whole	Hatch	Depredated or Missing			

- | | |
|---|--|
| Hen Status
1) Present/not flushed
2) Present/flushed
3) Present/captured
4) Absent
5) Found Dead
6) Other (see comments) | Box Status
1) Normal/no activity
2) Normal/nest present
3) Nest depredated
4) Hatched
5) Nest abandoned
6) Unsuccessful nest removed
7) Other (see comments) |
|---|--|

Wood Duck Nest Box Summary

Project Number: _____ - _____ - _____ Project Name: _____ Year: _____

Data Summarized By: _____ Phone: _____

Address: _____ City: _____ State: _____ Zip: _____

Box Number	Nest Number	Species	Eggs Laid	Eggs Hatched	Nest Fate/Comments
SUB-TOTAL					

Project Number: _____ - _____ - _____

Year: _____

Box Number	Nest Number	Species	Eggs Laid	Eggs Hatched	Nest Fate/Comments
SUB-TOTAL					

Project Number: _____ - _____ - _____

Year: _____

Box Number	Nest Number	Species	Eggs Laid	Eggs Hatched	Nest Fate/Comments
SUB-TOTAL					

GRAND TOTAL					
--------------------	--	--	--	--	--

Boxes available: _____ **Boxes used (all wildlife):** _____ **Boxes used by wood ducks:** _____

SUPPLIES TO BUILD & INSTALL NEST BOXES

Box Building Supplies:

1. 5/8" exterior plywood (preferred) 1/2" is a little too weak and 3/4" is too heavy
see other wood options below
2. #6~1-5/8" exterior galvanized screws (to assemble boxes)
3. #6~1-1/4" exterior galvanized screws (to attach the cleats to the underside of the lids)
4. Exterior wood glue (any good brand name will work)
5. Black spray paint for CWA stencil on front of box
6. Power drills, drills, hammers, gloves, goggles, and work tables would be helpful.

*Other acceptable types of wood that can be used are redwood, cedar & cyprus; these will make long lasting boxes, but can be expensive. Exterior plywood is cost effective and will last 15+ years. A pneumatic staple gun and staples can be handy to hold the box together and then put screws in, but it is not a necessity.

Installing Boxes:

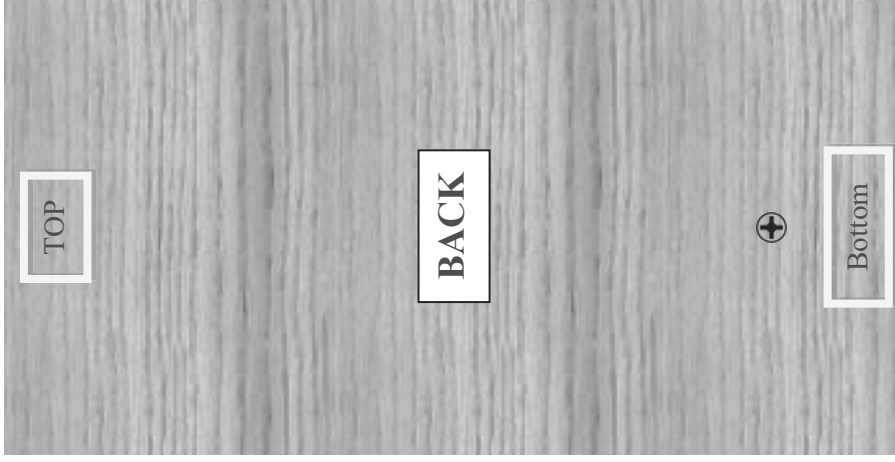
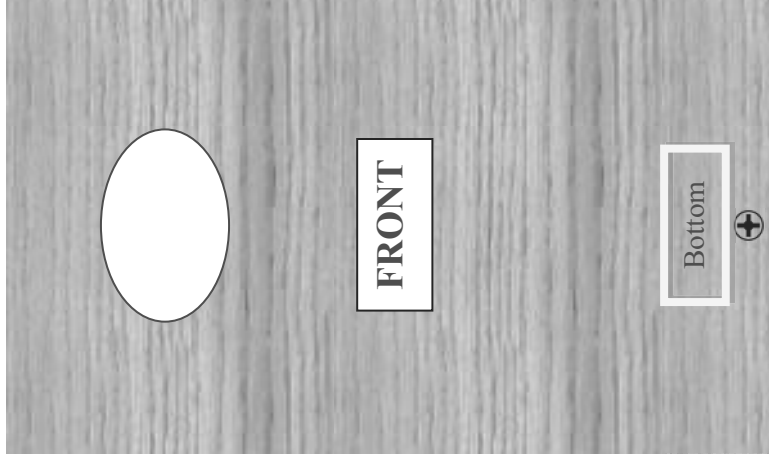
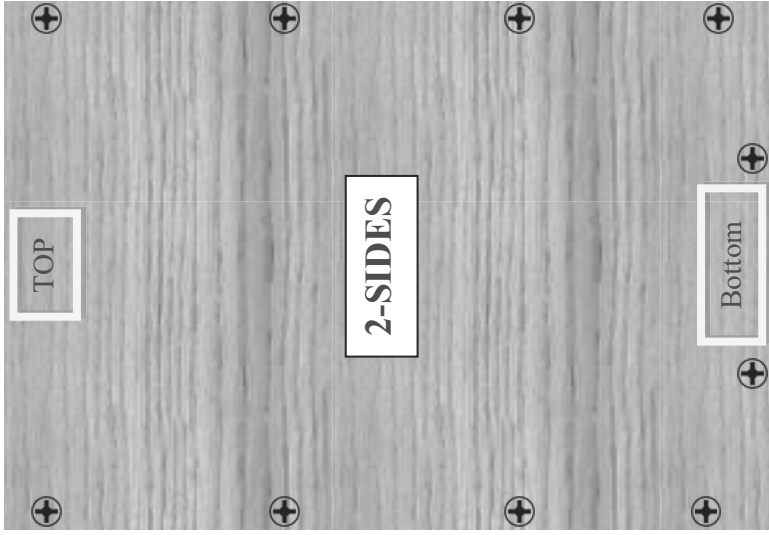
We encourage wood duck projects to install their boxes on galvanized poles to reduce predation issues. There are many ways to install your nest box with a variety of hardware to chose from; below is one option. Boxes can also be hung on trees or wooden posts, but other issues arise with these methods (box warping from tree growth, predation issues). If you go this route, be sure to install a predator guard.

1. Strong Ties – 2-3/8" Diameter (2 per box)
2. ¼-20 x 1-1/2 Hex Bolts
3. ¼-20 hex nut
4. ¼ x 1 fender washer
5. ¼ split washer
6. 2.38" x 2.38" x 8-10ft galvanized metal fence corner post
7. Pole pounder

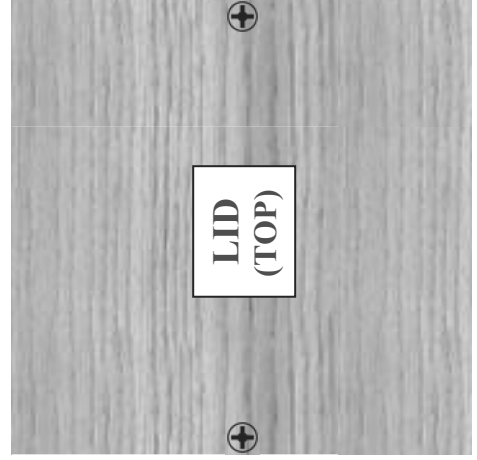
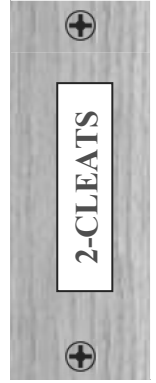
If the substrate you are trying to install your boxes in is too hard you may need to rent an auger to drill a hole. If you need to use an auger, you will also need to purchase dry cement mix. Simply mix cement and water in your freshly drilled hole, place pole and cover up with dirt.

ALWAYS INSTALL NEST BOXES SO THAT THERE IS A SLIGHT FORWARD LEAN FOR THE ENTRANCE HOLE

This makes it easier for ducklings to climb up and leap out of the box. A box that leans back will trap ducklings in the box.

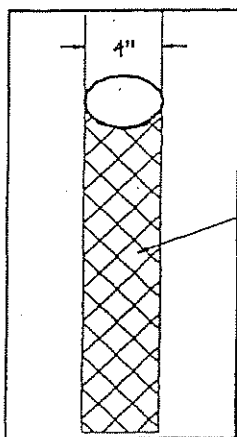
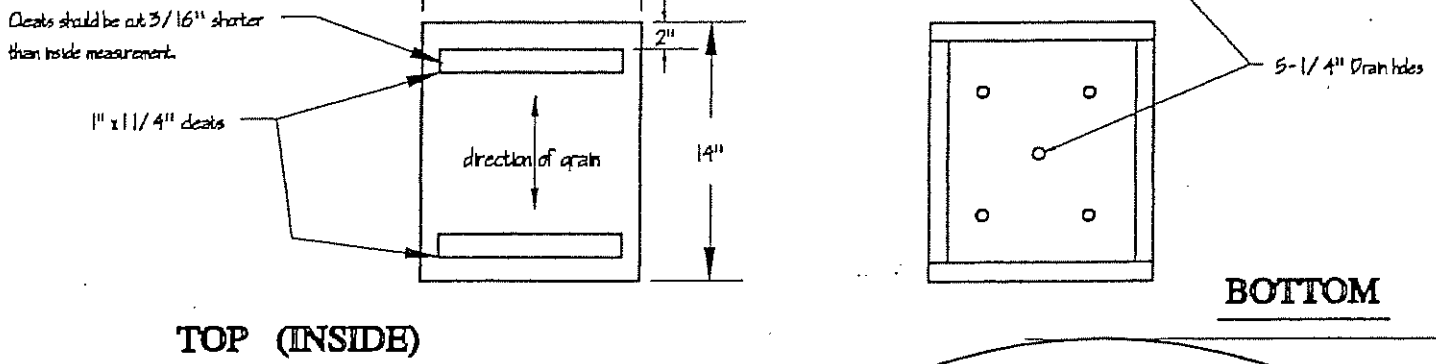
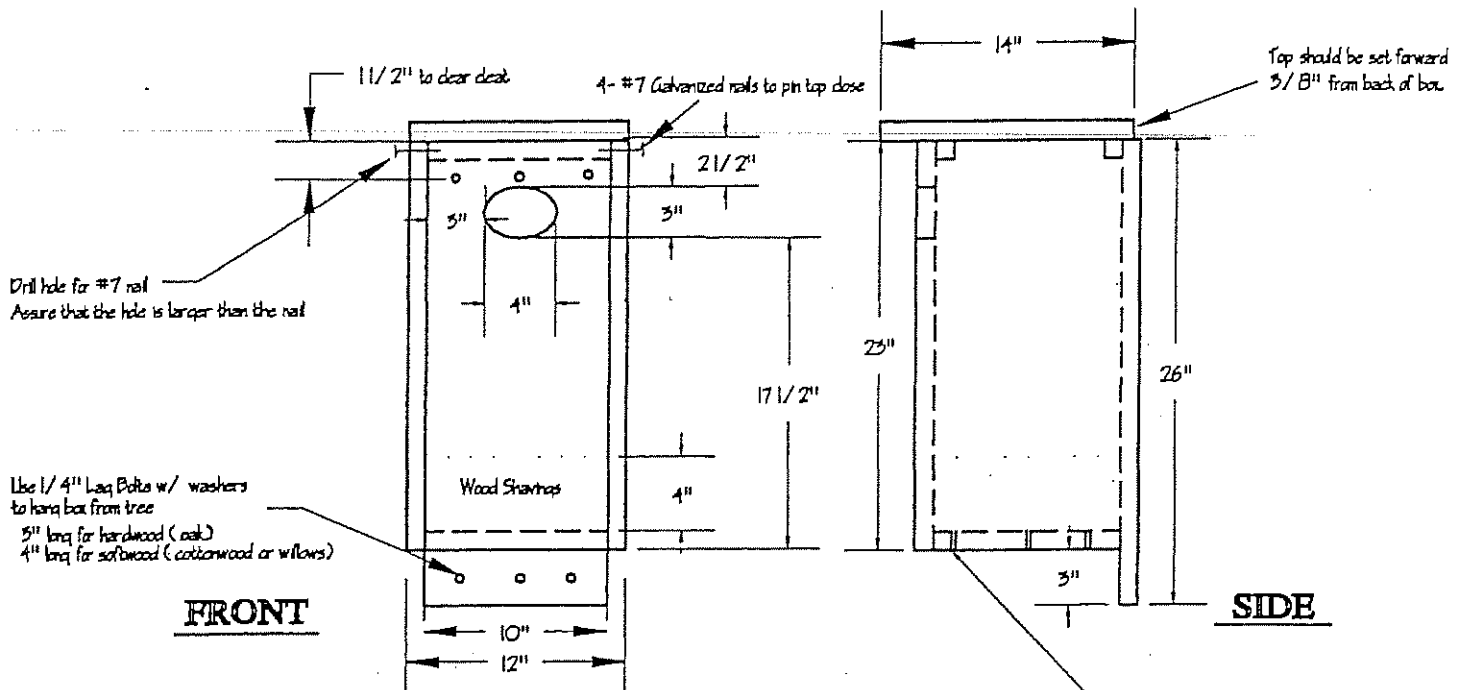


Use (24)-1½ inch exterior deck screws to assemble next box. (4)-1¼ inch exterior screws inserted at 45 degree angle to attach the cleats to the underside of the lid. Exterior wood glue is recommended for a secure fit. Follow the parts diagram for placement of screws. For more info, call CWA at (916) 648-1406 ©4HWoodys



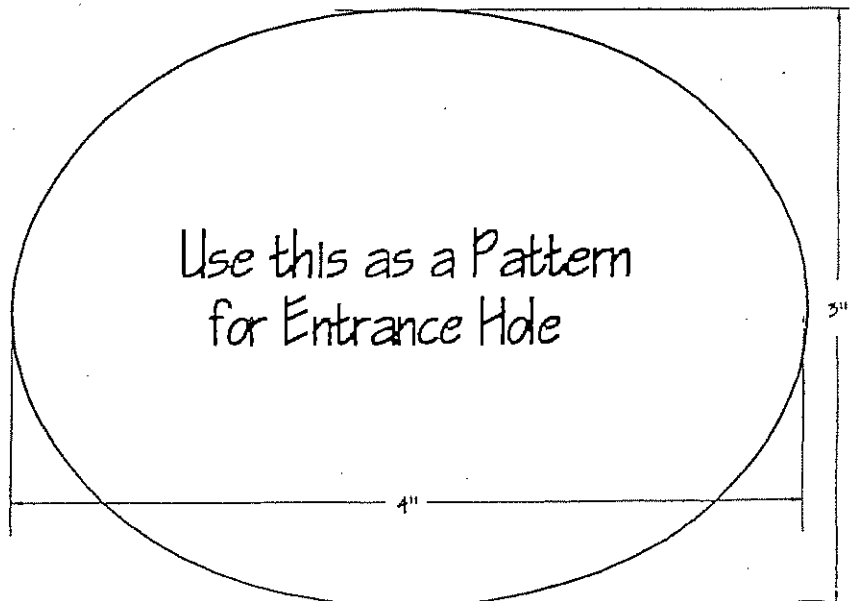
CALIFORNIA WOOD DUCK PROGRAM

WOOD DUCK NEST BOX DIMENSIONS



Front Panel Interior

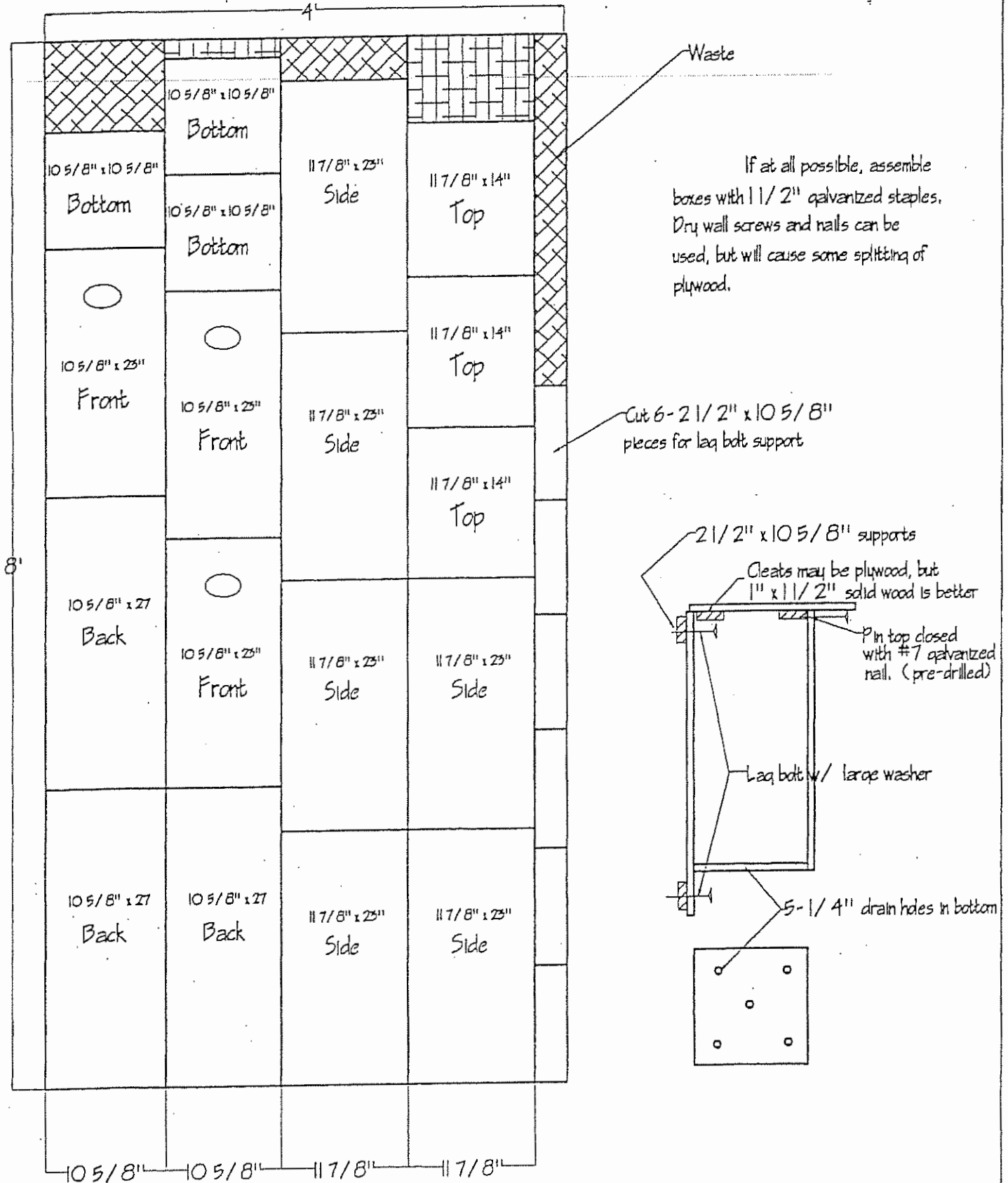
Use pointed tool to "scratch" ladder for duck/laps.



CALIFORNIA WOOD DUCK PROGRAM

WOOD DUCK NEST BOX DIMENSIONS

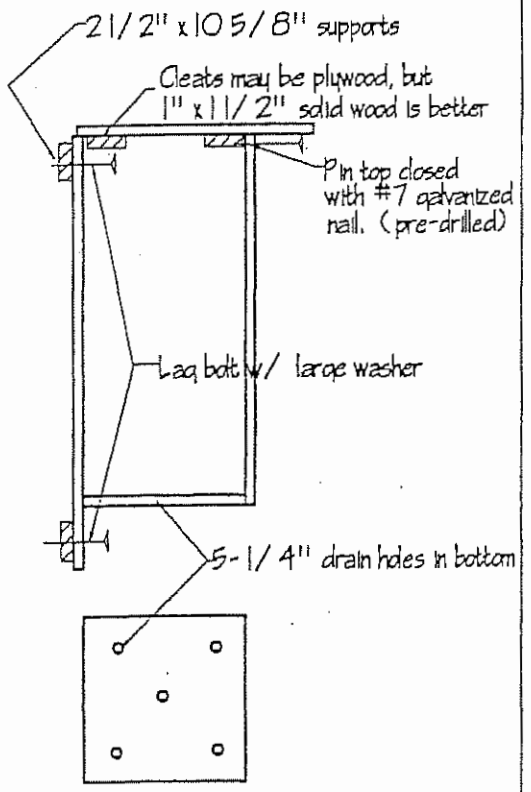
for 4' x 8' x 5/8' Exterior Plywood



Waste

If at all possible, assemble boxes with 1 1/2" galvanized staples. Dry wall screws and nails can be used, but will cause some splitting of plywood.

Cut 6- 2 1/2" x 10 5/8" pieces for lag bolt support



Appendix H

Special Status Species survey protocols

Special Status Species Survey Protocols

Vernal Pool Branchiopod Survey Protocol:

<https://www.fws.gov/cno/es/FinalSurveyGuidelinesforListedLargeBranchiopods.pdf>

Valley Elderberry Longhorn Beetle:

https://www.fws.gov/sacramento/documents/VELB_Framework.pdf

Giant Garter Snake:

<https://www.fws.gov/pacific/ecoservices/endangered/recovery/documents/GiantGarterSnake2003Protocol.pdf>

Rare Plants:

<http://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines>

Western Yellow-billed Cuckoo:

https://www.fws.gov/southwest/es/Documents/R2ES/YBCU_SurveyProtocol_FINAL_DRAFT_22Apr2015.pdf

Western Burrowing Owl:

<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83842>

Protocols will be updated as needed. Surveyors should ask CEIEC NRM for clarification when more than one protocol is available.

Appendix I

Reports Produced for Beale AFB

Table 1. Vernal Pool Reports

Publication Year	Report Title	Author/company
✓	California fairy shrimp (<i>Lindera occidentalis</i>)	Jones & Stokes
✓	Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	Jones & Stokes
✓	Vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	Gerrit A. J. Platenkamp - Jones & Stokes Associates, Inc.
✓	Vernal pools	Jones & Stokes Associates, Inc.
✓	Non-native plants that invade vernal pools	Jones & Stokes
✓	Vernal pool endemic plant species	Jones & Stokes
✓	1997	Investigations of Vernal Pool Attributes for Beale Air Force Base
✓	1997	Final Conservation and Development Areas Plan for the Habitat Conservation and Mgmt. Plan for Beale Air Force Base
✓	1998	Patterns of Vernal Pool Biodiversity at Beale Air Force Base
✓	1998	Revised Final Report Ecosystem Study: Phase II-Survey for Special-Status Aquatic Invertebrate, Botanical, & Wildlife Resor
✓	2000	Performance and Post-construction Monitoring Guidelines for Restored Vernal Pools of Phase 1 at Beale AFB
✓	2000	Soil Suitability Assessment for a Portion of the Vernal Pool Restoration Area, Beale AFB
✓	2000	Vernal Pool Grazing Study
✓	2001	Beale AFB Vernal Pool Restoration Project Storm Water Pollution Prevention Plan
✓	2001	Final Environmental Assessment for Vernal Pool Restoration
✓	2002	Draft Final Habitat Conservation and Management Plan for Beale Air Force Base, California
✓	2002	Draft Final Habitat Conservation and Management Plan for Beale Air Force Base, California
✓	2003	Vernal Pool Restoration and Creation Monitoring First Year 2003 Beale Air Force Base
✓	2004	Vernal Pool Restoration and Creation Veg Monitoring Second Year (2004) Beale AFB, CA
✓	2005	Effects of Cattle Grazing on Diversity in Ephemeral Wetlands
✓	2005	Vernal Pool Habitat Restoration and Creation Monitoring on Beale AFB, CA 2nd year 2004
✓	2005	Vernal Pool Habitat Restoration Monitoring on Beale Air Force Base, CA 3rd Yr (2005)
✓	2006	Vernal Pool Restoration Site 2 Biological Assessment Beale Air Force Base, CA
✓	2006	Dry-season Shrimp Sampling for Beale Air Force Base
✓	2006	Vernal Pool Restoration (Phase 1) Monitoring on Beale AFB, California 4th Year (2006)
✓	2007	Floristic Quality of Vernal Pools, at the Landscape Scale Beale AFB, Yuba County, California
✓	2007	Alternative V. P. Assessment Approaches for Beale AFB, Yuba County California
✓	2007	90-day Report of Findings Regarding Federally-Listed Brachiopods for Beale AFB, Placer County CA
✓	2007	V. P. Restoration/Creation Monitoring Phase II, Year 1 (2007) at Beale AFB Yuba County, CA
✓	2007	Vernal Pool Restoration (Phase 1) Monitoring on Beale AFB, CA 5th Year (2007)
✓	2007	Dry-season Sampling for Federally Listed Large Brachiopods at Beale AFB Main Base Developed Areas
✓	2008	Special Status Species Surveys Beale Air Force Base
✓	2008	2007-2008 Wet Season Large vernal pool Brachiopod Survey Beale AFB Pond A site
✓	2008	2007-2008 Wet Season Large Vernal Pool Brachiopod Survey Beale Air Force Base Pond A Site
✓	2008	Dry Season Sampling for Fed-listed Large Brachiopods at the A St Pond Expansion Excavation Project
✓	2008 (yr 6)	Monitoring Report Beale AFB V. P. Restoration Site 1 (Phase 1) Yuba County, CA
✓	2008	V. Pool Restoration/Creation Monitoring Phase II, Yr 2 (2008) at Beale AFB Yuba County, CA
✓	2008	Soil Aquifer Study at Beale AFB
✓	2008	90-Day Report of Findings Regarding Protocol-Level Brachiopod Survey for Beale Air Force Base Yuba County, California
✓	2008	90-day Report of Findings Regarding Federally Listed Brachiopods for Beale Air Force Base Site 1, Phase II Yuba County, CA
✓	2009	Supplemental Dry-season Sampling for Fed-listed Large Brachiopods at Beale AFB Dvp Areas & V. P. Mgmt. Areas
✓	2009	Soil Examinations for the Presence of Fed-listed Large Brachiopods at the Beale AFB Dragontown Training Area
✓	2009	Beale AFB Vernal Pool Restoration Site 1 (phase 1) 2009 (year 7) Monitoring Report
✓	2009	V. Pool Restoration/Creation Monitoring Site 2, Yr 1 (2009) for Beale AFB Yuba County, CA

Table 1. Vernal Pool Reports continued

Publication Year	Report Title	Author/company
2009	90-day Report of Findings Regarding Federally Listed Branchiopods for Beale Air Force Base Site 1, Phase II Yuba County, CA	ECORP Consulting, Inc.
2009	Vernal Pool Restoration/Creation Monitoring Phase II, Year 3 (2009) at Yuba County, California	ECORP Consulting, Inc.
2009	Monitoring Report Beale AFB Vernal Pool Restoration Site 1 (Phase 1) Yuba County, California	Foothill Associates
2010	V. P. Restoration/Creation Monitoring Phase II, Yr 4 (2010) at Beale AFB Yuba County, CA	ECORP Consulting, Inc.
2010	Monitoring Report Beale AFB V. Pool Restoration Site 1 (Phase 1) Yuba County, CA	Foothill Associate
2010	Monitoring Report Beale AFB Vernal Pool Restoration Site 2 Yuba County, CA	Foothill Associate
2010	90-Day Report of Findings Regarding Federally Listed Branchiopods for Site 1, Phase II Yuba County, California	ECORP Consulting, Inc.
2011	V. P. & Special Status Crustacean Impact Assessment for the Antiterosism/Force Protection Perimeter Fence Project at , CA Yr2	Kansas Biological Survey & Ecosystems Scientific & Reg. Serv. Inc.
2011	V. P. Restor/Creation Monitoring Site 1 Phase II, Yr 5 (2011) at Beale AFB Yuba County, CA	ECORP Consulting, Inc.
2011	Monitoring Report Beale AFB V. Pool Restoration Site 1 (Phase 1) Yuba County, CA	Foothill Associate
2011	Monitoring Report Beale AFB Vernal Pool Restoration Area Site 2 (Yr 3) Yuba County, CA	Foothill Associate
2011	Special Status Species Surveys	AECOM
2012	Vernal Pool Mitigation Monitoring , Beale Air Force Base, Marysville, California	Institute for Ecohydrology Research
2012	Wet-season Aquatic Bioassessment Field Report	Ayuda
2012	Special Status Species	Ayuda
2013	Final Beale Air Force Base Special Status Species Report	H.T. Harvey & Associates
2013	Final Report:Vernal Pool Mitigation Monitoring, Beale AFB, Marysville, California	Institute of Ecohydrology Research
2013	Vernal Pool Mitigation Monitoring, Beale Air Force Base, Marysville, California	Institute for Ecohydrology Research
2013	Vernal Pool Mitigation Monitoring 2012-2013	Institute for Ecohydrology Research
2014	Vernal Pool Mitigation Monitoring, Beale Air Force Base, Marysville, California	Institute for Ecohydrology Research
2014	Beale Air Force Base Wet-season V. Pool Branchiopod Survey 90-Day Report Yuba County, CA	H.T. Harvey & Associates
2015	Vernal Pool Listed Invertebrate Mitigation Monitoring, Beale Air Force Base, Marysville, CA	Institute for Ecohydrology Research
2016	Beale AFB Envir. Compliance Support: Wet-Season V. P. Branchiopod Survey. 90-Day Rpt.	H.T. Harvey & Associates
2016	Beale AFB Special Species Survey Report	HDR
2016	Soil Analysis for the Presence of Federally Listed Large Branchiopods at the Beale AFB Envir. Compliance project	H.T. Harvey & Associates (subcontractor - Helm Biological Consulting)
2016	Beale AFB Vernal Pool Mitigation Monitoring for Listed Invertebrates	Ayuda (subcontractor H.T. Harvey & Associates)
2016	Final Report: Vernal Pool Mitigation Status Report for Beale AFB, Marysville, CA (2015-2016)	Institute of Ecohydrology Research
2016	Summary Report for V. P. Community Survey - Vernal Pool Habitat Map and CRAM Assessment	Ayuda (Subcontractor H. T. Harvey & Associates)
2016	Summary of Survey Activities for Vernal Pool Community Surveys—CRAM Assessment	H. T. Harvey & Associates
2017	Summary Analysis for the Presence of Federally Listed Large Branchiopods at the Beale AFB Envir. Compliance project	H. T. Harvey & Associates (subcontractor - Helm Biological Consulting)
2017	Beale AFB Vernal Pool Mitigation Monitoring for Listed Invertebrates	Ayuda (subcontractor H.T. Harvey & Associates)
2017	V. P. & Wetland Mitigation Summary, Monitoring Results and Potential Compensation Enhancement of , Yuba County, CA	CEMML
2017	V. P. Branchiopod Survey Monitoring Report for Fence-to-Fence Envir. Services at Beale AFB, CA	AuxiliALL JV & H. T. Harvey & Associates
2018	Programmatic Biological Assessment 2018 Update Beale Air Force Base	CEMML
2018	Endangered Species Act Compliance Report	AuxiliALL JV
2018	Work Plan (Option Year 4) Fence-to-Fence Environmental Services Beale AFB, CA	AuxiliALL JV

Appendix I

Table 2. Valley Elderberry Longhorn Beetle Reports

Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)		
Publication Year	Report Title	Author/company
1998	Revised Final Report Beale AFB Ecosystem Study: Phase II -Survey for Special-Status Aquatic Invertebrate, Botanical, & Wildlife Resources	Jones & Stokes
2005	Potential Habitat for Valley Elderberry Longhorn Beetles at Beale AFB	EDAW
2005	Results of Elderberry Shrub and Valley Elderberry Longhorn Beetle Surveys Along the Perimeter of Beale AFB, CA	e ² M/North State Resources Inc.
2011	Restoration Plan for the Dry Creek Riparian Area, Beale AFB	River Partners
2011	Special Status Species Surveys	AECOM
2012	Special Status Species	Ayuda
2013	Final Beale AFB Special Status Species Report	H. T. Harvey & Associates
2016	Valley Elderberry Longhorn Beetle Summary Report	Ayuda
2016	Beale AFB Special Species Survey Report	HDR
2018	Programmatic Biological Assessment 2018 Update Beale Air Force Base	CEMML

Appendix I

Table 3. Special Status Bird Species Reports

	Publication Year	Report Title	Author/company
✓		Revised Final Report Beale AFB Ecosystem Study: Phase II - Survey for Special-Status Aquatic Invertebrate, Botanical, and Wildlife Resources	Jones & Stokes Associates, Inc.
	1988		
	2009	Beale AFB Vernal Pool Restoration site 1 (phase 1) 2009 (year 7) monitoring report	Foothill Associates
	2011	Special Status Species Surveys	AECOM
	2012	Special Status Species	Ayuda
	2013	Final Beale Air Force Base Special Status Species Report	H.T. Harvey & Associates
	2014	Black Rail Project Summer 2014 Results	Nathan Van Schmidt/The Black Rail Project
	2014	Memorandum for California Natural Diversity Database	9 CES/CD
	2014	Beale Air Force Base avian protection plan	EDM International, Inc.
	2016	Final Summary Report for California Black Rail Surveys	H.T. Harvey & Associates/Ayuda
	2016	Beale AFB Special Species Survey Report	HDR
	2016	Reed's Creek Summary Report for Fence to Fence Services at Beale Air Force Base	Ayuda
	2017	Western Burrowing Owl Summary Report	AuxiliALL JV
	2017	Incidental Raptor Sighting Report for Fence to Fence Environmental Services at Beale AFB, CA	Ayuda
	2018	Programmatic Biological Assessment 2018 Update Beale Air Force Base	GEMML
	2018	Work Plan (Option Year 4) Fence-to-Fence Environmental Services Beale AFB, CA	AuxiliALL JV
	2018	Yellow-billed Cuckoo Habitat Suitability Assessment for Beale AFB	GEMML (subcontractor Murrelet Halterman)
	TBD	Upcoming report on 2018 Western Yellow-billed Cuckoo surveys on Beale AFB	GEMML (subcontractor Murrelet Halterman)

Table 4. Migratory Bird Species Reports

		Publication Year	Report Title					Author/company	
✓	All bird species		✓	✓	✓	✓	✓	Revised Final Report Beale AFB Ecosystem Study: Phase II - Survey for Special-Status Aquatic Invertebrate, Botanical, and Wildlife Resources	Jones & Stokes Associates, Inc.
✓	Passerines and near passerines		✓	✓	✓	✓	✓	2001 Avian Behavior and Winter Habitat Use at Beale AFB, California	Dept. of Biological Sciences, CSU Sacramento
✓	Raptors		✓					2004 Season	Jones & Stokes
✓	Grassland birds							2006 Summer Breeding Bird Surveys on Beale AFB, CA	M.P. Guilfoyle, USACE Research & Development
	Waterfowl and water birds							2009 Monitoring Avian Productivity and Survivorship (MAPS) 2009, Beale AFB, CA	Ardea Consulting/PRBO
								2010 Beale AFB Winter Raptor Survey	Dr. E. Pandolfino and Z. Smith
								2011 Monitoring Avian Productivity & Survivorship Field Reports for Cumulative Events 1-6	AECOM/Ayuda
								2011 20-Day & 7-Day Pre-Construction Raptor Nest Surveys	Marcus H. Bole & Associates
								2012 Avian Inventory of Vernal Pools and Wetlands on Beale AFB, CA Winter 2012	Fischer
								2014 Beale AFB Avian Protection Plan	EDM International, Inc.
								2016 Monitoring Avian Productivity and Survivorship (MAPS) Summary Report	AuxiiiALL JV
								2016 Beale AFB Special Species Survey Report (Section 10 Raptors)	HDR
								2017 Incidental Raptor Sighting Report for Fence Envir Serv at Beale AFB, CA	HDR
								2017 BASH Support 2017: Avian Monitoring and Banding	Ayuda
								2018 Endangered Species Act Compliance Report	CEMML
								2018 Work Plan (Option Year 4) Fence-to-Fence Envir Serv Beale AFB, CA	AuxiiiALL JV
									AuxiiiALL JV

