CAMP ROBERTS

Integrated Natural Resources Management Plan

January 2022

Prepared For:

California Army National Guard
Sacramento, California

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Signature Pages

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Army National Guard Signature Page

This Integrated Natural Resources Management Plan (INRMP) meets the requirements of the Sikes Act (16 U.S.C. 670a *et.seq*.) as amended. The plan has been prepared in accordance with Department of Defense Instruction 4715.03, Natural Resource Conservation Program; Department of Defense Manual 4715.03, INRMP Implementation Manual, and ARNG G-9 Policy for INRMPs in coordination with the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and the National Marine Fisheries Service. The following signature indicates concurrence with the conservation, protection, and management of natural resources presented in this plan.

Colonel Anthony Hammett

Colonel, U.S. Army
Chief, G-9 Army National Guard

Date

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California Military Department Signature Page

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Major General David. S. Baldwin
Adjutant General
California Military Department

Date

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California Military Department Signature Page

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Colonel Phillip Armstrong

Commander, Camp Roberts
California Military Department

Date

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United States Fish and Wildlife Signature Page

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Stephen P. Henry

Field Supervisor, Ventura Office
United States Fish and Wildlife Service

Date

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California Department of Fish and Wildlife Signature Page

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Julie Vance

Regional Manager, Central Region
California Department of Fish and Wildlife

Date

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National Marine Fisheries Signature Page

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Amanda Ingham
Branch Chief, Central Coast Regional Office
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Date

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Acronyms

Ac	Acre
ACUB	Army Compatible Use Buffer
AMSL	Above mean sea level
AFY	Acre-feet per year
APHIS	Animal and Plant Health Inspection Service
AR	Army Regulation
Army	United States Department of the Army
ARNG	Army National Guard
ARNG TRS	ARNG Training
BCC	Birds of conservation concern
BGEPA	Bald and Golden Eagle Protection Act
BO	Biological Opinion
C	Celsius
CA ARNG	California Army National Guard
CAEV	CA ARNG Joint Staff- Environmental Office/Directorate
Cal Fire	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
CAOT	CA ARNG Organization, Training, and Mobilization Directorate
CCC	California Conservation Corps
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESU	Cooperative Ecosystem Studies Units
CH	Critical habitat
CLC	Creek Lands Conservation
Cm	centimeter
CMC	California Men's Colony
CNPS	California Native Plant Society
CRLF	California red-legged frog
CSSC	California species of special concern
CSLO	Camp San Luis Obispo
CX	Categorical Exclusion/Exemption
DOD	Department of Defense
DoDI	Department of Defense instruction
DoDM	Department of Defense Manual
DPOTS	Director of Plans, Operations, Training, and Security
DPS	Distinct Population Segments
DPW	Department of Public Works
EA	Environmental Assessment

ED	Environmental Determination
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESMC	Endangered Species Management Component
EST	Engagement Skills Trainer
F	Fahrenheit
FC	Federal candidate
FDR	Federally delisted (recovered)
FE	Federally endangered
Ft	Foot
FT	Federal threatened
GC	Garrison Commander
HA	Hectares
I&E	Installations and Environment
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPMP	Integrated Pest Management Plan
IRWM	Integrated Regional Water Management
IS	Initial Study
IWFMP	Integrated Wildland Fire Management Plan
IRP	Installation Restoration Program
ITAM	Integrated Training Area Management
LRC	Leadership Reaction Course
LRMP	Legacy Resource Management Program
MBNEP	Morro Bay National Estuary Program
MBTA	Migratory Bird Treaty Act
MCV	Manual of California Vegetation
MPH	Miles per hour
MOU	Memorandum of Understanding
NAPPC	North American Pollinator Protection Campaign
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NIDIS	National Integrated Drought Information System
NMFS	National Marine Fisheries Service
NPPA	Native Plant Protection Act
NPS	National Parks Service
NRCS	Natural Resources Conservation Service
NVCS	National Vegetation Classification System
OES	Office of Emergency Services
PIP	Project information packet
Pub. L	Public Law
RCD	San Luis Obispo Resource Conservation District
RCMP	Range Complex Management Plan
RDM	Residual dry matter
RFMSS	Range Facility Management Support System

RTLA	Range and Training Land Assessment
RWQCB	Central Coast Regional Water Quality Control Board
SAR	Species at risk
SCCC	South-central California coast
SE	State endangered
SLCRCD	San Luis Coastal Resource Conservation District
SRA	Sensitive Resource Area
ST	State threatened
SWAP	State Wildlife Action Plan
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
TRI	Training Requirements Integration
UC	University of California
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USPFO	United States Property and Fiscal Office
VWS	Ventana Wildlife Society
WBWG	Western bat working group
WDR	Waste Discharge Requirement
WMA	Weed Management Area

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Executive Summary

Purpose

Consistent with the Sikes Act Improvement Act of 1997, the California Army National Guard (CA ARNG) has prepared this Integrated Natural Resources Management Plan (INRMP) Update to provide Camp Roberts (CR) with a long-term viable framework for managing natural resources on its lands.

As required by the Sikes Act (DoD 2017a), this CR INRMP provides guidelines for:

- Management and conservation of flora and fauna;
- Wetland, riparian, and aquatic protection, enhancement, and restoration;
- Establishment of specific natural resource management goals and objectives and time frames for proposed action;
- Sustainable use by the public to the extent that the use is not inconsistent with the needs of fish and wildlife resources;
- Enforcement of applicable natural resource laws (including regulations);
- No net loss in the capability of military installation lands to support the military mission; and
- Such other activities as the Secretary of the military department determines appropriate.

The primary focus of the update was to create a clearer, more useful document that will allow the CA ARNG to ensure the sustainability of training lands and maintain ecosystem viability. Natural resource management goals and objectives have been developed to align with the Department of Defense (DoD) ecosystem management strategy. Particular consideration has been given to the projected impacts of climate change and the approach for overall resource management on the installation has an increased focus on climate resiliency. Climate adaptation is critical in retaining training lands and maintaining military readiness.

Overview

Camp Roberts is a 42,784 acre federally-owned military training site located in central California in San Luis Obispo and Monterey Counties and operated by CA ARNG. It is composed of a cantonment area; maneuver training areas; and firing ranges with a designated impact area.

The CA ARNG's primary federal mission is to provide mission-ready forces to the federal government, counterterrorism, and weapons of mass destruction. The state mission is to protect the public safety of the citizens of California by providing military support to the civil authority during natural disasters and other emergencies. CR supports a variety of users, including military units, federal and state agencies, and civilians.

Natural resources on CR are characteristic of a Mediterranean climate of dry summers and mild wet winters. CR is comprised of 27 different plant communities, 60 miles of waterways, 78 acres of wetlands, reservoirs, and ponds. A total of 617 plant species and 375 animal species have been recorded on the

installation, including ten federal or state threatened and endangered species and 60 special status species.

Goals

The primary goals of this INRMP are as follows:

- Ensure no net loss in the capability of CR lands to support military training.
- Integrate natural resources management with the military training mission.
- Ensure compliance with all state and federal laws and regulations pertaining to natural resources
- Manage state and federally threatened and endangered species and critical habitat to ensure compliance with existing Biological Opinions, the California Endangered Species Act, and the federal Endangered Species Act.
- Conserve and protect riparian, wetland, and aquatic habitats.
- Conserve trees through protection and by mitigating for tree removal.
- Provide environmental awareness education to the CR Commander, staff, troops, employees, tenants, and visitors.
- Define responsibilities for the management of natural resources.
- Provide an accurate, up-to-date source of natural resources data and inventories of natural resources on CR.
- Continue to incorporate climate adaptation strategies into resource management actions.

The ability to achieve these goals is dependent on the cooperation and collaboration of CR Command and staff, installation users, governmental agencies, regional landholders, and local agencies and organizations. Adaptive management will also be a key component to effective ecosystem management as legal or mission requirements change and new scientific information becomes available.

Partnerships

The CA ARNG has fostered a number of partnerships with various agencies that assist and participate in the natural resources management program. Those partners include the U.S. Fish and Wildlife Service (USFWS); U.S. Army Corps of Engineers (USACE); U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS); National Marine Fisheries Service (NMFS); California Department of Fish and Wildlife (CDFW); California Department of Forestry and Fire Protection (Cal Fire); California Conservation Corps (CCC); San Luis Obispo Resource Conservation District (RCD); Morro Bay National Estuary Partnership (MBNEP); Water Conservation Districts; National Park Service (NPS); Federally Recognized Native American Tribes; universities; and others.

Organization

This document is organized into six chapters:

1. Introduction and Overview
2. Historic and Current Land Use
3. Natural Resources of Camp Roberts
4. Natural Resources Management Strategy
5. Sustainability and Compatible Use
6. INRMP Implementation

Natural resource management actions are described in detail in Chapters 4 and 5 and are broken into conservation measures and conservation projects. Conservation measures specify protocols and procedures necessary to protect and conserve natural resources and are often implemented in-house by CR or environmental staff. Conservation projects are discrete actions for natural resources management and often require funding and external contracting for implementation. A list of conservation projects can be found in Appendix A.

Review and Approval

This INRMP was developed in collaboration with signatory parties: National Guard Bureau, United States Fish and Wildlife Service, and California Department of Fish and Wildlife. Although not a required signatory, National Marine Fisheries Service also contributed to INRMP development by participating in document review and providing critical feedback Upon mutual agreement between signatory parties, this INRMP will direct the natural resources management program on CR for a period of five years (2022-2027). Annual reviews with signatories will ensure management goals and objectives are being met and conservation actions are updated as necessary.

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1.0 Introduction and Overview

1.1 Purpose and Scope

The California Army National Guard (CA ARNG) has prepared this Integrated Natural Resources Management Plan (INRMP or Plan) Update to provide the Camp Roberts Training Site (Camp Roberts; CR) with a long-term, viable framework for managing natural resources on its lands. An INRMP is required by the Sikes Act (16 United States Code [U.S.C.] 670a §101[a][2], as amended by the National Defense Authorization Act of 2015 [Public Law (Pub. L.) 113-291]). It is the primary means by which natural resources compliance and stewardship priorities are set, and funding requirements are determined for the U.S. Department of Defense (DoD).

The principal purpose of Camp Roberts' land, waters, and airspace is to support various military training activities. Natural resources conservation program activities ensure there is no net loss in capability of Camp Roberts' training lands to support the military training mission while also sustaining the long-term ecological integrity of the resource base and the ecosystem services it provides.

As required by the Sikes Act (DoD 2017a), this Camp Roberts INRMP provides guidelines for:

- Management and conservation of flora and fauna.
- Wetland, riparian, and aquatic protection, enhancement, and restoration.
- Establishment of specific natural resource management goals and objectives and time frames for proposed action.
- Sustainable use by the public to the extent that the use is not inconsistent with the needs of fish and wildlife resources.
- Enforcement of applicable natural resource laws (including regulations).
- No net loss in the capability of military installation lands to support the military mission.
- Such other activities as the Secretary of the military department determines appropriate.

This INRMP establishes planning and management strategies; identifies natural resources constraints and opportunities; supports the resolution of land use conflicts; provides baseline descriptions of natural resources necessary for the development of conservation strategies and environmental assessment; serves as the principal information source for the preparation of future environmental documents for proposed Camp Roberts actions; and provides guidance for annual natural resources management reviews.

Additionally, the DoD is required to ensure that ecosystem management is the basis for all management of DoD lands and waters (Office of the Under Secretary of Defense 1994). Based on an ecosystem approach, the INRMP takes a broad view to ensure achievement of the overriding principle of protecting the properties and functions of natural ecosystems. This INRMP considers and uses a full and evolving array of ecosystem-based management tools which are described in detail in DoDI 4715.03. CR's ecosystem management approach is discussed further in Chapters 4 and 5.

> *Ecosystem-based management is a "goal-driven approach to managing natural and cultural resources that considers the environment as a complex system functioning as a whole, not as a collection of parts, and recognizes that people and their social and economic needs are a part of the whole" (DoD Instruction 4715.03).*

Section 2904a(2) of the Sikes Act states that INRMPs shall reflect the mutual agreement of installation commanders, the U.S. Fish and Wildlife Service (USFWS), and the states regarding natural resources management on DoD installations. As required by the 2013 Sikes-tripartite Memorandum of Understanding (MOU), the DoD, USFWS, and Association of Fish and Wildlife Agencies work cooperatively on the development and implementation of integrated natural resource programs on military lands. The USFWS and California Department of Fish and Wildlife (CDFW) are signatories to this INRMP Update. Although not a required signatory, the National Marine Fisheries Service (NMFS) is also given the opportunity to review and provide feedback on the INRMP, consistent with DoD Instruction (DoDI) 4715.03 CH-1 (DoD 2017a).

> *INRMPs are to be prepared collaboratively with partner federal and state fish and wildlife agencies, consistent with the Sikes-Tripartite MOU (2013)…The final INRMP will reflect mutual agreement of the USFWS and CDFW representatives concerning the conservation of natural resources under their respective legal authorities. The natural resources manager coordinates with NMFS when the INRMP will benefit from their perspective and review (DoD Manual 4715.03).*

1.2 Authority

This INRMP's content and the related planning process follows the direction provided in:

- DoDI 4715.03 (18 March 2011, Incorporating Change 1 [05 October 2017]) Natural Resources Conservation Program.
- DoD Manual (DoDM) 4715.03 (25 November 2013, Incorporating Change 1 13 December 2017) Integrated Natural Resources Management Plan Implementation Manual.
- U.S. Department of the Army (Army) Regulation (AR) 200-1 (13 December 2007) Environmental Protection and Enhancement.
- National Guard Bureau (NGB) (20 Mar 2019) "Army National Guard (ARNG) Installations and Environment (I&E) Directorate Policy for Integrated Natural Resource Management Plans (INRMP)."

Sikes Act

The Sikes Act directs the DoD to take appropriate management actions necessary to protect and enhance land and water resources through the development of INRMPs on all installations under its control. INRMPs establish fundamental land management policies and procedures for all military lands to preserve the military mission, while simultaneously protecting natural resources.

DoDI 4715.03 and DoDM 4715.03

DoDI 4715.03 details policy to ensure that all DoD natural resources conservation program activities promote DoD continued access to its land, air, and water resources for realistic military training while also sustaining the long term ecological integrity of the resource base and the ecosystem services it provides. It assigns natural resources management responsibilities, identifies procedures for natural resource management components, outlines programming, and budgeting, priorities, and details natural resource conservation metrics. DoDI 4715.03 is supported by DoDM 4715.03, which provides procedures to prepare, review, update, and implement INRMPs in compliance with the Sikes Act.

Army Regulation 200-1

AR 200-1 Environmental Protection and Enhancement (Army 2007), which superseded AR 200-3 Natural Resources—Land, Forest, and Wildlife Management, sets forth policy, procedures, and responsibilities for the conservation, management, and restoration of land and natural resources consistent with the military mission and national policies.

NGB INRMP Guidance Memorandum

This procedural Memorandum (NGB 2019) provides ARNG level guidance on developing the INRMP, coordinating with fish and wildlife agencies and the public, procedures for review, revision, and update of INRMPs, assigning funding priorities, and reporting on INRMP effectiveness. Natural resources Measures of Merit are used by the DoD to gauge the effectiveness of natural resources management and compliance with the Sikes Act.

> *ARNG-ILE INRMP Guidance (NGB 2019) is intended as a supplement to the Sikes Act and AR 200-1 and supersedes all previous ARNG-ILE INRMP guidance.*

1.3 INRMP Integration with the Military Mission

The health of CR's natural resources is crucial to providing realistic training for military troops. Realistic training opportunities require areas of ecologically intact natural habitat with a variety of topographic and vegetative features. Training areas with intact ecosystems remain resilient to ecological threats and land use impacts. Functioning watersheds and wetlands are essential to provide troops with a realistic training environment.

1.3.1 Military Mission

The military mission at Camp Roberts is described below. The mission is broken into components so that its benefit from, and influence on, natural resources can be analyzed for sustainability.

> *Natural resources shall be managed to facilitate testing and training, mission readiness, and range sustainability in a long-term, comprehensive, coordinated, and cost-effective manner pursuant to DoD Directive 3200.15, "Sustaining Access to the Live Training and Test Domain" (18 December 2013).*

Federal Mission

CA ARNG has both a U.S. and a California state mission. Its primary federal mission is to provide mission-ready forces to the federal government for counterterrorism efforts and weapons of mass destruction response (CA ARNG 2014).

The federal mission of the ARNG is as follows (ARNG 2021):

> During peacetime, each state National Guard answers to the leadership in the 50 states, three territories and the District of Columbia. During national emergencies, however, the President reserves the right to mobilize the National Guard, putting them in federal duty status. While federalized, the units answer to the Combatant Commander of the theatre in which they are operating and, ultimately, to the President.
>
> Even when not federalized, the Army National Guard has a federal obligation (or mission). That mission is to maintain properly trained and equipped units, available for prompt mobilization for war, national emergency, or as otherwise needed. The Army National Guard is a partner with the Active Army and the Army Reserves in fulfilling the country's military needs.

State Mission

CA ARNG's state mission is to protect the public safety of the citizens of California by providing military support to the civil authority during natural disasters and other emergencies (CA ARNG 2014).

The state mission of the ARNG is as follows (ARNG 2009):

> The Army National Guard exists in all 50 states, three territories and the District of Columbia. The state, territory or district leadership are the Commanders in Chief for each Guard. Their Adjutants General are answerable to them for the training and readiness of the units. At the state level, the governors reserve the ability, under the Constitution of the United States, to call up members of the National Guard in time of domestic emergencies or need.

The mission of the CA ARNG is as follows (CA ARNG 2018):

> The CA ARNG organizes, trains, equips, and resources community-based land forces. On order, mobilizes to support state and/or federal authority. (CA ARNG 2018).

Camp Roberts Mission

The mission at Camp Roberts is to facilitate the training, mobilization, and security of the National Guard, Army Reserve, and Active Component units in support of federal, state, and community missions (CA ARNG 2014).

1.3.2 Roles and Responsibilities

> *The DoD shall demonstrate stewardship of natural resources in its trust by protecting and enhancing those resources for mission support, biodiversity conservation, and maintenance of ecosystem services (DoDI 4715.03).*

The roles and responsibilities for developing, reviewing, and implementing this INRMP crosses several command layers within DoD and with external regional partners. They are described in DoD, Army, and ARNG guidance documents, as cited in *Section 1.2: Authority*. In addition, the DoD directs that natural resource managers engage with stakeholders on this INRMP regularly, and that this engagement follow an ecosystem management framework by:

- Involving the military operational community early in the planning process to accomplish ecosystem-based management consistent with the military mission.
- Developing a detailed ecosystem-based management implementation strategy for lands and other programs.
- Meeting regularly with regional stakeholders (i.e., state, tribal, and local governments; nongovernmental entities; private landowners; public) to discuss issues and to work toward common goals.

- Incorporating ecosystem-based management goals into strategic, financial, and program planning and design budgets.

1.3.2.1 Secretary of the Army

The Secretary of the Army is responsible to ensure scientifically sound, innovative, and effective stewardship of natural resources under Army jurisdictions. Through its environmental programs, the Secretary develops and implements programs to monitor, achieve, and maintain compliance with federal statutory requirements. The Secretary plans, programs, and budgets resources necessary to establish, execute, monitor, and maintain integrated natural resources conservation programs through INRMPs (DoDI 4715.03).

1.3.2.2 U.S. Army National Guard

National Guard Bureau

The NGB serves as the "channel of communication" between the Army and the National Guard of the States, Territories, and the District of Columbia, providing policy direction and funding. The NGB, through the ARNG G-9, is responsible for executing the environmental program of ARNG and oversees compliance with applicable laws and regulations to support the Army training and testing mission. Two branches within this organization, ARNG G-9 and ARNG Training (ARNG TRS), are responsible for the funding land management activities on ARNG installations. ARNG G-9 provides policy and guides preparation, implementation, and funds for natural resource activities, including preparation and implementation of INRMPs. All INRMPs, Biological Opinions, and other major compliance activities must be reviewed and approved by ARNG G-9. Natural resources-related responsibilities of each NGB Directorate are as follows.

1.3.2.3 California Military Department

The California Military Department is a State of California entity with federal, state, and community missions. It directs the CA ARNG, California Air National Guard, California State Military Reserve, and California Youth and Community Programs.

California Army National Guard

At the state level, the Deputy Chief of Staff for Operations participates in, and coordinates with, development of INRMPs and other environmental documents to ensure that INRMPs reflect mission requirements for ranges and training lands. The Deputy Chief serves as a point of contact between ARNG-OTZ and Training Support Branch and the state, in coordination with the garrison commanders of training centers (National Guard Regulation 5-3, 10 August 2015).

State governors are empowered, under the U.S. Constitution, to call up members of the National Guard. The Governor of California may call individuals or units of the California National Guard into state service during emergencies or to assist in special situations of need.

Office of the Adjutant General

The Office of the Adjutant General, who is signatory to the INRMP, is directly responsible for the operation and maintenance of Camp Roberts, including implementation of this INRMP. These responsibilities are delegated through CA ARNG Headquarters Command Staff and the Camp Roberts

Commander, who ensures that all installation land users are aware of—and comply with—procedures, requirements, or applicable laws and regulations that accomplish the INRMP's objectives.

The CA ARNG Organization, Training, and Mobilization Directorate (CAOT) and CA ARNG Directorate of Public Works (DPW) are the two primary offices within the Office of the Adjutant General whose projects and operations affect natural resources.

Plans, Operations, Training, and Security

The CAOT is responsible for identifying and executing the training requirements of CA ARNG, including range development, equipment and personnel levels, and the types of training needed. At Camp Roberts, these training requirements are coordinated with the Camp Roberts Commander and the Director of Plans, Operations, Training, and Security (DPOTS) to ensure they are integrated with the facility's capabilities. CAOT also funds and manages the Integrated Training Area Management (ITAM) program at Camp Roberts.

> *The Garrison Commander identifies/ addresses threats to mission land use… [and] ensures DPOTS (or equivalent) provides descriptions of mission landscape requirements to include recommendations for improving the capability, availability, and accessibility of land (Army 2007).*

Directorate of Public Works

The DPW allocates funding and implements all military construction, facilities maintenance, and real estate activities for CA ARNG, including Camp Roberts.

Environmental Directorate

The CA ARNG Joint Staff–Environmental Office (Environmental Directorate; CAEV) is responsible for ensuring CA ARNG's timely and proper compliance with all environmental laws and regulations. The Environmental Directorate's main office is located at CA ARNG Headquarters in Sacramento, with field offices located at Camps San Luis Obispo and Roberts. The Conservation Branch of the Environmental Directorate manages and funds the natural resources management programs statewide, including the INRMP at Camp Roberts. The Environmental Directorate ensures operational readiness by sustaining environmental quality.

The Environmental Directorate is responsible for managing flora, fauna, and all habitats at Camp Roberts. This includes directing compliance with the INRMP requirements, ensuring compliance with Biological Opinions (BOs) and other permits/agreements issued by state or federal agencies, conducting environmental review of projects pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), as well as providing technical expertise and environmental awareness to military and civilian personnel. The Environmental Directorate is directly responsible for preparing and updating the INRMP as required by DoD policy.

> *Natural resources managers… ensure consistency of goals/objectives/actions with mission requirements/other installation plans; identify potential project conflicts or opportunities for cooperative program implementation; and establish …-specific goals and measurable objectives for all INRMP elements and measure progress toward achieving them (DoD 2017b).*

1.3.2.4 Camp Roberts

Camp Roberts Garrison Commander

The Garrison Commander (GC) approves the INRMP. The GC uses the INRMP in conjunction with other installation plans to integrate land resources compliance and management activities with the military

mission. The GC identifies and addresses threats to mission land use and gives high priority to management objectives that protect mission capabilities of installation lands.

The Camp Roberts GC is responsible for coordination between the Environmental Directorate and DPOTS offices. The GC and the DPOTS determine the training load of Camp Roberts based upon the force structure determined by the Adjutant General. The GC plans for land use based on accomplishing training requirements while minimizing negative environmental effects.

Camp Roberts Garrison Training Center Personnel

Other personnel who are involved with management of natural resources are listed below.

