Preliminary Final

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN / ENVIRONMENTAL ASSESSMENT

U.S. ARMY COMBAT SUPPORT TRAINING CENTER
FORT HUNTER LIGGETT, CALIFORNIA

August 2011

PRELIMINARY FINAL

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN / ENVIRONMENTAL ASSESSMENT

U.S. ARMY COMBAT SUPPORT TRAINING CENTER FORT HUNTER LIGGETT, CALIFORNIA

Prepared for

DEPARTMENT OF THE ARMY
U.S. ARMY GARRISON FORT HUNTER LIGGETT
FORT HUNTER LIGGETT, CA

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ANNUAL REVIEW AND COORDINATION PAGE

This page is used to certify the annual review and coordination of this Integrated Natural Resources Management Plan (INRMP) with the U.S. Fish and Wildlife Service, and the California Department of Fish and Game, for Fort Hunter Liggett, California.

By their signatures below, the certifying official acknowledges that the annual review and coordination of the INRMP has occurred for the specified year.

Approving Official:

2011

_____ _____

Date

2012

_____ _____

Date

2013

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Date

2014

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2015

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Date

INRMP ACCEPTANCE PAGE

This Integrated Natural Resources Management Plan (INRMP), August 2011, has been prepared in accordance with regulations, standards, and procedures of the Department of Defense, the U.S. Army, and the Sikes Act Improvement Act (SAIA), as amended through 2003 (16 United States Code [U.S.C.] 670a et seq.) in cooperation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game. This INRMP provides for management and stewardship of all natural resources present on the installation.

To the extent that resources permit, the U.S. Fish and Wildlife Service, California Department of Fish and Game, and the U.S. Army by signature of their agency representative do hereby agree to enter a cooperative program for the conservation, protection, and management of natural resources present on Fort Hunter Liggett, California. The intention of this agreement is to develop functioning, sustainable ecological communities on Fort Hunter Liggett that integrate the interests and missions of the agencies charged with conservation, protection, and management of natural heritage in the public interest. This agreement may be modified and amended by mutual agreement of the authorized representatives of the three agencies. This agreement will become effective upon the date of the last signatory and shall continue in full force for a period of 5 years or until terminated by written notice to the other parties, in whole or in part, by any of the parties signing this agreement.

By their signatures below, or an enclosed letter of concurrence, all parties grant their concurrence with and acceptance of the following document.

Approving Officials:

James M. Suriano Colonel, U.S. Army Garrison Commander	**Date**
Ms. Dianne Noda Field Supervisor Ventura Fish and Wildlife Office U.S. Fish and Wildlife Service	**Date**
Dr. Jeffrey R. Single Central Regional Manager Region 4 California Department of Fish and Game	**Date**

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PRELIMINARY FINAL

FINDING OF NO SIGNIFICANT IMPACT
FOR
IMPLEMENTING AN INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
FOR
FORT HUNTER LIGGETT, CALIFORNIA

Pursuant to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508) for implementing the procedural provisions of the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4321 et seq.); and U.S. Army Regulation (AR) 200-2, *Environmental Analysis of Army Actions*, as amended (32 CFR Part 651); the U.S. Army has prepared an Environmental Assessment (EA) of the potential effects associated with implementing an Integrated Natural Resources Management Plan (INRMP) at Fort Hunter Liggett, California. The INRMP has been prepared in accordance with the provisions of the Sikes Act Improvement Act (16 U.S.C. 670a et seq.) and AR 200-1, *Environmental Protection and Enhancement*. The INRMP and EA are herewith incorporated by reference into this Finding of No Significant Impact (FONSI).

Proposed Action. The U.S. Army proposes to implement this INRMP, which supports the management of natural resources as described by the INRMP itself. The purpose of the Proposed Action is to continue several management programs currently in place and to carry out the set of resource-specific management measures developed in the INRMP. This would enable U.S. Army personnel to effectively manage the use and condition of natural resources on Fort Hunter Liggett. Implementation of the Proposed Action would support the U.S. Army's continuing need to ensure the safety and efficiency of the mission while practicing sound resources stewardship and complying with environmental policies and regulations.

The Proposed Action supports an ecosystem approach and includes natural resources management measures to be undertaken on Fort Hunter Liggett. The Proposed Action focuses on a 5-year planning period, which is consistent with the timeframe for the management measures described in the INRMP. This planning period will become effective upon the date of the last signatory and shall continue in full force for a period of 5 years. Additional environmental analysis might be required as new management measures are developed during annual reviews of the INRMP, or over the long term (i.e., beyond 5 years). The INRMP will be revised and updated at the end of the 5-year planning period.

Alternatives. The development of proposed management measures for the INRMP included a screening analysis of resource-specific alternatives. The screening analysis involved the use of accepted criteria, standards, and guidelines, when available; and best professional judgment to identify management practices for achieving U.S. Army natural resources management objectives. The outcome of the screening analysis led to the development of the Proposed Action as described above. Consistent with the intent of NEPA, this screening process focused on identifying a range of reasonable resource-specific management alternatives and, from that, developing a plan that could be implemented, as a whole, in the foreseeable future. Management alternatives deemed to be infeasible were not analyzed further. As a result of the screening process, the EA, which has been included as an integral part of this INRMP, formally addresses two alternatives: the Proposed Action (i.e., implementation of the INRMP) and the No Action Alternative.

No Action Alternative. Under the No Action Alternative, the proposed management measures set forth in the INRMP would not be implemented. Current management measures for natural resources would remain in effect, and existing (i.e., baseline) conditions would continue. The No Action Alternative serves as a benchmark against which federal actions can be evaluated. Inclusion of a No Action

Alternative is prescribed by CEQ regulations and, therefore, the No Action Alternative has been analyzed in the EA which is included as a component of this INRMP.

Factors Considered in Determining that No Environmental Impact Statement is Required. The EA examines the potential effects of the Proposed Action and the No Action Alternative on resources and areas of environmental concern that could be affected by implementing the INRMP. These include environmental setting; climate; air quality; noise; topography; geology; soils; water resources; wetlands; floodplains; aquatic habitat; riparian habitat; terrestrial ecosystems; fauna; endangered, threatened, and rare species; land use; facilities; hazardous and toxic materials; socioeconomic resources; environmental justice; and cultural resources. Implementation of the Proposed Action would result in either no effects, minor adverse effects, or short- and long-term beneficial effects on identified resources and areas of environmental concern.

Findings. Based on the results of the EA, it is determined that implementation of the Proposed Action would have no significant direct, indirect, or cumulative impacts on the quality of the natural or human environment. Implementation of the INRMP would be expected to improve existing conditions at Fort Hunter Liggett as shown by the potential for beneficial effects. The Proposed Action would enable the U.S. Army to continue to achieve its goal of maintaining ecosystem viability and ensuring sustainability of desired military training conditions. Because there would be no significant environmental impacts resulting from implementation of the Proposed Action, an Environmental Impact Statement is not required and will not be prepared.

James M. Suriano **Date**
Colonel, U.S. Army
Garrison Commander

Executive Summary

This Integrated Natural Resources Management Plan (INRMP) has been developed for Fort Hunter Liggett (FHL), California, in accordance with Department of Defense Instruction 4715.03, *Natural Resources Conservation Program*; and Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*. This INRMP provides a description of FHL and its surrounding environments, and presents various management practices designed to mitigate negative impacts and enhance positive effects of FHL's mission on regional ecosystems. These recommendations are balanced against the requirements of FHL to accomplish its mission with the highest efficiency.

The guiding principles for this INRMP are as follows:

- Identify installation activities that compromise the function and composition of ecosystems and develop remedies through adaptive management
- Sustain and enhance healthy, terrestrial and aquatic habitats on FHL that provide services and values in an ecosystem
- Protect, restore, and enhance wetlands to maintain no net loss of wetland acreage and quality
- Assess, sustain, and enhance the health and habitats of fish and wildlife populations in a manner consistent with the military mission and security constraints
- Minimize pest-related habitat damage and health risks to natural resources and people
- Provide sustainable natural resources-related outdoor recreation opportunities given security constraints
- Increase awareness of natural resources issues, programs, and responsibilities among FHL employees, residents, tenants, and visitors
- Integrate the FHL natural resources program with local, state, and regional environmental programs and initiatives
- Use a geographical information system (GIS) database to enhance natural resources management at FHL.

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INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN / ENVIRONMENTAL ASSESSMENT
FOR
FORT HUNTER LIGGETT, CALIFORNIA

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1. Introduction

1.1 Purpose and Guiding Principles

The purpose of this Integrated Natural Resources Management Plan (INRMP) revision is to integrate natural resources management with the military mission at Fort Hunter Liggett (FHL), California. INRMPs are an installation's planning tool for managing natural resources while ensuring success of the military mission, and are a component of the installation's Master Plan. This INRMP presents practicable alternatives and recommendations that allow for the protection and enhancement of natural resources and conservation of existing ecosystems, while minimizing impacts on the installation mission.

The guiding principles for this INRMP are as follows:

- Identify installation activities that compromise the function and composition of ecosystems and develop remedies through adaptive management
- Sustain and enhance healthy, terrestrial and aquatic habitats on FHL that provide services and values in an ecosystem
- Protect, restore, and enhance wetlands to maintain no net loss of wetland acreage and quality
- Assess, sustain, and enhance the health and habitats of fish and wildlife populations in a manner consistent with the military mission and security constraints
- Minimize pest-related habitat damage and health risks to natural resources and people
- Provide sustainable natural resources-related outdoor recreation opportunities given security constraints
- Increase awareness of natural resources issues, programs, and responsibilities among FHL employees, residents, tenants, and visitors
- Integrate the FHL natural resources program with local, state, and regional environmental programs and initiatives
- Use a geographical information system (GIS) database to enhance natural resources management at FHL.

1.2 Regulatory Drivers and Guidance

This INRMP was prepared in accordance with guidance and regulations provided in the Sikes Act Improvement Act (SAIA), as amended through 2003; Department of Defense (DOD) Instruction 4715.03 (*Natural Resources Conservation Program*, 1996); Army Regulation (AR) 200-1, (*Environmental Protection and Enhancement*, 2007); and more recent Department of the Army (DA) and DOD Sikes Act and INRMP guidance memoranda. AR 200-2, *Environmental Analysis of Army Actions* (32 Code of Federal Regulations [CFR] Part 651), states that the U.S. Army will comply with applicable federal, state, and local environmental laws and regulations, including NEPA. In addition, this INRMP complies with the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code 21000–21177).

According to the SAIA, the primary purposes of a military conservation program are conservation and rehabilitation of natural resources, sustainable multipurpose use of those resources, and public access to military lands, subject to safety requirements and military security. Moreover, the conservation program

must be consistent with the mission-essential use of the installation and its lands. The SAIA requires the preparation of an INRMP to facilitate the conservation program.

The Deputy Under Secretary of Defense (Installations and Environment) (DUSD[I&E]) has developed several memos that include outlining INRMP coordination, reporting, and implementation requirements (DUSD[I&E] 2002); a memo providing policy on the scope of INRMP review, public comment, and Endangered Species Act (ESA) consultation (DUSD[I&E] 2004); a memo providing policy for the applicability of the Sikes Act on DOD lands leased to a non-DOD party (DUSD[I&E] 2005a); and a memo outlining best practices for INRMP implementation (DUSD[I&E] 2005b). In addition, DOD developed a handbook to assist resource managers with developing and implementing INRMPs (Benton et al. 2008). The DA issued its implementing guidance on SAIA and INRMP requirements in AR 200-1.

Appendix B provides a complete list of laws, regulations, policy, and guidance that direct natural resources management on FHL.

1.3 Approvals and Revisions

To ensure that this INRMP properly addresses all aspects of the natural resources present on FHL and proposes actions that are in accordance with DA and installation goals and objectives, this INRMP and all its components are subject to approval by the FHL Environmental Division. This INRMP should be reviewed annually to assess the suggested management practices in terms of their appropriateness for current conditions at the installation.

The Sikes Act requires the preparation of an INRMP in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the state fish and wildlife agency, which is the California Department of Fish and Game (CDFG) for FHL. In addition, it is required that the resulting Plan reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources. The Sikes Act also requires public comment on the INRMP at its inception, and after each required 5-year revision.

If the 5-year INRMP review for operation and effect results in major revisions to the plan, FHL must solicit public review and comments (U.S. Army 2006). This document is considered a major revision and will be subject to public review and comments. In addition, the NEPA process may be used to meet public review requirements if the public is provided a meaningful opportunity to comment on the draft revised INRMP. Absent extraordinary circumstances, the public must be afforded a minimum of 30 days to review and comment on the revisions, either as part of the NEPA process or some other process. After soliciting public comments, FHL must afford the USFWS and the CDFG the opportunity to review all public comments. If an existing INRMP requires only limited revisions that are not expected to result in biophysical consequences other than those anticipated for the existing INRMP, then neither NEPA analysis nor public review comment are necessary (U.S. Army 2006).

According to the recent DA guidance, INRMPs must also be reviewed by installations at least once per year to verify the following (U.S. Army 2006):

- Current information on INRMP conservation metrics, as described in the Army Environmental Database – Environmental Quality, is available.
- All "must fund" projects and activities have been budgeted for and implementation is on schedule.
- All required trained natural resources positions are filled or are in the process of being filled.

- Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate INRMP revision.
- All required coordination has occurred.
- All significant changes to the installation's mission requirements or its natural resources have been identified.
- INRMP goals and objectives are still valid.
- No net loss of training capability has occurred due to implementation of the INRMP in accordance with the Sikes Act.

1.4 Integration with Other Plans

The information presented in this INRMP will be incorporated into the FHL Master Plan. The installation's comprehensive management planning process should incorporate the concerns presented in this INRMP so that the growth of the installation can progress in a manner consistent with, and complementary to, the objectives of the DA with respect to the protection of natural resources. The INRMP takes into consideration regional management plans, such as Threatened and Endangered Species Recovery Plans and State Wildlife Action Plans, and cultural resources and environmental compliance plans. Plans specific to natural resources concerns on FHL, such as endangered species management plans and the fire management plan, are components of the INRMP and are included as appendices. This INRMP will be reviewed by natural resources personnel to ensure that goals, objectives, and management initiatives included in this plan do not contradict those contained within regional and installation plans.

1.4.1 Regional Plans

California State Wildlife Action Plan (SWAP). The California SWAP was completed in 2007 and identified conservation issues based on regional landscape types, regional habitats, and ecosystem-level species needs and requirements, rather than prescribing management actions using a species-by-species approach (CDFG 2007). The goal of integrating the California SWAP with the INRMP is to establish regional partnerships and pilot projects that facilitate coordinated natural resources management (CDFG 2009a).

Recovery Plans. USFWS has prepared Recovery Plans for San Joaquin kit fox (1998), California condor (1996), least Bell's vireo (draft 1998), arroyo toad (1999), California red-legged frog (2002), and vernal pool fairy shrimp (2005). These are described further in **Section 4.8**.

1.4.2 Installation Plans

The following installation plans were reviewed to highlight key interrelationships, and recommendations contained within these plans were used to develop this INRMP. Note that the INRMP is not intended to compile detailed information on each plan and its contents. These resource issues are described in further detail in **Section 4**.

- *Integrated Pest Management Plan* (IPMP): The IPMP provides guidance for implementing a pest management program at FHL, promotes nonchemical controls for managing pests on FHL and includes management recommendations for a wide variety of pests (see **Section 4.7.6**).
- *Integrated Cultural Resources Management Plan* (ICRMP): The ICRMP provides guidelines and procedures to manage cultural resources on FHL. Cultural resources present on the installation are addressed fully in the ICRMP (FHL 2003a).

- *Installation Master Plan*: FHL is revising the Master Plan which provides guidance for land use and grounds maintenance management (e.g., treed walkways, planted medians and walkways, consolidating industrial areas separate from a town center and housing areas).
- *Area Development Plans* (ADPs): ADPs are being prepared for industrial area usage (i.e., Mission Valley Area), barracks, classrooms and offices (i.e., Blackhawk Hills Area), and a town center.
- *Fire Management Plan*: A Fire Management Plan was developed for FHL in 2001. The purpose of the plan is to provide a set of protocols to be used by FHL to determine the best methods for conducting prescribed burns to meet military training needs and habitat management needs (FHL 2001a).
- *Endangered Species Management Plans* (ESMPs): ESMPs were developed for the vernal pool fairy shrimp (*Branchinecta lynchi*) and arroyo toad (*Anaxyrus californicus*) in 2003 and 2004 (FHL 2003b, FHL 2004a). Development and implementation of these plans are required by U.S. Army regulations.
- *Integrated Hazardous Materials and Waste Management Plan* (IHMWMP): FHL is currently updating the Hazardous Waste Management Plan to an IHMWMP, which will be finalized in 2011. The IHMWMP will prescribe responsibilities, policies, and procedures for storing and managing hazardous materials and hazardous waste at FHL.

The U.S. Army has a Spill Prevention, Control and Countermeasures (SPCC) Plan (updated 2010), Installation Spill Contingency Plan (updated 2010), and Industrial Storm Water Pollution Prevention Plan (SWPPP) (updated annually) that describe pollution prevention measures at FHL.

1.5 Environmental Management System

Executive Order (EO) 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, was signed in January 2007. This EO sets federal goals in the areas of energy efficiency, acquisition, renewable energy, toxics reductions, recycling, renewable energy, sustainable buildings, electronics stewardship, fleets, and water conservation. In accordance with the EO, developing and implementing an Environmental Management System (EMS) is required to be the primary management approach for addressing environmental aspects of internal agency operations and activities.

The EMS is part of an installation's overall management system and includes organizational structure, planning, responsibilities, practices, procedures and processes, and resource allocation for developing, implementing, achieving, reviewing, and maintaining environmental commitments. The International Standards Organization (ISO)-14001 EMS model leads to continual improvement based upon the following:

- Planning, including identifying environmental aspects and establishing goals [plan]
- Implementing, including training and operational controls [do]
- Checking, including monitoring and corrective action [check]
- Reviewing, including progress reviews and acting to make needed changes to the EMS [act].

The EMS is continually updated through this cycle, fine-tuning its management of operations that could harm the environment. This continual improvement cycle is a fundamental attribute of the EMS that allows the system to adapt to the dynamic nature of the organization's operations.

FHL uses an EMS as a systematic approach to integrating environmental considerations into mission decisions and operations, while continuing to improve environmental compliance. The EMS is a

framework of five interrelated components that are consistent with other military services, federal agencies, and, with ISO 14001, an international standard. The components emphasize continual improvement through effective policy, planning, implementation, checking and preventive/corrective action, and management review. This INRMP will be used to directly support the development of the FHL EMS.

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2. Location and Mission

2.1 Location and Surrounding Area

FHL is in west-central California, approximately 113 kilometers (km) (70 miles [mi]) southeast of the City of Monterey, approximately 37 km (23 mi) southwest of King City, and approximately 19 km (12 mi) west of Lockwood (see **Figure 2-1**). Part of the San Luis Obispo County line forms the southern boundary of the military reservation. The Pacific Ocean is approximately 32 km (20 mi) west of the cantonment area. The Los Padres National Forest is north and west of FHL. Areas south and east include private agricultural lands used for grazing or farming and a county park.

FHL encompasses much of the headwaters of both the Nacimiento River and San Antonio River watersheds. Both rivers originate north of FHL on U.S. Forest Service property, then cross the installation from northwest to southeast; after leaving the installation, both rivers feed into reservoirs, and then flow east to the Salinas River. The rivers create two, gently sloping, meandering valleys separated by steep hills. Both rivers are primarily ephemeral. The Nacimiento River lies farther west, and its watershed includes the east side of the coast ridge; the San Antonio River lies east of the hills separating the two watersheds.

2.2 Historical Overview

FHL is situated on the ancestral homelands of the Salinan Indians. The earliest human occupation at FHL is estimated at 8,000 BC. Spanning more than 10,000 years, the pre-Hispanic period included a long history of adaptive shifts in population, subsistence, and social organization. At the time of initial occupation of the area by Europeans in 1769, the Salinans occupied almost 3,000 square miles, and there were at least 20 recorded villages throughout the territory. The Salinans were complex hunter-gatherers who managed the landscape in which they hunted, fished, and gathered. Food production included harvesting salmon and processing acorns in large developed bedrock milling stations. They hunted large and small game, and gathered numerous plants for food, medicine, and ceremony. Reeds and grasses were harvested for building housing, clothing, and basketry. Controlled burns of grasslands to manage stands were commonly practiced until outlawed by the Spaniards during the Mission period. Extensive trade networks had been established connecting the interior villages with coastal communities to exchange marine products for natural resources in the interior valleys.

Prior to becoming a military installation, valley bottomlands were intensively grazed or cultivated. The San Antonio River and Nacimiento River valleys and tributary stream valleys were grazed during the Spanish Mission and Mexican rancho periods (1771–1848). Established in 1771, the Mission San Antonia de Padua dramatically changed the valley, reforming the landscape with extensively built infrastructure that included an irrigation system to support crop cultivation. The irrigation system included a dam, aqueduct, reservoirs, and diversion channels at the confluence of Mission Creek and the San Antonio River that rerouted water from the creek and the river for domestic and farmland use. El Camino Real, the main transportation route linking Spanish settlements, traversed the San Antonio River Valley. The Mexican regime (1822–1848) redistributed mission lands, creating huge ranchos, many of which were extensively used for grazing or cultivation (FHL 2004b).

During all local historic periods, dry farming and irrigated cultivation, which required silos and barns, and heavy cattle grazing prevailed. Residences, isolated barn and silo sites, cemeteries, a school, the Mission water system, and trails attest to a busy historic period. All but two San Antonio homestead sites south of the Mission are situated on the east flood terrace of the river and, except for a few residences, the school, and a barn, are adjacent to the stream course, 3.2 to 6.5 meters (10 to 20 feet) above the streambed. Nearly all are close to El Camino Real, and several are adjacent to historic river crossings (FHL 2004b).

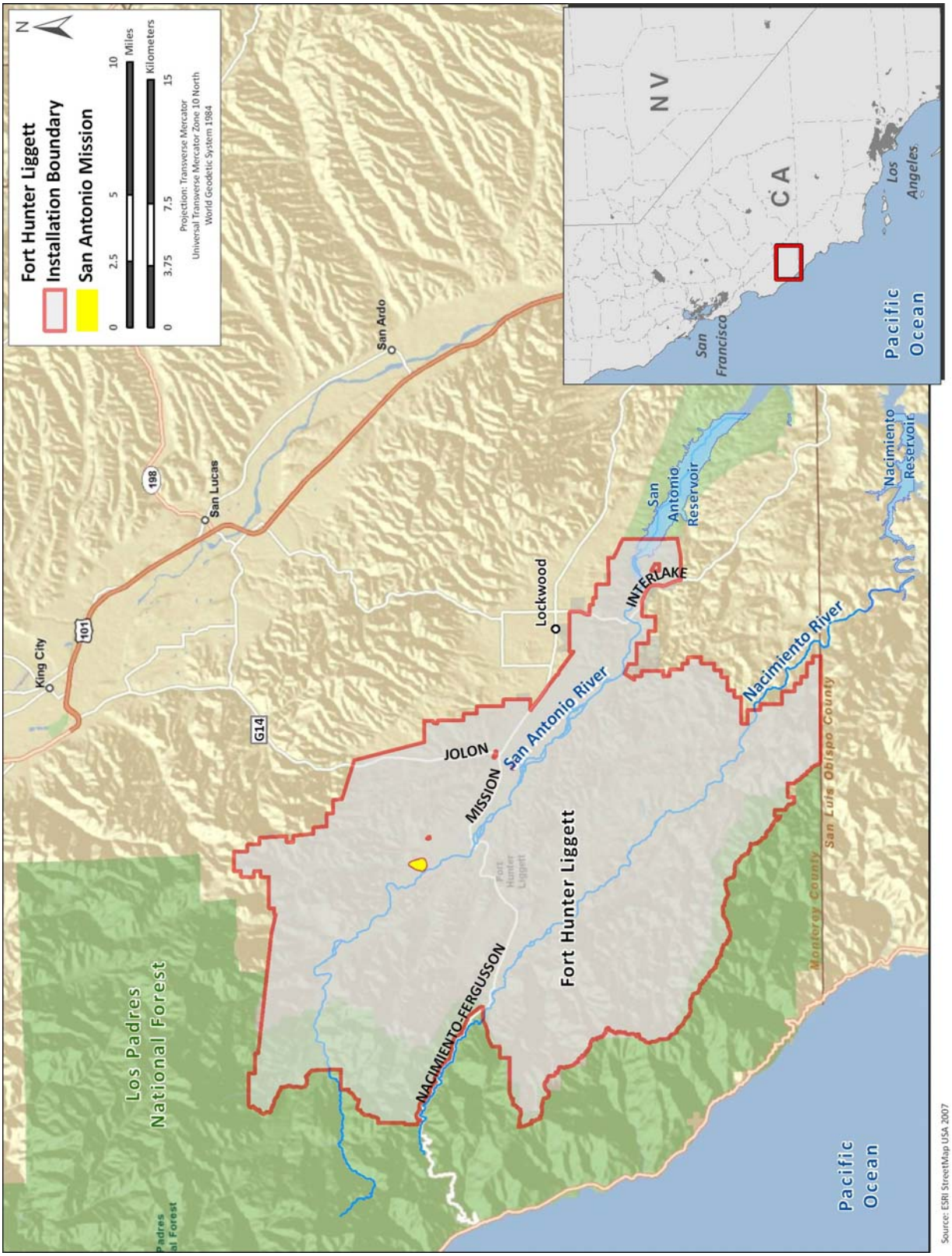

Figure 2-1. FHL Location Map

In the mid-1840s, American settlers began arriving and El Camino Real expanded into the Monterey/ Los Angeles stage route. During the American settlement period (1850–1880), homesteading resulted in fragmentation of the large Mexican land grants, and valley bottoms were intensively farmed. Two settlements were established during this period: one near the confluence of Nacimiento River and San Miguel Creek, and a second at the historic Jolon town site, upstream from the Jolon Creek/San Antonio River confluence. Jolon grew from a stage stop to a thriving town that served settlers and miners in the region. In the 1880s, small homestead parcels were consolidated by James Brown to support a large livestock operation, and local river valley economies again focused on heavy grazing. The Mission water system was expanded, and many channels were lined with concrete. Intensive use of waterways supported placer mining west of Jolon and in drainageways feeding the San Antonio River south of the San Antonio Mission. The Los Burros Mining District in the Santa Lucia Coast Range was formed in about 1850 for both placer and hard rock mining. The district was supported by the Town of Jolon with more than 2,000 mining claims recorded in the 1880s (FHL 2004b).

Maps produced in 1919 by the U.S. Geological Survey (USGS) show many established roadways, including Jolon, Argyle, Sulphur Springs, Upper Milpitas, Mission, Nacimiento-Fergusson, El Piojo, and Bear Trap Loop roads; as well as portions of Del Venturi, San Miguelito Loop, Gabilan, and River roads. Many of these are primary roads today. The 1919 maps show 10 San Antonio River crossings between the current location of San Antonio Lake and the San Antonio Mission. Most of these crossings were in the vicinity of current crossings but not at the exact location. The steel bridge at Nacimiento-Fergusson Road crossing San Antonio River was constructed in 1922 (FHL 2004b).

In the 1920s, publishing magnate William Randolph Hearst Jr. purchased Brown's holdings and continued to add to his vast ranch until it nearly equaled several of the Mexican ranchos. Hearst's ranching operation included development of infrastructure that included roads, bridges, corrals, spring development for watering livestock, and construction of buildings to augment those in place. Milpitas ranch headquarters, one of several, required construction of a poured concrete ranch house, known today as the Hacienda, on a hill overlooking the San Antonio River. Milpitas ranch house construction required that a road be built to accommodate the trucks importing concrete. Below the ranch house, the valley supported irrigated alfalfa (FHL 2004b).

Hunter Liggett Military Reservation was established in September 1940 when the U.S. Army purchased lands belonging to William Randolph Hearst, Jr. and other private landowners along with lands acquired from the U.S. Forest Service. The installation was named after Lieutenant General Hunter Liggett, who was General John J. Pershing's chief of staff during World War I. By 1941, troops began arriving at Hunter Liggett Military Reservation to train for World War II. During this time, the installation received intensive use for military training as a maneuver area for approximately 85,000 troops stationed in Monterey and San Luis Obispo counties at Fort Ord, Camp Roberts, and Camp San Luis Obispo. It also supported visiting troops from Fort Lewis, Washington, and other sites (FHL 2004b).

Since the 1950s, FHL has been intensively used to prepare troops for combat in Korea and Vietnam and participation in U.S. military operations throughout the world. From 1957 to 1995, FHL served as a field laboratory for the Combat Development Experimentation Center based at Fort Ord, later known as the Army Test and Experimentation Center (TEC); field activities conducted by TEC were significant for development of defense technology (FHL 2004b).

In 1974, the post was upgraded to fort status. Until the closure of Fort Ord in 1992, FHL was the primary training ground for the 7th Infantry Division that included up to approximately 20,000 troops. From 1994-2007, FHL was under the U.S. Army Reserve Command (USARC) as a subinstallation of Fort McCoy, Wisconsin. With the relocation of the TEC to Fort Hood, Texas, in 1997, the military testing mission of the installation was downsized (FHL 2004b).

In Fiscal Year (FY) 2004, FHL merged with Camp Parks and Moffett Field. In 2006, the Combat Support Training Center (CSTC) (Provisional) was created. In 2010, FHL was realigned as US Army Garrison Fort Hunter Liggett.

2.3 Current Military Mission

As part of the recently formed CSTC, FHL's mission is "to provide base operations support enabling world-class Combat Support (CS) and Combat Support Services (CSS) (CS/CSS) training, while providing for the well-being and security of Soldiers, Family Members and Civilians." FHL strives to maintain and allocate training areas, airspace, facilities, and ranges to support field maneuvers, live-fire exercises, testing, and institutional training. Additionally, the installation provides quality-of-life and logistical support to training units.

FHL is the nation's largest USARC training installation and the eighth largest Army facility in the continental United States. Major tenant units located at FHL are the 3rd Brigade/91st Division-356th Logistical Support Battalion, 7th Brigade/80th Division (Institutional Training Command), the 31st Naval Construction Regiment, the 63rd RRSC-Equipment Concentration Site 170, and the USARC Regional Training Center-West.

Military training at FHL supports from 750,000 to 1.5 million person-days of training, primarily for CS/CSS activities (FHL 2010a). Training exercises range from classroom activities to brigade-sized field training exercises and include training in live-fire munitions and use of high explosives at designated ranges, convoy operations, Tactical Training Base activities, heavy equipment operations, and other activities. Training units are typically on site for several days to several weeks per exercise.

3. INRMP Implementation and Responsibilities

3.1 Implementation and Integration

Successfully implementing an INRMP requires the support of natural resources personnel, other installation staff, command personnel, and installation tenants. As part of the EQCC, an INRMP Working Group will be developed, composed of key installation personnel from directorates and tenants. Their task will be to annually review and update issues, goals, and actions; prioritize actions; identify and resolve potential conflicts with other installation activities; and identify funding and resources as appropriate. This allows directorates and tenants to be involved in refining and improving actions that relate to their activities.

The following sections discuss responsibilities for INRMP implementation within the DA, and through other federal and state agency stakeholders.

3.1.1 Internal Stakeholders

3.1.1.1 Installation Commander

The FHL Installation Commander (Commander) is directly responsible for operating and maintaining FHL, including implementing and enforcing this INRMP. The Commander may be liable for noncompliance with environmental laws. Thus, the Commander has a vested interest in ensuring that this INRMP is properly implemented.

3.1.1.2 Directorate of Public Works

The Directorate of Public Works (DPW) manages real property; natural resources; environmental protection; pollution abatement; master planning; engineering; construction; operations; and maintenance of buildings, structures, grounds, and utilities.

The DPW Environmental Division (PWE) is responsible for environmental compliance, pollution prevention, cultural resources, and natural resources programs, including implementation of this INRMP. Environmental office personnel are also responsible for coordinating installation activities to ensure that they do not conflict with federal, state, and DA laws, regulations, and policies. Contractors are hired to provide technical knowledge about natural resources management or perform specialized management projects including endangered species surveys, invasive species surveys, soil surveys, and wetland delineations.

Natural resources program elements include the following:

- *Hunting and fishing programs*: These are conducted in accordance with federal and state laws and FHL Regulation 420-26 (see **Appendix G**). PWE provides oversight and staffing for fish and wildlife management aspects of the program, as described in **Sections 4.7.2**. As of FY 2011, the Directorate of Morale, Welfare and Recreation (MWR) provides oversight and staffing for recreational aspects of the programs.
- *Wood cutting privileges*: These are for personal firewood use only and permitted from designated training areas of FHL under the guidelines of CSTC Policy No. 25 (FHL 2008a). To limit impacts to natural resources, only residents of Monterey County, California, who are active-duty

military, retired military, DOD civilian working on FHL, or DOD contractors with one year or longer contracts on FHL are eligible to purchase wood cutting permits.

- *Habitat improvement and restoration activities*: These include maintaining 26 natural springs that are developed with tanks or troughs, 40 wildlife guzzlers, and 120 wood duck boxes. PWE coordinates with Integrated Training Area Management (ITAM) for reseeding with native seed mixtures after ground disturbance and planting oak seedlings. Thirteen ponds are monitored monthly and barley straw is used as an algae control agent. Control efforts are conducted for invasive species such as tamarisk or saltcedar (*Tamarix* spp.) and yellow star-thistle (*Centaurea solstitialis*) (see **Section 4.7.5**).

3.1.1.3 Directorate of Plans, Training, Mobilization, and Security

The Directorate of Plans, Training, Mobilization, and Security (DPTMS), particularly its Range Control Division, is the interface between the Environmental Division and troops training in the field. DPTMS is responsible for managing range complexes, coordinating military training, implementing ITAM, and releasing training areas for land restoration and recreational use. DPTMS provides control of military activities, access to ranges to accomplish natural resources management, and opportunities for wildlife-related recreation. It also enforces environmental requirements involving training area use.

The ITAM Program is a subcomponent of the Army's Sustainable Range Program, which is the Army's overall approach for improving the way in which it designs, manages, and uses its ranges to ensure long-term sustainability. ITAM has five components:

- **Range and Training Land Assessment (RTLA).** RTLA was first implemented at FHL in 1994 as the Land Condition Trend Analysis (LCTA) component, and was the first ITAM component established at FHL. In 2004, LCTA was renamed RTLA to reflect its role in training lands management and training support. The current goals of the RTLA program are to (1) assess impacts of live training and testing activities; (2) prioritize and assess land management activities external to training to maximize the capability, accessibility, and availability of land to meet the training mission; and (3) participate in training land use planning (e.g., Range Master Plan, Installation Master Plan, NEPA). RTLA at FHL has established excellent working relationships with other Directorates or Divisions and land managers to maximize its awareness of land use activities occurring on FHL, such as mapping controlled burns and fires to create a comprehensive database for Fire Department, Environmental Division, and ITAM use (FHL 2007a).
- **Land Rehabilitation and Maintenance (LRAM).** The LRAM component of the ITAM program has been in existence at FHL since 1996. The LRAM component directs programming, planning, design, and execution of land rehabilitation and maintenance projects. These projects arise from training land needs based on input from the RTLA and Training Requirements Integration (TRI) components of ITAM and input from the FHL Training Division/Range Control and the PWE. LRAM uses best management practices (BMPs) for design and execution of projects affecting all environmental media to ensure that the rehabilitation, repair, and maintenance results are cost- and resource-effective. The FHL LRAM program uses native plants, a multidisciplinary restoration approach, and ecosystem-level planning to provide sustainable and lasting solutions for maintaining quality training lands (FHL 2007a).
- **Sustainable Range Awareness (SRA).** The SRA component provides a proactive means to (1) develop and distribute educational materials to users of range and training land assets, (2) integrate SRA into existing command or installation operational awareness activities and events, and (3) initiate new events that maximize outreach for the command. FHL ITAM SRA is

a preventative program that uses several education tools to minimize the amount of potential damage to FHL's training lands. Educational tools include soldier field cards, pamphlets, handbooks, posters, and videotapes. Briefings to Officers in Charge, Range Safety Officers, troops, civilian employees, and other users of the installation are also important educational tools (FHL 2007a).

- **Training Requirements Integration (TRI).** The TRI component provides a decision support capability based on the integration of training requirements, land conditions, range facilities, and environmental management requirements. The installation ITAM coordinator consults with the DPTMS Range Officer, other range organization personnel, trainers, environmental technical staff, natural and cultural resources managers, and other environmental staff members to integrate: (1) training requirements; (2) land management, training management, and natural and cultural resources management data; and (3) data derived from the RTLA and Army conservation program components. TRI also provides input for developing and updating the INRMP (FHL 2007a).
- **Geographical Information System.** The FHL Sustainable Range Program (SRP) GIS component creates, manages, and distributes standardized spatial information, including cartographic support of training operations and global positioning system (GPS) surveys of features related to training, infrastructure, and the natural environment on and immediately surrounding FHL. SRP GIS provides spatial data and application support for all ITAM components to ensure that ITAM provides effective mission support (FHL 2009a).

3.1.1.4 Directorate of Emergency Services

The Directorate of Emergency Services (DES) provides for the protection, welfare, and safety of the garrison community. This includes all first responders to emergency situations and those functions that plan responses, educate the community, and disseminate public safety-related information. The DES includes a Law Enforcement Division and the Fire Protection and Prevention Division. The DES provides the game wardens for FHL.

3.1.1.5 Directorate of Logistics

The Directorate of Logistics (DOL) provides the programs and services to ensure readiness at FHL. The DOL provides services including receiving, storing, issuing, and managing retail supplies and organizational clothing and individual equipment (OCIE) provided by Army/Air Force Exchange Service Military Clothing Sales; providing field (tactical) maintenance, and selected national (sustainment) maintenance services; providing transportation management services; managing hazardous materials; providing installation dining facility services; and providing installation-level planning for mission support, training support, and deployment and mobilization support.

3.1.1.6 Installation Legal Office

The Installation Legal Office (ILO), through the Judge Advocate General (JAG), provides legal advice to the installation in all areas of the law, including compliance with applicable environmental and natural resources management laws and regulations. The JAG provides advice about the statutory and policy framework in which this INRMP is implemented.

3.1.1.7 Family, Morale, Welfare, and Recreation

Family, Morale, Welfare, and Recreation (FMWR) provides morale, welfare and recreation services, programs, activities, and facilities to meet the needs of military personnel, their families, and authorized DOD civilians.

3.1.1.8 Other Installation and Tenant Organizations and Partners

In addition to the directorates and offices mentioned above, INRMP implementation requires assistance from, or coordination with, a variety of other installation organizations, tenants, and contract personnel. Some of these support organizations for INRMP implementation include the Directorate of Contracting (purchasing) and Public Affairs (public awareness programs).