Table 5. Reptile and Amphibian Reports

Species	Publication Year	Report Title	Author/company
American bullfrog (<i>Rana catesbeiana</i>)			
CA (Blainsville) horned lizard (<i>Phrynosoma coronatum frontale</i>)			
CA red-legged frog (<i>Rana aurora draytonii</i>)			
CA tiger salamander			
Common garter snake (<i>Thamnophis sirtalis</i>)			
Footbill yellow-legged frog (<i>Rana boylei</i>)			
Giant garter snake (<i>Thamnophis gigas</i>)			
California kingsnake (<i>Lampropeltis getula californiae</i>)			
Northern pacific rattlesnake (<i>Crotalus oreganus oreganus</i>)			
Northern rubber boa (<i>Charina bottae</i>)			
Northwestern Pond Turtle (<i>Emys marmorata marmorata</i>)			
Pacific chorus frog (<i>Pseudacris regilla</i> : synonym? <i>hyala regilla</i>)			
Pacific gopher snake (<i>Pituophis catenifer catenifer</i>)			
Red-eared slider (<i>Trachemys scripta</i>)			
Sierran chorus frog (<i>Pseudacris sierra</i>)			
Spadefoot toad (<i>Spea hammondi</i>) Western			
Spiry softshell turtle (<i>Apalone spinifer</i>)			
Western terrestrial garter snake (<i>Thamnophis elegans</i>)			
Western fence lizard (<i>Sceloporus occidentalis</i>)			
Western pond turtle (<i>Actinemys marmorata</i>)			
Western Rattlesnake (<i>Crotalus viridis</i>)			
Western yellow-bellied racer (<i>Coleuber constrictor morroni</i>)			
Multiple species			
	1998	Personal Comm. Re: GGS Occurrence	Levse, K. (USFWS)
	2005	Giant Garter Snake (larger report titled Beale AFB GGS Surveys)	Hansen, Eric C.
	2005	Vernal Pool Habitat Restoration and Creation Monitoring on Beale AFB, CA 2nd year 2004	SRS Technologies
	2006	Beale AFB and Lincoln Receiver site Amphibian and Reptile Survey Report	EDAW, Inc.
	2006	CA Tiger Salamander (<i>Ambystoma californiense</i>) Habitat Assessment on Beale AFB and the LRS	Mark R. Jennings & Rana Resources
	2008	Special Status Species Surveys Beale Air Force Base	EDAW/AECOM
	2008	Amphibian Habitat Assessment for Beale AFB	URS Corporation
	2011	Vernal Pool Restoration/Creation Monitoring Site 1 Phase II, Yr 5 (2011) at Beale AFB Yuba County, CA	ECORP Consulting, Inc.
	2011	2011 Monitoring Report Beale AFB Vernal Pool Restoration Area Site 2 (Year 3) Yuba County, Ca	Foothill Associate
	2012	Special Status Species	Ayuda
	2013	Final Beale AFB Special Status Species Report	H.T. Harvey & Associates
	2013	Vernal Pool Mitigation Monitoring 2012-2013	N. McCarten & M. Chrisman Institute for Ecohydrology Research
	2014	Beale AFB Wet-Season Vernal Pool Branchiopod Survey 90-Day Report Yuba County, CA	H.T. Harvey & Associates
	2016	Year 2016 Giant Garter Snake (<i>Thamnophis gigas</i>) Surv at Beale AFB: Yuba County, CA	Eric C. Hansen
	2016	2016 Summary Report Western Spadefoot Toad for Fence to Fence Environmental Services at Beale AFB, CA	Ayuda
	2016	Summary of 2010-2016 Surveys of Turtle Populations in Aquatic Habitats on Beale AFB	Tag N. Engstrom and R. Scott
	2016	Beale AFB Special Species Survey Report	HDR under subcontract to Bhate
	2016	Beale AFB Environmental Compliance Support: Wet-Season Vernal Pool Branchiopod Survey 90-Day Report	H.T. Harvey & Associates
	2017	Beale AFB Special Species Survey Report	HDR
	2017	Plan for Non-native Red-eared Slider and American Bullfrog Control Beale AFB, CA	CEMML
	2018	Travis AFB and Beale AFB Surv & Habitat Modeling for the Western Spadefoot Toad in 2017	Center for Integrated Research on the Environmental
	2018	Summary of Survey Activities for Western Spadefoot	M. Wacker, H. T. Harvey & Associates
	2018	Programmatic Biological Assessment 2018 Update Beale AFB	CEMML
	2018	Work Plan (Option Year 4) Fence-to-Fence Environmental Services Beale AFB, CA	AuxiWALL JV

Table 6. Special Status Fishes Reports

		Publication Year	Report Title	Author/company
Steelhead (<i>Oncorhynchus</i> spp.)	✓			EDAW/AECOM
Central valley steelhead (<i>Oncorhynchus mykiss</i>)	✓			Consultants
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	✓			H.T. Harvey & Associates
Central Valley fall/late fall-run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	✓			H.T. Harvey & Associates
Central Valley spring-run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	✓			HDR
Multiple Species		2008	Special Status Species Report Beale AFB	AuxiliALL JV
		2009	Integrated Natural Resources Management Plan for Beale AFB, CA Results of Snorkelling Surveys	AuxiliALL JV
		2013	Final Beale AFB Special Status Species Report	Ayuda
		2016	Salmon	River Partners
		2016	Beale AFB Special Species Survey Report	AECOM
✓		2018	Endangered Species Act Compliance Report	
✓		2018	Work Plan (Option Year 4) Fence-to-Fence Environmental Services Beale AFB, CA	
	✓	2012	Special Status Species	
✓		2011	Restoration Plan for the Dry Creek Riparian Area, Beale AFB	
		2011	Special Status Species Surveys	

Appendix I

Table 7. Bat Reports

	Publication Year	Report Title	Author/company
Big brown bat (<i>Eptesicus fuscus</i>)			
California myotis (<i>Myotis californicus</i>)			
Canyon bat (<i>Parastrellus hesperus</i>)			
Horay bat (<i>Lasurus cinereus</i>)			
Long-eared myotis (<i>Myotis evotis</i>)			
Mexican free-tailed bat (<i>Tadarida brasiliensis</i>)			
Pallid bat (<i>Antozous pallidus</i>)			
Townsend's big-eared bat <i>Corynorhinis townsendi</i>			
Western red bat (<i>Lasurus borealis</i>)			
Western mastiff bat			
Yuma myotis (<i>Myotis yumanensis</i>)			
Bat roosts			
Multi species			
	2004	Bat Surveys at Beale AFB, Summer and Fall 2004	Central Coast Bat Research Group
	2015	2014 Bat Survey Report, Beale AFB, CA	AFCEC (Lauren Wilson)
	2015	Beale AFB Bat Survey, July 13 & 14, 2015	AFCEC (Lauren Wilson)
	2016	Technical Summary of Survey Methods and Results for Bats	H.T. Harvey/Ayuda
	2016	Beale AFB Special Species Survey Report	HDR
	2016	Proposed Bat Monitoring Protocol	H.T. Harvey/Ayuda
	2018	Endangered Species Act Compliance Report	AuxiiiALL JV
	2018	Work Plan (Option Year 4) Fence-to-Fence Environmental Services Beale AFB, CA	AuxiiiALL JV

Appendix I

Table 8. Special Status Plant Reports

	Publication Year	Report Title	Author/company
✓	1998	Resources	Jones & Stokes
	1998	Resources	Jones & Stokes
✓	1998	Patterns of Vernal Pool Biodiversity at Beale Air Force Base	G. Platenkamp - Jones & Stokes Associates
✓	2005	Vernal Pool Habitat Restoration and Creation Monitoring on Beale Air Force Base, CA second year 2004	SRS Technologies
✓	2005	Vernal pool habitat restoration monitoring on Beale Air Force Base, California 3rd year (2005)	SRS Technologies
✓	2008	Special Status Species Report Beale Air Force Base	EDAW/AECOM
✓	2008	Special Status Species Surveys Beale Air Force Base	EDAW/AECOM
✓	2012	Special Status Species	Ayuda
✓	2013	Final Beale Air Force Base Special Status Species Report	H.T. Harvey & Associates
✓	2013	Final Beale Air Force Base Special Status Species Report	H.T. Harvey & Associates
✓	2016	Beale Air Force Base Environmental Compliance Support: Yuba County, California Special Status Plant Surveys Summary Report	H.T. Harvey & Associates

Table 9. Invasive Plant Species Reports

	Publication Year	Report Title	Author/company
✓	2003	Beale AFB Native Grassland Restoration	Kirsten/ Beale AFB
✓	2004	Beale AFB Invasive Species Management Analysis	EDAW
✓	2010	Invasive Species Management Plan for Beale AFB	EM-Assist
✓	2011	V. P. Restoration/Creation Monitoring Site 1 Phase II, Yr 5 (2011) at Yuba County, CA	ECORP Consulting, Inc.
✓	2011	2011 Monitoring Report - Vernal Pool Restoration Area Site 2 (Year 3) Yuba County, CA	Foothill Associate
✓	2013	Beale AFB, CA Task 4.6 - Invasive Species Control Herbicide Application	DeAngelo Bros
✓	2013	Final Beale Air Force Base Special Status Species Report	H.T. Harvey & Associates
✓	2014	Yellow Starthistle Management Plan for Beale AFB Airfield	Unknown
✓	2015	Beale Weed Mapping Methodology Recommendations	Peter Hopkinson/CEMML
✓	2015	All Figures_2014 H.T. Harvey Weed Mapping	H.T. Harvey & Associates
✓	2015	Beale Air Force Base Reed's Creek Restoration Plan	Unknown
✓	2016	Invasive Species Trt Summary: Yellow Star-thistle Control Around Airfield in 2016	HDR
✓	2017	Updated Invasive Plant Species Management Guidelines	Peter Hopkinson/CEMML
✓	2017	Weed Mapping Survey Results at Beale Air Force Base	Paul Block/CEMML
✓	2017	Beale AFB Multi Invasive Species Mgmt. Annual Activity Report Task 1—BAEY167407	H. T. Harvey & Associates
✓	2017	Weed Trt Plan for -Task BAEY167047: Multi Invasive Species Mgmt. & BAEY167124: Post-Fire Rehabilitation	
✓	2017	Habitat Mgmt.	H. T. Harvey & Associates
✓	2017	Barbed Goatgrass Control Work Plan for Beale AFB, California	H. T. Harvey & Associates
✓	2017	Beale AFB Post-Fire Rehabilitation Habitat Mgmt. Report	Peter Hopkinson/CEMML
✓	2017	Riparian Invasive Plant Work Plan for Beale AFB, California	H. T. Harvey & Associates
✓	2017	Installation Pest Management Plan for Beale AFB, California	Sarah Ratay/CEMML
✓	2017	Beale AFB Post-Fire Rehabilitation Habitat Management Report Task 2—BAEY167124	Beale AFB, Department of Defense
✓	2018	2018 Invasive Plant Monitoring Annual Activity Plan Beale AFB, California	H. T. Harvey & Associates
✓			CEMML

Appendix J

California Whitenose Action Plan

California White-Nose Syndrome Action Plan
(WORKING DRAFT August 2018)
The California WNS Steering Committee

INTRODUCTION

Purpose

The purpose of this Plan is to reduce the threat of White-nose Syndrome to California's bat populations. The Plan provides information on the disease and how it affects bats, outlines actions to be taken by participating agencies and organizations to reduce the risk of disease introduction and transmission in California, as well as to manage the disease if/when it is detected in the state. Surveillance methods are described, which may provide the first indications of the arrival of WNS within California, as are population monitoring programs that should be implemented to help us understand the impacts of the disease on bat populations. A comprehensive approach to public education and outreach is outlined to ensure decision-makers and the interested public are aware of WNS and the actions being taken to reduce its threat.

BACKGROUND

White-Nose Syndrome

White-nose Syndrome (WNS) is a disease that is killing large numbers of bats in North America. Deaths in eastern populations have exceeded 6 million bats (ref), with mortality rates in hibernation colonies commonly exceeding 90%, and approaching 99%, for some species (ref). WNS is caused by a fungus, *Pseudogymnoascus* (formerly *Geomyces*) *destructans* (Pd). The fungus grows well at the cold temperatures and high humidity associated with bat hibernation sites. It appears to interfere with the hibernation, causing bats to arouse from torpor, which uses the bats' energy (fat) reserves needed to sustain them through winter when insect prey is not available. The fungus may also affect water balance and gas exchange in hibernating bats, making them more susceptible to energetic stress.

When affecting bats in hibernations White-nose Syndrome is visibly characterized by the presence of white fungal hyphae on the face, ears, and wing membranes of affected bats. In the days or weeks after emergence from hibernation, WNS-affected bats may remove the visible fungal hyphae and may present other characteristic signs of the disease, including ...

WNS does not appear to have been present in North America prior to 2006, with the first detections occurring that year at five sites in eastern New York. The first large scale mortality events occurred in that region in 2007. Since then, Pd and WNS have spread throughout eastern North America, extending north into Canada, south throughout Appalachia and into the Midwest and Plains states. In March 2016, a bat with WNS was found by hikers in Clark County, Washington. It is unknown how the disease made such a large jump from the leading edge of infection, but it is possible that humans assisted with the transmission of the fungus from an affected site in the southeastern United States.

As of summer 2018, the disease has been confirmed in bats in 33 states (Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, Rhode Island, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, Washington, West Virginia, Wisconsin) and seven Canadian provinces (Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Prince Edward Island, and Quebec).

Additionally, the fungus (but not yet the disease) has been found on bats in another three states (Mississippi, Texas and Wyoming). Further, detections of the fungus at low levels considered at the limit of detectability for lab tests have occurred in other locations in the western U.S. While these sites' test results are not considered positive for Pd, they do suggest the fungus has spread to more locations scattered in western North America, and possibly presage more widespread occurrence of the disease.

It appears that Pd was introduced to North America from Europe, where the fungus has been present for many years. Another strain of Pd is present in Asia. In neither continent are the effects of Pd apparently as deadly as in the presumably naïve bat populations in North America.

Over six million bats are estimated to have died because of WNS through the spring of 2014. Eleven species of hibernating bats have been affected by WNS through 2018: *Eptesicus fuscus*, *Myotis grisescens*, *M. leibii*, *M. lucifugus*, *M. septentrionalis*, *M. sodalis*, *M. velifer*, *M. volans*, *M. austroriparius*, *M. yumanensis*, and *Perimyotis subflavus*. An additional six species have been detected with Pd but no diagnostic sign of WNS has been documented in these species: *Corynorhinus townsendii* (including both federally-listed Endangered subspecies occurring in eastern states, *C. townsendii virginianus* and *C. townsendii ingens*), *C. rafinesquii*, *Lasionycteris noctivagans*, *Tadarida brasiliensis*, *Lasiurus borealis*, and *M. ciliolabrum*.

Nineteen species of bats are known to hibernate in California. Of these, five have been previously shown to suffer from WNS: *Eptesicus fuscus*, *M. velifer*, *M. lucifugus*, *M. volans*, and *M. yumanensis*. The others, including *Antrozous pallidus*, *Corynorhinus townsendii*, *Euderma maculatum*, *Eumops perotis*, *Lasionycteris noctivagans*, *Leptonycteris yerbabuenae*, *Macrotus californicus*, *M. californicus*, *M. ciliolabrum*, *M. evotis*, *M. occultus*, *M. thysanodes*, *M. velifer*, *Nyctinomops femorosaccus*, and *Parastrellus hesperus* are not yet known to have been exposed to Pd, and therefore their susceptibility to WNS is unknown. Information on the winter ecology in western states of most of these species is almost completely lacking. The general lack of information on hibernation sites and habits of most of these species poses a great problem in tracking the occurrence of WNS in California, understanding its impacts on bat populations, and developing disease management or treatment options.

Ecological and Economic Roles of Bats

Almost all of California's bats forage primarily on insects – in fact, most are exclusively insectivorous. The combined effects of bat foraging are huge, both in terms of controlling insect populations and in transferring nutrients from their insect prey into forms (feces, urine) that can be used by plants. Generalist bat species tend to consume the most abundant insects in an area at a given time, and thus contribute to insect community diversity and structure. In both natural plant communities and agricultural systems, such structuring probably prevents outbreaks of pests that otherwise would dominate the insect community and do excessive damage to certain plants. The natural pesticide benefit of bats to U.S. agriculture has been valued at more than \$3.7 billion per year in reduced crop damage and pesticide use.

Bat populations impacted by WNS would result in increased insect damage to forests and agriculture. It is likely that greater use of pesticides would be required to offset such damage, which in turn poses other environmental risks.

Bats also serve as a major contributor of nutrients in the form of guano and urea (the main byproduct of protein metabolism in mammals). Deposition of these waste products across the landscape is cumulatively very important. Guano and urea also are a major source of energy driving cave ecosystems.

Declines in bat populations has the potential to disrupt nutrient transfer into cave ecosystems and thereby jeopardizes these unique systems.

Appendix 1: CDFW Bat Scientific Collecting Permit Attachment- Conditions pertaining to WNS

The following measures are incorporated into all SCPs authorizing persons to capture and handle bats for scientific, educational, or management purposes. These measures are to be followed when handling bats and when entering roost sites or hibernacula, including caves, mines, buildings, bridges, and other structures, to prevent the possible spread of White-nose Syndrome (WNS):

- a. The principal investigator and all field personnel shall be familiar with the signs and symptoms of WNS. See <http://www.whitenosesyndrome.org/> for more information on WNS.
- b. Equipment, footwear, or clothing that has been exposed to roost sites or bats in areas in North America or Europe where White-nose Syndrome or the fungus *Pseudogymnoascus (=Geomyces) destructans* has been detected (see the WNS website for a current map of WNS- affected areas in North America) shall not be used to capture, handle or process bats, nor shall California roost sites be entered with equipment, footwear, or clothing from WNS-affected areas. Field vehicles used in WNS-affected areas shall not be used in California.
- c. Bats shall be held singly in bags. Each bag shall be used only once per night. Holding bags shall be washed after each night of work with an appropriate decontamination protocol (see the WNS website referenced above for a procedure acceptable to the Department).
- d. All field gear used to handle or measure bats shall be decontaminated between contact with individual bats as appropriate and feasible following the protocols outlined by the National WNS Decontamination Protocol (see <http://whitenosesyndrome.org/topics/decontamination> for more information). Decontamination of field gear after each night of field work shall occur as feasible. Deviations from recommended decontamination protocols shall be briefly documented and justified in the annual report of activities submitted to the Department.
- e. If a handled bat exhibits patagium scarring or other sign of WNS infection, the degree of damage shall be documented using the wing damage index described at <http://whitenosesyndrome.org/resource/wing-damage-index-used-characterizing-wing-condition-bats-affected-white-nose-syndrome>. Photo-documentation of scarring is encouraged.
- f. Unnecessary entry to known bat roost sites shall be avoided.
- g. Other measures to prevent the spread of WNS described at <http://whitenosesyndrome.org/what-can-you-do-help>, shall be implemented as appropriate.
- h. If WNS is observed or suspected at a roost site or in handled bats, notify the Department contact as soon as feasible. Dead or moribund bats suspected to be infected with *Pseudogymnoascus destructans* may be salvaged or sacrificed for testing. No more than two moribund individuals may be sacrificed for this purpose at a capture site. Carcasses shall be double-bagged and frozen, with the outside of the bags decontaminated prior to storage. Arrangements for testing of the carcasses shall be coordinated with the Department contact and one of the national centers.

Appendix K
USACE Jurisdictional Wetland
Delineation for Beale AFB



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

October 23, 2012

Regulatory Division SPK-1996-00445

Ms. Kirsten Christopherson
 Chief, Environmental Section
 6601 B Street
 Beale Air Force Base, California 95903

Dear Ms. Christopherson:

We are responding to your request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the Beale Air Force Base Planning area. The approximately 23,141.5 acre site is located on or near, Section 26, Township 15 N, Range 5 E, Mount Diablo Meridian, Latitude 39.118931°, Longitude -121.392156°, Beale AFB, Yuba County, California.

Based on available information, we concur with the amount and location of wetlands and/or other water bodies on the site as depicted on the February 23, 2010, Beale AFB Wetland Delineation drawings (Sheets 1-9). The approximately 3089 acres of wetlands, including vernal pools, and/or other water bodies present within the survey area are potential waters of the United States regulated under Section 404 of the Clean Water Act. This delineation verification is only for general planning, further development of a Special Area Management Plan, and/or general Department of the Army (DA) permitting purposes. Although the wetland and other boundaries shown on this mapping are expected to be reasonably close to what is actually on the ground, they have not been ground-truthed using the Corps' 1987 Manual and appropriate regional supplement, and cannot be used for project-specific DA permitting without additional site-specific data. In addition, there are some areas which were too complicated to accurately delineate based solely on remote sensing (i.e., the areas labeled, "Vernal Pool Swale Complex" which are characterized as approximately 50% wetlands for planning purposes). However, beyond allowing for large-scale planning, this delineation should provide a reasonable base map template which can easily be refined, with basic site-specific data, to facilitate delineations which can be separately verified and used for project level permitting in a timely manner. Project-level delineations, including those within this planning area, will require separate JD's, for DA permitting purposes.

A copy of our RGL 08-02 Preliminary Jurisdictional Determination Form for this site is enclosed. Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization for the activity. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. A Notification of Appeal Process and Request for Appeal form is enclosed to notify you of your options with this determination. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-1996-00445 in any correspondence concerning this project. If you have any questions, please contact me at Regulatory Division, 1325 J Street, Room 1350, Sacramento, California 95814-2922, email Michael.C.Finan@usace.army.mil, or telephone 916-557-5324. For more information regarding our program, please visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,



Michael Finan
Wetland Specialist
Regulatory Division

Enclosures

Copies Furnished without enclosures:

Mr. Jason Brush, U.S. Environmental Protection Agency, Region IX, Wetlands Regulatory Office
(WTR-8), 75 Hawthorne Street, San Francisco, California 94105-3901
Mr. Ken Sanchez, U.S. Fish and Wildlife Service, Endangered Species Division 2800 Cottage Way,
W-2605, Sacramento, California 95825-1888
Ms. Liz Lee, Storm Water and Water Quality Certification Unit, Central Valley Regional Water Quality
Control Board, 11020 Sun Center Drive #200, Rancho Cordova, California 95670
Mr. Kent Smith, California Department of Fish and Game Region 2, 1701 Nimbus Drive,
Rancho Cordova, California 95670-4599

PRELIMINARY JURISDICTIONAL DETERMINATION FORM
Sacramento District

This preliminary JD finds that there “may be” waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Regulatory Branch: **California North** File/ORM #: **SPK-1996-00445** PJD Date: **October 23, 2012**

<p>State: CA City/County: Beale AFB, Yuba County Nearest Waterbody: Hutchinson Creek/Yuba River</p> <p>Location (Lat/Long): 39.118931°, -121.392156°</p> <p>Size of Review Area: 23,141.5 acres</p>	<p>Name/Address Of Property Owner/ Potential Applicant Kirsten Christopherson, M.S. Chief, Environmental Section 6601 B Street Beale Air Force Base, CA 95903</p>
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<p>Identify (Estimate) Amount of Waters in the Review Area</p> <p><u>Non-Wetland Waters:</u> linear feet ft wide 760.93 acre(s) Stream Flow: Perennial and Seasonal</p> <p><u>Wetlands:</u> 2328.10 acre(s) Cowardin Mixed Class:</p>	<p>Name of any Water Bodies Tidal: on the site identified as Section 10 Waters: Non-Tidal:</p> <hr/> <p><input checked="" type="checkbox"/> Office (Desk) Determination <input checked="" type="checkbox"/> Field Determination: Date(s) of Site Visit(s): Various</p>
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SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply – checked items should be included in case file and, where checked and requested, appropriately reference sources below)

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- Data sheets prepared by the Corps.
- Corps navigable waters’ study.
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: **1:24K; CA-WHEATLAND; CAMP FAR WEST;**
- USDA Natural Resources Conservation Service Soil Survey.
- National wetlands inventory map(s).
- State/Local wetland inventory map(s).
- FEMA/FIRM maps.
- 100-year Floodplain Elevation (if known):
- Photographs: Aerial
 Other
- Previous determination(s). File no. and date of response letter:
- Other information (please specify): **Lidar, ERDC CRELL**

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)	Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)
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EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Kirsten Christopherson, Chief, Environmental Section		File No.: SPK-1996-00445	Date: October 23, 2012
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B	
	PERMIT DENIAL	C	
	APPROVED JURISDICTIONAL DETERMINATION	D	
x	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/cecw/pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Michael Finan
Wetland Specialist
U.S. Army Corps of Engineers
Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922
Phone: 916-557-5324, FAX 916-557-6877
Email: Michael.C.Finan@usace.army.mil
(Use this address for submittals to the **district** engineer)

If you only have questions regarding the appeal process you may also contact:

Thomas J. Cavanaugh
Administrative Appeal Review Officer
U.S. Army Corps of Engineers
South Pacific Division, CESPD-PDO
1455 Market Street, 2052B
San Francisco, California 94103-1399
Phone: 415-503-6574, FAX 415-503-6646
Email: Thomas.J.Cavanaugh@usace.army.mil
(Use this address for submittals to the **division** engineer)

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

<p>_____</p> <p>Signature of appellant or agent.</p>	Date:	Telephone number:
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Appendix L
Wetland Protection Best
Management Practices

Wetland Protection Best Management Practices

- **Environmental Awareness Training.** Training, including a discussion of Beale AFB wetland protection measures, will be given to all equipment operators prior to initiation of the construction activity.
- **Exclusion Period.** No work shall be conducted between November 1 and June 1, unless specifically approved by the Beale AFB Environmental Office, which will field-verify the ability of the project to meet BMPs. No work shall be conducted during rain events or within 12 hours of a rain event. Work during the wet season is subject to being temporarily postponed until conditions permit construction equipment use without damaging the soil or vegetation cover.
- **Wetland Construction Boundaries.** All work conducted within 50 feet of a wetland shall have construction boundaries designated with fencing to ensure no equipment will be in the vicinity of a drainage/wetland/vernal pool. All wetlands shall have erosion control measures (straw wattles) put in place when work is within 50 feet of a wetland.
- **Biological Monitor.** If the work is within 50 feet of a wetland/drainage, a biological monitor will be on site while work is conducted within the 50 feet.
- **Subsurface Protection.** If the project site is within 50 feet of a wetland, the preconstruction clearing of vegetation will be done with hand equipment to ensure no subsurface disturbance below 6 inches occurs in or near the wetland.
- **Upland Buffers.** Upland vegetated buffers shall be established and maintained, to the maximum extent practicable, next to all preserved open waters, streams and wetlands including created, restored, enhanced or preserved Waters of the U.S. Except in unusual circumstances, vegetated buffers shall be at least 50 feet in width.
- **Construction Barriers.** Orange barrier fences or pink flags will designate exclusion zones where construction activities cannot take place. A qualified biologist from Beale AFB Environmental Office will flag areas where barrier fencing is needed to keep equipment out of wetland areas. Construction workers will be responsible for fence installation.
- **Trenching Controls.** In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench.
- **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
- **Disposal of excavated material.** All dredged or excavated material must be deposited and retained in an upland area unless otherwise specifically approved by Beale AFB.
- **Staging and storage areas.** All equipment and vehicles must be restricted to paved/gravel surfaces or in the designated work area. All materials, vehicle parking and staging areas shall be designated by the Beale Environmental Office and located at least 50 feet away from drainages and other wetlands. Storage of all construction material/debris shall be kept to the designated storage/staging area.
- **Excess soil protection.** Excess soils temporarily stored on-site during construction needs to be covered with stabilization blankets/tarp and wattles to prevent exposure to the elements and to lessen chances of sedimentation due to storm water runoff and wind erosion. When the soil is revegetated, the contractor/shop will remove the erosion control systems.
- **Riprap.** The placement of riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure.

- **Erosion Control Systems.** Site-specific erosion control measures (i.e., hay bales, silt fencing) shall be implemented as directed by the Beale AFB Environmental Office. Proper erosion and sediment control measures will be installed. The contractor/shop shall install and maintain erosion control systems such as gravel/sand bags, silt fence, straw bale barriers, erosion control/stabilization blankets, straw wattles, or etc. as needed to protect drainage ditches, storm drains, seasonal wetlands and water bodies from sedimentation resulting from construction activity.
- **Soil Erosion and Sediment Controls.** Soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills must be permanently stabilized at the earliest practicable date.
- **Surface Flow Protection.** Access roads must be constructed so that the length of the road minimizes any adverse effects on wetlands and must be as near as possible to preconstruction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads).
- **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
- **Removal of Temporary Fills.** Temporary fills must be removed in their entirety, and the affected areas returned to pre-construction elevations. The affected areas must be revegetated as appropriate.
- **Proper Structure Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.
- **Revegetation.** All vegetated areas disturbed by construction shall be revegetated with a Beale Environmental Office-approved seed and “certified weed free” straw mulch upon completion. Exposed soil must be hydroseeded or covered with a geotextile to prevent sediments from entering waterways.
- **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the CWA).

Appendix M
Beale AFB 2017 Grounds Maintenance
Performance Work Statement

PERFORMANCE WORK STATEMENT

GROUND MAINTENANCE – Beale AFB, CA

February 24, 2017

Approvals:

Contracting Officer Date

Functional Commander/Functional Director Date

X

DALE J. BOWERS
COR

As per our mtg, 27 Feb 17

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PERFORMANCE WORK STATEMENT FOR GROUNDS SERVICES

1.0 Beale Description of Services. The Contractor shall provide all personnel, equipment, tools, supervision, and other items and services necessary to ensure that grounds maintenance is performed at **Beale Air Force Base (BAFB)** in a manner that will maintain healthy grass and a professional appearance in accordance with this PWS. The Contractor shall accomplish all grounds maintenance tasks identified in this PWS and Appendices A and B, in order to meet the requirements and the Service Summary (SS).

- Base maps of areas maintained are provided in Appendix A, Area Maps and Site Plans.
- Specific ground area measurements are established in Appendix B, Ground Maintenance Estimated Quantities.
- Required reports and forms are established in Appendix C, Required Reports/ Forms.

All work performed by the Contractor shall be performed in accordance with all applicable laws, regulations, standards, instructions, and commercial practices.

1.0.1 Lincoln Site Description of Services. Contractor shall provide all supervision, personnel, equipment, materials, transportation and services necessary to construct fire breaks and mow existing antenna pads and roadways within the Lincoln Site located at 5750 Moore Road, Lincoln, California.

1.1 Maintain Improved Grounds: The Contractor shall provide services identified below for all improved grounds on Beale AFB and at the Lincoln Site as identified in Appendices A and D.

1.1.1 Turf Areas. Grass, weeds and vegetation shall be mowed between three to five inches, on improved grounds (including drainage ditches), except for identified Athletic Fields whereby the height standard is between 2 to 4 inches. Grass and leaf clippings shall be removed or mulched when visible after mowing. All tree limbs, pine cones, leaves, litter and other debris shall be picked up and disposed of prior to each mowing. Ditches shall be free of shrubs, trees, silt and trash to in order to keep water free flowing. Contractor shall dispose of collected material in appropriate waste containers designated by the Contracting Officer's Representative (COR). All damage by the Contractor to Government property (to include personal property of base tenants and employees) due to performance of mowing operations shall be repaired or replaced by the Contractor at no additional cost to the Government within 15 days after identification/notification.

1.1.1.1 Trim. Grass, weeds and vegetation shall be trimmed to match surrounding areas, around trees, shrubs, buildings, fences, poles, posts, fire hydrants, parking lot bumper blocks, boulders, and other fixed obstacles on improved grounds. Trimming height shall match surrounding area grass heights as referenced in paragraph 1.1.1. All areas shall be trimmed concurrent with mowing. Litter, trash or other debris shall be picked up and disposed of properly during trimming operations. Damage to trees and shrubs from trimming shall be repaired by the Contractor at no additional cost to the Government. If a plant should die or become unhealthy due to damage, the Contractor will be responsible for replacing the damaged plant with a plant of

same size and type. Plant replacement shall occur within 15 days after identification/notification.

1.1.1.2 Edge. Sidewalks, driveways, curbs, patios, pavilions, and other concrete or asphalt edges shall be edged in improved grounds. Edge no more than one-half inch from the hard surface edge, maintaining an even contour with the edge surface, uniform in appearance and free of scalping, rutting, and uneven or rough cutting. Grass, vegetation and dirt from edging operations shall not be left on paved surfaces. Edging shall be accomplished at least once per month.

1.1.1.3 Fertilization. The Contractor shall have a pH adjustment and fertilizer application program for all improved turf. The type and amount of fertilizer or amendments applied should be based on the needs of the individual types (warm season grasses, cool season grasses) of turf to maintain optimal root growth. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.2 Non-Turf Areas. Maintain low maintenance beds/rock beds in improved grounds to present a neat and professional appearance. Maintenance activities include weeding, dead vegetation and litter removal. The Contractor shall remove tree suckers and water sprouts as required. The Contractor may use mechanical, chemical or physical methods of weed control that do not degrade the quality of the mulch surfaces. Dyes may also be used to enhance and track applications. Application of herbicides shall comply with all provisions in PWS paragraph 1.6.

1.1.3 Leaf Removal. Leaves and tree debris shall be removed from improved grounds. Sparse amounts of leaves may be mulched in place if the residual mulch does not excessively cover turf. The Contractor shall dispose of collected material in an appropriate waste container designated or identified by the COR. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.4 Special Landscaped/Flower/Rock Beds. Maintain beds to present a manicured appearance. Beds can include shrub beds, hedge beds, flower beds or a mixture of all types of vegetation arrangements to include individual trees. Maintenance activities include pruning shrubs, hedges and trees, trimming flowers, adding soil amendment/fertilizing, watering, weed eradication, trash/debris removal, replacement of plants and or shrubs. The Contractor shall remove tree suckers and water sprouts as required. The Contractor may use mechanical, chemical or physical methods of weed removal that do not degrade the quality of the mulched surfaces. Dyes may be used to enhance and track applications. Application of herbicides shall comply with all provisions in PWS paragraph 1.6.

1.1.5 Prune Shrubs. Prune shrubs on improved grounds not included in PWS paragraphs 1.1.4 to maintain natural growth characteristics, existing shape and health of the plant to promote safety and security. Maintain the existing shape and form of the shrubs by removing new growth. Prune hedges to maintain natural mature height. Prune shrubs to maintain a minimum of

three inches from buildings and other obstructions. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.6 Irrigation Systems. The Contractor shall maintain, adjust and repair existing lawn irrigation systems. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.6.1 Operation and Maintenance. The Contractor shall operate and maintain irrigation systems in order to maintain a uniform and healthy lawn or landscaped area. Operation includes initial (season start) setting of timer clocks and periodic checks and adjustments to preclude water runoff or increases and/or decreases in watering times to maintain the lawn. Minimize water consumption to the maximum extent possible. Maintenance includes adjustment of sprinkler heads and periodic checks to preclude water spray on streets, parking lots, or sidewalks. Irrigation system initialization shall commence at a pre-established time each year as specified by the COR. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.6.2 Initial Annual and Normal Seasonal Repairs. The Contractor shall survey and test irrigation systems at the start of the watering season to determine the extent of repairs required to bring the system(s) to an operational status. The Contractor shall provide a list of operational and non-operational systems within 30 days to the COR. The Contractor's repair responsibility is only for water lines and sprinkler heads downstream of the back flow, vacuum breaker or other appropriate valve. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.6.3 Winterize Irrigation Systems. The Contractor shall winterize all irrigation systems to prevent freezing/damage during the dormant season. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.7. DV/Special Cuts. Upon notification by the COR through the issuance of a work order, the Contractor shall perform DV/special event grounds maintenance required in specified improved areas covered under this contract. The COR shall notify the Contractor as soon as a DV/special event requirement is known, but no less than 24-hours prior to the event. A DV/special event notification shall require the Contractor to perform grounds maintenance in accordance with paragraphs 1.1.1. (mow), 1.1.1.1. (trim) and 1.1.1.2. (edge) on identified improved grounds. The Contractor shall accomplish the work before the event with no degradation to existing scheduled services. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.1.8. Remove Debris/Police Improved/ and Base Fence Lines. The Contractor shall perform general litter patrol in all areas of improved and semi-improved grounds (turf areas, base roads, streets and parking lots). The Contractor shall remove and dispose of natural debris, (tree limbs, dry brush, tumble weeds, pine cones, rodent habitats, dead animals, etc.), and man-made debris. The Contractor shall police areas to maintain a neat and professional appearance. Due to unforeseen natural disasters such as storms, high winds, ice storms, tornadoes or other acts of God, the Contractor will be required to remove detached or attached broken branches, tree limbs,

debris and deciduous debris that has fallen on all improved grounds. Providing such situations arise, the Contractor's work force shall respond within four hours (including weekends, if necessary) and remove all residues within 24-hours of notification. The Contractor shall place all yard and wood waste in provided green waste bins. Wood waste shall be not larger than 2 foot by 2 foot sections.

1.2 Maintain Semi-Improved Grounds. The Contractor shall provide services identified below for all semi-improved grounds on Beale AFB and at the Lincoln Site as identified in Appendices A and D.