- DPOTS (including ITAM)
- Environmental Directorate (CAEV)
- Department of Public Works (DPW)

These are the primary stakeholders who will ultimately implement this plan and ensure its success. These personnel are familiar with all aspects of Camp Roberts, including training scheduling (and conflicts), locations of training facilities, impairments or problems with human-made structures or natural functions, and needs for improvement or maintenance of training lands.

The Camp Roberts Director of DPOTS coordinates the ITAM program for the CAOT by developing a baseline of current and projected training requirements and training lands/facilities for the training site, tracking, and managing training operations on the installation, and directing the ITAM program coordinator and staff.

DPW is responsible for routine and annual maintenance of the facilities of Camp Roberts, including maintenance of roads and trails, buildings, grounds, firebreaks, and culverts, as well as minor construction projects. CAFE also oversees large military construction projects initiated at the headquarters level.

1.3.2.5 External

> *ARNG installation[s] shall involve the USFWS and State fish and wildlife agency in the scoping, design, preparation and/or review of a new INRMP. At a minimum, this requires that the…ARNG provides these agencies with draft INRMPs for review and comment, and that the…ARNG address these comments appropriately.*

Federal Agencies

U.S. Fish and Wildlife Service

The USFWS is responsible for ensuring compliance with the Endangered Species Act (ESA) as it pertains to plants, wildlife species, and non-anadromous fish. It also administers the Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA). The USFWS is a cooperating and signatory agency to the INRMP and reviewed the INRMP as it pertained to the species within USFWS jurisdiction.

National Marine Fisheries Service

NMFS is responsible for ensuring compliance with the ESA as it pertains to marine species and anadromous fish. Although not a signatory, the agency is invited to participate in INRMP review and provide feedback as it pertains to the south-central California coast (SCCC) steelhead (*Oncorhynchus mykiss irideus*) and its habitat.

State Agencies

California Department of Fish and Wildlife

The CDFW is a cooperating and signatory agency to the INRMP under the Sikes Act. This agency has regulatory authority over all plant and animal species listed under the California Endangered Species Act (CESA), as well as the state's wildlife resources, waterways, and fish and game animals. As with the federal agencies, CA ARNG and CDFW work cooperatively during plan development to ensure all species within their jurisdiction were adequately addressed in the INRMP policies.

1.4 INRMP Goals and Objectives

> *DoD policy guidance is to use INRMP goals and objectives as a tool to monitor and evaluate ecosystem outcomes. Implementation strategies include specific and measurable objectives and criteria to evaluate activities in the ecosystem (DoDI 4715.03).*

In close coordination with internal and external stakeholders, natural resources personnel consider management goals, objectives, and timelines for actions that serve to sustain training lands and mission capabilities. The goals of the INRMP integrate regional ecosystem, military, social (community), and economic concerns. Natural resource conservation, restoration, and enhancement will be conducted to ensure the continued ability of Camp Roberts to support its current and evolving mission, by applying the principles of ecosystem management in an integrated approach with other internal plans, and regional ecosystem management goals. The INRMP will fully comply with regulatory requirements while taking opportunities to enhance the resilience of natural resources to sustain military readiness. Goals and objectives are identified for each resource component in chapters 4 and 5.

1.5 Review and Revision for Operation and Effect

> *Ecosystem sustainability is a condition of living communities that meets, or can be manipulated to meet, current mission, compliance, stewardship and production needs without compromising the future ability to meet those needs (AR 200-1).*

Each INRMP is to "be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every 5 years." This review is required to reflect mutual agreement among Camp Roberts' signatory parties (USFWS, CDFW, and CA ARNG). The parties determine whether it is implemented pursuant to the Sikes Act, and contributes to the conservation and rehabilitation of natural resources on military installations. The conclusion may indicate that a revision or update to the INRMP is required or may result in a determination that the existing INRMP is adequate.

Annual reviews are also required. These reviews are to determine if the INRMP revisions are necessary and verify that funding, staffing, goals, and other aspects of the INRMP are current.

During the development of new or revised INRMPs, consultation should take place with Native Americans, per Executive Order (EO) 13175, DoDI 4710.02, and DoDI 4715.03. Unless pre-existing consultation practices have been established, consultation with federally recognized tribes who have an interest in specific natural resources within the installation should occur during the review of new or revised INRMPs. Evidence of consultation with federally recognized tribes regarding the potential effect of INRMP plans and projects must be included. Concerns from Tribes should also be addressed within the INRMP (DoDM 4715.03).

1.6 Consistency with Other Plans and Programs

DoD policy seeks to ensure that current and planned installation activities (e.g., site development plans, construction requests, site approval requests, host- tenant agreements, and outleases) are effectively coordinated and consistent with activities described in the INRMP. The INRMP has been developed to align with goals and objectives of other installation plans and programs to ensure the long-term sustainability of training lands and support of the military mission.

> *Ensure that INRMPs are fully coordinated with appropriate installation offices responsible for preparing, maintaining, and implementing other programs and plans that may affect land used or be affected by land use decisions (DoDI 4715.03).*

Integrated Training Area Management Program

The INRMP identifies natural resource management requirements necessary to support and maintain training areas and ranges and incorporates the ITAM Annual Work Plan into the implementation of the INRMP where these activities support INRMP goals and objectives.

The Training Requirements Integration (TRI) component of the ITAM program provides a decision support procedure that integrates training requirements with land management, natural/cultural resources management processes, and data derived from the Range and Training Land Assessment (RTLA). TRI involves continuous consultation, coordination, and planning between the DPOTS, Environmental Directorate, and other installation personnel as appropriate to improve coordination, decision making, and uniform data regarding land condition and trend. The ITAM Annual Work Plan is included in Appendix C.

Range Complex Management Plan/Operational Area Plans

The Sustainable Range Program is the Army's overall approach for improving the way in which it designs, manages, and uses its ranges to ensure long-term sustainability. The Range Complex Management Plan (RCMP) is the primary tool of the ARNG's Sustainable Range Program. The RCMP integrates mission support, environmental stewardship, and economic feasibility. The RCMP is designed to be a road map for the future development of the range complex to ensure that installations can meet their current and future training missions. The RCMP is updated annually and will integrate components of this INRMP update.

Sustainable range planning focuses on the research, development, demonstration, and implementation of sustainable range technologies to address environmental requirements for Army ranges without compromising military readiness or training. This strategy provides Camp Roberts with the capability to sustain environmentally compliant training ranges in order to accomplish its mission.

Integrated Cultural Resources Management Planning

CA ARNG manages cultural resources (e.g. archaeological resources and historic structures) through its Integrated Cultural Resources Management Plan (ICRMP), which is currently being updated. Like the INRMP, the ICRMP presents policies and management procedures to integrate the military training mission needs and legal requirements regarding cultural resources. Because management of cultural resources can adversely impact natural resources, all INRMP projects and conservation measures are intended to conform to the ICRMP.

Installation Restoration

The DoD established the Installation Restoration Program (IRP) in 1975 to provide guidance and funding for investigating and remediating hazardous waste sites caused by historical disposal activities at military installations. The fundamental goal of the IRP is to protect human health, safety, and the environment. The IRP investigates and, if necessary, remediates former disposal and test areas, some of which were used before the disposal of chemicals was regulated or even fully understood. Natural resources managers are directed to participate in IRP decision-making and restoration activities as a matter of Army policy.

Integrated Pest Management Plan

The Integrated Pest Management Plan (IPMP) is a long-range, comprehensive planning and operational document that establishes the procedures for conducting a safe, effective, and environmentally sound integrated pest management program. The purpose of the pest management program is to aggressively control, by mechanical means or pesticide application, all noxious and undesirable weeds, rodents, insects and other pests on improved grounds and agricultural lease parcels. It covers all pest management and pesticide-related activities conducted by civilian and military DoD personnel, commercial pest management services providers, and lessees, including tenant commands.

Integrated Wildland Fire Management Plan

The Integrated Wildland Fire Management Plan (IWFMP; 2021) details effective wildland fire guidance and management for CR. It provides a planning framework for fire management as it relates to fuel load reduction and natural resource management.

Installation Master Plan

The INRMP supports development of the Installation and State Master Plans by providing information about resource concerns, management requirements, and general natural resources information.

Regional Plans and Programs

Several local and regional plans were reviewed to identify areas that may be similar or may conflict with CR's management practices. The following plans were considered during development of this INRMP:

> *Each installation shall evaluate and incorporate appropriate information from other Federal and State natural resources management plans and agreements (DoDI 4715.03).*

- Land Use and Circulation Elements of the San Luis Obispo County General Plan: Framework for Planning (Inland) (San Luis Obispo County 2015)
- Integrated Regional Water Management Plan (San Luis Obispo County 2019)
- Riparian Bird Conservation Plan (Riparian Habitat Joint Venture 2004)
- California State Wildlife Action Plan 2015 Update (SWAP; CDFW 2015)

1.7 Regulatory Context and Natural Resources Consultation

A detailed listing of the government regulatory context of natural resources management and Sikes Act compliance is available in DoDI 4715.03. The primary regulations driving species and resource management are described briefly below.

To ensure exclusion of proposed CH under Section 4(a)(3)(B)(i) of the ESA, an installation's INRMP should provide for the benefit of listed species through the management and/or enhancement of habitat utilized by federally-listed species occurring on or contiguous to the installation.

Federal Endangered Species Act (ESA)

As required under Section 7 of the ESA, federal agencies must enter into consultation with USFWS or NMFS if proposed actions "may affect" listed species. There are two different consultation processes; informal and formal. Informal consultation occurs when an action is "not likely to adversely affect" a listed species. The NGB has designated the CA ARNG as a non-federal entity operating on their behalf and is responsible for participating in the informal consultation process. Formal consultation occurs when an action "may adversely affect" a listed species. This consultation process determines if a proposed action is likely to jeopardize the continued existence of a listed species. NGB is the federal agency responsible for formal consultation and works closely with the CA ARNG during the process.

Federal agencies are also required to determine if designated critical habitat (CH) for listed species may be adversely affected by the proposed action and complete consultation accordingly. Under Section 4(b)(2) of the ESA, DoD installations can be excluded from CH designations based on national security. Under Section 4(a)(3)(b)(i) of the ESA, DoD installations can be exempted from critical habitat designation if an INRMP provides a benefit to listed species.

California Endangered Species Act (CESA)

The CESA is the state equivalent of the ESA as is designed to "conserve, protect, restore, and enhance any endangered species or any threatened species" (California Department of Fish and Game [CDFG] Code § 2050-2089.25). Like the ESA, CESA allows for the incidental take of listed species in the process of otherwise lawful activities. The consultation process in many ways mirrors that of the ESA, and Incidental Take Permits are granted according to similar procedures.

Regulated Waters and Wetlands

In matters relating to Waters of the U.S. and Waters of the State, Camp Roberts falls under the jurisdiction of the U.S. Army Corps of Engineers (USACE)–Sacramento District, the Central Coast Regional Water Quality Control Board (RWQCB), and the CDFW. The USACE, Central Coast RWQCB, and CDFW regulate work within waterways and wetlands with each agency having their own limits of jurisdiction. The limit of federal jurisdiction is complicated and currently being updated, however it is generally linked to navigability and falls under USACE jurisdiction. Nearly all surface waters and drainages are considered "Waters of the State" and fall under the jurisdiction of RWQCB and CDFW. The USACE and Central Coast RWQCB jurisdictions are authorized under the Clean Water Act and the Porter-Cologne Water Quality Act. Consultation with these agencies is necessary for activities, such as filling, dredging, or clearing of streams, and require a USACE Section 404 Nationwide Permit and Section 401 Water Quality Certification, USACE individual permit, or coverage under a Central Coast RWQCB Waste Discharge Requirement (WDR).

CFG Code § 1602 requires any entity must first notify CDFW before beginning a proposed construction project that will divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; use materials from a streambed; or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake. Work proposed in water bodies regulated by CDFW normally requires completion of a CDFW Streambed Alteration Agreement prior to beginning the work.

National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA)

NEPA requires federal agencies to consider and document the potential environmental impacts of federal actions. Similarly, CEQA requires analysis and documentation of environmental impacts from state actions. NEPA and CEQA review constitute the baseline of environmental review and must be applied to nearly all actions on the installation. The CA ARNG acts as both a federal and state agency and must comply with the requirements of both acts. The NEPA/CEQA process is discussed in more detail in *Section 5.5: NEPA and CEQA Compliance.*

2.0 Current Land and Natural Resources Use

2.1 Real Estate Summary

Camp Roberts is located in California's south-central coast region in San Luis Obispo and Monterey Counties, approximately 25 miles (40 kilometers [km]) east of the Pacific Ocean in the southern portion of the Salinas River Valley, midway between San Francisco and Los Angeles (Map 2-1). The installation is bisected north to south by the Monterey/San Luis Obispo County line. Camp Roberts is bordered on the west by the unincorporated community of Heritage Ranch and on the east by the unincorporated community of San Miguel. It lies 11 miles (18 km) north of the City of El Paso de Robles (Paso Robles).

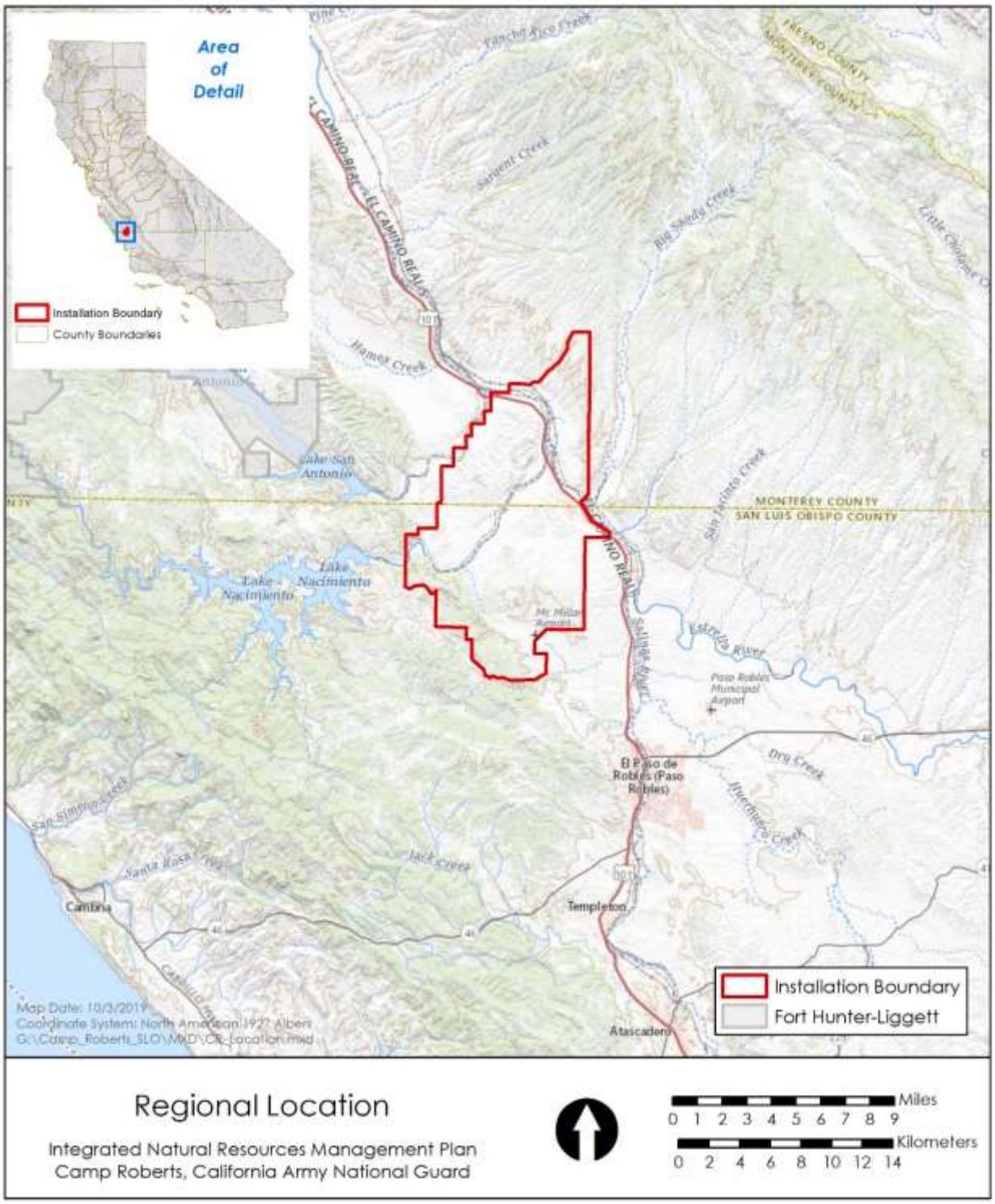
The installation is a 42,784-acre (ac; 17,314 hectares [ha]) training site owned by the USACE and leased to the CA ARNG. Camp Roberts supports several uses, including a large cantonment (administrative) area (2,491 ac [1,008 ha]), maneuver training area (15,580 ac [6,305 ha]), and firing ranges with a designated Impact Area (8,125 ac [3,288 ha]).

Real Estate and Ownership History

Camp Roberts was established in 1940 as a training camp and was capable of accommodating 30,000 troops. It was opened as the Camp Nacimiento Replacement Training Center and was renamed Camp Roberts in 1941 in honor of Corporal Harold W. Roberts, a tank crewman killed in action while saving a fellow soldier in World War I (CA ARNG 1996). Camp Roberts was one of the few wartime camps to be retained after World War II, and it is the only remaining training camp that was named after an enlisted man (USACE 1997).

Between 1941 and 1945, a total of 436,000 infantry and field artillery troops were trained at Camp Roberts (CA ARNG 2000). National Guard and Army Reserve units used a portion of the Camp, along with the adjacent Fort Hunter Liggett, for training required in the summer months. During WWII, in addition to training activities, the Main Garrison hosted a 750-bed hospital complex to support the war efforts. Between 1946 and 1950, facilities at Camp Roberts deteriorated from lack of use (USACE 1997).

Camp Roberts was reactivated in 1950 for the Korean War, and by the war's end in 1953, approximately 300,000 troops completed training there. During this time, the Camp continued to host the National Guard and Army Reserve units. At the conclusion of the Korean War, Camp Roberts was again deactivated but continued to provide space and services for the National Guard and Army Reserve units over the years that followed (USACE 1997). Outside of war-time, Camp Roberts has been deactivated and assigned "caretaker" status with only a few administrative and custodial personnel remaining. This continuous activation/deactivation cycle would earn Camp Roberts the nickname as "the most active 'inactive' post in the U.S."



Map 2-1. Regional Location of Camp Roberts.

2.2 Regional Land Ownership and Use

2.2.1 Surrounding Land Use

Camp Roberts is bordered largely by undeveloped areas used for agriculture, rural residences, and recreation (Map 2-2). The south-western border is shared with the Heritage Ranch residential subdivision. The closest communities are San Miguel (about 4 miles [6 km] southeast of the main gate) and Bradley (about 7 miles [11 km] northwest of the main gate). Both are unincorporated. Paso Robles is located 11 miles (18 km) southeast of Camp Roberts. The San Antonio Reservoir Recreation Area and Nacimiento Reservoir are located west of the Camp. Fort Hunter Liggett, a 165,000-ac (66,773-ha) Army base, is located approximately 25 miles (40 km) north-west of Camp Roberts. The public exposure to Camp Roberts is predominantly along U.S. Highway 101 (US 101), which divides the Camp and provides access to the main entrance.

The CA ARNG has successfully participated in the Army Compatible Use Buffer (ACUB) program, which promotes partnerships among neighboring landowners, conservation organizations and the military to protect surrounding properties from development. Funding is provided by DoD to a participating conservation organization who then purchases the title or conservation easements. Through 2011 ACUB funds, Camp Roberts was able to acquire the development rights of three parcels totaling 285 ac (115 ha) in the San Miguel Ranch area, to the east. Camp Roberts submitted a proposal in 2012 to secure additional parcels of land near the McMillan Airfield, to secure its unmanned aerial systems mission. Development rights for these 600 ac (243 ha) were secured through Readiness Environmental Protection Initiative funding. Additionally, over 1,300 ac (526 ha) of conservation easements were established with the Agricultural Land Trust on the northeastern border to prevent incompatible housing development and other land uses that may be sensitive to military operational impacts such as noise and aircraft accidents.

2.3 Historical Overview of Land Use

Camp Roberts was once part of El Rancho Nacimiento during the Mexican land grant period, during which livestock grazing was the primary use of the property. The Army continued cattle and sheep grazing leases for fuel load management until 2006, when the grazing program was suspended.

2.4 Current Operations and Activities

2.4.1 Training Activities Overview

Training Activities and Mission Siting

Camp Roberts' large maneuver area for collective force on force training and significant number of live fire and simulated ranges make it a very flexible training site for infantry, armor, artillery and all manner of Combat Support and Combat Service Support units. Field exercises include vehicle maneuvers, troop maneuvers, bivouacking, construction of fortifications, emplacements and obstacles, and manned and unmanned aircraft operations. These units ford rivers, fire all weapon systems in their inventory, establish operation centers in the field and in the cantonment area, excavate gun positions and defensive positions, conduct explosive demolition, construction, and many other activities. Live fire exercises involve the use of live ammunition or ordnance. Because of safety concerns, live fire exercises are highly structured and are tightly controlled.

Helipads, bivouac sites, and ranges within separate training areas are used for live fire and field training exercises. Roberts Army Heliport and McMillan Airfield are used for aviation training activities including the use of transport helicopters to ferry troops and equipment, helicopter gunships to conduct live-fire training, and fixed-wing aircraft to conduct simulated bombing runs. The McMillan Airfield is also used for unmanned aviation system training and development)

Camp Roberts has a unique relationship with Fort Hunter-Liggett derived from a 15-mile (24-km) tank trail that allows brigade size units to deploy forces from Camp Roberts to Fort Hunter-Liggett for force on force training while maintaining doctrinal distances with Combat Support and Combat Service Support units from Camp Roberts.

Camp Roberts training facilities are as follows (Map 2-3; Table 2-1).