The formal mechanism by which the INRMP and natural resources program are integrated with facility-wide activities is through participation on the Environmental Quality Control Committee (EQCC). The EQCC is a communications forum for environmental planning and management of installation lands. The Commander or a designated representative chairs the EQCC and facilitates the quarterly committee meetings. EQCC responsibilities with respect to the INRMP include the following:

- Identifying and evaluating management issues and concerns
- Providing policy, guidance, and oversight for development of goals and objectives
- Identifying staffing and funding resources for implementing the INRMP
- Overseeing development, implementation, and revision of the INRMP
- Fostering environmental awareness and sound stewardship
- Providing input on siting facilities and installation planning.

3.1.2 External Stakeholders

3.1.2.1 Government Agencies and Organizations

Federal Agencies

U.S. Fish and Wildlife Service

The USFWS is a signatory agency of installation INRMPs in accordance with the SAIA. In addition, the DOD and DA consult formally and informally with the USFWS on federally listed species. The USFWS office with responsibility for FHL is the Ventura Fish and Wildlife Office in Ventura, California.

Partners in Flight

In 1990, the National Fish and Wildlife Foundation initiated the Neotropical Migratory Bird Conservation Program, known as "Partners in Flight - Aves de Las Americas." The initiative stresses the importance of international conservation partnerships to focus limited resources, both financial and human, to provide for the long-term health of avifauna throughout the western hemisphere. The purpose of the program is to bring together the diverse array of groups and individuals involved in the conservation and management of birds and their habitats. In the United States, more than 300 partners from federal and state agencies, conservation groups, foundations, academia, and forest products companies have contributed expertise and resources to make Partners in Flight successful in its conservation efforts.

For further information on the DOD Partners in Flight program, go to <*http://www.DODpif.org*>.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) provides contract management, construction management, and technical support. FHL has the option to use USACE contracts as vehicles for natural resources management and to access USACE organizations, such as the U.S. Army Engineer Research and Development Center (ERDC) for technical assistance and support for natural resources projects.

In addition, the USACE has regulatory authority over waters of the United States, which include activities within perennial and intermittent streams and wetlands. Section 404 of the Clean Water Act (CWA) authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) has several natural resources conservation programs that could assist FHL in managing resources including conserving soils, improving water quality, increasing wildlife habitat, and reducing damage resulting from floods or other natural disasters (NRCS 2010).

U.S. Department of Agriculture – Wildlife Services

The mission of U.S. Department of Agriculture-Wildlife Services (USDA-WS) is "to provide Federal leadership in managing problems caused by wildlife... [by] helping to solve problems that occur when human activity and wildlife are in conflict with one another" (USDA-WS 2009). The USDA-WS can be contracted by FHL to monitor nuisance wildlife, and provide nuisance and nonnative fauna control.

U.S. Geological Survey

The USGS is a multi-disciplinary organization that provides scientific information on biology, geography, geology, geospatial information, and water, to minimize damage from natural disasters; and to manage the nation's water, biological, energy, and mineral resources. The USGS could assist FHL by helping design biological, water quality, and hydrologic surveys, and by facilitating the integration of installation data into national or regional databases.

State and County Agencies

California Department of Fish and Game

The CDFG is a signatory agency for this INRMP. The mission of the department is to "manage California's diverse fish, wildlife, and plant resources and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public" (CDFG 2009a). The CDFG has statewide responsibilities for assessing and restoring water quality and habitat; managing and regulating recreational boating, fishing, and hunting; and managing wetlands, wildlife, and rare, threatened, endangered, and species of concern. The CDFG office with responsibility for FHL is Central Region 4 in Fresno, California.

California Environmental Protection Agency

The California Environmental Protection Agency (Cal/EPA) is charged with developing, implementing, and enforcing the state's environmental protection laws that ensure clean air, clean water, clean soil, safe pesticides, and waste recycling and reduction (Cal/EPA 2010). Cal/EPA includes the Air Resources Board, the Department of Pesticide Regulation, the Department of Toxic Substances Control, Office of Environmental Health Hazard Assessment, and State Water Resources Control Board. Each of these divisions regulates different environmental media (e.g., air or water).

California Department of Food and Agriculture

California Department of Food and Agriculture provides subject matter experts and technical support in the field of invasive species management.

Monterey County Department of Agriculture

Monterey County Department of Agriculture provides subject matter experts in the field of invasive species management and Pest Control Advisor support.

3.1.2.2 Non-government Agencies and Organizations

NatureServe and State Heritage Programs

NatureServe is a nonprofit conservation organization whose mission is to provide the scientific basis for effective conservation. NatureServe represents an international network of biological inventories, known as natural heritage programs or conservation data centers. NatureServe not only collects and manages detailed local information on plants, animals, and ecosystems, but develops information products, data management tools, and conservation services to help meet local, national, and global conservation needs. The objective scientific information about species and ecosystems developed by NatureServe is used by all sectors of society, such as conservation groups, government agencies, corporations, academia, and the public, to make informed decisions about managing our natural resources.

Salinan Tribe

The Salinan Tribe lives in areas surrounding the installation and is active and interested in installation activities. The Salinan Tribe is not a recognized tribe by the federal government but is actively seeking formal recognition (FHL 2004b).

The Nature Conservancy

The Nature Conservancy (TNC) and DOD signed a cooperative agreement in 1988. This agreement allows installation commanders to obtain technical assistance from TNC and to participate in programs and projects of mutual interest. It also permits TNC to study significant ecosystems managed by the U.S. Army.

Rocky Mountain Elk Foundation

The Rocky Mountain Elk Foundation (RMEF) was created in 1984 and has a mission to "ensure the future of elk, other wildlife and their habitat" (RMEF 2010). Since the RMEF was created, the foundation has partnered with other organizations to protect and enhance more than 5.7 million acres of habitat and has conducted more than 6,500 permanent land protection, habitat stewardship, elk restoration, conservation education, and hunting heritage projects. In addition, RMEF has 500 chapters across the United States and Canada. The chapter nearest FHL is the Fresno RMEF chapter, and information pertaining to activities undertaken in either the Fresno region or within the state can be found at <*http://www.rmef.org/Conservation/WhereWeWork/California/*>.

Colleges and Universities

Universities can be contracted to provide technical support in natural resources management and technical expertise on specific resource issues. Seventeen universities and research institutions along with nine federal agencies (including DOD) compose the Californian Cooperative Ecosystems Studies Unit (CA-CESU). The host institution for the CA-CESU is the University of California at Berkeley. The

mission of the CA-CESU is "to provide research, technical assistance and education across the biological, physical, social, and cultural sciences to address natural and cultural resource management issues at multiple scales and in an ecosystem context in California and nationally as appropriate" (CA-CESU 2004). The CA-CESU was established in July 2003 through a cooperative agreement. FHL has access to any of the partners in the CA-CESU and can acquire their technical assistance through a task agreement.

Santa Barbara Botanic Garden Herbarium

Santa Barbara Botanic Garden Herbarium: provides technical expertise associated with ongoing Floristic Survey additions to the FHL RTLA reference plant collection

Ventana Wildlife Society

Ventana Wildlife Society (VWS) was instrumental in reintroducing bald eagles to the central coast prior to their delisting and remain key to reintroducing California condors into the wild in Los Padres National Forest north of FHL and Pinnacles National Monument to the northeast. <*http://www.ventanaws.org/*>.

3.2 Natural Resources Compliance Requirements

Natural resources compliance focuses on maintaining compliance with major federal laws that affect FHL activities. A comprehensive list of applicable laws is included in **Appendix B**. The following paragraphs discuss the most prominent laws:

Endangered Species Act. The ESA of 1973, as amended, requires that federal agencies conserve listed species, and consult on actions that may affect federally listed species (see **Section 4.8**). FHL currently operates under a Programmatic Biological Opinion (PBO) issued by USFWS in 2010 that addresses long-term training and future planned development in accordance with the *Environmental Assessment Addressing Installation Development and Training at Fort Hunter Liggett*, hereafter referred to as the Installation Development and Training Environmental Assessment (EA) (FHL 2010b). Actions that may affect federally listed species and that are not addressed by the PBO require additional informal or formal consultation with USFWS. Formal consultation requests require review by IMCOM.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds (see **Section 4.7.3**). The MBTA made it illegal for people to "take" migratory birds, their eggs, feathers, or nests. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act (BGEPA) of 1940, as amended, prohibits the take, possession, and commerce of bald and golden eagles except under certain specified conditions (see **Section 4.7.3**).

Clean Water Act. The CWA establishes the basic structure for regulating discharges of pollutants into waters of the United States and regulating quality standards for surface waters (see **Section 4.6.2**). The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. The U.S. Environmental Protection Agency (USEPA) National Pollutant Discharge Elimination System (NPDES) permit program controls discharges.

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4. Existing Conditions

FHL proposes to implement an INRMP, which supports the management of natural resources as described by the plan itself. The following text describes the existing conditions of resources that are potentially affected by implementation of the INRMP (i.e., the Proposed Action).

4.1 Airspace Management and Safety

Aircraft safety includes the following four key concerns: aircraft accidents, avoidance areas, bird/wildlife-aircraft strikes, and nighttime flying.

Bird and wildlife strikes are an aircraft safety concern due to the potential damage that a strike might have on the aircraft or injury to aircrews. As required by AR 95-2, all personnel performing daily airfield inspections or checks shall inspect for obstacles, including birds and animals, and, therefore, must be trained in bird/wildlife watch conditions, attractants, and control measures (U.S. Army 2008), as outlined in Federal Aviation Administration (FAA) Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports* (FAA 2007).

The FAA, U.S. Air Force, U.S. Army, USEPA, USFWS, and the USDA signed a Memorandum of Agreement in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the Agreement, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between birds or wildlife and aircraft (i.e., strikes) throughout the United States (FAA 2003).

4.2 Land Use

4.2.1 Land Use

FHL consists of approximately 162,000 acres with 160,800 acres of training and maneuver lands subdivided into 34 Training Areas (TAs), including 29 TAs and 5 sub-training areas (see **Figure 4-1**). FHL land use categories in the cantonment consist of administration, airfield, training (classroom), training (outdoor), community services/facilities, family housing, unaccompanied housing, maintenance, supply/logistics, medical, utility, and outdoor recreation/open space (FHL 2007b).

All 34 TAs are currently active and contain 26 facilities and 10 training ranges. Twenty-one of the TAs are designated for light forces maneuver training, and the remaining 13 TAs are capable of supporting heavy forces maneuver training. The Multi-Purpose Range Complex supports up to Tank/Bradley Table XII. The Stony Valley area allows units to design their own live-fire scenarios. As for maneuver training, TAs 12, 15, and 20 are suited for Mechanized Combat Operations and Lane Training. The varied terrain equally challenges light units (FHL 2007a).

The cantonment area is in the east-central portion of the installation and occupies approximately 1,500 acres. There are multiple land uses present in the cantonment area including mission-related uses and support functions. There are family housing areas currently used to support full-time residents of the installation and lodging for short-term residents in the form of transient training barracks and senior enlisted and officers' quarters (FHL 2007b). Nacimiento-Fergusson Road bisects the installation connecting Highway 1 and Highway 101.

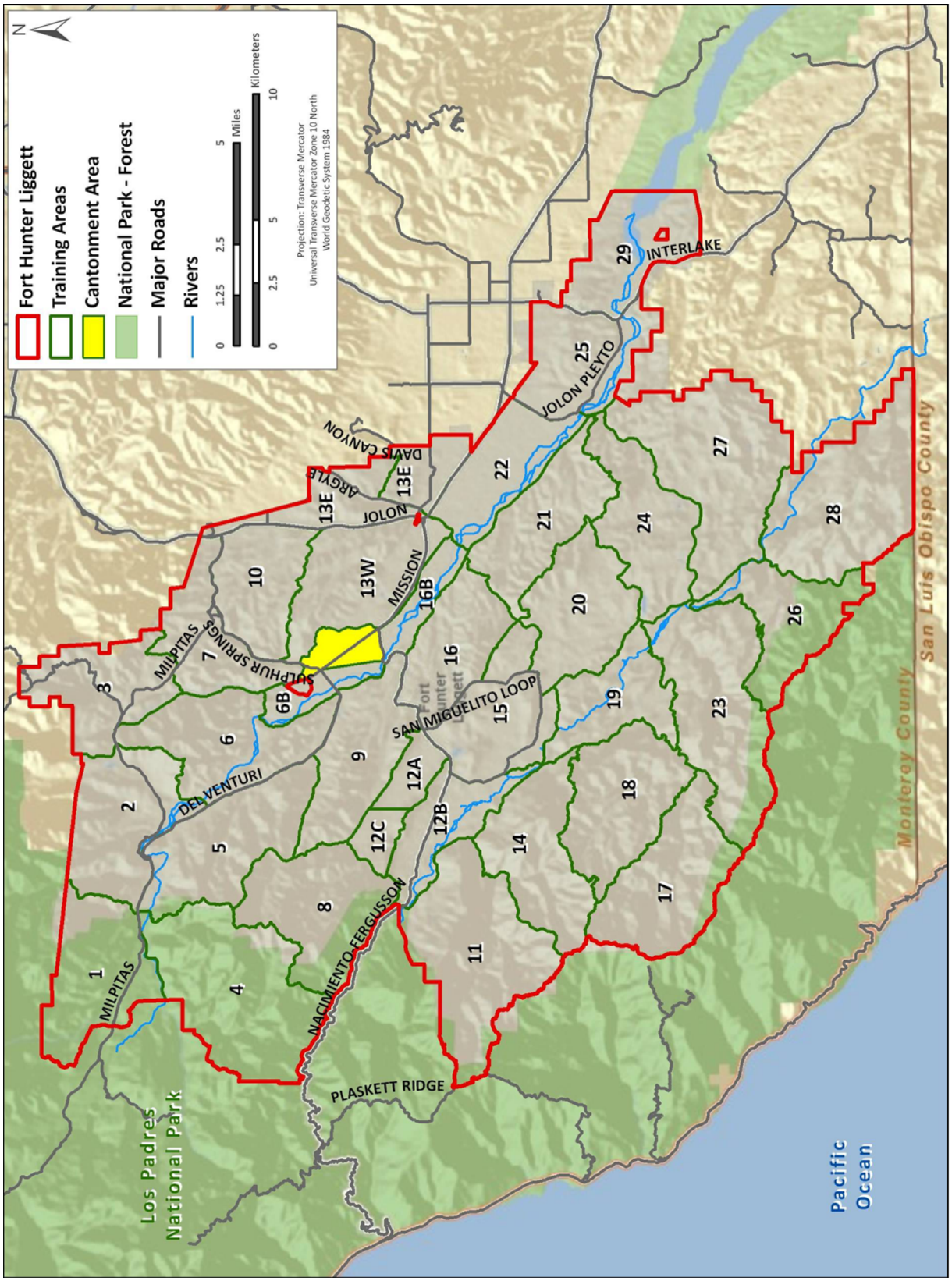


Figure 4-1. FHL Installation Map

4.2.2 Surrounding Land Use

The land surrounding FHL consists of Los Padres National Forest, which is adjacent to the installation to the north and west and includes portions of the Ventana and Silver Peak Wilderness areas, smaller areas of private land, private lands used for grazing and farming, and some Monterey County lands to the east and south.

Land uses on the west, north, and east sides of FHL are regulated by Monterey County, while land uses to the south are regulated by San Luis Obispo County. Agricultural zoning or other low-density uses are the primary land use designations for the areas surrounding the installation (FHL 2006a). Monterey County classified FHL as "Public/Quasi-Public" land use. The eastern portion of FHL and adjacent off-installation land have been designated as the Jolon Road Segment of the Agriculture and Winery Corridor by Monterey County. This designation establishes guidelines and standards for the development of wineries and wine industry-related uses within the designated corridor, and enhances marketing opportunities of these areas (Monterey 2007).

4.3 Climate

FHL has a Mediterranean climate characterized by warm, dry summers and mild, wet winters. Summer fog is uncommon, but coastal fog occasionally reaches the coast ridge area. Rainfall is higher in the western portion of the installation and at higher elevations. In 37 years of climate data collected in the cantonment area, temperature varied from a record minimum of 7 degrees Fahrenheit in December, to a record maximum of 116 degrees Fahrenheit in July. Twenty-four hour variations in temperature of 50 degrees are not uncommon year-round; average temperature ranges from 45 degrees Fahrenheit in December to 73 degrees Fahrenheit in July (Osborne 2000).

4.4 Air Quality

FHL is in Monterey County, which is within the North Central Coast Intrastate (NCCI) Air Quality Control Region (AQCR). The Proposed Action is in the Monterey Bay Unified Air Pollution Control District (MBUAPCD) and is subject to rules and regulations developed by the MBUAPCD. The air quality in the NCCI AQCR has been characterized by the USEPA as unclassified/attainment for all criteria pollutants (USEPA 2008). However, the California Air Resources Board has designated the NCCI AQCR as a nonattainment area for ozone (O_3) and particulate matter (PM_{10}) (CARB 2007).

4.5 Geological Resources

4.5.1 Regional Geology

FHL is located within the northwest-trending Santa Lucia Range, west of the Gabilan Range. The regional geology is composed of three groups of rocks all dating prior to the Quaternary period (2.6 million years ago to the present). These include the Salinian Block, the Franciscan Complex, and sediments deposited in marine and nonmarine basins. The Salinian Block is composed of crystalline intrusive rocks and metamorphic rocks, ranging in age from the Mesozoic Era (248 to 65 million years ago) to the Precambrian Eon (4.5 billion to 543 million years ago). The Franciscan Complex formed during the Mesozoic Era along a subduction zone, with associated ophiolitic rocks, greywacke, chert, greenstone, peridotite, and serpentinite. These rocks have undergone multiple metamorphic episodes resulting in the folding and faulting of beds. The Franciscan Complex underlies the southwestern corner of FHL along the Santa Lucia Range. Sedimentary rocks overlying the Franciscan Complex are composed of sandstone, shale, and conglomerates that underlie the eastern two-thirds of the installation (NPS 2007).

4.5.2 Topography

FHL elevations range from approximately 1,140 meters (3,740 feet) above mean sea level (msl) at Alder Peak to the west to approximately 232 meters (760 feet) above msl towards the upper end of the San Antonio Reservoir (FHL 2004b). Land surrounding the installation consists of heavily dissected rolling hills separating two valleys. The western boundary of the installation is formed by the Santa Lucia Range, which rises steeply out of the Pacific Ocean approximately 8 km (5 mi) west of the installation's western boundary. The eastern three-quarters of the installation have low hills and flat to rolling river valleys. A wide variety of soil types reflect the diversity of the installation's topography, although loamy types are most common. **Figure 4-2** shows topography on FHL.

4.5.3 Soils

More than 130 soil series and 57 soil associations are mapped on FHL, consistent with the geologic and topographic variety found in the region (FHL 2004b). The steep highlands in the west are composed of shallow soils indicative of the underlying parent material. Soils in the eastern and central portion of the installation consist of alluvial terrace soils derived from marine sedimentary rocks. In the southwestern corner of the installation, serpentinite composes an integral component of the soils and the flora present in the area consists of species adapted to the low mineral content of these soils. Digital information on the soil series and their attributes is stored on the FHL GIS database. **Figure 4-3** shows soils mapped on FHL.

Shallow soils and rock outcrops dominate steep highlands; deeper soils derived from alluvial terraces or underlying parent material prevail in the rolling hills; and alluvial deposits occur in river valleys. The three dominant soil parent materials on FHL are sedimentary (i.e., shale and sandstone), metamorphosed sedimentary, and granitic rocks. Metamorphosed and granitic rocks are concentrated in the northwestern portion of FHL. Granitic and sandstone parent materials have given rise to coarse, sandy soils, while shale and fine sandstone have given rise to finer soils. The San Antonio River valley cuts through all major parent materials of the area and exhibits a full range of soil textures and associations. Soils are coarse and of granitic origin upstream of Mission Creek, while downstream they are finer and of sedimentary and alluvial origin. In lower reaches of the river valley, soils are richer in clay due to shale erosion on the valley's southern side.

Alluvial soils of the cantonment area are derived from sedimentary parent materials. Textures of these soils range from gravelly sandy loams to clay loams. Soils that formed from granitic parent materials make up the Placentia, Chualar, and Arroyo Seco series. Soils that formed from sedimentary parent material make up the Lockwood, Rincon, and Metz series. Soils that formed from both of these parent materials form the Tujunga and Elder series. All of these soil series are greater than 60 inches deep and are well-drained. The Elder series can have gravel or cobbles at a depth of 24 inches. FHL soils on slopes are classed as moderately to highly erodible. As the topography becomes more extreme on the slopes of surrounding mountains, the erosion potential increases. Within the San Antonio River watershed, the surface texture of soils is commonly sandy loams, with large areas of clay loams and silty clay loams. There is a distinct corridor of sand and loamy sands along the San Antonio River, particularly evident in the cantonment and areas south where arroyo toads have been found; outside this corridor, sandy soil types are scarce.

The Nacimiento River watershed also has large areas with a sandy loam surface texture, substantial areas of bedrock in the western, mountainous areas, and more loam than is apparent in the San Antonio River watershed. There is a narrow strip of sand and loamy sand associated with portions of the Nacimiento River. However, these sandy soil types are scarce.

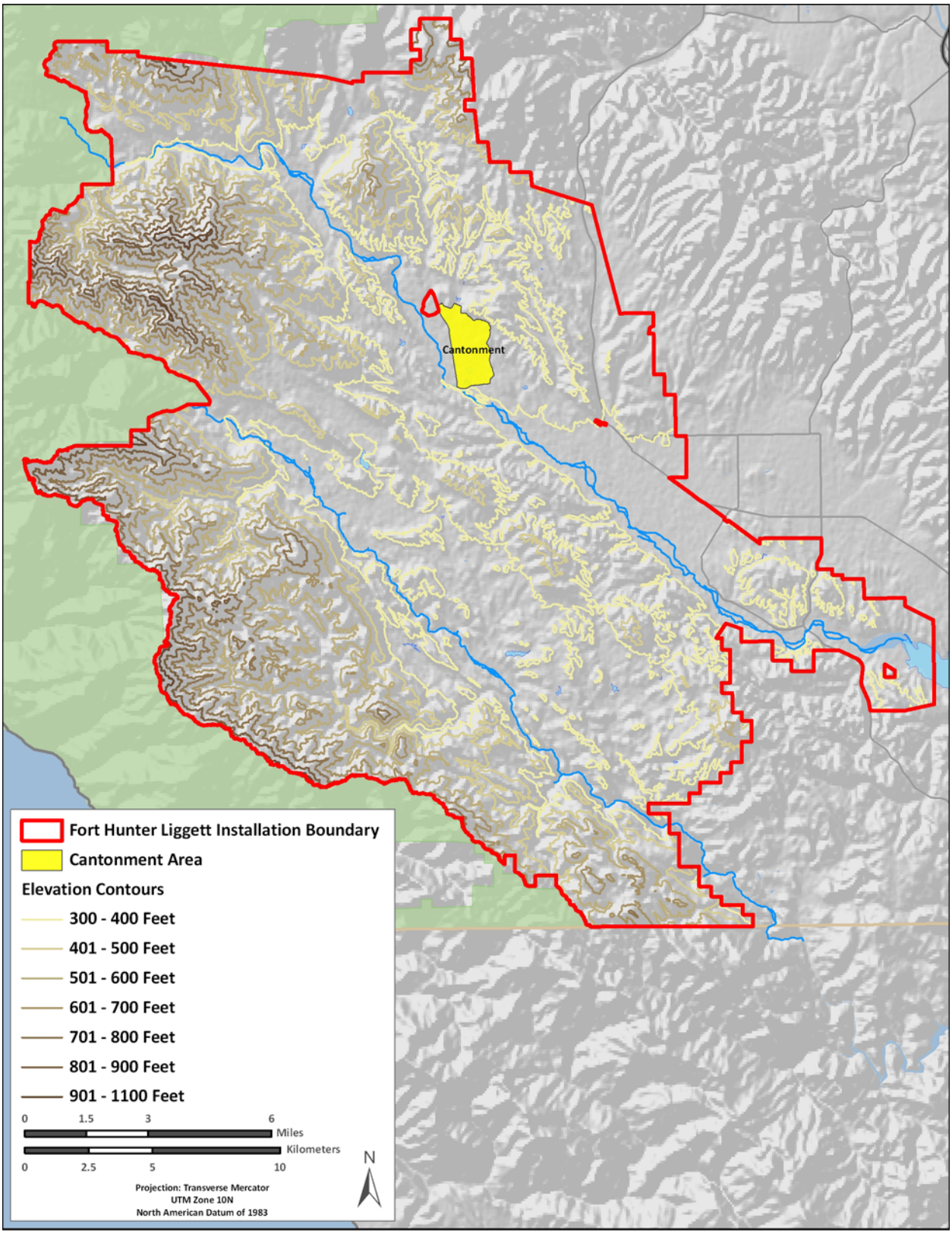


Figure 4-2. Topography on FHL

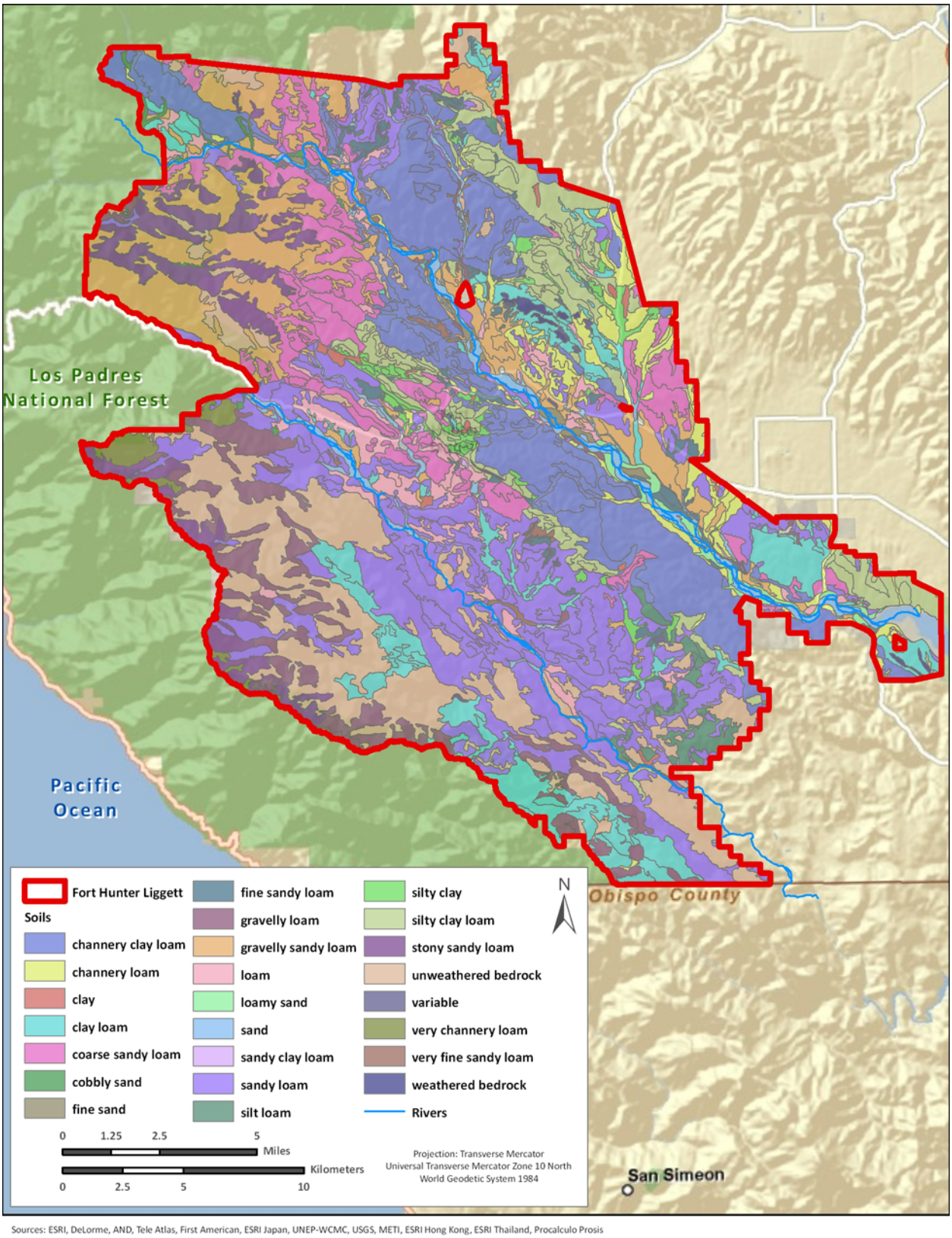


Figure 4-3. Soil Resources on FHL

4.5.4 Geologic Hazards

Numerous faults underlie FHL, including the Jolon and Nacimiento faults, and several smaller faults. These faults trend subparallel to the San Andreas Fault. In addition, the Riconda Fault and the Nacimiento Fault control the geomorphology and hydrology of the installation, specifically the northwestern trend of the San Antonio River and the Nacimiento River (see **Section 4.6.2** for a discussion on surface water).

The USGS has produced seismic hazard maps based on current information about the rate at which earthquakes occur in different areas and how far strong shaking extends from quake sources. The hazard maps show the levels of horizontal shaking that have a 2 in 100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of the force of gravity (percent g) and is proportional to the hazard faced by a particular type of building. In general, little or no damage is expected at values less than 10 percent g, moderate damage at 10 to 20 percent g, and major damage at values greater than 20 percent g. FHL is in an area with a 32 to 48 percent g interval (USGS 2008). Thus, major damage to buildings could occur as a result of seismic activity.

Most of FHL is classified as having a moderate to high erosion hazard due to topography, soils, past grazing practices, borrow excavations, and military training activities. Erosion hazards are heightened as topographic gradient increases.

4.6 Water Resources

4.6.1 Groundwater

Groundwater. Two aquifers underlie FHL, flowing to the southeast following the geologic structure of the Coast Ranges. Groundwater occurs in confined and unconfined conditions, due to fracturing or presence of impermeable sediments. The Jolon Fault separates the Lockwood groundwater basin to the east from the San Antonio Basin to the west and prevents mixing of the two basins (FHL 2006b). Groundwater for domestic consumption is derived from three wells tapped into the Jolon-Lockwood Basin and the Mission-San Antonio Basin. Well water consumption averages about 37 to 43 hectare-meter (300 to 350 acre-feet) per year, with well yields varying based on the seasonality, degree of weathering, spacing, abundance of fractures, and lithology of the aquifer (Jones & Stokes 1995).

Groundwater Quality. As part of the Defense Environmental Restoration Program (DERP), numerous monitoring wells have been and are being established to monitor confirmed sources of groundwater contamination with petroleum hydrocarbons. Sources include a closed landfill and two underground storage tank sites. These wells are sampled and tested at various time intervals to further delineate the extent of the contaminated plumes, and to determine corrective actions to be taken. Although military activities within the cantonment and field training areas have the potential to impact groundwater, data available to date suggest that water quality on FHL has not been impaired.

4.6.2 Surface Water

Surface Water. FHL is within the San Antonio River and Nacimiento River watersheds, which cover 1,830 square km (705.3 square mi) (RWQCB 2008). The two major watercourses flowing through FHL are the San Antonio River and the Nacimiento River. The two rivers are linear subparallel drainages that flow approximately 8 km (5 mi) apart from the northwest to the southeast. The San Antonio River watershed on FHL includes all or major portions of the northeastern half of the installation. The headwaters for the San Antonio River are in the Cone and Junipero Serra Peaks. The San Antonio River

flows for 40 km (25 mi) through FHL (NPS 2007). The headwaters for the Nacimiento River are in the Santa Lucia Range, south of Cone Peak. Water discharges through the man-made Lake Nacimiento and San Antonio Reservoir to the Salinas Valley Basin. Both rivers drain into the northwest-flowing Salinas River, which empties into Monterey Bay. FHL flow regimes are seasonal; the upper San Antonio River is fed by springs, while the lower portion has an intermittent flow. Much of the Nacimiento River is dry during summer months. Water features on FHL are depicted in **Figure 4-4**.

Both rivers are dammed to the southeast of FHL. The San Antonio River dam is 16 km (10 mi) downstream from FHL, and the Nacimiento dam is 16 to 21 km (10 to 13 mi) downstream. The San Antonio Reservoir is at the lowest elevation of the installation at approximately 232 meters (760 feet) above msl in the southeastern corner of the installation. The Nacimiento Reservoir is several miles south of the installation. The reservoirs are used for irrigation, flood control, and recreation. Numerous creeks exist on FHL, along with the Lake San Antonio shoreline and 14 impoundments that provide aquatic and riparian habitat. These impoundments are located throughout FHL in both watersheds.

Surface Water Quality. Surface water quality depends on seasonal flow regimes. Sediment loading of streams and rivers occurs in early winter as a result of heavy seasonal rains that wash large quantities of debris from the landscape. Nutrients that have accumulated in the soil over summer are transported into surface water by runoff and potentially into groundwater. During summer, rapid evaporation of surface waters results in increased mineral concentrations and subsequent microbial blooms. Watershed water quality is dependent upon many factors including amount and timing of rainfall, retention, recharge, and runoff; soil conditions such as erodability and recharge capacity; and influences by humans. Although military activities within the cantonment and in field training areas have the potential to impact surface water, data available to date suggest that water quality on FHL has not been impaired. Further data might be needed to define sediment and nutrient loads in the headwaters (outside of FHL influence) of both the San Antonio and the Nacimiento rivers in order to assess effects of military activities for those parameters.

4.6.3 Floodplains

Floodplains at FHL occur adjacent to rivers and major creeks. The April 2, 2009, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Monterey County, California, classify the majority of the cantonment area as within Zone X (minimal flooding). The northern portion of the cantonment area is primarily in Zone X but is cut by a small section classified as Zone A, which corresponds to the Sulphur Spring Canyon Creek. The areas surrounding the San Antonio River to the south and west are Zone A. Zone A surrounds streams and rivers and is likely to flood occasionally with prolonged or sufficient precipitation (FEMA 2009a, b, c).

4.7 Biological Resources

FHL contains a variety of soil and geological types, resulting in a diverse vegetative composition of more than 1,000 species of vascular plants (NPS 2007). The western side of the installation is dominated by steep hillsides covered with chaparral, scrub, and live-oak forests (42 percent of the total area). The hills are intersected by flat rolling river valleys and grasslands, oak savannas, and oak woodlands (55 percent of total area) (FHL 2009b). The varied plant composition combined with the relatively undeveloped nature of FHL is reflected in a richness of animal species. More than 300 animal species have been described for FHL, including 223 bird species (NPS 2007). Additionally, jurisdictional and nonjurisdictional wetlands exist at FHL. Vernal pools, which are seasonally filled pools that sometimes contain sensitive species, occur in limited environmental settings and are sensitive to development, erosion, compaction, fill, and other disturbances. The following section describes the habitat and species that can be found at FHL.

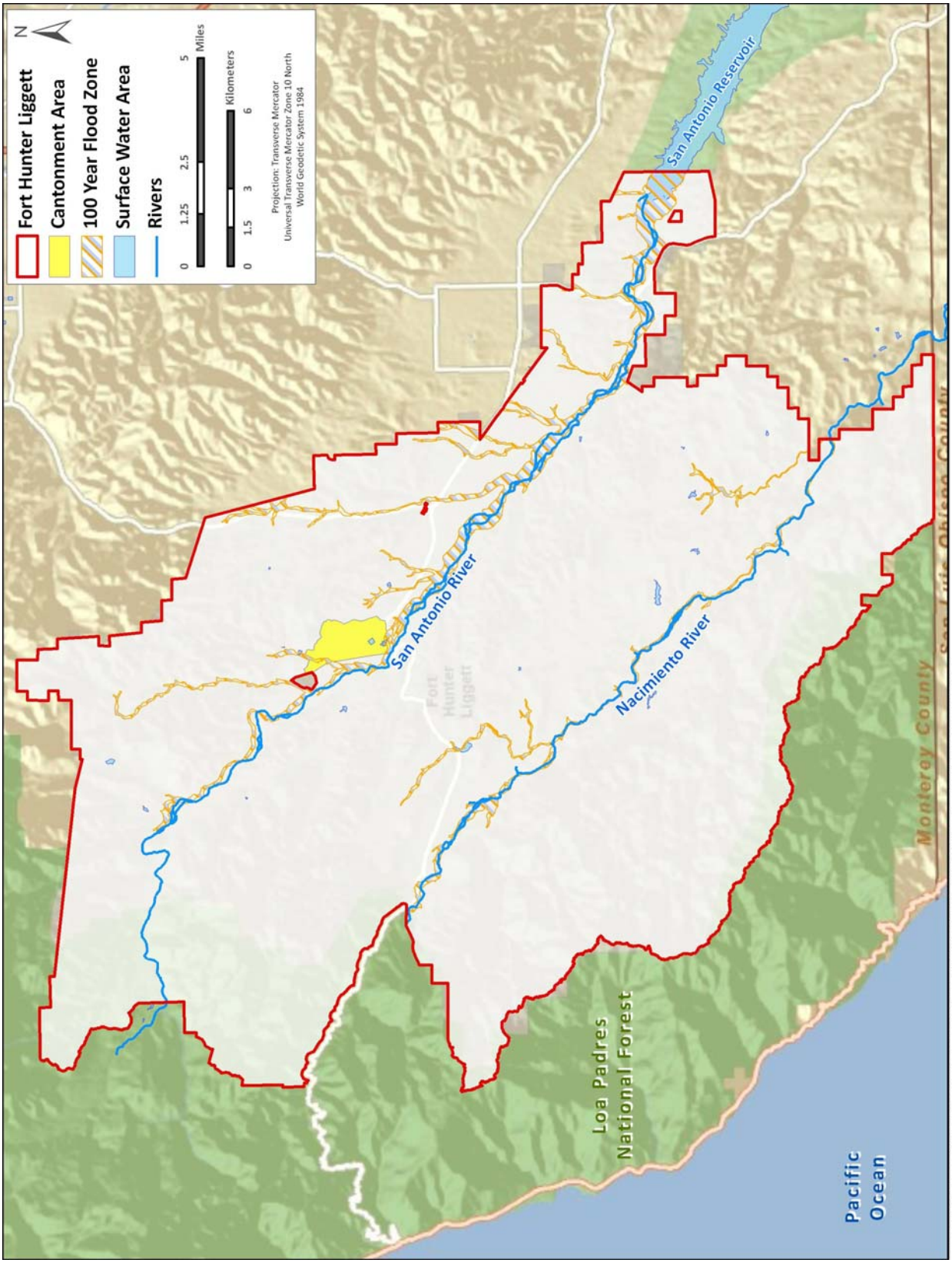


Figure 4-4. Water Features on FHL

4.7.1 Vegetation

Plant Communities

Plant communities at FHL include chaparral, oak woodlands and savannas, grasslands, riparian areas, and seasonal and perennial wetlands. A summary of habitat types and approximate acreage are included in **Table 4-1**. Rare vegetation communities occurring on the installation, as described by the California Natural Diversity Database (CNDDB), include sycamore alluvial woodland, valley needlegrass grassland, and valley oak woodlands (CDFG 2009b). Additional valuable communities on FHL include wetlands, riparian communities, oak woodlands, and savannas; native bunch grass grasslands; and rock outcrops (see below for detailed descriptions of these plant communities).