1.2.1 Semi-improved Non-airfield. Grass, weeds and vegetation shall be maintained between four to 10 inches on semi-improved grounds (including drainage ditches). Ditches shall be free of shrubs, trees, silt and trash in order to keep water free flowing. All damage by the Contractor to Government property (to include facilities, fences, equipment, etc.) due to performance of mowing operations shall be repaired or replaced by the Contractor at no additional cost to the Government within 15 days after identification/notification.

1.2.2 Semi-Improved Airfield. Grass, weeds and vegetation shall be maintained between seven to 14 inches with the exception of the first cut of the spring season. The first cut of the spring (growing season) will be at seven inches to accommodate for the rapid growth at the beginning of the season. All subsequent cuts after that will be mowed to regular height standards of 7 to 14 inches. Ditches shall be free of shrubs, trees, silt and trash to in order to keep water free flowing. All damage caused by the Contractor due to performance of mowing operations shall be repaired or replaced by the Contractor at no additional cost to the Government within 15 days after identification and/or notification.

1.2.3 Trim Semi-Improved. Grass, weeds and vegetation shall be trimmed, between four to 10 inches or seven to 14 inches, as appropriate per paragraphs 1.2.1 and 1.2.2, around trees, shrubs, buildings, fences, poles, posts, fire hydrants, parking lot bumper blocks, boulders and other fixed obstacles on semi-improved grounds. Trimming height shall match or be less than surrounding area grass heights. Damage to Government facilities, fences and equipment from trimming shall be repaired by the Contractor at no additional cost to the Government. The Contractor will be responsible for repairing the damage within 15 days after identification and/or notification. Damage to trees and shrubs from trimming shall be repaired by the Contractor at no additional cost to the Government. If a plant should die or become unhealthy due to damage, the Contractor will be responsible for replacing the damaged plant with a plant of same size and type. Plant replacement shall occur within 15 days after identification/notification. Application of non-selective herbicides to control grass, weeds and vegetation around obstacles to include fence lines, shall only be allowed with COR approval. Application of herbicides shall comply with all provisions in PWS paragraph 1.6. Adjuvants and dyes may also be used to enhance and track chemical applications.

1.2.4 Mow Taxiway, Runway Edge Lights and Signs. Grass, weeds and vegetation shall be maintained in a 15 foot diameter circle between four to seven inches, around runway edge lights and signs. No loose vegetation or debris created from operations shall be left on paved areas.

1.2.5 Airfield Coordination. The Contractor shall coordinate all activities on the airfield by contacting Airfield Management. Flight-line driver training must be completed prior to operating vehicles or mowers on the flight line. All employees working on airfield grounds shall be required to have an AF Form 483, Competency Card (flight-line driver's license) with them at all times. Vehicles must have a valid Privately-Owned Vehicle (POV) pass issued by Airfield Management prior to operating on the flight line. Contractor shall submit a letter requesting a POV pass to Airfield Management. The letter should include vehicle license number, model, and driver's names, and say why the pass is needed (i.e. the Contractor maintains airfield grounds and needs vehicular access to flight line pavements). Contractor personnel shall be familiar with and adhere to Beale AFB flight line driving rules found in Beale Inst 11-250 and Beale Inst 13-213. Contact the Deputy Airfield Manager for required flight line training at 530-634-2002. No equipment will be left unattended while working in these areas. The Contractor shall be responsible for insuring that all foreign objects and debris produced by ground maintenance is cleared off of all taxiways, runways and aircraft parking aprons.

1.2.6 Airfield Tower Communications. When operating near runways, overruns and taxiways, the Contractor shall be radio-equipped to maintain constant two-way radio contact with the control tower and Airfield Management. The Contractor shall maintain contact with the control tower when operating on or within 150 feet of the runway. The Contractor shall provide all communication equipment required for this contract. The Government will provide the transceiver frequency to the Contractor. All equipment shall be VHF type with a minimum five-mile range and shall have private line capability. The Contractor will be responsible for any changes to radio types that the base makes in the course of this contract, i.e. frequency changes. The Contractor shall respond immediately to the directions of the air traffic control tower personnel.

1.3 Maintain Un-improved Grounds. Grass, weeds and vegetation shall be maintained to prevent woody encroachment in un-improved grounds, as identified in Appendix A. Where drainage ditches exist, mow to the top edge of the ditch. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.4 Mulch. Contractor shall replace mulch that is less than three inches in depth. Mulch shall be applied in a way that hinders weed growth but does not negatively affect plant growth. Mulch applied shall match the mulch in the surrounding area and be applied in a neat manner. If only part of a planter bed is mulched to match the standards of the rest of the bed, the new mulch will be blended in to the existing mulch to create a uniform appearance. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.5. Trees. The Contractor shall prune or trim all trees, as necessary on Beale AFB and at the Lincoln Site. The Contractor shall be responsible for identifying all trees that require pruning or trimming. Pruning or trimming shall be accomplished in accordance with the American National Standards Institute ANSI A300 Part 1 industry standards. Pruning shall be required to lift, remove and/or cutback branches that conflict with normal traffic or safety. In addition, the Contractor shall prune or trim trees that pose public safety hazards. Minimum safety clearances are: 14 feet over streets, 12 feet over driveways, eight feet over walk areas, four feet over

buildings and one foot from buildings. Trees that pose threats to structures or buildings shall be removed. Topping and de-horning are not permitted. Trimming or pruning of trees that touch or hang over energized utility poles or power lines is the responsibility of the Contractor. Minimum clearance from primary lines (over 600 volts) shall be eight feet. Minimum clearance from secondary lines (under 600 volts, i.e. electric service drops, telephone and cable TV) shall be four feet. Contractor shall be responsible for removing all debris generated from trimming or pruning operations. This service is issued as a work order and must be completed within five (5) workdays from notification. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.5.1. Tree Care The Contractor shall brace, cable, guy (to keep tree vertical) and deep water all damaged trees after identification. The Contractor shall remove all guy wires, cables, straps and stakes when trees remain vertical (normally, after one growing season). The Contractor shall adjust wires, cables, and straps as required, to prevent girdling. The Contractor shall remove all suckers and water sprouts over four inches in length. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.5.2. Tree Standards. The Contractor shall perform all tree work in accordance with contract specifications and the following tree care standards, latest addition, unless otherwise directed by the CO.

ANSI A300 - Standard Practices for Tree Care Operations including referenced Combined Federal Regulations (Utility Pruning and Emergency Service Restoration)

ANSI A300 (Part 1) – Tree Pruning

ANSI A300 (Part 3) – Tree Support Systems (Cabling, Bracing, and Guying)

ANSI Z60.1 – American Standards for Nursery Stock

ANSI Z133.1 – Safety Requirements for Tree Care Operations

Note: Work for these services will be requested on a case-by-case basis by the COR.

1.5.3. Emergency Spot Pruning/Trimming. Emergency spot pruning/trimming shall only be accomplished through issuance of a work order by the CO or COR. The Contractor shall complete an emergency spot pruning/trimming within one (1) workday from the work order date. Typically, emergency spot pruning/trimming includes removal of dead and/or broken limbs or removal of limbs for required clearances. *Note: Work for these services will be requested on a case-by-case basis by the COR.*

1.5.4. Tree and Stump Removal. Tree and stump removal shall only be accomplished through issuance of a work order by the CO or COR. The Contractor shall perform stump and perimeter roots removal by completely removing by cutting and grinding all growth to a minimum of eight inches below grade. Stumps shall be ground within one (1) workday of the tree removal date. Stump-grinding debris shall be removed the same day grinding is performed. In areas where a lawn sprinkler system exists, the Contractor shall backfill with topsoil, and lay sod to match the existing ground grade. In areas where no lawn sprinkler system exists, the Contractor shall backfill with topsoil and compact to match existing grades. Trees identified for removal shall be considered within the following categories, Large, Medium, Small and Sapling, as based on their diameter. The diameter of the tree shall be determined by measuring 4.5 feet above the ground. Trees with multiple trunks shall be measured as follows: all trunk diameters shall be measured.

The largest trunk diameter shall be recorded. Each remaining trunk diameter shall be halved. All values will then be added together to obtain the final tree diameter.

Large Trees: Diameter 36" and above, remove within 10 workdays from the work order date.

Medium Trees: Diameter 24" to less than 36", remove within 10 workdays from the work order date.

Small Trees: Diameter 3" to less than 24", remove within five work days from the work order date.

Saplings: Diameter 3" and smaller, remove within two workdays from the work order date.

Note: Work for these services will be requested on a case-by-case basis by the COR.

1.5.5. Emergency Tree and Stump Removal. The Contractor shall perform emergency tree and stump removal only after the issuance of a work order by the CO or COR.

Large Trees: Remove within two workdays from the work order date.

Medium Trees: Remove within two workdays from the work order date.

Small Trees: Remove within one working day from the work order date.

Saplings: Not required

Note: Work for these services will be requested on a case-by-case basis by the COR.

1.6 Herbicide Application Procedures. Contractor personnel handling and applying herbicides shall possess state certification in Right of Way categories. Contractor personnel handling and applying herbicides for broadleaf weed control (pest weeds) shall possess state certification in Ornamental & Turf categories. The Contractor shall perform treatment of pest weeds (broadleaf weed control) in accordance with federal and state regulations and DoD Pest Management Programs prescribed in AFI 32-1053 para 4.7.4 and 4.7.6 and DoDI 4150.7 Encl 4 para 5b(3).

1.6.1 The Contractor shall submit a weed control plan to the CO for approval prior to any herbicide application being allowed. The plan must be updated before any new herbicide is used. The weed control plan shall detail:

(1) The type of herbicide(s) to be applied; with the name, EPA number and application rate (amount per acre)

(2) Timing of application(s)

(3) The type of application equipment

1.6.2 Contractor personnel handling and applying herbicides shall possess a current State of California certification (<http://aec.army.mil/usaec/pest/pest05.html>), business license and training in the appropriate herbicide/pesticide categories. A copy of all state certifications/licenses of personnel applying pesticides herbicides shall be provided to the COR seven days prior to the application of any pesticide. No uncertified technicians will be authorized to mix or apply herbicides.

1.6.3 The Contractor shall furnish the COR with labels and Material Safety Data Sheets (MSDS) for all herbicides to be approved by the base Pest Management Coordinator prior to use. Herbicides will be applied in accordance with label directions, including required personal

protective equipment, application rates and use restrictions. The Contractor shall submit a report (DD Form 1532-1) (available at: www.dtic.mil/whs/directives/forms/eforms/dd1532-1.pdf) to the COR the following regular workday after application listing the target pest, temperature, wind speed, direction and type and amount of chemical used per location and pesticide applicator(s). Wind speed information can be obtained from the Base Weather Office at (530) 634-2002.

1.6.4 Storage and mixing of herbicides by the Contractor is not allowed on base. Contractors must have a spill kit on each vehicle capable of containing 110 percent of the greatest container volume. All waste shall be the responsibility of the Contractor and will be disposed of off-site in accordance with all Federal and State regulations pertaining to hazardous chemicals, wastes, and herbicides/pesticides. In no manner will the Government be responsible for off-base disposals.

1.7 Fire Breaks. The Contractor shall annually cut and maintain firebreaks 16 to 30 feet wide with a 10 foot clearance around some utility poles, equal to approximately 240 acres. This includes all burrow and ditch maintenance within the firebreak path. The Contractor shall begin maintaining firebreaks upon notice from the Base Fire Marshall or Base Fire Chief. The Contractor shall complete firebreaks prior to the start of the California fire season in the priority order provided by the COR. Firebreaks shall be maintained relatively level to the existing grade, with no persistent vegetation growth and only minimal vegetation debris. Vegetation shall be cut and removed down to the mineral soil layer, with minimal disturbance to deeper soil layers. The Contractor shall prevent and control erosion resulting from maintenance of the firebreaks. Only established roads and gates shall be used when transporting firebreaks maintenance equipment, unless otherwise approved by the COR. Any sections of firebreak that cannot be maintained at the prescribed width due to obstacles shall be maintained to the maximum possible width. Damage to property as a result of maintaining the firebreaks shall be repaired or replaced to the satisfaction of the CO.

1.7.1 Clear Zones (Disked Areas). Primary alert area, weapons storage area and Petroleum, Oil and Lubricants (POL) facilities, a 50-foot wide belt of terrain (25 feet on the inside of the fence and 25-feet on the outside of the fence). Disking shall be done two times a year in the months of May and October. Disking time may vary due to weather. Areas not disked and/or where vegetation still exists shall be cleared manually to eliminate the vegetation. Application of herbicides shall comply with all provisions in PWS paragraph 1.6. The Contractor shall submit a proposed schedule to the COR for approval.

1.7.2 Lincoln Site Firebreaks. The Contractor shall create a firebreak around the site and mow the roadways and antenna pads as described herein and as shown on the attached maps (See Appendix D). The firebreak shall be 50 feet wide. The antenna pads shall be mowed for fire control from the base of the antenna to a radius of 20 feet beyond the antenna and/or its guy anchors - whichever is farthest from the base. Additional mowing shall be required at the rotating antennas. Additional mowing shall be approximately 60 feet by 120 feet beyond the radius in the direction the antenna is intended to be lowered to allow a clear spot for disassembly. The roadways within the antenna field shall be mowed to a minimum of 15 feet wide to define the roads and minimize fire hazard from exhaust sparks and catalytic converters. All mowing shall be performed in accordance with paragraph 4.2 in this document.

1.7.2.1 The designated firebreak areas shall be mowed and all cuttings removed before any excavation process may begin. Those areas where excavation is allowed shall be performed in a manner where there is no vegetation left exposed on the surface of the soil.

1.7.2.2 When excavating to create a firebreak, the blades shall be raised when crossing a signed, protected area. The blades shall not be lowered until the equipment has crossed the protected area.

1.7.2.3 Trimming with a string trimmer or other equipment that does not have a rigid blade that can disturb the soil must be used in the following areas that are marked in Appendix C, Area Maps. This is an especially sensitive area that has endangered species of native grasses in the vicinity.

1.7.2.4 Prior to firebreak construction, the Government shall establish “No Disc” zones at the sites. The locations of the “No Disc” zones are shown for both sites on the attached maps in Appendix D. “No Disc” zones around the perimeter of the sites shall be clearly staked, flagged and signed. “No Disc” areas shall be staked with posts/stakes placed approximately 25 feet from the perimeter fence and at least 15 feet from the vernal pool/wetland edge. The 25-foot placement of the posts will allow the tractor and blade(s) to pass between the post and the fence while the 15-foot placement will provide a buffer between the pool and the disked area. A post and sign will be installed on either side of the vernal pool to warn the operator of the presence of the pool from either direction.

1.7.2.5 “No Disc” zones may not be crossed if water is standing in the pool or if the soil is wet. In such cases, the operator must raise the blades and make a detour around the pool. Extra care must be exercised in these cases, as only pools against the fence will be marked with exclusion zones.

1.7.2.6 Fire Watch. Contractor(s) constructing firebreaks at these facilities shall have two people on-site during construction at all times. One person shall operate the equipment while the other person shall watch for fires that may start inadvertently due to the operation of the vehicles/equipment. Contractor shall provide a plan outlining precautions to be taken to prevent fires and methods to be used to control fire outbreaks.

1.7.2.6.1 Fire Precautions. All personnel used in firebreak construction shall have immediate access to a shovel and fire extinguisher for use in fire suppression. Where equipment is being used, the shovel and extinguisher shall be carried on the machinery.

1.7.3 Lincoln Site Antennas. Firebreaks shall be constructed at the site in a way that maximizes protection of antennas, buildings, and other structures while minimizing impacts on vernal pools. These firebreaks shall generally be constructed around the perimeter of the sites, but also may follow other designated routes in order to avoid sensitive habitats and the fenced central compounds at each facility. In those areas where there are three antenna sites outside of the firebreak, the vegetation shall be mowed or trimmed in a 50-foot radius measure from the base of

the antenna. The sites that shall be trimmed instead of being mowed are identified in paragraph 4.2.1 of this PWS.

1.8 Contractor Provided Equipment and Supplies.

1.8.1 Contractor-Furnished Equipment/Vehicles. The Contractor shall provide and maintain all equipment and vehicles necessary to perform the requirements of this contract. The Contractor may perform cleaning, minor repair and other normal maintenance requirements of equipment on-site. Maintenance and repair of Contractor vehicles or their privately owned vehicles shall not be accomplished on site. Contractor vehicles shall have the company name prominently displayed on both sides of the vehicle and be maintained to present a neat, professional appearance.

1.8.1.1 All equipment used in the performance of this contract shall be in good operable condition and carry a U/L (Underwriters Laboratory) listing, if applicable. Equipment found to be unsafe and unable to function as designed, shall not be used in performance of this contract. The CO or designated representative may inspect the Contractor's equipment and vehicles at any time and direct the removal of any unsafe or unusable equipment or vehicle from the installation.

1.8.1.2 The Contractor shall coordinate availability of a sufficient quantity of equipment and vehicles to effectively fulfill the scope of this contract. Equipment failure or maintenance requirements shall not alleviate the Contractor from meeting the performance standards contained in this contract.

1.9 Miscellaneous Requirements

- Practice water conservation
- Turn off unnecessary lights
- Report fire hazards, conditions, and items in need of repair to the COR
- Turn in lost and found articles to the COR
- The Contractor shall notify the COR of any condition, including adverse weather or special requests from Government personnel, that may interrupt or delay performance under this PWS. Once the condition is resolved, the Contractor shall resume interrupted work as soon as practical. When this period exceeds 24-hours the COR must approve the delay.

2. Service Summary (SS): The contract service requirements are summarized in performance objectives that relate directly to mission essential items. The performance threshold briefly describes the minimally acceptable levels of service required for each requirement. The SS and the Contractor's Quality Control Plan provide information on contract requirements, the expected level of Contractor performance, expected method of Government surveillance and confirmation of services provided. These thresholds are critical to mission success. Procedures as set forth in the FAR 52.212-4(a), Contract Terms and Conditions - Commercial Items, Inspection/Acceptance, will be used to remedy all deficiencies. During the first initial 30 days of the contract, two additional errors on each task shall be allowed in an effort to identify normal

phase-in problems. Additionally, an initial performance review will be accomplished by the CO within 30 days of the start of the contract.

Performance Objective	PWS Para	Performance Threshold	Remedy	Method of Assessment
SS-1 Maintain Improved Grounds a. Mow b. Trim c. Edge d. Ditches e. Fertilize f. Non-Turf g. Leaf Removal h. Special Landscape Flower/Rock Beds i. Prune Shrubs j. Irrigation Systems k. DV/Special Cuts l. Remove Debris/Police Improved/ and Base Fence Lines	1.1, inclusive	No more than five valid defects per month	Re-performance within eight hours of notification	Periodic Surveillance
SS-2 Maintain Semi-improved Grounds a. Mow non-airfield semi-improved areas b. Trim non-airfield semi-improved areas c. Mow airfield semi-improved areas d. Trim airfield semi-improved areas e. Mow taxiway, runway edge lights and signs g. Ditches	1.2, inclusive	No more than five valid defects per month	Re-performance within eight hours of notification	Periodic Surveillance
SS-3 Maintain Un-Improved Grounds	1.3	No more than two valid defects per month	Re-performance within eight hours of notification	Periodic Surveillance
SS-4 Mulch	1.4	No more than two valid defects per month	Re-performance within eight hours of notification	Periodic Surveillance

SS-5 Trees a. Tree pruning/trimming b. Emergency spot pruning/trimming c. Tree and stump removal d. Emergency tree and stump removal	1.5, inclusive	No more than three valid defects per month	Re-performance within eight hours of notification	Periodic Surveillance
SS-6 Herbicide	1.6 inclusive	No more than one defect per month	Mitigation within four hours of notification	Periodic Surveillance
SS-7 Quality Control Contractor's Quality Control Plan (incorporated into contract after award).	2.1	No more than three valid defect per month	Contractor shall provide a written Corrective Action Report.	Periodic Surveillance
SS-8 Firebreaks a. Disking b. Clear zones	1.7- 1.7.1	No more than two valid defects per construction	Re-performance within four hours of notification	100% Surveillance

2.1 Quality Control The Contractor shall develop and maintain a quality control program to ensure grounds maintenance services are performed in accordance with commonly accepted commercial practices and services identified in this PWS. The Contractor shall develop and implement procedures to identify, prevent and ensure non-performance and continual repeat of defective service does not occur. A written Quality Control Plan shall be submitted to the CO for review, feedback and approval. The plan shall be submitted no later than the pre-performance conference. The plan shall specifically address the Contractor's strategy to provide quality workmanship, continual process improvement and for correcting deficiencies as required.

2.2. Quality Assurance. The Government shall inspect and evaluate the Contractor's performance to ensure services are received in accordance with requirements set forth in this contract. The COR shall inspect by watching actual task performance, physically checking an attribute of the completed task, checking a management information report, investigating customer complaints, conferring with facility managers or otherwise inspecting the task or its results to determine whether or not performance meets the standards contained in this PWS. The COR will use the Contractor's work schedule or modified version thereof, to record surveillance results. Results of the surveillance then become the official Air Force record of the Contractor's performance. When a performance threshold has not been met or Contractor performance has not been accomplished, the COR will initiate and provide the CO a Corrective Action Report (CAR) for issuance to the Contractor. The Contractor shall respond to the CAR IAW instructions provided and return it to the CO within 10 calendar days of receipt. Inspections will be reduced by 50 percent in the first two weeks of the growing season due to no service being performed during the months of the non-growing season.

2.3 Surveillance Methods.

2.3.1 100% Surveillances. This method requires the COR to inspect the service each time it occurs. Results shall be annotated on the inspection schedule. Any deficiency shall be documented and the Contractor shall re-perform service immediately, if appropriate or within 24-hours at no increase in contract amount. Any unsatisfactory inspection identified but re-performed acceptably shall still be counted as an unsatisfactory inspection for trending purposes.

Receiving two or more unsatisfactory 100 percent surveillances within a 12-month period may result in unsatisfactory past performance documentation. Continued receipt of unsatisfactory 100 percent surveillances during the contract period shall constitute a negative trend and the CO may take any appropriate action in accordance with the FAR 52.212-4 (a), Contract Terms and Conditions - Commercial Items, Inspection/Acceptance.

2.3.2 Periodic Surveillances. This method requires the COR to employ a “spot check” style of evaluation based on the Contractor’s schedule. Periodic surveillances will be conducted on a scheduled basis (daily, weekly, monthly, quarterly, semi-annually or annually) and may be adjusted based on quality trends.

Any unsatisfactory inspection (defect) result shall be recorded, and the Contractor shall re-perform the service after notification by the COR.

Failing to meet the performance threshold as outlined in the SS for any of these performance objectives in any one month period shall result in a warning or letter of concern from the CO.

Failing to meet the performance threshold as outlined in the SS of these performance objectives in any combination for any two or more consecutive or non-consecutive months during a contract period shall constitute an immediate progress meeting with the multi-functional team. All remedies shall be in accordance with the FAR 52.212-4 (a), Contract Terms and Conditions - Commercial Items, Inspection/Acceptance.

2.3.3 Periodic Progress Meetings. The CO, Functional Commander, COR, other Government personnel as appropriate, and the Contractor shall periodically meet to discuss the Contractor’s performance. The following issues shall be discussed, opportunities to improve the contract, any modifications required of the contract, unsatisfactory inspections and trends against each performance objective observed, positive performance and steps taken by the Contractor to prevent unsatisfactory occurrences in the future. The Contractor shall provide a summation of unsatisfactory inspections and customer complaints and provide insight into any identified trends.

The minutes of these meetings will be reduced to writing, signed by the CO and any other signatures as deemed appropriate, distributed to the functional area and the Contractor. Should the Contractor not concur with the minutes, the Contractor will provide a written notification to the Beale AFB contracting office identifying areas of non-concurrence for resolution.

3.0 GOVERNMENT FURNISHED PROPERTY AND SERVICES

3.1 Government Furnished Facilities. The Government will make a site available to the Contractor on the main base area to store vehicles and equipment used to accomplish this contract. The site will sit on gravel, asphalt or concrete slabs. Major equipment maintenance, defined as involving more than 20 man-hours of labor, will be performed only on the site provided and not in other areas of the base. The Government will consider other locations at the request of the Contractor. The area designated to be made available to the Contractor is on the main portion of Beale AFB. The area is approximately 47,000 SF and is located at F and 9th streets. No alterations to the office space shall be made without the specific written permission from the functional commander and the CO as coordinated and approved. In case of alterations necessary for compliance with OSHA, such permission shall not be reasonably withheld. The Contractor shall return the office space to the Government in the same condition as received, fair wear and tear and approved modifications

3.2 Government Furnished Supplies and Equipment. None.

3.3 Government Furnished Utilities. The Government will furnish electricity, water and sewage service as necessary for accomplishment of work in accordance with this contract.

3.3.1 Utility Conservation. The Contractor shall adhere to all base level utility conservation practices or requirements. The Contractor shall be responsible for operating under conditions that prevent waste of utilities.

3.4 Telephone Service. The Government shall only provide base and local commercial telephone service. Long distance service, if desired, shall be at the Contractor's expense.

3.5 Security, Fire and Medical Services. The Government will provide police and fire protection. In the event of a medical emergency, base ambulance service for transporting an injured employee to a local hospital is available on a cost reimbursement basis.

3.6 Refuse Collection and Disposal. The Contractor shall use existing bulk containers to dispose of trash or refuse generated from accomplishment of services detailed in this PWS. The Contractor shall adhere to all base level recycling programs to include disposal of yard/tree waste in specified dumpster collection stations or at the recycling collection center on base. The COR shall identify these specific dumpsters for yard/tree waste.

3.7 Mail Service. The Contractor shall be responsible for coordinating with the US Postal Service for the delivery of mail to the Contractor's facility or post office box.

4. General Information

4.1 Hours of Operation. The Contractor shall perform the services required under this contract during the following hours. The Contractor is not required to perform services on federal holidays.

4.1.1 Normal Base Hours. Base hours of operation are 0600 to 1700. The Contractor may find it necessary to deviate from the normal base hours of operation to ensure timely completion of work under this PWS at no additional cost to the Government.

4.2 Federal Holidays.

New Year's Day - 1 January
Martin Luther King Day - 3rd Monday in January
Washington's Birthday - 3rd Monday in February
Memorial Day - last Monday in May
Independence Day - 4 July
Labor Day - 1st Monday in September
Columbus Day - 2nd Monday in October
Veteran's Day - 11 November
Thanksgiving Day - 4th Thursday in November
Christmas Day - 25 December

If these holidays fall on Saturday, the preceding Friday will be observed. If these holidays fall on Sunday, the following Monday will be observed. If a holiday falls on a scheduled service day, the Contractor will be responsible for rescheduling services for the first day post the holiday observance.

4.3 Base Closures. Work scheduled but not accomplished because of base closure due to weather, exercises, or actual alert, will be accomplished as soon as possible after reopening the base.

4.4 Contractor/Employee Base Pass and Identification, Special Clearances and Vehicle Passes. The Contractor shall comply with all requirements and procedures IAW FAR 5353.242-9000, Contractor Access to Air Force Installations. All documentation shall be submitted at the pre-performance conference.

4.5 HAZMART. The Government (HAZMART personnel) will inventory all chemicals that the Contractor brings on to **BAFB** or any property under the control of **BAFB**. Any products that meet the criteria of "Hazardous Waste" must be bar coded and tracked until permanently removed from Government property. The inventory will be performed prior to commencement of work. Criteria for identifying hazardous waste, is contained in Subpart C of 40 CFR, Part 261.

4.5.1 Spill Response. The Contractor will be briefed on **BAFB** spill response procedures at the pre-performance conference. The Contractor is responsible to report and promptly cleanup all spills in a manner consistent with current environmental regulations, in the event that it is necessary to utilize Government material, equipment or personnel to clean up a Contractor caused spill, the Contractor shall be required to reimburse the Government for all associated costs.

4.6 Hazardous Material/ Waste Management. The Contractor will be briefed on **BAFB** Hazardous Material/Waste Management Plan at the pre-performance conference.

4.7 Hazardous Material Handling. The Contractor shall have approval from the base HAZMART section prior to purchasing, handling, using, and storing any chemicals, solvents, lubricants and other products that require MSDSs. The Contractor shall identify these materials and products on Air Force Form 3952 Chemical/Hazardous Material Authorization Request, Process Identification Form, and Shop Disposal Form. The Contractor shall provide one copy of the MSDSs for each item to HAZMART section for review prior to any chemicals being brought onto **BAFB**. The Contractor shall maintain one copy of the MSDSs for each hazardous material line item used within the work center.

The Contractor shall not use products that are or contain Toxic 17 chemicals, Extremely Hazardous Substances (EHS), Ozone Depleting Substances (ODS), and/or Persistent Bio-accumulative and Toxic (PBT) chemicals. Any hazardous material containing one of these banned substances will not be allowed on base.

4.8 Training. The Contractor shall ensure all employees complete the local Air Force Hazardous Communication, HAZMART and hazardous waste training. The Contractor shall appoint a primary and alternate HAZMART and Hazardous Waste monitor. Monitors are responsible for training all Contractor personnel regarding hazardous material containers maintained within Beale AFB and complete MSDSs immediately upon receipt of new chemicals, products or materials. The Contractor shall submit MSDSs to HAZMART, as required.

4.9 Traffic Laws. The Contractor and its employees shall comply with base traffic regulations.

4.10 Weapons, Firearms, and Ammunition. Contractor employees are prohibited from possessing weapons, firearms, or ammunition on themselves or within their Contractor-owned or privately owned vehicle while on Beale AFB.

4.11 Reporting Requirements. Contractor personnel shall report to an appropriate authority any information or circumstances of which they are aware may pose a threat to the security of Department of Defense (DoD) personnel, Contractor personnel, resources and classified or unclassified defense information.

4.12 Physical Security. The Contractor shall be responsible for safeguarding all Government property and controlled forms provided for Contractor use. At the end of each work period, all Government facilities, equipment and materials shall be secured.

4.13 Contract Manager. The Contractor shall establish and maintain an office through which the contract manager or alternate(s) can be contacted during work hours. The contract manager or alternate shall be available during normal duty hours to meet on the installation within two hours with the Government personnel designated by the CO to discuss problem areas. The Contractor shall provide the CO with telephone number(s) where surveillance results and complaints can be reported. The Contractor shall also provide to the CO the names and phone/pager numbers of Contractor POCs for after business hours including nights, weekends and holidays. This information will be kept updated by the Contractor whenever personnel

changes occur. The contract manager or alternate shall have full authority to act for the Contractor on all contract matters relating to the daily operation of this contract.

4.14 Personnel. Contractor personnel shall present a neat appearance. Contractor personnel shall be easily recognizable while on the installation in conjunction with this contract. This shall be accomplished through the wear of distinctive clothing, overcoats, rain gear or hats bearing the company name or logo. The coloring or design of the items selected should be such that identifies personnel easily and quickly for reasons of safety and personal protection.

The Government is authorized to restrict the employment under the contract of any Contractor employee or prospective Contractor employee, who is identified as a potential threat to the health, safety, security, general well-being or operational mission of the installation and its population.

4.15 Key Control. The Contractor shall establish and implement methods of making sure all keys/combinations issued to the Contractor by the Government are not lost or misplaced and are not used by unauthorized persons. The Contractor shall not duplicate any keys issued by the Government. The Contractor shall immediately report to the COR or CO any occurrences of lost or duplicated keys. In the event keys, other than master keys, are lost or duplicated, the Contractor may be required, upon written direction of the CO, to re-key or replace the affected lock or locks without cost to the Government. The Government may, however, at its option, replace the affected lock or locks or perform re-keying and deduct the cost of such from the monthly payment due the Contractor. In the event a master key is lost or duplicated, the Government shall replace all locks and keys for that system, and the total cost will be deducted from the monthly payment due the Contractor.

4.16 Schedules. The Contractor shall submit a schedule for all services described in this PWS and Appendices A and B to the CO for approval at the pre-performance conference and at each change in the growing/non-growing season. The schedule shall identify plots, acreages, or base areas and days of the week service will occur. The Contractor shall be allowed 30 days to adjust work schedules based on inspections, use, traffic and with facility managers, if applicable. This second work schedule shall be submitted to the CO for approval within 10 days after the first contract month period. A monthly schedule shall be submitted to the CO and COR for approval five days prior to each month. The Contractor shall not deviate from the approved schedule without prior approval from the CO or COR. Permanent changes to the schedule must be submitted 10 days before implementation and receive CO approval before the Government will allow the proposed changes. The schedule may be submitted electronically using a file format compatible with Government software programs such as Microsoft Office software.

4.17 Occurrence Based (non-permanent) Schedule Changes. Changes due to customer requests or base exercises shall be submitted to the COR and do not require CO approval. The COR shall have the ability to adjust the Contractors improved grounds mowing schedule for DV and/or VIP visits to either the route or a specific area on base at no additional cost. Areas too wet to be mowed due to over watering by customers in the improved mow areas will be rescheduled by the Contractor and the COR.

4.18 Contractor Manpower Reporting. The Contractor shall report ALL Contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the Vegetation Control contract via a secure data collection site. The Contractor is required to completely fill in all required data fields at <http://www.ecmra.mil>. Reporting inputs will be for the labor executed during the period of performance for each Government fiscal year (FY), which runs 1 October through 30 September. While inputs may be reported any time during the FY, all data shall be reported no later than 31 October* of each calendar year. Contractors may direct questions to the CMRA help desk.

*Reporting Period: Contractors are required to input data by 31 October of each year.

Uses and Safeguarding of Information: Information from the secure web site is considered to be proprietary in nature when the contract number and Contractor identity are associated with the direct labor hours and direct labor dollars. At no time will any data be released to the public with the Contractor name and contract number associated with the data.

User Manuals: Data for Air Force service requirements must be input at the Air Force CMRA link. However, user manuals for Government personnel and Contractors are available at the Army CMRA link at <http://www.ecmra.mil>.

5.0 Appendices. The Government will make all publications, forms, references and report formats listed available. Publications can be accessed on-line at <http://www.e-publishing.af.mil/>. Supplements or amendments to listed publication from any organizational level may be issued during the life of the contract. The Contractor shall immediately implement those changes in publications, which result in a decrease, or no change in the contract price. Prior to implementing any such revision, supplement, or amendment that will result in an increase in contract price, the Contractor shall submit to the CO a price proposal and obtain prior approval. Price proposals shall be submitted within 15 calendar days from the date the Contractor receives notice of the revision, supplement, or amendment giving rise to the increase in cost of performance. Changes in the contract price due to supplements and amendments shall be considered under the FAR 52.212-4, Contract Terms and Conditions - Commercial Items clause. Failure of the Contractor to submit a price proposal within 15 calendar days from the date of receipt of any change, shall entitle the Government to performance in accordance with such change, at no increase in contract price.

APPENDIX A – MAPS OR SITE PLANS

Beale Grounds Maps

Lincoln Site Grounds Maps

[OTHER MAPS AS APPROPRIATE]

Semi-Improved mow; The majority of the road shoulders will be mowed approximately 10 feet with the exception of outside base entry gates and other areas indicated on the Maps in Appendix B.