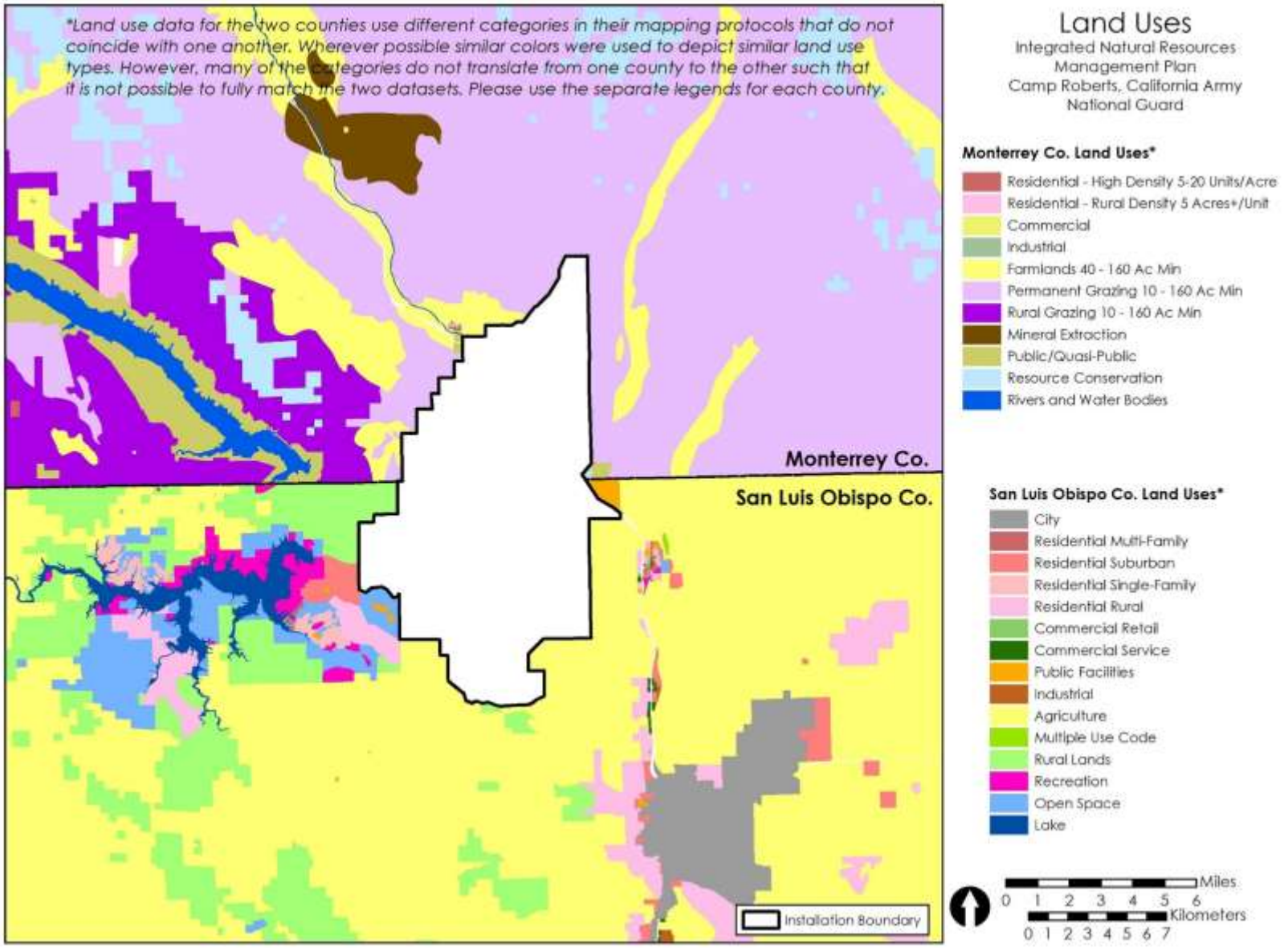
- 25 Training Areas ranging in size from 357 to 10,046 ac (144 to 4,065 ha).
- A dedicated 8,130-ac (3,290-ha) Impact Area.
- Maneuver areas covering 32,194 ac (13,028 ha) and encompassing 22 Training Areas.
- Two safety-surveyed parachute drop zones (Nacimiento Drop Zone and Twin Brothers Drop Zone) and one landing/pickup zone.
- Two heliports: Camp Roberts Army Heliport on East Garrison (rotary wing aircraft only) and West Garrison Heliport.
- A total of 2,514 ac (1,017 ha) of cantonment areas split between Main and East Garrisons.
- A total of 23 designated live-fire ranges and 39 surveyed artillery firing points; these points fire inward toward the center of the impact area.
- A 15-mile (24-km) tank trail that allows units to travel between Camp Roberts to Fort Hunter Liggett for specific types of training exercises and range use.

Utilization

The military units that regularly train at Camp Roberts for the CA ARNG consist of seven brigades. Of these, two are maneuver, one is Combat Service, three are Combat Service Support, and one is Combat Aviation. These Major Commands (brigades) are the 40th Infantry Division Headquarters, 79th Infantry Brigade Combat Team, 49th Military Police Brigade, the 224 Sustainment Brigade, the 115th Regional Support Group, the 100th Troop Command, and the 40th Combat Aviation Brigade.

Camp Roberts operates year-round on weekdays and weekends. The peak annual training period runs from April through August, but National Guard and reserve units utilize the facilities up to 50 weekends per year for inactive duty training. All military and nonmilitary organizations typically train as many as 200 weekdays per year. Also, Camp Roberts is host to year-round pre-mobilization training. CA ARNG generally uses the training site on weekends and during annual training periods.

Weekend training generally involves individual, team, squad, platoon, or collective army warrior task or battle drill activities (basic training activities that every soldier needs to know in order to shoot, move, and communicate on the battlefield). Camp Roberts hosts several large annual training exercises that each last approximately two weeks and occur from April through August. Most facilities and lands used to support the training activities are used at higher levels during this period.



Map 2-2. Land Ownership in the Vicinity of Camp Roberts.

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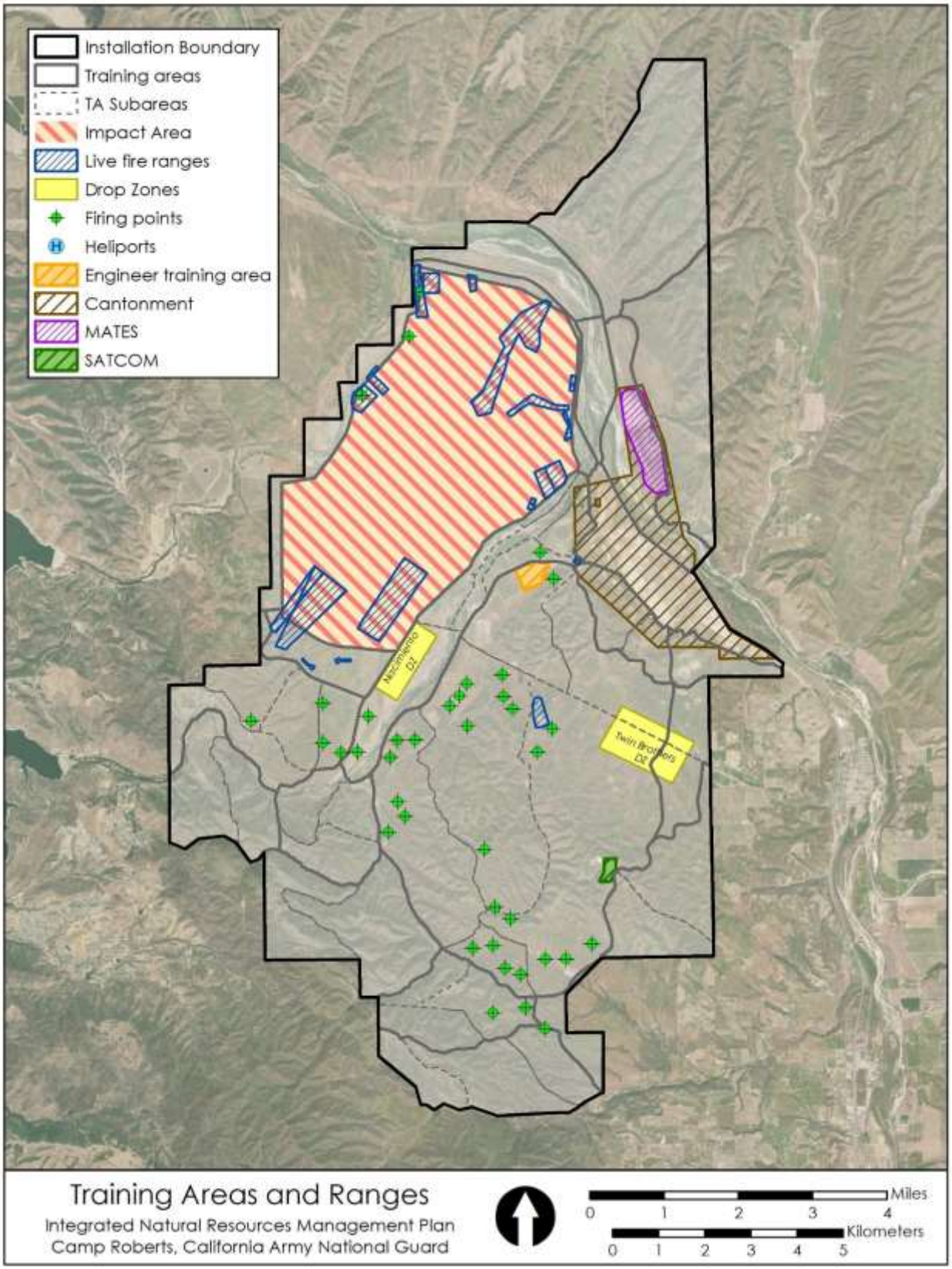


Map 2-3. Training Areas and Ranges at Camp Roberts.

Table 2-1. Training Areas in Camp Roberts.

AREA	ACREAGE	DESCRIPTION
A & C	1,672 ac (677 ha)	Cantonment and industrial operations (warehouses; maintenance; petroleum, oil, and lubricants facilities; trailer park; and sanitary fill) and driver training courses; classrooms and training simulators.
B	668 ac (270 ha)	Bivouacking, land navigation, mounted and dismounted scouting, and patrolling.
G	1,178 ac (477 ha)	MATES, Roberts Army Heliport, and sewage treatment plant.
H	2,073 ac (839 ha)	Mechanized infantry, armor, artillery, and combat service and combat service support maneuvering.
I	2,983 ac (1,207 ha)	Mechanized infantry, armor, artillery, and combat service and combat service support maneuvering.
J	444 ac (180 ha)	Bivouacking, tactical maneuver, helicopter operations, and staging area.
K	823 ac (333 ha)	Bivouacking, tactical maneuver, helicopter operations, and staging area.
L	1,018 ac (412 ha)	Bivouacking, tactical maneuver, helicopter staging and refueling area, ford site crossing, three firing points (31, 32, and 33), and one survey control point (TT-4).
M	8,130 ac (3,290 ha)	This is the only dedicated live impact area in California for all caliber (8-inch howitzer and below) direct and indirect weapon systems and multipurpose range complexes arrayed around this area. The northern area is used as a temporary troop maneuver zone for combined arms live fire exercise and live fire ranges. The southern area is used for indirect fire and large caliber weapons. Within the impact area boundaries are a specifically defined indirect fire target area, a surface danger zone buffer area, and a restricted troop maneuver zone. Area also includes one observation point (OP 2) and radar site (RS-1).
N	649 ac (263 ha)	Limited squad-level tactical training (indirect observation points).
O	1,843 ac (746 ha)	Bivouacking, tactical training, combined arms maneuvering, four surveyed artillery firing points (FP 2, 3, 5, and 37), one observation point (OP 7), two survey control points (Mike and TT1-B), and helicopter forward arming/refueling points.
P	1,826 ac (739 ha)	Bivouacking, tactical maneuvering; river crossing site (Low Water Bridge); airborne and air assault landing, pick-up and/or drop zones (Sherwood Forest Landing Zone/Pick-Up Zone and Nacimiento Drop Zone); driver training; nuclear, biological, chemical chambers; nuclear, biological, chemical decontamination site; engineer training center, bayonet assault training; basic land navigation; one observation point (OP 5); and three surveyed artillery firing points (FP 1,4, and HIPSHOOT).
Q	1,252 ac (507 ha)	Tactical training and dismounted operations, bivouacking, helicopter nap of earth activities, river crossing, rappelling, and basic mountaineering training.
R	1,115 ac (451 ha)	Bivouacking, tactical, and dismounted operations, indirect fire observation point (OP 7), and helicopter nap of earth operations.
S	1,863 ac (754 ha)	Bivouacking, tactical, and dismounted operations, and helicopter nap of earth operations.
T	1,138 ac (461 ha)	Bivouacking, dismounted operations, helicopter nap of earth operations, two surveyed artillery firing points (FP 18 and 35), and one survey control point (Nacimiento).

AREA	ACREAGE	DESCRIPTION
U	1,528 ac (618 ha)	Bivouacking, tactical, and dismounted operations, one surveyed artillery firing point (FP 22).
V	357 ac (144 ha)	Tactical training, bivouacking, helicopter staging, tactical/off-road driving, and landing zones.
W	1,418 ac (574 ha)	Tactical training, bivouacking, helicopter staging, tactical/off-road driving, and landing zones.
X	715 ac (289 ha)	Tactical training, bivouacking, staging, off-road driver training course, landing zone.
Y	10,046 ac (4,065 ha)	Prime maneuvering for battalion and up to brigade size combined arms team tactical training, airborne operations at Twin Brothers Drop Zone, 26 surveyed artillery firing points for live fire, and R2504 controlled airspace.

2.4.2 Installation Users

Military Users

Camp Roberts provides operational training, support, housing, stationing, maintenance, and recreation for at least two Brigade size units (5,000 soldiers each), and, their support package, training advisors, Opposing Forces, logistical packages, medical augmentation, chaplain support, and attached units for augmentation where training needs exist. The units using Camp Roberts normally consist of Active, Reserve, or National Guard Army, Navy, Marines, Coast Guard, and Air Force, and many other non-military organizations. Camp Roberts has a large assortment of ranges and a dudded impact area. These units drive vehicles throughout the installation, ford rivers, fire all weapon systems in their inventory, establish operation centers in the field and in the cantonment area, and excavate for gun positions, defensive positions, explosive demolition, construction, and many other needs. They conduct activities necessary for a military organization to train and sustain a wide variety of military operations.

Camp Roberts is home to the Regional Training Site-Maintenance which is responsible for training soldiers on maintenance and operation of various wheeled and track vehicles. Camp Roberts is also the home of Task Force Warrior, a Pre-Mobilization Training Assistance Element responsible for training soldiers preparing to deploy to overseas duty locations. Both the Regional Training Site-Maintenance and the Pre-Mobilization Training Assistance Element utilize roadways and trails throughout the installation.

Civilian and Other Organizations

The installation is home to hundreds of full-time employees who conduct facility, road, tank trail, and fire break maintenance, training management, information management, personnel support, logistical support, billeting and housing operations, environmental support, and compliance, as well as a very robust Sustainable Range Program (see *Section 1.6* for a description of this program).

Camp Roberts also houses numerous tenant organizations and is available to any organization requesting space on the post. Various organizations (e.g., BAE Systems, Naval Post Graduate School) conduct research and development (e.g., test vehicles and other equipment, fly pilotless aircraft). Numerous contractors and the USACE are contracted on a routine basis to perform all types of construction, maintenance, and support work at Camp Roberts. These projects range from contracted compliance work to multi-million dollar facilities.

Hobbyist groups who re-enact previous wars or battles use the post for training and rehearsal. Camp Roberts has an active recreational vehicle park. Environmental surveys and student projects are also conducted at the installation. Camp Roberts is occasionally home to a marathon or sporting event and sometimes has an active livestock grazing program.

Government Agencies

A host of federal, state, and local agencies use the installation for a variety of activities. Camp Roberts accommodates law enforcement agencies, government and school environmental study groups, game wardens for hunters and anglers, school youth groups, as well as other groups who petition for the use of the installation. Camp Roberts is also the planned support facility in the event of a large-scale disaster. Under this scenario the installation would house the Federal Emergency Management Agency and medical and law enforcement agencies to provide housing and assistance to thousands of disaster victims.

Foreign Military

Foreign Military units with the proper clearance from the U.S. Department of State may use Camp Roberts to conduct training similar to that mentioned in “Military Users” above.

3.0 Natural Resources of Camp Roberts

3.1 Ecoregional Setting and Values

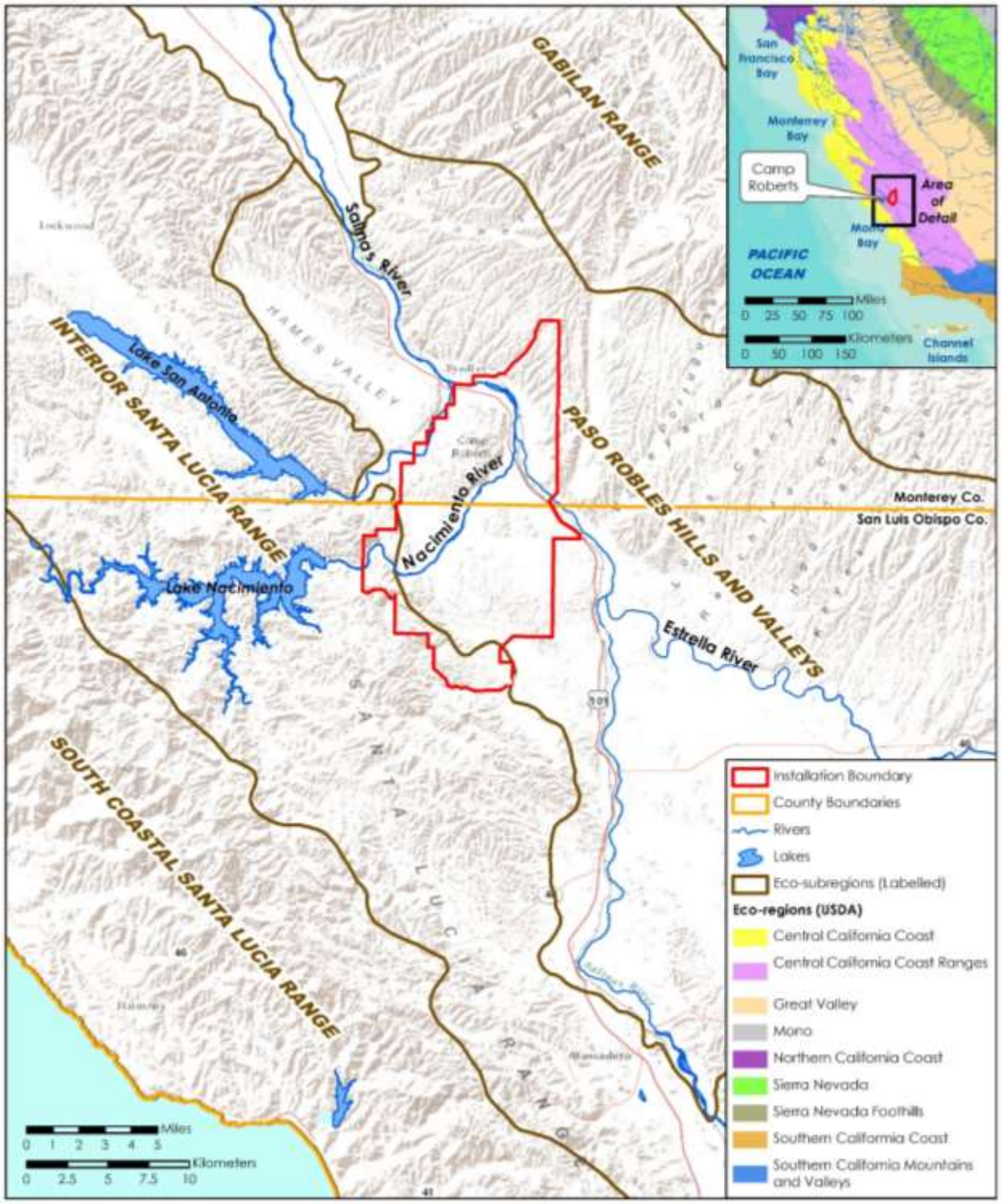
Camp Roberts lies in the rain shadow of the Santa Lucia Range of the Outer South Coast Ranges (Map 3-1). The Outer South Coast Ranges are the southern portion of the mountains which extend parallel to the Pacific Ocean from Santa Barbara County to near the Oregon border (Baldwin et al. 2012). The Paso Robles Hills and Valleys are dissected plain with low, rolling to moderately steep hills. It is lower, drier, and has less relief than the adjacent areas.

Runoff from the vicinity of the Santa Lucia Range on the west of the Salinas Valley, including Camp Roberts, provides most of the annual water supply for major tributaries (Arroyo Seco, San Antonio, and Nacimiento) to the Salinas River, which drains to Monterey Bay. As the most heat and drought tolerant of California oaks, blue oaks (*Quercus douglasii*) are characteristic of this region and circle California's Great Central Valley in low-elevation foothills; they dominate many slopes at Camp Roberts. Dry summers also promote fire as an underlying natural process, although summer fog and high night-time humidity ameliorates extreme fire risk compared to more inland areas. Camp Roberts' vegetation has specific adaptation to a background fire regime and can be stressed by a too-frequent or too-long fire interval.

The regional ecosystem has been highly altered by its land use history with the most visible signs at Camp Roberts being: (1) the grassland are largely non-native, weedy annuals instead of perennial bunchgrasses; (2) valley oak and blue oak cover has dramatically declined throughout California making the stands at Camp Roberts more important to conservation; and (3) the hydrologic regime of the rivers has been altered by dams.

3.2 Climate and Weather Patterns

Camp Roberts lies within the Mediterranean climate zone, characterized by hot dry summers and cool moist winters, with highly variable annual and monthly rainfall patterns. Despite the lack of rain in the summer, nighttime relative humidity recovery is high, averaging near 90% throughout the summer and higher during the rest of the year. However, daytime lows are often below 20% in the summer months. Northwesterly winds dominate for much of the year, and there is no diurnal wind shift on most days. Winds blow from the northwestern quadrant 45% of the time. Winds remain below 11 knots (12.5 miles per hour) 89% of the time and only rise above 16 knots (18.5 miles per hour) 2% of the time.



Camp Roberts Ecoregional Setting

Integrated Natural Resources Management Plan
Camp Roberts, California Army National Guard

Map Date: 1/25/2021
Coordinate System: North American 1927 Albers
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Service Layer Credits: Sources: Esri, USGS, NOAA
Sources: Esri, Garmin, USGS, NPS

Map 3-1. Camp Roberts ecoregional setting.

3.2.1 Precipitation

The total average annual precipitation in the area is 12.2 inches (31.0 centimeters [cm]), with a low of 1.9 inches (4.8 cm) in 2013 to a high of 25.6 inches (65.0 cm) in 1996 (Figure 3-1). Most rainfall occurs in winter and early spring from November through April, with little rain falling in May through October (Figure 3-2).

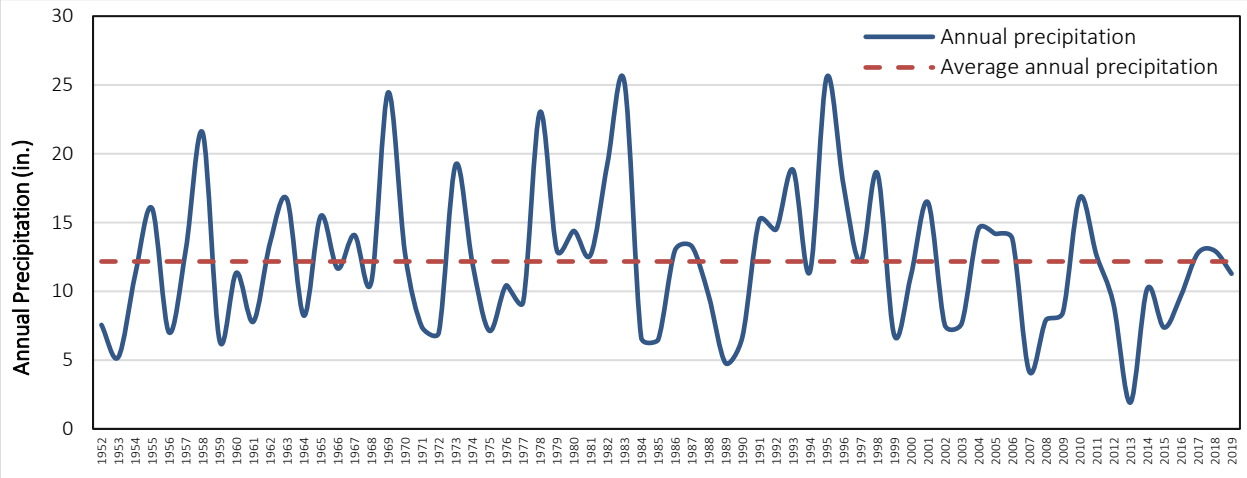


Figure 3-1. Annual precipitation in the vicinity of Camp Roberts (Data Source: Western Regional Climate Center, Paso Robles Municipal Airport station. Period of record 1952-2019).

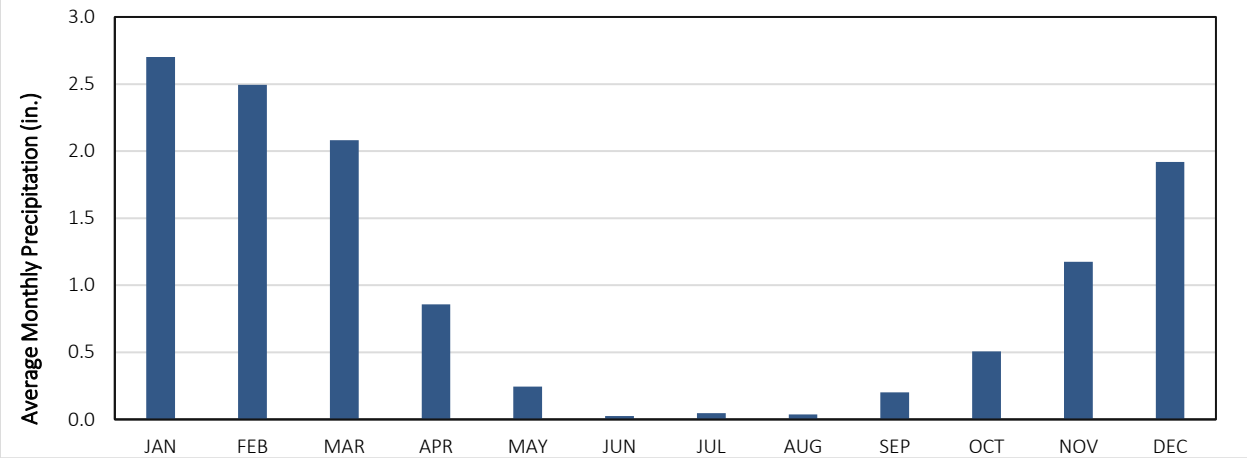


Figure 3-2. Monthly precipitation in the vicinity of Camp Roberts (Data Source: Western Regional Climate Center, Paso Robles Municipal Airport station).