Table 4-1. Habitat Types at FHL

Habitat Type		Acres (thousands)	Percent of Total
Mixed and Chamise Chaparral and Coastal Scrub		64.0	39.5
Oak Communities	Oak and Foothill Woodlands and Forests	54.3	33.5
	Oak Savannas	20.5	12.7
Grasslands		16.0	9.9
Riparian Areas		4.7	2.9
Seasonal and Perennial Wetlands*		0.8	0.5
Landscaped Areas	Urban- Cantonment Area	0.6	0.4
	Range	0.8	0.5
Unassigned		0.2	0.1
Total		**161.9**	**100**

Source: FHL 2009c

Note: *Range development areas in TA 22 contain 56 acres of vernal swales and wet meadows that remain functional but have been affected by past range and road construction.

Chaparral. The two most widespread chaparral types on FHL are mixed chaparral and chamise chaparral. Typical woody chaparral species on FHL include several species of oak (*Quercus* spp.), ceanothus (*Ceanothus* spp.), and manzanita (*Arctostaphylos* spp.); and additional species such as toyon (*Heteromeles arbutifolia*), black sage (*Salvia mellifera*), mountain mahogany (*Cercocarpus betuloides*), and others. Mixed chaparral is typified by a codominance of several of these chaparral species, while chamise chaparral, called chamisal, is dominated by chamise (*Adenostoma fasciculatum*). Chaparral covers 39 percent of FHL and is more abundant in the Nacimiento River watershed. On the installation, chaparral is generally found on south-facing slopes and is the dominant vegetation type along the western mountain areas and the ridges and slopes between the San Antonio River and Nacimiento River watersheds (FHL 2004b).

Coastal Scrub. Coastal scrub communities are not differentiated from chaparral communities in the GIS data layer of plant communities but are a distinct plant community. Coastal scrub communities are found along nearly the entire coast of California. Drought-tolerant species assume greater dominance in the southern half of the state. Northern and southern phases of coastal scrub can be found in both Monterey and San Luis Obispo counties. Evergreen shrubs dominate the northern coastal scrub plant communities. Southern coastal scrub communities are characterized by a mixture of shrubs, subshrubs, and herbs, many of which are resinous or produce scented volatile oils. The latter type of community is often referred to as

"soft chaparral." Coastal scrub communities vary considerably in species composition. The southern form is often referred to as coastal "sage" scrub because California sagebrush (*Artemisia californica*) and sages (*Salvia* spp.), both strongly scented plants, are frequently dominant species. However, in some areas they could be entirely absent. Chaparral and scrub communities are managed by use of periodic prescribed burns in an attempt to prevent very large, even-aged stands that provide less valuable wildlife habitat than mixed stands and are at risk of large wildfires.

Oak Communities. Oak communities (woodlands, forests, and savannas) are the most widespread vegetation type on FHL, covering an estimated 46 percent of the installation (FHL 2004b). Blue oak (*Quercus douglassi*) communities are the most prevalent of the oak communities at FHL. Blue oak can be found in pure stand woodlands to foothill woodlands where it mixes with other oak species and foothill pines, or in more open blue oak savannas with a grassland understory. Valley oak (*Q. lobata*) communities are the next most common oak community. Valley oaks are the largest of the California oak species and are frequently found growing in deep alluvial soils of valley bottoms, forming savannas with a grassland understory. Valley oak woodlands are rare on FHL and are considered a rare vegetation community by the CNDDB. Live oak communities consist of coast live oak (*Q. agrifolia* var. *agrifolia*), interior live oak (*Q. wislizeni* var. *wislizeni*), and canyon live oak (*Q. chrysolepis*). Native California oaks are slow-growing and long-lived under natural conditions. For a century, there has been concern that blue oaks and valley oaks are not regenerating adequately (UCANR 2011). Reduction of oak woodland and oak savanna is evident in aerial and satellite imagery of FHL from 1929 to 2010.

Mixed-evergreen Forest. The mixed evergreen forest community is not differentiated from oak communities in the GIS data layer of plant communities but is a distinct plant community. Mixed-evergreen forest is found along a portion of the installation's border that follows the coast ridge of the Santa Lucia Mountains. Mixed-evergreen forest is a broad category that includes communities varying widely in species composition throughout California. These communities are typically dominated by broad-leaved evergreen tree species, but coniferous evergreens are also common, and some deciduous tree species might be present. It is dominated by coast live oak (*Quercus agrifolia*), black oak (*Q. kelloggii*), canyon live oak (*Q. chrysolepsis*), California bay laurel (*Umbellularia californica*), madrone (*Arbutus menziesii*), tanoak (*Lithocarpus densiflorus*), and bigleaf maple (*Acer macrophyllum*).

Grasslands. Approximately 10 percent of FHL is covered by grasslands. Grasslands are typically found on open, level, or moderately sloped areas. Historic species composition of grasslands on FHL is not known; however, today, native grasslands are found on rocky hillsides or unusual soil types (FHL 2004b). FHL grasslands are dominated by nonnative grasses that thrive in California's Mediterranean climate and are more resilient to the heavy browsing pressure caused by domestic livestock. Native grasslands are estimated to compose approximately 2 to 5 percent of existing grasslands on FHL and include native species such as *Nassella pulchra*, *Nassella cernua*, *Deschampsia danthonioides*, *Melica imperfecta*, and *Poa secunda*. Nonnative grasslands are dominated by *Bromus hordeaceous*, and include other species such as *Bromus diandrus*, *Bromus madritensis*, and two species of wild oat (*Avena* spp.). Yellow star-thistle (*Centaurea solstitialis*), a noxious exotic forb, is also found in nonnative grasslands and has spread to an estimated 20,015 acres of FHL (FHL 2009d). FHL actively controls this species with a yellow star-thistle control program. State protection of native grasses are provided under California Fish and Game Code in Native Plant Protection (Fish & Game Code 1900–1913), Native Species Conservation and Enhancement (Fish & Game Code 1750–1772), and Natural Community Conservation Planning Act (Fish & Game Code 2800–2835). The California Native Plant Society (CNPS) is actively working to categorize, map, and conserve California's grassland vegetation as part of the Grassland Initiative (CNPS 2007).

Riparian Communities. Riparian communities on FHL consist of alluvial woodlands composed of sycamore (*Platanus racemosa*), cottonwood (*Populus fremontii*), and willow (*Salix* spp.) found along

rivers and streams. Riparian communities cover an estimated 3 percent of the installation. Sycamore alluvial woodlands are considered a rare vegetation type by the CNDDB. The San Antonio River watershed contains a greater amount of riparian habitat than the Nacimiento River watershed (FHL 2004b). The Nacimiento River watershed riparian corridors contain roughly equal coverage of mixed riparian woodland (44 percent) and sycamore alluvial woodland (43 percent). Common riparian species in addition to those listed above include mule fat (*Baccharis salicifolia*); willow species (*Salix laevigata*, *S. lasiolepis*, *S. goodingii*, and *S. exigua*); and herbaceous understory species including rushes (*Juncus* spp.), spikerushes (*Eleocharis* spp.), sedges (*Carex* spp.), and nut sedges (*Cyperus* spp.). Riparian areas are not typically used for military activities; vehicle travel is limited within 20 meters (66 feet) of streams and to established crossings (FHL 2001b).

Seasonal and Perennial Wetlands. Wetlands are relatively shallow and have slow-moving or stationary water, moist or wet soils, and hydrophytic plants in landscape depressions that include vernal pools, wet meadows, swales and drainages, freshwater marshes, and seasonal wetlands. Wetlands are considered to be special-status communities. The occurrence of vernal pools and wetlands are described in **Section 4.7.4**.

Landscaped Areas. The developed portion of the cantonment area contains a mixture of native trees, shrubs, and grasses, intermingled with ornamental landscaping immediately adjacent to buildings. Ornamental plants are only used around major buildings in the cantonment area.

Coniferous Forest. Coniferous forest on FHL includes closed-cone, pine-cypress forest, and yellow pine forest. Closed-cone, pine-cypress includes Sargent cypress (*Cupressus sargentii*), generally found on serpentine. Sargent cypress is included in the rare California series listed by Sawyer and Keeler-Wolf. Yellow pine forest is dominated by ponderosa pine (*Pinus ponderosa*) and Coulter pine (*Pinus coulteri*). Small stands of Santa Lucia fir (bristlecone fir) occur in the western mountains on FHL. Santa Lucia fir is included in the rare California series listed by Sawyer and Keeler-Wolf.

Rare Natural Communities. CDFG formerly used Significant Natural Areas to designate and recognize the rarity and threat to certain vegetation communities. CDFG now uses natural communities in its CNDDB to designate all vegetation communities and to identify those communities that are rare and most worthy of consideration for protection. CNDDB rare natural communities occurring on FHL include sycamore alluvial woodland, valley needlegrass grassland, and valley oak woodland.

Rock Outcrops. Rock outcrops occur when granitic, sedimentary, or basic rocks protrude from the ground surface. Rocks provide a unique substrate for several obligate plant species. In addition to providing unique substrates, outcrops are often used by raptors as roost and nesting sites. Rock outcrops are more common in the Nacimiento River watershed and include such large formations as the Palisades in TA 26 and Piedras Altas in TA 27 overlooking the Nacimiento River. Military activities at rock outcrops are limited to a few sites in the Palisades area and include limited use for rock climbing and repelling for military training purposes. Recreational rock climbing is not permitted.

Biological Soil Crusts. A community of highly specialized organisms referred to as biological soil crusts, or cryptogamic, cryptobiotic, microbiotic, or microphytic soil crusts, is found in arid and semi-arid lands throughout the world. Biological soil crusts are a complex mosaic of cyanobacteria, green algae, lichens, mosses, microfungi, and other bacteria. Biological soil crusts have only recently been recognized as having a major influence on terrestrial ecosystems. In rangelands, biological soil crusts have important ecological roles from functional, structural, and compositional perspectives. They function as living mulch by retaining soil moisture and discouraging annual weed growth. They reduce wind and water erosion, fix atmospheric nitrogen, and contribute to soil organic matter (FHL 2004b).

4.7.2 Wildlife

Scientists have recorded more than 300 animal species inhabiting FHL, including many special-status species (FHL 2004b). Special-status species include proposed, candidate, listed (federal or state), and sensitive species (see **Sections 4.7.3** and **4.8**).

Typical mammal species include the California ground squirrel (*Spermophilus beecheyi*), tule elk (*Cervus canadensis nannodes*), California black-tailed deer (*Odocoileus hemionus californicus*), American badger (*Taxidea taxus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), deer mouse (*Peromyscus maniculatus*), pocket mouse (*Perognathus californicus*), and kangaroo rat (*Dipodomys* spp.).

Migratory birds are present at FHL, with nesting populations present in late spring and summer, overwintering populations in the late fall and winter, and migrating populations transiting the region in between those periods. Birds frequently observed include the western meadow lark (*Sturnella neglecta*), western scrub jay (*Aphelocoma californica*), California quail (*Callipepa californica*), mourning dove (*Zenaida macroura*), turkey vulture (*Cathartes aura*), acorn woodpecker (*Melanerpes formicivorus*), and red-tailed hawk (*Buteo jamaicensis*) (FHL 2004b, U.S. Army 2005).

Nongame Species

The variety of plant communities provides a wide range of habitats for nongame wildlife. Species lists for mammals, birds, reptiles, and amphibians are stored and maintained in PWE files, and **Appendix F**. Nongame wildlife species are protected on FHL and may not be hunted, except for bobcat, gray squirrel, and coyote.

Sensitive species on FHL include taxa from a variety of habitats; therefore, surveys for these species include monitoring nongame species. For example, carnivores are monitored during kit fox spotlight surveys, and riparian songbirds are monitored during least Bell's vireo (*Vireo bellii pusillus*) surveys. A wide variety of species, including the arroyo toad, are recorded as incidental sightings during RTLA surveys.

FHL participates in the Monitoring Avian Productivity and Survivorship (MAPS) program that was created by The Institute for Bird Populations (IBP) in 1989 to assess and monitor the vital rates and population dynamics of more than 120 species of North American landbirds in order to provide critical conservation and management information on their populations (IBP 2002). From 2006 to 2009, the installation participated in a program to collect cloacal and feather samples. This program was a collaboration between the IBP and the Center for Tropical Research at UCLA to identify transmission paths in North American migratory landbirds.

FHL participates in surveys for state and national programs such as the Tricolored Blackbird Portal and the U.S. Nightjar Survey Network.

Game Species

FHL has an active hunting and fishing program. Deer, elk, pig, coyote, bobcat, jackrabbit, cottontail, tree squirrel, dove, quail, pigeon, turkey, duck, and geese may be hunted at FHL, in accordance with DOD and CDFG regulations, if MWR has listed the season as open.

Annual hunting permit fees for 2010 were $100 for the general public; $60 for officers; and $35 for enlisted soldiers, youth, and CDFG reduced-fee license holders. No fee permits were available for junior

enlisted soldiers and hunters with a free CDFG license. Beginning July 1, 2011, a pig only permit is $25, and a general public two-day permit is $51. These fees remain in effect through June 30, 2012. As of the 2011 CDFG hunt year beginning July 1, 2011, the total cost to the hunter will remain the same; however, the fees will be split between an MWR activity fee and a Fish and Wildlife Conservation Fund fee. PWE will continue to use the Fish and Wildlife Conservation Fund fees for wildlife management activities. An MWR activity fee will allow MWR to recoup costs of the recreational aspects of the program.

For FYs 2004 to 2009, revenue averaged about $150,000 per year. During this time period, PWE had full management responsibility for the hunting and fishing program. Recreational aspects of the program managed by PWE included selling and issuing permits, registering users into training areas, customer service, and conducting drawings for military deer and elk tags. Wildlife management aspects of the program included coordinating with installation directorates and CDFG, collecting harvest data for big game, monitoring big game populations, and conducting habitat improvement projects (e.g., pond, guzzler, and spring maintenance). Beginning in October 2010, recreational aspects of the program transitioned to MWR while wildlife management activities remained with PWE.

Deer. Deer are found in every training area on FHL, although in varying numbers. Few deer are found in old, dense stands of chaparral; more are found in areas with diverse habitats. The CDFG considers deer on FHL as part of the Santa Lucia herd for management purposes. The Santa Lucia herd occurs west of the Salinas River from the Pacific Ocean to the San Luis Obispo County line. Land ownership in the area includes private, Bureau of Land Management, military, and U.S. Forest Service lands, and includes the Ventana Wilderness Area. FHL is located in the southern part of this region.

Annual spotlight surveys are the basis of deer population status monitoring. Surveys are performed on six permanent routes in representative habitats, with each route surveyed five times. Deer herd health is monitored using harvest check station data. Harvested deer are weighed and aged, and overall health indices are calculated using a brisket fat index. Acorn mast surveys are conducted each fall to monitor feed sources for deer and other wildlife.

Tule Elk. Tule elk were nearly extirpated in California after the gold rush but were maintained on one ranch in Kern County. Elk were then relocated to several sites, often unsuccessfully, and from 1940 to 1970, there were three established herds. In December 1978, 22 elk were relocated onto FHL, and 2 bulls were added in 1979. In 1981, there were 14 illegal harvests, and only 4 cows remained. In 1981, 26 elk were relocated onto FHL and monitored until 1983. Elk use grasslands and oak savannas during the winter and spring seasons, and oak woodlands and riparian zones during summer and fall. In late spring, elk calve in chaparral within 0.5 km (0.31 mi) of water. During the breeding period, from late July to mid-October, elk form several herds (FHL 2004b).

Tule elk are monitored annually during fall and winter using daytime composition counts. During this time, elk congregate in large herds, and personnel survey for each herd during the same survey effort to avoid duplication of monitoring efforts.

Feral Pig. Pigs are a popular game hunted on FHL. Feral pigs compete with native wildlife species, prey upon amphibians and ground-nesting birds, and can cause damage to native plants in some areas. On FHL, the feral pig population has been kept at tolerable levels by recreational hunting and, though rooting is evident in some areas, the widespread damage seen in areas without population control is not apparent. Pigs are uncommon in the steep, western portion of the installation and most common in areas near the San Antonio River.

Feral pigs are difficult to monitor. They are nomadic and have varying reproductive rates, depending on habitat conditions. Due to the influence of weather patterns on short-term habitat quality and resulting responses of feral pig productivity, it is not feasible for FHL to directly monitor pig numbers.

Coyotes, Rabbits, and Bobcats. Coyote, rabbit, and bobcat abundance is monitored during San Joaquin kit fox monitoring, but this information is not used for game management, and different rabbit species are not differentiated during surveys. Squirrels are not monitored.

Upland Birds. California quail are a popular game species on FHL. California quail are found primarily in scattered shrub, open woodlands, and transition zones between dense vegetation and open areas and use brush piles and thickets for escape cover. They are dependent on summer water sources until the first fall rains. They feed on insects when young, then seeds of grasses and annual broad-leafed plants, such as filaree, clovers, and legumes; acorns are an important food source in dry years. California quail are common in lower elevation areas of FHL. Mountain quail inhabit live oak woodland and mixed chaparral on steeper slopes. Mountain and California quail are found together in some areas of FHL. Quail season normally runs from the third Saturday in October through the last Sunday in January. Use of bird dogs is allowed. However, dogs must be leashed or under voice control at all times to prevent the incidental take of San Joaquin kit foxes.

Mourning doves are a popular game species on FHL, particularly for opening weekend. Mourning dove season is September 1 through 15 and from the second Saturday in November for an additional 45 days. The bag limit is 10 birds per day. Though migratory, their breeding and wintering range overlap along the southern half of the United States. They typically nest either in trees or on the ground in open areas, and both males and females share in incubation. Mourning doves feed on forb and grass seeds and agriculture crops.

Band-tailed pigeon (*Columba fasciata*) season is open from the third Saturday in December for 9 consecutive days. The bag limit is two pigeons per day.

Wild Turkey. Wild turkey (*Meleagris gallopavo*) were stocked on FHL in the late 1970s and initially protected to allow the population to become established. In 1987, two to three weekends of hunting were allowed during the spring gobbler season. In 1990, the spring gobbler season was opened, and, in 1996, the fall gobbler and hen season was opened. Population surveys are not conducted. Wild turkeys are frequently sighted in TAs 6, 7, 9, 10 and 16 as well as other areas.

The fall bag limit is one either-sex turkey per person per season. This season is open statewide from the second Saturday in November for about 30 days. The spring bag limit is one bearded turkey per day and three per season. The season begins on the last Saturday in March and continues for 37 consecutive days. Check station personnel weigh and sex turkeys.

Waterfowl. Mallards (*Anas platyrhynchos*) and wood ducks (*Aix sponsa*) are the most commonly harvested species. In addition, large numbers of Canada geese (*Branta canadensis*) winter around San Antonio Lake. Duck breeding habitat is present along areas of the Nacimiento and San Antonio rivers and at many small ponds and reservoirs on FHL.

Duck hunting is relatively minor at FHL, except when the San Antonio Lake water level is high and water inundates the upper reaches of the lake. Season dates and bag limits for waterfowl are determined by CDFG using federally imposed guidelines. Seasons and bag limits vary considerably from year to year. Liberalization of these regulations is not possible.

More than 100 wood duck nesting boxes are annually monitored and maintained. Hens maybe banded during the breeding season in conjunction with California Waterfowl Association, and repaired in the fall.

Volunteer effort is important for duck box maintenance and monitoring. Duck boxes are moved as needed in response to changing water levels and use patterns.

Fisheries. Warmwater fish are the primary seasonal inhabitants of the San Antonio and Nacimiento rivers. Native minnows, such as California roach (*Lavinia symmetricus*), hitch (*Lavinia exilicauda*), Sacramento squawfish (*Ptychocheilus grandis*), and speckled dace (*Rhinichthys osculus*), as well as several gamefish species could be present throughout most of the river systems when adequate flows are present (winter periods).

Fish populations at FHL vary seasonally. As the river flows diminish during summer, some fish become stranded and die. Other fish seek permanent shelter in small isolated pools, where they remain throughout the dry summer and fall. These isolated populations do not support sustainable river fishing. Fishing is prohibited in FHL's rivers and streams to protect cultural resources, sensitive species, the safety of anglers, and the limited populations of native fish that persist in isolated pools.

At ponds bass, sunfish, and bluegill natural reproduction is good; however, FHL continues to restock to maintain fishable populations. Each year, rainbow trout and other species (e.g., bass, catfish, and bluegill) are stocked in various ponds and reservoirs for sport fishing. Stocking of ponds with fish obtained from offsite locations (i.e., outside FHL) requires a permit from CDFG.

4.7.3 Protected and Sensitive Species

State-listed species that are not federally listed under the ESA are considered in management. Species protected under the ESA are discussed in **Section 4.8**. AR 200-2 requires an EA in accordance with NEPA for activities affecting state-listed species (AR 200-2). Additionally, there are migratory birds and CNPS-listed plants at FHL that are taken into consideration in developing land management actions and priorities. **Table 4-2** lists FHL's high priority sensitive species; priority is based on state or federal status and distribution on FHL. Additional species could be added to the installation's sensitive species lists by agencies that maintain the lists or because a species was only recently found on FHL. Sensitive species are those that (1) could become endangered in or extirpated from a state, or within a significant portion of its distribution; (2) are under status review by the USFWS or the National Marine Fisheries Service (NMFS); (3) are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution; (4) are undergoing significant current or predicted downward trends in population or density such that federally listed, proposed, or candidate status or state-listed status could become necessary; (5) typically have small and widely dispersed populations; or (6) inhabit ecological refugia or other specialized or unique habitats.

There are 33 CDFG "species of special concern," which are species, subspecies, or distinct populations native to California that are of conservation concern and 33 CDFG special plants. There are two "candidate species," under review by CDFG for state listing. There are four state protected species. State requirements for mitigation of effects on special status species are not applicable on federal lands. However, documentation of potential effects for these species is required under NEPA. **Table 4-3** lists the special status species that have the potential to occur on or near FHL.

State-listed Species

There are two species listed as state-threatened and two listed as state-endangered that have the potential to occur on or near FHL: Santa Lucia mint (*Pogogyne clareana*), endangered; bald eagle (*Haliaeetus leucocephalus*), endangered; Swainson's hawk (*Buteo swainsoni*), threatened; and bank swallow (*Riparia riparia*), threatened.

Table 4-2. Protected and Sensitive Species Occurring on FHL

Scientific Name	Common Name	Status
Aquila chrysaetos	Golden eagle	BGEPA, MBTA
Collinsia antonina	San Antonio collinsia	CNPS 1B.2
Eriastrum luteum	Yellow-flowered eriastrum	CNPS 1B.2
Haliaeetus leucocephalus	Bald eagle	SE, BGEPA, MBTA
Pentachaeta exilis aeolica	San Benito pentachaeta	CNPS 1B.2
Pogogyne clareana	Santa Lucia mint	SE, CNPS 1B.2
Tropidocarpum capparideum	Caper-fruited tropidocarpum	CNPS 1B.1

Source: NPS 2007, FHL 2009e, CNPS 2010
Key:
SE = State Endangered; CNPS = California Native Plant Society; BGEPA = Bald and Golden Eagle Protection Act; MBTA = Migratory Bird Treaty Act
CNPS Status:
LIST 1: B = Plants rare, threatened, or endangered in California and elsewhere throughout range of plant.
Threat Ranks:
0.1 = Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)

Santa Lucia Mint. Santa Lucia mint (*Pogogyne clareana*) was listed as state-endangered in November 1979. Santa Lucia mint is an annual herb that blooms from April to July and is endemic to Monterey County, California. It is usually found in riparian woodlands, cismontane woodlands, and chaparral. Santa Lucia mint on FHL is mainly threatened by vehicle and military traffic and encroachment by nonnative yellow star-thistle (CNPS 2010; FHL 2008b, 2009c). It is only known to occur on the banks of moist streams and seasonal pools in the Los Bueyes and Los Burros watersheds (in TAs 18, 19, and 23) on FHL (FHL 2009e). Yearly point surveys are conducted to monitor Santa Lucia mint.

Bald Eagle. The bald eagle (*Haliaeetus leucocephalus*) was federally delisted on July 9, 2007 (USFWS 2010). The bald eagle continues to be a state-listed species and is protected by the BGEPA. It is a large raptor with a wingspan of up to 2 meters (7 feet). It has a brown body with a white head and tail, and a yellow beak (USFWS 2010). Bald eagles use estuaries, large lakes, reservoirs, and seacoast habitats for foraging. They build large nests in trees or on cliffs near these foraging areas. On FHL, bald eagles use the San Antonio reservoir, San Antonio River, and Nacimiento River for foraging, nesting, and overwintering habitat (FHL 2004b). The bald eagle has been nesting at FHL since 1996, with successful nesting in 1997 and every year thereafter except 1999. Currently there are two confirmed nests on the property, one near Hughes Reservoir during the breeding season and the other near Alice Road; a third nest is currently unconfirmed (FHL 2009f). It appears that FHL activities, including tank and live firing, prescribed burns, and wildfire, do not detrimentally affect eagle breeding and reproduction. FHL limits fishing in Hughes Reservoir to the western portion of the pond away from the nests to prevent bird disturbance. Annual surveys also look for wintering roosts, but so far none have been found.

Swainson's Hawk. The Swainson's hawk (*Buteo swainsoni*) was California state-listed as threatened in 1983 and also is protected under the MBTA. The USFWS has designated the Swainson's hawk as Not Listed (Resolved Taxon) in its entire range (FHL 2004b). The Swainson's hawk is a medium-sized hawk with relatively long, pointed wings, a wingspan of about 1.2 meters (4 feet), and a long, square tail. More than 85 percent of Swainson's hawk habitat in the Central Valley is in riparian systems adjacent to suitable foraging habitats. Swainson's hawks have not been sighted on FHL.

1 **Table 4-3. State Special Status Species Potentially Occurring On or Near FHL**

Scientific Name	Common Name	State Status
Plants		
Abies bracteata	Bristle cone fir	SSP
Aristocapsa insignis	Indian Valley spineflower	SSP
Baccharis plummerae ssp. *glabrata*	San Simeon baccharis	SSP
Calycadenia micrantha	Small flowered calycadenia	SSP
Calycadenia villosa	Dwarf calycadenia	SSP
Camissonia hardhamiae	Hardham's evening-primrose	SSP
Castilleja densiflora ssp. *obispoensis*	San Luis Obispo owl's clover	SSP
Chlorogalum purpureum var. *purpureum*	Purple amole	SSP
Chorizanthe rectispina	straight-awned spineflower	SSP
Clarkia jolonensis	Jolon clarkia	SSP
Collinsia antonina	San Antonio collinsia	SSP
Delphinium umbraculorum	Umbrella larkspur[2]	SSP
Didymodon norrissi	Norris' beard moss	SSP
Eriastrum luteum	Yellow-flowered eriastrum	SSP
Fritillaria viridea	San Benito fritillary	SSP
Galium californicum ssp. *luciense*	Cone Peak bedstraw	SSP
Galium hardhamiae	Hardham's bedstraw	SSP
Juglans hindsii	Northern California black walnut	SSP
Layia heterotricha	Pale-yellow layia	SSP
Malacothamnus davidsonii	Davidson's bushmallow	SSP
Malacothamnus palmeri var. *involucratus*	Carmel Valley bushmallow	SSP
Monardella palmeri	Palmer's monardella	SSP
Navarretia nigelliformis ssp. *radians*	Shining navarretia	SSP
Navarretia prostrate	Prostrate vernal pool navarretia	SSP
Pentachaeta exilis ssp. *aeolica*	San Benito pentachaeta	SSP
Plagiobothrys uncinatus	Hooked popcorn-flower	SSP
Pogogyne clareana	Santa Lucia mint	SSP
Senecio aphanactis	Chaparral ragwort	SSP
Sidalcea hickmanii ssp. hickmanii	Hickman's checkerbloom	SSP
Streptanthus albidus ssp. *peramoenus*	Most beautiful jewel-flower	SSP
Streptanthus morrisonii	Morrison's jewel flower	SSP
Triteleia ixioides ssp. *cookii*	Cook's triteleia	SSP
Tropidocarpum capparideum	Caper-fruited tropidocarpum	SSP
Fish		
Lavinia symmetricus subditus	Monterey roach	SSC
Amphibians		
Rana boylii	Foothill yellow-legged frog	SSC
Spea hammondii	Western spadefoot	SSC

Scientific Name	Common Name	State Status
Amphibians (continued)		
Taricha torosa	California newt	SSC
Reptiles		
Actinemys marmorata pallid	Southwestern pond turtle	SSC
Phrynosoma blainvilli	Coast horned lizard	SSC
Birds		
Accipiter cooperi	Cooper's hawk	SSC
Accipiter striatus	Sharp-shinned hawk[1]	SSC
Aechmophorus occidentalis	Western grebe[1]	C
Agelaius tricolor	Tricolored blackbird[2]	SSC
Aquila chrysaetos	Golden eagle[1]	SSC
Asio flammeus	Short-eared owl	SSC
Asio otus	Long-eared owl[1]	SSC
Athene cunicularia	Burrowing owl	SSC
Buteo regalis	Ferruginous hawk	SSC
Butteo swainsoni	Swainson's hawk	T
Circus cyaneus	Northern harrier[1]	SSC
Cypseloides niger	Black swift	SSC
Dendroica petechia brewsteri	Yellow warbler[1]	SSC
Elanus leucurus	White-tailed kite	Protected
Eremophila alpestris actia	California horned lark	SSC
Falco columbarius	Merlin	SSC
Falco mexicanus	Prairie falcon[1]	SSC
Falco peregrines	Peregrine falcon	Delisted
*Gymnogyps californianus**	California condor	E
Haliaeetus leucocephalus	Bald eagle	E
Icteria virens	Yellow-breasted chat[1]	SSC
Lanius ludovicianus	Loggerhead shrike	SSC
Larus californicus	California gull	SSC
Pandion haliaetus	Osprey	SSC
Pelecanus erythrorhynchos	American white pelican	SSC
Phalacrocorax auritus	Double-crested cormorant	SSC
Progne subis	Purple martin[1]	SSC
Riparia riparia	Bank swallow	T
Strix occidentalis occidentalis	California spotted owl	SSC
*Vireo bellii pusillus**	Least Bell's vireo	E
Mammals		
Antrozous pallidus	Pallid bat	C
Bassariscus astutus	Ring-tailed cat	Protected
Cervus canadensis nannodes	Tule elk	Protected
Corynorhinus townsendii pallescens	Pale big-eared bat	SSC

Scientific Name	Common Name	State Status
Mammals (continued)		
Felis concolor	Mountain lion	Protected
Neotoma fuscipes luciana	Monterey dusky-footed woodrat	SSC
Perognathus inornatus psammophilus	Salinas pocket mouse	SSC
Sorex ornatus salaries	Monterey Ornate Shrew	SSC
Taxidea taxus	American badger	SSC
*Vulpes macrotis mutica**	San Joaquin kit fox	T

Source: CDFG NDD 2011, Clark 2009a

Notes:

1. Present during breeding season
2. On or very near Fort Hunter Liggett.

*ESA-listed species discussed in separate section

Key:

E = Endangered

T = Threatened

C = Candidate Species

SSP = State Special Plant

SSC = Species of Special Concern is a species, subspecies, or distinct population native to California which is of conservation concern.

Protected = A 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.

Bank Swallow. The bank swallow (*Riparia riparia*) is not listed under the ESA, but is a species protected by the MBTA. The bank swallow is the smallest North American swallow, with a body length of about 12.1 centimeters (4.75 inches). Bank swallows are distinguished from other swallows by their brown breast band and contrasting white under parts. A neotropical migrant found primarily in riparian and other lowland habitats, the bank swallow arrives in California from South America in early March; its numbers decline in July and August. This species nests in colonies and creates nests by burrowing into vertical banks consisting of fine-grained soils (FHL 2004b). Bank swallows have not been sighted on FHL.

Migratory Birds

The MBTA protects migratory birds and implements the United States' commitment to international conventions for the protection of migratory birds. MBTA is the domestic law that governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent overutilization. FHL is subject to the provisions of the MBTA, statutory and regulatory requirements associated with the Migratory Bird Permits, Take of Migratory Birds by the Armed Forces (DOD/MBTA rule; 72 Federal Register [FR] 8931), and the MOU between DOD and the USFWS to Promote the Conservation of Migratory Birds (71 FR 51580) in protecting migratory birds.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the federal government. The EO provides a specific framework for the federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. The EO provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in an MOU. The EO is coordinated and implemented by the USFWS. The MOU outlines how federal agencies would promote conservation of migratory birds. The EO requires the support of various conservation planning efforts already in progress; incorporation of bird

conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Under the 2003 National Defense Authorization Act, the USFWS was authorized to develop regulations to address situations where DOD would be exempt during military readiness training activities from rules prohibiting the incidental taking of migratory birds. In the National Defense Authorization Act, Congress clearly expressed its intention that DOD should give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities; however, not at the expense of diminishing the effectiveness of such activities. If the DOD determines that a proposed or ongoing military readiness activity could result in a significant adverse effect on a population of a migratory bird species, then coordination must occur with the USFWS to develop appropriate and reasonable conservation measures to minimize or mitigate such potential adverse effects (see 72 FR 8931).

CNPS-Listed Plants

CNPS List 1B includes plants that are rare throughout their range and meet the requirements for state listing. The following four species are high priority at FHL due to their limited distribution. For each of these species, there are few occurrences (locations of plants separated by 0.25 miles; CDFG Natural Diversity Database 2011), many occurrences are on FHL, and occurrences are widespread. This list may be modified as new information is received.

Caper-fruited tropidocarpum. Caper-fruited tropidocarpum (*Tropidocarpum capparideum*) was added to the CNPS List 1.B in 2001 (CNPS 2010). Caper-fruited tropidocarpum is a small annual member of the mustard family that flowers from March through April; it is typically found in valley and foothill grasslands and is endemic to California (CNPS 2010). Caper-fruited tropidocarpum was first documented on FHL in TAs 24 and 15 in 2000, but also occurs in TAs 20, 22, and 27. The main threat on FHL appears to be cattle trespass and vehicle traffic (FHL 2008b and 2009c). There are four known locations on the installation; one population is in the northern part of the Tactical Training Base (TTB) Ward. This area is marked for avoidance during military training (Clark 2009b).

San Antonio Collinsia. San Antonio collinsia (*Collinsia antonina*), CNPS List 1.B, is known from fewer than 10 occurrences, and is endemic to Monterey County, California. It flowers from March to May and is found in cismontane woodland and chaparral (CNPS 2010). San Antonio collinsia is known primarily to occur on FHL and Jolon Road. It was first documented on FHL in 1961 and occurs in TAs 10, 24, 27, and 29. *Collinsia antonina* was mapped in TA 9 in 2010 and has been affirmed by the Santa Barbara Botanic Garden (SBBG) as of February 24, 2011. No formal monitoring is in place at FHL for San Antonio collinsia.

San Benito Pentachaeta. San Benito pentachaeta (*Pentachaeta exilis aeolica*), CNPS List 1.B, is known from approximately five occurrences. Found in cismontane woodland, valley, and foothill grassland, it flowers from March to May. San Benito pentachaeta is known from limited occurrences in Monterey, San Benito, and Santa Clara counties. It was first documented on FHL prior to 1970 and occurs in isolated patches in TAs 2 and 6. No formal monitoring is in place at FHL for San Benito pentachaeta.

Yellow-flowered Eriastrum. Yellow-flowered eriastrum (*Eriastrum luteum*), CNPS List 1.B, is endemic to Monterey and San Luis Obispo counties and blooms from May to June. Yellow-flowered eriastrum occurs in limited sites in Monterey and San Luis Obispo counties to include FHL. It was first documented "near Jolon" in 1901 and occurs in isolated patches in TAs 13E, 15, and 19. New populations were mapped in TAs 6, 25, and 27; however, they have not yet been affirmed by SBBG. No formal monitoring is in place at FHL for yellow-flowered eriastrum.

4.7.4 Wetlands and Vernal Pools

Wetlands. There are 146.3 acres of wetlands documented on FHL. Wetlands on FHL are recognized by their relatively shallow, slow-moving or stationary water, or wet to moist soils with hydrophytic plants, generally found in landscape depressions. There are both jurisdictional and nonjurisdictional wetlands at FHL. Two rivers, the San Antonio and Nacimiento, and a network of tributaries throughout their respective watersheds, compose the majority of the jurisdictional waters on the installation. USACE jurisdictional drainages (i.e., waters of the United States) are found scattered throughout FHL. Isolated wetlands that have no hydrological connection to a river also occur on the installation. Wetlands that are considered isolated are generally not jurisdictional. However, if the isolated wetland supports threatened or endangered species, it can be regulated by the USFWS.

Wetlands on FHL fall into two broad categories, ephemeral wetlands and perennial wetlands. Ephemeral wetlands have two phases, a wet season phase that is dependent on fall and winter rains to fill pools and depressions, and a dry season phase brought about by a lack of rain in the summer. On FHL, ephemeral wetlands include vernal pools, wet meadows, and vernal swales. Perennial wetlands maintain some level of saturation throughout the year. Perennial wetlands on FHL include streams, reservoirs/lakes, and freshwater marshes. Most of the wetlands on FHL are associated with the two watersheds, but at least some small wetland sites are found in most TAs (FHL 2004b). Most of the large wetlands occur in only a few training areas: the ammunition supply point (ASP) and TA 22 in the San Antonio Valley, and TA 12B in the Nacimiento Valley. The ASP area is not typically used for intensive training, and the wetland areas lie within Sensitive Resource Management Area 3 (see **Section 4.8**). Off-road vehicle travel in TA 22 is limited to emergency and target maintenance activities. Military training occurs in TA 12B.

Vernal Pools. Vernal pools are a special category of wetlands. These seasonal pools are difficult to detect because of their often small size and seasonal inundation, but they are producers of zooplankton, phytoplankton, and macroinvertebrates. The federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*) was found in 65 vernal and seasonal pools on FHL in 2000 (FHL 2004b).