Gavin Mandery

Warren Shingle

Doolittle

J Street

A Street

Camp Beale Highway

APPENDIX B – BASE Grounds Maintenance Estimated Quantities

ITEM	DESCRIPTION	ESTIMATED QUANTITIES		ESTIMATED WORKLOAD
		Quantity	Unit	Growing Season
1	Improved Grounds Turf	154.92	Acres	36
2	Edging	1,096,000	Linear Feet	10
3	Maintain Semi-Improved Grounds Non-Airfield 10 Feet wide	505.92	Acres	4
4	Maintain Semi-Improved Grounds Airfield	576.92	Acres	6
5	Firebreaks	240	Acres	1
6	Disking	48	Acres	2
<i>Work for the below services will be requested by the COR</i>				
7	Fertilization Areas	154.92	Acres	
8	Leaf Removal Areas	154.92	Acres	
9	Maintain Special Landscaped/Flower/Rock Beds	56,183	Square Feet	
10	Maintain Improved Grounds Non-Turf	48.41	Acres	
11	Maintain automatic irrigation systems	120.83	Acres	
	(Informational) # of Timer Clocks/Boxes	113	Unit	
11a	Repair Irrigation Systems	450	Each	
12	Prune Shrubs/Hedges	6,299	Each	
13	Mow Un-Improved Grounds	250	Acres	
14	Debris, Trash and Litter Policing	2080	Hours	
15	Tree Pruning	2,500	Each	
15a	Emergency Tree Pruning/Trimming	80	Each	
15b	Tree and Stump Removal, Large	10	Each	
15c	Tree and Stump Removal, Medium	10	Each	
15d	Tree and Stump Removal, Small	20	Each	
15e	Tree and Stump Removal, Sapling	20	Each	

15f	Emergency Tree and Stump Removal, Large	15	Each	
15g	Emergency Tree and Stump Removal, Medium	15	Each	
15h	Emergency Tree and Stump Removal, Small	25	Each	
16	DV/Special Cuts	152.24	Acres	
	(Informational) Streets and Roads	70.28	Miles	
	(Informational) Perimeter Fence Lines	30.4	Miles	
	(Informational) Parking Lots	1,611,726	Square Feet	

ALL QUANTITIES PROVIDED ARE ESTIMATED ONLY

APPENDIX B - HOSPITAL Grounds Maintenance Estimated Quantities

ITEM	DESCRIPTION	ESTIMATED QUANTITIES		ESTIMATED WORKLOAD
		Quantity	Unit	Growing Season
1	Improved Grounds Turf	1.0	Acres	36
2	Edging	2686	Linear Feet	10
3	Maintain Semi-Improved Grounds Non-Airfield	2.27	Acres	4
<i>Work for the below services will be requested by the COR</i>				
4	Fertilization	1.0	Acres	
5	Leaf Removal	1.0	Acres	
6	Maintain Improved Grounds Non-Turf	1.17	Acres	
7	Maintain automatic irrigation systems	1.0	Acres	
7a	Repair Irrigation Systems	3	Each	
	(Informational) # of Timer Clocks/Boxes	3	Unit	
8	Prune Shrubs/Hedges	150	Each	
9	Debris, Trash and Litter Policing	322	Hours	
10	Tree Pruning	19	Each	
10a	Emergency Tree Pruning/Trimming	40	Each	
10b	Tree and Stump Removal, Large	10	Each	
10c	Tree and Stump Removal, Medium	10	Each	

10d	Tree and Stump Removal, Small	15	Each	
10e	Tree and Stump Removal, Sapling	15	Each	
10f	Emergency Tree and Stump Removal, Large	15	Each	
10g	Emergency Tree and Stump Removal, Medium	15	Each	
10h	Emergency Tree and Stump Removal, Small	20	Each	
11	DV/Special Cuts	5.7	Acres	

ALL QUANTITIES PROVIDED ARE ESTIMATED ONLY

APPENDIX B – LINCOLN SITE Grounds Maintenance Estimated Quantities

ITEM	DESCRIPTION	ESTIMATED QUANTITIES		ESTIMATED WORKLOAD
		Quantity	Unit	Growing Season
1	Improved Grounds Turf	10.53	Acres	36
2	Edging	750	Linear Feet	10
3	Maintain Semi-Improved Grounds Non-Airfield (Roads Maintained)	1.073	Acres	4
5	Firebreaks	11.24	Acres	1
<i>Work for the below services will be requested by the COR</i>				
7	Fertilization Areas	10.53	Acres	
8	Leaf Removal Areas	10.53	Acres	
12	Prune Shrubs/Hedges	19	Each	
14	Debris, Trash and Litter Policing	140	Hours	
15	Tree Pruning	6	Each	
15a	Emergency Tree Pruning/Trimming	2	Each	
15b	Tree and Stump Removal, Large	2	Each	
15c	Tree and Stump Removal, Medium	2	Each	
15d	Tree and Stump Removal, Small	2	Each	
15e	Tree and Stump Removal, Sapling	0	Each	
15f	Emergency Tree and Stump Removal, Large	2	Each	
15g	Emergency Tree and Stump Removal, Medium	2	Each	

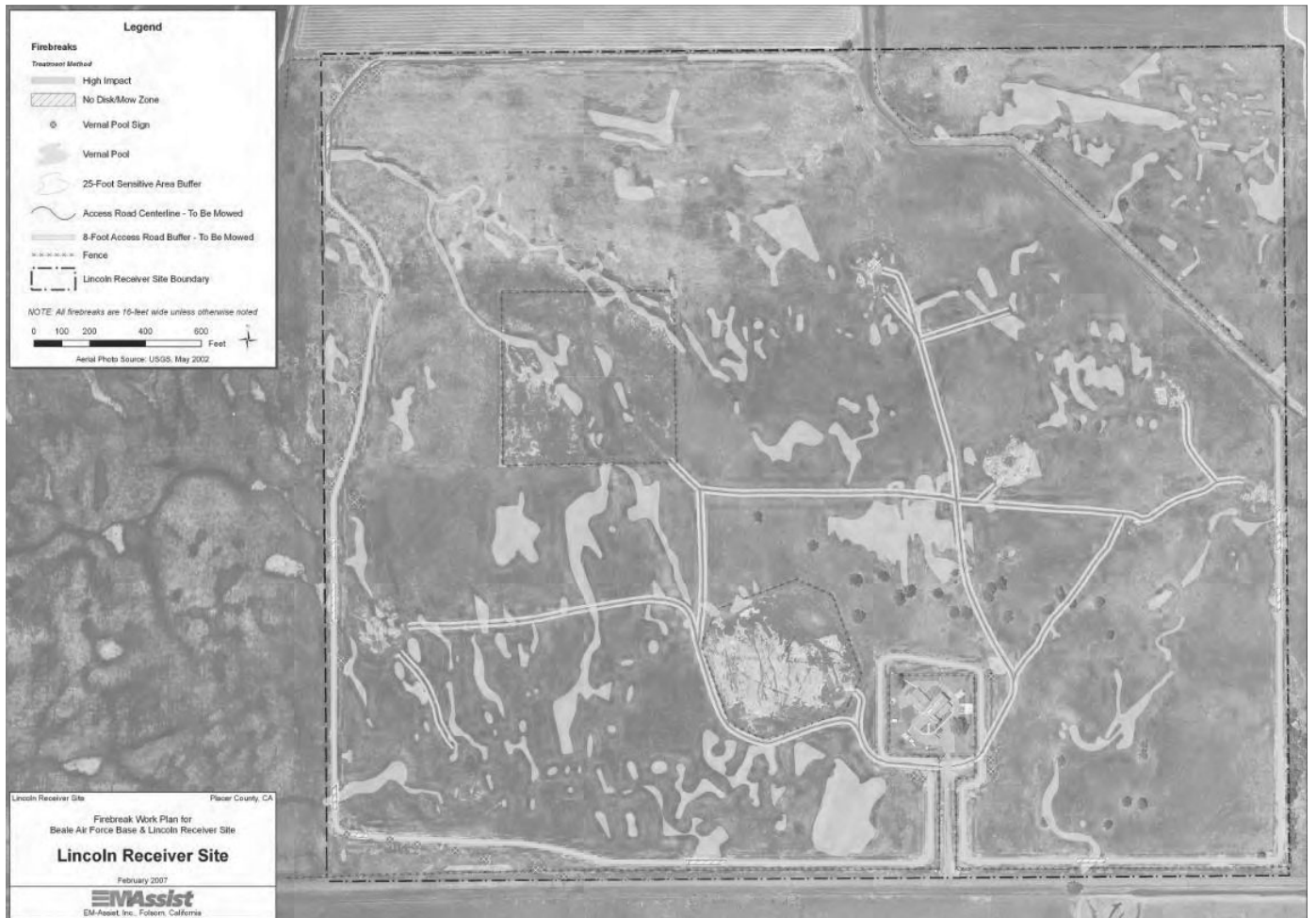
15h	Emergency Tree and Stump Removal, Small	2	Each	
16	DV/Special Cuts	10.53	Acres	

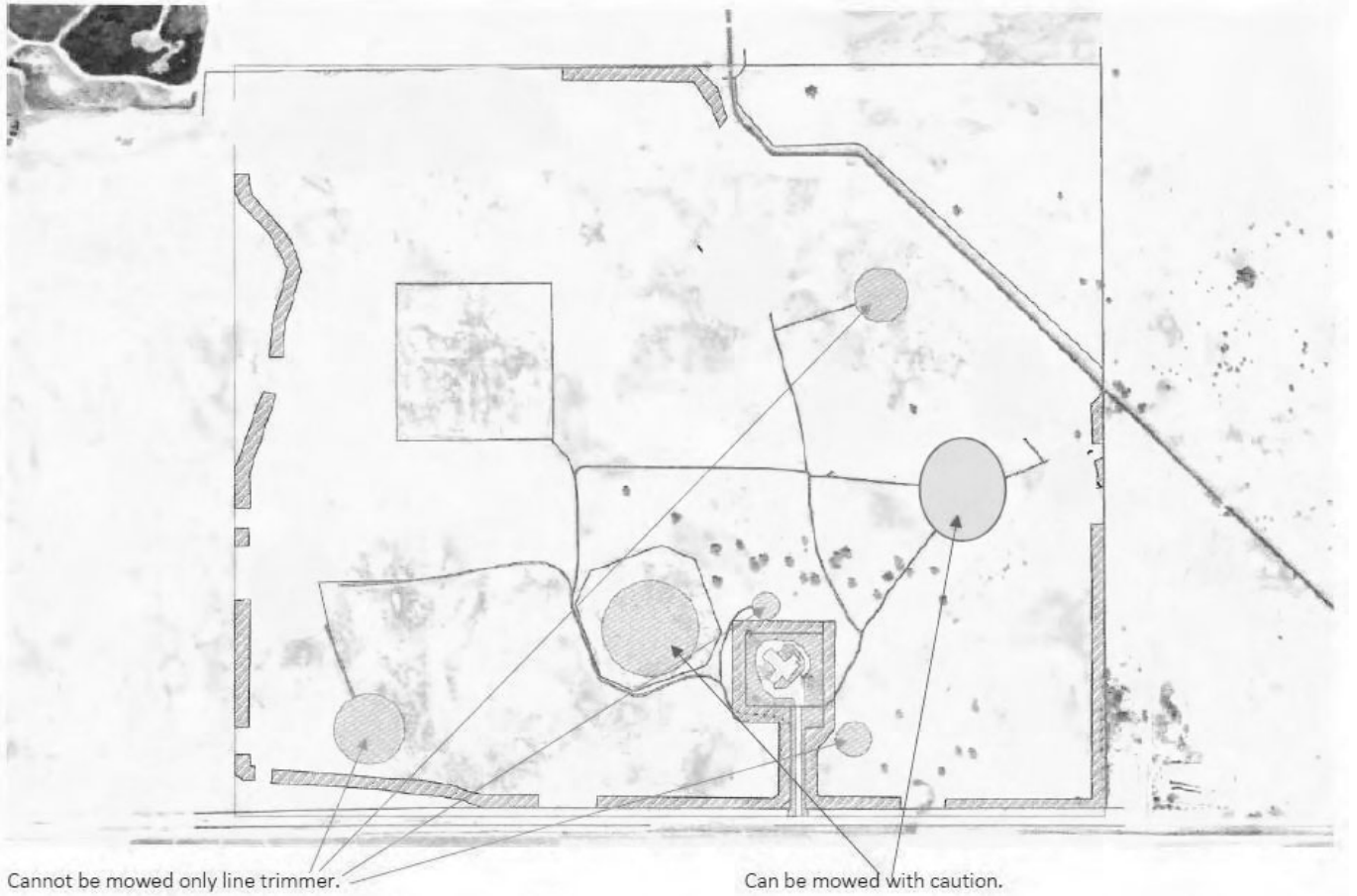
ALL QUANTITIES PROVIDED ARE ESTIMATED ONLY

APPENDIX C - Required Reports/Forms

Required	Due Date
Contractor's QCP	Pre-performance Conference
Annual Work Schedule	Pre-performance Conference
Primary/Alternate POCs	Pre-performance Conference
Herbicide - Weed Control Plan	Pre-performance Conference
Monthly Work Schedule	Due five days prior to the start of the month
Contractor's Daily Work Completed	Due by 9:00 AM the following day
AF Form 103 – Digging Permit	As Needed
AF Form 3952 - Chemical/Hazardous Material Authorization	As Needed
DD Form 1532-1 Pest Management Maintenance Record	As Needed
AF Form 483 – Competency Card	As Required

Appendix D





Appendix N

Beale AFB Approved Seed Mix

Beale AFB Erosion Control Seed Mix
9 CES/CEIE

<u>Scientific name</u>	<u>Common name</u>	<u>PLS Weight (lbs/ac)</u>
Stipa pulchra	Purple needle grass	6.0
Stipa cernua	Nodding needle grass	1.5
Bromus carinatus	California brome	3.5
Poa secunda secunda	One-sided blue grass	1.5
Elymus glaucus	Blue wildrye	3.5
Festuca microstachys	Pacific fescue	3.0
Lupinus bicolor	Miniature lupine	2.5
Trifolium wildenovii	Tomcat clover	2.0
Lasthenia fremontii	Fremont's goldfields	0.25
Lasthenia glabrata	Yellow rayed goldfields	0.50

24.25 lbs/acre

Seeding

Seeding with native grasses is one of the easiest methods of erosion control. Seeding can be quickly applied to slopes, materials are inexpensive, and technique is compatible with many construction situations.

Methods

Seeds may be applied to slopes by broadcasting seed mixes onto the slope by hand or by placing seed into small holes placed into the slope or by hydroseeding. Broadcast seeding is the most common application method employed in projects. Hydroseeding is another application method that uses seed mixed with water, fertilizer, and sometimes mulches to spray apply the mixture onto expansive or hard to reach slope areas.

Broadcast Seeding

For broadcast seeding, seeds are scattered uniformly by hand. If the application area soil has been roughened slightly, seed germination will be more successful. It is also important to make sure precipitation does not wash seeds down the slope. Seeding with native grasses requires little to no maintenance. The native grasses are adapted to the California Mediterranean climate (hot dry summers, cold wet winters) and germinate only when precipitation/temperatures are correct. To insure better germination rates and reduce sedimentation the seeded areas should be mulched. Mulching will keep seeds from being blown and washed away, or eaten by wildlife, and to keep the surface soils moist. Use 'weed free straw'.

Appendix O
Beale AFB Approved Landscaping Plant List

Beale Air Force Base Landscape Design

Plant Species Selection

2018

The following checklist includes trees, shrubs, groundcovers, vines, perennials and grasses approved for exterior planting at Beale Air Force Base. The plant list is intended for developed areas of the base and adjacent open/naturalized areas. All plantings outside the cantonment and other developed areas and adjacent habitat are managed and approved by the Natural Resource Manager and are subject to different requirements. Plants listed for xeriscape areas are tolerant of drought, heat, and intense light levels, but require good drainage. Except for plants suitable for lawn areas, plants on this list are low-water users and well adapted to a Mediterranean climate and clay soils. Landscape design should use regionally native plants whenever possible. Plant only those species listed in categories suitable for the planting purpose. Exceptions to this list must be approved by the base Landscape Architect and the Natural Resources Manager. This plant list is available as an excel table so it can be sorted by category (contact the Natural Resource Manager for a copy).

BOTANICAL NAME	COMMON NAME	CA NATIVE	HEIGHT (FT)	WIDTH (FT)	Exposure F=FULL SUN P=PART SHADE S=SHADE	IRRIGATION NEEDS	EVERGREEN/DECIDUOUS	VISUAL AREAS			STREET TREE	33 FT. UNOBSTRUCTED SPACE	SCREEN	LAWN AREAS	PARKING AREAS	XERISCAPE AREAS	PLAZA/PLANTERS/ENTRIES	POLLINATORS
								OPEN SPACE/NATURALIZED	MAIN BASE	FLIGHTLINE								
TREES																		
<i>Acacia baileyana</i>	Bailey or Mimosa Acacia	No	20-30	20	F	Low	E		X	X	X				X	X		
<i>Acacia decurrens</i>	Black or Green Wattle	No	7-50	5-30	F	Low	E		X	X	X				X	X		
<i>Acacia purpurea</i>	Purple Leaf Acacia	No	20-30	20	F	Low	E		X	X	X				X	X		
<i>Acacia stenophylla</i>	Shoestring Acacia	No	25-30	15-20	F	Low	E		X	X	X				X	X		
<i>Acer circinatum</i>	Vine Maple	Yes	25	12	F/P	Low	D		X	X	X	X			X		X	
<i>Acer Xfreemanii</i>	Freeman's Maple	No	20-25	20	F/P	Low	D		X	X	X	X			X		X	
<i>Aesculus californica</i>	California Buckeye	Yes	15-30	20-30	F/P	Low	D	X	X							X		X
<i>Arbutus 'Marina'</i>	Marina Strawberry Tree	No	35	35	F/P	Low	E		X				X	X	X	X	X	
<i>Arbutus unedo</i>	Strawberry Tree	No	8-35	8-35	F/P	Low	E		X				X	X	X	X		
<i>Brachychiton acerifolius</i>	Flame Tree	No	60	30	F/P	Low	D		X	X	X							
<i>Brahea armata</i>	Mexican Blue Palm	No	50	8	F	Low	E		X						X	X	X	
<i>Casuarinas cunninghamiana</i>	River She Oak	No	70	30	F	Low	E		X		X				X	X		
<i>Ceanothus 'Ray Hartman'</i>	Ray Hartman California Lilac	Yes	12-15	12-15	F	Low	E	X	X	X	X		X	X	X	X	X	X
<i>Cedrus atlantica 'Glauca'</i>	Blue Atlas Cedar	No	60-80	30-45	F	Low	E		X	X								
<i>Cedrus deodara</i>	Deodar Cedar	No	60-80	30-45	F	Low	E		X	X								
<i>Celtis australis</i>	Mediterranean Hackberry	No	40	25-30	F	Low	D		X									
<i>Celtis occidentalis</i>	Western Hackberry	No	50-60	40-60	F/P	Low	D		X									
<i>Cercis occidentalis</i>	Western Redbud	Yes	10-18	10-18	F	Low	D	X	X				X	X	X	X	X	X
<i>Cercis reniformis 'Texas White'</i>	Texas White Redbud	No	25-35	20-30	F	Med	D		X				X	X	X			X
<i>Cercis reniformis 'Oklahoma'</i>	Oklahoma Redbud	No	25-30	20-30	F	Med	D		X				X	X	X			X
<i>Ceratonia siliqua</i>	Carob Tree	No	30-50	30-50	F	Low	E		X									
<i>Chilopsis linearis</i>	Desert Willow	Yes	15-30	10-20	F	Low	D		X	X	X		X		X	X		X
<i>Chitalpa tashkentensis</i>	Chitalpa cultivars	No	20-30	20-30	F	Low	D		X	X	X		X		X	X		X
<i>Cordyline australis</i>	Cabbage Tree	No	40-50	20	F	Low	E		X		X				X	X		
<i>Cupressus arizonica</i>	Arizona Cypress	No	30-50	15-30	F	Low	E	X	X	X								X
<i>Cupressus glabra</i>	Smooth Arizona Cypress	Yes	50-60	20	F/P	Low	E	X	X	X			X					X
<i>Geijera parviflora</i>	Australian Willow	No	20-30	20	F	Med	E		X									
<i>Gleditsia triacanthos 'Shademaster', 'Skyline'</i>	Skyline and Shademaster Honey Locust	No	30-70	12-20	F	Med/Low	D		X		X				X			
<i>Hesperocyparis macnabiana</i>	Macnab's Cypress	Yes	10-40	12-20	F	Low	D	X	X	X					X	X		
<i>Koelreuteria paniculata</i>	Goldenrain Tree	No	20-35	10-40	F	Low	D		X		X							
<i>Lagerstroemia spp.</i>	Crape Myrtle hybrids	No	12-30	15-30	F	Low	D		X	X	X	X		X	X	X	X	

Appendix O

BOTANICAL NAME	COMMON NAME	CA NATIVE	HEIGHT (FT)	WIDTH (FT)	EXPOSURE			IRRIGATION NEEDS	EVERGREEN/DECIDUOUS	VISUAL AREAS			STREET TREE	33 FT. UNOBSTRUCTED SPACE	SCREEN	LAWN AREAS	PARKING AREAS	XERISCAPE AREAS	PLAZA/PLANTERS/ENTRIES	POLLINATORS
					F=FULL SUN	P=PART SHADE	S=SHADE			OPEN SPACE/NATURALIZED	MAIN BASE	FLIGHTLINE								
TREES																				
<i>Laurus nobilis</i> 'Saratoga'	Grecian Laurel	No	12-40	12-40	F/P	Low	E		X	X	X									
<i>Lyonothamnus floribundus</i>	Island ironwood	Yes	50-60	15-20	F/P	Med	E		X		X						X		X	
<i>Maclura pomifera</i> 'White Shield'	White Shield Osage Orange	No	35	25	F/P	Med	D		X	X					X	X	X			
<i>Nyssa sylvatica</i>	Tupelo	No	30-50	15-25	F	Low	D		X								X			
<i>Olea europaea</i> 'Swan Hill'	Fruitless Olive	No	25-30	25-30	F	Low	E		X	X	X		X	X	X	X	X			
<i>Parkinsonia</i> 'Desert Museum'	Desert Museum Palo Verde (thornless)	No	25	20	F	Low	E		X	X	X				X	X	X	X	X	
<i>Pinus attenuata</i>	Knobcone Pine	Yes	60-80	20-40	F	Low	E	X	X				X				X			
<i>Pinus brutia</i>	Calabrian Pine	No	60-80	20-40	F	Low	E		X				X				X			
<i>Pinus canariensis</i>	Canary Island Pine	No	50-70	15-25	F	Low	E		X				X	X			X			
<i>Pinus edulis</i>	Pinon Pine	Yes	10-20	20-25	F	Low	E	X	X				X				X			
<i>Pinus eldarica</i>	Mondell Pine	No	30-80	20-40	F	Low	E		X				X				X			
<i>Pinus halepensis</i>	Aleppo Pine	No	30-60	20-40	F	Low	E		X				x				X			
<i>Pinus nigra</i>	Austrian Black Pine	No	35-40	25-30	F	Low	E		X				X		X	X	X			
<i>Pinus pinea</i>	Stone Pine	No	40-80	30-60	F	Low	E		X				X				X			
<i>Pinus sabiniana</i>	Gray Pine	Yes	40-80	20-40	F	Low	D	X												
<i>Pinus torreyana</i>	Torrey Pine	Yes	25-150	25-50	F	Low	E	X	X				X				X			
<i>Pistacia chinensis</i> 'Keith Davey'	Keith Davey Chinese Pistache	No	60	50	F	Low	D		X	X	X	X				X	X			
<i>Platanus racemosa</i>	California Sycamore	Yes	100	60	F/P	Low	D	X	X		X								X	
<i>Prunus ilicifolia</i>	Hollyleaf Cherry	Yes	10-30	10-30	F	Low	E	X	X						X	X			X	
<i>Quercus agrifolia</i>	Coast live oak	Yes	70	70	F	Low	E	X	X											
<i>Quercus castaneifolia</i>	Chestnut Leaved Oak	No	70	70	F	Low	D		X		X				X					
<i>Quercus douglasii</i>	Blue Oak	Yes	40-60	25-50	F	Low	D	X									X		X	
<i>Quercus ilex</i>	Holly Oak	No	40-70	40-70	F	Low	E		X		X						X			
<i>Quercus lobata</i>	Valley Oak	Yes	70-80	70-80	F	Low	D	X											X	
<i>Quercus suber</i>	Cork Oak	No	70-100	70-100	F	Low	E		X		X		X				X			
<i>Quercus wislizenii</i>	Interior Live Oak	Yes	30-75	30-80	F	Low	E	X	X				X				X			
<i>Rhus lancea</i>	African Sumac	No	25	20	F	Low	E		X				X				X			
<i>Sequoiadendron giganteum</i>	Giant Sequoia	No	25	25	F	Med	D	X	X		X					X				
<i>Juglans hindsii</i>	Northern California Walnut	Yes	35-60	30-50	F	High	D	X			X				X					
<i>Washingtonia filifera</i>	California Desert Fan Palm	Yes	30-80	8-25	F	Low	E		X		X	X				X	X			
<i>Ziziphus jujube</i>	Chinese Jujube	No	15-35	10-30	F	Med	D		X		X					X	X			
<i>Umbellularia californica</i>	California Bay Laurel	Yes	25-50	20-30	F/P	Low	E	X	X	X						X	X		X	
<i>Vitex agnus-castus</i>	Chaste tree	No	25	25	F	Med	E		X	X		X				X				

BOTANICAL NAME	COMMON NAME	CALIFORNIA NATIVE	MATURE HEIGHT (FT)	MATURE WIDTH (FT)	EXPOSURE		IRRIGATION NEEDS	EVERGREEN/DECIDUOUS	VISUAL AREAS			STREET TREE	33 FT. UNOBSTRUCTED SPACE	SCREEN	LAWN AREAS	PARKING AREAS	XERISCAPE AREAS	PLAZA/PLANTERS	POLLINATORS
					F=FULL SUN P=PART SHADE S=SHADE				OPEN SPACE/NATURALIZED	MAIN BASE	FLIGHTLINE								
SHRUBS																			
<i>Arbutus unedo</i>	Strawberry Tree	No	8-35	8-35	F/P		Low	E		X	X	X		X		X	X		
<i>Arbutus unedo</i> 'Compacta'	Compact Strawberry Tree	No	6-10	6	F/P		Low	E		X						X	X	X	
<i>Arctostaphylos</i> 'Howard McMinn'	McMinn's Manzanita	Yes	4-7	4-8	F		Low	E	X	X									X
<i>Arctostaphylos</i> 'Dr. Hurd'	Dr. Hurd Manzanita	Yes	8-15	8-15	F		Low	E	X	X									X
<i>Arctostaphylos glauca</i>	Big Berry Manzanita	Yes	7-10	7-10	F		Low	E	X	X		X		X		X	X		X
<i>Arctostaphylos</i> 'John Dourley'	John Dourley Manzanita	Yes	3	8	F/P		Low	E	X	X	X			X		X	X	X	X
<i>Arctostaphylos</i> 'Lester Rowntree'	Lester Rowntree Manzanita	Yes	8-10	8-10	F/P		Low	E	X	X				X		X	X	X	X
<i>Artemisia arborescens</i>	Tree Wormwood	No	4-6	4-6	F/P		Low	E		X									
<i>Artemisia californica</i>	California Sagebrush	Yes	4	4	F		Low	E	X	X	X			X		X	X	X	X
<i>Artemisia</i> 'Powis Castle'	Silver Sage	No	3	6	F		Low	E	X							X	X	X	X
<i>Baccharis pilularis</i>	Coyote Bush	Yes	6-10	12	F/P		Low	E	X	X	X			X	X	X	X		X
<i>Berberis darwinii</i>	Darwin Barberry	No	5-10	4-7	F/P		Low	E		X						X	X	X	X
<i>Caesalpinia gilliesii</i> 'Poinciana'	Bird of Paradise Bush	No	15-30	15	F		High	D		X				X		X	X	X	X
<i>Callistemon</i> spp.	Bottle Brushes	No	3-10	3-6	F		Low	E		X	X			X		X		X	
<i>Calycanthus occidentalis</i>	Spice Bush	Yes	6-12	8-12	F/P		Med	E	X	X				X		X	X		X
<i>Caragana arborescens</i>	Siberian Pea Shrub	No	10-15	6-10	F/P		Med	D		X									
<i>Carpentaria californica</i>	Bush Anemone	Yes	6-8	3-6	F/P		Low	E	X	X	X			X		X	X		X
<i>Cassia artemisioides</i>	Feathery Cassia	No	3-5	3-5	F/P		Low	E		X	X					X	X	X	
<i>Ceanothus</i> 'Blue Jeans'	Blue Jeans Mountain Lilac	Yes	6	6	F		Low	E	X	X	X			X		X	X		X
<i>Ceanothus</i> 'Concha'	California Lilac	Yes	6-7	6-8	F		Low	E	X	X	X			X		X	X	X	X
<i>Ceanothus crassifolius</i>	Hoary-Leaved Ceanothus	Yes	12	8	F		low	E	X	X	X			X		X	X		X
<i>Ceanothus</i> 'Dark Star'	Dark Star Ceanothus	Yes	5-6	8-10	P		Med	E	X	X	X			X		X	X	X	X
<i>Ceanothus griseus</i>	Carmel Ceanothus	Yes	10-15	5-15	P		Med	E	X	X	X			X		X		X	X
<i>Ceanothus impressus</i>	Santa Barbara Ceanothus	Yes	4	6	F/P		Med	E		X	X			X		X	X	X	X
<i>Ceanothus</i> 'Joyce Coulter'	Joyce Coulter Mountain Lilac	Yes	2	8	F/P		Med	E	X	X	X			X		X	X	X	X
<i>Ceanothus</i> 'Joan Mirov'	Joan Mirov Lilac	Yes	5-7	7-9	F		Low	E		X	X					X	X	X	X
<i>Ceanothus</i> 'Julia Phelps'	Julia Phelps California Lilac	Yes	3-5	8-10	F		Low	E	X	X	X					X	X	X	X
<i>Ceanothus</i> 'Tassajara Blue'	Tassajara Blue Ceanothus	Yes	6-8	5-8	F		Low	E	X	X	X			X		X	X	X	X
<i>Ceanothus Thryssiflorus</i> 'Perado'	El Dorado California Lilac	Yes	6-8	6-8	F		Low	E	X	X	X			X		X	X		X
<i>Cercocarpus alnifolius</i>	Island Mountain Mahogany	Yes	10-26	10-15	F		Low	E	X	X	X		X			X	X	X	X
<i>Cercocarpus betuloides</i>	Mountain Mahogany	Yes	10-26	10-20	F		Low	E	X	X	X		X			X		X	X
<i>Chamaerops humilis</i>	Mediterranean Fan Palm	No	10-20	8-10	F		Med	E		X									
<i>Chamelauicum uncinatum</i>	Geraldton Wax Shrub	No	12	12	F/P		Low	E		X						X	X		

BOTANICAL NAME	COMMON NAME	CALIFORNIA NATIVE	MATURE HEIGHT (FT)	MATURE WIDTH (FT)	EXPOSURE		IRRIGATION NEEDS	EVERGREEN/DECIDUOUS	VISUAL AREAS			STREET TREE	33 FT. UNOBSTRUCTED SPACE	SCREEN	LAWN AREAS	PARKING AREAS	XERISCAPE AREAS	PLAZA/PLANTERS	POLLINATORS
					F=FULL SUN P=PART SHADE S=SHADE				OPEN SPACE/NATURALIZED	MAIN BASE	FLIGHTLINE								
SHRUBS																			
<i>Cistus</i> spp.	Rock Roses	No	2-5	2-8	F	Low	E		X	X						X	X	X	
<i>Convolvulus cneorum</i>	Bush Morning Glory	No	2-4	2-4	F	Low	E		X	X							X	X	
<i>Coprosma kirkii</i>	Kirk's Coprosma	No	1-3	4-6	F/P	Low	E		X								X	X	
<i>Cotinus coggygria</i>	Purple Smoke Bush	No	20-25	20-25	F	Med	D		X			X			X			X	
<i>Dendromecon rigida</i>	Bush Poppy	Yes	5	6	F	Low	E	X	X								X	X	X
<i>Dodonaea viscosa</i>	Hop Bush	No	12-15	6-8	F/P	Low	E		X			X	X	X	X	X	X		
<i>Epilobium canum</i>	California Fuchsia selections	Yes	1-1/2	2-3	F	Low	E	X	X							X	X	X	X
<i>Epilobium canum</i> 'Bert's Bluff'	Bert's Bluff California Fuchsia	Yes	1-1/2	2-3	F	Low	D	X	X							X	X	X	X
<i>Epilobium canum</i> 'Catalina'	Catalina California Fuchsia	Yes	1-1/2	2-3	F	Low	D	X	X							X	X	X	X
<i>Eriogonum arborescens</i>	Santa Cruz Island Buckwheat	Yes	2-6	2-9	F	Low	E		X	X						X	X	X	X
<i>Eriogonum fasciculatum</i>	California Buckwheat	Yes	4-6	3-5	F	Low	E	X	X					X	X	X	X	X	X
<i>Eriogonum giganteum</i>	St Catherine's lace	Yes	2-5	4-10	F	Low	E		X					X	X	X	X		X
<i>Fremontodendron californicum</i>	Flannel Bush varieties (Requires excellent drainage)	Yes	6-20	6-15	F	Low	E	X	X	X		X			X	X			X
<i>Grevillea</i> spp.	Spider Flower	No	4-5	4-5	F	Low	E		X								X	X	
<i>Hakea laurina</i>	Pin Cushion Hakea	No	10-15	6-10	F/P	Low	E		X		X					X	X	X	
<i>Hakea saligna</i>	Willow Leaved Hakea	No	12-15	12-15	F/P	Low	E		X	X		X			X	X	X		
<i>Hakea suaveolens</i>	Sweet Hakea	No	10-20	10-20	F	Low	E		X		X		X		X	X	X	X	
<i>Heteromeles arbutifolia</i>	Toyon	Yes	10-15	10-15	F/P	Low	E	X	X			X	X	X	X	X	X		X
<i>Lavandula</i> spp.	Lavender	No	1-4	1-4	F	Low	E		X	X						X	X	X	X
<i>Leonotis ocymifolia</i>	Minaret Flower	No	4-5	2-3	F	Low	E		X									X	
<i>Leucophyllum frutescens</i>	Texas Ranger	No	3-4	4-6	F	Low	E		X			X			X	X	X		
<i>Leucophyllum frutescens</i> 'Compacta'	Compact Texas Ranger	No	2-3	4-5	F	Med	E		X						X	X	X	X	X
<i>Mahonia</i> spp.	Barberrys	Yes	2-3	3-6	P/S	Low	E	X	X							X	X	X	X
<i>Mimulus aurantiacus</i>	Sticky Monkey Flower selections	Yes	3-5	5	F	Low	E	X	X	X	X					X	X	X	X
<i>Monarda villosa</i>	Coyote Mint	Yes	1/2	1	F/P	Low	D	X	X								X	X	X
<i>Myoporum insulare</i>	Blueberry Tree	No	10	5	F/P	Low	E		X			X	X			X			
<i>Nerium</i> spp.	Oleander	No	6-12	6-12	F	Low	E		X			X							
<i>Photinia serrulata</i>	Chinese Photinia	No	25	15	F	Med	E		X	X		X			X				
<i>Pittosporum tobira</i>	Mock Orange	No	2	5	F	Med	E		X			X			X			X	
<i>Plumbago auriculata</i>	Cape Plumbago	No	6	6	F	Med	E		X									X	

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					F=FULL SUN P=PART SHADE S=SHADE				OPEN SPACE/NATURALIZED	MAIN BASE	FLIGHTLINE								
SHRUBS																			
<i>Prosopis glandulosa torreyana</i>	Mesquite selections	Yes	20-30	23	F		Low	E		X				X			X		X
<i>Punica granatum</i>	Pomegranate	No	6-20	4-15	F/P		Low	E		X				X		X	X	X	
<i>Rhamnus ilicifolia</i>	Hollyleaf Redberry	Yes	3-9	3-9	F/P		Low	E	X	X							X		X
<i>Rhamnus crocea</i>	Spiny Redberry	Yes	3-7	7	F/P		Low	E	X	X							X		X
<i>Rhamnus californica</i>	California Coffeeberry selections	Yes	4-8	4-8	F/P		Low	E	X	X				X		X	X		X
<i>Rhus ovata</i>	Sugar Bush	Yes	5-10	5-10	F		Low	E	X	X				X	X	X	X	X	X
<i>Rosmarinus spp</i>	Rosemary	No	1-7	4-6	F		Low	E		X	X				X	X	X	X	X
<i>Romneya coulteri</i>	Matilija Poppy	Yes	5-8	10-20	F		Low	D		X				X	X	X	X		X
<i>Salvia brandegi</i>	Island Sage selections	Yes	4-6	4-8	F		Low	E		X						X	X	X	X
<i>Salvia clevelandii</i>	Cleveland Sage	Yes	4-6	4-8	F		Low	E	X	X				X		X	X	X	X
<i>Salvia clevelandii</i> 'Poza Blue'	Pozo Blue Sage	Yes	3-4	4-5	F		Low	E		X				X		X	X	X	X
<i>Salvia apiana</i>	White Sage varieties	Yes	3-4	5-6	F		Low	E		X						X	X	X	X
<i>Salvia leucantha</i>	Mexican Bush Sage	No	3	4	F		Low	E		X						X	X	X	X
<i>Salvia leucophylla</i> 'Point Sal'	Point Sal Purple Sage	Yes	4-6	4-6	F		Low	E		X						X	X		X
<i>Salvia</i> 'Dara's Choice'	Dara Emery Hybrid Sage	Yes	2-3	3-4	F/P		Low	E		X						X	X	X	X
<i>Salvia melifera</i>	Black sage	Yes	4-6	8-10	F		Low	D	X	X						X	X		X
<i>Santolina chamaecyparissus</i>	Santolina	No	2-4	1-3	F		Low	E		X	X						X	X	X
<i>Sarcococca hookerana humilis</i>	Sarcococca	No	2	3-7	P/S		Low	E		X	X						X	X	X
<i>Sphaeralcea ambigua</i>	Desert Mallow	Yes	3-4	3-4	F		Low	E		X						X	X	X	X
<i>Teucrium fruticans</i> 'Azuereum'	Blue Bush Germander	No	4-8	4-10	F		Low	E		X	X			X		X	X		X
<i>Xylosma congestum</i>	Xylosma selections	No	5-8	5-6	F/P		Med	E		X	X			X		X	X		