3.2.2 Temperature

Average monthly temperatures range from a low of 46.8 degrees Fahrenheit (°F; 8.2 degrees Celsius [°C]) in December to a high of 74.1°F (23.4°C) in July (Figure 3-3).

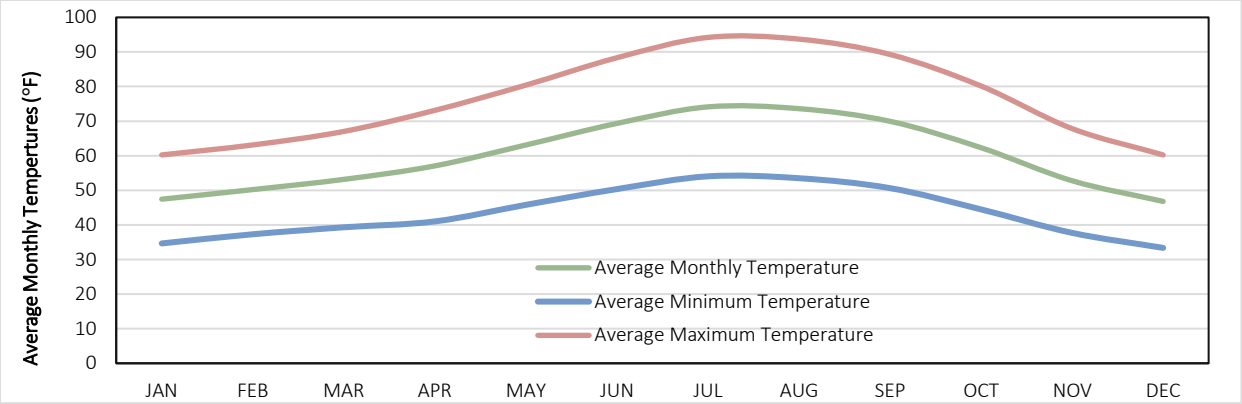


Figure 3-3. Average monthly temperatures in the vicinity of Camp Roberts (Data Source: Western Regional Climate Center, San Luis Obispo Polytech station).

3.2.3 Wildland Fire Regime

Camp Roberts lies in a high fire risk region of the Central Coast (CFCCA 2018), and the training activities at involve many actions that increase that risk. Additionally, Camp Roberts has natural resources, an operations schedule, and a training landscape that are vulnerable from extremes in fire regime. As a result, wildland fire management is high priority for the mission and the natural resources of Camp Roberts.

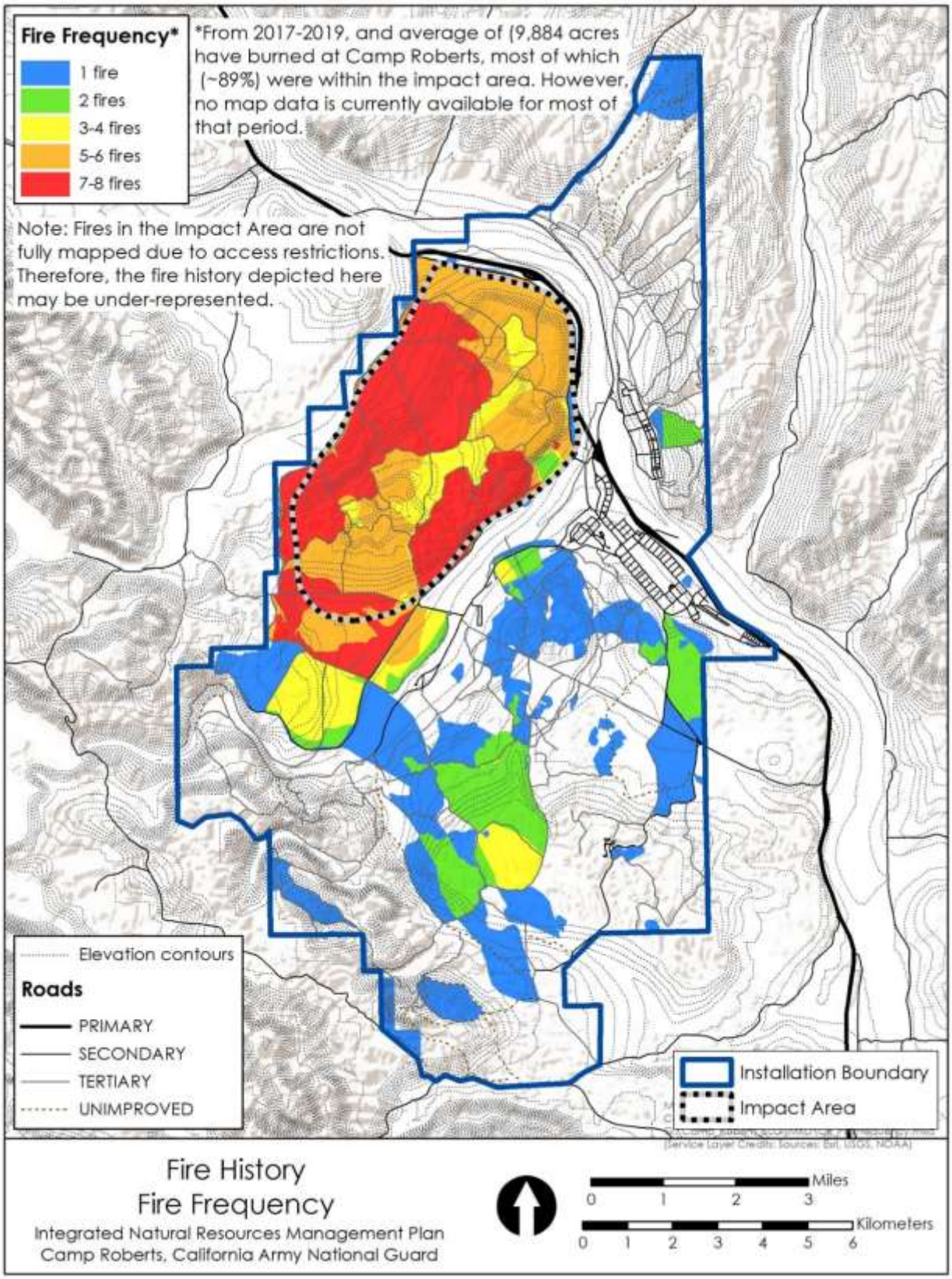
For most years on record, Camp Roberts has typically experienced several thousand acres of wildland and prescribed fires, most of which are confined to the impact area. Virtually all wildland fires at Camp Roberts are caused directly or indirectly by training activities, with most fires occurring April-July (CA ARNG 2015).

The recorded fire frequency for Camp Roberts is depicted on Map 3-2, covering the period 1951-2018. The maps are compiled from data obtained from California Department of Forestry and Fire Protection and photo interpretation of historic aerial photography accessed through GoogleEarth. While these maps provide a general depiction of fire patterns at Camp Roberts, significant gaps in the data since 2002 (from 2002-2019, data for all but three years is missing or incomplete) yield an incomplete record.

Fire sizes may be growing in recent years. At least three very large wildland fires (≥1,000 ac [405 ha] burned, CA ARNG 2015) have occurred at Camp Roberts since 2016 (California Department of Forestry and Fire Protection 2019): the Roberts Fire in May 2016, 3,712 ac [1,502 ha]; unnamed fire in May 2017 6,513 ac [2,636 ha]; and the Yankee fire in June 2018, 1,500 ac [607 ha]. This contrasts with one wildfire burning over 1,000 ac [405 ha] in the preceding 10 years (CA ARNG 2015).

Wildland fuel classifications are derived from vegetation maps, and vegetation was last mapped at Camp Roberts in 2007 (Woolf 2007). Fuel classifications from outside Camp Roberts' boundaries can be derived from a national fuel database called LANDFIRE.[1] Light flashy fuels dominate much of the installation and they can produce rapidly expanding fires on dry and windy days; fires can quickly exceed 1,000 ac [405 ha]. Fuel conditions are frequently very dry, with average one-hour fuel moisture (fine fuels) of 4% and 97th percentile average moisture of 1%.

[1] See: www.landfire.org.



Map 3-2. Fire frequency, 1951-2018. Map depicts only those fire polygons currently available and do not reflect the total burned areas.

The other important fuel issue is the heavier shrub fuel loads in the south. These fuels are capable of producing very intense wildfires that will resist containment through sheer intensity as well as spotting.

The IWFMP (Appendix H) provides in depth documentation of all prescribed and wildlife data and management plans. Policy, land management planning, wildland fire area and characteristics, operational guidance, monitoring, and evaluation, as well as program implementation are all addressed within the IWFMP.

3.2.4 Climate Change

Future climate change scenarios and impacts are estimated from modeling for climate impacts to CR. USACE's Climate Change Assessment Tool was utilized for running these models. CSLO and CR are both located within the California Central Coast and as such, are assumed to have similar climate impact predictions. The climate exposure assessments and data visualizations presented address eight climate change impact issues that have relevance to Army installation operations and planning: drought, coastal flooding, riverine flooding, heat, energy demand, wildfires, land degradation, and historical extreme weather. These impacts are represented using specific indicators as shown and described further in Figure 3-4. Indicators and impacts are presented for the current time period (based on a 30-year average from 1950 to 2005), for the 2050 future period (based on the 30-year average from 2035 to 2064), and the 2085 future period (based on 30-year average from 2070 to 2099). Projected impacts and indicators for each time period area also projected for higher and lower levels of emissions.

Details on how the Climate Assessment Tool works can be found in the Army Climate Resilience Handbook (USACE 2020). Overall, the two largest projected climate impacts for CR are wildfire and drought. Other projected impacts (from highest to lowest) include riverine flooding, heat, energy demand, land degradation, and historical extreme conditions. The following is a breakdown and summary of indicator weights for each climate change impact in the four projected scenarios (Lower 2050, Lower 2085, Higher 2050, and Higher 2085). Implications of these projections and management actions to address climate change are discussed in *Section 5.1.1 Climate Change*.

Wildfire

According to the USACE Climate Change Assessment Tool, predictions show that an increase in wildfire will likely be due to flash drought and fuel abundance. Flash drought is the average number of times per year in which rapid-onset drought occurs, characterized by a sharp drop in precipitation over a three-month period. They can lead to unexpected water shortages, but contribute to wildfire risk and excess heat stress. Continuous drought is counted as a single drought episode.

Fuel abundance refers to a greater share of the installation and adjoining lands in native vegetation-areas that are not agriculture and ornamental vegetation. The indicator measures the abundance of fuel in the installation and within 1-mile of the border to serve as an ignition source or which can carry fire to an installation.

Drought

Drought predictions indicate mean annual runoff and aridity are the largest contributing factors to future conditions. Runoff is anticipated to increase due to more intense storm events. A high aridity score

indicates that the area is becoming more arid due to a decrease in precipitation relative to potential evapotranspiration.

Coastal Flooding

Camp Roberts is not located within a climate change scenario that would be effected by coastal flooding or sea-level rise.

Riverine Flooding

Increase in flooding will likely be due to extreme precipitation days, indicating a greater exposure due to increases in flood risk and extreme behavior. This is the average annual number of days that precipitation in a future scenario is greater than what would have been considered an extreme precipitation day historically (the historic period 1% annual chance event storm).

The second highest indicator is maximum one day precipitation, creating a greater exposure due to increases in flood risk. The maximum one-day precipitation is the average annual maximum 1-day precipitation amount and is a measure of precipitation intensity.

Heat

Heat is closely correlated with wildfire and drought and is a projected increase in temperature. Hotter temperatures and greater heat stress exposures are the biggest threat within this indicator. The value of the annual 5-day maximum temperature is a measure of the 5-day hottest period.

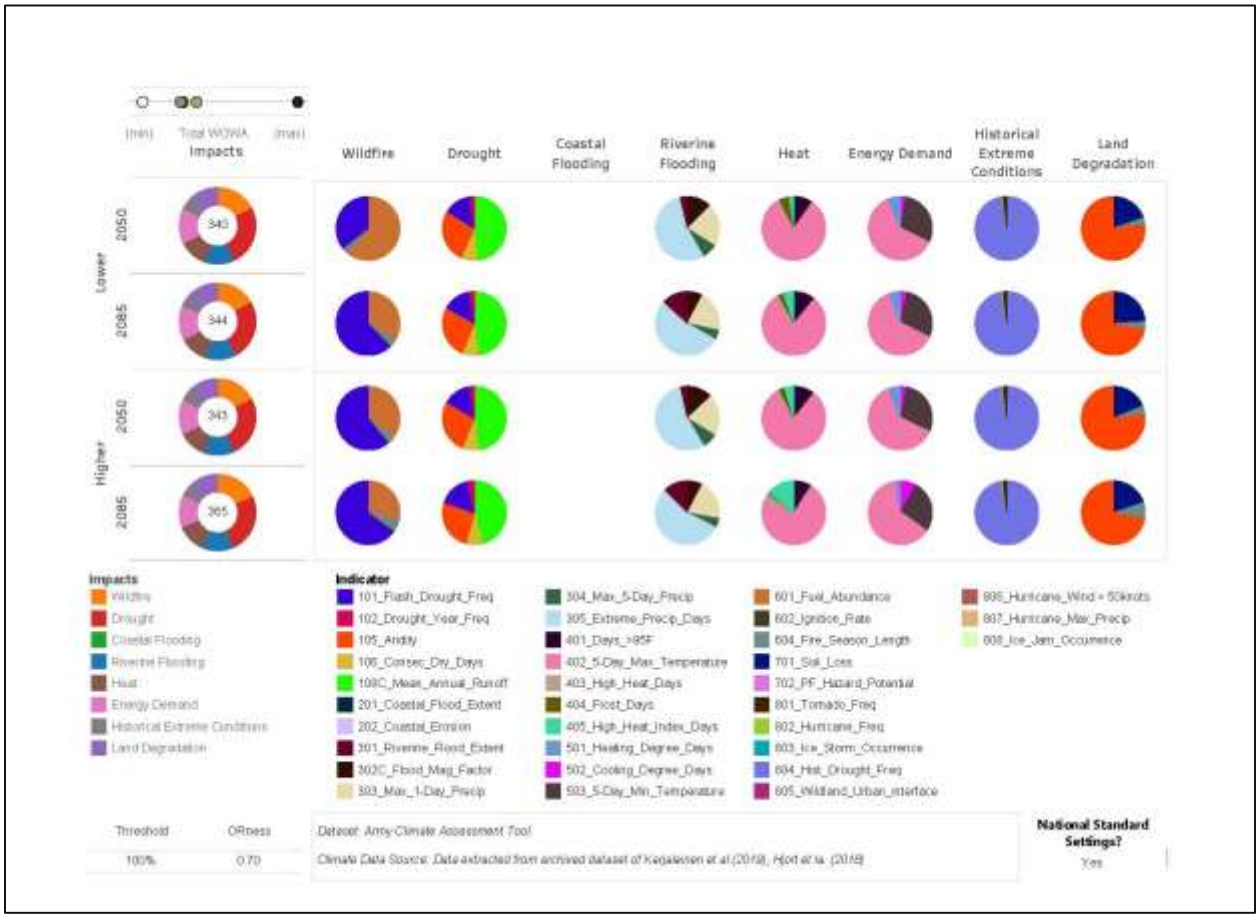


Figure 3-4. Projected climate change impacts and indictors (Data source: Army Climate Assessment Tool, 2021).

Energy Demand

The projected increase in temperatures will result in an increase in energy demand. All four scenarios indicate that maximum five-day temperatures are a high influence, followed by days over 95°F. Five-day maximum temperature indicators and meanings are described as above in *Heat.* Days above 95°F is expected to increase.

Historical Extreme Conditions

Historical extreme conditions are mostly indicated by history of drought frequency, indicating a greater drought risk. Historical drought frequency is the percent of weeks in the historic period when any part of an installation was categorized as in severe, extreme, or exceptional drought as determined by the National Integrated Drought Information System (NIDIS) Gridded Annual US Drought Monitor data.

Land Degradation

Land degradation will likely be due to aridity, and then to a much lesser extent is soil loss and fire season length. With the likelihood of limited precipitation causing a long-term reduction in water availability in the area, it is logical that aridity is the highest indicator as it plays into soil loss and fire season length.

3.3 Physical Setting

3.3.1 Geology and Geomorphic Features

Camp Roberts is located in the Upper Salinas Valley, its southern terminus, and is traversed by the Nacimiento and San Antonio drainages, which converge into the Salinas River and thence to the Pacific Ocean. The area is characterized by steep and rolling hills, and includes two major fault lines, the San Andreas, and Nacimiento Faults. Geologic formations in the Camp Roberts region consist of uplifted seafloor sediments that have been compressed and consolidated to form material such as sandstone and shale. As these materials have weathered, they have created a variety of hills and valleys with variable slopes. Two watersheds make up Camp Roberts, the San Antonio and Nacimiento River watersheds which lie within the Salinan Block of the Pacific plate.

3.3.2 Mineral Resources

Southern Salinas Valley is rich in petroleum resources. There has been minimal development of other minerals, such as diatomite, gold, gypsum, and rock products (CA ARNG 2014).

3.3.3 Soils and Ecological Sites

Soils

The U.S. Department of Agriculture's (USDA's) Natural Resources Conservation Service (NRCS) completed soil surveys for Monterey County and San Luis Obispo County in 1978 and 1983, respectively (Soil Conservation Service 1978, 1983). Soils may be grouped into three main categories based on parent material and geomorphic position: (1) alluvial fans and flood plains, (2) terraces, and (3) upland hills and mountains. Soils on alluvial fans and floodplains are generally formed in alluvium from mixed rock sources and flood plains mainly run along the river channels. They are very deep and poorly drained to somewhat excessively drained and surface layers range from loamy sand to silty clay. Soils on terraces are generally formed in alluvium from mixed rock sources, and vary from nearly level to very steep, are shallow to very deep, and are well drained. The surface layer is coarse sandy loam to shaley loam, with low clay content. Soils on the upland hills and mountains are generally formed in weathered sandstone and shale and are shallow to moderately deep, with strong to very steep slopes. They are composed of excessively drained to well-drained loamy sand to silty clay and have a high shrink-swell ability due to their clay content (Soil Conservation Service 1978, 1983). Soil loss is a critical component of soil conservation and while several factors determine how erosive a soil is (i.e. slope, vegetative cover), generally soils high in clay have low erodibility, sandy loams have moderate erodibility, and soils high in silt have high erodiblity (Rennard et. Al. 1997). The soils of Camp Roberts are depicted on Map 3-3. Complete soil descriptions and a current map for Camp Roberts may be accessed digitally at the University of California (UC) Davis California Soil Resource Lab website.[2]

The Monterey County soil survey is considered to be out of date, and the CA ARNG and the NRCS have identified the need to have soils within Monterey County remapped to current standards. Environmental Science Associates (1989) created specific soils maps, slope maps, and erosion potential maps for Camp Roberts based on the county soil surveys. These maps were then used to create the Camp Roberts geographic information systems (GIS) data layer that was used in this report.

Ecological Sites

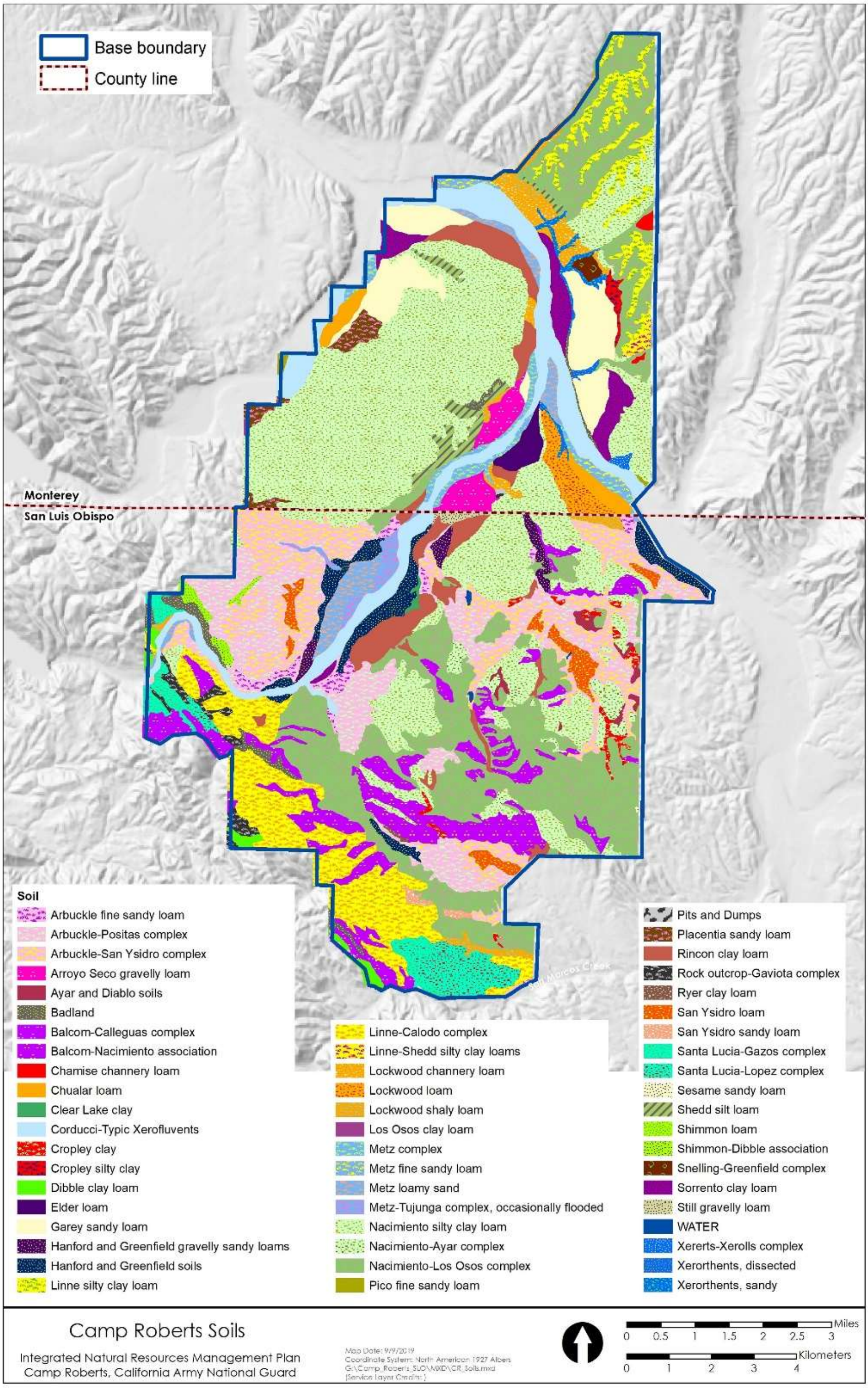
The variations among natural communities are classified into units called Ecological Sites (ESs) based on soils and vegetation (NRCS 2019). An ES has specific characteristics to produce distinctive vegetation communities based on characteristics of soil, vegetation, hydrology, and topography. There are 27 ESs at Camp Roberts, including soil complexes (Map 3-3; Table 3-1).

[2] See: https://casoilresource.lawr.ucdavis.edu/.

Table 3-1. Ecological Sites of Camp Roberts.