4.7.5 Exotic and Invasive Species

The Federal Noxious Weed Act and EO 13112 require federal agencies to control noxious and invasive species on federal lands. At FHL, there are several plant species that are considered noxious, and control is mandatory for those found on the federal list (see **Appendix K**). EO 13112 requires that federal agencies prevent the introduction of invasive species, detect and control populations of invasive species, and restore native species and habitat conditions in ecosystems that have been invaded. Exotic and invasive plant species on FHL include mustard (*Hirschfeldia incana* and *Brassica nigra*), cheatgrass (*Bromus tectorum*), saltcedar (*Tamarisk parviflora*), and yellow star-thistle (*Centaurea solstitialis*). The presence and spread of saltcedar and yellow star-thistle are the most widespread and severe FHL natural resources issues.

Saltcedar. Saltcedar is a nonnative shrub originating in southeastern Europe. The plant occurs in patches along the San Antonio River between the San Antonio Mission and the San Antonio Reservoir. It is also used as an ornamental shrub in portions of the cantonment area. Saltcedar can form dense, low-growing thickets that displace native vegetation and negatively alter riparian soil chemistry.

Yellow Star-thistle. Yellow star-thistle is a nonnative annual/biennial member of the aster (Asteraceae) family of flowering plants with Eurasian origins. Yellow star-thistle is now estimated to occupy approximately 8,100 hectares (20,007 acres) of FHL predominantly in lowlands of the San Antonio and Nacimiento valleys with smaller patches in outlying areas. **Figure 4-5** shows locations of yellow star-thistle on FHL. It is extremely dense in areas historically cultivated or highly disturbed, such as the San Antonio and Nacimiento valley floors. Yellow star-thistle adversely affects the integrity of nonnative ecosystems and reduces the quality of training lands for military training. Training is impeded by dense stands of yellow star-thistle that obscure ditches, creating a hazard for vehicle traffic. Yellow star-thistle provides fuel to intensify wildfires, which halt training activities until the fire is controlled; and it tears parachutes in drop zones, which ruins the chutes. It encroaches on rare native plants, such as purple amole, Santa Lucia mint, and caper-fruited tropidocarpum, the latter of which was presumed extirpated until 2000 when it was found at a star-thistle control site and an LCTA plot. Yellow star-thistle reduces upland habitat quality for arroyo toads, tiger salamanders, and San Joaquin kit foxes.

ITAM and DPW coordinate yellow star-thistle control efforts. In 2008, 1,448 acres of yellow star-thistle were treated using aerial application of Transline® herbicide in TAs 15, 16, 20, 24, and 27. Studies indicate that Transline® will readily break down, and is not highly mobile in the conditions present at FHL. Transline may persist in water bodies therefore untreated buffer areas are maintained around standing or flowing water. FHL uses low application rates of Transline and Transline is not effective or deleterious to monocots, such as lilies like purple amole.

4.7.6 Nuisance or Pest Species

The installation's IPMP identifies and prioritizes pests and their destructive effects to determine particular levels of protection. Integrated pest management (IPM) is used at FHL, and typically a combination of IPM techniques is required to resolve a problem on a sustained basis. The IPM comprehensive approach to pest control or prevention, using methods of pest control in a compatible manner, avoids damage and minimizes adverse side effects on nontarget organisms and the environment. Only pest-control activities that could impact sensitive species or habitats are addressed; many other pest-control methods are used that have no effect on natural resources (i.e., cultural controls to prevent attracting pest animals).

FHL recognizes six general categories of pests that cause significant damage and require control or management:

- Disease vectors and medically important pests (e.g., deer mice [hantavirus], mosquitoes, black widow spiders, fleas, and bees and wasps)
- Real property pests (e.g., termites and carpenter ants)
- Undesirable vegetation (e.g., weeds in cantonment and range areas, particularly yellow star-thistle)
- Vertebrate pests (e.g., swallows, gophers, mice, ground squirrels, Pacific rattlesnakes, feral cats, coyotes, skunks, and raccoons)
- General household and nuisance pests (e.g., cockroaches, crickets, ants, and beetles)
- Other requirements (e.g., carcass removal, odor control).

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, regulates pesticide use. In 1996, the DOD signed an MOU with USEPA to reduce the potential risks to human health and the environment associated with pesticides by adopting IPM strategies. The DOD committed to fully implementing IPM as a tool to help achieve a 50 percent reduction in its pesticide use by the end of FY 2000. The adoption of the IPM approach has been accepted as a policy approach that will reduce problems associated with pesticides.

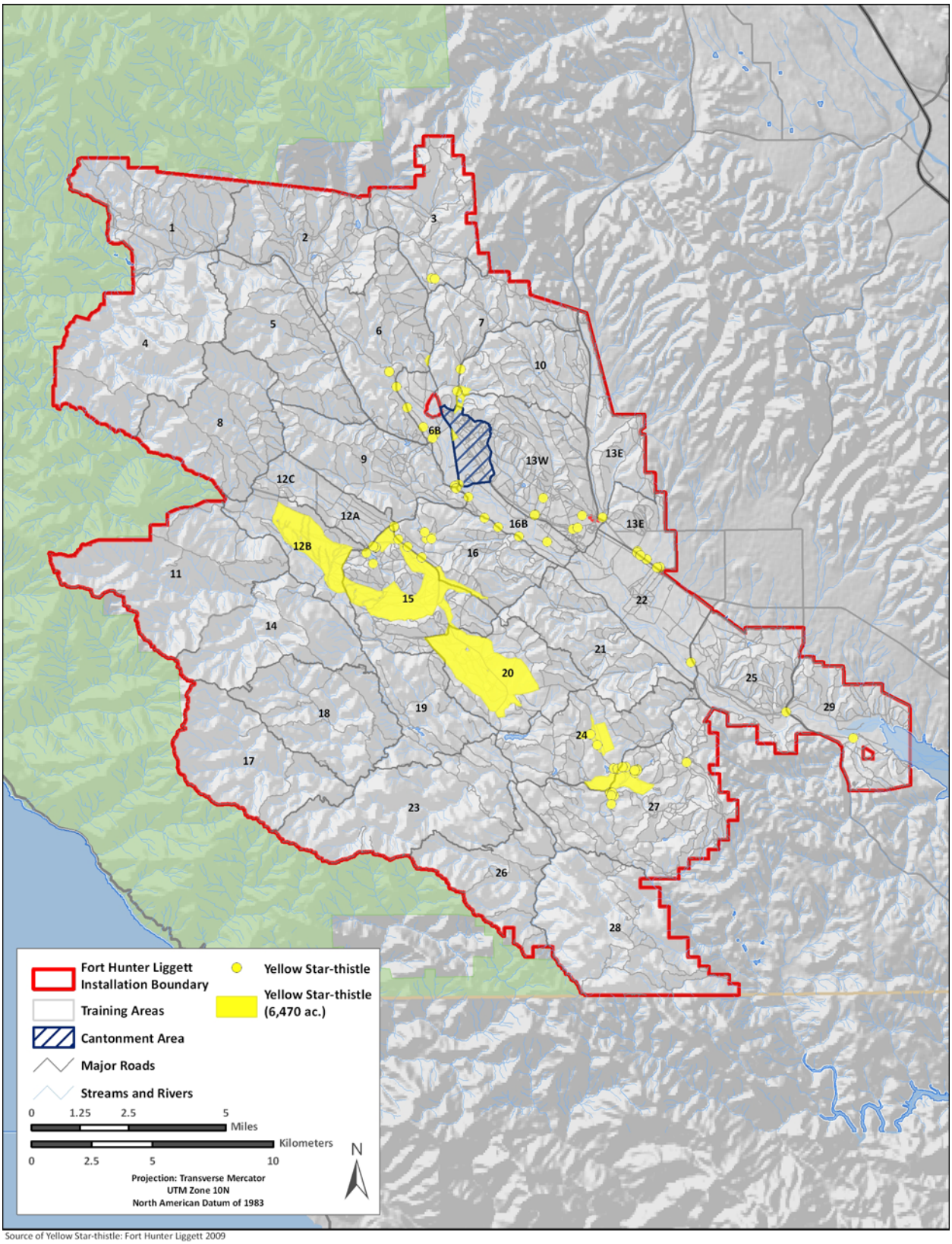


Figure 4-5. Locations of Yellow Star-thistle on FHL

Protection of sensitive and federally listed animals and plants is an important aspect of pest control operations. Chemical control is used only when nonchemical techniques are inadequate or impractical. FHL Regulation 200-3 lists the following potential threats that require Environmental Review prior to pest control activities:

- Application of poisoned baits or fumigants for ground squirrel control
- Application of flea dust (Sevin® 10 or Ficam D®)
- Live-trapping for cats or other problem mammals
- Application of herbicides within 200 meters (656 feet) of rare plant populations
- Application of herbicides or insecticides within 200 meters (656 feet) of known vernal pool fairy shrimp pools
- Release of mosquito fish
- Cattail/tule control.

California ground squirrels carry the fleas that transmit plague, and their burrowing activities are destructive to roads, buildings, dams, berms, and range targets. California ground squirrels are controlled primarily around buildings and fields in the administrative area of the cantonment, and along roads and berms in the ASP and fixed ranges. Biologists survey prior to ground squirrel poisoning. Trapping is conducted infrequently within the cantonment at or near buildings primarily to remove feral cats and raccoons causing problems to facilities. No San Joaquin kit foxes or other fox species have been caught or observed during trapping efforts.

Herbicides are sprayed along main paved roads, near buildings, power poles, and other property to reduce the chance of damage by fire. Herbicide use along shoulders of main roads occurs along Mission Road from the Main Gate to San Antonio Mission, Silo Road, Infantry Road, Sam Jones Road from Martinus Corner to Sam Jones Bridge, ASP Road, Nacimiento-Fergusson Road, Del Venturi Road, Vasques Road, Sulphur Springs Road, and San Miguelito Loop Road from Nacimiento-Fergusson Road to Site 8-J; use will not exceed 3 meters (10 feet) from the edge of the road or structure and is applied using a vehicle-mounted boom or hand applicator.

Insecticides are used inside and around buildings to control ants and spiders. Malathion® is sprayed as a fog along roads in populated areas from about mid-April through mid-October to control adult mosquitoes. Malathion® is not sprayed if winds are greater than 10 miles per hour (mph). Mosquito fish (*Gambusia* spp.) are used in permanent water bodies such as reservoirs and cattle troughs to control mosquito larvae. Larvicide can be applied to water bodies containing mosquito larvae as a last resort measure. Mosquito fish are released only into reservoirs already stocked with nonnative fish associated with the fishing program. Mosquito fish can be released into cattle troughs if PWE determines there is no chance of their entry into nearby drainages during heavy rains.

4.8 Threatened and Endangered Species

AR 200-1 requires that installations prepare and implement an Endangered Species Management Component to the INRMP consistent with current policy and guidance. It is a U.S. Army goal to systematically conserve biological diversity on Army lands within the context of its mission.

The ESA, as amended, defines endangered species protection for federal agencies. "Taking" is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or

attempting to do so. Harm includes the destruction of habitat. The ESA imposes five primary requirements upon the U.S. Army:

1. Conserve listed species.
2. Not "jeopardize" listed species.
3. "Consult" and "confer".
4. Conduct a biological assessment.
5. Not to "take" listed fish and wildlife species or to remove or destroy listed plant species.

The *Programmatic Biological Assessment of the Effects of Activities Conducted at FHL, Monterey County, California, on Federal Endangered and Threatened Species* (FHL 2004c) that was submitted to USFWS to initiate consultation contains species- and activity-specific minimization measures to protect federally listed or proposed species. The minimization measures are subject to modification during the consultation process through coordination between FHL and USFWS; the measures are finalized at the conclusion of consultation. The PBA was amended in and consultation reinitiated in 2007 and 2009.

USFWS proposed critical habitat on FHL for purple amole (2001), arroyo toad (2000 and 2004), and vernal pool fairy shrimp (2002 and 2004). In the most recent final designations for each species, FHL was excluded from critical habitat designation based on conservation benefits to the species through U.S. Army actions, which are addressed in the INRMP and have been reviewed and co-signed by USFWS (FHL 2009e).

There are four species federally listed as endangered and four species federally listed as threatened that have the potential to occur within or near FHL, including the San Joaquin kit fox (*Vulpes macrotis mutica*), endangered; least Bell's vireo (*Vireo bellii pusillus*), endangered; California condor (*Gymnogyps californianus*), endangered; arroyo toad (*Anaxyrus californicus*), endangered; California red-legged frog (*Rana draytonii*), threatened; California tiger salamander (*Ambystoma californiense*), threatened; vernal pool fairy shrimp (*Branchinecta lynchi*), threatened; and purple amole (*Chlorogalum purpureum* var. *purpureum*), threatened (see **Table 4-4**). Two "delisted species," the peregrine falcon and the bald eagle, were previously listed under the ESA but have recovered to the point that they no longer require protection under the ESA.

Table 4-4. Federally Endangered and Threatened Species with the potential to occur on or near FHL

Scientific Name	Common Name	Federal Status
Ambystoma californiense	California tiger salamander	T
Branchinecta lynchi	Vernal pool fairy shrimp	T
Anaxyrus californicus	Arroyo toad	E
Chlorogalum purpureum var. *purpureum*	Purple amole	T
Gymnogyps californianus	California condor	E
Rana draytonii	California red-legged frog	T
Vireo bellii pusillus	Least Bell's vireo	E
Vulpes macrotis mutica	San Joaquin kit fox	E

Source: FHL 2009e

Key: E = Endangered; T = Threatened

Vernal Pool Fairy Shrimp. The vernal pool fairy shrimp (*Branchinecta lynchi*) was listed as threatened in 1994 (59 FR 180, September 19, 1994). The vernal pool fairy shrimp occur in vernal pools in the Central Valley, Coast Ranges, and a limited number of other sites. Threats to the species include

destruction of vernal pools from urban development, flood control, agricultural development, highway, and utility projects. At FHL, most vernal pool fairy shrimp sites are in the San Antonio Valley in the cantonment area and TAs 13, 16B, 22, and 25, with two additional sites in the Nacimiento Valley in TA 20. Additional vernal pools occur in both valleys. Surveys continue annually. One additional occupied pool was discovered in 2008 (FHL 2009g).

California Tiger Salamander. The Central California distinct population segment of the California tiger salamander (*Ambystoma californiense*) was listed as a threatened species in 2004 (USFWS 2009). The California tiger salamander is a large terrestrial salamander with a rounded snout. It is black in color with white to pale yellow spots or bars. The California tiger salamander inhabits vernal and seasonal pools in grassland, oak savanna, and coastal scrub communities. Populations of California tiger salamander have declined due to habitat degradation and loss caused by urban and agricultural development (USFWS 2009). All tiger salamanders on FHL are considered hybrids, a combination of the native California tiger salamander and the nonnative Eastern tiger salamander (*Ambystoma tigrinum*) (FHL 2005, FHL 2004b). Tiger salamanders occur in at least 16 locations on the installation (FHL 2004b). Due to the hybrid nature of occurrences on FHL, there is no formal protection for the populations here.

Arroyo Toad. The arroyo toad (*Anaxyrus californicus*) was listed as endangered on December 16, 1994, and is classified as a species of concern by the State of California. . This species inhabits very restricted areas in southern California and Baja California, Mexico (USFWS 1999). The arroyo toad is a medium-sized species that inhabits streams where water levels fluctuate and natural disturbance is common during flooding events (FHL 2004b, NPS 2007). Primary threats to this species include habitat loss due to urbanization, agriculture, and dam construction. Additional threats include water management and diversion activities; road construction, maintenance, and use; predation by exotic species; loss of habitat to exotic plants; livestock grazing; mining; and recreational activities. Arroyo toads are limited to 22 drainages in California, to include the San Antonio River on FHL where breeding and upland habitat occurs in the cantonment area and TAs 6B, 16B, 22, 25, and 29. In these areas, arroyo toads breed, forage, and aestivate in sandy soils along the San Antonio River and may forage in adjacent nonsandy upland terraces (FHL 2010a).

Annual surveys are conducted and comprise breeding distribution (April–July), clutch development and survivorship (May–August), and habitat assessment surveys (May–July). Surveys conducted every 1 to 5 years include fall surface water mapping, invasive tamarisk distribution, and remote sensing of vegetation encroachment. Preactivity surveys are performed regularly prior to construction in or around potential arroyo toad habitat (FHL 2004a, 2007c, 2008b, 2009c). Arroyo toads continue to be found in suitable habitat along the San Antonio River with minor and expected annual changes in abundance and distribution. A decrease in abundance was noted in the upstream reaches of suitable habitat in the cantonment associated with channel incision and riparian vegetation succession (FHL 2009g).

California Red-legged Frog. The California red-legged frog (*Rana draytonii*) was listed as federally threatened on May 23, 1996 (USFWS 2010). Breeding habitat includes streams, deep pools, backwaters within streams and creeks, ponds, marshes, sag ponds, dune ponds, and lagoons with deep, slow-moving water with or without dense vegetation. The range of the California red-legged frog has diminished by 70 percent due to habitat loss and alteration. Non-native bullfrog predate upon California red-legged frog. Occurrences of the California red-legged frog have been reported in the Nacimiento River Valley in 1948; however, surveys conducted of the California red-legged frog since 2003 have not detected them on the installation (FHL 2004b, FHL 2005, FHL 2009g). Potential habitat for this species exists along the San Antonio and Nacimiento rivers (FHL 2004b).

California Condor. The California condor (*Gymnogyps californianus*) was listed as federally endangered on March 11, 1967. It is the largest bird in the United States, with a wing span of more than 3 meters

(9 feet). The reintroduction of captive-bred individuals into the wild, which began in 1992, continues today and contributes to the increase in current population estimates (FHL 2004b). Suitable habitat for condors includes foothill rangeland and forest in remote areas where the birds can roost and nest in tall trees and on cliffs. Rocky outcrops in the Nacimiento River valley provide suitable foraging habitat for California condors (NPS 2007). In May 2002, one California condor was observed foraging on an elk killed by a mountain lion in TA 20 on FHL (FHL 2004b). Releases of captive-bred young California condors continue in Los Padres National Forest to the north and Pinnacles National Monument to the northeast of FHL. No nesting habitat is known on the installation, but the area continues to provide suitable foraging areas with a forage base of carcasses from deer, elk, coyote, and other medium to large animals (FHL 2009g). As of October 2009, 15 wild condors have fledged, and the current wild population in California was 87 (Ventana 2009). California condors have been observed on FHL, and sightings could increase as more birds are released in Monterey County. To date, no specific monitoring program has been implemented for the California condor on FHL. Free-flying California condors continue to have lead poisoning, which is believed to be the result of scavenging on carcasses killed by hunters using lead bullets. The hunting program on FHL requires that ammunition does not contain more than one percent lead (FHL 2009f).

Least Bell's Vireo. The least Bell's vireo (*Vireo bellii pusillus*) was listed as federally endangered on May 2, 1986. The least Bell's vireo is a small songbird with grey upper and white underparts and nondistinct spectacles (NatureServe 2009). The least Bell's vireo was once abundant in the Central Valley; however, populations have declined significantly due to loss and degradation of riparian habitat and the expansion of the range of the nest-parasitizing brown-headed cowbird (*Molothrus ater*). The last documented occurrence of least Bell's vireo on FHL was a lone singing male observed on El Piojo Creek in TA 24 in 1988 (Roberson and Tenney 1993). FHL began annual surveys for the species in suitable breeding habitat in 1999 along Mission Creek, the San Antonio River, Nacimiento River, and other scattered drainages on FHL. Although the species has not been detected, potential for colonization exists with the continuing recovery of the least Bell's vireo range in California (Howell et al. 2010).

San Joaquin Kit Fox. The San Joaquin kit fox (*Vulpes macrotis mutica*) was listed as federally endangered on March 11, 1967. The species inhabits grasslands, scrublands, oak woodlands, and vernal pool areas in the California Central Valley floor and the interior coastal ranges. It is the smallest canid in North America. Den sites are dug in sandy loam on hillsides. The California ground squirrel (*Spermophilus beecheyi*) is an important prey species for kit fox on FHL. Coyotes compete with the kit fox for prey on FHL. Potential habitat for kit fox can be found in portions of the San Antonio River Valley (cantonment and TAs 7, 10, 13, 16B, 22 and 25), and the Nacimiento River Valley (TAs 12, 15, 16, 19, 20, 21, 24, and 27).

Spotlight and scent station surveys have been conducted 2-3 times per year since 1998. The most recent sighting was in 2000 near TA 22.Preactivity surveys are regularly conducted prior to construction or use of rodenticide in potential habitat; however, no San Joaquin kit fox dens have been found.

Purple Amole. Purple amole (*Chlorogalum purpureum* var. *purpureum*) was federally listed as threatened on March 20, 2000 (CNPS 2010). Purple amole is a small perennial member of the lily family that flowers from April through June. It is threatened by habitat fragmentation, habitat conversion, nonnative plants, foot traffic, vehicles, and military activities and is potentially threatened by grazing (CNPS 2010). Purple amole is known only from limited areas (i.e., approximately 15 occurrences) almost entirely on FHL and Camp Roberts in Monterey and San Luis Obispo counties in the Nacimiento and San Antonio River watersheds. On FHL it occurs primarily in the San Antonio Valley in portions of the cantonment area and TAs 13, 16B, 22, and 25, with an additional small site in TA 24 in the Nacimiento Valley (FHL 2009c).

Annual surveys are conducted at 14 transects to count the number of purple amole plants present, the number of those plants that successfully produced seed, and the numbers of seeds produced. The majority of purple amole is currently found in TAs 13 and 25. Gopher activity continues to be the primary disturbance factor of purple amole on FHL (2004–2008 Yearly Reviews). Surveys continue annually. Additional populations have been found within the general known distribution on FHL (FHL 2009c).

Sensitive Resource Management Areas

Sensitive resource protection areas (SRPAs) were previously designated as mitigation for construction and use of ranges and to place land use restrictions to protect vernal pool fairy shrimp, San Joaquin kit fox, and purple amole. The Programmatic Biological Assessment (PBA) (FHL 2004c) was amended (FHL 2009f) to redesignate SRPAs as Sensitive Resource Management Areas (SRMAs) to highlight their long-term management requirements. Management area boundaries should be adapted as new information is available, with changes proposed to USFWS and included in annual updates to the INRMP.

The PBA evaluated existing SRPAs 1 through 7 in relation to (i) conflicts with military training and development, (ii) sensitive resources protected, (iii) existing protections in place, and (iv) potential and need for future management and protection actions. Existing overlap between the SRPAs was eliminated so that no areas were double-counted. Revised SRMAs are described in **Table 4-5**. Current land use for each area includes the following unless stated otherwise: vehicle traffic on existing roads to include low water crossings, maintenance of roads and facilities, emergency traffic, foot traffic, landings by helicopters, and habitat improvement projects. All other activities require coordination with PWE.

Table 4-5. Sensitive Resource Management Areas (SRMA) at FHL

SRMA	Description	Acreage and Location
1	Purple Amole Area	166 acres in TA 13-W
2	San Joaquin Kit Fox Management Area II	289 acres in TA 22
3	Vernal Pool Fairy Shrimp, Dwarf Calycadenia, and San Joaquin Kit Fox Management Area I	1,800 acres in TAs 13E, 13W and 22
4	San Joaquin Kit Fox Mitigation Area	212 acres in TA 13E
5	San Antonio Mission Regulated Area	342 acres in TA 12C, Upper Stoney Valley
6	San Antonio Mission Regulated Area	469 acres in TA 6B
7	Historic Jolon Town Site and Gil Adobe	120 acres in TAs 16B, 13 E, and 13W
8	Arroyo Toad Habitat	4,059 acres in TAs 6B, 16B, 22, 25, and 29
9	Purple Amole TA 25	767 acres in TA 25

4.9 Cultural Resources

Cultural resources consist of landscapes, archaeological sites, structures, artifacts, flora and fauna, and geological features that are considered important to a social, ethnic, cultural, or occupational group's shared identity, existence as a community, or necessity for continuation of traditional life ways. The National Historic Preservation Act (NHPA), as amended in 2006 (16 U.S.C. 470 et seq.), NEPA, and

AR 200-4 require the consideration of impacts on cultural resources either listed in or eligible to be listed in the NRHP. Cultural resources on FHL are discussed, and management of the resources is prescribed in the ICRMP.

The potential for the inadvertent discovery of unknown cultural resources during ground-disturbing activities always exist. Certain areas (e.g., stream banks and bottoms, hilltops, and near rock outcrops) have a higher potential to yield cultural resources and at a greater density than others (e.g., steep slopes). Consistent with the ICRMP, FHL ensures that in the event of the inadvertent discovery of an archaeological resource, measures are taken promptly to protect the find from disturbance, assess the significance of the discovery, and implement appropriate mitigative measures for significant resources.

In the event of discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony, FHL shall ensure that all appropriate measures are implemented to protect the remains and any other protected cultural items. All appropriate tribes and agencies will be promptly notified of the find, and all applicable federal, tribal, and state procedures will be followed consistent with the FHL ICRMP.

4.10 Hazardous Materials and Wastes

The FHL Hazardous Waste Management Plan is being updated to IHMWMP, which will be finalized in 2011. The IHMWMP will prescribe responsibilities, policies, and procedures for storing and managing hazardous materials and hazardous waste at FHL. As required by AR 200-1, *Environmental Protection and Enhancement*, dated December 13, 2007, the IHMWMP is being written to ensure continued compliance with applicable federal, state, and local laws and regulations. The IHMWMP will supersede previous versions of the Hazardous Waste Management Plan.

FHL is a large-quantity hazardous waste generator (Handler Identification CA8210020436). The installation has a Resource Conservation and Recovery Act (RCRA) Hazardous Waste Storage permit, which is renewed annually (USEPA 2009). The permit authorizes storage of hazardous waste in containers at the Central Hazardous Waste Facility. All hazardous waste is processed through the servicing Defense Reutilization and Marketing Office, then recycled or transported off installation to a hazardous waste disposal facility (FHL 2001c).

4.10.1 Pollution Prevention

The U.S. Army has the following plans describing pollution prevention measures at FHL: SPCC Plan (updated 2011), Installation Spill Contingency Plan (updated 2011), and Industrial SWPPP (updated annually).

The SPCC Plan addresses hazardous waste satellite/accumulation facilities; aboveground and underground petroleum, oils, and lubricant (POL) storage tanks; a pesticide storage and mixing facility; and other miscellaneous storage areas on FHL due to their capacity for storage. Specific guidelines for spill prevention for hazardous waste Satellite Accumulation Points (SAPs), underground POL storage tanks, and military field exercises involving refueling are included. In addition, the SPCC Plan describes general guidelines for the following: underground storage tanks, hazardous waste storage tank systems, aboveground tanks, indoor maintenance facilities, storage rooms, outdoor new product storage, outdoor waste product storage, battery shops, mobile storage, inspections, fuel points, pesticides, and electrical transformers and capacitors.

The Installation Spill Contingency Plan, updated in 2011, sets procedures for reporting all releases or threatened releases of hazardous materials. At FHL, most materials that could be spilled are fuel or oil products. The Installation Spill Contingency Plan includes emergency contacts; response, notification,

and reporting procedures; responsibilities of the Installation Response Team; clean-up resources; underground storage tank management; and required training.

The Industrial SWPPP is updated annually. In recent years, the U.S. government has become increasingly concerned about the damaging effects of polluted storm water discharge. Such pollution typically occurs when rainwater comes into contact with exposed materials and subsequently carries pollutants into nearby surface waters such as creeks, rivers, lakes, and oceans. In California, storm water discharge regulations are administered by the State Water Resources Board and are enforced by nine Regional Water Quality Control Boards. The Industrial SWPPP is an integral part of the Industrial Storm Water Management Plan and is the plan for reducing storm water pollution from industrial activities at FHL. It was prepared in compliance with the Industrial Storm Water General Permit Order 97-03-DWQ under a Notice of Intent filed by the installation. The permit is enforced by the Central Coast Regional Water Quality Control Board, Region 3.

The General Permit also requires storm water monitoring to verify the effectiveness of the SWPPP. The Storm Water Monitoring Plan (SWMP), a separate document, provides detailed guidance for evaluating storm water runoff for FHL. The SWMP includes sections describing storm water monitoring requirements under the General Permit: dry and wet season inspections, storm water sampling and analysis, and annual evaluations. It also contains all of the forms and logistical information necessary to complete the monitoring requirements. Both the SWPPP and the SWMP are kept at the installation, readily available for the routine use of facility operators, the public, and regulators. The two plans are "living documents" subject to periodic reviews and updates.

Cleanup of hazardous waste or materials is conducted immediately, as safety permits, to prevent spread and further contamination. Cleanup can include minor actions such as mop-up or might require excavation of contaminated soils. Pollution prevention measures and the Environmental Review process are intended to reduce the potential that an accidental spill could occur in the vicinity of a sensitive resource. Clean-up activities requiring soil excavation are reported to PWE for assessment of adverse effects on sensitive resources.

4.10.2 DERP Program

The DERP was formally established by Congress in 1986 to provide for the cleanup of DOD sites. The Environmental Restoration Program (ERP) and the Military Munitions Response Program (MMRP) are components of the DERP. The ERP requires each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The MMRP addresses nonoperational range lands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination.

The Installation Action Plan (updated annually) outlines the clean-up program for FHL. It identifies 33 ERP sites (3 active ERP sites and 30 response complete sites) and 12 MMRP sites (1 active MMRP site and 11 response complete sites) within FHL. The 45 sites identified in the Installation Action Plan at FHL consist of old landfills, fire training areas, past equipment maintenance activities, and bulk fuel storage areas. Contamination in the form of elevated levels of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons, metals, and pesticides are found in soil, sediments, and groundwater at many of these sites. The contaminants of concern that have been identified in groundwater are fuels, oils, and lubricants (FHL 2008c).

As part of the DERP, numerous monitoring wells have been and are being established to monitor confirmed sources of groundwater contamination with petroleum hydrocarbons. Sources include a closed

landfill and two former underground storage tank sites. These wells are sampled and tested at various time intervals to further delineate the extent of the contaminated plumes, and to determine corrective actions to be taken. Although military activities within the cantonment and in field training areas have the potential to impact groundwater, data available to date suggest that water quality on FHL has not been impaired.

4.11 Noise

This INRMP does not propose management actions that have the potential to affect the ambient noise environment on FHL.

4.12 Socioeconomics and Environmental Justice

Socioeconomics. Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these two fundamental socioeconomic indicators can be accompanied by changes in other components such as housing availability and the provision of public services. There would be no change in the number of personnel as result of the implementation of this INRMP; therefore, there would be no changes in area population or associated changes in demand for housing and services. Accordingly, FHL has omitted detailed examination of socioeconomics as a resource area.

Environmental Justice. On February 11, 1994, President William Jefferson Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires that federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. Implementation of the INRMP would not render vulnerable any of the groups targeted for protection in the EO and no groups of people, including racial, ethnic, or socioeconomic groups, would bear a disproportionate share of any resulting potential negative environmental consequences. Accordingly, a detailed examination of environmental justice has been dismissed from further analysis as a resource area. On April 21, 1997, the President issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO requires federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. The proposed action of implementing the INRMP would not pose any adverse or disproportionate environmental health risks or safety risks to children in the areas associated with the Proposed Action. Accordingly, a detailed examination of health and safety risks that might disproportionately affect children has been dismissed from further analysis.

4.13 Infrastructure

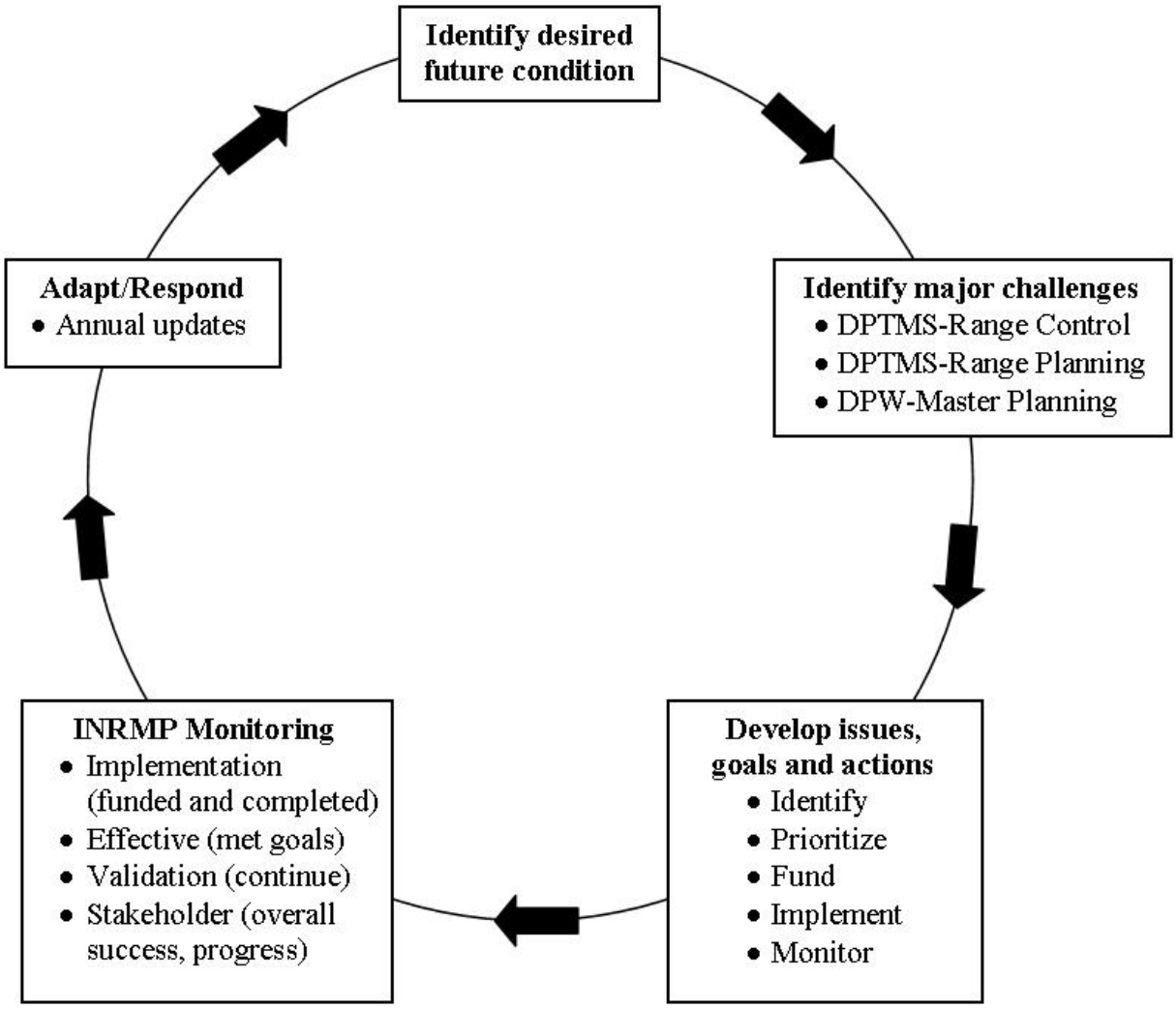
This INRMP does not propose management actions that have the potential to affect infrastructure on FHL. Therefore, facilities are not described in detail in this INRMP.

5. Natural Resources Management Issues, Goals, and Actions

The purpose of this section is to outline management actions that will be implemented to conserve natural resources for ecosystem integrity and to support sustainable military training.

This section addresses issues that cross traditional definitions of discreet resource areas; this allows for more effective ecosystem management. This method also identifies must-fund, or compliance, components of an action that additionally improve resource areas that are not must-fund.

The desired future condition of the training lands and cantonment area as related to natural resources was identified. Next, the major challenges that are related to natural resources and based on current conditions, as well as expectations over the next 10 years, were identified. Based on these challenges, issues with associated goals and actions were identified. Issues are intended to be specific, and associated goals measurable. Actions are intended to have quantifiable and trackable costs, and be reportable. To identify current achievements and future progress, actions are identified as current or future. All identified current actions are implemented by PWE unless otherwise noted.



5.1 Desired Future Condition and Natural Resources Challenges

The following conditions are sustainable, support ecosystem integrity, and maintain current and future needs for military training and, therefore, should be maintained:

1. High-quality surface water conditions in rivers and streams based on 2010 and prior surveys of invertebrate diversity, water chemistry (e.g., pH, dissolved oxygen, temperature, and turbidity), and lack of detectable pollutants.
2. Overall distribution and quantity of most major vegetation types described in the Installation Development and Training EA (FHL 2010b), such as chaparral, oak woodland, and riparian areas, comparable to 1994 satellite imagery.
3. Healthy oak woodland habitats that lack sudden oak death syndrome and other diseases.
4. Notable stands of native bunch grasses, such as *Nasella* spp. grasslands and *Muhlenbergia* stands along drainages.
5. Game populations and harvest levels comparable to those reported in 2000–2010.
6. Overall distribution and abundance of nesting bald and golden eagles, rare plants, and federally threatened purple amole.
7. Coordination between PWE, other DPW divisions, and DPTMS through the Environmental Review process, quarterly EQCC meetings, and EMS meetings.

The following conditions should be improved:

1. Valley oak regeneration, particularly in savannas affected by fire and historic tree clearing.
2. Blue oak regeneration.
3. Riverine conditions suitable for arroyo toad breeding in the San Antonio River. Breeding habitat has declined in recent years from natural succession and channel stabilization.
4. Occupied vernal pool fairy shrimp sites, particularly in areas that support other protected resources, to mitigate for loss from natural succession of artificial pools and construction activities.
5. Storm water system capability in the cantonment area and storm water processes at TTBs, urban training sites, and live-fire ranges in the training areas to minimize effects of storm water flow and pollutants.
6. TTB, urban training, and live-fire range facilities to support increased requirements projected for Army Reserve units, in accordance with the Installation Development and Training EA (FHL 2010b).
7. Cantonment facilities to support increased requirements projected for Army Reserve units, in accordance with the Installation Development and Training EA (FHL 2010b).

The following disturbances should be reduced:

1. Total area affected by invasive species, such as yellow star-thistle and tamarisk.
2. Introduction of invasive species through imported soil material at construction sites.
3. Disturbance to vernal pools, wetlands, and cultural resources from military training and operations.