BOTANICAL NAME	COMMON NAME	CALIFORNIA NATIVE	MATURE HEIGHT (FT)	MATURE WIDTH (FT)	EXPOSURE		IRRIGATION NEEDS	EVERGREEN/DECIDUOUS	VISUAL AREAS			SWALES/WETLAND	33 FT. UNOBSTRUCTED SPACE	SCREEN	LAWN AREAS	PARKING AREAS	XERISCAPE AREAS	PLAZA/PLANTERS	POLLINATORS
					F=FULL SUN P=PART SHADE S=SHADE				OPEN SPACE/NATURALIZED	MAIN BASE	FLIGHTLINE								
GROUNDCOVERS, VINES, PERENNIALS, GRASSES																			
<i>Aloe</i> spp.	Aloes	No	1-10	1-15	F	Low	E		X	X							X	X	
<i>Achillea millefolium</i>	Yarrow selections	Yes	2-3	3-5	F	Low	D	X	X	X							X	X	
<i>Agrostis pallens</i>	California Bent Grass	Yes	1	1-2	F	Low	E		X		X				X			X	
<i>Amaryllis belladonna</i>	Belladonna Lily/Naked Lady	No	1-2	3-4	P	Med	D		X									X	
<i>Arctotheca prostrata</i>	Creeping Capeweed	No	1/4	1+	P	High	E		X	X								X	
<i>Arctostaphylos uva ursi</i> 'Green Supreme'	Bearberry	Yes	1/2	5+	P	Low	E	X	X	X					X	X	X	X	X
<i>Artemisia californica</i> 'Montara'	Montara Sagebrush	Yes	2-3	5	F/P	low	E	X	X	X		X	X		X	X	X	X	X
<i>Baccharis pilularis</i> 'Pigeon Point' & 'Twin Peaks'	Dwarf Coyote Bush	Yes	1-2	6	F	Low	E	X	X	X		X			X	X	X	X	X
<i>Baptisia australis</i>	Blue False Indigo	No	2-3	2-4	F	Med	D		X									X	X
<i>Bouteloua gracilis</i>	UC Verde Buffalo Grass	No	1/2	1/2	P/S	Low	E		X						X			X	
<i>Carex barbarae</i>	Valley/Santa Barbara Sedge	Yes	3	3	F/P	Low	E		X		X				X			X	
<i>Ceanothus</i> 'Diamond Heights'	Diamond Heights Ceanothus	Yes	1	5	F/P	Med	E	X	X	X					X	X	X	X	X
<i>Diates grandiflora</i>	African Iris/Fortnight Lily	No	3-4	2	F/P	Low	E		X						X		X	X	
<i>Echeveria agavoides</i>	House Leek	No	1/4	1	F	Low	E		X								X	X	X
<i>Echeveris</i> spp.	Hens And Chicks	No	1/3	1	F/P	Low	E		X									X	X
<i>Elymus condensatus</i> 'Canyon Prince'	Canyon Prince Giant Wild Rye	No	5	3	F/P	Low	E	X	X								X	X	X
<i>Erigeron glaucus</i>	Wayne Roderick Daisy	Yes	1	1-3	F/P	Low	E	X	X		X				X	X	X	X	X
<i>Erigeron karvinskianus</i>	Compact Santa Barbara or Mexican Daisy	No	1	1-3	F/P	Low	E		X						X	X	X	X	X
<i>Eriogonum grande</i>	Red Buckwheat	Yes	1-1/2	3	P	Low	E		X	X		X					x	X	X
<i>Eriogonum umbellatum</i>	Sulphur Flower	Yes	1-5	5	F/P	Low	E	X	X	X					X	X	X	X	X
<i>Euphorbia characias wulfenii</i>	Mediterranean Spurge	No	3-4	3-4	F/P	Low	E		X	X							X	X	
<i>Euphorbia x martini</i>	Compact Spurge	No	3	3	F/P	Low	E		X	X							X	X	X
<i>Euphorbia griffithii</i>	Fire Glow/Fire Charm Spurge cultivars	No	3-4	3-4	F/P	Low	E		X	X							X	X	
<i>Festuca</i> 'Serpentine Blue'	Blue California Fescue	Yes	2-3	1/2	F/P	Low	E	X	X	X	X	X			X	X	X	X	X
<i>Festuca idahoensis</i>	Idaho Fescue	Yes	2	2-3	F/P	Low	E	X	X	X					X	X	X	X	X
<i>Festuca occidentalis</i>	Western Fescue	Yes	3	2	P	Med	D		X	X					X	X	X	X	
<i>Festuca rubra</i>	Molate Fescue	Yes	8-12	12+	P/S	Med	E		X	X					X				
<i>Gazania linearis</i> 'Colorado Gold'	Colorado Gold Gazania	No	1/2	1	P/F	Low	D		X								X		
<i>Haworthia</i> spp.	Various succulents	No	1/4	3/4	P/S	Med	E		X								X	X	
<i>Hemerocallis</i> spp.	Day Lily selections	No	2-3	2-4	F/P	Low	E		X								X	X	
<i>Hesperaloe parviflora</i>	Coral Yucca	No	3-5	2-4	F	Low	E		X								X	X	X

BOTANICAL NAME	COMMON NAME	CALIFORNIA NATIVE	MATURE HEIGHT (FT)	MATURE WIDTH (FT)	EXPOSURE		IRRIGATION NEEDS	EVERGREEN/DECIDUOUS	VISUAL AREAS			SWALES/WETLAND	33 FT. UNOBSTRUCTED SPACE	SCREEN	LAWN AREAS	PARKING AREAS	XERISCAPE AREAS	PLAZA/PLANTERS	POLLINATORS
					F-FULL SUN P-PART SHADE S-SHADE				OPEN SPACE/NATURALIZED	MAIN BASE	FLIGHTLINE								
GROUNDCOVERS, VINES, PERENNIALS, GRASSES																			
<i>Hippocrepis comosa</i>	Horseshoe Vetch	No	1-3	3+	F	Med	D		X										
<i>Heuchera</i> spp.	Alum Root/Coral Bells varieties	Yes	1-1	1	P/S	High	E		X	X								X	
<i>Iris douglassiana</i>	Douglas Iris	Yes	1-2	2-3	P	Low	E	X	X	X							X	X	X
<i>Iris</i> spp.	Bearded Iris	No	1/2-3	1/4-1/2	F	Med	D		X	X								X	
<i>Iris</i> 'Pacific Coast Hybrids'	Pacific Coast Hybrid Iris	Yes	1-2	1-3	P	Low	E		X									X	X
<i>Juncus Patens</i>	California Gray Rush	Yes	2-3	2-3	F/P	Med	E	X	X		X				X			X	
<i>Juniperus horizontalis</i>	Various Juniper cultivars	No	1/2-1	6-10	F	Low	E		X	X								X	
<i>Kniphofia uvaria</i>	Red Hot Poker/ Poker Plant/Torch-lily	No	1-3	2-5	F/P	Low	E		X								X	X	
<i>Liatris spicata</i>	Gay Feather	No	1-2	3-4	F/P	Med	D		X									X	
<i>Mimulus puniceus</i>	Red Monkey Flower	Yes	2	3	F	Low	D	X	X	X						X	X	X	X
<i>Narcissus</i> spp.	Daffodils	No	1	1	F/P	Low	D		X									X	
<i>Opuntia ficus-indica</i>	Mission Cactus	No	10-15	5+	F	Low	E		X							X	X	X	
<i>Muhlenbergia rigens</i>	Deer Grass	Yes	3-5	3-6	F/P	Low	E	X	X	X	X					X	X	X	X
<i>Penstemon</i> 'Margarita BOP'	Margarita BOP Penstemon	Yes	1-2	1-2	F-P	Low	E	X	X	X					X		X	X	X
<i>Penstemon X parishii</i>	Parish's Penstemon	Yes	1-3	1-3	F-P	Low	E	X	X	X					X		X	X	X
<i>Phlomis frutescens</i>	Shrubby Jerusalem Sage	No	2-4	2-3	F	Low	E		X	X						X		X	
<i>Phormium</i> spp.	New Zealand Flax	No	1-3	1-2	F/P	Low	E		X	X						X		X	
<i>Salvia chamaedryoides</i> 'Marine Blue'	Marine Blue Salvia	No	2	3	F	Med	E		X							X	X	X	X
<i>Salvia farinacea</i>	Blue Salvia selections	No	2	1	F/P	Low	E		X							X	X	X	X
<i>Salvia greggii</i>	Autumn Sage selections	No	2	3	F/P	Low	D		X	X									X
<i>Salvia mellifera</i> 'Terra Seca'	Creeping Black Sage	Yes	1-3	6	F	Low	E	X	X						X	X	X	X	X
<i>Salvia sonomensis</i> 'Bee's Bliss', 'Mrs. Beard', 'Gracias'	Creeping Sage cultivars	Yes	1	6-8	F/P	Low	E	X	X	X		X			X	X	X	X	X
<i>Salvia sonomensis</i> 'Dara's Choice'	Dara's Choice Hybrid Sage	Yes	1/2	6-8	F/P	Low	E	X	X	X					X	X	X	X	X
<i>Salvia</i> 'Gracias'	Gracias Hybrid Sage	Yes	1/2	6-8	F/P	Low	E	X	X	X					X	X	X	X	X
<i>Salvia</i> 'Hot Lips'	Hot Lips Salvia	No	3	4	F/P	Low	E	X	X	X							X	X	X
<i>Salvia spathecea</i>	Hummingbird Sage	Yes	1-3	3	S/P	Med	E	X	X								X	X	X
<i>Sedum</i> spp.	Stone Crop cultivars	No	1/2	3	F	Low	E		X	X						X	x	X	X
<i>Sedum spurium</i> 'Dragon's Blood'	Stone Crop cultivars	No	1/2	1-3	F/P	Low	E		X	X						X	X	X	X
<i>Thymus citriodoros</i> 'Doone Valley'	Creeping Thyme	No	1/2	3	F/P	Low	E		X	X						X	X	X	
<i>Verbena</i> spp.	Verbena cultivars/hybrids	No	1/2	2-4	F	Low	E		X							X	X	X	

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GROUNDCOVERS, VINES, PERENNIALS, GRASSES																			
<i>Yucca aloifolia</i>	Spanish Bayonet	Yes	10	5	F	Low	E		X						X	X	X	X	
<i>Yucca baccata</i>	Banana Yucca	No	10	5	F	Low	E		X	X					X	X	X	X	
<i>Yucca elata</i>	Soap Tree Yucca	Yes	15-20	6-8	F	Low	E		X	X					X	X	X		
<i>Yucca endlichianas</i>	Ground Yucca	No	2-3	2-3	F	Low	E		X	X					X	X	X		
<i>Yucca gloriosa</i>	Mound Lily	No	2-3	2-3	F	Low	E		X						X	X	X		
<i>Wisteria sinensis</i> (and cultivars)	Chinese Wisteria (vine needs support)	No	20+	6-10	F/P	Med	E		X								X	X	

Appendix P

Plants that Provide Resources for Wildlife

Plants That Provide Resources for Wildlife

California Native Trees

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Acer macrophyllum</i> Big-Leaf Maple	Cover, seeds, nest sites for birds	All
<i>Alnus rhombifolia</i> White Alder	Cover, seeds, nest sites for birds	All
<i>Calocedrus decurrens</i> Incense Cedar	Cover, seeds, nest sites for birds	All
<i>Cercocarpus betuloides</i> Mountain Mahogany	Cover, seeds for birds, browse for deer	All
<i>Cupressus forbesii</i> Tecate Cypress	Cover, seeds, nest sites for birds	All
<i>Cupressus macnabiana</i> Macnab's Cypress	Cover, seeds, nest sites for birds	All
<i>Fraxinus dipetala</i> Foothill Ash	Cover, seeds, nest sites for birds	All
<i>Juglans hindsii</i> California Black Walnut	Nuts, cover, and nest sites for birds, small mammals	All
<i>Juniperus occidentalis</i> Western Juniper	Cover, nest sites, fruit for birds	All
<i>Pinus attenuate</i> Knob-cone Pine	Cover, nest sites, and seed for birds, small mammals	All
<i>Pinus coulteri</i> Coulter Pine	Cover, nest sites, and seed for birds, small mammals	All
<i>Pinus monophylla</i> Pinyon Pine	Cover, nest sites, and seed for birds, small mammals	All
<i>Pinus sabiniana</i> Digger pine	Cover, nest sites, and seed for birds, small mammals	All
<i>Pinus torreyana</i> Torrey Pine	Cover, nest sites, and seed for birds, small mammals	All
<i>Platanus racemosa</i> California Sycamore	Nest sites, forage, and seeds for birds	All
<i>Populus fremontii</i> Fremont Cotton Wood	Cavity nest sites, cover and forage for birds and small mammals	All
<i>Quercus agrifolia</i> Coast Live Oak	Acorns, cover, and nest sites for birds and mammals	All
<i>Quercus douglasii</i> Blue Oak	Acorns, cover and nest sites for birds and mammals	All
<i>Quercus dumosa</i> Scrub Oak	Acorns, cover and nest sites for birds and mammals	All
<i>Quercus lobata</i> Valley Oak	Acorns, cover, and nest sites for birds and mammals	All
<i>Quercus wislizenii</i> Interior Live Oak	Acorns, cover, and nest sites for birds and mammals	All
<i>Salix heinziniana</i> Heinz Willow	Nest sites and forage for birds, browse for deer	All
<i>Salix laevigata</i> Red Willow	Nest sites and forage for birds, browse for deer	All

California Native Trees

<i>Salix lasiolepis</i> Arroyo Willow	Nest sites and forage for birds, browse for deer	All
<i>Salix lasiandra</i> Western Black Willow	Nest sites and forage for birds, browse for deer	All
<i>Salix scoulerana</i> Scouler Willow	Nest sites and forage for birds, browse for deer	All

California Native Shrubs

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Arctostaphylos manzanita</i> Common Manzanita	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Arctostaphylos desniflora</i> 'Howard McMinn' Howard McMinn Vine Hill Manzanita	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Arctostaphylos</i> 'Emerald Carpet' Emerald Carpet Manzanita	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Atriplex</i> spp Salt Bush/Desert Holly	Seeds, flowers and cover for birds, quail	All
<i>Baccharis pilularis</i> spp. <i>Consanguinea</i> Coyote Bush	Cover and seeds for birds	All
<i>Ceanothus lemonii</i> California Lilac	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Ceanothus cuneatus</i> Buckbrush	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Ceanothus</i> 'Blue Jeans' California Lilac	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Ceanothus leucodermis</i> Chaparral Whitethorn	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Ceanothus</i> 'Concha' Concha Ceanothus	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Ceanothus</i> 'Frosty Blue' Frosty Blue Ceanothus	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Ceanothus</i> 'Ray Hartman' Ray Hartman Ceanothus	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Corylus cornuta</i> Western Hazelnut	Nuts for birds and small mammals	all
<i>Fremontia californicum</i> Flannelbush	Cover, and seeds for birds, flowers and insects	All
<i>Garrya elliptica</i> Coast Silk Tassel	Fruit and cover for birds	All
<i>Heteromeles arbutifolia</i> Toyon	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Lonicera interrupta</i> Chaparral Honeysuckle	Flowers for birds and insects, fruits for birds	All
<i>Mahonia aquifolium</i> Oregon Grape	Fruit and cover for birds, flowers for insects	All
<i>Mahonia</i> 'Golden Abundance' Golden Abundance Hollygrape	Flowers for insects, fruit and cover for birds	All
<i>Mahonia pinnata</i> California Holly Grape	Flowers for insects, fruit and cover for birds	All

California Native Shrubs

<i>Prunus besseyi</i> Western Sand Cherry	Flowers for insects, fruit and cover for birds	All
<i>Prunus ilicifolia</i> Holly-Leaf Cherry	Flowers for insects, fruit and cover for birds	All
<i>Prunus lyonii</i> Catalina Cherry	Flowers for insects, fruit and cover for birds	All
<i>Prunus subcordata</i> Sierra Plum	Flowers for insects, fruit and cover for birds	All
<i>Prunus virginiana demissa</i> Western Choke Cherry	Flowers for insects, fruit and cover for birds	All
<i>Rhamnus californica</i> Coffeeberry	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Rhamnus crocea ilicifolia</i> Holly-Leaf Redberry	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Rhus Ovata</i> Sugar Bush	Flowers for insects and birds, fruit and cover for birds	All
<i>Ribes sanguineum</i> Red-Flowering Currant	Flowers and fruit for birds	Summer, fall
<i>Ribes speciosum</i> Fuschia-Flowering Currant	Flowers and fruit for birds	Summer, fall
<i>Rosa californica</i> California Wild Rose	Flowers for birds and insects, fruit and cover for birds, deer browse	all
<i>Rosa woodsii</i> Wood's Rose	Flowers for insects, fruit for birds and small mammals, brose for deer	All
<i>Rubus ursinus</i> California Blackberry	Flowers for insects, cover, nest sites, fruit for birds and small mammals	All
<i>Sambucus caerulea</i> Blue Elderberry	Cover and fruit for birds, flowers for insects	All
<i>Shepherdia argentea</i> Silver Buffalo Berry	Cover, nest sites and fruit for birds	All
<i>Symphoricarpos albus</i> Snowberry	Cover and fruit for birds	All

California Native Perennials

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Achillea spp.</i> Yarrow	Flowers for insects	Summer
<i>Asclepias cordifolia</i> Milkweed	Flowers and leaves for butterflies and caterpillars	summer
<i>Aquilegia Formosa</i> Western Columbine	Flowers for birds and insects, seed for birds and small mammals	Spring, summer, fall
<i>Brodiaea spp.</i> Brodiaea	flowers for insects and birds, roots for small mammals	All year
<i>Cirsium californicum</i> Sierra Thistle	Flowers for insects and birds, seeds for birds	Summer, fall
<i>Delphinium decorum</i> Small Larkspur	Flowers for birds	Summer
<i>Eriogonum spp.</i> Buckwheat	Flowers for insects, seed for birds	Spring, summer

California Native Perennials

<i>Eschscholzia californica</i> California Poppy	Flowers for insects, seeds for birds	Spring, summer
<i>Heauchera micrantha</i> Alum Root	Flowers for birds	Spring, summer
<i>Iris spp.</i> Iris	Flowers for insects and birds	Spring
<i>Lupinus albifrons</i> Bush Lupine	Flowers for insects	Spring, summer
<i>Mimulus spp. (Diplacus)</i> Monkey Flower	Flowers for insects, birds	Summer
<i>Monardella villosa</i> Coyote Mint	Flowers for insects and birds	Summer
<i>Penstemon heterophyllus</i> Foothill Penstemon	Flowers and seeds for birds	Summer, fall
<i>Salvia spp.</i> Sage	Flowers for birds and insects, seed for birds	All
<i>Trifolium spp.</i> Clover	Flowers for insects	Spring, summer
<i>Wyethia angustifolia</i> Mule Ears	Flowers for insects, seeds for birds and small mammals	All
<i>Zauschneria californica</i> California Fuschia	Flowers for birds	Summer, fall

California Native Perennial Grasses

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Bromus carinatus</i> California Brome	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Deschampsia caespitosa</i> Tufted Hair-Grass	Cover, nesting, seed for birds and small mammals, forage for deer	all
<i>Elymus condensatus</i> Giant Wild Rye	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Elymus condensatus</i> 'Canyon Prince' Giant Blue Wild Rye	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Elymus glaucus</i> Blue Wild Rye	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Elymus triticoides</i> Creeping Wild Rye	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Festuca californica</i> California Fescue	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Festuca idahoensis</i> Idaho Fescue	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Festuca rubra</i> 'Molate Point' Molate Fescue	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Hordeum jubatum</i> Meadow Barley	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Hordeum jubatum</i> Foxtail Barley	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Millica californica</i> Mellic Grass	Cover, nesting, seed for birds and small mammals, forage for deer	All

California Native Perennial Grasses

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Muhlenberiga rigens</i> Deer Grass	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Sitaneum jubatum</i> Big Squirrel-Tail Grass	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Sporulus airoides</i> Dropseed	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Stipa cernua</i> Nodding Stipa	Cover, nesting, seed for birds and small mammals, forage for deer	All
<i>Stipa lepida</i> Foothill Stipa	Cover, nesting, seed fo birds and small mammals, forage for deer	All
<i>Stipa pulchra</i> Purple Needlegrass	Cover, nesting, seed for birds and small mammals, forage for deer	All

California Native Ground Covers and Vines

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Arctostaphylos uva-ursi</i> Bearberry	Berries, food for birds and deer, flowers for birds and insects	Fall
<i>Baccharis pilularis</i> 'Twin Peaks' Dwarf Coyote Bush	Cover for birds, small mammals	All
<i>Ceanothus hearstiorum</i> Hearst Ceanothus	Flowers for birds and insects, seeds for birds	Spring, summer, fall
<i>Ceanothus griseus horizontalis</i> 'Yankee Point' Carmel Creeper	Flowers for birds and insects, seeds and cover for birds	All
<i>Fragaria californica</i> California Strawberry	Fruit for birds and small mammals	Spring, summer
<i>Mahonia repens</i> Creeping Oregon Grape	Flowers for insects, fruit for birds and deer	All
<i>Oenothera stubbei</i> Baja Evening Primrose	Flowers for insects	Summer
<i>Ribes viburnifolium</i> Evergreen Currant	Flowers for birds and insects, fruit and cover for birds and small mammals	All
<i>Salvia sonomensis</i> Creeping Sage	Flowers for insects and birds	Summer
<i>Symphoricarpos mollis</i> Creeping Snowberry	Fruit for birds and small mammals	Fall, winter
<i>Vitis californica</i> California Wild Grape	Flowers for insects, fruit for birds	Spring, fall
<i>Zauschneria latifolia</i> Prostrate California Fuschia	Flowers for birds	Summer, fall

Introduced Ornamental Trees

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Arbutus unedo</i> Strawberry Tree	Flowers for birds and insects, cover and fruit for birds, small mammals and deer	All
<i>Catalpa speciosa</i> Western Catalpa	Flowers for birds and insects, cover and nesting for birds	Spring, summer

Introduced Ornamental Trees

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Celtis spp.</i> Hackberry	Flowers for butterflies, berries and nest sites for birds	All
<i>Crataegus phaenopyrum</i> Washington Thorn	Flowers for insects, berries and nest sites for birds	All
<i>Cupressus glabra</i> Arizona Cypress	Cover, seed, and nest sites for birds	All
<i>Elaeagnus angustifolia</i> Russian Olive	Cover and fruit for birds	All
<i>Eriobotrya japonica</i> Loquat	Flowers for insects, fruit, nest sites, and cover for birds	All
<i>Eucalyptus leucoxylon macrocarpa</i> 'Rosea' Large-Fruited, Red-Flowering Gum	Flowers for birds in the fall	fall
<i>Gleditsia triacanthos inermis</i> Honey Locust	Flowers for bees, pods for deer brose	All
<i>Ligustrum lucidum</i> Glossy Privet	Flowers for insects, fruit, cover and nest sites for birds	All
<i>Malus spp.</i> Crabapple	Flowers for insects, fruit and cover for birds	All
<i>Morus alba tartarica</i> Russian Mulberry	Cover, nest sites, and fruit for birds	All
<i>Nyssa sylvatica</i> Tupelo	Cover, nest sites, and fruit for birds	All
<i>Pinus spp.</i> Pines	Cover, nest sites, seeds for birds, seeds for small mammals	All
<i>Prunus caroliniana</i> Carolina Laurel Cherry	Flowers for insects, fruit and cover for birds	All
<i>Prunus domestica</i> Garden Plum	Flowers for insects and birds, fruit and cover for birds	Spring, summer, fall
<i>Prunus serotina</i> Black Cherry	Flowers for insects, fruit and cover for birds	Spring, summer
<i>Quercus spp.</i> Oaks	Acorns for birds, deer, and small mammals, cover and nest sites for birds	All
<i>Sorbus aucuparia</i> European Mountain Ash	Flowers for insects, fruit and nest sites for birds	All
<i>Tilia cordata</i> Little-leaf Linden	Flowers for bees, fruit, cover and nest sites for birds	All
<i>Ziziphus jujube</i> Chinese Jujube	Fruit, cover and nest sites for birds	All

Introduced Ornamental Shrubs

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Berberis thunbergii</i> Japanese Barberry	Cover, nest sites and fruit for birds	All
<i>Buddlei davidii</i> Butterfly Bush	Flowers for insects	Summer
<i>Cotoneaster spp.</i> Cottoneaster	Flowers, fruit and cover for birds	All

Introduced Ornamental Shrubs

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Arbutus unedo</i> 'Compacta' Dwarf Strawberry Tree	Flowers, fruit and cover for birds	All
<i>Escallonia</i> spp. Escallonia	Flowers for insects	Summer, fall
<i>Feijoa sellowiana</i> Pineapple Guava	Flowers, fruit and cover for birds	all
<i>Juniperus</i> spp. Juniper	Nest sites, cover and berries for small mammals and birds	All
<i>Mahonia</i> spp.	Cover, flowers and berries for birds	All
<i>Ligustrum japonicum</i> Wax-leaf Privet	Flowers for insects, fruit and cover for birds	All
<i>Nandina domestica</i> Heavenly Bamboo	Fruit for birds, flowers for insects	Winter
<i>Photinia</i> spp. Phontinia	Forage, cover, flowers and fruit for birds	All
<i>Pyracantha</i> spp. Firethorn	Flowers for insects, nest sites and cover for birds	All
<i>Rosa rugosa</i> Ramana's Rose	Flowers for insects, fruit for birds and small mammals, browse for deer	All
<i>Rosmarinus officinalis</i> 'Tuscan Blue' Tuscan Blue Rosemary	Flowers for insects and birds, seeds for birds	Spring, summer, fall
<i>Syringa vulgaris</i> Common Lilac	Flowers for insects	Spring
<i>Viburnum</i> spp. Viburnum	Flowers for insects. Fruit, cover and nest sites, for birds.	All

Introduced Ornamental Ground Covers, Perennials and Vines

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Aster</i> spp. Asters	Flowers for insects, food for caterpillars	Summer
<i>Coreopsis</i> spp. Coreopsis	Flowers for insects, seeds for birds	Summer, fall
<i>Cotoneaster dammeri</i> Bearberry Cotoneaster	Flowers for insects, fruit for birds and small mammals	Spring, summer, fall
<i>Duchesnea indica</i> Mock Strawberry	Flowers for insects, fruit for birds	Spring, summer
<i>Echinacea purpurea</i> Purple Coneflower	Flowers for insects	summer
<i>Hemerocallis</i> spp. Daylily	Flowers for insects	summer
<i>Heuchera sanguinea</i> Coral Bells	Flowers for birds	Spring, summer
<i>Lonicera</i> spp. Honeysuckle	Flowers for birds and insects, fruit for birds	Summer, fall
<i>Lavendula angustifolia</i> Lavender	Flowers for insects and birds	Summer

Introduced Ornamental Ground Covers, Perennials and Vines

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Oenothera berlandieri</i> Mexican Primrose	Flowers for insects	summer
<i>Parthenocissus tricuspidata</i> Boston Ivy	Nest sites, cover and fruit for birds	Fall, winter
<i>Penstemon spp.</i> Beard Tongue	Flowers for insects and birds, seed for birds	Summer, fall
<i>Rosemarinus officinalis 'Prostratus'</i> Creeping rosemary	Flowers for insects and birds, seeds for birds	Summer, fall
<i>Rudbeckia hirta</i> Gloriosa Daisy	Flowers for insects	Summer
<i>Salvia spp.</i> Sage	Flowers for insects and birds	Summer, fall
<i>Sedum spectabile</i> Sedum	Flowers for butterflies, food for caterpillars	Summer
<i>Trifolium fragiferum</i> O'Connor's Strawberry Clover	Flowers for insects, forage for waterfowl and deer	Summer

Introduced Ornamental Perennial Grasses

<u>Plant Name</u>	<u>Wildlife Value</u>	<u>Season</u>
<i>Andropogon gerardi</i> Big Blue Stem	Cover and seed for birds and small mammals, forage for deer	All
<i>Bouteloua curtipendula</i> Side Oats Grama	Cover and seed for birds and small mammals, forage for deer	All
<i>Calimogrostus arundinacea 'Stricta'</i> Feather Reed Grass	Cover and seed for birds and small mammals, forage for deer	All
<i>Helictotrichon sempervirens</i> Blue Oat Grass	Cover and seed for birds and small mammals, forage for deer	All
<i>Miscanthus transmornisonensis</i> Evergreen Maidengrass	Cover and seed for birds and small mammals, forage for deer	All
<i>Panicum biregatum</i> Switchgrass	Cover and seed for birds and small mammals, forage for deer	All
<i>Pennisetum orientale</i> Oriental Fountaingrass	Cover and seed for birds and small mammals, forage for deer	All
<i>Pennisetum setaceum cv. 'Rubrum'</i> Purple-Leaved Fountaingrass	Cover and seed for birds and small mammals, forage for deer	All
<i>Sorghastrum nutans</i> Indian Grass, Goldstem	Cover and seed for birds and small mammals, forage for deer	All
<i>Stipa gigantean</i> Giant Feather Grass	Cover and seed for birds and small mammals, forage for deer	All

Appendix Q

Beale AFB Firewood Permit Application

Beale AFB Application for Firewood Permits

FUELWOOD PRODUCTS PERMITS NO.
DATA REQUIRED BY THE PRIVACY ACT OF 1974

PRESCRIBING DIRECTIVE: AFI 32-7064

AUTHORITY: Section 6311 of Title 5 of the U.S. Code

PRINCIPLE PURPOSE: To obtain information from individuals who desire to purchase fuel wood/forest products permits.

ROUTING USES: To maintain a record of fuel wood products from Beale AFB.

DISCLOSURE AND EFFECT: MANDATORY: If information is not furnished, permit will not be issued.

1. The following individual is authorized, per AFI 32-7064, to remove or pickup one (1) cord of fuel wood products from Beale AFB. This permit is valid for **30 days** following date of sale. It is required to call or email 9 CES/CEV office upon completion of picking up purchased fuel wood.

NAME: _____

ADDRESS: _____

TELEPHONE: _____ **DATE:** _____

CASH RECEIVED: _____ **PERMIT#** _____

AUTHORIZED LOCATION OF WOOD _____

2. Requirements are as follows:
 - a. Cost of fuel wood is **\$40.00** per cord of dead or down wood removed from base. A load is any amount up to, but not exceeding one cord. One cord is a pile of wood, eight (8) ft. long, four (4) ft. wide and four (4) ft. high. Cost of fuel wood has been determined based on current fair market prices.
 - b. All wood from areas designated at time of purchase shall be dead and down or already cut up and stored in the environmental yard. Standing trees, living or dead will not be cut unless specifically authorized by the Natural Resources Manager or their representative.
 - c. Clean up: No branches over three (3) inches in diameter and twelve (12) inches in length will be left in the cutting area.
 - d. All equipment and labor will be supplied by the buyer.
 - e. NO off-road vehicular travel will be permitted.
 - f. Trash and refuse will not be deposited on the base.
 - g. The removal of fuel wood products is restricted to daylight hours (sunrise to sunset)
 - h. The U.S. Government and the State of California are not responsible for any damage or injury to persons or property incurred as a result of this sale and removal of fuel wood products from Beale AFB.
 - i. The sale and permits will be limited to **5** cords per qualified person per year.
 - j. Individuals not following the above requirements will not receive fuel wood products permits.
 - k. Purchased wood is for personal use only and shall not be re-sold.

THIS PERMIT IS NON-REFUNDABLE

Signature of Authorizing Official _____

STATEMENT: I agree to abide by the requirement listed above. I agree to hold harmless the U.S. Government and the State of California for any damage or injury to property or a person, which is incurred in the use of this permit to cut and/or remove, authorized fuel wood products from Beale AFB.

SIGNATURE OF PERMIT HOLDER: _____

Appendix R
Operation Agreement and Leases for Beale
AFB Grazing Program

**OPERATING AGREEMENT
FOR GRAZING LEASE
ON BEALE AFB**

Provision 1. Overview

1.1 The Leased Premises are subject to multiple uses, and the Lessee's use of the Leased Premises is subordinate to and must not interfere with the military mission of Beale AFB. Additionally, it is the expressed intent of the Air Force to maintain the Leased Premises in accordance with best range management practices. The protection of the soil and its vegetative cover from deterioration by erosion, overgrazing, wildfire, noxious weed infestation, or other causes is considered part of best range management. The Lessee's use of the land must comply with Beale AFB land use, conservation, and environmental concerns. The purpose of this Operating Agreement is to give effect to the provisions of the Lease and to ensure the Lessee uses the Leased Premises in a manner consistent with the Beale AFB land use and range management practices.

Provision 2. Supervision

2.1 The Lessee's use and occupation of the Leased Premises shall be subject to the general supervision and approval of the 9th Civil Engineer Squadron Commander (9 CES/CC), or his or her representatives, and to such rules and regulations regarding the ingress, egress, safety, sanitation and security as may be prescribed by 9 CES/CC from time to time, provided that such rules and regulations do not unnecessarily interfere with the Lessee's use of the Leased Premises.

2.1.1 The Lessee shall furnish all equipment, labor and supplies and shall pay all expenses necessary and incident to compliance with these regulations. The maintenance, protection and restoration required of the Lessee constitute a portion of the compensation for use of the leased land. FAILURE TO ACCOMPLISH THE MAINTENANCE, PROTECTION, AND RESTORATION AS HEREIN SPECIFIED WILL BE REGARDED AS A DELINQUENCY THE SAME AS FAILURE TO PAY CASH RENTAL.

2.2 The Lessee shall closely coordinate grazing operations with 9 CES/CC representative, including, but not limited to, the following:

2.2.1 The Lessee shall provide 9 CES/CC representative with current emergency telephone numbers where the Lessee may be contacted at any time twenty-four (24) hours per day, seven (7) days per week.

2.2.2 The Lessee shall provide 9 CES/CC representative with a list of all ranch hands or other persons expected to require access to Beale AFB in support of the Lessee's operations prior to the beginning of each grazing season. This list may be modified as necessary, but the Lessee must comply with the Provision 3, Access to Beale AFB, before any individual may be given access to Beale AFB.

2.2.3 The Lessee shall contact 9 CES/CC representative at least once per week to maintain adequate coordination between military uses and the Lessee's operations once livestock are present on the Leased Premises.

2.2.4 The Lessee shall attend occasional meetings, which may be called for the purpose of discussing the Lessee's operation, when requested to do so by 9 CES/CC representative.

2.2.5 All mature cattle will be marked with a distinctive, permanent brand or ear tag, visible from at least 50 feet, and meet State brand and industry standards. The Lessee shall provide to 9 CES/CC representative a list of all brands registered to the Lessee prior to the start of the Lease. The Air Force may confiscate livestock found on the Leased Premises that possess brands that are not on this list.

2.3 The Lessee shall provide 9 CES/CC representative with sufficient information to verify the numbers and weights of livestock brought onto and removed from the Leased Premises. Therefore, the Lessee shall:

2.3.1 Notify 9 CES/CC representative at least two (2) working days prior to placing livestock on or removing livestock from the Leased Premises. Transportation of livestock onto Beale AFB without the consent of 9 CES/CC representative is prohibited.

2.3.2 Make available for inspection upon the request of 9 CES/CC representative pertinent documents including, but not limited to, weight certificates, health certificates, brand inspection reports, and shipping documents.

2.3.3 Submit by the tenth (10th) day of each month a report that lists the number of AUMs grazed during the previous month.

2.3.3.1 9 CES/CC representative will provide the Lessee with the format for the report and specify the method for computing Animal Unit Month (AUM).

2.3.3.2 AUM is a unit of measurement based on a 1,000-pound dry cow grazing for 30 days. It is further defined as:

2.3.3.2.1. 1.3 AUM is a mature bull, pregnant cow, or one cow with suckling calf less than six months of age at the time of entry to the leased premises that has grazed for one month.

2.3.3.3. If there is a dispute about AUM categories assigned to specific cattle on the report, weight certificates for livestock placed on the Leased Premises will be requested. In the absence of weight certificates, each bovine will be considered as one animal unit. The Lessee shall ensure properly completed weight certificates accompany all arriving livestock shipments. The Lessee shall make these certificates available for inspection by the 9 CES/CC representative at the time of livestock delivery to the Leased Premises.