ECOLOGICAL SITE	COMPONENT SOILS	ACRES
Clayey	Cropley clay, Linne silty clay loam, Linne-Calodo complex, Linne-Shedd silty clay loams, Nacimiento silty clay loam, Xererts-Xerolls complex	3003.4
Clayey Hills 10-14	Ayar and Diablo soils	123.9
Claypan	Placentia sandy loam	277.3
Coarse Loam or N/A	Snelling-Greenfield complex	64.0
Coarse Loamy	Arbuckle fine sandy loam, Garey sandy loam, Sesame sandy loam	1717.9
Coarse Loamy Bottom	Hanford and Greenfield gravelly sandy loams, Hanford and Greenfield soils	925.4
Coarse Loamy, Coarse Loamy Claypan*	Arbuckle-Positas complex	2548.3
Coarse Loamy, Loamy Claypan*	Arbuckle-San Ysidro complex	2960.2
Fine Loamy	Los Osos clay loam, Nacimiento silty clay loam	1243.9
Fine Loamy 9-13	Dibble clay loam, Nacimiento silty clay loam, Nacimiento-Los Osos complex	13913.9
Fine Loamy 9-13, Clayey Hills 10-14*	Nacimiento-Ayar complex	312.5
Fine Loamy 9-13, N/A*	Nacimiento-Los Osos complex	149.8
Fine Loamy Bottom	Rincon clay loam, Ryer clay loam	1252.2
Gravelly Fine Loamy	Santa Lucia-Gazos complex	393.3
Gravelly Fine Loamy, Shallow Fine Loamy*	Linne-Calodo complex	2542.9
Gravelly Fine Loamy, Shallow Gravelly Fine Loamy*	Santa Lucia-Lopez complex	591.4
Limy Upland (Shallow) 9-12 P.Z.	Rock outcrop-Gaviota complex	230.8
Loamy Claypan	San Ysidro loam, San Ysidro sandy loam	462.8
Loamy North	Shimmon loam	115.9
Loamy North, Fine Loamy 9-13*	Shimmon-Dibble association	21.2
Loamy South, Fine Loamy 9-13*	Balcom-Nacimiento association	1551.5
Loamy South, Shallow Gravelly Loamy*	Balcom-Calleguas complex	952.8
N/A	Arroyo Seco, Badland, Chualar, Clear Lake, Corducci-Typic Xerofluvents, Cropley, Elder, Lockwood, Metz, Pico, Pit and Dumps, Shedd, Sorrento, Still, Water, Xerorthents	6375.9
Sandy	Xerorthents, sandy	169.6
Sandy Bottom	Metz loamy sand	351.9
Sandy Bottom, Sandy Wash*	Metz-Tujunga complex, occasionally flooded	207.9
Terrace	Chamise channery loam	40.4

*These soil mapping units are comprised of more than one ES.



Map 3-3. Soils of Camp Roberts.

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3.3.4 Watersheds and Water Resources

Camp Roberts is located in the southern end of the Salinas Valley within the Salinas River Watershed (U.S. Geological Survey [USGS] Hydrologic Unit No. 18060005). Camp Roberts depends on aquifers as a critical source of water. The northeastern portion of Camp Roberts is underlain by the Upper Salinas Groundwater Basin and the Salinas Valley aquifer, and the southwestern portion of Camp Roberts is underlain by the Paso Robles Area Sub-basin of the Salinas Valley Groundwater Basin (locally referred to as the "Paso Robles Groundwater Basin").[3]

A 2015 wetland assessment found that there is 60 miles of drainages and 12.8 ac (5 ha) of wetlands (western vernal pools, freshwater marshes, and impoundments) on CR. Additionally, Camp Roberts has 13 ponds and reservoirs totaling about 65 ac (26 ha) that are either natural or artificially created for use as livestock ponds and or flood control basins. A single potential seep was noted in the 2015 Camp Roberts Wetland Assessment (CA ARNG 2015).

Drainages

The primary surface water resources are the Salinas River, which flows to the northwest from the La Panza and Santa Lucia Mountains to Monterey Bay, and its tributaries, the Nacimiento and San Antonio Rivers (Map 3-4). The Salinas River extends for approximately 170 miles (274 km), crossing the northeastern portion of Camp Roberts. Its flow is mostly subsurface. The Nacimiento River originates on the east side of the Coastal Mountain Range and flows eastward to meet the Salinas River, crossing the northeastern portion of the installation and flowing northeast. The San Antonio River only briefly crosses the post in the northwestern portion of the installation in the impact area. The Nacimiento and San Antonio River flows to the Salinas Rivers are regulated by dams at the Nacimiento and San Antonio Reservoirs.

One perennial stream, Sulphur Springs Creek, is located in Training Areas X and W and is artificially sustained by runoff from properties adjacent to Camp Roberts. Many intermittent drainages on Camp Roberts have well-defined beds and banks that sustain flow only after rain events.

Ponds and Reservoirs

The following is a brief description of ponds and reservoirs on CR. Four reservoirs have been designated mitigation areas for VPFS and are protected from disturbance.

Avery Reservoir. Avery reservoir is approximately 2.6 acres in size and at least ten feet deep when fully inundated. The reservoir is surrounded by woodlands and grasslands and contains some emergent wetland vegetation. This is the only reservoir on CR that holds water year-round and is an important breeding location for various amphibians and waterfowl.

Generals Reservoir. Generals reservoir is approximately one acre in size and five feet deep when fully inundated. This reservoir is located at the confluence of two intermittent streams that flow from the south and the west. Wetland vegetation is absent because this reservoir only holds water after significant rain events. A dirt road passes through the central portion of the reservoir. Woodlands and grasslands surround the reservoir.

[3] See DWR Bulletin 118 Basin No. 3-004.06.

Black Bass Reservoir. Black bass reservoir is estimated to be approximately five acres and 15 feet deep when fully inundated. Water enters this reservoir from a drainage at its southeast side. The banks of this reservoir are steep and mostly vegetated with grasses. Several willows (Salix sp.) and a cottonwood occur along the northwest bank, providing some cover for aquatic species. This reservoir holds water for a portion of the year depending on rainfall and is an important breeding area for western toads.

West Black Bass Reservoir. West black bass reservoir is estimated to be approximately 5.7 acres in size and only contains water during significantly wet winters. The banks of the reservoir are steep with grasses forbs and oak trees.

Four Corners Reservoir. Four Corners Reservoir is approximately 0.4 acres in size and has had a recorded maximum depth of nine feet. Water enters the reservoir from the west by two drainages, which partially fill up and forms arms of the reservoir. This reservoir holds water long enough to offer breeding habitat for amphibians and operates as a water source for a variety of wildlife species.

Bee Rock Reservoir. Bee Rock reservoir is approximately 17 acres in size when fully inundated and has a maximum depth of five feet. Water enters the reservoir from a drainage to the south and a constructed ditch to the east. The banks are low to moderately sloped and covered with grasses and forbs. The ephemeral nature of this reservoir provides habitat to VPFS and has been protected as part of VPFS mitigation.

Canyon Reservoir. Canyon Reservoir is approximately four acres in size when fully inundated and is estimated to have a maximum depth of nine feet. Water enters this reservoir through a drainage to the east. The banks of the reservoir are low to moderately sloped and retains water long enough to offer breeding habitat for amphibians as well as VPFS. This reservoir has been protected as part of VPFS mitigation.

Last Chance Reservoir. Last Chance Reservoir is approximately 26 acres when fully inundated and has a maximum depth of ten feet. The reservoir receives water from a drainage to the south. The banks are low to steeply sloped with grasses and forbs and some submerged vegetation exists when water is present. This reservoir provides habitat for breeding amphibians and VPFS and has been protected as part of VPFS mitigation.

East Twin Brothers Reservoir. East Twin Brothers Reservoir is approximately three acres when fully inundated and has a maximum depth of three feet. The reservoir is filled by a drainage from the south. The banks are low to moderately sloped and covered by grasses. This reservoir retains water long enough to provide breeding habitat for amphibians and foraging habitat to waterfowl and shorebirds.

West Twin Brothers Reservoir. West Twin Brothers Reservoir is approximately four acres when fully inundated and has a maximum depth of ten feet. The reservoir is filled by a drainage to the south. The banks are low to moderately sloped and covered with grasses and forbs. This reservoir is an important breeding location for amphibians and VPFS. This reservoir has been protected as part of VPFS mitigation.

East Perimeter Pond. East Perimeter Pond is approximately three acres when fully inundated and about three feet deep. This reservoir is filled by a drainage from the east. The banks are low to moderately sloped. This pond is an important breeding location for amphibians and VPFS.

Map 3-4. Camp Roberts and its watershed context.

3.3.5 Surface Water Quality

Water quality is monitored by the USGS on the Salinas River (USGS 11150500 Salinas River near Bradley, California), 7.6 miles (12.2 km) downstream of Bradley. Bradley is located near the northwestern corner of Camp Roberts at the confluence of the Salinas and San Antonio Rivers. Section 303(d) of the federal Clean Water Act (CWA), states, territories, and authorized tribes are required to develop a list of water quality limited segments of surface water bodies. The CWA requires that these jurisdictions establish priority rankings for water on the lists and develop action plans to improve water quality. When a California water body is assessed and/or listed as impaired by the U.S. Environmental Protection Agency (EPA) and State Water Resources Control Board (SWRCB), it is placed on the CWA Section 303(d) list, referred to hereafter as the CWA 303(d) list.[4]

Of the three rivers running through Camp Roberts, the Salinas and San Antonio Rivers are both impaired under Section 303(d) of the CWA. The San Antonio and Salinas Rivers (Salinas only north of its confluences with the Nacimiento) are both impaired by pathogen concentrations. South of the Nacimiento, the Salinas River is additionally listed as impaired by high levels of salinity, while north of the Nacimiento it is impaired by toxicity. The entire stretch of the Salinas River through the Camp is impaired by high sediment levels. The Nacimiento River is unimpaired after leaving Lake Nacimiento.

3.3.6 Floodplains and Flooding

Throughout the Central Coast Hydrologic Region, flooding is a significant issue; and exposure to a 500-year flood event threatens one in three residents, and more than 310 sensitive species (California Water Plan 2018). Debris flows occur during most major storms, particularly when forest fires of the previous season have damaged vegetation in the upper watershed areas. Flood-related projects totaling $280 million in the Central Coast Hydrologic Region have been proposed, including major projects on the Salinas River. Floodwaters in the Camp Roberts hydrologic region produce slow-rise floods of a long duration. Remnants of the natural floodplain-riparian-wetland community complexes include Valley Oak Woodlands and mixed riparian woodland and scrub.

3.4 Vegetation Communities and Wildlife Habitat

3.4.1 Regional Floristic Province

Floristically, Camp Roberts occurs within the Central Western California Province (Hickman 1993; Baldwin et al. 2012), which extends from the northern edge of Marin County southward into Santa Barbara County, and is bounded to the west by the Pacific Ocean, and the San Joaquin Valley to the east. Within this province, most of Camp Roberts lies within the Inner South Coast Ranges District, while the northern end of the Camp extends into the Outer South Coast Range District. The two districts are divided by the Salinas River, which flows through Camp Roberts. Majority of vegetation in the Inner South Coast Ranges District is Blue Oak Woodland and chaparral. The Outer South Coast Ranges subdivision area is primarily vegetated with chaparral and blue oak–foothill pine woodland (Hickman 1993).

[4] To view the most recent 2010 California CWA 303(d) list, go to http://maps.waterboards.ca.gov/webmap/303d/files/2010_USEPA_approv_303d_List_Final_122311.xls.

Floral Diversity

A comprehensive floral inventory was completed at Camp Roberts by the University and Jepson Herbarium in 2001 which resulted in documentation of 617 plant species (Painter and Wetherwax 2001). Additional flora surveys have been completed since then by the CA ARNG (CA ARNG 2021) and Colorado State University Center For Environmental Management Of Military Lands (CEMML; 2007). To date, , 617 species of plants have been recorded. Of these, 477 are native and 140 are exotic, including 76 listed with a California Invasive Plant Council (Cal-IPC) invasive rating (Appendix E). Plant species at Camp Roberts include 106 Monocots, more than half of which (62) are grasses, and 502 Dicots; the largest Dicot family is the Asteraceae (Sunflower Family) with 96 species. See Appendix D. Plant nomenclature and taxonomy follow the Jepson eFlora. Recorded plants have been vouchered and are deposited at the Santa Barbara Botanical Garden and the Hoover herbarium at California Polytechnic State University, San Luis Obispo.

3.4.2 Vegetation Community Distribution and Condition

The vegetation of Camp Roberts was mapped in 2007 using a combination of sources for classifying vegetation communities:

- CDFW's List of California Terrestrial Natural Communities (California Department of Fish and Game 2003),
- the National Vegetation Classification System (NVCS) data collected at Camp Roberts in 2007 by the Center for Environmental Management of Military Lands (Woolf 2007),
- accepted community descriptions as published in the Manual of California Vegetation 2nd Edition (MCV2; Sawyer et al. 2009).

Vegetation was classified by the dominant plant species in the topmost layers (trees/shrubs/herbaceous) of the vegetated canopy. Current nomenclature uses the term 'alliance' to designate the dominant species for a given patch (or 'stand') of vegetation. For example, a stand that is dominated by California sagebrush (*Artemisia californica*) is classified as belonging to the 'Artemisia Californica Shrubland Alliance.' Within the NVCS, alliances are part of a hierarchical classification as follows. **Error! Reference source not found.** shows the NVCS hierarchy for the Artemisia Californica Shrubland Alliance as an example.

Table 3-2. NVCS classification hierarchy for the Artemisia Californica Shrubland Alliance (CNPS 2020).

- Formation Class (e.g. Mesomorphic Shrub and Herb Vegetation (Shrubland and Grassland)
  - Formation Subclass (e.g. Mediterranean Scrub and Grassland)
    - Formation (e.g. Mediterranean Scrub)
      - Division (e.g. California Scrub)
        - Macrogroup (e.g. California Coastal Scrub)
          - Group (e.g. Central and South Coastal Californian coastal sage scrub)
            - Alliance (e.g. Artemisia Californica Shrubland Alliance)
              - Association*

For this plan, the alliances identified in the 2007 mapping efforts have been updated to the currently accepted NVCS nomenclature as described by the MCV2 (Sawyer et al. 2009) and the Manual of California Vegetation (MCV) Online database (MCV Online [California Native Plant Society 2020]).[5] It should be noted

that while the 2007 mapping distinguished between woodlands (open stands of trees) and forests (closed stands), the MCV2 does not separate tree alliances in this way. Therefore, the tree-dominated alliances described below present the total acreages wherever the 2007 map described woodlands and forests for the same dominant species. Where applicable, the difference and relative areas of woodlands and forests will be discussed in more detail elsewhere.

The vegetation at Camp Roberts include 27 distinct plant communities and one anthropogenic community at Camp Roberts (Map 3-5, Map 3-6; Table 3-3). Non-native annual grasslands and Blue Oak Woodlands cover approximately 88% of the training site, with smaller areas of sage scrub, chaparral, and riparian scrubs and other woodland types.

Table 3-3. Vegetation communities of CR.

Vegetation Community [Macrogroup/Group]	Alliances & Associations	Area (ac)	% of Total
California Annual and Perennial Grassland		**25,038.6**	**58.5**
Mediterranean California Naturalized Annual and Perennial Grassland	**Wild Oats and Annual Brome Grasslands** *Avena* spp. - *Bromus* spp. Herbaceous Semi-Natural Alliance	24,680.2	57.6
	Horehound Stands[1] *Marrubium vulgare* Herbaceous Semi-Natural Stands	7.7	0.0
California Perennial Grassland	**Needle Grass-Melic Grass Grassland** *Nassella* spp.-*Melica* spp. Herbaceous Alliance: *Nassella pulchra* Association[2]	350.7	0.8
California Coastal Scrub		**523.6**	**1.2**
Central and south coastal California seral scrub	**Deer Weed Scrub** *Lotus scoparius* Shrubland Alliance	6.3	0.0
	Bush Mallow Scrub *Malacothamnus fasciculatus-Malacothamnus* spp. Shrubland Alliance	4.5	0.0
Central and South Coastal Californian coastal sage scrub	**Black Sage Scrub** *Salvia mellifera* Shrubland Alliance	346.9	0.8
	California Sagebrush Scrub *Artemisia californica* Shrubland Alliance	165.9	0.4
Vancouverian Coastal Dune and Bluff		**166.5**	**0.4**
California Coastal evergreen bluff and dune scrub	**Coyote Brush Scrub** *Baccharis pilularis* Shrubland Alliance	166.5	0.4
California Chaparral		**330.5**	**0.8**
Californian xeric chaparral	**Chamise Chaparral** *Adenostoma fasciculatum* Shrubland Alliance	264.3	0.6

[5] Available at: https://vegetation.cnps.org/.

Vegetation Community [Macrogroup/Group]	Alliances & Associations	Area (ac)	% of Total
	Wedge Leaf Ceanothus Chaparral *Ceanothus cuneatus* Shrubland Alliance	12.4	0.0
	Bigberry Manzanita Chaparral *Arctostaphylos glauca* Shrubland Alliance	23.1	0.1
Californian mesic chaparral	**Holly Leaf Cherry-Toyon-Greenbark Ceanothus Chaparral**[3] *Prunus ilicifolia-Heteromeles arbutifolia-Ceanothus spinosus* Shrubland Alliance	30.7	0.0
	Heteromeles arbutifolia Association[2]	15.2	0.0
	Prunus ilicifolia Association[2]	15.5	0.0
Warm Interior Chaparral		**526.7**	**1.2**
Western Mojave and Western Sonoran Desert borderland chaparral	**Tucker Oak Chaparral** *Quercus john-tuckeri* Shrubland Alliance	526.7	1.2
California Forest and Woodland		**13,486.1**	**31.5**
Californian broadleaf forest and woodland	**Blue Oak Woodland** *Quercus douglasii* Woodland Alliance	13,095.7	30.6
	Coast Live Oak Woodland *Quercus agrifolia* Woodland Alliance	267.6	0.6
	Valley Oak Woodland *Quercus lobata* Woodland Alliance	106.5	0.3
	California Walnut Groves *Juglans californica* Woodland Alliance	7.7	0.0
Californian evergreen coniferous forest and woodland	**Foothill Pine Woodland** *Pinus sabiniana* Woodland Alliance	8.6	0.0
Introduced North American Mediterranean Woodland and Forest		**5.5**	**0.0**
Introduced North American Mediterranean woodland and forest	**Eucalyptus-Tree of Heaven-Black Locust Groves** *Eucalyptus-Ailanthus altissima-Robinia pseudoacacia* Woodland Semi-Natural Alliance: *Eucalyptus* spp. Association	5.5	0.0
Southwestern North American Riparian, Flooded and Swamp Forest		**1,461.4**	**3.4**
Southwestern North American riparian/wash scrub	**Sandbar Willow Thickets**[4] *Salix exigua* Shrubland Alliance	347.8	0.8
	Mulefat Thickets *Baccharis salicifolia* Shrubland Alliance	137.0	0.3
Southwestern North American riparian evergreen and deciduous woodland	**Fremont Cottonwood Forest** *Populus fremontii-Fraxinus velutina-Salix gooddingii* Forest Alliance *Populus fremontii* Association[2]	732.7	1.7
	California Sycamore Woodlands *Platanus racemosa* Woodland Alliance (	105.1	0.2
	Goodding's Willow - Red Willow Riparian Woodlands *Salix gooddingii - Salix laevigata* Woodland Alliance: *Salix laevigata* Association[2]	93.3	0.2

Vegetation Community [Macrogroup/Group]	Alliances & Associations	Area (ac)	% of Total
	Box-Elder Forest *Acer negundo* Forest Alliance	45.5	0.1
Madrean Warm Semi-Desert Wash Woodland/Scrub		**307.2**	**0.7**
Mojavean semi-desert wash scrub	**Scale Broom Scrub** *Lepidospartum squamatum* Shrubland Alliance	307.2	0.7
Other Cover Types		**970.3**	**2.3**
Urban	**Urban**	787.0	1.8
Water	**Water**	183.3	0.4
	Total	**42,816.5**	-

[1]*Picris echioides* is not a described alliance or association in the current MCV On-line database. Because it includes many of the same component species as the more broadly mapped non-native grasslands, it is included here as a component of the naturalized annual and perennial grasslands Macrogroup/Group.

[2]These types were designated in the Woolf 2007 vegetation map as alliances. However, they have since been re-classified by the MCV On-line database as associations under more broadly defined alliances.

[3]As described above, this alliance now encompasses both the *Heteromeles* and *Prunus* associations which were mapped as alliances in the 2007 vegetation map.

[4] This type was originally designated as *Salix sessilifolia* by Woolf 2007. However, the current name in the MCV On-line database is *Salix exigua*.

3.4.2.1 California Annual and Perennial Grasslands

Three types of grasslands occur at Camp Roberts, covering approximately 25,039 ac (10,137 ha), or 59% of the Camp; wild oat and annual brome grasslands, needle grass-melic grass grasslands, and horehound stands. Grasslands are the most common plant community found on the installation, generally occurring on the gentle exposed upland slopes with well drained mineral soils containing little to no organic matter and in the deep soils of the lowlands at the lower slopes of the base. The shallower soils are typically dominated by filaree (*Erodium* sp.) or other low growing nonnative forbs and the deeper soils, with higher water holding capacity, being dominated by wild oats (*Avena* spp.) and other tall annual grasses. While not considered sensitive themselves, grasslands contain seasonal/vernal pools and are relied upon by many sensitive plant and animal species which overlap with oak woodlands. The purple amole (*Hooveria purpurea* var. *purpurea*), San Joaquin kit fox (*Vulpes macrotic mutica*), and golden eagle (*Aquila chrysaetos*) all rely on this habitat type for survival. The Swainson's hawk (*Buteo swainsoni*), a California threatened species, also relies on grasslands for survival. Various other species of special concern also rely on grasslands (primarily for forage).

Table 3-4. California Annual and Perennial Grassland vegetation communities at CR.

California Annual and Perennial Grassland Macrogroup	
Mediterranean California Naturalized Annual and Perennial Grassland Group (24,688 ac)	
Wild Oats and Annual Brome Grasslands *Avena* spp.–*Bromus* spp. Herbaceous Semi-Natural Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Non-Native Grasslands [42200], (MCV) California Annual Grasslands, (MCV2) Annual Brome Grassland Semi-Natural Herbaceous Stands
Horehound Stands *Marrubium vulgare* Herbaceous Semi-Natural Stands Alliance (Woolf 2007)	Equivalent Nomenclatures: (Holland) Non-Native Grasslands [42200], (MCV) California Annual Grasslands, (MCV2) Annual Brome Grassland Semi-Natural Herbaceous Stands
California Perennial Grassland Group (351 ac)	
Needle Grass-Melic Grass Grassland *Nassella* spp.-*Melica* spp. Herbaceous Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Valley Needlegrass Grassland [42110], (MCV) Valley Needlegrass, (MCV2) Purple Needlegrass Grassland
***Nassella pulchra* Association**	

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3.4.2.2 California Coastal Scrub

California Coastal Scrub covers approximately 524 ac (212 ha) of Camp Roberts (**Error! Reference source not found.**). There are four coastal scrub alliances at Camp Roberts (**Error! Reference source not found.**) which include a highly variable mix of species. Dominant species include California sagebrush, black sage (*Salvia mellifera*), bush mallow (*Malacothamnus* spp.), and deer weed (*Acmispon glaber*). These communities also include a number of other shrub species characteristic of coastal scrubs, including California buckwheat (*Eriogonum fasciculatum*), sticky monkeyflower (*Diplacus aurantiacus*), sawtoothed goldenbush (*Hazardia squarrosa*), and coffeeberry (*Rhamnus* spp.). Native grasses such as needlegrass (*Nassella* spp.) and blue wild rye (*Elymus glaucus*) occur on the spaces between shrubs, as do a variety of native forbs and non-native grasses. Compared to other, more coastal sage scrubs, this type has a poorer shrub flora but a greater diversity of perennial forbs (Holland 1986). Sites supporting coastal scrub are typified by shallow, rocky soils, typically on hot southern exposures, and occur well inland from the coastal fog incursion zone.

Table 3-5. California Coastal Scrub vegetation communities at CR.