The following are current challenges to natural resources management at FHL to be considered and addressed during development and implementation of this INRMP:

1. Habitat Quality:
    a. Invasive species, in particular yellow star-thistle, tamarisk, bullfrog, beaver, and new invasive species. Impacts of invasive species include reduced quality of training lands, reduced biodiversity, competition with protected species, degraded native grassland and riparian habitats, and competition for water resources with native plants and wildlife.
    b. Degradation of native grasslands from invasive species, development, and pressure from training activities.
    c. Loss of native oak habitats, in particular valley oak savanna, due to fire, development, and lack of natural regeneration.
    d. Reduction in breeding habitat for the federally endangered arroyo toad due to succession of the San Antonio River from both natural processes and effects from man-made crossings.
    e. Potential reduction in vernal pools due to natural succession as many vernal pools occur in areas previously, but not currently, compacted by military activities.
2. Runoff and erosion: Potential for decreased surface water quality due to future development and resulting increased runoff from the cantonment area, TTBs, and fixed ranges.
3. Coordination between PWE and other installation directorates and tenants: FHL is growing rapidly with increases in military training and changes in key installation staff. Maintaining processes that foster open communication is critical to maintaining effective natural resources management.
4. ITAM identifying and advocating for the desired future condition of the training lands protects training land capabilities in the long-term.
5. Borrow sites: Soil material is frequently required for construction projects and road maintenance. Existing borrow sites are largely depleted; however, importing soil is costly and has resulted in invasive species introduction at FHL.

5.2 Integration with Environmental Laws

5.2.1 NEPA Environmental Review

Issue: Sensitive natural and cultural resources may be adversely affected as a result of activities on FHL, resulting in harm to resources or violation of CWA, ESA, NHPA, or other laws and regulations.

Goal: Minimize the potential for adverse effects on sensitive resources from FHL activities through conducting the NEPA process at FHL.

Current Actions:

1. Conduct Environmental Review (FHL Regulation 200-2) to identify actions that may result in adverse effects on sensitive resources or that require a compliance action, such as consulting with, obtaining a permit from, or notifying a regulatory agency.
2. Coordinate with the proponent to develop and implement measures that minimize adverse effects while supporting sustainable operations and military training.

3. Include consideration of impacts on resources protected by federal law described in AR 200-2 as well as state-listed species, state-protected vegetation communities, CNPS List 1 and 2 species, vernal pools, native oak, bunch grass stands, and other sensitive resources in the Environmental Review process.
4. Continue land-use regulations as described in FHL Training Regulation 350-2. Requirements to avoid wet areas, cross only at established fording sites, minimize off-road vehicle travel, and conduct high explosives training at designated areas could have direct conservation benefits.

Future Actions:

1. Implement a post action monitoring phase of the Environmental Review process. Documentation should be included as part of the Environmental Review database and include dates of surveys, purpose, photos, GIS data as applicable, and purpose for follow up monitoring (e.g., proximity to a listed species site or verifying project parameters).
2. Develop a checklist or questionnaire for project proponents to describe a project. Incorporate the checklist/questionnaire information into the Environmental Review database so consistent reports of decision processes can be produced with a simple query.

5.2.2 Cultural Resources

Issue: Natural and cultural resources share potential adverse effects from ground-disturbing activities, damage to rock outcrops, and construction and development.

Goal: Integrate cultural and natural resource management programs to provide effective and efficient protection for resources by minimizing redundancy and sharing limited manpower and funding resources.

Current Actions:

1. Maintain trained government staff at the appropriate level to include cultural resources manager, natural resources manager, wildlife biologist, and compliance program manager to oversee, integrate, and coordinate natural and cultural resources.
2. Develop environmental coordination maps and educational materials for military training units, Roads and Grounds, and the Fire Department to facilitate resources protection and enhance environmental compliance.

Future Action:

1. Improve cultural and natural resources program coordination to identify and implement appropriate management activities that enhance inter-program protection and conservation while supporting sustainable operations and military training.

5.2.3 Law Enforcement

Issue: Natural or cultural resources may be damaged by illegal activities such as trespassing, vandalism, and resources theft. Unintentional harm to resources may result from conducting activities in a way that is inconsistent with environmental laws.

Goal: Develop a high compliance rate of FHL users with state and federal natural and cultural resource related laws and regulations.

Future Actions:

1. Coordinate law enforcement effort for natural and cultural resource program needs among Law Enforcement and PWE staff.
2. Support a full time warden to address the hunting and fishing program (DES).

5.2.4 Conservation Education

Issue: Environmental education and communication with installation staff, tenants, and the public is a keystone of successful environmental management and a requirement of EMS. Additionally, professional training for natural resources staff is critical to stay up-to-date with current technology and studies, and maintain an effective and professional program.

Goal: Educate military and civilian users and FHL workforce of environmental programs on the installation to maintain compliance with environmental laws and minimize impacts on natural and cultural resources.

Current Actions:

1. Provide annual natural and cultural resources program briefings to Roads and Grounds and the Fire Department.
2. Provide input as needed for ITAM educational materials to troops.
3. Participate in Earth Day activities at FHL, and, as requested, provide briefings to school-age class groups.
4. Support research activities for species occurring on FHL, particularly for university and government research projects, as access to TAs permits.
5. Natural and cultural resources staff attend training and conferences as funding permits. Examples include attending the annual conferences for National Military Fish and Wildlife Association, and western section of The Wildlife Society meeting; participating in webinars; and attending training courses.

Future Actions:

1. Investigate and implement methods to improve communication with FHL users and the public that promotes environmental awareness (e.g., maintaining an informative website, creating pamphlets and standard operating procedures, developing informational posters).
2. Provide environmental briefings to unit leaders prior to large training exercises.

5.3 Land, Water and Soils Management

5.3.1 Planning Level Surveys

Issue: Planning level surveys (PLSs) are required by AR 200-1 for topography, wetlands, surface waters, soils, flora, fauna, vegetation communities, and threatened and endangered species; however, PLSs for wetlands and vegetation communities are incomplete or out of date, and GIS data of PLSs, to include metadata, require updates.

Goals: Obtain and use full range of required PLSs for land management tools. Obtain GIS data of PLS's in federally compliant GIS format.

Current Actions:

1. Use topographic, surface water, and soils data in GIS format to assist in land use and conservation planning. Update data as improved data sources become available.
2. ITAM's RTLA program and PWE update the floristic inventory flora list as needed by maintaining an electronic list available to both programs and updating plant collections as new species are found. Santa Barbara Botanic Garden Herbarium provides technical expertise associated with ongoing Floristic Survey additions to the FHL RTLA reference plant collection, and maintains a large collection of FHL voucher specimens.
3. Use data from incidental observations, birds surveys (e.g., MAPS, least Bell's vireo transects), and deer and kit fox spotlight surveys to update an electronic list of birds and mammals sighted on FHL. Continue documenting nongame species that are incidentally observed during sensitive species surveys.
4. Conduct annual monitoring surveys for threatened and endangered species and bald and golden eagles, which include collecting and storing GIS data and monitoring results. Methods and results are reported in the annual INRMP implementation report submitted to USFWS and CDFG.

Future Actions:

1. Conduct or contract for quarterly or semiannual geodatabase updates to incorporate recent survey findings for threatened and endangered species and bald and golden eagles.
2. Conduct or contract a wetlands delineation for major land use areas on the installation. In areas in or near future development, obtain jurisdictional determination for wetlands.
3. Conduct or contract a survey to identify and map major vegetation communities using the Keeler-Wolf classification system, producing GIS data compatible with ArcGIS software.
4. Conduct annual monitoring at known large bat colonies, such as Interlake Bridge. Investigate and implement cost-effective bat survey techniques for additional bat surveys.
5. Initiate efforts to inventory mammal, avian, reptile, amphibian, fish, invertebrate, and crustacean species occurrence on FHL; combine survey efforts as appropriate to minimize redundant effort and cost.

5.3.2 Soil Erosion

Issue: Soil erosion and compaction results in lack of protective vegetation cover, and degrades surface water quality, adversely affects federally listed species and sensitive plant habitats, and creates dangerous training conditions for vehicle travel and foot maneuvers. Soil erosion from human disturbance is associated with off-road military training, construction development, creation of emergency firebreaks, maintenance and use of existing dirt roads and highly used training sites, such as urban training sites and TTBs.

Goals: Minimize compaction and erosion from current and future activities. Identify and restore eroded sites.

Current Actions:

1. Monitor construction projects and training sites as part of the post-action monitoring phase of the Environmental Review process. Work with project proponents to identify potential erosion sites. Coordinate with Roads and Grounds if heavy equipment work is needed. Reseed with predominantly native seed mixtures or restore as needed.
2. ITAM monitors and restores training-related land erosion or potential erosion sites by reseeding with native mixtures or minor earthwork to repair erosion and prepare sites for reseeding.

Future Actions:

1. PWE and DPW Roads and Grounds will monitor road maintenance and emergency firebreaks as part of the post-action monitoring phase of the Environmental Review process.
2. To reduce excessive erosion at highly used training sites, LRAM program will investigate if construction of hardened bivouac sites, troop assembly sites, and river and stream fording sites is feasible or necessary and implement projects as funding permits.
3. PWE will develop a standard BMP list to prevent adverse erosion and sedimentation on FHL, and incorporate into an Erosion Control Plan to include as an appendix in this INRMP. Provide BMP list to DPW Roads and Grounds, construction engineer training units, and construction contractors. The Erosion Control Plan should include the following:

    a. A review of critical slopes on FHL.
    b. The identification of highly erodible soil types present as described in the soil survey.
    c. An analysis of applicable federal, state, and local regulatory requirements for erosion and sedimentation control.
    d. The identification of erosion and sedimentation BMPs applicable to FHL.
    e. A description of how to select, install, and maintain erosion-control measures, and establish protocols for revegetation of disturbed areas.
    f. An example Erosion and Sedimentation Control Plan for a generic project that can be tailored for use at FHL.
    g. Requirement that all earth-moving activities (including contractor operations) comply with an Erosion and Sedimentation Control Plan.

5.3.3 Pollutants

Issue: There is the potential for point source and nonpoint source contamination from pollutants, sedimentation, and nutrients, especially waters downstream from the cantonment area, TTBs, and field parking sites and at ponds used for military training sites. Pollutants can degrade water quality in surface waters, adversely affect breeding habitat for federally endangered arroyo toads, and violate provisions of the CWA.

Goals: Maintain high quality surface waters to support viable populations of native aquatic and terrestrial life. Remain in compliance with ESA, CWA, Energy Independence and Security Act (EISA) Section 438, and other regulatory drivers.

Current Actions:

1. Implement provisions of the FHL Industrial SWPPP (see **Section 4.10.1**) to include BMPs, monitoring, reporting, and modifying BMPs as needed.
2. To maximum extent feasible, maintain 100-foot buffer between wetlands, riparian areas, or drainages and construction or other ground-disturbance areas in accordance with American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 189.1, as part of the Army Sustainability Policy; and maintain 50-foot buffer between minor drainages and construction or disturbance.
3. Monitor groundwater to include drinking water per the Safe Drinking Water Act, monitoring for suspected pollution sources, and monitoring at known plumes.

5.3.4 Natural Resources Monitoring, Protection and Restoration

Issue: Military training and associated land management can affect natural resources on FHL.

Goal: Conduct long-term resources monitoring to detect changes caused by military activities, and identify measures to minimize impacts and protect resources.

Current Actions:

1. ITAM's RTLA and LRAM programs collect data on bivouacs and other heavily used sites and identify land-use measures that might minimize land disturbance, or restoration actions to recontour and revegetate sites, as needed.
2. ITAM coordinates with Range Control to site military missions in areas best capable of supporting those missions. PWE coordinates with project proponents through the Environmental Review process for best project siting to protect resources and support the mission.
3. The RTLA component of the ITAM program conducts long-term resource monitoring to detect vegetation changes caused by military activities.
4. PWE and RTLA identify invasive weeds during RTLA surveys and incidental observations. PWE and LRAM identify and implement control measures.
5. The LRAM component of the ITAM program evaluates and prioritizes active erosion sites. Subject to funding, ITAM implements an average of three projects per year from the Training Land Rehabilitation Plan.

Future Actions:

1. Develop and implement a native vegetation management plan that includes management actions for oak, riparian areas, and native grass vegetation communities. Specific actions should include using GIS data to develop large-scale management units by classifying areas by dominant vegetation (e.g., valley oak savanna, blue oak woodland). Within these, identify locations most frequently used for military training, annual burn sites, and endangered species habitats. Identify management and monitoring requirements in the management units, such as exotic species control, propagating and replanting oaks, and assessing effects of frequent fire. Identify the status of stands in management units, such as recruitment of oaks, a sampling of stand density, and health of trees in the stand. Identify areas where oaks historically occurred that might support restored oak stands. Identify areas where oak recruitment is most likely to be successful and focus efforts at those locations.

2. Enhance and adapt existing databases for natural resources data collection, and acquire applicable databases from outside sources for application in GIS, as needed.

3. Develop specifications and standards for reseeding/revegetation of disturbed sites for use in contracts, maintenance, and other projects.

4. Identify actions that can be undertaken by troops to reduce impact to listed species (e.g., discourage parking vehicles under trees at TTB to avoid compacting soil). Coordinate with DPTMS to identify appropriate management actions to reduce adverse impacts on natural resources resulting from training exercises.

5.3.5 Surface Waters and Wetlands

Issue: Surface waters and wetlands may be degraded by poorly maintained dam structures, new range construction, military training, and cantonment area development.

Goals: Maintain no net loss of wetlands per EO 11990 and no net loss of training lands per the SAIA. Maintain safety and capability of current and future training lands. Maintain compliance with regulatory requirements (i.e., CWA, ESA).

Future Actions:

1. Initiate water chemistry data collection in San Antonio and Nacimiento rivers per pilot plan initiated in winter 2011. Include summary of data results in annual INRMP implementation report.

2. Prepare a general wetlands management plan based on the 1995 National Wetlands Inventory data and incorporate this plan into the INRMP. The plan will provide a list of wetlands, their type and status (e.g., delineated, jurisdictional), maps with GIS data, threats based on current and future FHL activities, monitoring to ensure no net loss, and site-specific protection or restoration actions as needed.

3. Add significant wetlands areas to the environmental resources layer of ITAM's GIS planning tool, which is called Geographic Information Supporting Military Operations (GISMO).

5.3.6 Riparian Areas

Issue: Riparian areas are sensitive and rare habitats, important to a wide variety of terrestrial and aquatic species, and they require protective measures to ensure that they remain a viable and intact native community of the FHL ecosystem. Loss of riparian habitat results in degradation of stream quality through increased temperatures, erosion into and within the stream, and excessive nutrient loads.

Goal: Maintain or enhance riparian community structure, functionality, and species diversity to protect water quality, federally endangered species habitat, and maintain regulatory compliance.

Current Actions:

1. Monitor riparian health through annual photo-plots to identify improvements or degradation (see **Appendix I**). Identify and implement restoration as needed.

2. Protect waterways and their associated riparian areas through land use limitations identified in FHL Regulation 350-2.

5.3.7 Native Oak Communities

Issue: Native oaks are lost to fire, disease, damage from military live-fire, and cantonment and range development. Recruitment of mature oak trees is poor throughout California and may eventually result in the loss of the mature component of the oak population. Oaks provide habitat structure for wildlife habitat, sequester carbon dioxide, and provide shade and cover for wildlife and military training activities.

Goal: Maintain oak woodland stands and enhance oak woodland seedling regeneration to ensure long-term conservation of oak woodlands and savannas.

Current Actions:

1. Implement FHL 350-2 prohibition on cutting live oaks for training purposes.
2. Collect local acorns and seeds for revegetation projects. Propagate and transplant 75-100 valley oaks annually at tactical concealment sites (ITAM) or oak mitigation sites (PWE).
3. Design construction projects to minimize oak loss and mitigate as needed.

Future Action:

1. Initiate monitoring program to assess effects of frequent fires on valley oaks. Plant oak seedlings from locally collected acorns in affected areas.

5.3.8 Native Bunch Grass Communities

Issue: Native bunch grass stands are uncommon in California as most have been replaced with less desirable Mediterranean annual grasslands. Exotic annual grasses outcompete native species and reduce diversity and abundance of native forbs, including wildflowers; yet Mediterranean grasslands also provide valuable habitat for wildlife and typically support some native plant species.

Goals: Identify and maintain stands of native bunch grasses. Promote diverse native bunch grass grasslands.

Current Actions:

1. Reseed areas disturbed during training activities (LRAM is lead) or FHL projects (PWE is lead) using a mixture of native grasses and forbs.
2. Include as a contract requirement for military construction projects reseeding of disturbed areas at construction sites with native grasses and forbs.
3. Collect local native bunch grass seeds for re-vegetation projects.

Future Action:

1. Develop and maintain a GIS layer of locations of notable native grassland communities.

5.3.9 Rock Outcrops

Issue: Rock outcrops provide rare habitats and permanent landscape features that can enhance military training. Large outcrops are important for California condors, peregrine falcons, and cultural resource features. Smaller outcrops affect water runoff and erosion. Outcrops may be damaged by graffiti and

physical destruction, and boulders may be displaced or stolen. Rock outcrops require protective measures to ensure that they remain a viable and intact component of the FHL ecosystem.

Goal: Maintain rock outcrops as areas of special interest due to cultural resources and unique wildlife habitat.

Current Actions:

1. Prohibit activities that could degrade the Palisades rock formation and other rock formations, as such activities would significantly reduce the quality of military training in a natural environment and the quality of this important natural and cultural resource at FHL.
2. Limit rappel activities to authorized military training at appropriate sites approved by Range Control and PWE; approved sites will avoid disturbance to raptors and degradation from bolts and erosion.
3. Prohibit unauthorized destruction, removal, movement, or use of boulders and rock formations.

5.3.10 Invasive Plant Species

Issue: The infestation by yellow star-thistle is a wide-spread problem beyond the scope of normal pest management practices and abilities. Tamarisk occurs in low to moderate densities in breeding habitat for federally endangered arroyo toads in the San Antonio River. Imported borrow material for a 2009 facility construction project contained a highly invasive Brassica species. Medusahead was found at one location on FHL and, though aggressively controlled, could recur or occur at other sites.

Goal: Reduce invasive vegetation through integrated habitat restoration.

Current Actions:

1. Apply proven habitat restoration practices to promote native vegetation in previously disturbed areas.
2. Implement the *Integrated Weed Management Plan for the Control of Yellow Star-thistle* (Joley et al. 1999, 2000, 2001).
    a. Monitor and continue releases of biocontrol agents to sustain sufficient populations to reduce yellow star-thistle reinfestations and reduce yellow star-thistle in areas where it cannot be sprayed or otherwise controlled.
    b. Continue aerial spraying of Transline® herbicide in severe infestation areas.
    c. Implement control techniques identified in the *Yellow Star-thistle Management Guide*. This management guide is specific to the control of yellow star-thistle and provides the most up-to-date treatment strategies, timing, and yellow star-thistle ecology.
    d. Work with USACE ERDC to test the ability of native California plant species to persist and resist yellow star-thistle reinvasion of sites treated previously with mechanical removal methods (burn, spray, hand-pulling, disking).
    e. Monitor thistle populations on the installation to identify if proliferation of the species is adversely impacting native species or training.

Future Actions:

1. Develop and implement a plan for tamarisk removal that includes mapping tamarisk along the San Antonio River; prioritizing infestation areas based on proximity to arroyo toad breeding habitat, size of infestation, and potential for further spread; and removing plants by hand-cutting or injuring plants and painting stumps/injured bark with herbicide (Rodeo® or Roundup®) and introducing biological control agents.
2. Develop and implement action plans for controlling or eliminating new invasive plant species (e.g., hand pulling as soon as an invasive has been identified has been highly effective at small patches).

5.3.11 Recreational Use

Issues: Recreational use of FHL's diverse and unique natural resources is desired and requested by many people; FHL Regulation 420-26 prohibits use of all-terrain vehicles, motorcycles, and off-road vehicle travel. AR 200-2 requires that an EA be prepared for recreational activities involving off-road recreational vehicles. Per AR 200-2, the INRMP will evaluate the feasibility and potential impacts of operating motorized off-road vehicles and non-motorized vehicles.

Goal: Support MWR's development of recreational activities while conserving natural and cultural resources and environmental compliance.

Current Actions:

1. Provide preplanning coordination regarding sensitive resources; share knowledge of resources of interest with FMWR.
2. Regularly monitor the FHL mountain bike course to identify potential erosion sites and recommend action for FMWR to implement to minimize and mitigate erosion.
3. Identify off-road vehicle trespassing by hunters or other public, and close and restore trails.

Future Action:

1. Review any future EAs for use of motorized off-road vehicles. Any motorized off-road vehicle proposal would need to take into consideration potential impacts such as damage to cultural and natural resources, noise disruption to wildlife and adjoining properties, dust, introduction or spread of invasive weeds, and erosion associated with ground disturbance.

5.3.12 Wildland and Prescribed Fire

Issues: Fire affects vegetation communities and wildlife. Wildland fire is a relatively common event, and prescribed fires are conducted annually to reduce the potential and severity of wildland fires.

Goals: Assess the impact of fire on vegetation communities and animal and plant populations of interest. Use fire as a tool to achieve natural resource management and training goals and objectives.

Current Actions:

1. PWE and the ITAM program assist the Fire Department in developing and reviewing annual burn plans, and in mapping the actual extent of annual prescribed and wild fires.

2. PWE and the ITAM program coordinate with the FHL Fire Department to use prescribed fire to manipulate vegetation to achieve natural resource and training goals and objectives.

3. The Fire Department develops and implements an annual prescribed burn plan in accordance with applicable permits and FHL Environmental Review.

4. The Fire Department fights wildfires as appropriate to reduce wildland and facility damage and prevent injury.

Future Actions:

1. Evaluate fire history and vegetation communities using GIS to determine major shifts in vegetation communities, such as conversion of oak savannas to grasslands.
2. PWE will assist the Fire Department in completing the Integrated Wildland Fire Management Plan as required by AR 200-1.

5.3.13 Fuel Wood

Issue: There is local community interest in cutting fuel wood, primarily for personal use. However, Monterey County is a quarantine area for sudden oak death syndrome; FHL cannot receive funds from fuel wood permits, and PWE is not funded to support this activity.

Goal: Continue as appropriate a fuelwood program that minimizes FHL's costs and potential for spread of sudden oak death syndrome and supports FHL Fire Department needs. The 2010 fuel wood cutting program is described in FHL Policy 25.

Current Actions:

1. Limit fuel wood cutting to FHL soldiers and civilians that are Monterey County residents for personal use within Monterey County.
2. Limit fuel wood cutting to targeted areas for heavy fuels reduction in coordination with the FHL Fire Department.
3. Limit fuel wood cutting to spring and fall. Avoid wet season conditions that exacerbate spread of sudden oak death syndrome and increase likelihood of damage due to vehicles getting stuck while retrieving wood. Avoid dry season conditions that increase wild fire risk.
4. Prohibit fuel wood cutting in TAs 11, 14, 17, 18, 23, 26, and 28 as these areas are more likely to be affected by sudden oak death syndrome due to proximity to the coast ridge and greater annual precipitation.
5. Monitor annually for sudden oak death syndrome.
6. Evaluate program annually for feasibility of keeping the program open.

5.3.14 Integrated Pest Management

Issue: Pests, as defined in **Section 4.7.6**, can transmit diseases, compete with and have other negative effects on flora and fauna, and may damage real property, such as dam structures.

Goal: Control those plant and animal species that adversely affect natural resources management (e.g., reduce ecosystem functionality, displace native species) or affect the military mission or facilities on FHL per the FHL IPMP and DOD Measures of Merit.

Current Actions:

1. DPW Operations and Maintenance updates the FHL IPMP to ensure that the plan reflects changes in pest populations and current management issues. PWE will include the revised IPMP as appendix in this INRMP.
2. DPW Operations and Maintenance implements pest management controls from the IPMP and other pest-related guidance and plans. DPW tracks usage of active ingredients per reporting requirements.
3. DPW Operations and Maintenance conducts surveys of pests that pose a potential health risk to humans or natural resources.

5.3.15 Cantonment Area Management

Issue: The cantonment area has converted natural habitat to meet human habitat needs.

Goal: Maintain an aesthetically pleasing cantonment landscape that conserves natural ecosystem functions as feasible.

Current Action:

1. Support DPW-Master Planning Division in developing ADPs and an Installation Design Guide that makes best use of existing native trees; conserves floodplains, drainages, and topography; and enhances aesthetic and structural standards fitting to the area and local historic structures.

Future Action:

1. Provide professional advice to assist the grounds landscaping and maintenance program toward the use of native species by developing a list of native plants that can be used in cantonment landscaping.

5.4 Protected Species Management

5.4.1 Compliance with Endangered Species Act

Issue: FHL and USFWS must balance ESA consultation and conservation requirements with military training requirements. This may result in conflicts with land use and agency objectives, as well as staffing and funding resources.

Goals: Maximize effectiveness and efficiency of the FHL Endangered Species Program to achieve the best conservation possible with the limited funds available. Maintain and improve training activities at the desired level while maintaining compliance with ESA and improving conservation of listed species.

Current Actions:

1. Consult with USFWS or NMFS for FHL actions that may affect federally listed species and comply with biological opinions issued under Section 7 of ESA. FHL currently complies with a

PBO issued in 2010 that addressed current and future projected operations and maintenance activities, military training activities, cantonment and range development, and implementation of the 2004 FHL INRMP.

2. Prioritize INRMP activities to guide management actions and funding expenditures as described in **Section 6.1**.

3. Integrate protection measures and management actions with military training to minimize the amount of lands closed to military training by ensuring that DPTMS is aware of restrictions (e.g., breeding season), and develop materials to distribute to troops about the species they may encounter at FHL.

4. During Section 7 consultations with USFWS, identify conservation and minimization actions that adversely impact training capabilities. By clearly describing the military mission requirement, USFWS and FHL can adapt conservation and minimization measures to comply with ESA while supporting military needs.

Future Action:

1. Consult with USFWS regarding implementing this revised INRMP and pesticide usage.

5.4.2 Compliance with Migratory Bird Treaty Act

Issues: The MBTA prohibits "take" of migratory birds except by permit; permit requirements are exempt for military training but not for construction, operations, or maintenance of a military installation. FHL activities, such as spring season prescribed burns or tree and building maintenance have the potential to result in take.

Goals: Comply with MBTA and minimize incidental loss of migratory and nonmigratory birds.

Current Actions:

1. Conduct surveys of activity sites as needed to determine if migratory bird nests are present and active. If take is unavoidable and would require an MBTA permit, FHL will apply for an appropriate permit for intentional take of migratory birds.

2. Participate with the MAPS survey.

Future Actions:

1. Participate in the California Chapter of Partners in Flight initiatives as appropriate.

2. Work with project proponents and FHL directorates to develop effective management for minimizing the unintentional take of migratory birds.

3. Conduct acoustic transect surveys in grassland, oak savanna, oak woodland, and riparian vegetation communities to identify trends in species of concern and to maintain a list of migratory birds using those vegetation communities at FHL.

4. Identify ownership and responsibilities for power lines and facilities on the base.

5. Identify and mitigate bird/wildlife-aircraft strike hazards, such as near Tusi and Schoonover airfields.

5.4.3 San Joaquin Kit Fox

Issue: The ESMP for San Joaquin kit fox will be included in **Appendix H** to this INRMP once revised and approved. A summary of issues identified in the plan is as follows: (i) population decline of the species in many areas of California including a lack of kit fox sightings at FHL since 2000 and Camp Roberts since 2006; (ii) potential for encroachment of nonnative red foxes; and (iii) potential for take of kit foxes if they return to FHL.

Goals: Implement a San Joaquin kit fox management plan that (i) minimizes the potential for take of kit foxes while allowing for FHL base operations and military training to meet current and future missions, (ii) establishes a protocol for monitoring for presence of kit foxes and red foxes at FHL.

Current Actions:

1. Monitor predator indices of abundance in kit fox habitat biannually by means of night-time spotlighting and scent stations.
2. If a kit fox is sighted within the past 12 months, conduct pre-activity surveys prior to ground disturbing activities in the valley in which the sighting occurred.
3. Conduct pre-activity surveys prior to poisoning of ground squirrels.
4. Annually monitor artificial kit fox dens.
5. Update GIS data for kit fox and red fox observations.
6. Manage vegetation by implementing yellow star-thistle control (**Section 5.3.10**) and conducting prescribed burns (**Section 5.3.12**).

Future Action:

1. Keep abreast of many factors affecting satellite populations of San Joaquin kit fox by attending local resource agency meetings and coordinating with USFWS, and adapt management and monitoring as needed to address new information.

5.4.4 California Condor

Issue: Due to very low population numbers, any loss of a California condor is considered a threat to the survival and recovery of the species. California condors may forage, roost, or nest on FHL in various sites, so different protective measures must be developed for each situation. To date, no California condors have been sighted in conflict with military training exercises; however, with increases in the condor population as well as more frequent and intensive military training, future conflicts might occur.

Goal: Protect California condors on FHL from human disturbance and accidental harm and harassment.

Current Actions:

1. If a FHL action may adversely affect a California condor (e.g., a condor being in a live-fire zone of an active range), the FHL action must cease until the condor moves away from danger unless a USFWS-approved hazing strategy is implemented.
2. Coordinate with USFWS and Ventana Wilderness Society regarding California condor activities and requirements in the FHL area.

Future Actions:

1. Develop management strategies in coordination with USFWS to address potential conflicts between condors and FHL activities, roads, and military overflights.
2. Establish and implement guidelines for condor hazing in accordance with USFWS requirements. Coordinate with USFWS and Ventana Wilderness Society to develop a training program for FHL staff to haze condors as needed to protect them from live-fire areas.

5.4.5 Bald and Golden Eagles

Issue: The Bald and Golden Eagle Monitoring Plan will be included in **Appendix H** of this INRMP once revised and approved. A summary of issues for bald and golden eagle management and conservation is as follows: (i) nesting and roosting/wintering sites may vary from year to year, and (ii) bald and golden eagles may be subject to harassment, harm, or take due to activities at FHL.

Goal: Implement a bald and golden eagle protection plan that (i) minimizes the potential for take of bald and golden eagles while allowing for FHL base operations and military training to meet current and future missions, (ii) establishes a protocol for monitoring eagle productivity, (iii) and responds to changes in the USFWS eagle permitting program for incidental take to comply with MBTA and BGEPA.

Current Actions:

1. Identify locations of nesting and wintering bald and golden eagles, monitor active nesting sites, and estimate productivity.
2. Implement protection measures, such as seasonal limitations for military overflights at nest sites.
3. As funds are available, improvements will continue to be made to fisheries, reservoirs, and rivers; such actions improve bald eagle habitat and food sources.

Future Action:

1. Identify any actions that require an MBTA or BGEPA permit and, if necessary, obtain appropriate permit for intentional take.

5.4.6 Least Bell's Vireo

Issue: Surveys to detect least Bell's vireos are required to detect a range expansion onto FHL.

Goal: Using a cost-effective method, detect if least Bell's vireos are present or breeding at FHL and monitor suitability of their habitat conditions.

Current Action:

1. Conduct least Bell's vireo listening surveys in suitable habitat. The monitoring protocol is based upon USFWS presence/absence surveys, but survey intensity is less than the protocol because protocol level surveys were conducted for more than 10 years with no detections. Surveys are focused on best available habitat, typically in Mission Creek riparian areas.

5.4.7 Arroyo Toad

Issue: The ESMP for arroyo toads is included as **Appendix H** to this INRMP. A summary of issues for arroyo toad management and conservation identified in the plan is as follows: (i) succession of breeding habitat to less favorable and more stable riverine conditions, (ii) impacts from future cantonment development, and (iii) impacts from exotic species. Breeding habitat associated with riparian succession and associated stream channel incision and stabilization appears to be declining. Succession is likely affected by natural processes and riparian vegetation growth, fire suppression, beaver activity, and stream stabilization associated with three concrete river crossings. Cantonment storm water runoff feeds into tributaries of the San Antonio River and arroyo toad breeding habitat. Exotic species that affect arroyo toads include bullfrogs and tamarisk.

Goal: Implement an arroyo toad management plan that (i) provides sufficient benefit to federally endangered arroyo toads to allow USFWS to exempt FHL from critical habitat designations and (ii) allows for FHL base operations and military training to meet current and future missions in accordance with the Installation Development and Training EA (FHL 2010b).

Current Actions:

1. Monitor populations and breeding success.
2. Monitor for disturbance around human activity areas.
3. Implement protection measures as needed to minimize adverse effects of FHL activities, such as signage at river crossings and closing unauthorized river crossings.
4. Conduct geomorphology study to identify processes affecting stream structure and succession in arroyo toad breeding habitat.
5. Comply with CWA and EISA Section 438 to protect hydrology and water quality of arroyo toad breeding habitat.

Future Actions:

1. Control exotic species such as bullfrogs and beavers.
2. Design and implement habitat improvement projects based on results of geomorphology studies.
3. Implement SWAMP (surface water and ambient monitoring program) in San Antonio and Nacimiento Rivers to assess water quality.
4. Implement monitoring of riparian and wetland health using the California Rapid Assessment Method along the San Antonio River in and near breeding habitat for the arroyo toad.
5. Revise and update ESMP.

5.4.8 California Red-legged Frog

Issue: California red-legged frogs may occur on FHL in remote areas.

Goal: Minimize the potential for harm to red-legged frogs.

Future Action:

1. Develop and conduct red-legged frog surveys as suitable habitat is identified incidental to other surveys and in response to FHL activities that may adversely affect habitat suitable for red-legged frogs.

5.4.9 California Tiger Salamander

Issue: Per USFWS, hybrid tiger salamanders are considered a threat to native California tiger salamanders. Genetic data support that tiger salamanders on FHL are nonnative or hybrids and, per data on other hybridized sites, the hybrids have likely been at FHL for decades. Genetic data could not determine if tiger salamanders on FHL had ever been purely native or resulted from introduced populations. There are no known native populations of tiger salamander adjacent to FHL. There are abundant ephemeral pools and streams that support native frogs, toads, and crustaceans. Eradication efforts would be resource intensive with unknown costs, effectiveness, and benefit.

Goal: Determine cost and value of eradicating hybrid or nonnative tiger salamanders; this would provide valuable information for sites that have encroachment of nonnative tiger salamanders into native territories as well as for FHL.

Current Actions:

1. Conserve ephemeral pools.
2. Coordinate with other agencies and researchers to make the FHL population available for research and teaching purposes.

Future Actions:

1. Conduct genetic studies using more up to date markers and methods to gain a better understanding of the degree of nonnativeness and origin of FHL tiger salamanders.
2. Study effects on pool ecology of eradicating hybrid tiger salamanders from selected pools.

5.4.10 Vernal Pool Fairy Shrimp

Issue: The ESMP for vernal pool fairy shrimp is included as **Appendix H** to this INRMP. A summary of issues for vernal pool fairy shrimp management and conservation identified in the plan is as follows: (i) loss or degradation of pools resulting from activities that alter pool hydrology, cause erosion or sedimentation, and introduce contaminants or nonnative species, and (ii) loss of pools due to natural succession. Changes in pool hydrology can be caused by direct destruction or modification of pools, or modification that alters the watershed of surrounding vernal pool uplands. Activities of most concern include off-road vehicle travel, road/firebreak maintenance, construction, and pesticide application. Additionally, the majority of pools at FHL are artificial and were created by soil compaction, such as adjacent to roads (road pools are exempt from protection) and in abandoned soil borrow sites. As those areas are no longer subject to compaction, surrounding vegetation encroaches, burrowing mammals loosen soil compaction, and pools reduce.

Goal: Implement a vernal pool fairy shrimp management plan that (i) provides sufficient benefit to the federally threatened vernal pool fairy shrimp to exempt FHL from USFWS critical habitat designation, and (ii) allows for FHL base operations and military training to meet current and future missions in accordance with the Installation Development and Training EA (FHL 2010b).

Current Action:

1. Annually monitor pools that support fairy shrimp for presence of vernal pool fairy shrimp, potential for or evidence of disturbance, adequacy of protection measures, exotic species encroachment, and evidence of succession.

Future Actions:

1. Identify restoration opportunities to mitigate for loss of vernal pools due to natural succession.
2. Revise and update ESMP.

5.4.11 Purple Amole

Issue: The ESMP for purple amole is included as **Appendix H** to this INRMP. A summary of issues for purple amole management and conservation identified in the plan is as follows: (1) there are redundant GIS layers of known populations from surveys conducted in different years, (2) data were collected for ecological studies and may not be adequate to determine population status, and (3) monitoring protocols for ecological studies have not been reviewed for adequacy in monitoring impacts of training and or development.

Goal: Implement a purple amole management plan that (i) provides sufficient benefit to federally threatened purple amole to allow USFWS to exempt FHL from critical habitat designations, (ii) allows for FHL base operations and military training to meet current and future projected missions in accordance with the Installation Development and Training EA (FHL 2010b), and (iii) addresses data issues described above.

Current Actions:

1. Update GIS data as necessary and archive redundant or inaccurate data.
2. Continue to monitor population status and productivity, and develop and implement new studies, as warranted.
3. Monitor for disturbance around human activity areas.
4. Implement protection measures as needed to minimize adverse effects of FHL activities.

Future Actions:

1. Design and implement habitat improvement projects.
2. Review ecological studies conducted 1998-2011 and transition monitoring priorities to population and habitat monitoring.

5.4.12 Santa Lucia Mint

Issue: Issues for Santa Lucia mint include a very limited known distribution, inhabited locations near roadsides where there is potential damage from road maintenance, and potential for degradation of inhabited sites from yellow star-thistle.

Goals: Maintain a stable or expanding population and distribution of Santa Lucia mint. Minimize the potential for disturbance to Santa Lucia mint during road maintenance activities and minimize nonnative species encroachment.

Current Action:

1. Monitor Santa Lucia mint sites for yellow star-thistle encroachment and disturbance from human activities or flooding and erosion of stream banks where populations occur.

Future Action:

1. Identify areas of moderate or severe yellow star-thistle encroachment, and implement weed control, as needed.

5.4.13 High Priority CNPS-listed Plant Species

Issue: No formal monitoring is in place at FHL for San Antonio collinsia, San Benito pentachaeta, or yellow-flowered eriastrum. Caper-fruited tropidocarpum was presumed extirpated until located at several sites on FHL; some sites may be affected by future range development activities, TTB activities, and convoy activities.

Goal: Minimize adverse effects on CNPS-listed species and conserve populations, which would prevent the need for future state or federal protection.

Current Action:

1. Conduct periodic distribution surveys, particularly in areas where yellow star-thistle control has been implemented, to determine if additional occurrences of caper-fruited tropidocarpum are located at FHL. Data are stored in ArcGIS format.

Future Action:

1. Annually monitor known populations for human disturbance, encroachment of yellow star-thistle or other invasive species, and continued presence of the species.

5.5 Fish and Wildlife Management

5.5.1 Hunting

Issues: Hunting program issues are summarized as follows: (i) Sikes Act requires DOD installations to manage lands for wildlife conservation and recreational access for the public, (ii) recreational hunting opportunities are limited by safety considerations, military training restrictions, and ability of populations to sustain harvest, and (iii) CDFG requires annual population and harvest data for game on FHL as part of their responsibility to manage game and nongame wildlife in California.