2.3.3.4 This report shall be completed in duplicate and mailed to: Grazing Program Manager, 9 CES/CEIEC, 6601 B Street, Beale AFB CA 95903-1708.

2.3.4 In addition to the monthly AUM report, 9 CES/CC representative may require supplemental information regarding AUM usage by pasture. The format for such a report shall be supplied by 9 CES/CC representative. The Lessee shall submit such information as required to 9 CES/CC representative.

2.3.5 Failure of the Lessee to comply with the reporting requirements outlined in this Condition shall constitute justification for 9 CES/CC to order all livestock to be gathered, counted, weighed, and assigned an animal unit classification based on the result of the weighing. The Lessee shall be liable for all costs associated with such action, and the Lessee shall have no claim of any character on account thereof against the government or any officer, agent, or employee thereof.

2.3.6 To ensure compliance with the Lease and Operating Agreement and to document Lessee performance, an inspection checklist may be reviewed by 9 CES/CC representative with the Lessee up to four times throughout the grazing season with additional documentation recorded and filed as necessary.

Provision 3. Access to Beale AFB

3.1 The Lessee shall obtain installation entry passes from the 9th Security Forces Squadron for all personnel who require access to Beale AFB as part of the Lessee's operations. Enacted in 2005 the REAL ID Act established minimum security standards for state-issued driver's licenses and identification cards and prohibits federal agencies from accepting for official purposes licenses and identification cards from states that do not meet these standards. Beale AFB cannot accept licenses from the following states for visitor access unless it is an Enhanced Driver's License: Kentucky, Maine, Minnesota, Missouri, Montana, Pennsylvania, and Washington. Minnesota and Washington States are issuing Enhanced Driver's License approved for installation access.

ACCEPTABLE FORMS OF IDENTIFICATION:

- Unexpired US Passport of passport card
- Driver's License/State photo ID
- ID card issued by federal, state or local government agencies, with all required REAL ID Act information, which should contain a photo, name, date of birth, gender, height, eye color and address.
- Personal Identification Verification (PIV) card, issued by Federal Government
- Veterans Health ID card, issued by U.S. Department of Veteran's Affairs
- Certificate of Naturalization/Certificate of Citizenship (Form N-550)
- Permanent Resident Card/Alien Registration Receipts card (Form I-551)
- Native American Tribal document with photograph
- An employee authorization document that contains a photograph (Form I-766)
- U.S. Coast Guard merchant mariner cards/credentials
- Foreign Government issued passport
- U.S. Military ID (Including retirees and dependents)

3.1.1 For all personnel requiring a pass, the Lessee shall submit a list of full names (first, middle, and last), dates of birth, home addresses, home or business phone numbers, and drivers' license numbers and states of issue. This list shall also include the name, address, and grazing pasture(s) of the Lessee.

3.1.2 The 9th Security Forces Squadron shall perform a background check for all individuals requesting a pass. The Lessee shall ensure that no person on the access list is an illegal alien or felon. Individuals who have criminal convictions, outstanding warrants, or are determined to be a security risk or detrimental to the good order and discipline at Beale AFB may, solely at the discretion of the Air Force, be denied access to Beale AFB.

3.2 All installation entry passes shall be issued for daytime use only. Access to Beale AFB during non-daytime hours shall be limited to emergencies only. All base access must be through a manned base entry control point (e.g. Schneider Gate, Wheatland Gate, Vassar Lake Gate, Grass Valley Gate, or Doolittle Gate), or the Lessee must be escorted by an Air Force representative onto the base property. Vehicles with equipment or large enclosures must enter through the Inspection Gate and undergo inspection.

3.3 The Lessee shall ensure that all installation entry passes are returned to the Air Force before any employee leaves the Lessee's employ or the expiration of the term of the Lease, whichever is earlier.

3.4 The Lessee shall only use the Inspection Gate/Commercial Vehicle Search Area when transporting cattle or equipment. 9 CES/CC representative shall designate the route of ingress and egress for livestock through the base to the Leased Premises. Loading and unloading of animals, in areas other than the government corrals, must be approved by 9 CES/CC representative.

3.5 There is one (1) area that can be accessed from the outside of the base: Grass Valley Gate Pasture C-2. This route is approved for loading and unloading cattle. However, the Lessee must be escorted to that area by a designated Air Force representative. Under no circumstances will the Lessee be given a key to the gate. Cattle trucks must be inspected at the Inspection Gate prior to unloading cattle in these locations.

3.6 The Lessee shall carry a cell phone at all times while on the installation to allow the Security Forces Command Center (SFCC) to contact them for emergency purposes.

3.7 If heightened security concerns arise, the 9th Reconnaissance Wing Commander or designated representative may require the movement of cattle to a separate pasture or removal of cattle from the base. The Lessee shall commence cattle movement within four (4) hours of notification.

3.8 The Lessee shall receive an antiterrorism/force protection briefing from the Security Forces prior to the start of the Lease.

Provision 4. Maintenance of Property

4.1 The Lessee, at the Lessee's own expense, shall:

4.1.1 Perform minor fence repair as needed and report routine maintenance and repair needs for fences, corrals, cattle guards, troughs and gates in livestock-tight condition.

4.1.2 Repair any facilities damaged by the Lessee, his employees, and or livestock.

4.1.3 Ensure that all water troughs are in good working order before the grazing season including repairing leaky float devices. Leaking water lines shall be repaired by the 9 CES/CC representative.

4.2 All materials used in maintaining Air Force facilities shall be at least the same type and quality as those used in original construction and shall remain as Air Force property after the expiration of the Lease. 9 CES/CC representative may order the Lessee to replace material that does not meet these specifications at the Lessee's expense.

4.3 9 CES/CC representative shall repair facilities damaged by military and firefighting activities unless the Lessee caused the damage or the fire.

4.4 The Lessee shall ensure proper clean-up of all areas used by his personnel and will dispose of refuse and debris generated as a result of various lease activities conducted on the leased property.

4.5 The Lessee shall obtain written approval from the 9 CES/CC representative before using any pesticides on the Leased Premises. As used herein, the term "pesticides" includes herbicides, insecticides, fungicides and rodenticides but does not include products commonly known as medicines. All pesticides must be applied in accordance with the manufacturer's instructions by a certified applicator. All chemicals, pesticides or medicines used on the leasehold will be disposed of according to label instructions. The Lessee will be held financially accountable for improper disposal of chemicals or containers that contaminate either the soil or ground water.

Provision 5. Resource Management

5.1 The term of the grazing season shall generally be seven (7) months as described in Annex 1. However:

5.1.1 9 CES/CC may curtail the grazing season when, in his opinion, accessible forage has been utilized to the extent where further grazing would be detrimental to the land or vegetative resources.

5.1.2 9 CES/CC may extend the grazing season when, in his opinion, sufficient forage exists to sustain additional grazing and the Lessee has submitted a written request to 9 CES/CC requesting an extension to the grazing season.

5.2 The nominal grazing capacity (total number of AUM) of the Leased Premises is described in Annex 1. The acreage was calculated using a computer mapping system (ESRI GIS Software) and excludes roads, buildings, and old building foundations within the pastures. The availability of forage and the general condition of the range shall determine the grazing capacity for each grazing season. The Air Force seeks to ensure that a minimum quantity of residual dry matter (mulch) in the amount of approximately 800 lbs. per acre remain on all pastures at end of grazing season.

5.2.1 Contingencies before or during the grazing season may increase or decrease the grazing capacity of the Leased Premises. Thus, 9 CES/CC representative may modify the grazing capacity as follows:

5.2.1.1 9 CES/CC representative may reduce the nominal grazing capacity of the Leased Premises prior to the start of the grazing season. 9 CES/CC representative will notify the Lessee of this reduction in writing at least thirty (30) calendar days in advance of the Term Beginning Date for that grazing season.

5.2.1.2 9 CES/CC may reduce the grazing capacity by requiring the Lessee to refrain from using part of the Leased Premises in accordance with Condition 7, Easements, Rights-Of-Way, and Reserved Rights.

5.2.1.3 9 CES/CC may reduce the grazing capacity through controlled burns of the pastureland.

5.2.1.3.1 To improve range conditions, the Beale AFB Prescribed Burn Management Plan sets forth goals to burn approximately 1,500-2,000 acres of pastureland per year. Forage production in these burned areas will be reduced following the burn. Up to fifty (50) percent reduction in AUMs for the burn area will be applied to the first grazing season following the burn, based on the growth rate of the burned area. There will be no adjustments to the grazing capacity in the second or later grazing seasons following the burn.

5.2.1.3.2 Wildfires are not part of the Beale AFB controlled burn plan and are not governed by this Provision. However, while there will be no rental rebate in the event of a wildfire, the number of cows able to graze on that land the following year will be reduced by up to fifty (50) percent, based on the growth rate of the burned area.

5.2.1.3.3 9 CES/CC shall provide Lessee with a minimum of forty-eight (48) hours advance notice for all such burns when livestock are present in the lease area.

5.2.1.4 The Lessee may make a written request to increase the grazing capacity of the Leased Premises. 9 CES/CC representative may, at his or her discretion, approve this request provided adequate forage is available.

5.2.2 When the grazing capacity of the Leased Premises is increased or decreased, the rent owed by the Lessee to the Air Force shall be calculated according to the adjusted AUM number multiplied by the negotiated AUM rate.

5.3 The forage that exists on the Leased Premises shall be the major source of food for the livestock. The Lessee shall not feed the livestock with supplemental tabs, grains, hay, silage, or other similar feeds when this material constitutes a major portion of the livestock’s total daily feed requirement. The Lessee may feed the livestock with protein, salt, minerals, and trace additives, whether singly or in combination, to supplement the animals' daily food requirements only. Short-term emergency feeding may be permitted, in lieu of hardship of temporary removal of the animals, only with prior written permission of the 9 CES/CC representative.

5.3.1 The Lessee shall use hay or other materials that are certified weed free for feeding of horses or livestock.

5.4 The Air Force (AF) will provide water for the Lessee’s livestock in accordance with the terms of the Lease. The following conditions shall apply:

5.4.1 A Utility Sales Agreement AF Form 3553, will be made a part of the Lease Agreement. The AF will meter the water used by the Lessee in each of the parcels. Thus, the Lessee will be sent monthly utility billings for water usage in each of the parcels with watering troughs; and troughs serviced by tank filling will be billed each time the tanks are filled, at a rate of 49 cents per 1000 gallons.

5.4.2 The Air Force shall provide the following number of troughs in the following pastures. The Air Force shall not be responsible for providing additional troughs unless at the discretion of 9 CES/CC representative.

A-2	A-3	A-6	A-7	A-9	B-1	B-2	B-3	B-6	C-1	C-2	C-4	C-5	D-3	F-4
1	1	1	1	1	2	2	1	3	7	1	1	1	2	2
(To Be Verified)														

5.4.3 Reservoirs that have been fenced to enhance the wildlife habitat and recreational qualities of the sites may not be used by cattle.

Provision 6. Livestock Management

6.1 The Lessee shall move cattle onto and off of the base during business hours, Monday-Friday, 6 a.m. – 4 p.m., unless special arrangements have been made through the 9 CES/CC representative.

6.2 The Lessee shall ensure that his livestock are confined to the Leased Premises at all times. If the Lessee’s livestock stray from the Leased Premises:

6.2.1 The Lessee shall collect the strays and return them to the Leased Premises as soon as possible, but no later than four (4) hours after receiving notice of the strays by the Air Force.

6.2.2 The Lessee shall determine how the strays exited from the Leased Premises and take immediate action to correct the deficiency in coordination with the Grazing Manager.

6.2.3 The Lessee shall move individual animals at the request of the 9 CES/CC representative, within 48 hours, if animals cause problems such as fence damage or repeated escapes.

6.3 The Lessee shall not use any of the structures existing on the land with the exception of corrals. These structures are used by the Air Force for various purposes including weather and wildlife monitoring, bivouacs, etc.

6.3.1 The Lessee shall remove any livestock that stray into these structures within four (4) hours of notification by the Air Force.

6.3.2 The Lessee shall take immediate action to prevent livestock from entering into the structures again and repair any fences around these structures completely within two (2) calendar days of the incident.

6.4 The Lessee shall ensure that the livestock are distributed over the Leased Premises to ensure a uniform use of the Leased Premises, minimize sacrifice areas, reduce the overall fire hazard, and enhance the overall land use. To accomplish this, unless otherwise directed in writing by the 9 CES/CC representative, the Lessee shall adhere to the following practices:

6.4.1 When forage on any portion of the Leased Premises has been reduced to the minimum level, the Lessee shall move and restrict livestock to areas containing adequate forage.

6.4.2 The Lessee shall distribute and move salt blocks and feed supplements to promote optimum distribution of livestock.

6.4.3 The Lessee shall move salt blocks and feed supplements monthly throughout the Leased Premises to limit sacrifice areas.

6.4.4 The Lessee shall not place salt blocks or feed supplements within 250 feet of any watering sources, wetland, vernal pool, archeological site, or wildlife nesting site unless approved by 9 CES/CC representative. To avoid conflicts, the Lessee shall request approval from 9 CES/CC representative of proposed supplement locations.

6.4.5 The Lessee shall not place salt blocks or feed supplements within one-quarter (1/4) mile of any paved road unless approved by the 9 CES/CC representative.

6.5 Upon the request of 9 CES/CC representative, the Lessee shall furnish written evidence that the Lessee is in compliance with all federal, state, and local animal health laws and regulations with respect to livestock grazing in the Leased Premises. 9 CES/CC representative reserves the right to impose quarantine, immunization, removal, or other health requirements deemed necessary to prevent or control diseases.

6.6 The Lessee shall comply with all instructions issued by 9 CES/CC representative concerning the disposition of dead livestock.

6.6.1 If not otherwise instructed, dead livestock that present no hazard to health and do not constitute a nuisance may be left to decompose naturally, except that carcasses shall be immediately removed a distance of 250 feet from (a) any areas adjacent to or near a water source when contamination of the water source may result from natural decomposition of the carcasses, (b) areas adjacent to or near paved road where the animal can be seen, and (c) any area within a flight safety wildlife exclusion zone.

6.6.2 The Lessee shall respond to the 9 CES/CC representative request to move dead livestock within twenty-four (24) hours of 9 CES/CC representative notification.

6.7 The Lessee shall comply with all instructions issued by the 9 CES/CC representative concerning the movement of or emergency response to injured or diseased livestock within four (4) hours of receiving the notification. At the discretion of 9 CES/CC representative, the Lessee shall move the injured or diseased livestock to a different location within the Leased Premises or remove them completely from the Leased Premises.

FREDRICK S. BERRIAN, Lt Col, USAF
Commander, 9th Civil Engineer Squadron

Date

NAME
TITLE
COMPANY NAME

Date



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 9TH MISSION SUPPORT GROUP
BEALE AIR FORCE BASE, CALIFORNIA

MEMORANDUM FOR Auburn Ravine Ranch, Inc.
1364 Ferreira Road
Lincoln, CA 95648

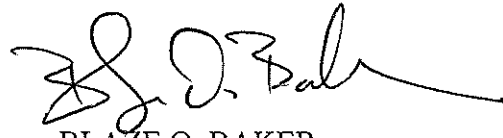
OCT 11 2017

FROM: 9CES/CEI
6601 B Street
Beale AFB CA 95903-1708

SUBJECT: Results of Beale AFB Grazing Lease Selection

1. A selection board convened to evaluate proposals from offerors interested in Beale's five grazing leases. A total of 4 proposals were received, with three (3) bids for the A lease, two (2) bids for the B lease, two (2) bids for the C lease, two (2) bids for the D lease, and two (2) bids for the F lease.
2. Your Grazing Plan was rated as Outstanding. Your confidence assessment was rated as Satisfactory.
3. For the A Parcel, the selected offeror is Auburn Ravine Ranch, Inc. The selected offeror's grazing plan was rated as Outstanding, and the confidence assessment was rated as Satisfactory. The selected offeror's bid is \$359,685.00.
4. For the B Parcel, the selected offeror is Auburn Ravine Ranch, Inc. The selected offeror's grazing plan was rated as Outstanding, and the confidence assessment was rated as Satisfactory. The selected offeror's bid is \$316,639.00.
5. For the C Parcel, the selected offeror is Auburn Ravine Ranch, Inc. The selected offeror's grazing plan was rated as Outstanding, and the confidence assessment was rated as Satisfactory. The selected offeror's bid is \$349,020.00.
6. For the D Lease, the selected offeror is C&S Family Venture. The selected offeror's grazing plan was rated as Outstanding, and their past performance confidence assessment was rated as Substantial. The selected offeror's bid is \$ 85,225.00.
7. For the F Lease, the selected offeror is Auburn Ravine Ranch, Inc. The selected offeror's grazing plan was rated as Outstanding, and their past performance confidence assessment was rated as Satisfactory. The selected offeror's bid is \$ 212,127.00.

8. Beale AFB must complete all required environmental documentation before the lease is signed. We estimate completion by 30 November 2012. We will be contacting you to arrange lease signature and a preliminary meeting. POC for this correspondence is Ms. Tamara Gallentine at (530) 634-2738 or tamara.gallentine.2@beale.af.mil.

A handwritten signature in black ink, appearing to read "Blaze O. Baker". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

BLAZE O. BAKER
Source Selection Authority



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 9TH MISSION SUPPORT GROUP
BEALE AIR FORCE BASE, CALIFORNIA

MEMORANDUM FOR C&S Family Venture
PO BOX 391
Gridley, CA 95948

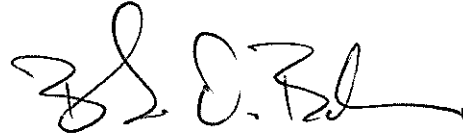
OCT 11 2017

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6601 B Street
Beale AFB CA 95903-1708

SUBJECT: Results of Beale AFB Grazing Lease Selection

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2. Your Grazing Plan was rated as Outstanding. Your confidence assessment was rated as Substantial.
3. For the A Parcel, the selected offeror is Auburn Ravine Ranch, Inc. The selected offeror's grazing plan was rated as Outstanding, and the confidence assessment was rated as Satisfactory. The selected offeror's bid is \$359,685.00.
4. For the B Parcel, the selected offeror is Auburn Ravine Ranch, Inc. The selected offeror's grazing plan was rated as Outstanding, and the confidence assessment was rated as Satisfactory. The selected offeror's bid is \$316,639.00.
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A handwritten signature in black ink, appearing to read "B. O. Baker", with a stylized flourish at the end.

BLAZE O. BAKER
Source Selection Authority

Appendix S
Beale AFB Invasive Plant List

Invasive Species Found on Beale AFB

Scientific Name	Common Name	Cal-IPC Rating*	CDFR Rating*
<i>Aegilops triuncialis</i>	barbed goatgrass	High	B
<i>Arundo donax</i>	giant reed	High	B
<i>Centaurea solstitialis</i>	yellow starthistle	High	C
<i>Elymus caput-medusae</i> (= <i>Taeniatherum caput-medusae</i>)	medusahead	High	C
<i>Rubus armeniacus</i> (= <i>Rubus discolor</i>)	Himalayan blackberry	High	
<i>Dittrichia graveolens</i>	stinkwort	Mod-Alert	
<i>Acroptilon repens</i>	Russian knapweed	Moderate	B
<i>Ailanthus altissima</i>	tree-of-heaven	Moderate	C
<i>Avena barbata</i> and <i>A. fatua</i>	(slender) wild oat	Moderate	
<i>Brassica nigra</i>	black mustard	Moderate	
<i>Bromus diandrus</i>	ripgut brome	Moderate	
<i>Carduus pycnocephalus</i>	Italian thistle	Moderate	C
<i>Chondrilla juncea</i>	rush skeletonweed	Moderate	A
<i>Cirsium vulgare</i>	bull thistle	Moderate	C
<i>Conium maculatum</i>	poison-hemlock	Moderate	
<i>Cynodon dactylon</i>	bermudagrass	Moderate	
<i>Cynosurus echinatus</i>	hedgehog dogtailgrass	Moderate	
<i>Festuca myuros</i> (= <i>Vulpia myuros</i>)	rattail fescue	Moderate	
<i>Festuca perennis</i> (= <i>Lolium multiflorum</i>)	Italian ryegrass	Moderate	
<i>Ficus carica</i>	edible fig	Moderate	
<i>Geranium dissectum</i>	cutleaf geranium	Moderate	
<i>Glyceria declinata</i>	waxy mannagrass	Moderate	
<i>Hordeum marinum</i>	Mediterranean barley, seaside barley	Moderate	
<i>Hordeum murinum</i>	hare barley, foxtail barley	Moderate	
<i>Hypericum perforatum</i>	common St. John's wort, klamathweed	Moderate	C
<i>Hypochaeris radicata</i>	rough catsear, hairy dandelion	Moderate	
<i>Phalaris aquatica</i>	hardinggrass	Moderate	
<i>Potamogeton crispus</i>	curlyleaf pondweed	Moderate	
<i>Trifolium hirtum</i>	rose clover	Moderate	
<i>Agrostis avenacea</i>	Pacific bentgrass	Limited	
<i>Briza maxima</i>	big quakinggrass, rattlesnakegrass	Limited	
<i>Bromus hordeaceus</i>	soft brome	Limited	
<i>Carduus tenuiflorus</i>	slenderflower and Italian thistle	Limited	C
<i>Erodium cicutarium</i>	redstem filaree	Limited	
<i>Hypochaeris glabra</i>	smooth catsear	Limited	
<i>Lythrum hyssopifolium</i>	hyssop loosestrife	Limited	
<i>Medicago polymorpha</i>	California burclover	Limited	
<i>Olea europaea</i>	olive	Limited	
<i>Parentucellia viscosa</i>	yellow glandweed, sticky parentucellia	Limited	
<i>Phytolacca americana</i>	common pokeweed	Limited	
<i>Plantago lanceolata</i>	buckhorn plantain, English plantain	Limited	
<i>Polypogon monspeliensis</i>	rabbitfoot polypogon, annual beardgrass	Limited	
<i>Robinia pseudoacacia</i>	black locust	Limited	
<i>Rumex crispus</i>	curly dock	Limited	
<i>Silybum marianum</i>	blessed milkthistle	Limited	
<i>Rotala indica</i>	Indian toothcup	not listed	
<i>Sorghum halepense</i>	Johnson grass	not listed	C
<i>Verbena litoralis</i>	seashore vervain	not listed	
<i>Verbena bonariensis</i>	tall vervain	watch list	
<i>Ludwigia sp.</i>	water-primrose	depends on sp.	
<i>Myriophyllum sp.</i>	parrot feather	depends on sp.	

* See Cal-IPC (<https://www.cal-ipc.org/plants/inventory/>) or CDFR (<https://www.cdfa.ca.gov/plant/>) webpage for ratings definitions

Appendix T
Invasive Plant Species Management
Guidelines Weed Management Toolkit

Excerpt from the 2017 Invasive Plant Species Management Guidelines ¹

5.0 Weed Management Toolkit

Having a varied toolkit of available methods to control invasive species allows for a more nuanced approach to selecting and killing only the target species, making each application of herbicide or other removal technique as efficient as possible. Furthermore, a single weed management tool typically does not result in successful control (DiTomaso et al. 2007). To increase the likelihood of successful long-term control, weed management experts recommend combining several weed management methods, tailored to situation-specific goals, constraints, and opportunities (DiTomaso et al. 2007; NISC 2016). Mechanical methods may be preferable in some situations or with certain species, particularly tree species. Some trees and shrubs can be killed by girdling or cutting down at the base, while others may need a combination of mechanical and chemical treatments. Grazing may be the preferred method to control annual grass species, and this has the added benefit of maintenance of sensitive species habitat. Prescribed burning is also a highly effective control technique in many instances, although it can require substantial planning and logistical support. For all control methods, timing of treatment to coincide with the vulnerable phenological stage of the target species is an essential consideration (see Appendix B of the 2017 IPSMG for species-specific timing). See DiTomaso et al. 2013 for further information on the control methods described below. The Cal-IPC website (<http://cal-ipc.org/resources/booksandcds/index.php>) also offers many free publications that provide details on control methods used in California.

5.1 General Weed Treatment Methods

- **Hand/Mechanical Removal.** Hand removal methods or the use of small hand-powered or handheld equipment (such as a weed-pulling tool or weed whacker) are often the first methods considered for removing small or new weed infestations. Whole weed plants removed using a weed-pulling tool, and weed material left over from weed-whacking or mowing efforts, should always be collected and disposed of in a manner that prevents spread to other areas; in some species, seed can ripen and disperse from plants that have been pulled up. This step is not critical if the weeds are treated before they produce viable propagules unless the weed is capable of vegetative reproduction (e.g., perennial pepperweed and many floating aquatic weeds).

Hand removal may also be a good option for containing the leading edge of an infestation where target plants are mixed with desirable native species. Use caution in hand removal efforts that result in turned soil. These disturbed, bare areas can be quickly recolonized by the target weed or other weed species. Minimize disturbance where possible, and consider revegetating or seeding turned soil. For perennial species, especially trees, hand removal can take the form of girdling, but this will only be effective if the species is incapable of resprouting below the girdling cut.

¹Hopkinson, P. 2017b. Grazing Management Guidelines Beale Air Force Base, California. Center for Environmental Management of Military Lands. Colorado State University. Fort Collins, CO.

- **Herbicides.** Herbicides are often used to manage dense or large weed infestations. Herbicides can often successfully control infestations that cannot be effectively or reasonably controlled through other management actions. Consider the herbicide's potential effect on surrounding vegetation, habitats, and wildlife (Cal-IPC 2015b). Some herbicides and surfactants should never be used where they may contaminate water bodies or wetlands. Timing of application is an important consideration. Pre-emergent herbicides are applied to the soil before weed seeds germinate, during fall before the rainy season has begun. Post-emergent herbicides are applied directly to the weeds once they have germinated and are actively growing. Selectivity of the herbicide (which types of plants the herbicide affects) is one of the most important considerations when choosing a chemical to apply in a wildland setting. Some herbicides are selectively more toxic to a range of species such as a group of families or broadleaf species only, while others are toxic to the majority of plants. Chemical companies conduct extensive testing on these effects, but actual toxicity in the field to many native plants as well as non-target species is unknown. When adequate background information is lacking, conduct small-scale tests to ensure that desirable or sensitive species are not damaged by the herbicide prior to its application at a large scale.

If herbicide use is being contemplated, it is important to account for the fact that some herbicides have restrictions for use in rangeland and grazing pastures, and treated areas may have to be excluded from livestock grazing for weeks or even an entire season, depending on the herbicide (DiTomaso et al. 2013, 510-511; Hulting 2016; Prather 2017). For example, clethodim, recommended for goatgrass control, is not registered for use on land grazed by livestock unless grazing is halted for 1-2 years (Beitz 2016). Although this trade-off may be well worth making in order to control a weed population, the restriction on livestock use should be planned for, in consultation with the grazing lessee. Herbicide use on rangeland weeds can also result in loss of organic certification for livestock that graze in the treated area; consult lessees with organic livestock operations before herbicides are used in their lease areas. Some organic certification-compatible herbicides are available, but information about their efficacy in range systems is generally limited. Available organic herbicides damage a plant upon contact but are not conveyed through the plant's vascular system so typically do not kill large or perennial plants; control of small, annual plants may be achievable. Available organic herbicides are also non-selective so will damage non-target plants if contact occurs (Cal-IPC 2015b, 9-10; Kyser 2015).

Herbicides must always be applied in accordance with the Air Force Pest Management Program, the Beale *Installation Pest Management Plan* (Beale AFB 2017a), General National Pollutant Discharge Elimination System Permit for Residual Aquatic Pesticide Discharges, and all applicable federal, Department of Defense, United States Air Force, State of California, and local directives and regulations. The Department of Defense maintains a list of approved pesticides. Cal-IPC (2015b) has produced a useful publication on the use of herbicides in wildlands, especially relating to minimizing impacts on wildlife.

- **Grazing.** Livestock grazing during specific times and at carefully monitored intensity can help control populations of non-native plant species, including medusahead and other annual grassland species. Particularly in grassland/vernal pool complexes, grazing can have direct benefits to sensitive species (Marty 2005; 2015). Moderate grazing of non-native annual grasses reduces cover and thatch that inhibit native plant species from germinating and growing and can prevent the formation of some types of weed infestations. Well-timed, intensive grazing can also help to control infestations of weeds. However, poorly timed and overly heavy livestock use can also contribute to disturbance that may favor weed colonization. Some weed seeds can adhere to the coats of livestock and fall off elsewhere (Chuong et al. 2016) or pass through the digestive system of livestock without harm and be deposited with feces in other areas, creating additional pathways for the spread of infestations.

Using livestock to control invasive plants often requires prescription grazing, which is the application of specified livestock grazing actions to accomplish specific vegetation management goals. Grazing intensity, animal distribution, and grazing period are often rather different from standard, light to moderate intensity grazing, and livestock performance may be significantly reduced. Consequently, finding a lessee willing to implement a grazing prescription can prove difficult and may require reduced grazing fees or even payment to the livestock operator. Furthermore, intensive grazing, sometimes necessary for successful weed control, can have undesirable consequences: concentrated hoof impacts and greatly reduced vegetative cover could result in increased soil erosion, and greater area of bare ground may allow other weed species to thrive. In addition, intensive grazing may significantly impact desirable species in the weed-infested area. Those caveats noted, prescription grazing can work well in controlling some weed species (DiTomaso et al. 2007). An essential planning factor is that prescription grazing has to be timed to the target species' phenology. Grazing must occur when weeds are most vulnerable to defoliation; poorly timed grazing can actually benefit target species, like yellow starthistle (Huntsinger et al. 2007). Timing prescription grazing to avoid vulnerable periods for desirable plants like native bunchgrasses may also be necessary.

Deciding what species of livestock to employ for weed control in any particular area is based on considerations of the vegetation each species eats in relation to weed management goals and forage availability, of the site's topography, of the site's existing infrastructure, and of revenue needs. Cattle prefer to eat grass rather than forbs or shrubs; sheep eat both grass and forbs and can eat shrubs; goats eat shrubs, forbs, grass, and have a wide tolerance for plants that are toxic or too thorny/spiny for other ungulates; horses primarily eat grass and can crop vegetation very close to the ground (Larson et al. 2015). Livestock species also use the landscape differently, with sheep and goats generally able to use steeper terrain than cattle. Stockers (young, weaned cows) may be more willing to scale slopes than adult cows, especially those that are pregnant and/or lactating. Sheep and goats are typically herded and fenced in with mobile, often electric, fencing so they can be spatially and temporally controlled much more easily than cattle and horses. In addition, their water needs can often be met by mobile water sources. Sheep and goat operators are likely to be concerned about predators, including domestic dogs. Sheep and

goats typically require a herder onsite with them at all times, and herding dogs may also be a necessary component of a sheep operation. As heavier animals, cattle and horses can have an impact on soil stability and creek banks (large numbers of smaller ungulates can also cause soil erosion). Cattle, in particular, are attracted to riparian areas, which can result in undesirable impacts. Sheep can be kept away from riparian areas, and goats tend to avoid water. Bedding locations for sheep can also be a concern and generally should be moved every few days to avoid damage to natural resources. Finally, cattle and sheep operators typically pay for the use of grazing land, whereas goat herd owners frequently charge land managers for employing their goats to control vegetation.

For details on grazing at Beale, consult the Base's *Grazing Management Guidelines* (Hopkinson 2017).

- **Prescribed Burning.** Prescribed burns are highly effective for controlling some species, particularly those present over large areas (e.g., over 100 acres). Beale has a *Wildland Fire Management Plan*, and one of its goals is to “[r]educe the abundance of undesirable plant species base-wide”. Beale’s three most troublesome grassland weeds, yellow starthistle, medusahead, and barbed goatgrass, can all be successfully controlled with prescribed burning. In addition, prescribed fire reduces hazardous fuel loads, removes thatch, recycles nutrients back into the soil, promotes several native fire-adapted species, and may help reduce the reestablishment of invasive species (DiTomaso and Johnson 2006). Because of air quality issues and concerns about fire escapes, prescribed burns require careful planning, coordination, and implementation to ensure success and may not be feasible in some portions of Beale because of potential conflicts with mission-critical operations. Prescribed burning is also likely to reduce forage production by as much as half in the first year or two following the fire and should be planned for in consultation with grazing lessees (RMA 2000; Becchetti et al. 2011).

As with other weed control methods, timing of treatment is an essential consideration. Grassland fires typically do not burn hot enough to kill the seeds once they have entered the soil so prescribed burns must occur while seeds are still held aloft and vulnerable to the fire’s heat. Fire effects are often short-lived and so consecutive annual burns are often necessary for longer term control. Conversely, another control method, such as herbicide application, may be used to follow up the prescribed burn (DiTomaso et al. 2013). Some species cannot be controlled with burning; black mustard (*Brassica nigra*), for example, often flourishes following a fire. DiTomaso and Johnson (2006) is a useful handbook on burning for weed control.

- **Torching (Also Known as Flaming).** Some weed infestations may be effectively treated using handheld propane torches to treat seedlings (DiTomaso et al. 2013, 471-472). Apply this method carefully and use only in winter or spring during or following rain events to limit the risk of wildfire. Torching may be best employed as a retreatment method to control new individuals germinating from a latent seed bank where an infestation was identified and treated the previous year. This method can be used to kill small seedlings that have recently germinated, before the seedlings have begun to flower or have gotten too large to easily kill using brief heat. This treatment can reduce the seed

bank in the soil by killing the germinated seeds and preventing weed reproduction that would lead to additional seed production during that year. The method has the advantages of requiring relatively low effort and being precise. It kills weeds before propagules have been set and therefore does not require the collection and disposal of weed material. Also, it does not involve the use of chemicals that could affect surrounding vegetation and wildlife.

- **Mowing.** Regular mowing performed for fuels control and grounds maintenance is not an effective invasive species control technique and should be distinguished from a carefully timed and precisely executed weed mowing treatment. Mowing using tractors or hand-held string trimmers can be used to control annual species, but is generally less effective in controlling perennials (DiTomaso et al. 2013, 462-463). When mowed, many perennial species respond with rapid regrowth, although reproduction can be depressed if mowing is timed correctly or with sufficient frequency. For annual species control, mowing must be carefully timed to coincide with the target species' phenology. Ideal timing for annual grasses, including barbed goatgrass and medusahead, coincides with the earliest stages of seed-set when embryos are still milky and vegetation is no more than six inches tall (Stromberg and Kephart undated; Brownsey et al. 2016). If performed after this stage, when new seeds have become viable, mowing is likely to make the infestation more severe by spreading the seeds. In the case of barbed goatgrass, early mowing will stimulate rapid growth of new tillers that will produce more seed, while mowing that is performed too late will disperse the seeds (DiTomaso et al. 2013).

Mowing presents a biosecurity threat from equipment that is used off Base that may transport weed seeds or vegetative propagules, as well as equipment that moves on Base from an area infested with a weed to an area that does not yet support it. In general, mowing is a technique for temporarily limiting the height of vegetation, and as such is not a recommended weed control strategy for Beale. Where its use is absolutely necessary, mow at the correct phenological stage and with appropriate cleaning best management practices implemented between sites.

5.2 Best Management Practices for Weed Management

Best management practices (BMP) range from programmatic recommendations for how goals are accomplished to specific protocols for executing tasks (Cal-IPC 2012; 2015b). Weed control BMPs can be recommended to contractors, residents, or Base divisions to guide their work and reduce the possibility that projects will introduce, spread, or increase weed infestations. Some BMPs will apply to all groups, while others are very specific to Base residents, grounds maintenance personnel, or grazing lessees. The BMP sections below are intended to be easily separated out from the larger document and provided to the appropriate user groups.