California Coastal Scrub Macrogroup	
Central and South Coastal California Seral Scrub Group (11 ac)	
Deer Weed Scrub *Acmispon glaber* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Coastal Sage-Chaparral Scrub [37G00], (MCV) not treated, (MCV2) not treated.
Bush Mallow Scrub *Malacothamnus fasciculatus–Malacothamnus* spp. Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Coastal Sage-Chaparral Scrub [37G00], (MCV) Black Sage Series, (MCV2) *Malacothamnus fasciculatus* Shrubland Alliance.
Central and South Coastal Californian Coastal Sage Scrub Group (513 ac)	
Black Sage Scrub *Salvia mellifera* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Diablan sage scrub [32600], (MCV) Black sage series, (MCV2) *Salvia mellifera* Shrubland Alliance.
California Sagebrush Scrub *Artemisia californica* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Diablan Sage Scrub [32600], (MCV) California Sagebrush Series, (MCV2) *Artemisia californica* Shrubland Alliance.

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Wildlife species commonly found in California coastal scrub habitats include western fence lizard (*Sceloporus occidentalis*), wrentit (*Chamea fasciata*), California thrasher (*Toxostoma redivivum*), gopher snake (*Pituophis catenifer*), brush rabbit (*Sylvilagus bachmani*) and gray fox (*Urocyon cinereoargenteus*).

3.4.2.3 Vancouverian Coastal Dune and Scrub

Vancouverian Coastal Dune and Scrub covers only 167 ac (68 ha) of Camp Roberts (**Error! Reference s ource not found.**) and is dominated by coyote brush (*Baccharis pilularis*). This community occurs at elevations below 4,900 ft (1,500 m) on stream sides, terraces, open slopes, and ridges. Soils vary from sandy to clayey.

Table 3-6. Vancouverian Coastal Dune and Bluff vegetation communities at CR.

Vancouverian Coastal Dune and Scrub Macrogroup	
California Coastal Evergreen Bluff and Dune Scrub Group (167 ac)	
Coyote Brush Scrub *Baccharis pilularis* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: Holland) Diablan Sage Scrub [32600], (MCV) Coyote Brush Series, (MCV2) *Baccharis pilularis* Shrubland Alliance

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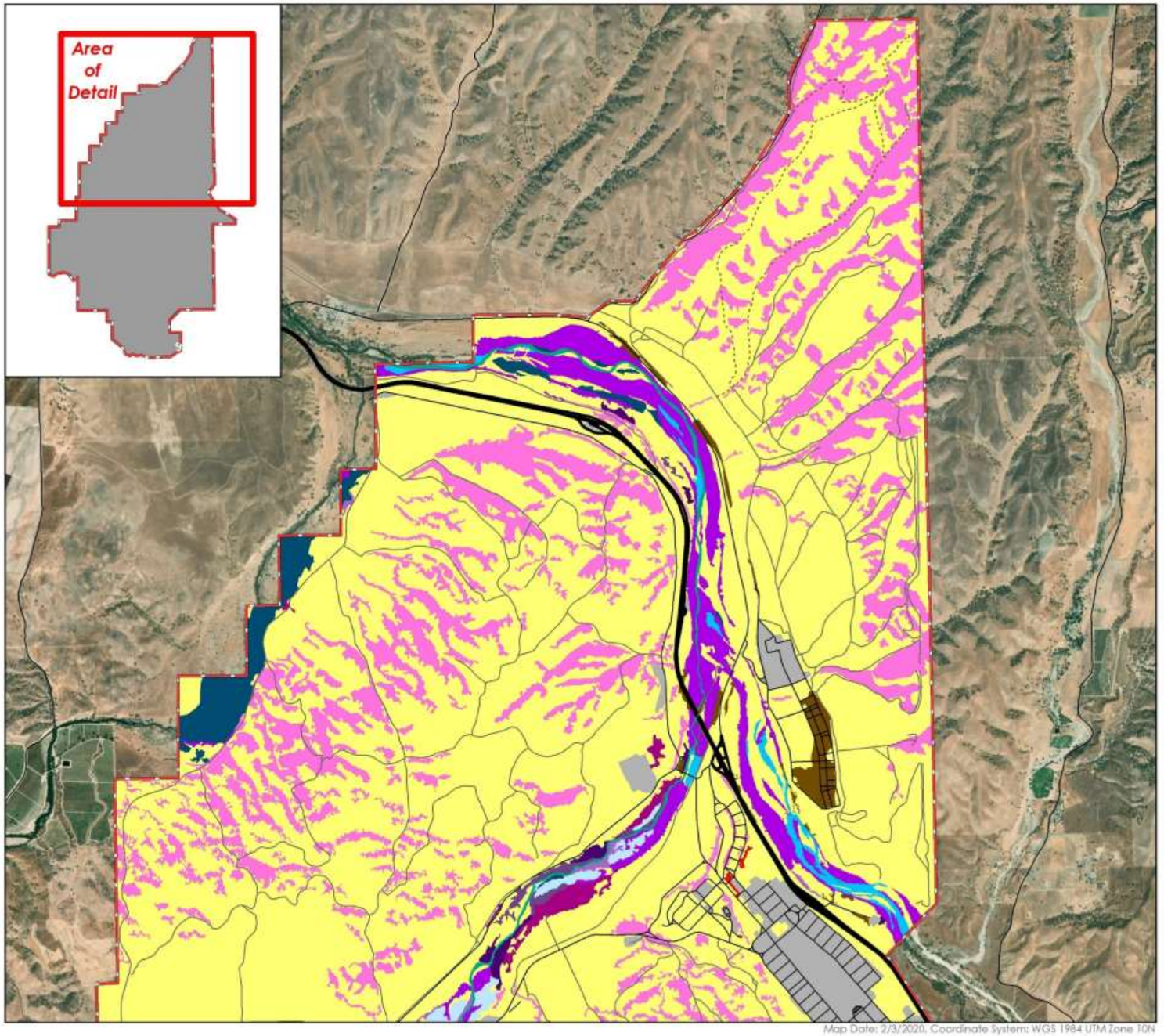
There is only one alliance at Camp Roberts in this macrogroup, where other common shrub species such as California sagebrush and California buckwheat occur with the dominant coyote brush. Native grasses such as needlegrass and blue wild rye may occur in the spaces between shrubs, as do a variety of native forbs and non-native grasses.

Wildlife species which may utilize coyote brush include western fence lizard (*Sceloporus occidentalis*), woodland alligator lizard (*Elgaria multicarinata multicarinata*), wrentit, California thrasher, orange-crowned warbler (*Oreothlypis celata*), brush rabbit, California mouse (*Peromyscus californicus*), and gray fox.



Camp Roberts Vegetation - Northern Half -

Integrated Natural Resources Management Plan
Camp Roberts, California Army National Guard

Vegetation Communities

California Annual and Perennial Grassland
- Wild Oats and Annual Brome Grasslands

California Coastal Scrub
- Coyote Brush Scrub

California Forest and Woodland
- Blue Oak Woodland
- Valley Oak Woodland

Introduced North American Woodland and Forest
- Eucalyptus-Tree of Heaven-Black Locust Groves: *Eucalyptus* spp. Association

Southwestern North American Riparian, Flooded and Swamp Forest
- Sandbar Willow Thickets
- Muletat Thickets
- Fremont Cottonwood Forest: *Populu fremontii* Association
- California Sycamore Woodland
- Goodding's willow-red willow riparian woodlands:*Salix laevigata* Association
- Box-elder Forest

Madrean Warm Semi-Desert Wash Woodland/Scrub
- Scale Broom Scrub

Other Cover Types
- Water
- Urban

- Installation Boundary

Roads
- Primary roads
- Secondary roads
- Tertiary roads
- Unimproved roads

Miles
0 0.5 1 1.5 2
Kilometers
0 1 2 3

Map 3-5. Vegetation communities on the northern half of Camp Roberts.

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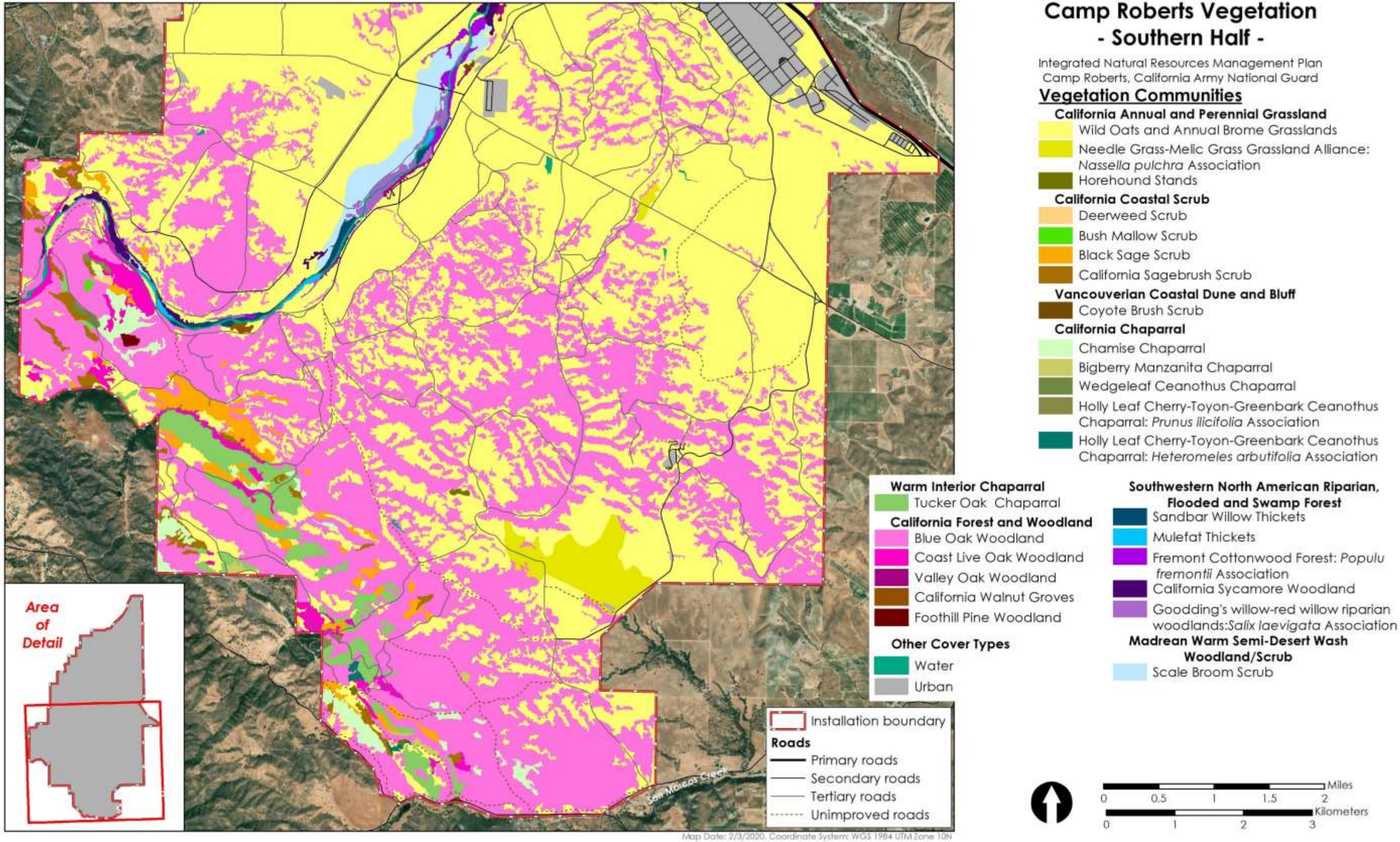

Map 3-6. Vegetation communities on the southern half of Camp Roberts.

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3.4.2.4 California Chaparral

The California chaparral shrublands at Camp Roberts occur on 330 ac (133 ha) in patches along the southwestern boundary of the training site on the highly sloped areas of Training Areas Q, R, and S. Chaparral occurs at elevations up to 5,906 ft (1,800 m) in a mosaic with oak woodlands and grasslands. Topography varies from slopes to ridgetops, outcrops, alluvial fans, on variable aspects. Typical soils can be shallow to deep, coarse textured over colluvium or varied bedrock. On mesic slopes it is replaced by woodlands, and by sage scrub on drier slopes.

Although two alliances, the Tucker Oak (*Quercus john tuckeri*) Chaparral and Chamise (*Adenostoma fasciculatum*) Chaparral, comprise the bulk of the chaparral communities at Camp Roberts. The composition of chaparral at Camp Roberts is variable and may include any of the following species which may be dominant in certain areas (Table 3-7): bigberry manzanita (*Arctostaphylos glauca*), chamise, hollyleaf cherry (*Prunus ilicifolia*), toyon (*Heteromeles arbutifolia*), and wedgeleaf ceanothus (*Ceanothus cuneatus* var. *cuneatus*) (Woolf 2007). Other manzanitas (*Arctostaphylos* spp.), poison oak (*Toxicodendron*

Table 3-7. Chaparral vegetation communities at CR.

California Chaparral Macrogroup	
Californian Xeric Chaparral Group (300 ac)	
Chamise Chaparral *Adenostoma fasciculatum* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Chamise Chaparral [37200], (MCV) Chamise Series, (MCV2) *Adenostoma fasciculatum* Shrubland Alliance
Wedge Leaf Ceanothus Chaparral *Ceanothus cuneatus* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Buck Brush Chaparral [37810], (MCV) Wedgeleaf Ceanothus Series, (MCV2) *Ceanothus cuneatus* Shrubland Alliance.
Bigberry Manzanita Chaparral *Arctostaphylos glauca* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Northern Mixed Chaparral [37110], (MCV) Bigberry Manzanita Series (MCV2): *Arctostaphylos glauca* Shrubland Alliance.
Californian Mesic Chaparral Group (61 ac)	
Holly Leaf Cherry-Toyon-Greenbark Ceanothus Chaparral *Prunus ilicifolia-Heteromeles arbutifolia-Ceanothus spinosus* Shrubland Alliance (MCV On-line 2019)	
***Heteromeles arbutifolia* Association**	Equivalent Nomenclatures: (Holland) Mesic North Slope Chaparral [37E00], (MCV) Hollyleaf Cherry Stands, (MCV2) *Heteromeles arbutifolia* Shrubland Alliance.
***Prunus ilicifolia* Association**	Equivalent Nomenclatures: (Holland) Northern North Slope Chaparral [37E10], (MCV) Holly Leaf Cherry Stands, (MCV2) *Prunus Ilicifolia* Shrubland Alliance.
Warm Interior Chaparral Macrogroup	
Western Mojave and Western Sonoran Desert Borderland Chaparral Group (527 ac)	
Tucker Oak Chaparral *Quercus john-tuckeri* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Northern North Slope Chaparral [37E10], (MCV) Cupleaf Ceanothus-Fremontia-Oak Series, (MCV2) *Quercus john-tuckeri* Shrubland Alliance.

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diversilobum), California peony (*Paeonia californica*), fiesta flower (*Pholistoma auritum*), bedstraw (*Galium* sp.), and annual grasses also occur in mixed chaparral. This community type also includes a small area (approximately 4.5 ac [1.8 ha]) dominated by Jones' bush-mallow (*Malacothamnus jonesii*).

Many wildlife species utilize chaparral habitats, including western fence lizard, woodland alligator lizard, wrentit, California thrasher, orange-crowned warbler, brush rabbit, California mouse, and gray fox.

3.4.2.5 California Forest and Woodland

Oak woodlands are recognized as having greater species richness than any other vegetation type in California (Allen-Diaz et al. 2007). At Camp Roberts, oak woodlands can be divided into three community types: Blue Oak (*Quercus douglasii*) Woodland, Valley Oak (*Quercus lobata*) Woodland, and Coast Live Oak (*Quercus agrifolia*) Woodland (Table 3-8). These three communities together make oak woodlands the second most common community type at Camp Roberts, at about 31% of the installation. Oak woodlands are located throughout Camp Roberts but primarily in the southwestern corner of the installation and more specifically on more sheltered north facing slopes and along the upland slopes of intermittent stream drainages.

Blue oak woodlands and forests is the predominant type of oak woodland at Camp Roberts, occurring on approximately 13,096 ac (5,300 ha). Blue Oak Woodlands occur on valley bottoms, foothill slopes, and rocky outcrops at elevations between 98-6,234 ft (30-1900 m). Typical soils are shallow, low in fertility, moderately to excessively well drained and may have extensive rock fragments. The overstory of Blue Oak Woodlands ranges from sparsely scattered trees (woodlands) in some areas to nearly closed canopies (forests) on benches along the Nacimiento River and in higher elevations in the southwestern portion of the Installation. Open woodlands comprise 65% (8,542 ac [3,457 ha]) of all Blue Oak Woodlands, with the remainder classified as closed forests (4,554 ac [1,843 ha]). The overstory is dominated by blue oak, with coast live oak and foothill pine (*Pinus sabiniana*) co-dominant. Shrubs in the typically include holly-leaf redberry (*Rhamnus ilicifolia*) and toyon (*Heteromeles arbutifolia*). The herbaceous understory is dominated by nonnative invasive grasses and forbs of European origin, typically wild oats, and brome grasses (*Bromus* spp.).

Coast live oak woodlands and forests cover approximately 268 ac (108 ha) of Camp Roberts, most of which (212 ac [86 ha]) is classified as closed forests. These oak woodlands occur on alluvial terraces, canyon bottoms, stream banks, slopes, and flats at elevations up to 3,937 ft (1,200 m). Typical soils are deep, sandy, or loamy with high organic matter. This evergreen oak intersperses within Blue Oak Woodlands at higher elevations in the southwestern portion of Camp Roberts and is dominated by coast live oak with a woody understory often dominated by poison oak. The herbaceous understory is comparable to that described above for Blue Oak Woodland and Valley Oak Woodland. Representative native forbs present in the herbaceous understory include crimson sage (*Salvia spathacea*), miner's lettuce (*Claytonia perfoliata*), and California buttercup (*Ranunculus californicus*).

Valley oak woodlands and forests occur on approximately 106 ac (43 ha) of Camp Roberts, with 72 ac (29 ha) classified as closed forests and 34 ac (14 ha) as open woodlands. Valley Oak Woodlands occur on valley bottoms, on seasonally saturated soils that may intermittently flood lower slopes and summit valleys at elevations up to 2,543 ft (775 m). Typical soils are alluvial or residual. Characterized predominantly by large valley oak trees in the Sherwood Forest on the southern side of the Nacimiento

River. The woody understory of contains poison oak, toyon, and California coffeeberry (*Rhamnus californica*). The herbaceous understory is comparable to that described above for Blue Oak Woodlands.

California walnut (*Juglans californica*) groves occur in small, isolated stands at Camp Roberts. While small in extent, these woodlands can provide valuable nesting sites. A single stand (7.7 ac [3 ha]) of California walnut occurs on the south of the Nacimiento. California Walnut Groves typically occur at elevations of 492-2,953 ft (150-900 m) in riparian corridors but can also occur on all hillslopes. Soils are typically relatively moist, fine-textured soils. The tree canopy is open and dominated by walnut trees, while the under is non-native grassland.

A single stand (8.6 ac [3.5 ha]) of foothill pine (*Pinus sabiniana*) woodland occurs within a matrix of blue oak with native shrubs and non-native grasses in the understory. This community typically occurs at elevations of 984-6890 ft (300-2,100 m) on streamside terraces, valleys, slopes, and ridges. Typical soils are shallow, often stony, and infertile and moderately to excessively drained.

Table 3-8. California Forest and Woodland vegetation communities at CR.

California Forest and Woodland Macrogroup	
Californian Broadleaf Forest and Woodland Group (13,478 ac)	
Blue Oak Woodland *Quercus douglasii* Woodland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Blue Oak Woodland [71140], (MCV) Blue Oak Series, (MVC2) *Quercus douglasii* Woodland Alliance.
Coast Live Oak Woodland *Quercus agrifolia* Woodland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Coast Live Oak Woodland [71160], (MCV) Coast Live Oak Series, (MCV2) *Quercus agrifolia* Woodland Alliance.
Valley Oak Woodland *Quercus lobata* Woodland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Valley Oak Woodland [71130], (MCV) Valley Oak Series, (MCV2) *Quercus lobata* Woodland Alliance.
California Walnut Groves *Juglans californica* Woodland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Walnut Woodland [71200], (MCV) California Walnut Series, (MCV2), *Juglans californica* Woodland Alliance.
Californian Evergreen Coniferous Forest and Woodland Group (9 ac)	
Foothill Pine Woodland *Pinus sabiniana* Woodland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Non-serpentine Digger Pine Chaparral [71322], (MCV) Foothill Pine Series, (MCV2) *Pinus sabiniana* Woodland Alliance.

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Many wildlife species utilize forests and woodlands , including golden eagle, American kestrel (*Falco sparverius*), wild turkey (*Meleagris gallopavo*), band-tailed pigeon (*Patagioenas fasciata*), acorn woodpecker (*Melanerpes formicivorus*), bushtit (*Psaltriparus minimus*), western bluebird (*Sialia mexicana*), dusky footed woodrat (*Neotoma fuscipes*), California ground squirrel (*Spermophilus beecheyi*), gray fox, bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), and tule elk (*Cervus elaphus nannodes*).

3.4.2.6 Introduced North American Mediterranean Woodland and Forest

Eucalyptus (*Eucalyptus* sp.) groves (Table 3-9) occurs in two stands (6 ac [2.4 ha]) surrounded and underlain by non-native grasslands. Eucalyptus woodlands occur at elevations of 0-984 ft (0-300 m) and are naturalized in uplands and stream courses.

Table 3-9. Introduced North American Mediterranean Woodland and Forest vegetation communities at CR.

Introduced North American Mediterranean Woodland and Forest Macrogroup	
Introduced North American Mediterranean Woodland and Forest Group (6 ac)	
Eucalyptus Groves *Eucalyptus* spp. Woodland Semi-Natural Alliance(MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Eucalyptus Woodland [79100], (MCV) Eucalyptus Series, (MCV2) *Eucalyptus* spp. Semi-natural Forest Alliance.

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Eucalyptus trees are non-native and tend to suppress the growth of native vegetation that provides resources to wildlife around them –understories of eucalyptus are usually very low in diversity. Still, some wildlife utilizes eucalyptus groves as breeding habitat, such as Anna's hummingbird (*Calypte anna*) and red-tailed hawk (*Buteo jamaicensis*), or foraging habitat for species such as red-breasted sapsucker (*Sphyrapicus ruber*).

3.4.2.7 Southwestern North American Riparian, Flooded and Swamp Forest

Riparian woodlands cover approximately 1,462 ac (592 ha) (3.4%) of Camp Roberts (Table 3-10) along the Salinas, Nacimiento, and San Antonio Rivers. The riparian communities at Camp Roberts are comprised of four Holland vegetation types (Table 3-10), with six distinct alliances. These communities occur on floodplains, low-gradient rivers, perennial or seasonally intermittent streams, valleys with dependable sub-surface water, gullies, springs, terraces adjacent to floodplains at elevations up to 7,874 ft (2,400 m). Typical soils are deep alluvium to rocky or cobbly alluvium with permanent moisture at depth

Mulefat (*Baccharis salicifolia*) thickets occur on canyon bottoms, flood plains, irrigation ditches, lake margins, stream channels at elevations up to 4,101 ft (1,250 m). Typical soils are mixed alluvium. Other species that may occur in riparian scrub are coyote brush, elderberry (*Sambucus* sp.), and mugwort (*Artemisia douglasiana*), as well as a variety of native and non-native grasses and forbs. At Camp Roberts it occurs in scattered stands along the Salinas and Nacimiento Rivers in association with stands of sandbar willow (*Salix sessilifolia*), California sycamore (*Platanus racemosa*), and Fremont cottonwood (*Populus fremontii*).

Sandbar willow (*Salix exigua*) thickets occur on stream banks and benches, slope seeps, and stringers along drainages at elevations up to 7,119 ft (2,170 m). Typical soils are fine-grained sand and gravel bars. Other species that may occur in this community are mulefat, coyote brush, elderberry, and mugwort, as well as a variety of native and non-native grasses and forbs. At Camp Roberts it occurs in scattered stands along the Salinas, San Antonio, and Nacimiento Rivers in association with stands of red willow (*Salix laevigata*), California sycamore, box elder (*Acer negundo*), and Fremont cottonwood.

Table 3-10. Southwestern North American Riparian vegetation communities CR.