Goals: A summary of hunting program goals is as follows: (i) providing optimum hunting opportunities within limitations inherent with training activities, hunter safety considerations, and maintain productive and self-sustaining populations, (ii) promoting maximum sustainable harvest yields, (iii) conducting all hunting activities on FHL within applicable state and federal laws and regulations, (iv) supporting CDFG in their wildlife management responsibilities, (v) updating and maintaining a deer and elk management plan, and (vi) managing FHL small game species and their habitats to promote healthy and sustainable populations.

Current Actions:

1. Establish desired hunter and harvest quotas based on population recruitment and mortality estimates, desired hunter density in the field, and access restrictions due to military training activities.
2. Coordinate with DES to provide sufficient law enforcement effort to deter violations of state and federal laws and regulations.
3. Consult regularly with FMWR and DPTMS-Range Control to determine hunting area access.
4. Conduct spotlight surveys for deer and daytime composition counts for deer and elk for an index of population status in accordance with protocol within the Fish and Wildlife Management Plan, deer and elk component (see **Appendix G** once component has been drafted).
5. Conduct antlerless hunts based on the previous year's buck kill and fall rainfall.
6. Conduct check station data collection to determine herd health.
7. Provide CDFG with annual population and harvest data for big game annually in December.
8. Coordinate with CDFG to reevaluate population goal of 300 set in the 1995 Elk Management Plan, as population exceeds that goal.

Future Actions:

1. Develop and implement a deer and an elk component for the FHL Fish and Wildlife Management Plan that includes protocols for how FHL will handle deer and elk tags, and harvest data collection and reporting to CDFG.
2. Conduct waterfowl/waterbird surveys to determine waterfowl presence at FHL.
3. Implement cooperative agreements with various conservation agencies for FHL's hunting and fishing program.
4. Increase the number of military A-33 and J-10 tags from 25 to 40 and 10 to 15 respectively.

5.5.2 Fisheries Management

Issue: All ponds on FHL are artificial, require periodic maintenance to support viable fish populations, and support nonnative stocked fish and bullfrogs. At the same time, they provide water sources for wildlife, habitat for native birds, amphibians and plants, wetland areas, and opportunities for angling and military training. Rivers on FHL do not provide suitable or sustainable angling opportunities due to their ephemeral nature, limited abundance of highly sought-after fish such as trout, difficulty in providing safe access that does not conflict with military training, and presence of protected natural and cultural resources.

Goal: Maintain ponds to support viable fish populations in conjunction with TES goals.

Current Actions:

1. Monitor pond and reservoir water quality on a monthly basis. Use monitoring results to guide management actions that reduce occurrences of summer fish kills.
2. Continue barley straw treatment to reduce algae growth.
3. Initiate dam repairs and investigate deepening of reservoir shorelines.

4. Investigate methods to prevent summer fish kill.
5. Relocate fish between established fishing reservoirs to restore depleted or expired fisheries.

5.5.3 Summer Water Sources

Issue: Summer water sources for wildlife are scarce in the dry season resulting in stress and mortality to game and nongame species.

Goal: Maintain existing artificial water sources and conserve remaining undeveloped natural springs and seeps; increase water sources with new artificial sources if specific needs arise.

Current Actions:

1. Conduct annual spring and guzzler maintenance and identify potential new guzzler locations. Establish escape cover (e.g., brush piles) around guzzlers in open terrain areas.
2. Maintain a GIS layer of artificial and natural water sources.
3. Install and upgrade to big game, wildlife guzzlers in hunt areas 2, 6, 7, 10, and 25.

5.5.4 Amphibian Disease

Issue: Disease is a significant factor in the decline of native amphibians. Surveys have not been conducted at FHL to identify presence or absence of known threatening diseases.

Goal: Prevent introduction and spread of disease at FHL.

Future Actions:

1. Identify potential for threatening diseases at FHL by identifying which diseases are most likely to occur at FHL, how they are transmitted, and the species potentially affected.
2. Review protocols for existing and proposed surveys to identify ways to reduce the potential for infections (e.g., boot and hand cleaning between survey areas, minimizing activities in breeding or wet areas). Measures in Appendix B, "Recommended Equipment Decontamination Procedures" of the USFWS's August 2005 *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* should be included in protocols.
3. Survey for the presence of pathogens in FHL amphibians.

5.5.5 Habitat Improvement

Issue: The form and function of California ecosystems are adversely affected and modified by human activity. As a result, many areas deviate from their original conditions, reducing native diversity and abundance. For example, only 5 percent of California's historical grasslands and forested wetlands remain.

Goal: Improve habitats on FHL to support healthier, more diverse biological communities and reduce the potential for wildlife-vehicle collisions.

Current Actions:

1. Continue to provide and maintain wood duck nest boxes in conjunction with California Waterfowl Association's Wood Duck Program.
2. Identify and remove abandoned or unnecessary cattle fencing.
3. Investigate the need to alter fencing to improve wildlife movement. Install wildlife-friendly fence modifications where appropriate.
4. Monitor vehicle collisions with wildlife, installing cautionary wildlife crossing signage where appropriate.
5. Investigate need for other nesting enhancement (e.g., artificial burrowing owl burrows and blue bird boxes).

Future Actions:

1. Investigate control of non-native Asian carp in arroyo toad habitat in the San Antonio River.
2. Improve native trout populations in the Nacimento River by relocating non-native bass from the river to FHL's fishing ponds.

6. INRMP Review, Update, and Implementation

6.1 Project Development

The most recent policy on INRMP implementation is contained in DoD Memorandum *Implementation of the Sikes Act Improvement Act: Updated Guidance.* According to the memorandum, an INRMP is considered implemented if an installation (DoD 2002):

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

Key elements of INRMP implementation (e.g., projects) are addressed in **Appendix C**, FHL INRMP Projects, Schedules and Implementation Table.

6.2 Funding Sources and Mechanisms

DoD cannot commit funding before Congress makes it available (DoD 2011). In order to program for future expected expenses, DoD employs the Planning, Programming, Budget and Execution System (PPBES) budget process. The PPBES is an ongoing process and is continuously reviewed and refined. Environmental budget requirements are identified by the installation staff, submitted to its Major Command, and then included in the Program Objectives Memorandum (POM), which is modified and forwarded to the Chief of Staff, to the Secretary of the Army, the Secretary of Defense, and to the President. The PPBES is summarized as follows:

- The PPBES process consists of long-range planning to anticipate and secure funding requirements to meet security threats and accomplish program goals.
- These requirements are estimated and programmed for the next six years (the subsequent fiscal year and five years out) in the Future Year Defense Plan (FYDP).
- The FYDP resources are analyzed in the Programming Process, where funding requirements are reevaluated and reprioritized for the next budget year, plus the subsequent five fiscal years. The POM process begins in the fall and is finalized the following spring, for development of the President's annual budget that will be submitted to Congress in the spring of each year.

The time scale of an INRMP fits well into the DoD PPBES forecasting process. One full cycle of the DoD budget process includes the next budgeted fiscal year and projections for the following 5 fiscal years. One full cycle of the INRMP, with upper command reapproval, covers a 5-year period. This means that by relying on an INRMP that is updated regularly, installations should be able to project relatively accurate funding requirements for natural resources management for 5-year periods, at a minimum (DoD 2005).

Environmental funding for conservation programs are prioritized as follows:

1. Government Service (GS) Natural Resources Manager, Wildlife Biologist, and Cultural Resources Manager. The functions of these staff members are vital to implementing the Natural

Resources, Threatened and Endangered Species, and Cultural Resources Programs; Environmental Review; and NEPA compliance.

2. Natural Resources program funding for natural resources activities will be prioritized as follows:

   a. ESA compliance projects, to include minimization measures and monitoring required by the project description and terms and conditions of a biological opinion.

   b. Endangered species conservation projects to enhance recovery of listed species and to conduct research necessary to better understand habitat conditions, habitat use, life history, or other factors for federal- and state-listed species.

   c. Natural resources projects to include the following programs: habitat, game management, hunting and fishing, grazing, NEPA, administrative, nongame species, and migratory bird management.

The Garrison Commander is responsible for ensuring that FHL has sufficient staff to implement the INRMP. The PWE is responsible for annual coordination with USFWS and CDFG, requesting funds for INRMP implementation, and documenting implementation actions. However, the Commander is not responsible for whether or not funding is allocated for a specific project. Consequently, the projects and schedules proposed in this revised INRMP are targets to facilitate natural resources program planning. When requested funds are not received, natural resource management prescriptions and the programming schedule may be reexamined. In addition, plans may be adapted to account for the revised project schedule and the proposed budget may be adjusted to account for available funding.

6.2.1 Secondary Funding Sources

6.2.1.1 Fish and Wildlife Conservation Funds

The SAIA allows installations, in cooperation with state and federal agencies, to establish fees for hunting, fishing, or trapping. The SAIA provides installation commanders with the authority to collect, spend, administer, and account for the fees. Fees are collected from installation hunting or fishing permits. The funds may only be expended for the protection, conservation, and management of fish and wildlife on the installation for which they were collected. Administrative expenses, such as printing and issuing of permits, may not exceed 10 percent of the annual revenues. Installations have access to all unobligated balances from previous years (Army Policy Guidance Fish and Wildlife Conservation Fund Dec 2001). MWR may charge an additional activity fee (AR 215-1) for hunting and fishing permits; this fee goes directly to support MWR.

6.2.1.2 The Legacy Resource Management Program Funds

The Legacy Resource Management Program (Legacy) is a special Congressionally mandated initiative to fund military conservation projects. Legacy can provide funding for a variety of conservation projects, such as regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, monitoring and predicting migratory patterns of birds and animals, and national partnerships and initiatives, such as National Public Lands Day. Preproposals and proposals for Legacy funds are submitted via the Legacy Project Tracker (https://www.dodlegacy.org).

6.2.1.3 National Public Lands Day Grants

Installations are eligible to receive DoD Legacy funds in support of National Public Lands Day. Project eligible for funds include habitat restoration, wetland restoration, and stream cleanup.

6.2.1.4 Forestry Reimbursement Authority Funds

Forestry revenues are first used to reimburse commercial forestry expenses. Then, as directed by DoD Financial Management Regulation 7000.14-R Volume 11A, 40 percent of installation net proceeds for the fiscal year are distributed to the state that contains the installation. The funding is used to support road systems and schools. Once the commercial forestry expenses are reimbursed and a portion of the proceeds are distributed among the state counties, any remaining amount is transferred to a holding account known as the DoD Forestry Reserve Account. Reserve account funds are issued once per year, or on an emergency basis, and can be used for the following:

1. Improvement of forest lands;
2. Unanticipated contingencies in the administration of forest lands and the production of forest products for which other funding sources are not available within an acceptable timeframe (e.g., actions necessary as a result of a storm or wildfire); and
3. Natural resources management that implements approved plans and agreements. To be eligible for funding, these project must (1) be specifically included in an approved management plan, such as an INRMP, and (2) provide for at least one of the following purposes: fish and wildlife habitat improvements or modifications; range rehabilitation where necessary for support of wildlife; control of off-road vehicle traffic; specific habitat improvement projects and related activities; and adequate protection for species of fish, wildlife, and plants considered threatened or endangered.

6.2.1.5 Agricultural Reimbursement Authority Funds

Money collected through the leasing of Army-owned property for agricultural use is directed back into the natural resources program and reallocated by the DA. These funds are available to natural resource managers primarily for agricultural outlease improvements, and potentially for natural resources management and stewardship projects once the primary objective is met. Agricultural and grazing outlease revenues are available for the following:

1. Administrative expenses of lease (salaries of professional and technical support of the grazing and cropland programs in direct support of agricultural or grazing outlease which meet INRMP goals and objectives, training, scientific meetings, parts and supplies);
2. Initiation, improvement, and perpetuation of agricultural or grazing outleases (increased productivity, reduced soil erosion, and fencing);
3. Implementation of INRMP Stewardship Projects (compliance measures should be budgeted through the POM process).

6.2.1.6 ITAM Funds

The ITAM Program is managed by the Headquarters Department of Army proponent (i.e., the Department of the Army Management Office – Training Simulations), which funds the installation DPTMS for the ITAM core capabilities (i.e., LCTA, TRI, LRAM, GIS, and SRA components at FHL). A standard funding model is used based on an installation's priority category determined by the installation's mission.

Additional funds are sometimes available for ITAM projects from the Army Environmental Command. Ongoing ITAM projects include single-season projects such as individual revegetation and erosion

control projects (LRAM) and multiple-year efforts such as Training Area Use database data collection (GIS) and vegetation monitoring of rehabilitated training areas (RTLA).

6.2.2 Projects Priority

Project priority within this INRMP is initially determined by funding classification, as defined in Department of Defense Instruction 4715.3, *Environmental Conservation Program* (DoD 2011). The revised 4715.3 has updated the traditional Class 0, 1, 2 and 3 funding classes with the ones presented in **Table 6-1**.

6.3 Approvals and Revisions

The SAIA requires that INRMPs must be reviewed for operation and effect no less than once every 5 years by the installation, the USFWS, and the state fish and wildlife agency (in this case, the CDFG). The DoD and DA have provided specific guidance on the joint review and coordination process and timeframe (DUSD[I&E] 2002, DoD 2011, AR 200-1). Installations must document the outcome of the joint review to reflect the parties' mutual agreement (U.S. Army 2006a). If the 5-year INRMP review for operation and effect results in major revisions to the plan, FHL must solicit public review and comments (U.S. Army 2006a). The NEPA process may be used to meet public review requirements. FHL must afford the USFWS and the CDFG the opportunity to review all public comments.

INRMPs must be also reviewed by installations at least once per year to verify the following (U.S. Army 2006a):

- Current information on INRMP conservation metrics, as described in the Army Environmental Data Base – Environmental Quality, is available
- All "must fund" projects and activities have been budgeted for and implementation is on schedule
- All required trained natural resources positions are filled or are in the process of being filled
- Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate INRMP revision
- All required coordination has occurred
- All significant changes to the installation's mission requirements or its natural resources have been identified
- INRMP goals and objectives are still valid
- No net loss of training capability has occurred due to implementation of the INRMP in accordance with the SAIA.

In addition, DoD has adopted conservation metrics to assess the overall health and trends of an installation's natural resources program and to identify and correct potential funding and other resource shortfalls (DoD 2011). These metrics assess INRMP implementation, measure conservation efforts, ensure no net loss of military testing and training lands across the various installations, understand the conservation program's installation mission support, and indicate the success of partnerships with the USFWS, state fish and wildlife agencies, and, when applicable, with the NOAA Fisheries Service. Seven focus areas assess requirements, goals, and objectives of the Sikes Act annually for an installation with an INRMP and include the following (DoD 2011):

Table 6-1. Crosswalk Table Comparing 1996 and 2011 Funding Classes

Traditional Funding Class (1996)	Revised Funding Class (2011)
Class 0: Recurring Natural Resources Conservation Management Requirements. Includes activities needed to cover the recurring administration, personnel, and other costs associated with managing DoD's conservation program that are necessary to meet applicable compliance requirements (federal and state laws, regulations, Presidential EOs, and DoD policies) or which are in direct support of the military mission.	**1. Recurring Natural Resources Conservation Management Requirements:** a. Administrative, personnel, and other costs associated with managing the DoD Natural Resources Conservation Program that are necessary to meet applicable compliance requirements in federal and state laws, regulations, EOs, and DoD policies, or in direct support of the military mission. b. DoD components shall give priority to recurring natural resources conservation management requirements associated with the operation of facilities, installations, and deployed weapons systems. These activities include day-to-day costs of sustaining an effective natural resources management program, as well as annual requirements, including manpower, training, supplies, permits, fees, testing and monitoring, sampling and analysis, reporting and recordkeeping, maintenance of natural resources conservation equipment, and compliance self-assessments.
Class I: Current Compliance. Includes projects and activities needed because an installation is currently out of compliance (has received an enforcement action from a duly authorized federal or state agency, or local authority); has a signed compliance agreement or has received a consent order; has not met requirements based on applicable federal or state laws, regulations, standards, Presidential EOs, or DoD policies; and/ or are projects and activities that are immediate and essential to maintain operational integrity or sustain readiness of the military mission. "Class I" also includes projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable laws, regulations, standards, DoD policies, or Presidential EOs, but deadlines have not passed or requirements are not in force) but shall be if projects or activities are not implemented in the current program year.	**2a. Non-Recurring Natural Resources Management Requirements**. Current Compliance. Includes installation projects and activities to support: a. Installations currently out of compliance (e.g., received an enforcement action from an authorized federal or state agency or local authority). b. Signed compliance agreement or consent order. c. Meeting requirements with applicable federal or state laws, regulations, standards, EOs, or DoD policies. d. Immediate and essential maintenance of operational integrity or military mission sustainment. e. Projects or activities that will be out of compliance if not implemented in the current program year. Those activities include: i. Environmental analyses for natural resources conservation projects, and monitoring and studies required to assess and mitigate potential impacts of the military mission on conservation resources. ii. Planning documentation, master plans, compatible development planning, and INRMPs. iii. Natural resources planning-level surveys. iv. Reasonable and prudent measures included in incidental take statements of biological opinions, biological assessments, surveys, monitoring, reporting of assessment results, or habitat protection for listed, at-risk, and candidate species so that proposed or continuing actions can be modified in consultation with the USFWS or National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. v. Mitigation to meet existing regulatory permit conditions or written agreements. vi. Nonpoint source pollution or watershed management studies or actions needed to meet compliance dates cited in approved state coastal nonpoint source pollution control plans, as required to meet consistency determinations consistent with Coastal Zone Management. vii. Wetlands delineation critical for the prevention of adverse impacts to wetlands, so that continuing actions can be modified to ensure mission continuity. viii. Compliance with missed deadlines established in DoD executed agreements.

Traditional Funding Class (1996)	Revised Funding Class (2011)
Class II: Maintenance Requirements. Includes those projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable laws, regulations, standards, Presidential EOs, or DoD policies) but deadlines have not passed or requirements are not in force, but shall be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year.	**2b. Non-Recurring Natural Resources Management Requirements**. Maintenance Requirements. Includes those projects and activities needed to meet an established deadline beyond the current program year and maintain compliance. Examples include: a. Compliance with future deadlines. b. Conservation, GIS mapping, and data management to comply with federal, state, and local regulations, EOs, and DoD policy. c. Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives. d. Wetlands enhancement to minimize wetlands loss and enhance existing degraded wetlands. e. Conservation recommendations in biological opinions issued pursuant to the ESA.
Class III: Enhancement Actions, Beyond Compliance. Includes those projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or EO and are not of an immediate nature.	**2c. Non-Recurring Natural Resources Management Requirements**. Enhancement Actions Beyond Compliance. Includes those projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required by law, regulation, or EO, and are not of an immediate nature. Examples include: a. Community outreach activities, such as International Migratory Bird Day, Earth Day, National Public Lands Day, Pollinator Week, and Arbor Day activities. b. Educational and public awareness projects, such as interpretive displays, oral histories, Watchable Wildlife areas, nature trails, wildlife checklists, and conservation teaching materials. c. Restoration or enhancement of natural resources when no specific compliance requirement dictates a course or timing of action. d. Management and execution of volunteer and partnership programs.

1. INRMP project implementation.
2. Federally listed species and critical habitat.
3. Partnerships effectiveness.
4. Fish and wildlife management and public use.
5. Team adequacy.
6. Ecosystem integrity.
7. INRMP impact on the installation mission.

To ensure that this INRMP properly addresses all aspects of the natural and cultural resources present on FHL and proposes actions that are in accordance with DA and installation goals and objectives, this INRMP, its components, and future updates are subject to approval by the FHL natural resources manager. The USFWS should be informed whenever there is a modification to the INRMP or there is a substantial change to natural resources and initiate consultation if an action could affect a federally listed species. Operational Component Plans must be updated annually during preparation of the environmental budgets for the installation.

7. INRMP and NEPA

To comply with NEPA, the planning and decisionmaking process for actions proposed by federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or Environmental Impact Statement (EIS), which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to Council on Environmental Quality (CEQ) regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively." The adoption of an INRMP can be considered a major federal action as defined by Section 1508.18 of the CEQ regulations. The CEQ regulations (40 CFR Parts 1500 to 1508) for implementing the procedural provisions of the NEPA (42 U.S.C. 4321 et seq.) require the preparation of an EA or EIS for the implementation of an INRMP, whichever is appropriate. For the purposes of implementing the FHL INRMP, an EA has been chosen as the appropriate level of NEPA analysis and is integrated as part of the INRMP.

7.1 Purpose and Need for Proposed Action

The purpose of the Proposed Action is to carry out the set of resource-specific management measures developed in the INRMP. Implementation of the Proposed Action would support FHL's need to fulfill mission requirements while practicing sound resources stewardship on the installation and complying with environmental policies and regulations.

7.2 Description of the Proposed Action and Alternatives

Proposed Action. FHL proposes to implement an INRMP, which supports the management of natural resources as described by the plan itself.

The Proposed Action supports an ecosystem approach and includes natural resources management measures to be undertaken at FHL. The Proposed Action focuses on a 5-year planning period. This planning period would begin in FY 2011 and end in FY 2015. Additional environmental analysis could be required as new management measures are developed.

Alternatives. The development of proposed management measures for the INRMP included a screening analysis of resource-specific alternatives. As a result of this screening process, this EA, which has been included as an integral part of this INRMP, formally addresses two alternatives: the Proposed Action (i.e., implementation of the INRMP) and the No Action Alternative.

No Action Alternative. Under the No Action Alternative, the proposed management measures set forth in the revised INRMP would not be implemented. Current management measures for natural resources would remain in effect and existing conditions would continue. This document refers to the continuation of existing (i.e., baseline) conditions of the affected environment, without implementation of the Proposed Action, as the No Action Alternative. The No Action Alternative serves as a benchmark against which federal actions can be evaluated. Inclusion of a No Action Alternative is prescribed by CEQ regulations and, therefore, will be carried forward for further analysis.

7.3 Environmental Assessment and Consequences

7.3.1 No Action Alternative

Adoption of the No Action Alternative would mean that the FHL INRMP would not be implemented and current natural resources management practices would continue "as is." Existing conditions and management practices would continue, and no new initiatives would be established.

Potential consequences associated with the No Action Alternative are discussed in this section for each resource area. This section summarizes the analysis of potential consequences for the No Action Alternative and compares them to the Proposed Action. As shown, no significant adverse effects would be expected. Under the No Action Alternative, the environmental conditions at FHL would not benefit from the management measures associated with implementing the proposed INRMP.

Expected consequences of the No Action Alternative for each resource area are presented in the following paragraphs:

- *Airspace Management and Safety* – Minor, adverse effects would be expected. By failing to implement an effective BASH program, impacts on aircraft safety associated with wildlife strikes at FHL would be expected to continue.
- *Land Use* – No effects would be expected.
- *Climate* – No effects on climate would be expected.
- *Air Quality* – Minor, adverse effects would be expected. The primary concern regarding air quality and potential environmental effects pertains to increases in pollutant emissions; exceedance of any National Ambient Air Quality Standard (NAAQS) or other federal, state, or local limits; and impacts on existing air permits. Examples of natural resources management activities that could result in potential adverse changes in air quality conditions include changes in equipment, increased usage of equipment for management purposes, and smoke from prescribed fire. The existing conditions as outlined under the 2004 INRMP, which would constitute the No Action Alternative, include activities that contribute to changes in existing air quality conditions (e.g., a prescribed fire). Prescribed burns carried out under the No Action Alternative would continue to comply with the General Conformity Rule. FHL is located in the NCCI AQCR and is under the jurisdiction of the MBUAPCD.
- *Geology* – Minor, adverse effects would be expected. By failing to implement an effective soil erosion and sedimentation program, impacts on geological resources associated with erosion and sedimentation at FHL would be expected to continue.
- *Topography* – Minor, adverse effects would be expected. By failing to implement an effective soil erosion and sedimentation program, impacts on topography associated with erosion and sedimentation at FHL would be expected to continue.
- *Soils* – Minor, adverse effects would be expected. By failing to implement an effective soil erosion and sedimentation program, impacts on soils associated with erosion and sedimentation at FHL would be expected to continue. The No Action Alternative does not include the implementation of soil conservation measures, or a plan of action to prevent or minimize potential soil problems related to erosion and sedimentation before their occurrence. Implementation of the No Action Alternative would involve reactive management to problems after their occurrence, rather than managing the resources to prevent impacts.

- *Water Resources* – Minor, adverse effects would be expected. The No Action Alternative does not provide a formal plan of action for monitoring and protecting the water resources at FHL. Water resources are vulnerable to degradation without the implementation of a formal plan of action that includes watershed protection measures, nonpoint source pollution controls, and a comprehensive monitoring program designed to identify water quality problems at their onset.
- *Wetlands* – Minor, adverse effects would be expected. The No Action Alternative does not provide a formal plan for evaluating and monitoring wetland habitat conditions, nor does it establish formal protection measures to prevent or minimize potential impacts that could result from mission-related activities.
- *Floodplains* – No effects would be expected.
- *Aquatic Habitat* – Minor, adverse effects would be expected. The No Action Alternative does not provide for the formal implementation of a routine habitat assessment and monitoring program. Implementation of such a program not only provides a method for protecting these habitats, but also provides a baseline of data that can be used to prioritize stream restoration projects and identify the most efficient allocation of resources. In addition, the No Action Alternative does not establish routine management measures to protect and enhance these habitats by preventing or minimizing potential impacts.
- *Riparian Habitat* – Minor, adverse effects would be expected. As with aquatic habitats, the No Action Alternative does not provide for the implementation of a routine assessment and monitoring program to protect these habitats. Also, the No Action Alternative does not establish limited-use riparian buffers to protect water quality by reducing nonpoint source impacts associated with runoff and adjacent land uses, nor does it establish a formal set of management measures to protect and enhance these habitats by preventing or minimizing potential impacts resulting from mission-related activities.
- *Terrestrial Ecosystems* – Minor, adverse effects would be expected. Under the No Action Alternative, there would be no formal plan of action to conserve terrestrial habitat conditions and diversity, resulting in a continued challenge for FHL to achieve their objective of providing benefits to wildlife species and to maintain or improve overall biodiversity. Under the No Action Alternative, there would be no coordinated effort or plan to create or maintain the quality of habitat attractive to, or required by, a diverse population of wildlife that is compatible with the mission.
- *Fauna* – Minor, adverse effects would be expected to continue. Under the No Action Alternative, the health and condition of the wildlife populations would not be improved, and management measures to increase the abundance and biodiversity of wildlife at FHL would not be implemented. In addition, management measures designed to protect and enhance wildlife habitats (i.e., aquatic, riparian, wetlands, terrestrial) would not be implemented, thereby resulting in a continuing decline in the quality and complexity of the habitats. Decline in habitat quality and complexity would continue to adversely affect wildlife and biodiversity.
- *Endangered, Threatened, and Rare Species* – Minor, adverse effects would be expected for special-status species not protected under the ESA. The No Action Alternative does not provide special measures for the protection and management of these species or future nesting activity that might occur. Implementation of the No Action Alternative would continue to leave these species vulnerable to potential impacts that could adversely affect their existence at the installation.
- *Cultural Resources* – No effects would be expected. The No Action Alternative in itself does not lead to any actions that have the potential to adversely affect cultural resources, tribal resources, tribal rights, or Indian lands, which is the threshold consideration of the Annotated DOD

American Indian and Alaska Native Policy for analysis of effects on Native Americans (October 27, 1999).

- *Hazardous Materials and Wastes* – No effects would be expected. Hazardous and toxic materials would continue to be handled in accordance with Federal laws and ARs, including RCRA, FIFRA, and the Toxic Substances Control Act (TSCA). Therefore, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the No Action Alternative.
- *Noise* – No effects would be expected. The primary concern regarding noise and potential environmental effects pertains to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance (i.e., noise complaints). Current natural resources management actions do not involve activities that would affect noise conditions. Existing noise levels would not change. Therefore, there would be no effects regarding noise levels or sound quality as a result of implementation of the No Action Alternative.
- *Socioeconomic Resources* – No effects would be expected. Under the No Action Alternative, typical changes in population, housing, and economic conditions would continue. The No Action Alternative does not involve activities that change existing socioeconomic resources.
- *Environmental Justice* – No effects would be expected. The primary concern regarding environmental justice and potential environmental effects pertains to disproportionately high and adverse consequences to minority or low-income communities. The No Action Alternative in itself does not create any advantage or disadvantage for any group or individual, and is not expected to create disproportionately high or adverse human health or environmental effects on minority or low-income populations or communities at or surrounding the installation. The installation would address, however, any project-specific issues regarding disproportionate adverse health or environmental effects on minority or low-income groups, should they arise, and would use best environmental management practices to ensure compliance with applicable regulatory requirements. Therefore, there would be no effects as a result of implementation of the No Action Alternative.
- *Infrastructure* – No effects would be expected. All facilities would continue to be maintained and operated in accordance with required permits and capabilities of the systems. The demand for utilities and roads would not be expected to change. Therefore, no effects on existing facilities would be expected under the No Action Alternative.

In summary, the analysis of existing (i.e., baseline) conditions identifies no significant adverse environmental concerns for the conservation, management, or restoration of its natural resources. The absence of a formal set of management measures inhibits FHL's ability to adequately engage in future planning initiatives, and does not capture benefits derived from identifying and executing comprehensive, integrated environmental and natural resources management strategies that might be implemented over the long-term. Therefore, implementation of the No Action Alternative is not the preferred alternative.

7.3.2 Proposed Action (Preferred Alternative)

Military Mission Benefits: Implementing this INRMP will improve training lands, enhance mission realism through more training options and more intensive planning of missions, and facilitate long-range planning at FHL.

Environmental Benefits: The INRMP conserves natural resources. It will help reduce soil erosion and vegetation loss caused by military activities, reduce the potential for environmental pollution, improve

water quality in riparian and aquatic ecosystems, enhance biodiversity, and increase knowledge of ecosystems through surveys.

Other Benefits: Troop environmental awareness will be enhanced while training at FHL. Both community relations and FHL's environmental image will be enhanced. Quality of life for the FHL community and its neighbors will be improved. Implementing this plan will decrease long-term environmental costs and reduce personal and installation liabilities from environmental noncompliance. Potential consequences associated with the Proposed Action are discussed in this section for each resource area described in **Section 4**. This section summarizes the analysis of potential consequences for the Proposed Action and compares them to the No Action Alternative (i.e., baseline or existing conditions). Potential environmental consequences associated with implementation of the INRMP would result in either no effects, minor adverse effects, or beneficial effects for each resource area (see **Table 7-1**). Compared to the No Action Alternative, environmental conditions at FHL would improve as a result of implementing the proposed INRMP. Therefore, implementing the INRMP (i.e., the Proposed Action) is the preferred alternative.

The potential effects that would be expected as a result of implementation of the Proposed Action for each resource area are presented in the following paragraphs:

- *Airspace Management and Safety* – Beneficial impacts would be expected. Under the Proposed Action, FHL will work to identify and mitigate bird/wildlife-aircraft strike hazards. Impacts on aircraft safety at FHL would be minimized.
- *Land Use* – Beneficial impacts would be expected. Under the Proposed Action, greater guidance on the overall land use management objective would be afforded. Land uses would not specifically be expected to change at FHL; follow up monitoring for Environmental Reviews would provide lessons learned to improve future land use choices.
- *Climate* – No effects on climate would be expected.
- *Air Quality* – Minor, adverse effects would be expected. The primary concern regarding air quality and potential environmental effects pertains to increases in pollutant emissions; exceedance of any NAAQS or other Federal, state, or local limits; and impacts on existing air permits. The Proposed Action includes activities that would contribute to changes in existing air quality conditions, such as prescribed fire. However, if the goals for wildland fire management are met through the development and implementation of an Integrated Wildland Fire Management Plan, which would include BMPs for smoke management and emissions reductions techniques, there would be only minor adverse effects on air quality as a result of implementing the Proposed Action. Under USEPA's policy, federal prescribed fire projects would be considered to conform with the state implementation plan if they are managed under a certified basic smoke management program. The program must require regional coordination (cooperation of all jurisdictions in an airshed) when authorizing fires and real-time air quality monitoring at sensitive receptors, when warranted, in addition to the basic program components. As with the No Action Alternative, prescribed burns carried out under the Proposed Action would continue to comply with the General Conformity Rule. The NCCI AQCR is a designated NAAQS maintenance area for ozone. The air quality in the NCCI AQCR has been characterized by the USEPA as unclassified/attainment for all criteria pollutants (USEPA 2008). However, the California Air Resources Board has designated the NCCI AQCR as a nonattainment area for ozone (O_3) and particulate matter (PM_{10}) (CARB 2007).
- *Geology* – Beneficial effects would be expected. By implementing an effective soil erosion and sedimentation program, impacts on geologic resources associated with erosion and sedimentation on FHL would be minimized.

- *Topography* – Beneficial effects would be expected. By implementing an effective soil erosion and sedimentation program, impacts on topography associated with erosion and sedimentation at FHL would be minimized.
- *Soils* – Beneficial effects would be expected. By implementing an effective soil erosion and sedimentation program, impacts on soils associated with erosion and sedimentation on FHL would be minimized. Some mission activities result in soil disturbance which can be mitigated through seeding and revegetation.
- *Water Resources* – Beneficial effects would be expected. The establishment of riparian buffers would result in beneficial effects on water quality at FHL by reducing nonpoint source impacts associated with runoff and adjacent land uses.
- *Wetlands* – Beneficial effects would be expected. Implementation of the Proposed Action would protect wetlands. Additional efforts would be made to reduce impacts on wetlands by planning mission activities, when possible, in a manner consistent with wetlands protection objectives. Where current activities might be impacting wetlands functions, efforts would be made to identify the type and source of impacts and, where applicable, restoration of affected habitats would be implemented.
- *Floodplains* – No effects would be expected.
- *Aquatic Habitat* – Beneficial effects would be expected. The assessment of aquatic habitats at FHL would provide a basis to develop a management program that would protect and enhance these habitats. Assessment of aquatic habitats would provide a baseline that can be used in tracking conditions and trends of these habitats, which would allow management practices to be applied where and when they are needed. The establishment of limited-use buffers around water bodies would provide protection to habitats both in and adjacent to the resource. Where impacts on aquatic habitats occur as a result of mission activities, management objectives provide for the timely mitigation of the impacts.
- *Riparian Habitat* – Beneficial effects would be expected. The assessment of riparian habitats at FHL would provide a basis to develop a management program that would protect and enhance these habitats at each site. Assessment of riparian habitats would provide a baseline that can be used in tracking conditions and trends of these habitats, which would allow management practices to be applied where and when they are needed. The establishment of limited-use riparian buffers would result in beneficial effects on water quality by reducing nonpoint source impacts associated with runoff and adjacent land uses. Additional management measures established to protect or enhance riparian habitats would include proper planning of recreational developments; limiting pesticide and fertilizer use in the riparian buffer; properly locating, constructing, and designing stream crossings to reduce impacts on flora and fauna; and minimizing the modification of existing hydrologic characteristics to minimize erosion and sedimentation.
- *Terrestrial Ecosystems* – Beneficial effects would be expected. Implementation of the Proposed Action would result in improved terrestrial habitat conditions for wildlife because maintaining a high level of habitat diversity at FHL that does not conflict with the FHL missions is a priority of the INRMP. Under the Proposed Action, removal of invasive species would create a beneficial environment for native species.
- *Fauna* – Beneficial effects for wildlife species would be expected. Implementation of the Proposed Action would result in conservation of native habitat and the reestablishment of native vegetation and would result in the protection of habitat for wildlife species that depend on wetlands for breeding, foraging, and nesting.
- *Endangered, Threatened, and Rare Species* – Beneficial effects on all special-status species at the installation would be expected. Implementation of the Proposed Action would provide protection

and management for state special concern plants and animals with limited distributions that are primarily found on FHL. Also, under the Proposed Action, rare flora and fauna would be treated with added importance and valued for their contribution to the unique natural heritage of the installation.

- *Cultural Resources* – Beneficial effects would be expected. By implementing an effective soil erosion program, impacts on cultural resources associated with erosion on FHL would be minimized. Additionally, prescribed burning can have beneficial effects, enhancing valuable cultural resources. Prescribed fires can be used to maintain or restore some cultural resources, or geographic areas.
- *Hazardous Materials and Wastes* – No effects would be expected. Hazardous and toxic materials would continue to be handled in accordance with Federal laws and ARs, including RCRA, FIFRA, and TSCA. Therefore, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the Proposed Action.
- *Noise* – No effects would be expected. The primary concern regarding noise and potential environmental effects pertains to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance (i.e., noise complaints). The Proposed Action does not involve activities that would impact noise conditions, such as changes in military equipment (especially aircraft), increases in the number or location of personnel, construction of new facilities or modification of existing facilities, or increase or change military operations.
- *Socioeconomic Resources* – No effects would be expected. The primary concern regarding potential effects on socioeconomic resources pertains to changes in population, housing, and economic conditions. The Proposed Action does not involve any activities that would contribute to changes in socioeconomic resources.
- *Environmental Justice* – No effects would be expected. The primary concern regarding environmental justice and potential environmental effects pertains to disproportionately high and adverse consequences to minority or low-income communities. Implementation of the Proposed Action in itself would not create any advantage or disadvantage for any group or individual. The proposed INRMP is not expected to create disproportionately high or adverse human health or environmental effects on minority or low-income populations or communities at or surrounding FHL. FHL would address, however, any project-specific issues regarding disproportionate adverse health or environmental effects on minority or low-income groups, should they arise, and would use best environmental management practices to ensure compliance with applicable regulatory requirements.
- *Infrastructure* – No effects would be expected. Facilities would continue to be maintained and operated in accordance with required permits and capabilities of the systems. Under the Proposed Action, the demand for utilities and roads would not be expected to increase and, therefore, would not adversely affect existing facilities.

These findings are consistent with the following goals of the natural resources management program to maintain ecosystem viability and ensure the sustainability of desired military mission conditions: to maintain, protect, and improve ecological integrity; to protect and enhance biological communities, particularly sensitive, rare, threatened, and endangered species; to protect the ecosystems and their components from damage or degradation; and to identify and restore degraded habitats. The nature of the management measures recommended by the INRMP, if implemented, would directly and positively affect the health and condition of natural resources at FHL.

Table 7-1. Summary of Potential Environmental Consequences

Resource Area/Environmental Condition	Environmental Consequence	
	No Action Alternative	**Proposed Action**
Airspace Management and Safety	Minor Adverse	Beneficial
Land Use	None	Beneficial
Climate	None	None
Air Quality	Minor Adverse	Minor Adverse
Geology	Minor Adverse	Beneficial
Topography	Minor Adverse	Beneficial
Soils	Minor Adverse	Beneficial
Water Resources	Minor Adverse	Beneficial
Wetlands	Minor Adverse	Beneficial
Floodplains	None	None
Aquatic Habitat	Minor Adverse	Beneficial
Riparian Habitat	Minor Adverse	Beneficial
Terrestrial Ecosystems	Minor Adverse	Beneficial
Fauna	Minor Adverse	Beneficial
Endangered, Threatened, and Rare Species	Minor Adverse	Beneficial
Cultural Resources	None	Beneficial
Hazardous and Toxic Materials	None	None
Noise	None	None
Socioeconomic Resources	None	None
Environmental Justice	None	None
Infrastructure	None	None

Note: * Resource areas presented in this column are adapted from the resources described in **Sections 4**.