5.2.1 Prevention BMPs

Incorporate Prevention BMPs 1–7 into permits (e.g., work orders, NEPA documents, dig permits), leases, contracts, and similar agreements between Beale and its contractors, as appropriate:

- **Prevention BMP 1:** All livestock forage, seed, and erosion control materials should be certified weed free. To prevent the spread of invasive plants, County Agricultural Commissioners and the California Department of Food and Agriculture (CDFA) offer inspection services to certify materials as “weed free”. Weed-free forage is defined as hay, feed, straw, or straw mulch that has been inspected and certified not to contain propagative plant parts or seeds found on the California noxious weed list, as listed in the California Code of Regulations, Title 3, Division 4, Chapter 6, Section 4500. Appendix D of the IPSMG contains the Cal-IPC list of weed free forage providers.
- **Prevention BMP 2:** Consider installing “shaker plates” or similar devices in roads near entrances to construction sites and other areas of ground disturbance and construction equipment access on Beale. Vehicle can also be washed (see Cal-IPC 2012 for details and vehicle washing checklist). Shaker plates are corrugated plates that vibrate and loosen seeds and soil attached to vehicles and equipment. Seeds and soil shaken loose from the vehicles and equipment are collected below the shaker plates. Monitor the plates for the growth of weedy species and spray any weeds observed to be germinating with an appropriate herbicide to prevent growth and the formation of seeds. Periodically remove soil accumulating below the shaker plates to retain their effectiveness.
- **Prevention BMP 3:** Tools used to manage or control vegetation, such as chainsaws, hand clippers, and pruners, should be washed before being used on Beale and before being moved from one location to another (i.e., from one weed treatment site to another).
- **Prevention BMP 4:** Earth-moving equipment brought onto Beale should be washed before use and before being moved from one location on the installation to another (i.e., from one construction site to another). Use water or compressed air to remove any visible plant material, soil or compacted mud, gravel, sand, etc.
- **Prevention BMP 5:** Base residents, grounds maintenance, and landscaping teams should not plant any invasive weed species listed on the Beale invasive plant species watch list (IPSMG Appendix A), the State of California noxious weed list (IPSMG Appendix C), or Tables 3.1 to 3.4 in the IPSMG.
- **Prevention BMP 6:** Develop and distribute biosecurity pamphlets or other instructional materials to applicable personnel including, but not limited to, the Grounds Maintenance Shop, Dry Creek Saddle Club, cattle grazing lessees, sheep or goat contractors, and Civil Engineering Shops that handle base construction and landscaping contracts. Install instructional material as posted signs at access points such as gates, corrals, trail heads, and near the stables of the Dry Creek Saddle Club. The instructional materials could consist of “Wanted” style posters for Watch List or Eradication-level invasive species, general information about weed prevention, and contact information for the responsible Base personnel. Cal-IPC (2015b) has already produced a series of identification cards for invasive species either known on Beale or with the potential to be on Base that are designed for this purpose. Also, consider the CalFlora weed observer smart phone app

for weed reporting on Base
(<http://www.calflora.org/entry/applications2.html#smartphone>).

- **Prevention BMP 7:** Dispose of all plant debris potentially containing reproductive plant parts (i.e., seeds or plant fragments for species that reproduce vegetatively) removed using mechanical methods at an offsite landfill or green waste facility in such a manner as to prevent the potential spread of seeds or other propagules from the collected materials to other locations. This action may require, but is not limited to, bagging the material before it is transported within or off the site.

5.2.2 Grazing BMPs

- **Grazing BMP 1:** Graze pastures in accordance with the Beale *Grazing Management Guidelines* and monitoring data, e.g., fall RDM monitoring.
- **Grazing BMP 2:** All supplemental feed should be certified weed free forage (see Prevention BMP 1 above).
- **Grazing BMP 3:** Regularly consult with the Dry Creek Saddle Club to ensure that management of species toxic to horses (for example, yellow starthistle and Russian knapweed) is effective.
- **Grazing BMP 4:** Regularly monitor horse riding trails for invasive species that may be introduced on tack, in hooves, or in supplemental feed.
- **Grazing BMP 5:** Grazing animals disperse seeds via their dung and their hides or coats (Chuong et al. 2016). If livestock graze in invasive-infested pastures, consider holding the animals in a weed-free transitional pasture for three or more days before moving them to uninfested locations (Cal-IPC 2012).
- **Grazing BMP 6:** Explicitly include grazing lessees in biosecurity and early detection efforts. Weed reporting could be by the methods suggested in Prevention BMP 7 or as part of the required monthly Animal Unit Month reports. Include weed reporting requirements in the Grazing Land Use Rules attached to Beale's grazing leases.

5.2.3 Mowing BMPs

- **Mowing BMP 1.** Mowers should be cleaned prior to arrival at Beale. Cleaning between locations while on Base is strongly recommended.
- **Mowing BMP 2.** Schedule mowing events to coincide with the correct phenological stage for the target species to prevent dispersal of seed or rapid regrowth of the target weed or other species.
- **Mowing BMP 3.** Ensure that mower height is appropriate for target weed species and desired effect.

- **Mowing BMP 4.** Because mowing often results in the subsequent transport of seeds to other locations, avoid grounds maintenance mowing in areas that are infested with particularly troublesome weeds.

5.1.4 Herbicide BMPs

- **Herbicide BMP 1:** Schedule herbicide application to maximize kill rate with regard to weather conditions and target species' phenology. The Weed Program Manager should be familiar with target species biology and seasonality of the Base and take these into account when scheduling herbicide application.
- **Herbicide BMP 2:** In areas with sensitive resources, use low-volume applications and reduce the amount of herbicide applied per acre. Consider spot applications versus broadcast applications whenever feasible to limit the effects of contamination of small mammals' insect-based diets (Cal-IPC 2015b).
- **Herbicide BMP 3:** When possible, time herbicide application to coincide with multiple species' phenology window to maximize efficiency.
- **Herbicide BMP 4:** Ensure that the most effective herbicide for the target species is used. If necessary, submit an AF Approval Request Form for Non-Standard Pesticides to the IPMC 30 calendar days prior to application to request herbicides be added to the list of DoD approved pesticides. Effectiveness includes the assumption that the chemical will not have deleterious effects on any sensitive resources near the application site.
- **Herbicide BMP 5:** Care must be taken on Beale where invasive species co-occur with sensitive wetland, amphibian, plant, and invertebrate resources. Consultation with the Beale NRM will occur if herbicide/surfactant use is planned within 250 feet of a wetland. Herbicide application at Beale within Clean Water Act jurisdictional wetlands or Waters of the US will require coverage under a National Pollutant Discharge Elimination System (NPDES) Aquatic Pesticide Permit. Any herbicide application within jurisdictional or biological wetlands may require an Aquatic Pesticide Applicator License.
- **Herbicide BMP 6:** Do not spray herbicides in wetlands or waters of the US when water is present unless specifically targeting aquatic weeds and all permits and permissions have been obtained for such use.
- **Herbicide BMP 7:** Do not use herbicides within the effective catchment or natural drainage area (as indicated by micro- and macro-topography) of a wetland where the herbicides may potentially run off into the wetland during the wet season (approximately 1 November to 1 May) or when the 2-week chance of rainfall is greater than 70% (Ripley et al. 2002/2003).
- **Herbicide BMP 8:** Ensure that all herbicide applicators know and can recognize sensitive resources including listed wildlife and plants, vernal pools, and nesting birds.

- **Herbicide BMP 9:** Protect nearby non-target vegetation by minimizing drift and applying only enough herbicide to effectively treat the target plants. Minimize drift by applying herbicide under low wind conditions, and within the heat tolerances of herbicides that may be volatile.
- **Herbicide BMP 10:** All pesticide applicators must hold current Qualified Applicator Certificates (minimum qualification) from the California Department of Pesticide Regulation and submit copies to the IPMC within 30 days of contract award date.
- **Herbicide BMP 11:** Herbicides can be used up to the edge of a wetland during the dry season, where edges are marked or monitored in the field by the NRM or other qualified biologist. Consultation with the USFWS may be required if herbicides are to be used inside a vernal pool at any time of year.

5.2.5 Monitoring BMPs

- **Monitoring BMP 1:** The Weed Program Manager or contractor, as assigned by the Weed Program Manager, should conduct regular inspections for weeds at infestation locations that are the focus of eradication or containment efforts, along major travel corridors, in active construction sites and other areas of ground disturbance, and along waterways, per the monitoring program outlined in the Early Detection-Rapid Response Work Plan (IPSMG Appendix J). The frequency and intensity of weed inspections are expected to vary each year, based on the amount and timing of precipitation. In general, conduct inspections in late winter/early spring and late summer/early fall. These surveys should be feasible to conduct in approximately five days and should be a general area survey rather than detailed mapping of infestations. Perform detailed infestation mapping only for Eradication-level species or when a species may be directly threatening a sensitive resource. Map all weed inspection survey areas and identified weed problems using GIS equipment and add them to the ArcGIS database for tracking and management purposes.
- **Monitoring BMP 2:** The Weed Program Manager and/or contractor should determine protocols and scheduling for specific weed control actions based on the regular inspections and should determine the effectiveness of ongoing weed control actions to determine whether contingency actions are needed. Initially, this should consist of a review of existing data collection (2014 and 2016 weed surveys, and monitoring and implementation reports from contractors performing invasive species control work). If this existing information is determined to be insufficient to address the Weed Program's data needs, incorporate the monitoring methodology outlined in Section 4.3 of the IPSMG.
- **Monitoring BMP 3:** The contractor should maintain and regularly update a database of spatial and tabular data that allows tracking of weed populations and control efforts that the Weed Program Manager can review annually. Spatial data should include both

general area surveys from Monitoring BMP 1 and any detailed infestation mapping data that are available (see Section 4.3 of the IPSMG).

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Appendix U

List of AF Approved Herbicides

Standard List of Pesticides Available to DoD Components and Agencies

October 1, 2018

This list comprises the pesticides that the Armed Forces Pest Management Board (AFPMB) has approved for DLA Aviation/DSCR stockage. DoD policy (DoD Instruction 4150.07) requires that the use of most of these pesticides whether procured from DLA or locally, be pre-approved by a professional pest management consultant. This is usually done when the command pest management consultant approves the Installation's pest management plan, but can be approved on a case-by-case basis. DoD policy also requires that only trained and certified applicators may apply pesticides on DoD installations. Only authorized personnel should procure and use these pesticides. Note: For Contingencies, see the [Contingency Pesticides List](#) and [AFPMB Technical Guide 24](#).



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1. Herbicides/Fungicides

The following herbicides must be applied by a DoD Certified Pesticide Applicator or under the direct supervision of a DoD Certified Pesticide Applicator.

<u>NSN 6840-</u>	<u>Item Name (Alternative Trade Name)</u>	<u>MOA Code</u>	<u>Unit Package</u>	<u>AAC*</u>	<u>Price</u>	<u>UOI</u>	<u>DOD Users**</u>
01-360-4741 <u>SDS Label</u>	Fungicide, Methylisothiocyanate, 97% (MITC-FUME) ***RESTRICTED USE PESTICIDE***	NA	18 tubes	J	47.03	CO	A, N, F
01-457-6588 <u>SDS Label</u>	Fungicide, Azoxystrobin, 50% (Heritage)	11	(6) 1 lb cont.	H	6566.10	BX	A, N, M
01-643-0704 <u>SDS Label</u>	Herbicide Aminocyclopyrachlor, 39.5% and Chlorsulfuron, 15.8% (Perspective)	O, B	(12) 1.25 lb bt	J	974.16	BX	A, N, M, F
01-643-0697 <u>SDS Label</u>	Herbicide Aminocyclopyrachlor, 39.5% and Metsulfuron methyl, 12.6% (Streamline)	O, B	(8) 3 lb bt	J	2191.86	BX	A, N, M, F
01-643-0702 <u>SDS Label</u>	Herbicide Aminocyclopyrachlor, 22.8%; Metsulfuron methyl, 7.3% and Imazapyr 31.6% (Viewpoint)	O, B	(8) 5 lb bt	J	2841.30	BX	A, N, M, F
01-561-9603 <u>SDS Label</u>	Herbicide, Aminopyralid, 40.6% (Milestone)	O	(2) 2.5 gal co	J	2951.95	BX	A, N, M, F
00-392-7593 <u>SDS Label</u>	Herbicide, Bromacil, 21.9% lithium salt of bromacil, liquid (Hyvar X-L)	C1	(4) 1 gal co	H	615.65	BX	A, F, M, N
01-408-9079 <u>SDS Label</u>	Herbicide, Bromacil, 80%, wettable powder (Hyvar-X)	C1	(12) 4 lb bags	H	2230.58	BX	A, M, N
01-005-7523 <u>SDS Label</u>	Herbicide, Diquat, 37.3%, water soluble liquid (Reward)	D	1 gal co	H	494.72	GL	F, N
00-815-2799 <u>SDS Label</u>	Herbicide, Diquat, 37.3%, water soluble liquid (Reward)	D	(2) 2.5 gal co	H	1051.39	BX	A, N, F
01-341-9346 <u>SDS Label</u>	Herbicide, Diuron, minimum 80% diuron, granular	C2	25 lb bag	H	265.39	BG	A, N, F, M
00-001-7710 <u>SDS Label</u>	Herbicide, 40% bromacil, 40% diuron, granular (Krovar I DF)	C2,C1	6 lb bag	H	118.21	BG	A, N, F, M
01-630-3501 <u>SDS Label</u>	Herbicide, 40% bromacil, 40% diuron, granular (Krovar I DF)	C2,C1	25 lb bag	H	294.95	BG	F

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01-356-6001 <u>SDS Label</u>	Herbicide, Fluridone, 5%, pellets (Sonar SRP)	F1	40 lb co	J	646.92	CO	A, N
01-356-8888 <u>SDS Label</u>	Herbicide, Fluridone 41.7% liquid (Sonar A.S.)	F1	1 qt co	H	1172.45	QT	A, N
01-525-5869 <u>SDS Label</u>	Herbicide, Imazapic ammonium salt 23.6% liquid (Plateau)	B	(2) 1 gal co	J	1428.84	BX	A, N, M, F
01-108-9578 <u>SDS Label</u>	Herbicide, Isopropylamine salt of glyphosate, 41%, water soluble liquid (Roundup Pro/Ranger Pro/Razor Pro/Glyfos Pro)	G	(2) 2.5 gal co	H	164.59	BX	A, N, F, M
01-388-0142 <u>SDS Label</u>	Herbicide, Isopropylamine salt of glyphosate, 41%, water soluble liquid (Roundup Pro/Ranger Pro/Razor Pro/Glyfos Pro)	G	30 gal drum	H	1062.34	DR	A, F, N
01-356-8893 <u>SDS Label</u>	Herbicide, Isopropylamine salt of glyphosate, 53.8%, water soluble liquid (Rodeo/Roundup Custom)	G	(2) 2.5 gal co	H	381.76	BX	A, F, M, N
01-377-7113 <u>SDS Label</u>	Herbicide, Isopropylamine salt of glyphosate, 2.0%, Pelargonic acid 2.0% (Roundup Ready-to-Use)	G	24 oz pump spray bottle	H	9.55	BT	N, F
01-399-0673 <u>SDS Label</u>	Herbicide, Ammonium salt of glyphosate, 73.3% and 2.9% Diquat dibromide, (Quik Pro)	G, D	5 pkg.	H	19.67	BX	A, F, M
01-545-4540 <u>SDS Label</u>	Herbicide, Ammonium salt of glyphosate, 73.3% and 2.9% Diquat dibromide, (Quik Pro)	G, D	6.8 lb co	H	198.67	CO	A, N, M, F
01-356-8902 <u>SDS Label</u>	Herbicide, Isopropylamine salt of Imazapyr, 26.7% (Arsenal Powerline)	B	(2) 2.5 gal co	H	2901.40	BX	A, N, F, M
01-532-5403 <u>SDS Label</u>	Herbicide, Isopropylamine salt of Imazapyr, 27.7% (Habitat)	B	(2) 2.5 gal co	H	2300.84	BX	A, N, M
01-318-7417 <u>SDS Label</u>	Herbicide, Oryzalin, 40.4% (Surflan A.S.)	K1	(2) 2.5 gal co	H	415.99	BX	A, N, F, M
00-145-0013 <u>SDS Label</u>	Herbicide, Prometon, 25% prometon, emulsifiable concentrate (Pramitol 25E)	C1	(2) 2.5 gal co	H	281.26	BX	A, F, N

01-356-8891 <u>SDS Label</u>	Herbicide, Sulfometuron methyl, 75% (Oust XP)	B	48-oz co	H	280.11	CO	A, N, M
01-319-2890 <u>SDS Label</u>	Herbicide, Tebuthiuron, 80% (Spike 80 DF)	C2	4 lb bag	J	138.53	BG	A, N, F
01-457-6576 <u>SDS Label</u>	Herbicide, Tebuthiuron-Diuron, 1% Tebuthiuron, 3% Diuron (Spraykil SK-13)	C2	40 lb container	H	154.77	CO	A, N, M
01-552-1822 <u>SDS Label</u>	Herbicide, Triclopyr, 60.45% (Garlon 4 Ultra)	O	(2) 2.5 gal co	H	705.76	BX	A, N, M, F
00-577-4194 <u>SDS Label</u>	Herbicide, 2,4-Dichlorophenoxy-acetic acid (2,4-D), 67.2% oil miscible/water emulsifiable liquid (low volatile ester form)	O	(2) 2.5 gal co	H	215.49	BX	A, N, M
00-664-7060 <u>SDS Label</u>	Herbicide, 2,4-Dichlorophenoxy-acetic acid (2,4-D), 46.8% water soluble liquid (amine salt form)	O	(2) 2.5 gal co	H	143.19	BX	A, N, M
01-377-7110 <u>SDS Label</u>	Herbicide, 2,4-Dichlorophenoxy-acetic acid (2,4-D), 0.128%, 0.22% Mecoprop-p and 0.05% Dicamba water soluble liquid (Weed-B-Gon)	O	24-oz pump spray bottle	H	12.09	BT	F, N

2. Repellents

The following repellents must be applied by trained personnel or a DoD certified pesticide applicator.							
01-334-2666 <u>SDS Label</u>	Insect Repellent, clothing application, 40% permethrin, liquid (2-Gal sprayer)	3A	(12) 151 ml bt	H	141.16	BX	A, N, F, M
All DoD personnel following label and SDS familiarization may apply the following repellents.							
01-284-3982 <u>SDS Label</u>	Insect Repellent, personal application, Ultrathon (3M)	NA	(12) 2 oz tubes	H	90.18	BX	A, N, F, M
01-278-1336 <u>SDS Label</u>	Insect Repellent, clothing application, aerosol (Permethrin Arthropod Repellent)	3A	(12) 6 oz cans	H	72.64	BX	A, N, F, M
01-137-8456 <u>SDS Label</u>	Insect Repellent, personal application, 5% benzocaine, 10% precipitated sulfur (Chigg-Away)	NA	118 ml bt	H	6.16	BT	A, N, F, M

01-345-0237 <u>SDS Label</u>	Insect Repellent, clothing application, permethrin (IDA)	3A	12 kits	H	47.40	BX	A, N, F, M
01-584-8393 <u>SDS Label</u>	Insect Repellent, personal application, 30% DEET (SP532-Ultra30, Liposome formulation)	NA	(12) 2 oz tubes	H	75.15	BX	A, N, M, F
01-584-8598 <u>SDS Label</u>	Insect Repellent, personal application, 25% DEET, pump spray bottles (Cutter Backwoods Insect Repellent)	NA	(12) 6 oz bt	H	74.44	BX	A, N, F, M
01-619-4795 <u>SDS Label</u>	Insect Repellent, personal application, 20% Picaridin, pump spray bottle (NATRAPEL Insect Repellent)	NA	(12) 3.4 oz bt	H	109.27	BX	A, N, M, F
01-656-7707 <u>SDS Label</u> <u>SDS Label</u>	Insect Repellent, 20% IR3535 pump spray bottle (Bullseye Bug Repellent or Coleman 7466-1)	NA	(12) 4 oz bt	D	68.84	BX	A, N, F, M

3. Insecticides

The following insecticides must be applied by a DoD certified pesticide applicator or under the direct supervision of a DoD certified pesticide applicator.

01-642-8892 <u>SDS Label</u>	Insecticide, Acetamiprid 4.4% (End Zone Insecticide Stickers)	4A	(12) pkg of 20 stickers per pkg	J	601.71	BX	A, N, F, M
01-543-0662 <u>SDS Label</u>	Insecticide, Abamectin, 0.011%, (Advance 360A Dual Choice Ant Bait Stations)	6	72 bait stations	H	104.44	BX	A, N, M, F
01-561-9766 <u>SDS Label</u>	Insecticide, Abamectin, 0.05% (Avert Dry Flowable Cockroach Bait)	6	(12) 30 gram tubes	H	432.45	BX	A, N, M, F
01-561-9649 <u>SDS Label</u>	Insecticide, Abamectin, 0.05% (Avert Cockroach Bait Stations)	6	4 bags. Each bag contains 72 bait stations	H	181.49	BX	A, N, F, M
00-145-0016 <u>SDS Label</u>	Insecticide, Aluminum phosphide, 55 % tablets (Phostoxin/Fumitoxin) ***RESTRICTED USE PESTICIDE***	24A	100 tablets	H	39.14	CN	A, N, F
00-442-5698 <u>SDS Label</u>	Insecticide, Aluminum phosphide, 55 % pellets (Phostoxin/Fumitoxin) ***RESTRICTED USE PESTICIDE***	24A	1660 pellets	H	71.04	BT	A, N, F, M

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01-377-7049 <u>SDS Label</u>	Insecticide, <i>Bacillus thuringiensis</i> , 10.31% (Summit BTI Briquets)	11A	100 Briquets	H	122.09	BX	A, N, F, M
01-565-8243 <u>SDS Label</u>	Insecticide, <i>Bacillus thuringiensis</i> , subspecies <i>israelensis</i> , strain AM 65-52, 2.8% (VectoBac GR)	11A	40 lb bag	J	119.74	BG	A, N, F, M
01-565-8241 <u>SDS Label</u>	Insecticide, <i>Bacillus thuringiensis</i> , subspecies <i>israelensis</i> , strain AM 65-52, 37.4% (VectoBac WDG)	11A	(24) 1 lb bags/co	H	1338.08	CO	A, N, M, F
01-287-3938 <u>SDS Label</u>	Insecticide, Boric Acid, 35.5% aerosol (Perma-Dust)	8D	(12) 9 oz cans	Y	112.65	BX	A, N, F, M
01-525-6888 <u>SDS Label</u>	Insecticide, Bifenthrin, 7.9% liquid (Talstar P Professional)	3A	1-qt co	H	63.46	QT	A, N, M, F
01-104-0887 <u>SDS Label</u>	Insecticide, Carbaryl, 43%, liquid (Carbaryl 4L)	1A	(2) 2.5 gal co	H	384.99	BX	F, N
01-525-7139 <u>SDS Label</u>	Insecticide, Chlorfenapyr, 21.45%, liquid (Phantom)	13	(4) 75 oz co	H	1145.02	BX	A, N, F, M
01-313-7359 <u>SDS Label</u>	Insecticide, Beta-Cyfluthrin, 11.8% (Tempo SC Ultra)	3A	(12) 240 ml bt	H	625.84	BX	A, N, F, M
01-383-6251 <u>SDS Label</u>	Insecticide, Beta-Cyfluthrin, 10% (Tempo Ultra WSP)	3A	(32) 50 gm packs	H	467.92	BX	A, N, F, M
01-561-9717 <u>SDS Label</u>	Insecticide, Cyfluthrin, 0.1%, aerosol (PT Cy-Kick CS)	3A	(12) 17.5 oz cans/box	H	187.60	BX	A, M, F, N
01-561-9669 <u>SDS Label</u>	Insecticide, Lambda-cyhalothrin, 0.05% aerosol (PT 221L Residual)	3A	(12) 17.5 oz cans/box	H	162.22	BX	A, M, N, F
01-390-4822 <u>SDS Label</u>	Insecticide, Cypermethrin, 40% (Demon WP)	3A	1 lb jar	H	60.39	LB	A, N, M
01-573-5024 <u>SDS Label</u>	Insecticide, Deltamethrin, 0.03% (Kills Bedbugs II)	3A	(4) 1 gal jugs	J	107.44	BX	A, N, M
01-431-3345 <u>SDS Label</u>	Insecticide, Deltamethrin, 0.05% (DeltaDust)	3A	1 lb co	H	22.09	LB	A, N, F, M
01-642-9286 <u>SDS Label</u>	Insecticide, Deltamethrin, 0.1% granules (DeltaGard G)	3A	20 lb bag	J	180.80	BG	A, N, F, M
01-561-9745 <u>SDS Label</u>	Insecticide, Deltamethrin, 0.06%, aerosol (D-Force)	3A	8 x 14 oz cans/box	H	142.50	BX	A, N, M, F

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00-142-9438 <u>SDS Label</u>	Insecticide, Dichlorvos, 20% (Hot Shot No-Pest Strips)	1B	48 strips	H	224.16	BX	A, N, F, M
01-603-5650 <u>SDS Label</u>	Insecticide, Dichlorvos, 20% (NUVAN PROSTRIPS + 65 Gram)	1B	6 packs per box (3 strips per pack)	H	427.99	BX	A, N, M, F
01-603-5654 <u>SDS Label</u>	Insecticide, Dichlorvos, 20% (NUVAN PROSTRIPS 16 Gram)	1B	6 packs per box (12 strips per pack)	J	507.38	BX	A, N, M
01-628-4751 <u>SDS Label</u>	Insecticide, Dichlorvos, 10.75% (Ovitrap Mosquito Trap-N-Kill)	1B	12 traps per box	J	113.77	BX	A, F, N, M
01-647-8840 <u>SDS Label</u>	Insecticide, 0.5% Dichlorvos (Nuvan Directed Spray Aerosol)	1B	(12) 17 oz aerosols per box	J	507.38	BX	A, N, M, F
01-647-8844 <u>SDS Label</u>	Insecticide, 0.50% Dinotefuran, 0.04% (Z)-9-Tricosene (Quikstrike Fly Bait)	4A	5 lb co	J	36.53	CO	A, N, M, F
01-412-4634 <u>SDS Label</u>	Insecticide, D-Phenothrin, 2%, (Black Knight Roach Killer) aerosol	3A	12 oz can	H	19.31	CN	A, N, F, M
01-675-2534 <u>SDS Label</u>	Insecticide, 2% Permethrin aerosol, US DoD use only, (Callington Aircraft Insecticide) ***FOR USE IN UNOCCUPIED US DoD AIRCRAFT INTERIORS ONLY***	3A	(12) 100 gram cans per box	D	508.05	BX	A, N, F, M
66-131-2263 <u>SDS Label</u>	Insecticide, D-Phenothrin 2% and Permethrin 2% (Callington 1-Shot Aircraft Insecticide) ***FOR USE IN DISINSECTION OF AIRCRAFT CARGO HOLDS ONLY***	3A	150 gram can	H	50.62	CN	N, F
01-586-8718 <u>SDS Label</u>	Insecticide, 0.125% d-Phenothrin, 0.1% Prallethrin, aerosol (Raid House & Garden Bug Killer)	3A	15 oz can	H	7.73	CN	A, N, M, F
01-067-2137 <u>SDS Label</u>	Insecticide, d-trans Allethrin 0.125%, Resmethrin 0.2%, aerosol (Kill Zone House & Garden Insect Killer Formula 4)	3A	14 oz can	Y	3.60	CN	A, N, F, M
01-573-4964	Insecticide, Etofenprox, 20% (Zenivex E20)	3A	(2) 2.5 gal co	H	2817.87	BX	A, N, M

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<u>SDS Label Supplemental</u>												
01-619-6396 <u>SDS Label</u>	Insecticide, Etofenprox 1.0%, Pyrethrins 0.15%, Tetramethrin 0.5% and Piperonyl Butoxide 1.5% (Zenprox Aerosol)	3A	(6) 16 oz cans	H		96.94						A, N, F, M
01-183-7244 <u>SDS Label</u>	Insecticide, Methomyl, 1%, (Z)-9-Tricosene, 0.049%, fly bait (Golden Malrin/Stimukil)	1A	5 lb can	Y		21.71						A, N, F, M
01-667-4358 <u>SDS Label</u>	Insecticide, Methomyl, 1%, (Z)-9-Tricosene, 0.049% Fly Bait, (Golden Malrin/Stimukil)	1A	10 lb co	Z		41.60						A, N, M, F
01-287-3913 <u>SDS Label</u>	Insecticide, Hydramethylnon, 0.73% (Amdro Fire Ant Bait; PROBAIT Fire Ant Bait)	20A	(12) 6 oz bt	H		270..35						A, N, F, M
01-501-2905 <u>SDS Label</u>	Insecticide, (S)-Hydroprene, 90.6% (Gentrol Point Source)	7A	20 devices/box	H		42.68						A, M, N
01-585-9976 <u>SDS Label</u>	Insecticide, (S)-Hydroprene, 0.36%(Gentrol Aerosol)	7A	(12) 16 oz cans	H		195.33						A, N, M F
01-424-2494 <u>SDS Label</u>	Insecticide, Fenoxycarb, 1% (Award Brand of Logic)	7B	25 lb bag	H		433.06						A, N, F, M
01-585-9950 <u>SDS Label</u>	Insecticide, Fipronil, 0.0143% (Topchoice Fire Ant Granules) ***RESTRICTED USE PESTICIDE***	2B	50 lb bag	H		294.94						A, N, M, F
01-224-1269 <u>SDS Label</u>	Insecticide, Fipronil, cockroach, large size 0.03 % (COMBAT MAX Roach Killing Bait Stations)	2B	8 bait stations/box/12 boxes	H		169.43						A, N, F, M
01-180-0167 <u>SDS Label</u>	Insecticide, Fipronil, cockroach, regular size 0.03% (COMBAT MAX Roach Killing Bait Stations)	2B	12 bait stations/box/12 boxes	H		160.43						A, N, F, M
01-483-3065 <u>SDS Label</u>	Insecticide, Fipronil 0.01% (Maxforce FC Roach Killer Bait Gel)	2B	(24) 60 gram reservoirs/box	H		353.09						A, N, M
01-471-5650 <u>SDS Label</u>	Insecticide, Fipronil 0.01% (Maxforce FC Roach Killer Bait Gel)	2B	(4) 30 gram reservoirs/box	H		30.00						N, M
01-500-4579 <u>SDS Label</u>	Insecticide, Fipronil 0.001% (Maxforce Carpenter Ant Bait Gel)	2B	4 reservoirs/box	H		34.15						A, N, M

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01-602-8269 <u>SDS Label</u>	Insecticide, Fipronil 0.05% (Maxforce FC Magnum Roach Killer Bait Gel)	2B	12-33 gram reservoirs per box	H	174.65	BX	A, N, M, F
01-298-1122 <u>SDS Label</u>	Insecticide, Fipronil 0.01% (MaxForce FC Ant Bait Stations)	2B	96 stations	H	126.88	PG	A, N, F, M
01-483-3072 <u>SDS Label</u>	Insecticide, Fipronil 80% (Termidor 80WG)	2B	24 co/box	H	3796.26	BX	A, N, M
01-483-3068 <u>SDS Label</u>	Insecticide, Fipronil 9.1% (Termidor SC)	2B	(4) 78 oz bt/box	H	1172.64	BX	A, N, M
01-318-7416 <u>SDS Label</u>	Insecticide, (S)-Hydroprene, 9.0%, emulsifiable concentrate (Gentrol IGR)	7A	(10) 1 oz bt	H	75.36	BX	A, N, F, M
01-591-2150 <u>SDS Label</u>	Insecticide, Imidacloprid 21%, beta-Cyfluthrin 10.5% (Temprid SC)	4A, 3A	400 ml co	H	149.05	CO	A, N, F, M
01-642-9292 <u>SDS Label</u>	Insecticide, Imidacloprid 0.05% and beta-Cyfluthrin 0.025% (Temprid Ready-To-Spray)	4A, 3A	15 fl oz	Z	23.07	CN	A, N, F, M
01-518-5807 <u>SDS Label</u>	Insecticide, Imidacloprid 0.5%, (Z)-9-Tricosene 0.1% (Maxforce Granular Fly Bait)	4A	5 lb co	H	53.14	CO	A, N, F, M
01-555-9369 <u>SDS Label</u>	Insecticide, Imidacloprid 10%, (Z)-9-Tricosene 0.1% (Maxforce Fly Spot Bait)	4A	(50) 2 oz pkg/box	H	333.37	BX	A, N, M, F
01-457-6580 <u>SDS Label</u>	Insecticide, Imidacloprid, 0.5% granular (Merit 0.5 g)	4A	30 lb bag	H	228.31	BG	A, N, F, M
01-647-8857 <u>SDS Label</u>	Insecticide, Imidacloprid, 0.025% (Kaput Rodent Flea Control Bait) ***RESTRICTED USE PESTICIDE***	4A	25 lb co	J	101.48	CO	A, N, M, F
01-428-6646 <u>SDS Label</u>	Insecticide, Lambda-cyhalothrin, 9.7% (Demand CS)	3A	(8) 8 oz bt	H	459.11	BX	A, N, M
00-655-9222 <u>SDS Label</u>	Insecticide, Malathion, 57.0%, emulsifiable concentrate, class 2	1B	1 gal co	H	69.54	GL	A, N, F, M
00-685-5438 <u>SDS Label</u>	Insecticide, Malathion, 57.0%, emulsifiable concentrate, class 2	1B	5 gal can	Y	284.17	CN	A, N, F, M
00-926-1481 <u>SDS Label</u>	Insecticide, Malathion, 96.5%, liquid, (Fyfanon ULV)	1B	54 gal drum	H	3938.02	DR	A, N, F, M

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01-169-1842 <u>SDS Label</u>	Insecticide, Malathion, 96.5%, liquid, (Fyfanon ULV)	1B	5 gal can	H	354.66	CN	A, N, F, M
01-424-2495 <u>SDS Label</u>	Insecticide, (S)-Methoprene 2.1% (Altosid XR Briquets)	7A	220 briquettes	H	1016.25	BX	A, N, F, M
01-511-0535 <u>SDS Label</u>	Insecticide, (S)-Methoprene 4.25% (Altosid Pellets)	7A	(2) 22 lb co/box	H	2092.27	BX	A, N, F, M
01-424-2493 <u>SDS Label</u>	Insecticide, (S)-Methoprene 20% (Altosid Liquid Larvicide Conc.)	7A	(2) 2.5 gal co	H	9247.64	BX	A, N, F, M
01-591-2155 <u>SDS Label</u>	Insecticide, (S)-Methoprene 0.085%, Permethrin 0.35%, Phenothrin 0.3%, N-octyl bicycloheptene dicarboximide 2%, and Piperonyl butoxide 1.75% (Precor 2000 Plus)	7A	12 aerosols/box	H	225.94	BX	A, N, M, F
01-270-9765 <u>SDS Label</u>	Insecticide, Naled, 87.4%, liquid (Dibrom)	1B	30 gal drum	H	7461.67	DR	A, F, N
01-532-5414 <u>SDS Label</u>	Insecticide, Naled, 78%, liquid (Trumpet EC)	1B	30 gal drum	J	8791.60	DR	A, N, F, M
00-597-6111 <u>SDS Label</u>	Insecticide, Naphthalene 99.95%, ball form (Enoz Old Fashioned moth balls)	NA	14 oz box	H	7.34	BX	A, N, F, M
01-467-0994 <u>SDS Label</u>	Insecticide, Nithiazine 1%, Fly Strips (Quikstrike), 2 strips per package	4A	(12) pkg/box	H	265.58	BX	A, N, F
00-174-1825 <u>SDS Label</u>	Insecticide, P-Dichlorobenzene 99.9%, crystal/flake (Enoz moth ice crystals)	NA	100 lb drum	J	382.20	DR	A, N, F
00-174-1824 <u>SDS Label</u>	Insecticide, P-Dichlorobenzene 99.9%, crystal GSA (Enoz moth ice crystals)	NA	1 lb can	J	17.04	LB	N, F
01-606-8581 <u>SDS Label</u>	Insecticide, Permethrin-Piperonyl Butoxide (20.6+ 20.6%), All Pro Aqualuer 20-20	3A	(2) 2.5 gal co/box	H	1511.87	BX	A, N, F, M
01-550-5660 <u>SDS Label</u>	Insecticide, Permethrin-Piperonyl Butoxide (4.6+4.6%), (Kontrol 4-4)	3A	(2) 2.5 gal co	H	140.44	BX	A, N, F, M
01-104-0780 <u>SDS Label</u>	Insecticide, Pyrethrins, 3% with synergists, liquid (ULV fog concentrate)	3A	1 gal bt	H	226.91	GL	A, N, F, M
00-459-2443 <u>SDS Label</u>	Insecticide, Prallethrin 0.1% aerosol (Wasp-Freeze II)	3A	(12) 17.5 oz cans	H	127.88	BX	A, N, F, M
01-619-6467 <u>SDS Label</u>	Insecticide, Etofenprox 0.5%; Tetramethrin 0.2% and Piperonyl	3A	(12) 16 oz cans	H	115.52	BX	A, N, F, M

	Butoxide 1.0% (Wasp-X Wasp and Hornet Spray)								
00-823-7849 <u>SDS Label</u>	Insecticide, Pyrethrins 0.5%, Piperonyl butoxide 1% and N-octyl bicycloheptene dicarboximide 1%, aerosol (PT 565 Plus XLO)	3A	(12) 20 oz cans	H		277.47	BX		A, N, F
01-359-8533 <u>SDS Label</u>	Insecticide, Resmethrin 4%, Piperonyl butoxide 12.42% (Scourge) ***RESTRICTED USE PESTICIDE***	3A	5 gal can	Y		757.78	CN		A, N, F
01-457-6583 <u>SDS Label</u>	Insecticide, Spinosad, 11.6% (Conserve SC)	5	1 quart co	H		218.71	QT		A, N, M
01-617-0886 <u>SDS Label</u>	Insecticide, Spinosad, 0.50% and (Z)-9-tricosene (Pheromone), 0.04% (Conserve Fly Bait)	5	4 lb co	J		35.28	CO		N, M, F
01-474-7751 <u>SDS Label</u>	Insecticide, Sumithrin-Piperonyl Butoxide, 10%-10%, (Anvil 10+10 ULV)	3A	(2) 2.5 gal co/box	H		2336.38	BX		A, M, N
01-474-7706 <u>SDS Label</u>	Insecticide, Sumithrin-Piperonyl Butoxide, 10%-10%, (Anvil 10+10 ULV)	3A	250 gal co	J		-----	CO		A, N
01-657-8033 <u>SDS Label</u>	Insecticide, Tau-fluvalinate, 22.3% liquid (Mavrik Perimeter)	3A	8 oz co	Z		49.37	CO		A, N, F, M
01-424-3132 <u>SDS Label</u>	Insecticide, Temephos, 45% (ALLPRO Provect 4E Larvicide)	1B	2.5 gal co	H		1566.66	CO		A, N, F, M
01-652-1530 <u>SDS Label</u>	Mosquito Larvicide, Mineral Oil, 10% (CocoBear Oil)	NA	(2) 2.5 gal co/box	J		202.95	BX		A, N, F, M

4. FIFRA 25(b) Exempt Pesticide Products

The following are FIFRA 25(b) exempt pesticides that have been approved by the AFPMB for stock listing.