Southwestern North American Riparian, Flooded and Swamp Forest Macrogroup	
Southwestern North American Riparian Wash Scrub Group (13,478 ac)	
Mulefat Thickets *Baccharis salicifolia* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Mulefat Scrub [63310], (MCV) Mulefat Series, (MCV2) *Baccharis salicifolia* Intermittently Flooded Shrubland Alliance.
Sandbar Willow Thickets *Salix exigua* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Central Coast Riparian Scrub [63200], (MCV) Narrowleaf Willow Series, (MCV2) *Salix exigua* Temporarily Flooded Shrubland Alliance.
Southwestern North American Riparian Evergreen and Deciduous Woodland Group (977 ac)	
Fremont Cottonwood Forest *Populus fremontii-Fraxinus velutina-Salix gooddingii* Forest Alliance , *Populus fremontii* Association (MCV On-line 2019):	Equivalent Nomenclatures: (Holland) Central Coast Cottonwood–Sycamore Riparian Forest/Woodland [61210/62000], (MCV) Fremont Cottonwood Series, (MCV2) *Populus fremontii* Temporarily Flooded Woodland Alliance.
California Sycamore Woodlands *Platanus racemosa* Woodland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Central Coast Cottonwood–Sycamore Riparian Forest/Woodland [61210/62000], (MCV) California sycamore series, (MCV2) *Platanus racemosa* Temporarily Flooded Woodland Alliance.
Gooding's Willow-Red Willow Riparian Woodlands *Salix goodingii-Salix laevigata* Woodland Alliance, *Salix laevigata* Association (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Central Coast Cottonwood–Sycamore Riparian Forest/Woodland [61210/62000], (MCV) Red willow series, (MCV2) *Salix laevigata* Temporarily Flooded Woodland Alliance.
Box-Elder Forest Acer negundo Forest Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Central Coast riparian forest [61100], (MCV) not treated, (MCV2) Acer negundo Seasonally Flooded Forest Alliance.

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Many wildlife species depend upon riparian communities in some degree as a source of food, shelter, or perennial water. Many species are also endemic to this community type and cannot occur without it. For example, the federally protected bald eagle (*Haliaeetus leucocephalus*) relies upon the riparian habitat at Camp Roberts for nesting. Along with the bald eagle, the least Bell's Vireo (*Vireo bellii pusillus*) has potential to occur in the riparian woodlands. A number other wildlife species depend upon the riparian habitats at Camp Roberts, including Pacific chorus frog (*Pseudacris regilla*), southwestern pond turtle (*Clemmys marmorata pallida*), wood duck (*Aix sponsa*), red-shouldered hawk (*Buteo lineatus*), golden eagle, wild turkey, California quail (*Callipepla californica*), Nuttall's and downy woodpeckers (*Dryobates nuttallii*, *D. pubescens*), Bewick's wren (*Thryomanes bewickii*), spotted towhee (*Pipilo maculatus*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and long-tailed weasel (*Mustela frenata*).

3.4.2.8 Madrean Warm Semi-Desert Wash Woodland/Scrub

Riparian scrub covers approximately 307 ac (124 ha) (0.7%) of Camp Roberts (Table 3-11) along the Nacimiento River. There is only one riparian scrub in this macrogroup that occurs at Camp Roberts (Table 3-11). Scalebroom (*Lepidospartum squamatum*) scrub occurs on flood plains having very well-drained deep alluvium sandy soils containing gravel and cobbles. Scalebroom scrub occurs on low-gradient intermittently or rarely flooded alluvial deposits along streams, washes, and fans at elevations up to 4,900

ft (1,500 m). Other species that may occur in this community are mulefat, coyote brush, elderberry, and mugwort, as well as a variety of native and non-native grasses and forbs. At Camp Roberts it occurs in along the Nacimiento River in association with stands of sandbar willow, red willow, box elder, and Fremont cottonwood.

Wildlife species associated with this riparian scrub community include black phoebe (*Sayornis nigricans*), yellow-rumped warbler (*Setophaga coronata*), gopher snake, dusky footed woodrat and raccoon.

Table 3-11. Madrean Warm Semi-Desert Wash Woodland/Scrub vegetation communities at CR.

Madrean Warm Semi-Desert Wash Woodland/Scrub Macrogroup	
Mojavean Semi-Desert Wash Scrub Group (307 ac)	
Scalebroom Scrub *Lepidospartum squamatum* Shrubland Alliance (MCV On-line 2019)	Equivalent Nomenclatures: (Holland) Mojavean Semi-Desert Wash Scrub [63700], (MCV) Scalebroom Series, (MCV2) *Lepidospartum squamatum* Intermittently Flooded Shrubland Alliance.

MCV = Manual of California Vegetation; MCV2 = Manual of California Vegetation 2nd Edition

3.4.2.9 Wetlands and Aquatic Areas

The aquatic communities of Camp Roberts consist of riverine, perennial stream, intermittent streams, ponds, and reservoirs. Aquatic habitats cover less than 1% (183 ac [74 ha]) of Camp Roberts and are generally open or flowing water and do not support plant populations. However, they generally have vegetation along their edges. Aquatic areas are key components of the ecosystem and are important habitats for various wildlife species. Water on Camp Roberts is a valuable resource and is protected as such by several regulating agencies.

Riverine

Three rivers make up the riverine community type: the Salinas, Nacimiento, and San Antonio Rivers. These rivers cover about 264 ac (107 ha) of Camp Roberts.

Perennial Streams

There is one perennial stream (Sulphur Springs Creek) at Camp Roberts. It is artificially sustained by runoff from properties adjacent to Camp Roberts. Some portions of Sulphur Springs support freshwater marsh and a mixture of other hydrophytic species. Common plant species associated with this nonriverine perennial drainage include slender wild oats, brome grasses, small fescue (*Festuca microstachys*), clovers, lupine species, goldfields, fiddleneck, popcorn-flower (*Plagiobothrys* spp.), blue dicks (*Dichelostemma capitatum*), common plantain (*Plantago major*), filaree, tocalote (*Centaurea melitensis*), soft chess (*Bromus hordeaceus*), and tarweeds (*Blepharizonia* sp., *Centromadia* sp., *Deinandra* sp., *Hemizonia* sp., *Holocarpha* sp.).

Intermittent Streams

There are numerous intermittent streams at Camp Roberts. Intermittent drainages on Camp Roberts have well-defined beds and banks that contain water flow after rain events and are dry for the rest of the year. Deeply carved intermittent drainages are located in low-lying areas throughout the training site and have vegetation similar to that of the grasslands.

Ponds and Reservoirs

Camp Roberts has 13 ponds and reservoirs (totaling about 65 ac [26 ha]) that are either natural or artificially created for use as livestock ponds and or flood control basins. Some of the ponds support emergent wetland vegetation and riparian species along the receding water line or low-water edge. Vegetation found along ponds and reservoirs at Camp Roberts includes cattails (*Typha* spp.), bulrush (*Scirpus* spp.), rush (*Juncus* spp.), willows, smartweed (*Polygonum* sp.), lesser duckweed (*Lemna aequinoctialis*), streamside monkeyflower (*Erythanthe guttata*), white sweetclover (*Melilotus albus*), rabbitsfoot grass (*Polypogon monspeliensis*), and curly dock (*Rumex crispus*).

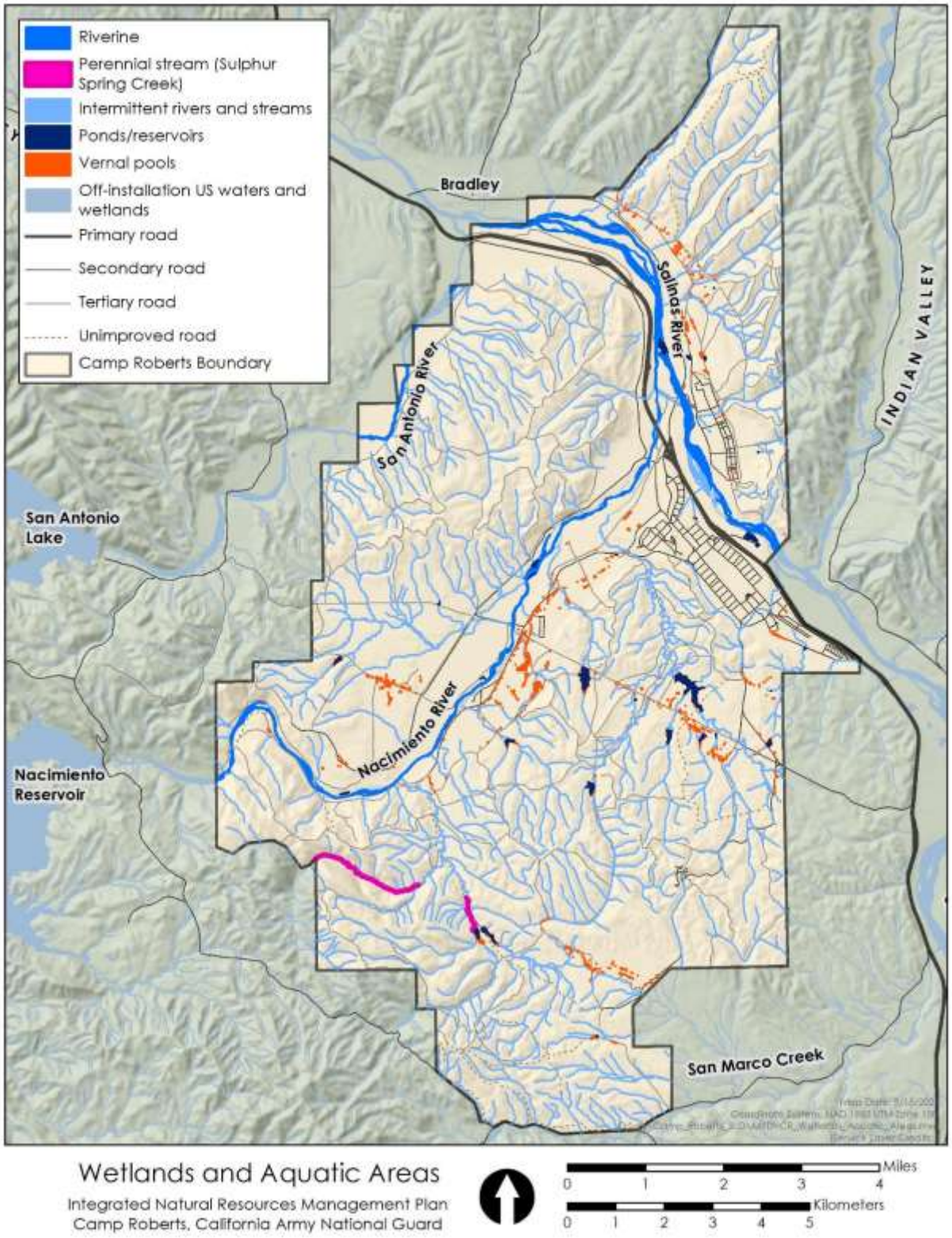
Vernal Pools

Vernal pools are landscape depressions that pond water during winter and spring and remain dry during the rest of the year. They support a unique plant association that is adapted to inundation during winter and extreme drought during summer.

At Camp Roberts vernal pools cover a total area of 47 ac (19 ha) and range in size from a few square feet to more than an acre in size and were usually found in grasslands in gently sloping terrain such as river terraces, benches, valleys, or swales (HDR Engineering, Inc. 2015). Vernal pools were found formed over a variety of soil types containing loam, clay, or clay loam. Both natural and artificially created vernal pools occur at Camp Roberts. Natural vernal pools occur on stream terraces, alluvial fans, and alluvial terraces, while artificially created pools consist of borrow pits, shell craters, and vehicle tire ruts created during training activities.

Vernal pools at Camp Roberts support a unique plant association that is adapted to inundation during winter and extreme drought during summer. Vernal pool endemics found in these pools include adobe popcorn-flower (*Plagiobothrys acanthocarpus*), stalked popcorn-flower (*P. stipitatus*), rough-fruit popcorn-flower (*P. trachycarpus*), coyote thistle (*Eryngium vaseyi*), dwarf woollyheads (*Psilocarphus brevissimus*), and annual hair grass (*Deschampsia danthonioides*) (HDR Engineering, Inc. 2015). Vinegar-weed (*Trichostema lanceolatum*), seaside barley (*Hordeum marinum*), neckweed (*Veronica peregrine*), toad rush (*Juncus bufonius*), and shining pepperwort (*Lepidium nitidum*) were also common associates in vernal pools.

Vernal pools also provide habitat to aquatic wildlife species such as western spadefoot (*Spea hammondii*), versatile fairy shrimp (*Branchinecta lindahli*), and the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*). The vernal pool fairy shrimp is discussed in detail in *Section 3.6.1.2 Vernal Pool Fairy Shrimp.*



Map 3-7. Camp Roberts wetlands and aquatic areas.

3.4.2.10 Other Cover Types

Urban

There are approximately 787 ac (318 ha) of developed lands at Camp Roberts (not counting roads, which are not delineated in the vegetation map), primarily in the cantonment area (Training Area A). This mapping also includes many of the training ranges. These areas are either paved or are otherwise maintained in an unvegetated condition. Wildlife use of these areas is minimal and may include such species as California scrub jay (*Aphelocoma californica*), northern mockingbird (*Mimus polyglottos*), house finch (*Haemorhous mexicanus*), rock pigeon (*Columba livia*), raccoon, opossum, and skunk.

3.4.3 Invasive Plant Species

Federal and/or state agencies identify non-native plants as noxious when species are invasive and require control or eradication to prevent habitat degradation. These species pose a serious long-term threat to many plant communities found on Camp Roberts. Many of these noxious species have the ability to completely change the structure and diversity of vegetation communities, often making habitats unsuitable to native wildlife or plants over time. Sensitive species are particularly at risk of extirpation by these non-native plants.

EO 13112 established federal agency responsibilities for the identification and management of invasive species and restricts the introduction of exotic organisms of all kinds into natural ecosystems, plants, and wildlife. The order stipulates that actions will be taken to prevent the introduction of invasive species, monitor for their presence, and respond rapidly to eliminate them. The DoD subsequently issued a memorandum of compliance with this EO.

Lists of noxious or invasive weeds are maintained by federal and state agencies as well as other non-governmental organizations, including non-profits and advocacy groups. The USDA and California Department of Food and Agriculture (CDFA) noxious weed programs emphasize weeds that are threats to agriculture, including rangeland. A few of the species on the CDFA noxious weed list are native; however, they are considered agricultural pests because of negative impacts they can potentially have on agriculture, silviculture, or important native species (CDFA 2010b). The Cal-IPC maintains lists that emphasize non-native plants that threaten the biotic integrity of wildlands and native ecosystems (Cal-IPC 2006). Additionally, San Luis Obispo and Monterey Counties also have noxious weed lists prioritizing species for eradication and control (Monterey County 2021; San Luis Obispo County 2002).

There are 76 non-native plant species recorded at Camp Roberts that are considered invasive or noxious; this list is presented in Appendix D. The CDFA list includes a total of 21 species that have been observed at Camp Roberts. Of those, false brome is the only species on CDFA's List A. This designation calls for its eradication, containment, or entry refusal. Of the 76 invasive species at Camp Roberts, 14 are listed as "High" by Cal-IPC. The "High" rating is for species having severe ecological impacts, moderate to high dispersal rates and a widespread distribution. A total of 30 out of the 76 non-native plant species have been given a "Moderate" rating by Cal-IPC. This means, although they can have substantial effects on biological communities and can have widespread distribution, their ability to become established is directly related to the degree of disturbance, which is one of the leading causes of invasive establishment. The remaining 32 non-native species have been given a "Limited" rating by Cal-IPC because they have lesser impacts on biological communities and are less widespread.

Twelve invasive species have been identified as having the highest priority for removal at Camp Roberts. These are listed in Table 3-12 below.

Table 3-12. Invasive plant species targeted for removal at CR.

Scientific Name	Common Name	Potential for Concern at Camp Roberts?
Arundo donax	arundo	It tends to overwhelm riparian and wetland habitats and has the potential to lower the water table due to high transpiration rates.
Centaurea solstitialis	yellow starthistle	It has a highly competitive nature coming from its ability to produce allelopathic chemicals enabling it to outcompete native vegetation. It depletes soil moisture reserves in annual grasslands and interferes with grazing.
Cortaderia jubata	pampas grass	It has an ability to spread quickly by colonizing bare ground rapidly and other areas without fertilization.
Delairea ordorata	cape ivy	It is toxic to wildlife. It is also highly invasive, forming dense mats of vegetation in riparian areas and wetlands, outcompeting native vegetation.
Elymus caput-medusae	Medusa head	It is highly competitive. It persists as dense layers preventing germination and survival of native species. Grows in clay soils, the preferred habitat for the federally threatened purple amole.
Foeniculum vulgare	wild fennel	It has an ability to drastically alter the composition and structure of multiple different plant communities including grassland, coastal scrub, riparian, and wetland communities.
Genista monspessulana	French broom	It has an ability to form dense stands excluding multiple native plant and wildlife communities.
Lepidium latifolium	perennial pepperweed	It has an aggressive growth nature that forms dense monospecific colonies excluding an abundant and diverse amount of native plant species.
Ludwigia peploides	creeping water-primrose	It has an ability to form dense mats that outcompete native aquatic plant populations and reduce water oxygen content.
Spartium junceum	Spanish broom	It has an ability to form dense stands excluding multiple native plant and wildlife communities.
Tamarix parviflora	smallflower tamarisk	It has an ability to dramatically change soil geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity.
Tamarix ramosissima	saltcedar, tamarisk	It has an ability to dramatically change soil geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity.

Tamarisk (*Tamarix* spp.) and arundo (*Arundo donax*) are likely the two highest priority weeds needing management at Camp Roberts. This is based on their ability to negatively impact sensitive vegetative communities, wildlife, wetland areas, riparian areas and by having severe ecological impacts, high dispersal rates and a widespread distribution. Invasive weeds at Camp Roberts generally tend to be worse along disturbed, urban, grazed, drainage, and training areas. While there are a number of stands of non-native eucalyptus species on the installation, they generally function well as windbreaks, provide habitat for raptors and other birds, and are not expected to rapidly increase in distribution.

Invasive plant species at Camp Roberts have the potential to negatively impact the habitat of several different federal or state listed threatened and endangered wildlife species along with multiple CDFW-

sensitive natural communities and California Wildlife Action Plan target conservation vegetative communities. Appendix D highlights these communities and wildlife species. The primary threatened and endangered wildlife species affected by these invasive plants include: the San Joaquin kit fox, SCCC steelhead, purple amole, and the vernal pool fairy shrimp.

The CDFW sensitive natural communities on Camp Roberts that are adversely affected by invasive plants include: California Sycamore Woodland, Valley Oak Woodland, and Vernal Pools. The California Wildlife Action Plan target conservation vegetative communities affected include: Perennial Grasslands, Warm Southwestern Riparian Forests, California Woodlands, Western North American Freshwater Marsh, and California Chaparral.

The total amount of sensitive communities, target communities, and protected wildlife species impacted was used as a tool to determine which invasive plants were prioritized for a higher management concern.

3.5 Fish and Wildlife Populations

The different habitat types on Camp Roberts are home to a variety of wildlife and are key to ecosystem biodiversity. Numerous biological surveys completed at Camp Roberts have documented the range of that diversity. Many common species of mammals, birds, reptiles, amphibians, insects, and fish have been identified on Camp Roberts as well as some sensitive plant and wildlife species (see Appendix C).

Game species known to occur at Camp Roberts include black-tailed deer (*Odocoileus hemionus columbianus*), wild turkey, California quail, mourning dove (*Zenaida macroura*), and various waterfowl species.

3.5.1 General Fish and Wildlife

Invertebrates

The ecosystem level benefits of invertebrate are becoming much more appreciated considering well-documented declines. Many are pollinators, such as most bees, butterflies, moths, flies, and beetles. Some are pathogenic, and carry disease for humans, wildlife, or trees.

Currently there are 94 invertebrate species have been recorded at Camp Roberts, although comprehensive surveys have not been conducted (Appendix C). Ten species of mollusks have been recorded, including six Gastropoda (snails and limpets) and four Bivalvia (clams). Six species of Crustacea have been recorded.

Insects make up the bulk of the invertebrates with 77 species recorded, including 25 flies (Diptera), 22 beetles (Coleoptera), 13 true bugs (Hemiptera), seven mayflies (Ephemeroptera), four dragonflies and damselflies (Odonata), three stoneflies (Plecoptera), and three caddisflies (Trichoptera). Most of the insects currently identified at Camp Roberts are either aquatic (water boatmen, backswimmers, water striders, etc.), or associated with aquatic habitats (water midges, mayflies, dragonflies). Records for terrestrial insects include desert tarantulas, deer flies, and horse flies.

Fish

Twenty-six fish species are present in the Nacimiento, Salinas, and San Antonio Rivers at Camp Roberts. Many of these species have been identified at Camp Roberts as part of a larger effort to quantify and monitor the population of the federally threatened SCCC steelhead across its range which includes the Salinas and Nacimiento Rivers (Cuthbert et al. 2010, 2011, 2013, 2014; Monterey County Water Resources Agency [MCWRA] 2013, 2014). The SCCC steelhead, along with two California Species of

Special Concern (CSSC), the Monterey hitch (*Lavinia exilicauda harengus*) and Monterey roach (*Lavinia symmetricus subditus*), are described in *Section 3.6.1.3 South-central California Coast Steelhead.*

Reptiles and Amphibians

A total of 26 species of herpetofauna have been recorded at Camp Roberts, including five toads and frogs (Order Anura), three salamanders (Order Caudata), six lizards (Order Squamata: Suborder Lacertilia), 11 snakes (Order Squamata: Suborder Serpentes), and one turtle (Order Testudines). Two are Focal Species for the California Wildlife Action Plan (southwestern pond turtle and coast horned lizard [*Phrynosoma blainvillii*]). There are five CSSC: western spadefoot, Northern California legless lizard (*Anniella pulchra*), California glossy snake (*Arizona elegans occidentalis*), San Joaquin coachwhip (*Masticophis flagellum ruddocki*), and coast horned lizard. One is a serious aquatic invasive species, the American bullfrog (*Lithobates catesbeianus*).

Birds

Birds play many important ecological roles and are one of the most visible components of animal communities. At Camp Roberts, 170 bird species have been identified and recorded. This tally is just over one-third of the total bird diversity recorded in Monterey and San Luis Obispo Counties.[6] Bird species found on Camp Roberts include neotropical migrants (birds that winter in South America and nest in North America) and resident (non-migratory) species. The upland and aquatic habitats of Camp Roberts provide important foraging and resting spots for migrants, as well as habitat for breeding.

Mammals

Fifty-nine species of mammal have been recorded at Camp Roberts. Of the mammals, seven are special status species: pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis californicus*), western red bat (*Lasiurus blossevillii*), Monterey dusky-footed woodrat (*Neotoma macrotis luciana*), American badger (*Taxidea taxus*), and San Joaquin kit fox.

Additionally, nine of the mammal species are highlighted in the California Wildlife Action Plan (2015) as species that would benefit from conservation strategies: pallid bat, tule elk, Townsend's big-eared bat, western mastiff bat, western red bat, long-legged myotis (*Myotis volans*), western spotted skunk, American badger, and San Joaquin kit fox.

In addition, there are six species of mammal which are introduced in the area (Virginia opossum, eastern woodrat [*Neotoma floridana*], Florida mouse [*Podomys floridanus*], eastern harvest mouse [*Reithrodontomys humulis*], red fox [*Vulpes vulpes*], and house cat [*Felis catus*]).

3.5.2 Pollinators

Pollinators on CR consist of various types of species such as bees, butterflies, moths, flies, beetles, birds, and bats. While no pollinator specific surveys have been completed on CR, a review of other species lists indicates the diversity of pollinator species present on the installation. Pollinator diversity on Camp Roberts is directly correlated with the diversity of vegetation and plant communities on the installation. Management for pollinator species is accomplished primarily through the protection and management of associated habitats and compliance with pest management regulation (DoD 4150.07 DoD Pest Management Programs May 2008, DoD 4715.03 March 2011).

[6] Note that nomenclature for birds is consistent with that of the American Ornithological Union except with regard to their convention for capitalizing all bird names.