7.4 Cumulative Effects

A cumulative effect is defined as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place locally or regionally over a period of time.

Implementation of the INRMP would result in a comprehensive natural resources management strategy for FHL that represents compliance, restoration, prevention, and conservation; improves the existing management approach for natural resources on the range; and meets legal and policy requirements consistent with national natural resources management philosophies. Implementation would be expected initially to improve existing environmental conditions at FHL, as described in **Section 7.2**. Over time, adoption of the Proposed Action would enable FHL to achieve their goal of maintaining ecosystem viability and ensuring sustainability of desired military mission conditions.

Although growth and development can be expected to continue outside of FHL and within the surrounding natural areas, cumulative adverse effects on these resources would not be expected when added to the effects of activities associated with the proposed management measures included in the INRMP.

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APPENDIX A

ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

ADP	Area Development Plan
AQCR	Air Quality Control Region
AR	Army Regulation
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASP	ammunition supply point
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CA-CESU	Californian Cooperative Ecosystems Studies Unit
Cal/EPA	California Environmental Protection Agency
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Species
CS/CSS	Combat Support and Combat Support Services
CSTC	Combat Support Training Center
CWA	Clean Water Act
DA	Department of the Army
DERP	Defense Environmental Restoration program
DES	Directorate of Emergency Services
DOD	Department of Defense
DODI	Department of Defense Instruction
DOL	Directorate of Logistics
DPTMS	Directorate of Plans, Training, Mobilization and Security
DPW	Directorate of Public Works
DPTMS	Directorate of Plans, Training, Mobilization and Security
DUSD	Deputy Under Secretary of Defense
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EMS	Environmental Management System
EO	Executive Order
EQCC	Environmental Quality Control Committee
ERDC	Engineering Research and Development Center
ESA	Endangered Species Act
ESMP	Endangered Species Management Plan
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHL	Fort Hunter Liggett
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRM	Flood Insurance Rate Map
FMWR	Family, Morale, Welfare, and Recreation
FONSI	Finding of No Significant Impact
FR	Federal Regulation
FY	Fiscal Year
GIS	Geographical Information System
GISMO	Geographic Information Supporting Military Operations
GPS	Global Positioning System
GS	Government Service
HWMP	Hazardous Waste Management Plan
I&E	Installations and Environment
IBP	Institute for Bird Populations
ICRMP	Integrated Cultural Resources Management Plan
IHMWMP	Integrated Hazardous Materials and Waste Management Plan
INRMP	Integrated Natural Resources Management Plan
ILO	Installation Legal Office
IMCOM	Installation Management Command

IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
ISO	International Standards Organization
ITAM	Integrated Training Area Management
JAG	Judge Advocate General
km	kilometers
LCTA	Land Condition Trend Analysis
LRAM	Land Rehabilitation and Maintenance
MAPS	Monitoring Avian Productivity and Survivorship
MBTA	Migratory Bird Treaty Act
MBUAPCD	Monterey Bay Unified Air Pollution Control District
mi	miles
MMRP	Military Munitions Response Program
MOU	Memorandum of Understanding
mph	miles per hour
msl	mean sea level
MWR	Directorate of Morale, Welfare and Recreation
NCCI	North Central Coast Intrastate
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O_3	Ozone
PAH	polycyclic aromatic hydrocarbon
PBA	Programmatic Biological Assessment
PBO	Programmatic Biological Opinion
percent g	percentage of the force of gravity
PIF	Partners in Flight
PM_{10}	Particulate Matter
POL	petroleum, oils, and lubricant
POM	Program Objectives Memorandum
PWE	Directorate of Public Works, Environmental Division
RCRA	Resource Conservation and Recovery Act
RMEF	Rocky Mountain Elk Foundation
RTLA	Range and Training Land Assessment
SAIA	Sikes Act Improvement Act
SAP	Satellite Accumulation Points
SBBG	Santa Barbara Botanic Garden
SPCC	Spill Prevention, Control and Countermeasures
SRA	Sustainable Range Awareness
SRMA	Sensitive Resource Management Area
SRP	Sustainable Range Program
SRPA	Sensitive Resource Protection Area
SVOC	semivolatile organic compound
SWAP	State Wildlife Action Plan
SWMP	Storm Water Monitoring Program
SWPPP	Storm Water Pollution Prevention Plan
TA	Training Area
TEC	Test and Experimentation Center
TNC	The Nature Conservancy
TRI	Training Requirements Integration
TSCA	Toxic Substances Control Act
TTB	Tactical Training Base
USACE	U.S. Army Corps of Engineers
USARC	U.S. Army Reserve Command
USDA-WS	U.S. Department of Agriculture-Wildlife Services
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound

APPENDIX B

RELEVANT ENVIRONMENTAL LAWS, REGULATIONS, POLICIES, GUIDANCE, INSTRUCTION, AND ORDERS

APPENDIX B
LIST OF RELEVANT ENVIRONMENTAL LAWS, REGULATIONS, POLICIES, AND GUIDANCE

FEDERAL LAWS, REGULATIONS, AND EXECUTIVE ORDERS

American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)

Anadromous Fish Conservation Act (16 U.S.C. 757)

Animal Damage Control Act (7 U.S.C. 426 et seq.)

Anti-Deficiency Act (31 U.S.C. 1341 et seq.)

Antiquities Act of 1906 (16 U.S.C. 431 et seq.)

Archaeological Resource Protection Act Regulations (18 CFR 1312)

Archeological and Historical Preservation Act of 1974 (16 U.S.C. 469 et seq.)

Archeological Resources Protection Act of 1979 (16 U.S.C. 470 et seq.)

Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.)

Base Closure and Realignment Act (Part A of title XXIX of Public Law 101-510; 10 U.S.C. 2687)

Clean Air Act, as amended (42 U.S.C. 7401 et seq.)

Clean Water Act (33 U.S.C. 1251 et seq.)

Coastal Barrier Resources (16 CFR 3501)

Coastal Barriers Resources Act (16 U.S.C. 1451 et seq.)

Coastal Zone Act Reauthorization Amendments (16 U.S.C. 1451 et seq.)

Coastal Zone Management Act of 1972 (16 U.S.C. 1451-1456)

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. 9601 et seq.)

Conservation and Rehabilitation Program on Military and Public Lands (16 U.S.C. 670 et seq.)

Conservation and Rehabilitation Programs on Military and Public Lands (Public Law 93-452)

Cooperative Conservation (Executive Order 13352)

Council on Environmental Quality Regulations on Implementing NEPA Procedures (40 CFR 1500-1508)

Curation of Federally Owned and Administered Archaeological Collections (36 CFR 79)

Defense Environmental Restoration Program (10 U.S.C. 2701)

Department of Defense Appropriation Act of 1991 (PL 102-393)

Determination of Eligibility for Inclusion in the National Register of Historic Places (36 CFR 63)

Dredge and Fill Nationwide Permit Program (33 CFR 330)

Endangered and Threatened Wildlife and Plants (50 CFR 17)

Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)

Entering Military, Naval, or Coast Guard Property (18 U.S.C. 1382)

Environmental Effects in the United States of Department of Defense Actions (32 CFR 188)

EPA Guidelines for Resource Recovery Facilities (40 CFR 245)

EPA National Drinking Water Regulations (40 CFR 141-143)

EPA National Pollutant Discharge Elimination System Permit Regulations (40 CFR 122)

EPA Regulations Designating Areas for Air Quality Planning (40 CFR 81)

EPA Regulations for Ambient Air Monitoring Reference and Equivalent Methods (40 CFR 53)

EPA Regulations for Pesticide Programs (40 CFR 150-186)

EPA Regulations Implementing the Resource Conservation and Recovery Act (40 CFR 260-270)

EPA Regulations on Criteria and Standards for the National Pollutant Discharge Elimination System (40 CFR 125)

EPA Regulations on Discharge of Oil (40 CFR 110)

EPA Regulations on Disposal Site Determination under the CWA (40 CFR 231)

EPA Regulations on Implementation of NEPA Procedures (40 CFR 6)

EPA Regulations on Insecticide, Fungicide, and Rodenticide Use (40 CFR 162)

EPA Regulations on Land Disposal Restrictions (40 CFR 268)

EPA Regulations on National Primary and Secondary Ambient Air Quality Standards (40 CFR 50)

EPA Regulations on Regional Consistency under the Clean Air Act (40 CFR 56)

EPA Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans (40 CFR 51-52)

EPA Requirements for Water Quality Planning and Management (40 CFR 130)

EPA Special Exemptions from Requirements of the Clean Air Act (40 CFR 69)

Erosion Protection Act (33 U.S.C. 426)

Estuary Protection Act (16 U.S.C. 1221)

Farmland Protection Act (7 U.S.C. 4201 et seq.)

Federal Compliance with Pollution Control Standards (42 U.S.C. 4321)

Federal Consistency with Approved Coastal Management Programs (15 CFR 930)

Federal Facilities Compliance Act of 1992 (42 U.S.C. 6961)

Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 136 et seq.)

Federal Land Policy and Management Act (43 U.S.C. 1701)

Federal Noxious Weed Act (7 U.S.C. 2801 et seq.)

Federal Plant Pest Act (7 U.S.C. 150aa et seq.)

Federal Water Pollution Control Act (Clean Water Act) (33 U.S.C. 1251 et seq.)

Fish and Wildlife Conservation Act (16 U.S.C. 2901 et seq.)

Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)

Fish and Wildlife Service List of Endangered and Threatened Wildlife (50 CFR 17)

Fishery Conservation and Management Act of 1976 (16 U.S.C. 1801 et seq.)

Floodplain Management (Executive Order 11988, as amended by Executive Order 12148 and 13286)

Forest Resources Conservation and Shortage Relief Act (16 U.S.C. 620 et seq.)

Historic Sites Act of 1935 (16 U.S.C. 461 et seq.)

Hunting and Fishing on Federal Lands (10 U.S.C. 2671 et seq.)

Implementation of Section 311 of the Federal Water Pollution Control Act of October 18, 1972, as amended, and the Oil Pollution Act of 1990 (Executive Order 12777, as amended by Executive Order 13286)

Interagency Cooperation Endangered Species Act of 1973(50 CFR 402)

Invasive Species (Executive Order 13112)

Lacey Act (16 U.S.C. 701) and Lacey Act Amendments of 1981 (16 U.S.C. 3371–3378)

Land and Water Conservation Act of 1965 (16 U.S.C. 4601 et seq.)

Legacy Resource Protection Program Act (PL 101–511)

Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801)

Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 et seq.)

Marine Protected Areas (Executive Order 13158)

Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1401 et seq.)

Migratory Bird Conservation Act (16 U.S.C. 715 et seq.)

Migratory Bird Treaty Act (16 U.S.C. 703–711)

Migratory Birds List (50 CFR 10.13)

Military Construction Authorization Act of 1956 - Leases; non-excess property (10 U.S.C. 2667)

Military Construction Authorization Act of 1956 - Sale of Certain Interests in Lands; Logs (10 U.S.C. 2665)

Military Construction Authorization Act of 1956- Military Reservations and Facilities: Hunting, Fishing, and Trapping (10 U.S.C. 2671)

Military Construction Authorization Act of 1975 (10 U.S.C. 2665)

Military Reservation and Facilities: Hunting, Fishing and Trapping (10 U.S.C. 2671)

Multiple-Use Sustained Yield Act (16 U.S.C. 528)

National Defense Authorization Act for Fiscal Year 1999 (PL 105-261)

National Defense Authorization Act for Fiscal Year 2003 (PL 107-314)

National Defense Authorization Act for Fiscal Year 2004 (PL 108-136)

National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.)

National Heritage Policy Act of 1979 (16 U.S.C. 470)

National Historic Landmarks Program (36 CFR 65)

National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.)

National Historic Preservation Act Regulations for the Protection of Historic Properties (36 CFR 800)

National Oceanic and Atmospheric Administration Coastal Zone Management Program Development and Approval Regulation (15 CFR 923)

National Register of Historic Places (36 CFR 60)

National Register of Historic Places, current edition (36 CFR 60 78, 79, 800, and 1228)

National Trails System Act of 1968 (16 U.S.C. 1271)

Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001-3013)

Natural Resources Management Program (32 CFR 190)

Neotropical Migratory Bird Conservation Act (16 U.S.C. 6101 et seq.)

Nonindigenous Aquatic Nuisance Prevention and Control Act as amended (16 U.S.C. 4701et seq.)

North American Wetlands Conservation Act (16 U.S.C. 4401 et seq.)

Noxious Plant Control Act (43 U.S.C. 1241).

Ocean Dumping Regulations and Criteria (40 CFR 220, 227)

Off-Road Vehicles Use on Public Lands (Executive Order 11989)

Oil Pollution Control Act of 1990 (33 U.S.C. 2701 et seq.)

Outdoor Recreation - Federal/State Program Act (16 U.S.C. 4601 et seq.)

Outer Continental Shelf Air Regulations (40 CFR 55)

Partners for Fish and Wildlife Act (16 U.S.C. 3771 et seq.)

Plant Quarantine Act (7 U.S.C. 151-167)

Pollution Prevention Act (42 U.S.C. 13101 et seq.)

Protection and Enhancement of Environmental Quality (Executive Order 11514, as amended by Executive Order 11541 and 11991)

Protection and Enhancement of the Cultural Environment (Executive Order 11593)

Protection of Wetlands (Executive Order 11990, amended by Executive Order 12608)

Recreational Fisheries (Executive Order 12962, as amended by Executive Order 13474)

Regulations Concerning Marine Mammals (50 CFR 10)

Regulations Concerning Marine Mammals (50 CFR 18, 216, 228)

Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.)

Responsibilities of Federal Agencies to Protect Migratory Birds (Executive Order 13186)

Rivers and Harbors Act of 1889 (33 U.S.C. 403 et seq.)

Safe Drinking Water Act (42 U.S.C. 300(f) et seq.)

Sales of Forest Products on Federal Lands (10 U.S.C. 2665 et seq.)

Salmon and Steelhead Conservation and Enhancement Act (16 U.S.C. 3301-3345)

Sikes Act Improvement Act of 1997 (16 U.S.C. 670a et seq.)

Soil and Water Conservation Act (16 U.S.C. 2001 et seq.)

Soil Conservation (16 U.S.C. 5901)

Strengthening Federal Environmental, Energy, and Transportation Management (Executive Order 13423)

Water Pollution Prevention and Control (33 U.S.C. 1251 et seq.)

Wetland Resources (16 U.S.C. 3901)

Wild and Scenic River Act (16 U.S.C. 1274)

Youth Conservation Corps Act of 1972 (16 U.S.C. 1701)

FEDERAL GUIDELINES

Cooperative Agreement between the Department of Defense and The Nature Conservancy for Assistance in Natural Resources Inventory

Memorandum of Agreement for Federal Neotropical Migratory Bird Conservation Program and Addendum (Partners in Flight-Aves De Las Americas) among the Department of Defense, through Each of the Military Services, and Over 110 Other Federal and State Agencies and Nongovernmental Organizations

Memorandum of Agreement for Professional and Technical Assistance Conducting Biological Surveys, Research and Related Activities between the Department Of Defense and the National Biological Service of the Department of the Interior

Memorandum of Understanding between Department of Defense, U.S. Fish and Wildlife Service, and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resources Management Program on Military Installations

Memorandum of Understanding between the Environmental Protection Agency and the Department of Defense with Respect to Integrated Pest Management

Memorandum of Understanding for Watchable Wildlife Programs

USACE *1987 Wetland Delineation Manual*

DEPARTMENT OF DEFENSE POLICY, REGULATIONS AND GUIDANCE

AR 200–1, *Environmental Protection and Enhancement*

Environmental Analysis of Army Actions (32 CFR 651)

AR 200–4, *Cultural Resources Management*

AR 200–5, *Pest Management*

AR 210–9, *Use of Off-Road Vehicles on Army Lands*

AR 210-20, *Master Planning*

AR 350–19, *The Army Sustainable Range Program*

AR 405–80, *Granting Use of Real Estate*

Army Goals and Implementing Guidance For Natural Resources Planning Level Survey and Integrated Natural Resources Management Plan

Army Guidance for the Implementation of the Sikes Act Improvement Act

Army Policy and Guidance on Critical Habitat Designations

Army Policy Guidance for Fish & Wildlife Conservation Fund

Army Policy Guidance for Management and Control of Invasive Species

Army Policy Guidance on Migratory Bird Treaty Act

Department of Army Memorandum, Sustainable Design and Development Policy Update – SPiRiT to LEED Transition

Department of Army Pam 420–7, *Natural Resources – Land, Forest, and Wildlife Management*

Department of Army, *Army Forest Inventory Guidance*

Deputy Under Secretary of Defense Memorandum, *Integrated Natural Resource Management Plan Template*

DOD Directive 3200.15, *Sustainment of Ranges and Operating Areas*

DOD Directive 4001.1, *Installation Management*

DOD Directive 4140.1, *Material Management Policy*

DOD Directive 4150.7, *DOD Pest Management Program*

DOD Directive 4165.57, *Air Installations Compatible Use Zones*

DOD Directive 4165.59, *DOD Implementation of the Coastal Zone Management Act*

DOD Directive 4165.61, *Intergovernmental Coordination of DOD Federal Development Programs and Activities*

DOD Directive 4700.2, *Secretary of Defense Award for Natural Resources and Environmental Management*

DOD Directive 4700.4, *Natural Resources Management Program*

DOD Directive 4705.1, *Management of Land-Based Water Resources in Support of Joint Contingency Operations*

DOD Directive 4710.1, *Archaeological and Historic Resources Management*

DOD Directive 4715.1, *Environmental Security*

DOD Instruction 4715.03, *Natural Resources Conservation Program*

DOD Directive 4715.4, *Pollution Prevention*

DOD Directive 4715.6, *Environmental Compliance*

DOD Directive 4715.7, *Environmental Restoration Program*

DOD Directive 4715.9, *Environmental Planning and Analysis*

DOD Directive 4751.DD-R, *Draft Integrated Natural Resources Management in the Department of Defense*

DOD Directive 5030.41, *Oil and Hazardous Substance Pollution Prevention and Contingency Program*

DOD Directive 6050.1, *Environmental Effects in the U.S. of DOD Actions*

DOD Directive 6050.15, *Prevention of Oil Pollution from Ships Owned or Operated by the Department of Defense*

DOD Directive 6050.2 (as amended), *Use of Off-Road Vehicles on DOD Lands*

DOD Directive 6050.4, *Marine Sanitation Devices for Vessels Owned or Operated by DOD*

DOD Directive 6050.5, *DOD Hazard Communication Program*

DOD INRMP Handbook, *Resources for INRMP Implementation*

DOD Instruction 5000.13, *Natural Resources - The Secretary of Defense Natural Resource Conservation Award*

DOD Instruction 6055.6, *DOD Fire and Emergency Services Program*

DOD Memorandum on Implementation of Ecosystem Management in DOD

DOD Urban Forestry Manual

Emergency Consultations under the Endangered Species Act

Supplemental Army Policy Guidance on Migratory Bird Treaty Act

APPLICABLE STATE AND LOCAL REGULATION

Aquatic Invasive Species (Fish & Game Code 2300-2302)

Ballast Management for Control of Nonindigenous Species Act of 1999 (California Public Resources Code 71200-71271)

Birds (Fish & Game Code 3500-3864)

California Coastal Act (Public Resources Code 30000-30900)

California Endangered Species Act (Fish & Game Code 2050 et seq.)

California Environmental Quality Act (Public Resources Code 21000-21177)

California Harbors and Navigation Code (Division 1.5 Sections 90-153, Division 2 Sections 240-308, Division 3 Sections 650-685, and Division 6 Sections 1690-3980)

California Ocean Protection Act (Public Resources Code 35500-35650)

California Riparian Habitat Conservation Program (Fish & Game Code 1385-1391)

California Waterfowl Habitat Program (Fish & Game Code 3460-3467)

California Watershed Protection and Restoration Act (Public Resources Code 5808-5808.2)

California Wildlife Protection Act (Fish & Game Code 2780-2799.6)

California Wildlife, Coastal, and Park Land Conservation Act (Public Resources Code 5900 et seq.)

Coastal Ecosystems Protection Act of 2006 (California Public Resources Code 71205.3)

Cobey-Alquist Flood Management Act (Water Code 8400-8415)

Conservation and Management of Marine Living Resources (Fish & Game Code 7050-7090)

Conservation of Aquatic Resources (Fish & Game Code 1700)

Conservation of Wildlife Resources (Fish & Game Code 1801-1802)

Conservation, Development, and Utilization of State Water Resources (Water Code 10004-10013)

Fish (Fish & Game Code 6400-6930)

Fish and Wildlife Habitat Enhancement Act of 1984 (Fish & Game Code 2600-2651)

Fish and Wildlife Protection and Conservation (Fish & Game Code 1600-1616)

Inland Wetlands Conservation Program (Fish & Game Code 1400-1431)

Mammals (Fish & Game Code 4150-4904)

Management of Fish and Wildlife on Military Lands (Fish & Game Code 3450-3453)

Marine Invasive Species Act of 2003 (California Public Resources Code 71200)

Marine Life Protection Act (Fish & Game Code 2850-2863)

Native Plant Protection (Fish & Game Code 1900-1913)

Native Species Conservation and Enhancement (Fish & Game Code 1750-1772)

Natural Community Conservation Planning Act (Fish & Game Code 2800-2835)

Ocean Use Planning (Public Resources Code 30960)

Pesticides and Pest Control Operations (Food and Agriculture Code 6000 et seq.)

Porter-Cologne Water Quality Control Act (Water Code 13000 et seq.)

Refuges (Fish & Game Code 10500-10932)

Reptiles and Amphibians (Fish & Game Code 5000-5050)

San Diego County Zoning Ordinance (Section 4000 – 4920)

Stream Alteration Controls (Water Code 5653, 1601 et seq.)

The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006(Public Resources Code 75001-75130)

Urban Forestry (Public Resources Code 4799.06-4799.12)

Watershed, Clean Beaches, and Water Quality Act (Public Resources Code 30901-30960)

Wetlands Mitigation Banking (Fish & Game Code 1850-1852)

Wetlands Preservation (Public Resources Code 5810-5818.2)

Wildlife and Natural Areas Conservation Program (Fish & Game Code 2700-2729)

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APPENDIX C

INRMP PROJECTS, SCHEDULES, AND IMPLEMENTATION TABLE

Table C-1. Fort Hunter Liggett INRMP Projects and Implementation Table

INRMP Subject Area	Project Description	Federal, State, DoD or DA Law, Policy or Guidance[1]	DoD Class	Fiscal Year	Est. Cost	Date Project Completed	Initials
NEPA Environmental Review	Conduct Environmental Review (FHL Regulation 200-2) to identify actions that may result in adverse effects on sensitive resources or that require a compliance action, such as consulting with, obtaining a permit from, or notifying a regulatory agency.	SAIA, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
NEPA Environmental Review	Coordinate with the proponent to develop and implement measures that minimize adverse effects while supporting sustainable operations and military training.	SAIA, DoD Instruction 47150.3, AR 200-1	2a	2011 - 2015			
NEPA Environmental Review	Develop a checklist or questionnaire for project proponents to describe a project. Incorporate the checklist/questionnaire information into the Environmental Review database so consistent reports of decision processes can be produced with a simple query.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
NEPA Environmental Review	Include consideration of impacts on resources protected by federal law described in AR 200-2 as well as state-listed species, state-protected vegetation communities, CNPS List 1 and 2 species, vernal pools, native oak, bunch grass stands, and other sensitive resources in the Environmental Review process.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
NEPA Environmental Review	Continue land-use regulations as described in FHL Training Regulation 350-2. Requirements to avoid wet areas, cross only at established fording sites, minimize off-road vehicle travel, and conduct high explosives training at designated areas could have direct conservation benefits.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
NEPA Environmental Review	Implement a post action monitoring phase of the Environmental Review process. Documentation should be included as part of the Environmental Review database and include dates of surveys, purpose, photos, GIS data as applicable, and purpose for follow up monitoring (e.g., proximity to a listed species site or verifying project parameters).	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Cultural Resources	Maintain trained government staff at the appropriate level to include cultural resources manager, natural resources manager, wildlife biologist, and compliance program manager to oversee, integrate, and coordinate natural and cultural resources.	SAIA, DoD Instruction 47150.3, AR 200-1	1	2011 - 2015			
Cultural Resources	Develop environmental coordination maps and educational materials for military training units, Roads and Grounds, and the Fire Department to facilitate resources protection and enhance environmental compliance.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2012			
Cultural Resources	Improve cultural and natural resources program coordination to identify and implement appropriate management activities that enhance inter-program protection and conservation while supporting sustainable operations and military training.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Law Enforcement	Coordinate law enforcement effort for natural and cultural resource program needs among Law Enforcement and PWE staff.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Law Enforcement	Support a full time warden to address the hunting and fishing program (DES).	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Conservation Education	Provide annual natural and cultural resources program briefings to Roads and Grounds and the Fire Department.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Conservation Education	Provide input as needed for ITAM educational materials to troops.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Conservation Education	Participate in Earth Day activities at FHL, and, as requested, provide briefings to school-age class groups.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Conservation Education	Support research activities for species occurring on FHL, particularly for university and government research projects, as access to TAs permits.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			

INRMP Subject Area	Project Description	Federal, State, DoD or DA Law, Policy or Guidance[1]	DoD Class	Fiscal Year	Est. Cost	Date Project Completed	Initials
Conservation Education	Attend training and conferences as funding permits (natural and cultural resources staff). Examples include attending the annual conferences for National Military Fish and Wildlife Association, and western section of The Wildlife Society meeting; participating in webinars; and attending training courses.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Conservation Education	Investigate and implement methods to improve communication with FHL users and the public that promotes environmental awareness (e.g., maintaining an informative website, creating pamphlets and standard operating procedures, developing informational posters).	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Conservation Education	Provide environmental briefings to unit leaders prior to large training exercises.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Planning Level Surveys	Use topographic, surface water, and soils data in GIS format to assist in land use and conservation planning. Update data as improved data sources become available.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Planning Level Surveys	ITAM's RTLA program and PWE update the floristic inventory flora list as needed by maintaining an electronic list available to both programs and updating plant collections as new species are found. Santa Barbara Botanic Garden Herbarium provides technical expertise associated with ongoing Floristic Survey additions to the FHL RTLA reference plant collection, and maintains a large collection of FHL voucher specimens.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Planning Level Surveys	Use data from incidental observations, birds surveys (e.g., MAPS, least Bell's vireo transects), and deer and kit fox spotlight surveys to update an electronic list of birds and mammals sighted on FHL. Continue documenting nongame species that are incidentally observed during sensitive species surveys.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2012			
Planning Level Surveys	Conduct annual monitoring surveys for threatened and endangered species and bald and golden eagles, which include collecting and storing GIS data and monitoring results. Methods and results are reported in the annual INRMP implementation report submitted to USFWS and CDFG.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Planning Level Surveys	Conduct or contract for quarterly or semiannual geodatabase updates to incorporate recent survey findings for threatened and endangered species and bald and golden eagles.	SAIA, ESA, CESA, CA Mgmt of Fish and Wildlife on Military Lands (CA MIL), DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Planning Level Surveys	Conduct or contract a wetlands delineation for major land use areas on the installation. In areas in or near future development, obtain jurisdictional determination for wetlands.	SAIA, CWA, CA Wetlands Preservation, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Planning Level Surveys	Conduct or contract a survey to identify and map major vegetation communities using the Keeler-Wolf classification system, producing GIS data compatible with ArcGIS software.	SAIA, DoD Instruction 4715.03, AR 200-1	2a	2012			
Planning Level Surveys	Conduct annual monitoring at known large bat colonies, such as Interlake Bridge. Investigate and implement cost-effective bat survey techniques for additional bat surveys.	SAIA, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Planning Level Surveys	Initiate efforts to inventory mammal, avian, reptile, amphibian, fish, invertebrate, and crustacean species occurrence on FHL; combine survey efforts as appropriate to minimize redundant effort and cost.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Soil Erosion	Monitor construction projects and training sites as part of the post-action monitoring phase of the Environmental Review process. Work with project proponents to identify potential erosion sites. Coordinate with Roads and Grounds if heavy equipment work is needed. Reseed with predominantly native seed mixtures or restore as needed.	SAIA, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Soil Erosion	ITAM monitors and restores training-related land erosion or potential erosion sites by reseeding with native mixtures or minor earthwork to repair erosion and prepare sites for reseeding.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			

INRMP Subject Area	Project Description	Federal, State, DoD or DA Law, Policy or Guidance[1]	DoD Class	Fiscal Year	Est. Cost	Date Project Completed	Initials
Soil Erosion	PWE and DPW Roads and Grounds will monitor road maintenance and emergency firebreaks as part of the post-action monitoring phase of the Environmental Review process.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2011 - 2015			
Soil Erosion	To reduce excessive erosion at highly used training sites, LRAM program will investigate if construction of hardened bivouac sites, troop assembly sites, and river and stream fording sites is feasible or necessary and implement projects as funding permits.	SAIA, DoD Instruction 47150.3, AR 200-1	2c	2012			
Soil Erosion	Develop a standard BMP list to prevent adverse erosion and sedimentation on FHL, and incorporate into an Erosion Control Plan to include as appendix in this INRMP. Provide BMP list to DPW Roads and Grounds, construction engineer training units, and construction contractors. The Erosion Control Plan should include the following: o A review of critical slopes on FHL. o The identification of highly erodible soil types present as described in the soil survey. o An analysis of applicable federal, state, and local regulatory requirements for erosion and sedimentation control. o The identification of erosion and sedimentation BMPs applicable to FHL. o A description of how to select, install, and maintain erosion-control measures, and establish protocols for revegetation of disturbed areas. o An example Erosion and Sedimentation Control Plan for a generic project that can be tailored for use at FHL. o Requirement that all earth-moving activities (including contractor operations) comply with an Erosion and Sedimentation Control Plan.	SAIA, CWA, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Pollutants	Implement provisions of the FHL Industrial SWPPP (Radian Corporation 1995) to include BMPs, monitoring, reporting, and modifying BMPs as needed.	SAIA, CWA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Pollutants	To maximum extent feasible, maintain 100-foot buffer between wetlands, riparian areas, or drainages and construction or other ground-disturbance areas in accordance with American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 189.1, as part of the Army Sustainability Policy; and maintain 50-foot buffer between minor drainages and construction or disturbance.	SAIA, CWA, CA Wetlands Preservation, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Pollutants	Monitor groundwater to include drinking water per the Safe Drinking Water Act, monitoring for suspected pollution sources, and monitoring at known plumes.	SAIA, CWA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Natural Resources Monitoring, Protection, and Restoration	ITAM's RTLA and LRAM programs collect data on bivouacs and other heavily used sites and identify land-use measures that might minimize land disturbance, or restoration actions to recontour and revegetate sites, as needed.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Natural Resources Monitoring, Protection, and Restoration	ITAM coordinates with Range Control to site military missions in areas best capable of supporting those missions. PWE coordinates with project proponents through the Environmental Review process for best project siting to protect resources and support the mission.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Natural Resources Monitoring, Protection, and Restoration	The RTLA component of the ITAM program conducts long-term resource monitoring to detect vegetation changes caused by military activities.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Natural Resources Monitoring, Protection, and Restoration	PWE and RTLA identify invasive weeds during RTLA surveys and incidental observations. PWE and LRAM identify and implement control measures.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Natural Resources Monitoring, Protection, and Restoration	The LRAM component of the ITAM program evaluates and prioritizes active erosion sites. Subject to funding, ITAM implements an average of three projects per year from the Training Land Rehabilitation Plan.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			

INRMP Subject Area	Project Description	Federal, State, DoD or DA Law, Policy or Guidance[1]	DoD Class	Fiscal Year	Est. Cost	Date Project Completed	Initials
Natural Resources Monitoring, Protection, and Restoration	Develop and implement a native vegetation management plan that includes management actions for oak, riparian areas, and native grass vegetation communities. Specific actions should include using GIS data to develop large-scale management units by classifying areas by dominant vegetation (e.g., valley oak savanna, blue oak woodland). Within these, identify locations most frequently used for military training, annual burn sites, and endangered species habitats. Identify management and monitoring requirements in the management units, such as exotic species control, propagating and replanting oaks, and assessing effects of frequent fire. Identify the status of stands in management units, such as recruitment of oaks, a sampling of stand density, and health of trees in the stand. Identify areas where oaks historically occurred that might support restored oak stands. Identify areas where oak recruitment is most likely to be successful and focus efforts at those locations.	SAIA, DoD Instruction 4715.03, AR 200-1	2b	2012			
Natural Resources Monitoring, Protection, and Restoration	Enhance and adapt existing databases for natural resources data collection, and acquire applicable databases from outside sources for application in GIS, as needed.	SAIA, DoD Instruction 4715.03, AR 200-1	2b	2012			
Natural Resources Monitoring, Protection, and Restoration	Develop specifications and standards for reseeding/revegetation of disturbed sites for use in contracts, maintenance, and other projects.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 – 2015			
Natural Resources Monitoring, Protection, and Restoration	Identify actions that can be undertaken by troops to reduce impact to listed species (e.g., discourage parking vehicles under trees at TTB to avoid compacting soil). Coordinate with DPTMS to identify appropriate management actions to reduce adverse impacts on natural resources resulting from training exercises.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Surface Waters and Wetlands	Initiate water chemistry data collection in San Antonio and Nacimiento rivers per pilot plan initiated in winter 2011. Include summary of data results in annual INRMP implementation report.	SAIA, CWA, CA Wetlands Preservation, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Surface Waters and Wetlands	Prepare a general wetlands management plan based on the 1995 National Wetlands Inventory data and incorporate this plan into the INRMP. The plan will provide a list of wetlands, their type and status (e.g., delineated, jurisdictional), maps with GIS data, threats based on current and future FHL activities, monitoring to ensure no net loss, and site-specific protection or restoration actions as needed.	SAIA, CWA, CA Wetlands Preservation, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Surface Waters and Wetlands	Add significant wetlands areas to the environmental resources layer of ITAM's GIS planning tool, which is called Geographic Information Supporting Military Operations (GISMO).	SAIA, CWA, CA Wetlands Preservation, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Riparian Areas	Monitor riparian health through annual photo-plots to identify improvements or degradation (see **Appendix I**). Identify and implement restoration as needed.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Riparian Areas	Protect waterways and their associated riparian areas through land use limitations identified in FHL Regulation 350-2.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Native Oak Communities	Implement FHL 350-2 prohibition on cutting live oaks for training purposes.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Native Oak Communities	Collect local acorns and seeds for revegetation projects. Propagate and transplant 75-100 valley oaks annually at tactical concealment sites (ITAM) or oak mitigation sites (PWE).	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Native Oak Communities	Design construction projects to minimize oak loss and mitigate as needed.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2012			
Native Oak Communities	Initiate monitoring program to assess effects of frequent fires on valley oaks. Plant oak seedlings from locally collected acorns in affected areas.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Native Bunch Grass Communities	Reseed areas disturbed during training activities (LRAM is lead) or FHL projects (PWE is lead) using a mixture of native grasses and forbs.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			

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Native Bunch Grass Communities	Include as a contract requirement for military construction projects reseeding of disturbed areas at construction sites with native grasses and forbs.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Native Bunch Grass Communities	Collect local native bunch grass seeds for re-vegetation projects.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Native Bunch Grass Communities	Develop and maintain a GIS layer of locations of notable native grassland communities.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2b	2011 – 2015			
Rock Outcrops	Prohibit unauthorized destruction, removal, movement, or any activities that could degrade rock formations. Limit rappel activities to authorized military training at appropriate sites approved by Range Control and PWE; approved sites will avoid disturbance to raptors and degradation from bolts and erosion.	SAIA, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Invasive Plant Species	Apply proven habitat restoration practices to promote native vegetation in previously disturbed areas.	SAIA, EO 13112, CA MIL, CA Native, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Invasive Plant Species	Implement the Integrated Weed Management Plan for the Control of Yellow Star-thistle (Joley et al. 1999, 2000, 2001). o Monitor and continue releases of biocontrol agents to sustain sufficient populations to reduce yellow star-thistle reinfestations and reduce yellow star-thistle in areas where it cannot be sprayed or otherwise controlled. o Continue aerial spraying of Transline® herbicide in severe infestation areas. o Implement control techniques identified in the *Yellow Star-thistle Management Guide*. o Work with USACE ERDC to test the ability of native California plant species to persist and resist yellow star-thistle reinvasion of sites treated previously with mechanical removal methods (burn, spray, hand-pulling, disking). o Monitor thistle populations on the installation to identify if proliferation of the species is adversely impacting native species or training.	SAIA, EO 13112, CA MIL, CA Native, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Invasive Plant Species	Develop and implement a plan for tamarisk removal that includes mapping tamarisk along the San Antonio River; prioritizing infestation areas based on proximity to arroyo toad breeding habitat, size of infestation, and potential for further spread; and removing plants by hand-cutting or injuring plants and painting stumps/injured bark with herbicide (Rodeo® or Roundup®) and introducing biological control agents.	SAIA, EO 13112, CA MIL, CA Native, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Invasive Plant Species	Develop and implement action plans for controlling or eliminating new invasive plant species (e.g., hand pulling as soon as an invasive has been identified has been highly effective at small patches).	SAIA, EO 13112, CA MIL, CA Native, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Recreational Use	Provide preplanning coordination regarding sensitive resources; share knowledge of resources of interest with FMWR.	SAIA, CWA, CA Wetlands Preservation, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Recreational Use	Regularly monitor the FHL mountain bike course to identify potential erosion sites and recommend action for FMWR to implement to minimize and mitigate erosion.	SAIA, CWA, DoD Instruction 4715.03, AR 200-1	2c	2011			
Recreational Use	Identify off-road vehicle trespassing by hunters or other public, and close and restore trails.	SAIA, CWA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Recreational Use	Review any future EAs for use of motorized off-road vehicles. Any motorized off-road vehicle proposal would need to take into consideration potential impacts such as damage to cultural and natural resources, noise disruption to wildlife and adjoining properties, dust, introduction or spread of invasive weeds, and erosion associated with ground disturbance.	SAIA, CWA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			