01-607-0000 <u>SDS Label</u>	Insecticide, Thyme Oil, 4.1%; (TyraTech Tech Dust Natural Insecticide)	NA	10 lb pail	J		86.25	CO		A, N, M
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5. Rodenticides									
The following rodenticides must be applied by trained personnel or a DoD certified pesticide applicator.									
<u>SDS Label</u>		1st Gen	40 blocks	H	114.10	BX	A, N, F, M		
00-089-4664 <u>SDS Label</u>	Rodenticidal Bait, Anticoagulant, 0.005% Diphacinone (Ditrac/Ramik), blocks	1st Gen	40 blocks	H	114.10	BX	A, N, F, M		
01-577-2202 <u>SDS Label</u>	Rodenticide, Anticoagulant, (Kaput Combo Bait Pellets), 0.020% Imidacloprid and 0.025% Warfarin	1st Gen	250 packets/box	H	174.73	BX	A, N, F, M		
01-598-2617 <u>SDS Label</u>	Rodenticidal Bait, Anticoagulant, 0.005% Bromadiolone (Maki), pellets	2nd Gen	175 pkgs/co	Y	155.00	CO	A, N, M, F		
01-666-3395 <u>SDS Label</u>	Rodenticidal Bait, Anticoagulant, 0.005% Bromadiolone (Maki-87112), pellets	2nd Gen	4 pails each w/ 75 place packs per box	H	192.80	BX	A, N, F, M		
01-598-4840 <u>SDS Label</u>	Rodenticidal Bait, Anticoagulant, 0.005% Brodifacoum (Talon-G), pellets	2nd Gen	2 pails each w/150 pkgs per box	H	169.65	BX	A, N, M, F		
01-501-2858 <u>SDS Label</u>	Rodenticidal Bait, Anticoagulant, 0.005% Bromadiolone, (Contrac Blox), 1 oz. bait blocks	2nd Gen	18 lb co	H	91.96	CO	A, N, M, F		
01-503-5348 <u>SDS Label</u>	Rodenticidal Bait, Anticoagulant, 0.005% Brodifacoum, (Final Blox), 20-gram bait blocks	2nd Gen	18 lb co	H	115.75	CO	A, M, N		
00-753-4972 <u>SDS Label</u>	Rodenticide, Anticoagulant, concentrate 0.106% sodium salt of diphacinone (LIQUA-TOX II)	1st Gen	50 pouches	V	36.10	BX	A, N, F, M		
01-598-4844 <u>SDS Label</u>	Rodenticide, Anticoagulant, concentrate 0.106% sodium salt of diphacinone (LIQUA-TOX II)	1st Gen	4 pkgs per box w/8 packets per pkg	H	123.06	PG	A, N, M, F		
01-435-9318 <u>SDS Label</u>	Rodenticide, 10% zinc phosphide (ZP Tracking Powder) ***RESTRICTED USE PESTICIDE***	Non	(4) 500 g bt	H	46.53	BX	N		
01-619-6419 <u>SDS Label</u>	Rodenticide, Anticoagulant, Difethialone 0.0025% (First Strike Soft Bait Rodenticide)	2nd Gen	16 lb co	H	216.89	CO	A, N, M, F		

6. Surfactants

Surfactants are not pesticides, but are wetting agents that lower the surface tension, allowing easier spreading, and lower the interfacial tension between two liquids. Some pesticides, particularly herbicides, either require the use of a surfactant or performance may be improved by the addition of a surfactant. Refer to the pesticide label to determine if a surfactant is recommended by manufacturer.

01-546-3053 <u>SDS Label</u>	Surfactant, Pesticide, Spray Adjuvant (Cygnet Plus)	NA	(2) 2.5 gal co	H	142.32	BX	A, N, M, F
01-356-8896 <u>SDS Label</u>	Surfactant, Pesticide, Spray Adjuvant (Cide-Kick II)	NA	(2) 2.5 gal co	H	251.77	BX	A, N, M, F
01-356-8897 <u>SDS Label</u>	Surfactant, Pesticide, Spray Adjuvant (Cide-Kick)	NA	(2) 2.5 gal co	H	228.79	BX	A, N, M, F

*Acquisition Advice Codes (AAC)

- D. DoD Integrated Material Manager (IMM) Stocked, and Issued. Issue, transfer, or shipment is not subject to specialized controls other than those imposed by the Integrated Material Manager/Military Service supply policy.
1. The item is centrally managed, stocked, and issued.
 2. Requisitions will be submitted in accordance with Military Service requisitioning procedures.
- G. General Services Administration (GSA) Integrated Material Managed, Stocked and Issued. Identifies GSA managed items available from GSA Supply Distribution Facilities. Requisitions and fund citations will be submitted in accordance with GSA/Military Service requisitioning procedures.
- H. Central Contract - Not Stocked Item. Direct delivery under central contract # (non-stocked items) issue, transfer, or shipment is not subject to specialized controls other than those imposed by IMM/Service/Agency supply policy.
1. The item is centrally managed and procured.
 2. Normal issue is by direct shipment from the vendor to the user at the order of the ICP or IMM. However, orders for quantities less than the vendor's minimum order of quantity may be issued from stock by ICP or IMM supply distribution facilities.
 3. Requisitions and fund citations will be submitted in accordance with IMM/Service/Agency requisitioning procedures.
 4. Generally, delivery will be made within applicable Service/Agency guidelines addressing customer-required time frame.
- I. Direct Ordering from a Central Contract/Schedule. Issue, transfer, or shipment is not subject to specialized controls other than those imposed by Integrated Material Manager/Military Service supply policy. The item is covered by a centrally issued contractual document, or by a multiple award Federal Supply schedule for GSA managed items, which permits using activities to place orders on vendors for direct delivery to the user.

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- J. Not Stocked, Controlled Procured. Identifies IMM/Military Service centrally managed but not stocked items. Long lead times must be anticipated, since procurement will be initiated only after receipt of a requisition. Requisitions will be submitted in accordance with IMM/Military Service requisitioning procedures.
- K. Centrally Stocked for Overseas Only. Main means of supply is local purchase. Item is stocked in domestic supply system for those overseas activities unable to procure locally due to non-availability of procurement sources or where local purchase is prohibited. Requisitions will be submitted by overseas activities in accordance with Service/Agency requisitioning procedures. NOTE: CONUS activities will obtain supply support through local procurement procedures.
- L. Local Purchase. IMM/Military Service managed items authorized for local purchase, as a normal means of support, by the Military Service, or base, post, camp, or station level. Items not stocked in wholesale distribution system of IMM/Military Service ICP. The local purchase forms authorized by the individual IMM/Military Service must be used. NOTE: GSA FSS items are included.
- V. Terminal Item. Identifies items in stock; but future procurement is not authorized. Requisitions may continue to be submitted until stocks are exhausted. Preferred items National Stock Number (NSN) normally provided by the application of the phrase, "When Exhausted Use (NSN)". Requisitions will be submitted in accordance with IMM/Military Service requisitioning procedures as applicable.
- X. Semiactive Item-No Replacement. A potentially inactive NSN which must be retained in the supply system as an item of supply because (1) stocks of the item are on hand or in use below the wholesale level and (2) the NSN is cited in equipment authorization documents TO&E, TA, TM, etc. or in-use assets are being reported.
 - 1. Items are authorized for central procurement but not authorized for stockage at wholesale level.
 - 2. Requisitions for in-use replacement will be authorized in accordance with individual Military Service directives.
 - 3. Requisitions may be submitted as requirements generate. Repetitive demands may dictate at ACC change to permit Wholesale stockage.
- Y. Terminal Item. Further identifies AAC V items on which wholesale stocks have been exhausted. Future procurement not authorized.
 - 1. Requisitions will not be processed to the wholesale suppliers.
 - 2. Internal Services' requisitioning may be continued in accordance with Military Service requisitioning policies.
- Z. Insurance/Numeric Stockage Objective Item. Items, which may be required occasionally or intermittently and prudence requires that a nominal quantity of material be stocked due to the essentiality or the lead-time of the item.
 - 1. The item is centrally managed, stocked and issued.
 - 2. Requisitions will be submitted in accordance with IMM/Military Service requisitioning procedures.

**User Code A = Army, N = Navy, F = Air Force, M = Marines, SOS (DSCR-Richmond/DLA Aviation) = SMS

Emergency Procurement of Pesticides and Pest Management Equipment

The Defense Logistics Agency (DLA) has established Emergency Supply Operations Center (ESOC) to provide equipment and supplies to deploying forces with urgent requirements and in a timely manner.

For insect repellents, pesticides, pesticide application equipment, personal protection equipment (bednets, head nets, etc.) and respirators:

Contact the DLA Customer Interaction/Contact Center at Tel: 1-877-352-2255 or DSN: 661-7766. They are open 24/7/365 days a year for all customer inquiries and submittal of requisitions. Email and related contact info is listed below:

Email Address: DLAContactCenter@dla.mil

Phone: 1-877-352-2255

Phone: 269-961-7766

DSN: 661-7766

Fax: 269-961-7791

DSN Fax: 661-7791

For technical/quality/logistical/ordering inquiries/questions: contact the DLA Chemist/Product Manager at (804) 279-3995, DSN: 695-3995. Normal business hours are 0800-1700 hours weekdays EST.

Pesticide Mode of Action (MOA) Codes

Fungicide Resistance Action Committee (FRAC)		
Code	Mode of Action	Chemical Class
11	Complex III of fungal respiration	Methoxyacrylates
NA	Not assigned	Respiration

Herbicide Resistance Action Committee (HRAC)		
Code	Mode of Action	Chemical Class
B	Inhibition of ALS (branched chain amino acid synthesis)	Imidazolinones and Sulfonylureas
		Physiological Functions Affected
		Cell metabolism

Appendix U

C1, C2	Inhibition of photosynthesis at PS II	Uracils and Ureas	Light processes
D	PS I electron diversion	Bipyridyliums	Light processes
F1	Inhibition of PDS	Other (PDS)	Light processes
G	Inhibition of EPSP synthase	Glycines	Cell metabolism
K1	Inhibition of microtubule assembly	Dinitroanilines	Growth/Cell division
O	Synthetic auxin	Phenoxy-carboxylic acids, Pyridine-carboxylic acids, Pyrimidine carboxylic acids	Growth/Cell division

Insecticide Resistance Action Committee (IRAC)

Code	Mode of Action	Chemical Class	Physiological Functions Affected
1A, 1B	Acetylcholinesterase (AChE) inhibitors	Carbamates, Organophosphates	Nerve and muscle
2B	GABA-gated chloride channel blockers	Phenylpyrazoles	Nerve and muscle
3A	Sodium channel modulators	Pyrethroids	Nerve and muscle
4A	Nicotinic acetylcholine receptor (nAChR) competitive modulators	Neonicotinoids	Nerve and muscle
5	Nicotinic acetylcholine receptor (nAChR) allosteric modulators	Spinosyns	Nerve and muscle
6	Glutamate-gated chloride channel (GluCl) allosteric modulators	Avermectins	Nerve and muscle
7A, 7B	Juvenile hormone mimics	Juvenile Hormone Analogues, Fenoxycarb	Growth
8D	Miscellaneous non-specific (multi-site) inhibitors	Borates	Unknown or non-specific
11A	Microbial disruptors of insect midgut membranes	Bacillus thuringiensis and the insecticidal proteins produced	Midgut
13	Uncouplers of oxidative phosphorylation via disruption of the proton gradient	Chlorfenapyr	Respiration

Appendix U

20A	Mitochondrial complex III electron transport inhibitors	HydramethylInon	Respiration
24A	Mitochondrial complex IV electron transport inhibitors	Phosphides	Respiration
NA	Not assigned		

Rodenticide Resistance Action Committee (RRAC)

Code	Mode of Action	Chemical Class	Physiological Functions Affected
1st Gen	First generation anticoagulant. All anticoagulant rodenticides have the same mode of action, they inhibit the synthesis of vitamin K-dependent clotting factors, which results in hemorrhaging and death. One of the series of rodenticide active substances invented, mainly during the 1950s and 1960s, the first of which was warfarin. The most commonly used of these compounds are chlorophacinone and diphacinone (1,3-indandiones) and coumatetralyl, coumatetralyl, and warfarin (4-hydroxycoumarins).	Indandiones, Hydroxycoumarins	Blood clotting
2nd Gen	Second generation anticoagulant. All anticoagulant rodenticides have the same mode of action, they inhibit the synthesis of vitamin K-dependent clotting factors, which results in hemorrhaging and death. Invented mainly during the 1970s and 1980s, in response to the development of resistance to compounds of the first-generation. The five second-generation anticoagulants are (in order of their chronological introduction) difenacoum, bromadiolone, brodifacoum, flocoumafen (4-hydroxycoumarins) and difethialone (4-thiochromenones). Difenacoum and bromadiolone are sometimes called 'multi-feed' compounds because rodents usually require more than one feeding for a lethal effect. The other three compounds, brodifacoum, flocoumafen and difethialone, are called 'single feed' because often one feed is sufficient for lethality.	Hydroxycoumarins, Thiochromenones	Blood clotting
Non	Non-anticoagulant. Upon ingestion of Zinc phosphide the toxic gas phosphine will be produced. The mode of action of phosphine is by inhibition of cytochrome C	Phosphides	Respiration

	<p>oxidase, which is vital to mitochondrial respiration, and will cause damage to internal organs and heart failure. Non-anticoagulants are generally acute acting substances unaffected by physiological resistance to anticoagulants and therefore present useful options for resistance management. However, they are mainly older products, with higher toxicity and the main drawback of many of them is that they are not as reliably effective as anticoagulants.</p>		
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In order to provide the most current information to the DoD Pest Management Community, the Armed Forces Pest Management Board and DLA Aviation/Defense Supply Center Richmond (DSCR) jointly publish this list. Comments and questions are welcome. Please send them to:

E-mail: osd.pentagon.ousd-atl.mbx.afpmb@mail.mil
 Telephone: Commercial (301) 295-7476, DSN 295-7476
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 Attn: Equipment Committee Ex-Officio
 US Army Garrison Forest Glen
 2460 Linden Lane, Bldg. 172
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Appendix V
General Measures and Monitoring for
Proposed Projects

GENERAL MEASURES AND MONITORING FOR PROPOSED PROJECTS

Beale AFB has developed general and species-specific avoidance and minimization measures designed to protect natural resources. General and activity-specific avoidance and minimization measures were designed to reduce effects and include measures such as identification of limited operating periods, pre-maintenance flagging of resources, and equipment restrictions. Most of these measures have been required or negotiated with the Service during previous Section 7 ESA consultations at Beale AFB.

Preconstruction Survey

MM-1. A Service-approved Biologist will conduct preconstruction surveys of all ground disturbance areas within sensitive habitats to determine if any federally-listed species may be present during the start of construction. These surveys will be conducted prior to the start of construction activities in and around any sensitive habitat. If any federally-listed species are found during the preconstruction surveys, the Service-approved Biologist will follow procedures outlined in Table 1 and Table 2. At least 15 business days prior to the onset of activities, Beale AFB will submit the name(s) and credentials of biologists who will conduct these preconstruction surveys if they have not previously received Service approval for similar surveys. A formal letter will be updated every time a Service-approved Biologist is added to the PBO list. No project activities will begin until proponents have received written approval from the Service that the biologist(s) is qualified to conduct the work through an updated Formal Letter from the Service of all Service-approved Biologists.

Monitoring

MM-2. A Natural Resources Monitor will monitor construction activities in or adjacent to sensitive habitats as required. The Natural Resources Monitor will ensure compliance with all applicable avoidance and minimization measures required to protect federally-listed species and their habitats.

MM-3. If federally-listed species are found that are likely to be affected by work activities, the Service-approved Biologist will have the authority to stop any aspect of the project that could result in take of a federally-listed species with the coordination from Beale AFB Contracting Office. If the Service-approved Biologist exercises this authority, she/he must coordinate this with the Beale Environmental Office to follow protocol laid out in this PBA.

Environmental Awareness Training

MM-4. A Service-approved Biologist will conduct environmental awareness training for all construction personnel working within and near sensitive habitat on Beale AFB. Training will be provided at the start of work and within 15 days of any new worker arrival. The program will consist of a briefing on environmental issues relative to the proposed project. The training program will include an overview of the legal status, biology distribution, habitat needs, and compliance requirements for each federally-listed species that may occur in the project area. The presentation will also include a discussion of the legal protection for endangered species under the ESA, including penalties for violations. A fact sheet conveying this information will be distributed to all personnel who enter the project site. Upon completion of the orientation, employees will sign a form stating that they attended the program and understand all avoidance and minimization measures. These forms will be maintained at Beale AFB and will be accessible to the appropriate resource agencies.

Erosion Controls

MM-5. Wetlands/drainages/vernal pools, if present, will have erosion control measures (straw wattles, silt fencing) installed where hydrological continuity exists between the construction activities and the wetland or when work is within 25 feet of a wetland/drainage/vernal pool. A Service-approved Biologist or Natural Resources Monitor will determine whether erosion control measures should be utilized, weighing the potential for impacts to other species. Construction boundaries within the buffer will be designated with fencing or other suitable means to ensure no equipment and/or construction workers access protected wetland resources. These measures are in accordance with the current Beale AFB Storm Water Pollution Prevention Plan.

MM-6. All areas of upland ground disturbance or exposed soil will be reseeded with a native “weed free” seed mix approved by 9 CES/CEIE. Ground disturbance within vernal pools will require a restoration plan and two years of follow-up monitoring by a Service-approved Biologist. Note: direct impacts to wetlands require a Clean Water Act Section 404 permit issued by the USACE and a Section 401 Water Quality Certification from the State Regional Water Quality Control Board.

Pesticide and Herbicide Application

MM-7. Herbicide will only be administered by current Qualified Applicator Certificate holders (minimum qualification) from the California Department of Pesticide Regulation. If the applicator will be using herbicides within jurisdictional wetlands or waters of the U.S., the applicator needs to also have a current Aquatic Pesticide Applicator License. The Installation Pest Management Coordinator will receive qualifications from applicators within 30 days of contract award. These applicators must know and be able to recognize sensitive resources including listed wildlife plants, vernal pools and nesting birds. If not, they will receive Environmental Awareness Training (MM-4).

MM-8. The application of any pesticide, including herbicides will be conducted in accordance with approved Integrated Pest Management Plan, Invasive Plant Species Management Guidelines, and Integrated Natural Resources Management Plan.

MM-9. In areas with sensitive resources, use low-volume applications and reduce the amount of herbicide applied per acre. Spot applications rather than broadcast applications will be used when feasible to limit the effects of contamination of small mammals’ insect-based diets (Cal-IPC 2015b).

MM-10. Herbicides will not be sprayed in wetlands or waters of the US when water is present unless specifically targeting aquatic weeds and all permits and permissions are obtained. These permits include a NPDES Aquatic Pesticide Permit.

MM-12. When applying herbicides near wetlands in the dry season, herbicides can be applied up to the edge of the wetland. The wetland edge will be marked before application by a Service-approved Biologist. If application is required within a vernal pool, notification to the Service will be required.

MM-13. When applying herbicides near wetlands in the wet season (1 Nov to 1 May) or when the 2-week chance of rainfall is greater than 70%, herbicides may not be applied within the effective catchment or natural drainage area (as indicated by micro- and macro-topography) of a wetland where they may potentially run off into the wetland (Ripley et al. 2002, 2003).

MM-14. Herbicides will be applied under low wind conditions and within specified heat tolerances of volatile herbicides to protect nearby non-target vegetation.

MM-15. Herbicides will be applied according to the chemical manufacturer’s instructions on the label.

All mixing of herbicides will be conducted at least 150 feet from water and often off Beale AFB.

MM-16. Herbicide applicators will prescribe and use only non-ionic surfactants near open water. These surfactants are readily biodegradable and low in aquatic toxicity.

MM-17. No herbicide will be applied within 100 feet of known Native American cultural sites without prior consultation with the Base NRM/CRM and local tribes.

Additional Measures

MM-18. Tools used to manage or control vegetation (such as chainsaws, hand clippers, and pruners, should be washed before being used on Beale AFB and before being moved from one location to another. Earth-moving equipment brought onto Beale AFB should be washed before use and before being moved from one location to another (i.e. from one construction site to another). Water or compressed air will be used to remove any visible plant material, soil or compacted mud, gravel, sand, etc.

MM-19. Off-road travel outside of the demarcated construction boundaries will be prohibited.

MM-20. Prior to initiation of construction activities, sensitive areas, such as vernal pools, wetlands, riparian areas, and potential habitat for federally-listed species (i.e., VPFS/VPTS, VELB, WYBC or GGS), will be staked and flagged as exclusion zones where construction activities cannot take place. Orange construction barrier fencing (or an appropriate alternative method) will designate exclusion zones where construction activities cannot occur. The flagging and fencing will be clearly marked as an *environmentally sensitive area*. The contractor will remove all fencing, stakes and flagging within 60 days of construction completion.

MM-21. Any worker that inadvertently kills or injures a federally-listed species, or finds one injured or trapped, will immediately report the incident to the on-site Biologist. The Biologist will inform the Beale Natural Resources Manager (NRM) immediately (9 CES/CEIE). The Beale NRM will verbally notify the Sacramento Fish and Wildlife Office within one day and will provide written notification of the incident within five days.

MM-22. Motor vehicles and equipment will only be fueled and serviced in designated service area. All fueling and maintenance of vehicles and other equipment will occur in a designated area with appropriate spill containment. Any newly established, project specific fueling and maintenance areas will be located at least 250 feet away from any wetland/drainage/creek habitat or water body. Prior to the onset of work, Beale AFB will ensure a plan, to allow a prompt and effective response to any accidental spills, is in place. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

MM-23. During construction activities, all trash that may attract animals will be properly contained, removed from the work site daily, and disposed of properly. Following construction, all refuse and construction debris will be removed from work areas. All garbage and project construction-related materials in construction areas will be removed immediately following project completion.

MM-24. Unless otherwise designated as part of a habitat restoration plan, all excess soil excavated during construction in the vicinity of vernal pools and other wetlands will be removed and disposed of outside the project area. Coordination with the Beale AFB Environmental Office and appropriate regulatory agencies is required prior to disposal of the excavated soil.

MM-25. The number of access routes, number and size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Routes and boundaries will be

clearly demarcated, and these areas will avoid wetlands/drainage areas whenever feasible. All access routes will be restored to normal grade and revegetated with certified weed freed seed mix approved by 9 CES/CEIE at project completion

MM-26. All vehicle operators will follow the posted speed limit on paved roads and a 15-miles per hour speed limit on unpaved roads. Per the Fugitive Dust Emissions rule, a person shall take every reasonable precaution to not cause or allow the emissions of fugitive dust from being airborne past the action area especially near threatened or endangered species or their habitats.

MM-27. No trenches will be left open at the end of the day; trenched areas will be compacted and restored to normal grade once the project is completed.

MM-28. No work requiring vehicles/equipment will be done when the ground is soft enough where travel will cause depressions.

MM-29. A Service-approved Biologist or Natural Resources Monitor will inspect equipment for cleanliness to minimize spread of invasive and noxious weeds onto and around Beale AFB. The designated biologist or monitor may reject equipment that has visible clumps of mud when arriving on site. The biologist or monitor will also identify any listed noxious weed found on project site and will hand-pull noxious weeds where practical.

Nesting Migratory Bird AMMs

Migratory bird AMMs for construction sites:

MB-1. Pre-construction surveys for migratory bird nests are required for any construction projects or maintenance activities conducted during the breeding season (March 1-Aug 31).

MB-2. Incomplete or empty nests are removed; nests containing eggs or chicks are not to be removed. Birds exhibiting nesting behavior in construction areas are hazed when possible.

MB-3. Once nests are established, avoidance is the only practical protection measure. A buffer is flagged around active nests at a distance that is sufficient to protect the nest from disturbance by project activities.

MB-4. Contractors are encouraged to conduct any project-related vegetation removal before March 1.

MB-5. Proactive exclusion measures are encouraged to prevent birds from using areas and structures where construction will occur.

MB-6. Other methods to discourage nesting birds include noise cannons and scarecrows or other visual deterrents.

MB-7. If nest removal or re-location cannot be avoided, permits are obtained from USFWS on an as-needed basis by 9 CES/CEIEC.

MB-8. Injured or trapped birds will be reported to 9 CES/CEIEC. Trapped birds will be freed or exit holes created, and injured native birds are taken to rehabilitation facilities by permitted 9 CES/CEIEC staff.

Vernal Pool Shrimp AMMs

All projects that occur within 250 feet of known or potential VPFS habitat, will implement the following measures to avoid or minimize disturbances and adverse effects to the species (unless otherwise noted in the Project Effects Analysis):

VP-1. No work will be conducted in the vicinity of vernal pool species' habitat between 1 Nov and 1 May unless specifically approved by the Beale AFB NRM who will field-verify soil saturation, visual ponding,

and expected surface disturbance. USFWS will be notified of any off-pavement work within 250 feet approved between 1 Nov and 1 May.

VP-2. Mowing in and around vernal pool habitat after seed set but during the dry season (1 May to 15 Oct) is considered a beneficial effect. Mowing conducted earlier in the season may be desirable to maintain appropriate conditions for vernal pool species. If mowing occurs in or near vernal pools, it will occur only when the soil is no longer saturated to ensure tracks are not left in or near wetlands. The mower height will be set to avoid the flowering heads of sensitive vernal pool plant species.

VP-3. Projects that occur on road surfaces and along road shoulders will avoid direct impacts to wetland habitats, including roadside ditches that act as seasonal wetlands.

VP-4. If access routes crossing vernal pool habitats cannot be avoided, ground protection mats will be used to disperse the weight of vehicles and equipment so as to not harm any existing cysts. These can be used in both dry and wet seasons.

VP-5. A USFWS-approved Biologist will flag vernal pool species' habitat and a reasonable buffer to be avoided. The area will be protected by placing construction fencing or other appropriate protective fencing around the pools, including a buffer. Fencing will be used in locations where project equipment and/or personnel will be situated adjacent to or in the near vicinity of suitable vernal pool species' habitat.

VP-6. A USFWS-approved Biologist will conduct environmental awareness training for construction crews before and during project implementation. The education program will briefly cover threatened and endangered species and their habitats that might be encountered during construction or be within close proximity of the action area. Awareness training will cover all restrictions and guidelines that must be implemented by construction/project crews to avoid or minimize impacts to threatened and endangered species and their habitat. Environmental awareness training will be conducted prior to commencement of project, when crews are about to enter potentially sensitive areas, and when new personnel join the project.

VP-7. Dust control measures will be utilized during project construction to prevent excessive dust from silting nearby vernal pools. Type of dust control measure will take into account potential to impact proximal vernal pool landscape and thus will not impact nearby pools.

VP-8. If herbicide spraying is required within and near vernal pool species' habitat, only herbicide without toxic surfactants, approved for use in aquatic environments, will be used.

VP-9. All equipment used in projects requiring access to sites within vernal pool species' habitat will be staged outside of vernal pool habitat and will be on paved or gravel surfaces wherever possible. If paved or gravel surfaces are not available, construction mats and or drip pans will be placed under vehicles to minimize impacts. To further minimize adverse effects, the following measures will be implemented at these project sites near vernal pools:

- a. No work shall occur within vernal pool habitat when water is present.
- b. Ground disturbances, such as trenching, and permanent disturbances, such as pole installation, will avoid hydrologically connected areas.
- c. As necessary, a USFWS-approved Biologist will be present during access and project work within vernal pool habitat to monitor activities.
- d. For projects adjacent to (within 10 meters) vernal pool species' habitat or hydrologically connected to the habitat, silt fencing or other appropriate best management practices (BMPs) to prevent siltation shall be implemented prior to work within that area. A USFWS-approved Biologist will flag areas where silt fencing or BMPs shall be implemented. BMPs may include sand bags and weed-free straw bales or straw wattles.
- e. Spill containment kits will be present at all sites where petroleum-fueled equipment is used.

VP-10. If project activities encroach within the perimeter of a pool, the following measures will be implemented:

- a. Protective mats should be used as first resort, if not possible, equipment with pneumatic tires should be used over tracked equipment.
- b. Non-wetlands present within adjacent habitat will be used as an equipment-parking platform. Alternately, ground protection mats, boards, or plates will be used to distribute the weight of construction equipment for access. Drip pans will also be placed under vehicles parked on non-wetland vegetation.
- c. Project will be implemented during the dry season only, when the pool is dry.

VP-11. Pre- and post-project surveys will be conducted to record habitat condition before the start of a project and after completion of the project for tracking purposes. This may include photos and/or species surveys and will be used to better manage for the species.

Valley Elderberry Longhorn Beetle (VELB) AMMs

All projects that occur within 165 feet of elderberry shrubs with stems of 1-inch diameter or more, will implement the following measures to avoid or minimize disturbances and adverse effects to the species (unless otherwise noted in the Project Effects Analysis):

VELB-1. Prior to start of construction activities in known VELB habitat, a Service-approved biologist will conduct surveys to determine the presence of elderberry shrubs within a buffer of 165 feet of the project footprint to determine areas to be avoided.

VELB-2. All areas to be avoided during construction will be fenced and flagged by a USFWS-approved biologist.

VELB-3. A Service-approved biologist will monitor the work area at project-appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring required will depend on the project specifics and should be discussed with the USFWS-approved Biologist.

VELB-4. If encroachment of the 165-foot buffer cannot be avoided, a 20-foot buffer from the dripline of the plant will be established, fenced and flagged.

VELB-5. If encroachment within 20 feet from the dripline of an eligible elderberry shrub is expected to occur, then the recommended compensation as described in the Service's 2017 guidelines would apply.

VELB-6. As much as feasible, all activities that could occur within 165 feet of an elderberry shrub, will be conducted outside of the flight season of the VELB (March-July).

VELB-7. Signs will be erected for 50 feet along the edge of the avoidance areas with the following information: "This area is habitat of the Valley Elderberry Longhorn Beetle, a threatened species, and must not be disturbed. The Endangered Species Act of 1973, as amended, protects this species. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet and must be maintained for the duration of construction.

VELB-8. No insecticides, herbicides, fertilizer, or other chemicals that might harm the beetle or its host plant will be used in the buffer areas or within 100 feet of any elderberry plant. All chemicals will be applied using a backpack sprayer or similar direct application method.

VELB-9. Dust control procedures, such as regular watering of disturbed soils and soil piles and covering of soil piles, will be used throughout the construction period. Soil disturbance activities will be delayed during high wind conditions.

VELB-10. Mechanical weed removal such as mowing and weed-whacking, within the dripline of the shrub will be limited to the season when adults are not active (August-February). When weed removal needs to occur during the active season, weeds will be removed by hand only using non-electric hand tools. Site would be accessed by foot only. No chemicals or electric tools (mowers, weed-whackers) would be used.

VELB-11. As necessary, a Service-approved Biologist will be present during access and project work within VELB habitat to ensure that no damage to elderberry shrubs occurs.

VELB-12. Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants.

VELB-13. If destruction of shrub cannot be avoided, an effort to successfully transplant the shrub should be taken under the advice of the Service-approved Biologist, if it is desired on Base or contact should be made with the USFWS to transplant the plant to an approved mitigation site.

VELB-14. Prescribed burns will avoid areas with elderberry shrubs with a minimum of 150-foot buffer and will be limited to the season when adults are not active (August—February).

VELB-15. Grazing will be limited within areas containing elderberry shrubs and any shrubs within grazed areas will be fenced and adequately protected. A natural resource monitor will periodically check protected shrubs to maintain fences etc.

VELB-16. Pre- and post-project surveys will be conducted to record habitat condition before the start of a project and after completion of the project for tracking purposes. This may include photos and/or species surveys and will be used to better manage for the species.

Western Yellow-billed Cuckoo AMMs

If WYBC has the potential to be present within a project area during breeding season, a Service-approved biologist will make an initial site visit to determine if suitable habitat for the species exists within 1,000 feet of the project area. If suitable habitat exists, Beale AFB will implement the following measures to avoid or minimize disturbances and adverse effects to the species (unless otherwise noted in the Project Effects Analysis):

Any projects that involve excessive noise (81 dB or more) or other disturbance within suitable WYBC habitat, commencing between June 1 and August 31 (migration and breeding season), will require a minimum of three pre-construction surveys to be conducted by a Service-approved biologist. Surveys will be conducted within a 500-foot buffer of the project footprint and shall take place within 30 days before the onset of construction or vegetation removal activities. The final survey will be within three days of commencement of activities.

WYBC-1. Where suitable habitat is present and potentially disruptive activities will be conducted June 1-August 31, a minimum of three surveys will be conducted by Service-Approved biologists adhering to guidance offered in Western Yellow-billed Cuckoo Natural History Summary and Survey Methodology (Haltermann et al. 2015) prior to the commencement of activities.

WYBC-2. If nests are detected, Beale AFB Environmental will establish buffers around nests that are sufficient to ensure that breeding is not likely to be disrupted or adversely impacted by construction. No-disturbance buffers around active nests will be a minimum of 1,000 feet, unless a qualified biologist determines that smaller buffers would be sufficient to avoid impacts to nesting birds. Factors to be considered for determining buffer size will include: the presence of natural buffers provided by vegetation or topography, nest height, locations of foraging territory, and baseline levels of noise and human activity. Buffers will be maintained until a qualified biologist has determined that young have fledged and are no longer reliant upon the nest or parental care for survival.

WYBC-3. No riparian vegetation alterations will occur in the WYBC breeding habitat area during the WYBC nesting season, June 1 – August 31. This includes mechanical removal and herbicide spray treatment.

WYBC-4. If vegetation removal cannot be avoided, a qualified biologist will conduct a minimum of five surveys in the 30 days leading up to the commencement of the project, with the final survey conducted within the three days of commencement of project.

WYBC-5. Herbicide treatments will be restricted to manual treatments during the nesting season (June 1 – August 31).

WYBC-6. Pesticide application will maintain a 100-foot buffer of the riparian corridor along Dry Creek and Best Slough during the nesting season (June 1 – August 31) unless otherwise approved by 9 CES/CEIEC staff.

WYBC-7. A USFWS-approved biologist will conduct environmental awareness training for construction crews before and during project implementation. The education program will briefly cover threatened and endangered species and their habitats that might be encountered during construction or be within close proximity of the proposed action project sites. Awareness training will cover all restrictions and guidelines that must be followed by construction crews to avoid or minimize impacts on threatened and endangered species and their habitat. Environmental awareness training will be conducted prior to construction, when crews are about to enter potentially sensitive areas, and when new personnel join the construction crews.

WYBC-8. Conservation measures will be adjusted if additional guidelines are released by the Service and the Service will be notified at that time.

WYBC-9. Pre- and post-project surveys will be conducted to record habitat condition before the start of a project and after completion of the project for tracking purposes. This may include photos and/or species surveys and will be used to better manage for the species.

WYBC-10. Prescribed burns will be limited to non-breeding season (September 1—May 31).