INRMP Subject Area	Project Description	Federal, State, DoD or DA Law, Policy or Guidance[1]	DoD Class	Fiscal Year	Est. Cost	Date Project Completed	Initials
Wildland and Prescribed Fire	PWE and the ITAM program assist the Fire Department in developing and reviewing annual burn plans, and in mapping the actual extent of annual prescribed and wild fires.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Wildland and Prescribed Fire	PWE and the ITAM program coordinate with the FHL Fire Department to use prescribed fire to manipulate vegetation to achieve natural resource and training goals and objectives.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Wildland and Prescribed Fire	The Fire Department develops and implements an annual prescribed burn plan in accordance with applicable permits and FHL Environmental Review.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Wildland and Prescribed Fire	The Fire Department fights wildfires as appropriate to reduce wildland and facility damage and prevent injury.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Wildland and Prescribed Fire	Evaluate fire history and vegetation communities using GIS to determine major shifts in vegetation communities, such as conversion of oak savannas to grasslands.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Wildland and Prescribed Fire	Assist the Fire Department in completing the Integrated Wildland Fire Management Plan as required by AR 200-1.	SAIA, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Fuel Wood	Limit fuel wood cutting to the following: o FHL soldiers and civilians that are Monterey County residents for personal use within Monterey County. o Targeted areas for heavy fuels reduction in coordination with the FHL Fire Department. o Spring and fall. Avoid wet season conditions that exacerbate spread of sudden oak death syndrome and increase likelihood of damage due to vehicles getting stuck while retrieving wood. Avoid dry season conditions that increase wild fire risk.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Fuel Wood	Prohibit fuel wood cutting in TAs 11, 14, 17, 18, 23, 26, and 28 as these areas are more likely to be affected by sudden oak death syndrome due to proximity to the coast ridge and greater annual precipitation.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Fuel Wood	Monitor annually for sudden oak death syndrome.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Fuel Wood	Evaluate program annually for feasibility of keeping the program open.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Integrated Pest Management	Update the FHL IPMP to ensure that the plan reflects changes in pest populations and current management issues. PWE will include the revised IPMP as appendix in this INRMP.	SAIA, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Integrated Pest Management	Continue to implement pest management controls from the IPMP and other pest-related guidance and plans. Tracks usage of active ingredients per reporting requirements.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Integrated Pest Management	Conduct surveys of pests that pose a potential health risk to humans or natural resources.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2013			
Cantonment Area Management	Support DPW-Master Planning Division in developing ADPs and an Installation Design Guide that makes best use of existing native trees; conserves floodplains, drainages, and topography; and enhances aesthetic and structural standards fitting to the area and local historic structures.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2012			
Cantonment Area Management	Provide professional advice to assist the grounds landscaping and maintenance program toward the use of native species by developing a list of native plants that can be used in cantonment landscaping.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2012			
Compliance with the ESA	Consult with USFWS or NMFS for FHL actions that may affect federally listed species and comply with biological opinions issued under Section 7 of ESA. FHL currently complies with a PBO issued in 2010 that addressed current and future projected operations and maintenance activities, military training activities, cantonment and range development, and implementation of the 2004 FHL INRMP.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Compliance with the ESA	Prioritize INRMP activities to guide management actions and funding expenditures.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			

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Compliance with the ESA	Integrate protection measures and management actions with military training to minimize the amount of lands closed to military training by ensuring that DPTMS is aware of restrictions (e.g., breeding season), and develop materials to distribute to troops about the species they may encounter at FHL.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Compliance with the ESA	Identify conservation and minimization actions that adversely impact training capabilities during Section 7 consultations with USFWS. By clearly describing the military mission requirement, USFWS and FHL can adapt conservation and minimization measures to comply with ESA while supporting military needs.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Compliance with the ESA	Consult with USFWS regarding implementing this revised INRMP and pesticide usage.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Compliance with the MBTA	Conduct surveys of activity sites as needed to determine if migratory bird nests are present and active. If take is unavoidable and would require an MBTA permit, FHL will apply for an appropriate permit for intentional take of migratory birds.	SAIA, MBTA, DoD Instruction 4715.03, AR 200-1, Army MBTA Guidance	2b	2011 - 2015			
Compliance with the MBTA	Participate with the MAPS survey and the California Chapter of Partners in Flight initiatives as appropriate.	SAIA, MBTA, DoD Instruction 4715.03, AR 200-1, Army MBTA Guidance	2c	2011 - 2015			
Compliance with the MBTA	Work with project proponents and FHL directorates to develop effective management for minimizing the unintentional take of migratory birds.	SAIA, MBTA, DoD Instruction 4715.03, AR 200-1, Army MBTA Guidance	2c	2011 - 2015			
Compliance with the MBTA	Conduct acoustic transect surveys in grassland, oak savanna, oak woodland, and riparian vegetation communities to identify trends in species of concern and to maintain a list of migratory birds using those vegetation communities at FHL.	SAIA, MBTA, DoD Instruction 4715.03, AR 200-1, Army MBTA Guidance	2b	2011 - 2015			
Compliance with the MBTA	Identify ownership and responsibilities for power lines and facilities on the base.	SAIA, MBTA, DoD Instruction 4715.03, AR 200-1, Army MBTA Guidance	2c	2011 - 2015			
Compliance with the MBTA	Identify and mitigate bird/wildlife-aircraft strike hazards, such as near Tusi and Schoonover airfields.	SAIA, MBTA, DoD Instruction 4715.03, AR 200-1, Army MBTA Guidance	2b	2011 - 2015			
San Joaquin Kit Fox	Monitor predator indices of abundance in kit fox habitat biannually by means of night-time spotlighting and scent stations.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2012			
San Joaquin Kit Fox	If a kit fox is sighted within the past 12 months, conduct pre-activity surveys prior to ground disturbing activities in the valley in which the sighting occurred.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
San Joaquin Kit Fox	Conduct pre-activity surveys prior to poisoning of ground squirrels.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
San Joaquin Kit Fox	Conduct annual artificial kit fox den checks.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
San Joaquin Kit Fox	Update GIS data for kit fox and red fox observations.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
San Joaquin Kit Fox	Manage vegetation by implementing yellow star-thistle control and conducting prescribed burns.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
San Joaquin Kit Fox	Attend local resource agency meetings and coordinating with USFWS, and adapt management and monitoring as needed to address new information.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
California Condor	If a FHL action may adversely affect a California condor (e.g., a condor being in a live-fire zone of an active range), the FHL action must cease until the condor moves away from danger unless a USFWS-approved hazing strategy is implemented.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			

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California Condor	Coordinate with USFWS and Ventana Wilderness Society regarding California condor activities and requirements in the FHL area.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
California Condor	Develop management strategies in coordination with USFWS to address potential conflicts between condors and FHL activities, roads, and military overflights.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
California Condor	Establish and implement guidelines for condor hazing in accordance with USFWS requirements. Coordinate with USFWS and Ventana Wilderness Society to develop a training program for FHL staff to haze condors as needed to protect them from live-fire areas.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Bald and Golden Eagles	Identify locations of nesting and wintering bald and golden eagles, monitor active nesting sites, and estimate productivity.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Bald and Golden Eagles	Implement protection measures, such as seasonal limitations for military overflights at nest sites.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Bald and Golden Eagles	Continue to make improvements to fisheries, reservoirs, and rivers; such actions improve bald eagle habitat and food sources as funds are available.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Bald and Golden Eagles	Identify any actions that require an MBTA or BGEPA permit and, if necessary, obtain appropriate permit for intentional take.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011			
Least Bell's Vireo	Conduct least Bell's vireo listening surveys in suitable habitat. The monitoring protocol is based upon USFWS presence/absence surveys, but survey intensity is less than the protocol because protocol level surveys were conducted for more than 10 years with no detections. Surveys are focused on best available habitat, typically in Mission Creek riparian areas.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Arroyo Toad	Monitor populations for breeding success and disturbance around human activity areas.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Arroyo Toad	Implement protection measures as needed to minimize adverse effects of FHL activities, such as signage at river crossings and closing unauthorized river crossings.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Arroyo Toad	Conduct geomorphology study to identify processes affecting stream structure and succession in arroyo toad breeding habitat.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2013			
Arroyo Toad	Comply with CWA and EISA Section 438 to protect hydrology and water quality of arroyo toad breeding habitat.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Arroyo Toad	Control exotic species such as bullfrogs and beavers.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2012			
Arroyo Toad	Design and implement habitat improvement projects based on results of geomorphology studies.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2012			
Arroyo Toad	Implement SWAMP (surface water and ambient monitoring program) in San Antonio and Nacimiento Rivers to assess water quality.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Arroyo Toad	Implement monitoring of riparian and wetland health using the California Rapid Assessment Method along the San Antonio River in and near breeding habitat for the arroyo toad.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Arroyo Toad	Revise and update ESMP.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
California Red-legged Frog	Conduct red-legged frog surveys as suitable habitat is identified incidental to other surveys and in response to FHL activities that may adversely affect habitat suitable for red-legged frogs.	SAIA, CWA, CA Native Spp. Conservation and Enhancement (CA Native), DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			

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California Tiger Salamander	Conserve ephemeral pools.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2011 – 2015			
California Tiger Salamander	Coordinate with other agencies and researchers to make the FHL population available for research and teaching purposes.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2011 – 2015			
California Tiger Salamander	Conduct genetic studies using more up to date markers and methods to gain a better understanding of the degree of nonnativeness and origin of FHL tiger salamanders.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2011 – 2015			
California Tiger Salamander	Study effects on pool ecology of eradicating hybrid tiger salamanders from selected pools.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2011 – 2015			
Vernal Pool Fairy Shrimp	Annually monitor pools that support fairy shrimp for presence of vernal pool fairy shrimp, potential for or evidence of disturbance, adequacy of protection measures, exotic species encroachment, and evidence of succession.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 – 2015			
Vernal Pool Fairy Shrimp	Identify restoration opportunities to mitigate for loss of vernal pools due to natural succession.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
Vernal Pool Fairy Shrimp	Revise and update ESMP.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
Purple Amole	Update GIS data as necessary and archive redundant or inaccurate data.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Purple Amole	Continue to monitor population status and productivity, and develop and implement new studies, as warranted.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 – 2015			
Purple Amole	Monitor for disturbance around human activity areas.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Purple Amole	Implement protection measures as needed to minimize adverse effects of FHL activities.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2a	2011 - 2015			
Purple Amole	Design and implement habitat improvement projects.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Purple Amole	Review ecological studies conducted 1998-2011 and transition monitoring priorities to population and habitat monitoring.	SAIA, ESA, CESA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Santa Lucia Mint	Monitor Santa Lucia mint sites for yellow star-thistle encroachment and disturbance from human activities or flooding and erosion of stream banks where populations occur.	SAIA, ESA, CESA, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
Santa Lucia Mint	Identify areas of moderate or severe yellow star-thistle encroachment, and implement weed control, as needed.	SAIA, ESA, CESA, DoD Instruction 4715.03, AR 200-1	2b	2011 - 2015			
CNPS-listed Plant Species	Conduct periodic distribution surveys, particularly in areas where yellow star-thistle control has been implemented, to determine if additional occurrences of caper-fruited tropidocarpum are located at FHL. Data are stored in ArcGIS format.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011-2015			
CNPS-listed Plant Species	Annually monitor known populations for human disturbance, encroachment of yellow star-thistle or other invasive species, and continued presence of the species.	SAIA, DoD Instruction 4715.03, AR 200-1	2b	2011-2015			
Hunting	Establish desired hunter and harvest quotas based on population recruitment and mortality estimates, desired hunter density in the field, and access restrictions due to military training activities.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
Hunting	Coordinate with DES to provide sufficient law enforcement effort to deter violations of state and federal laws and regulations.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			

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Hunting	Consult regularly with FMWR and DPTMS-Range Control to determine hunting area access.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Hunting	Conduct spotlight surveys for deer and daytime composition counts for deer and elk for an index of population status in accordance with protocol within the Fish and Wildlife Management Plan, deer and elk component.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2013			
Hunting	Conduct antlerless hunts based on the previous year's buck kill and fall rainfall.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Hunting	Conduct check station data collection to determine herd health.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Hunting	Provide CDFG with annual population and harvest data for big game annually in December.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Hunting	Coordinate with CDFG to reevaluate population goal of 300 set in the 1995 Elk Management Plan, as population exceeds that goal.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Hunting	Develop and implement a deer and an elk component for the FHL Fish and Wildlife Management Plan that includes protocols for how FHL will handle deer and elk tags, and harvest data collection and reporting to CDFG.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011			
Hunting	Conduct waterfowl/waterbird surveys to determine waterfowl presence at FHL.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
Hunting	Implement cooperative agreements with various conservation agencies for FHL's hunting and fishing program.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Hunting	Increase the number of military A-33 and J-10 tags from 25 to 40 and 10 to 15 respectively.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Fisheries Management	Monitor pond and reservoir water quality on a monthly basis. Use monitoring results to guide management actions that reduce occurrences of summer fish kills.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011-2015			
Fisheries Management	Continue barley straw treatment to reduce algae growth.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011-2015			
Fisheries Management	Initiate dam repairs and investigate deepening of reservoir shorelines.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
Fisheries Management	Investigate methods to prevent summer fish kill.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2012			
Fisheries Management	Relocate fish between established fishing reservoirs to restore depleted or expired fisheries.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Summer Water Sources	Conduct annual spring and guzzler maintenance and identify potential new guzzler locations. Establish escape cover (e.g., brush piles) around guzzlers in open terrain areas.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011-2015			
Summer Water Sources	Maintain a GIS layer of artificial and natural water sources.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011			
Summer Water Sources	Install and upgrade to big game, wildlife guzzlers in hunt areas 2, 6, 7, 10, and 25.	SAIA, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Amphibian Disease	Identify potential for threatening diseases at FHL by identifying which diseases are most likely to occur at FHL, how they are transmitted, and the species potentially affected.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2013			

INRMP Subject Area	Project Description	Federal, State, DoD or DA Law, Policy or Guidance[1]	DoD Class	Fiscal Year	Est. Cost	Date Project Completed	Initials
Amphibian Disease	Review protocols for existing and proposed surveys to identify ways to reduce the potential for infections (e.g., boot and hand cleaning between survey areas, minimizing activities in breeding or wet areas). Measures in Appendix B, "Recommended Equipment Decontamination Procedures" of the USFWS's August 2005 *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* should be included in protocols.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2011-2015			
Amphibian Disease	Survey for the presence of pathogens in FHL amphibians.	SAIA, CA MIL, DoD Instruction 4715.03, AR 200-1	2c	2013			
Habitat Improvement	Continue to provide and maintain wood duck nest boxes in conjunction with California Waterfowl Association's Wood Duck Program.	SAIA, CA MIL, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Habitat Improvement	Identify and remove abandoned or unnecessary cattle fencing.	SAIA, CA MIL, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Habitat Improvement	Investigate the need to alter fencing to improve wildlife movement. Install wildlife-friendly fence modifications where appropriate.	SAIA, CA MIL, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2-12			
Habitat Improvement	Monitor vehicle collisions with wildlife, installing cautionary wildlife crossing signage where appropriate.	SAIA, CA MIL, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2012			
Habitat Improvement	Investigate need for other nesting enhancement (e.g., artificial burrowing owl burrows and blue bird boxes).	SAIA, CA MIL, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2013			
Habitat Improvement	Investigate control of non-native Asian carp in arroyo toad habitat in the San Antonio River.	SAIA, CA MIL, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			
Habitat Improvement	Improve native trout populations in the Nacimento River by relocating non-native bass from the river to FHL's fishing ponds.	SAIA, CA MIL, CA Habitat Enhancement Act, DoD Instruction 4715.03, AR 200-1	2c	2011 - 2015			

Note:

1. This is not a comprehensive list of applicable regulations, other regulations, policy, or guidance may apply. Please review **Appendix B** for a comprehensive list of law, policy or guidance for management of natural resources.

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APPENDIX D

INRMP DOCUMENTATION AND CORRESPONDENCE

APPENDIX E

DISTRIBUTION LIST FOR INRMP/EA

APPENDIX F

SPECIES LISTS

APPENDIX G

INFORMATION SUPPORTING
FISH AND WILDLIFE MANAGEMENT

[INFORMATION TO BE ADDED TO THIS APPENDIX THROUGH THE COMPLETION OF THIS PLAN]

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APPENDIX H

INFORMATION SUPPORTING
THREATENED AND ENDANGERED SPECIES MANAGEMENT

[INFORMATION TO BE ADDED TO THIS APPENDIX THROUGH THE COMPLETION OF THIS PLAN]

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APPENDIX I

INFORMATION SUPPORTING WETLANDS AND DEEP WATER HABITATS MANAGEMENT

[INFORMATION TO BE ADDED TO THIS APPENDIX THROUGH THE COMPLETION OF THIS PLAN]

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APPENDIX J

INFORMATION SUPPORTING WATERSHED MANAGEMENT

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APPENDIX K

INFORMATION SUPPORTING GROUNDS MAINTENANCE AND LAND MANAGEMENT

APPENDIX K-1
FEDERAL NOXIOUS WEED LIST

Scientific Name **(Family)**	**Common Name**
AQUATIC/WETLAND	
Azolla pinnata (Azollaceae)	Mosquito fern or Water velvet
Caulerpa taxifolia (Caulerpaceae)	Mediterranean clone of caulerpa
Eichhornia azurea (Ponterderiaceae)	Anchored waterhyacinth
Hydrilla verticillata (Hydrocharitaceae)	Hydrilla
Hygrophila polysperma (Acanthaceae)	Miramar weed
Ipomoea aquatica (Convolvulaceae)	Chinese waterspinach
Lagarosiphon major (Hydrocharitaceae)	Oxygen weed
Limnophila sessiliflora (Scrophulariaceae)	Ambulia
Melaleuca quinquenervia (Myrtaceae)	Melaleuca
Monochoria hastata (Pontederiaceae)	Monochoria
Monochoria vaginalis (Pontederiaceae)	Pickerel weed
Ottelia alismoides (Hydrocharitaceae)	Duck-lettuce
Sagittaria sagittifolia (Alismataceae)	Arrowhead
Salvinia auriculata (Salviniaceae)	A giant salvinia
Salvinia biloba (Salviniaceae)	A giant salvinia
Salvinia herzogii (Salviniaceae)	A giant salvinia
Salvinia molesta (Salviniaceae)	A giant salvinia
Solanum tampicense (Solanaceae)	Wetland nightshade
Sparganium erectum (Sparganiaceae)	Exotic bur-reed
PARASITIC	
Aeginetia spp. (Orobanchaceae)	No common name
Alectra spp. (Scrophulariaceae)	No common name
Cuscuta spp. other than native or widely distributed species (Cuscutaceae)	Dodders
Orobanche spp. other than native or widely distributed species (Orobanchaceae)	Broomrapes
Striga spp. (Scrophulariaceae)	Witchweeds
TERRESTRIAL	
Ageratina adenophora (Asteraceae)	Crofton weed
Alternanthera sessilis (Amaranthaceae)	Sessile joyweed
Asphodelus fistulosus (Liliaceae)	Onionweed
Avena sterilis L. (Poaceae)	Animated or Wild oat
Carthamus oxyacanthus (Asteraceae)	Wild safflower
Chrysopogon aciculatus (Poaceae)	Pilipiliula
Commelina benghalensis (Commelinaceae)	Benghal dayflower
Crupina vulgaris (Asteraceae)	Common crupina
Digitaria abyssinica (*=D. scalarum*) (Poaceae)	African couch grass

Scientific Name **(Family)**	**Common Name**
TERRESTRIAL (continued)	
Digitaria velutina (Poaceae)	Velvet fingergrass
Drymaria arenarioides (Caryophyllaceae)	Lightening weed, alfombrilla
Emex australis (Polygonaceae)	Three-cornered jack
Emex spinosa (Polygonaceae)	Devil's thorn
Galega officinalis (Fabaceae)	Goatsrue
Heracleum mantegazzianum (Apiaceae)	Giant hogweed
Imperata brasiliensis (Poaceae)	Brazilian satintail
Imperata cylindrica (Poaceae)	Cogongrass
Ischaemum rugosum (Poaceae)	Murain-grass
Leptochloa chinensis (Poaceae)	Asian sprangletop
Lycium ferocissimum (Solanaceae)	African boxthorn
Melastoma malabathricum (Melastomataceae)	No common name
Mikania cordata (Asteraceae)	A mile-a-minute
Mikania micrantha (Asteraceae)	A mile-a-minute
Mimosa invisa (Fabaceae)	Giant sensitive plant
*Mimosa pigra (*Fabaceae)	Catclaw mimosa
Nassella trichotoma (Poaceae)	Serrated tussock
Opuntia aurantiaca (Cactaceae)	Jointed prickly pear
Oryza longistaminata (Poaceae)	A red rice
Oryza punctata (Poaceae)	A red rice
Oryza rufipogon (Poaceae)	A red rice
Paspalum scrobiculatum (Poaceae)	Kodo-millet
Pennisetum clandestinum (Poaceae)	Kikuyugrass
Pennisetum macrourum (Poaceae)	African feathergrass
Pennisetum pedicellatum (Poaceae)	Kyasuma-grass
Pennisetum polystachion (Poaceae)	Missiongrass
Prosopis alapataco (Fabaceae)	A mesquite
Prosopis argentina	A mesquite
Prosopis articulata	A mesquite
Prosopis burkartii	A mesquite
Prosopis caldenia	A mesquite
Prosopis calingastana	A mesquite
Prosopis campestris	A mesquite
Prospis castellanosii	A mesquite
Prosopis denudans	A mesquite
Prosopis elata	A mesquite
Prosopis farcta	A mesquite
Prosopis ferox	A mesquite
Prosopis fiebrigii	A mesquite
Prosopis hassleri	A mesquite

Scientific Name **(Family)**	**Common Name**
TERRESTRIAL (continued)	
Prosopis humilis	A mesquite
Prosopis kuntzei	A mesquite
Prosopis pallida	A mesquite
Prosopis palmeri	A mesquite
Prosopis reptans	A mesquite
Prosopis rojasiana	A mesquite
Prosopis ruizlealii	A mesquite
Prosopis ruscifolia	A mesquite
Prosopis sericantha	A mesquite
Prosopis strombulifera	A mesquite
Prosopis torquata	A mesquite
Rottboellia cochinchinensis (Poaceae)	Itchgrass
Rubus fruticosus (Rosaceae)	Wild blackberry complex
Rubus moluccanus (Rosaceae)	Wild blackberry
Saccharum spontaneum (Poaceae)	Wild sugarcane
Salsola vermiculata (Chenopodiaceae)	Wormleaf salsola
Setaria pallide-fusca (Poaceae)	Cattail grass
Solanum torvum (Solanaceae)	Turkeyberry
Solanum viarum (Solanaceae)	Tropical soda apple
Spermacoce alata (Rubiaceae)	Borreria
*Tridax procumbens (*Asteraceae)	Coat buttons
Urochloa panicoides (Poaceae)	Liverseed grass

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APPENDIX K-2
LIST OF CALIFORNIA INVASIVE PLANT SPECIES

SPECIES BY COMMON NAME

acacia, blackwood *Acacia melanoxylon*
acacia, plume *Albizia lophantha*
alligatorweed *Alternanthera philoxeroides*
alyssum, sweet *Lobularia maritima*
asparagus, smilax *Asparagus asparagoides*
barberry, Darwin *Berberis darwinii*
barbwire Russian-thistle *Salsola paulsenii*
barley, Mediterranean *Hordeum marinum,*
barley, wall *Hordeum murinum*
beachgrass, European *Ammophila arenaria*
beardgrass, annual *Polypogon monspeliensis* and subspp.
bellardia *Bellardia trixago*
bentgrass, creeping *Agrostis stolonifera*
bentgrass, Pacific *Agrostis avenacea*
bermudagrass *Cynodon dactylon*
bindweed, field *Convolvulus arvensis*
birdsfoot trefoil *Lotus corniculatus*
blackberry, Armenian *Rubus armeniacus (=R. discolor)*
blackberry, Himalaya *Rubus armeniacus (=R. discolor)*
bladderflower *Araujia sericifera*
bluegrass, Kentucky *Poa pratensis*
blue gum, Tasmanian *Eucalyptus globulus*
bouncingbet *Saponaria officinalis*
brassbuttons *Cotula coronopifolia*
brome, downy *Bromus tectorum*
brome, red *Bromus madritensis* ssp. *rubens (=B. rubens)*
brome, ripgut *Bromus diandrus*
brome, soft *Bromus hordeaceus*
broom, bridal *Retama monosperma*
broom, French *Genista monspessulana*
broom, Portuguese *Cytisus striatus*
broom, Scotch *Cytisus scoparius*
broom, Spanish *Spartium junceum*
broom, striated *Cytisus striatus*
buckwheat, California *Eriogonum fasciculatum*
burclover, California *Medicago polymorpha*
burnweed, Australian *Erechtites glomerata, E. minima*
buttercup, Bermuda *Oxalis pes-caprae*
buttercup, creeping *Ranunculus repens*
butterflybush *Buddleja davidii*
cabbage *Brassica oleracea*
cabbage tree, New Zealand *Cordyline australis*
calla lily *Zantesdeschia aethiopica*
camelthorn *Alhagi maurorum (=A. pseudalhagi)*
canarygrass, reed *Phalaris arundinacea*
Cape-ivy *Delairea odorata (=Senecio mikanioides)*
capeweed, fertile *Arctotheca calendula* (fertile)
capeweed, sterile *Arctotheca calendula* (sterile)
carrot, wild *Daucus carota*
castorbean *Ricinus communis*
catalpa, southern *Catalpa bignonioides*
catsear, rough *Hypochaeris radicata*
catsear, smooth *Hypochaeris glabra*
chamomile, mayweed *Anthemis cotula*
charlock *Sinapis arvensis*
cheatgrass *Bromus tectorum*
cherry plum *Prunus cerasifera*
Chinese tallowtree *Sapium sebiferum*
clover, California bur *Medicago polymorpha*
clover, rose *Trifolium hirtum*
cordgrass, Atlantic *Spartina alterniflora*
cordgrass, common *Spartina anglica*
cordgrass, dense-flowered *Spartina densiflora*
cordgrass, saltmeadow *Spartina patens*
cordgrass, smooth *Spartina alterniflora* hybrids
cotoneaster, orange *Cotoneaster franchetii*
cotoneaster, Parney's *Cotoneaster lacteus*
cotoneaster, silverleaf *Cotoneaster pannosus*
creeper, Australian bluebell *Sollya heterophylla*
creeper, bearded *Crupina vulgaris*
creeper, bridal *Asparagus asparagoides*
cress, hoary *Cardaria draba*
croftonweed *Ageratina adenophora*
crupina, common *Crupina vulgaris*
cypress, Monterey *Cupressus macrocarpa*
daisy, African *Dimorphotheca sinuata*
daisy, corn *Chrysanthemum segetum*
daisy, crown *Chrysanthemum coronarium*
daisy, English *Bellis perennis*
daisy, Mexican *Erigeron karvinskianus*
daisy, oxeye *Leucanthemum vulgare*
daisybush, shrubby *Osteospermum fruticosum*
dandelion, common *Taraxacum officinale*

dandelion, hairy *Hypochaeris radicata*
devil's thorn *Emex spinosa*
dock, curly *Rumex crispus*
dogtailgrass, hedgehog *Cynosurus echinatus*
dracaena, giant *Cordyline australis*
dyer's woad *Isatis tinctoria*
egeria, Brazilian *Egeria densa*
elm, Chinese *Ulmus parvifolia*
elm, Siberian *Ulmus pumila*
emex, spiny *Emex spinosa*
eupatorium *Ageratina adenophora*
false-brome, perennial *Brachypodium sylvaticum*
fennel *Foeniculum vulgare*
fennel, dog *Anthemis cotula*
fescue, rattail *Vulpia myuros*
fescue, squirreltail *Vulpia bromoides*
fescue, tall *Festuca arundinacea*
fig, edible *Ficus carica*
filaree, broadleaf *Erodium botrys*
filaree, redstem *Erodium cicutarium*
filaree, shortfruited *Erodium brachycarpum*
filaree, whitestem *Erodium moschatum*
firethorn *Pyracantha* spp.
fireweed, Australian *Erechtites glomerata, E. minima*
fivehook bassia *Bassia hyssopifolia*
flixweed *Descurainia sophia*
forget-me-not, common *Myosotis latifolia*
fountaingrass, crimson *Pennisetum setaceum*
foxglove *Digitalis purpurea*
foxtail restharrow *Ononis alopecuroides*
fumitory *Fumaria officinalis*
garlic, false *Nothoscordum gracile*
gazania *Gazania linearis*
geranium, cutleaf *Geranium dissectum*
geranium, dovefoot *Geranium molle*
geranium, New Zealand *Geranium retrorsum*
geranium, Robert *Geranium robertianum*
German-ivy *Delairea odorata*
glandweed, yellow *Parentucellia viscosa*
glasswort *Salsola soda*
goatgrass, barb *Aegilops triuncialis*
gorse *Ulex europaeus*
grass, rabbitfoot *Polypogon monspeliensis*
gumweed, curlycup *Grindelia squarrosa*
hairgrass, European *Aira praecox*
hairgrass, silver *Aira caryophyllea*
halogeton *Halogeton glomeratus*
hardinggrass *Phalaris aquatica*
hawksbeard, smooth *Crepis capillaris*
hawthorn, English *Crataegus monogyna*
heath, Spanish *Erica lusitanica*
hedgeparsley *Torilis arvensis*
herb-robert *Geranium robertianum*
holly, English *Ilex aquifolium*
horehound, white *Marrubium vulgare*
Hottentot-fig *Carpobrotus edulis*
houndstongue *Cynoglossum officinale*
hydrilla *Hydrilla verticillata*
hypericum, Canary Island *Hypericum canariense*
iceplant *Carpobrotus chilensis*
iceplant *Carpobrotus edulis*
iceplant, crystalline *Mesembryanthemum crystallinum*
iceplant, heartleaf *Aptenia cordifolia*
iceplant, narrowleaf *Conicosia pugioniformis*
iceplant, slenderleaf *Mesembryanthemum nodiflorum*
iris, yellowflag *Iris pseudacorus*
ivy, Algerian *Hedera canariensis*
ivy, English *Hedera helix*
jessamine, willow *Cestrum parqui*
jointvetch, rough *Aeschynomene rudis*
jubatagrass *Cortaderia jubata*
kangaroothorn *Acacia paradoxa*
kikuyugrass *Pennisetum clandestinum*
klamathweed *Hypericum perforatum*
knapweed, diffuse *Centaurea diffusa*
knapweed, meadow *Centaurea debeauxii (=C.* x *pratensis)*
knapweed, Russian *Acroptilon repens*
knapweed, spotted *Centaurea maculosa (=C. biebersteinii)*
knapweed, squarrose *Centaurea virgata* ssp. *squarrosa (=C. squarrosa)*
knotweed, Japanese *Polygonum cuspidatum (=Fallopia japonica)*
knotweed, Sakhalin *Polygonum sachalinense*
kochia *Kochia scoparia*
leek, three-cornered *Allium triquetrum*
lettuce, prickly *Lactuca serriola*
licoriceplant *Helichrysum petiolare*
locust, black *Robinia pseudoacacia*
locust, honey *Gleditsia triacanthos*
London rocket *Sisymbrium irio*
loosestrife, hyssop *Lythrum hyssopifolium*
loosestrife, purple *Lythrum salicaria*
lupine, yellow bush *Lupinus arboreus*
mannagrass, waxy *Glyceria declinata*

mayten *Maytenus boaria*
Mediterraneangrass *Schismus arabicus, S. barbatus*
Mediterranean sage *Salvia aethiopis*
medusahead *Taeniatherum caput- medusae*
mesembryanthemum,
coppery *Malephora crocea*
milkthistle, blessed *Silybum marianum*
mirrorplant, creeping *Coprosma repens*
montbretia *Crocosmia* x *crocosmiiflora*
mullein, common *Verbascum thapsus*
mullein, woolly *Verbascum thapsus*
mustard, birdsrape *Brassica rapa*
mustard, black *Brassica nigra*
mustard, blue *Chorispora tenella*
mustard, field *Brassica rapa*
mustard, Saharan *Brassica tournefortii*
mustard, shortpod *Hirschfeldia incana*
mustard, summer *Hirschfeldia incana*
mustard, tansy *Descurainia sophia*
mustard, wild *Sinapis arvensis*
myoporum *Myoporum laetum*
nasturtium, garden *Tropaeolum majus*
nightshade, silverleaf *Solanum elaeagnifolium*
oat, slender wild *Avena barbata*
oat, wild *Avena fatua*
oleander *Nerium oleander*
olive, Russian- *Elaeagnus angustifolia*
olive *Olea europaea*
onionweed *Asphodelus fistulosus*
orchardgrass *Dactylis glomerata*
oxalis, buttercup *Oxalis pes-caprae*
oxalis, yellow *Oxalis pes-caprae*
oxtongue, bristly *Picris echioides*
palm, Canary Island date *Phoenix canariensis*
palm, date *Phoenix dactylifera*
palm, Mexican fan *Washingtonia robusta*
palm, Washington *Washingtonia robusta*
paloverde, Mexican *Parkinsonia aculeata*
pampasgrass *Cortaderia selloana*
parentucellia, sticky *Parentucellia viscosa*
parrotfeather *Myriophyllum aquaticum*
passionflower, blue *Passiflora caerulea*
pea, perennial sweet *Lathyrus latifolius*
pea, Tangier *Lathyrus tingitanus*
pennyroyal *Mentha pulegium*
peppertree, Brazilian *Schinus terebinthifolius*
peppertree, Peruvian *Schinus molle*
pepperweed, perennial *Lepidium latifolium*
periwinkle, big *Vinca major*
pine, Monterey *Pinus radiata* cultivars
pistache, Chinese *Pistachia chinensis*
plantain, buckhorn *Plantago lanceolata*
plantain, cutleaf *Plantago coronopus*
plantain, English *Plantago lanceolata*
plum, wild *Prunus cerasifera*
poison-hemlock *Conium maculatum*
pokeweed *Phytolacca americana*
polypogon, rabbitfoot *Polypogon monspeliensis* and subspp.
pondweed, curlyleaf *Potamogeton crispus*
pride-of-Madeira *Echium candicans*
privet, glossy *Ligustrum lucidum*
pyracantha *Pyracantha* spp.
quackinggrass, big *Briza maxima*
Queen Anne's lace *Daucus carota*
radish *Raphanus sativus*
ragwort, tansy *Senecio jacobaea*
rattlesnakegrass *Briza maxima*
red gum *Eucalyptus camaldulensis*
redhot poker *Kniphofia uvaria*
reed, common *Phragmites australis*
reed, giant *Arundo donax*
rockrose, gum *Cistus ladanifer*
rose, baby sun *Aptenia cordifolia*
Russian-thistle *Salsola tragus*
ryegrass, Italian *Lolium multiflorum*
salsify, yellow *Tragopogon dubius*
saltbush, Australian *Atriplex semibaccata*
saltcedar *Tamarix ramosissima*
salvinia, giant *Salvinia molesta*
sea-fig *Carpobrotus chilensis*
sea-lavender *Limonium ramoissimum* ssp. *provincale*
sea-rocket, European *Cakile maritima*
sesbania, red *Sesbania punicea*
skeletonweed, rush *Chondrilla juncea*
smilograss *Piptatherum miliaceum*
sorrel, red *Rumex acetosella*
sorrel, sheep *Rumex acetosella*
sowthistle, spiny *Sonchus asper*
speargrass, twisted-awned *Stipa capensis*
spiny emex *Emex spinosa*
spurge, caper *Euphorbia lathyris*
spurge, carnation *Euphorbia terracina*
spurge, leafy *Euphorbia esula*
spurge, oblong *Euphorbia oblongata*
St. Johnswort, common *Hypericum perforatum*
starthistle, Malta *Centaurea melitensis*
starthistle, purple *Centaurea calcitrapa*
starthistle, yellow *Centaurea solstitialis*
steppegrass, Mediterranean *Stipa capensis*

stinkwort *Dittrichia graveolens*
sweetclover, Indian *Melilotus indicus*
sweetclover, yellow *Melilotus officinalis*
sweetpea, perennial *Lathyrus latifolius*
tallowtree, Chinese *Sapium sebiferum*
tamarisk *Tamarix ramosissima*
tamarisk, athel *Tamarix aphylla*
tamarisk, smallflower *Tamarix parviflora*
tansy, common *Tanacetum vulgare*
tea tree, Australian *Leptospermum laevigatum*
teasel, fuller's *Dipsacus sativus*
teasel, wild *Dipsacus fullonum*
thistle, artichoke *Cynara cardunculus*
thistle, bull *Cirsium vulgare*
thistle, Canada *Cirsium arvense*
thistle, Italian *Carduus pycnocephalus*
thistle, musk *Carduus nutans*
thistle, plumeless *Carduus acanthoides*
thistle, Scotch *Onopordum acanthium*
thistle, slenderflower *Carduus tenuifolius*
thistle, woolly distaff *Carthamus lanatus*
toadflax, Dalmatian *Linaria genistifolia* ssp. *dalmatica (=L. dalmatica)*
tobacco, tree *Nicotiana glauca*
tocalote *Centaurea melitensis*
tree-of-heaven *Ailanthus altissima*
veldtgrass, erect *Ehrharta erecta*
veldtgrass, long-flowered *Ehrharta longiflora*
veldtgrass, purple *Ehrharta calycina*
velvetgrass, common *Holcus lanatus*
vernalgrass, sweet *Anthoxanthum odoratum*
vervain, seashore *Verbena litoralis*
vervain, tall *Verbena bonariensis*
vetch, hairy *Vicia villosa*
Victorian box *Pittosporum undulatum*
wakame *Undaria pinnatifida*
water hyacinth *Eichhornia crassipes*
waterlily, fragrant *Nymphaea odorata*
watermilfoil, Eurasian *Myriophyllum spicatum*
water-primrose, creeping *Ludwigia peploides* ssp. *montevidensis*
water-primrose, Uruguay *Ludwigia hexapetala (=L. uruguayensis)*
watsonia *Watsonia borbonica*
watsonia, bulbil *Watsonia meriana*
whitetop, hairy *Cardaria pubescens*
whitetop, lens-podded *Cardaria chalepensis (=C. draba* ssp. *chalepensis)*
whitetop, tall *Lepidium latifolium*
wisteria, scarlet *Sesbania punicea*
woodsorrel, creeping *Oxalis corniculata*
zoysiagrass *Zoysia* spp.

Cal-IPC. 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA. Available: www.cal-ipc.org.

[INFORMATION TO BE ADDED TO THIS APPENDIX THROUGH THE COMPLETION OF THIS PLAN]

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APPENDIX L

INFORMATION SUPPORTING
OUTDOOR RECREATION MANAGEMENT

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APPENDIX M

INFORMATION SUPPORTING
GEOGRAPHIC INFORMATION SYSTEMS MANAGEMENT

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