3.5.3 Invasive and Feral Animals

There are 22 invasive or feral terrestrial vertebrate species known to occur at Camp Roberts, which consist of 15 fish species, one amphibian species, two bird species, and four mammal species. Table 3-13 lists invasive species at Camp Roberts and their priority. Management for these and other invasive species is discussed in Chapter 4.

Table 3-13. Invasive or Pest Species Present at Camp Roberts.

Scientific Name	Common Name	Camp Roberts Priority*	Potential for Concern at Camp Roberts?
Fish			
Alosa sapidissima	American shad		Potential for adverse impacts on SCCC Steelhead as a result of disease, disruption of behavior or habitat displacement
Ameiurus melas	black bullhead	Low—monitor	Potential to prey on SCCC Steelhead eggs and juveniles.
Carassius auratus	goldfish	Low—monitor, control	Potential to negatively affect native fish habitat, including SCCC Steelhead, when their population is high. Beyond that, generally, they are not a problem.
Cyprinus carpio	common Carp		Potential to negatively affect SCCC Steelhead habitat when their population is high. Beyond that, generally, they are not a problem.
Dorosoma petenense	threadfin shad		Potential to compete with some native species but not SCCC Steelhead, making them a low concern.
Gambusia affinis	western mosquitofish	Medium—monitor, control	Potential to compete with and prey on juvenile SCCC Steelhead.
Ictalurus punctatus	channel catfish		Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Ictalurus catus	white catfish		Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Lepomis cyanellus	green sunfish	Low—monitor	Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Lepomis macrochirus	bluegill	Low—monitor	Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Morone chrysops	white bass	Low—monitor	Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Micropterus dolomieu	smallmouth bass		Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Micropterus salmoides	largemouth bass	Low—monitor	Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Notemigonus crysoleucas	golden shiner		Effects on native species is unknown, however there is still potential for adverse impacts on SCCC Steelhead as a result of disruption of behavior and/or habitat displacement.
Pomoxis nigromaculatus	black crappie	Low—monitor	Potential for adverse impacts on SCCC Steelhead as a result of predation, disease, disruption of behavior or habitat displacement
Reptiles and Amphibians			
Lithobates catesbeianus	Bullfrog	Medium—monitor, eradicate	Have a diverse omnivore diet both as tadpoles and adults. Have high potential to eat southwestern pond turtle and a lower potential to eat vernal pool fairy shrimp.
Birds			
Molothrus ater	Brown-headed Cowbird	High—monitor, control	The Least Bell's Vireo is listed as Federally Endangered in part due to nest parasitism by brown-headed cowbirds.

Scientific Name	Common Name	Camp Roberts Priority*	Potential for Concern at Camp Roberts?
Sternus vulgaris	European Starling	High—monitor, control	Has potential to compete with the Federally Endangered Least Bell's Vireo for food along with several other listed CSSC.
Mammals			
Felis catus	feral cat	Low—monitor, control	Low concern at Camp Roberts. Potential to adversely impact mammal, reptile, bird, and amphibian populations, including CSSC.
Spermophilus beecheyi	California ground squirrel	High—monitor, control	Can be a serious rangeland pest if populations become dense or widespread. This can have negative impacts on rangeland for cattle and training activities. Overpopulation can decrease the regeneration of CDFW sensitive natural community; Valley Oak Woodland.
Sus scrofa	feral or wild pig	High—monitor, control	Pig activity can prevent the regeneration of CDFW sensitive natural communities, Valley Oak Woodland & California Sycamore Woodland by de-rooting saplings. They also have the potential to deplete populations of federally threatened purple amole by uprooting the bulbs.
Vulpes vulpes	red fox	High—monitor, control	Has potential to negatively compete with the federally endangered San Joaquin kit fox for habitat, space, and food. It also has the potential to spread disease and predate on the San Joaquin kit fox.

* Priority ratings are from the February 2014 Camp Roberts INRMP, which were determined and designated by CA ARNG Environmental Programs Directorate staff.

3.6 Special Status Species

The following section describes special-status species that are known to occur or have the potential to occur at Camp Roberts. A description of the various special status species classifications or laws that protect specific species are provided below.

Federal

The ESA (16 U.S.C. §§ 1531-1544), administered by USFWS and NMFS, protects federally listed endangered and threatened plants and wildlife and critical habitat. Specific ESA definitions are as follows:

- *Endangered Species*. Any species in danger of extinction throughout all or a significant portion of its range.
- *Threatened Species.* Any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- *Critical Habitat.* Specific areas found to be essential to the conservation of a threatened or endangered species and which may require special management considerations or protection.
- *Candidate Species.* Any species for which the USFWS has sufficient information on their biological status and threats to propose them as threatened or endangered.

State

The CESA (CFG Code § 2050 et. Seq.), the California Native Plant Protection Act (CFG Code § 1900 et seq.; NPPA), and the California Natural Community Conservation Planning Act (CFG Code § 2800 et seq.), administered by CDFW, protect and enhance wildlife resources, native plant species, and natural communities of California. Specific State listing definitions are as follows:

- *Endangered species.* A native species or subspecies of bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its

range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

- *Threatened species.* A native species or subspecies of bird, mammal, fish, amphibian, reptile, or plant, that although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.
- *Candidate species.* A native species or subspecies of bird, mammal, fish, amphibian, reptile, or plant that the CDFW commission has formally noticed as being under the review by CDFW for listing.
- *Rare.* Species, subspecies, or varieties of plants, although not presently threatened with extinction, are in such small numbers throughout their range that they may become endangered if the present environment worsens (CFG Code § 1901). Rare plant species include species designated by the California Native Plant Society (CNPS) to have a California Rare Plant Rank (CRPR) of 1A, 1B, 2A, 2B, 3, and 4. These rankings area as follows:
  - *1A.* Plants that are presumed extirpated from California or extinct.
  - *1B.* Plants that are rare, threatened, or endangered in California and elsewhere. Plants in this rank meet the definitions of CESA and are eligible for state listing.
  - *2A.* Plants that are presumed extirpated in California, but are more common elsewhere in their range. Plants in this rank meet the definitions of CESA and are eligible for state listing.
  - *2B.* Plants that are rare, threatened, or endangered in California, but are more common elsewhere. Plants in this rank meet the definitions of CESA and are eligible for state listing.
  - *3.* Plants about which more information is needed. Information on these plants is lacking, making it difficult to assign them to an existing rank or reject them. Many of the plants in this rank meet the definitions of CESA and are eligible for state listing.
  - *4.* Plants of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low. Plants in this rank should be monitored regularly.

  Each ranking is further broken down into the following threat rank:
    - *.1* - Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
    - *.2* – Moderately threatened in California (20-80% occurrences threatened/moderate degree of immediacy of threat)
    - *.3* - Not very endangered in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
- *Fully protected.* Species that may not be taken or possessed at any time, and no license or permits may be issued for their take except when necessary for scientific purposes.
- *California Species of Special Concern.* Species, subspecies, or distinct population of an animal native to California that exhibits declining population levels, limited ranges, and/or experience continuing threats that make them vulnerable to extinction.

Global and State (NatureServe)

The NatureServe conservation status system was originally developed by the Nature Conservancy and serves as a ranking system for the relative impairment of flora and fauna species. It includes a global ranking system (G rank), describing the rank for a taxon over it entire distribution and a state rank (S

rank), describing the rank for the taxon over its state distribution. There is also a "T" rank describing the global rank for a subspecies or variety which is attached to the "G" rank.

- Rankings are as follows:
  - *G1 or T1 or S1.* Critically imperiled.
  - *G2 or T2 or S2.* Imperiled.
  - *G3 or S3.* Vulnerable to extirpation or extinction.
  - *G4 or S4*. Apparently secure.
  - *G5 or S5*. Demonstrably widespread, abundant, and secure.

DoD

The DoD has identified plant and animal species on military installations that if listed, could have a significant impact on military readiness. These species warrant conservation actions.

- *Species at Risk.* Plant and animal species that are not yet federally listed as threatened or endangered under the ESA, but that are federally designated as proposed or candidates for listing, are globally ranked G1 or G2 throughout their range, or are birds ranked G3 or have an International Union for Conservation of Nature status of critically endangered, endangered, vulnerable, or near threatened.

- *Mission Sensitive Species.* Bird species that, if federally listed in the future under the ESA, would have the largest impact to military testing and training missions.

Other

In addition to the above rankings, migratory birds are protected under the MBTA with some even further ranked as Birds of Conservation Concern (BCC) by the USFWS. DoD committed to conservation of BCC under the MOU between the DoD and the USFWS to Promote The Conservation Of Migratory Birds (2006). This MOU was signed pursuant to EO 13186 (17 January 2001) Responsibilities of Federal Agencies to Protect Migratory Birds.[7] Eagles are also protected under the BGEPA. Eagles and BCC list birds designated for the Camp Roberts region are considered special-status species in this INRMP.

Also considered in this document are bat species designated by the Western Bat Working Group (WBWG) as having "high" conservation importance due to overall population declines. The California State Wildlife Action Plan (SWAP) also identifies species in California that have a higher conservation need and should be considered when developing conservation or management plans.

Special-Status Species Accounts

Various surveys conducted since the 1990s have identified 72 special-status plant and animal species that are known or have the potential to occur on Camp Roberts. Of these species, ten are state or federally listed as threatened or endangered, and 62 are special status or sensitive plant, fish, and wildlife species. General information on the status, distribution, and habitat requirements of federal and state listed species are discussed below and summarized in Table 3-14. Other special status species known to occur or likely to occur on CSLO are discussed below and summarized in Table 3-15.

[7] The current version of the BCC list (USFWS 2008) is available at https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php.

3.6.1 Federal and State Listed Species

Ten species with Federal or State listing as threatened or endangered are known to occur or have potential to occur at Camp Roberts (Table 3-154). Detailed descriptions of these species are provided below. Map 3-8 shows federally sensitive species at Camp Roberts.

Table 3-14. Federal and State listed species occurring at Camp Roberts or with the potential to occur.

Common Name	Scientific Name	Listing Status	Status at Camp Roberts
Plants			
purple amole	*Hooveria purpurea* var. *purpurea*	FT, CNPS 1B.1	Known to occur
Invertebrates			
vernal pool fairy shrimp	*Branchinecta lynchi*	FT	Known to occur
Fish			
south-central California coast steelhead	*Oncorhynchus mykiss irideus*	FT	Known to occur
Birds			
bald eagle	*Haliaeetus leucocephalus*	FDR, SE, BCC	Known to occur
California condor	*Gymnogyps californianus*	FE, SE, FP	Known to occur*
Swainson's hawk	*Buteo swainsoni*	ST, BCC	Known to occur*
least Bell's vireo	*Vireo bellii pusillus*	FE, SE	Potential†
tricolored blackbird	*Agelaius tricolor*	ST, BCC, CSSC	Potential†
bank swallow	*Riparia riparia*	ST	Potential
Mammals			
San Joaquin kit fox	*Vulpes macrotis mutica*	FE, ST	Potential‡

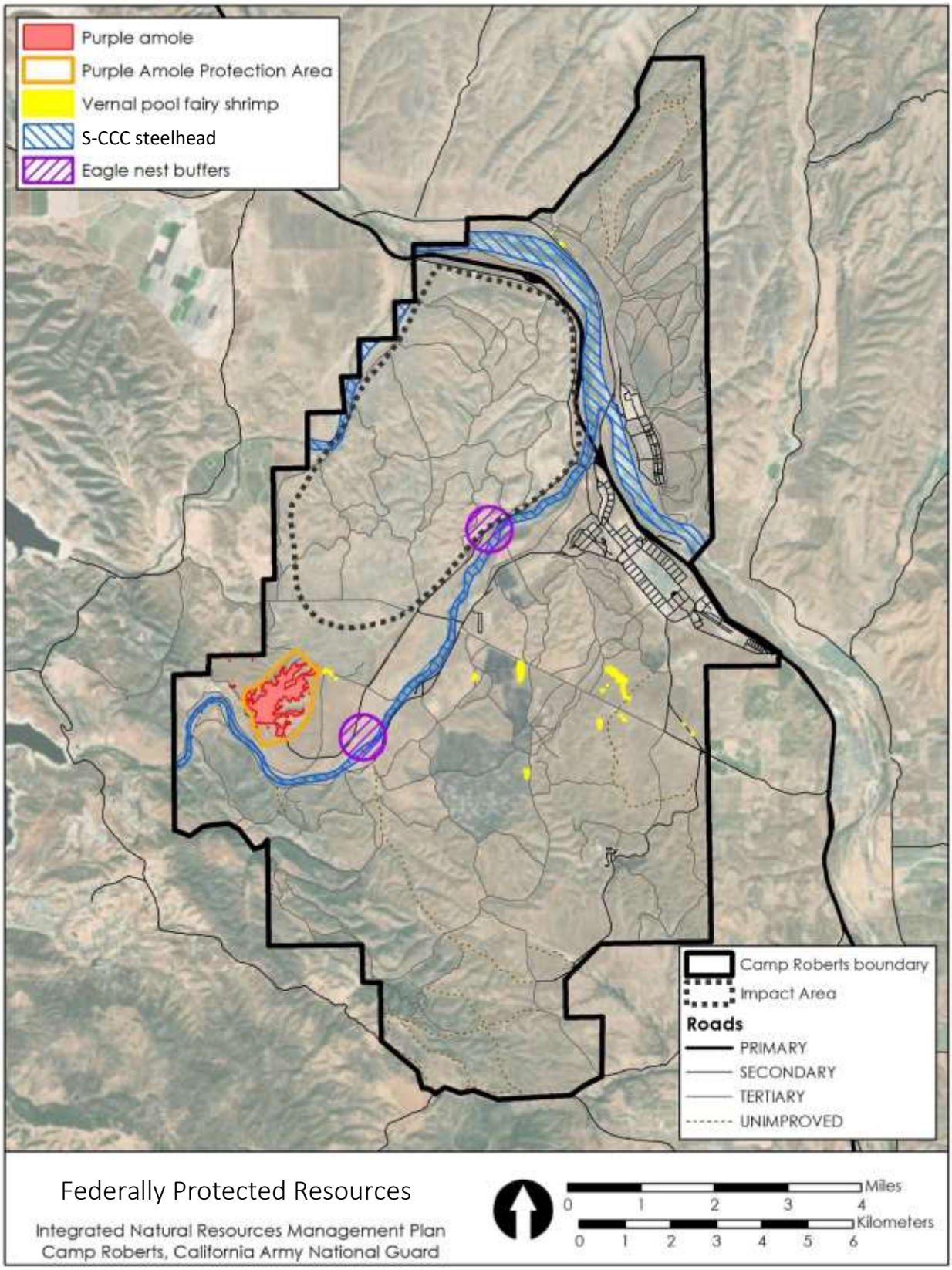
Listing Status:

CNPS 1B.1 = California Rare Plant Rank. 1B-Plants rare, threatened, or endangered in California and elsewhere; 0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat);
BCC = USFWS Bird of Conservation Concern; **FDR** = Federal Delisted (Recovered) [Protected]; **FE** = Federal Endangered; **FT** = Federal Threatened;
SE = State Endangered; **ST** = State Threatened; **CSSC** = California Species of Special Concern; **FP** = CDFW Fully Protected Species

* Incidental sightings of these species foraging within or flying over Camp Roberts have been reported, but they are not known to nest there.

† The species has been documented in close proximity to Camp Roberts and suitable habitat is known to occur there.

‡ Kit fox had been regularly seen at Camp Roberts, but the last known sighting was in 2007.



Map 3-8. Federally protected resources at Camp Roberts.

3.6.1.1 Purple Amole

Federally Threatened, CNPS 1B.1

The purple amole (*Hooveria purpurea* var. *purpurea*) was listed as a federally threatened species (65 FR 14878-14888) in 2000. It is also listed as a CNPS 1B.1 species (CNPS 2022). In 2020, a five year Species Status Assessment for purple amole was completed by USFWS which resulted in no change to the species' threatened status. A member of the century plant family (Agavaceae), the purple amole occurs on clay soils in the south Coast Ranges of Monterey and San Luis Obispo Counties. It is currently known from 17 occurrences on the eastern side of the Santa Lucia Range. The purple amole occupies a total area of approximatley 1,235 acres (500 ha) and is considered to occur in four main populations; three on Fort Hunter Liggett in Monterey County and one on Camp Roberts in San Luis Obispo County (USFWS 2020).

Purple amole is a bulb forming perennial herb with a basal rosette of linear, flat, bright green leaves (USFWS 2000). The basal rosette is typically comprised of 4–7 leaves that are approximately 12 inches (30 cm) long and up to 0.2 inch (2 to 5 millimeters [mm]) wide with wavy margins, though the margins are often straight if the plant grows in shaded conditions (Terra Verde 2017). The bulb is 0.98–1.4 inches (2.5–3.5 cm) around and occurs in the upper few inches of soil. The inflorescence is a single stem, 10 to 16 inches (25 to 40 cm) high, with spreading branches bearing bluish-purple petals and sepals. It is the only member of the genus with bluish-purple flowers that open during the day (USFWS 2000). Most fruits produce between three and six seeds (CA ARNG 2014).

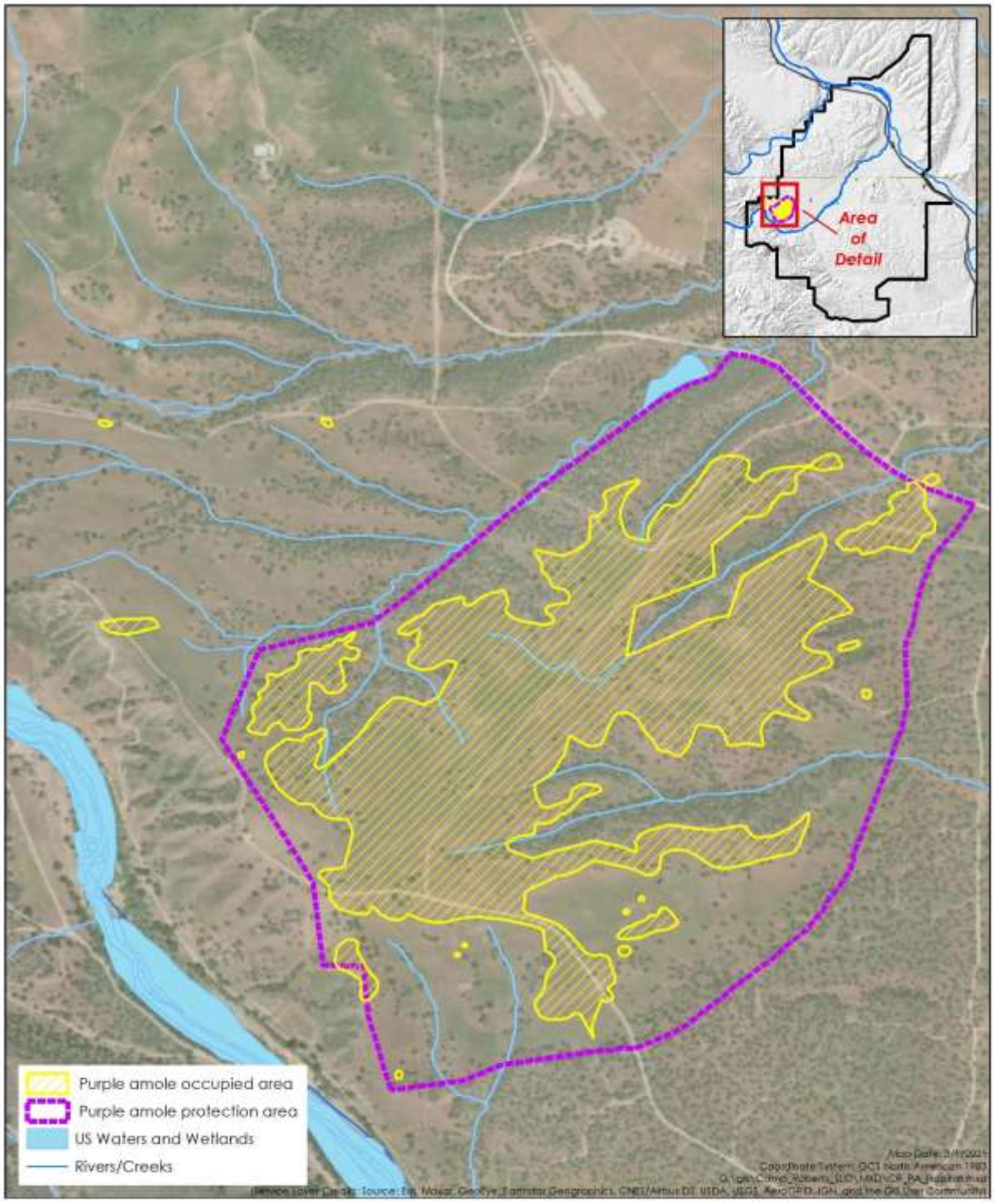
Root and leaf growth occur during the wet season with leaf shoots typically appearing above ground in December or January. The vegetative growth stage is typically short with flowering and fruiting being completed before the start of the dry summer months (USFWS 2020). Purple amole flowers start to develop in early spring and seed production typically peaks in late June through early July (USFWS 2020). Overall plant development is dependent on amount and timing of rainfall (USFWS 2020). The lifespan of this species remains unknown.

Purple amole occurs in a Mediterranean climate (hot, dry summers and cool, wet winters) in grassland, oak woodland, and oak savannah plant communities (USFWS 2020). Sparsely vegetated areas and open bare ground are important habitat components for the species. Purple amole requires sandy and/or clay loams with gravel components in the top and subsoil strata and is often associated with cryptogamic crusts (USFWS 2002). This species also requires adequate annual precipitation and suitable temperature regimes to facilitate vegetative growth and dormancy, avoid desiccation, and stimulate seed germination. Insect pollinators are also are also critical habitat components.

Threats to purple amole include construction and use of military training facilities, military training activities, competition with non-native annual grasses, and potentially by alteration of fire cycles due to military training (USFWS 2000). Livestock are also a potential threat, as are feral pigs. A recovery plan has not been prepared.

Critical Habitat

In October 2002, USFWS issued a final rule to designate CH for the purple amole (67 Federal Register [Fed. Reg.] 65414 [24 October 2002]). However, USFWS determined that Camp Roberts did not meet the definition of CH as defined under section 3(5)(A)(i) because the land was being managed to meet the conservation needs of the species and thus, Camp Roberts was not included in the final rule.



Purple amole *(Hooveria purpurea* var. *purpurea)*

Integrated Natural Resources Management Plan
Camp Roberts, California Army National Guard

Map 3-9. Purple amole at Camp Roberts.

Status at Camp Roberts—Known to Occur

The purple amole population on Camp Roberts is one of four main populations and occurs on 534.2 acres (216.2 ha) in Training Area O (Map 3-9). It grows primarily in open grassland communities, with a few individuals occurring in marginal oak woodland communities on the gently sloping terrace of an old alluvial fan. Soils in this areas contain high concentrations of gravel and pebbles, underlain by hard packed clay (Kofron et al. 2013). The C A ARNG has monitored the species annually since it was listed in 2000, except for years 2010 and 2012. In 2021 a census was completed which documented 24,903 individual plants in a 215 acre area (Terra Verde 2021). The population decreased from 230,370 as determined in a 2001 census, representing an 89% reduction. However, a lack of background information and methodology used during the 2001 census, makes it difficult to equally compare the 2001 and 2021 census results (Terra Verde 2021). An analysis of purple amole monitoring results in 2020 found that the Camp Roberts population appears to be stable (Althouse and Meade 2020).

3.6.1.2 Vernal Pool Fairy Shrimp

Federally Threatened

The vernal pool fairy shrimp is a federally threatened species (USFWS 1994). Its range extends from Shasta County south throughout the Central Valley to Tulare County and west to the central Coast Ranges, with disjunct populations in San Luis Obispo, Santa Barbara, and Riverside Counties (Eriksen and Belk 1999). Most known locations are in the Sacramento and San Joaquin Valleys and along the eastern margin of the central Coast Ranges (Eng et al. 1990). Vernal pool fairy shrimp inhabit vernal pools, usually in grassland habitats (Eng et al. 1990). Pools must stay inundated long enough for the shrimp to complete their life cycle.

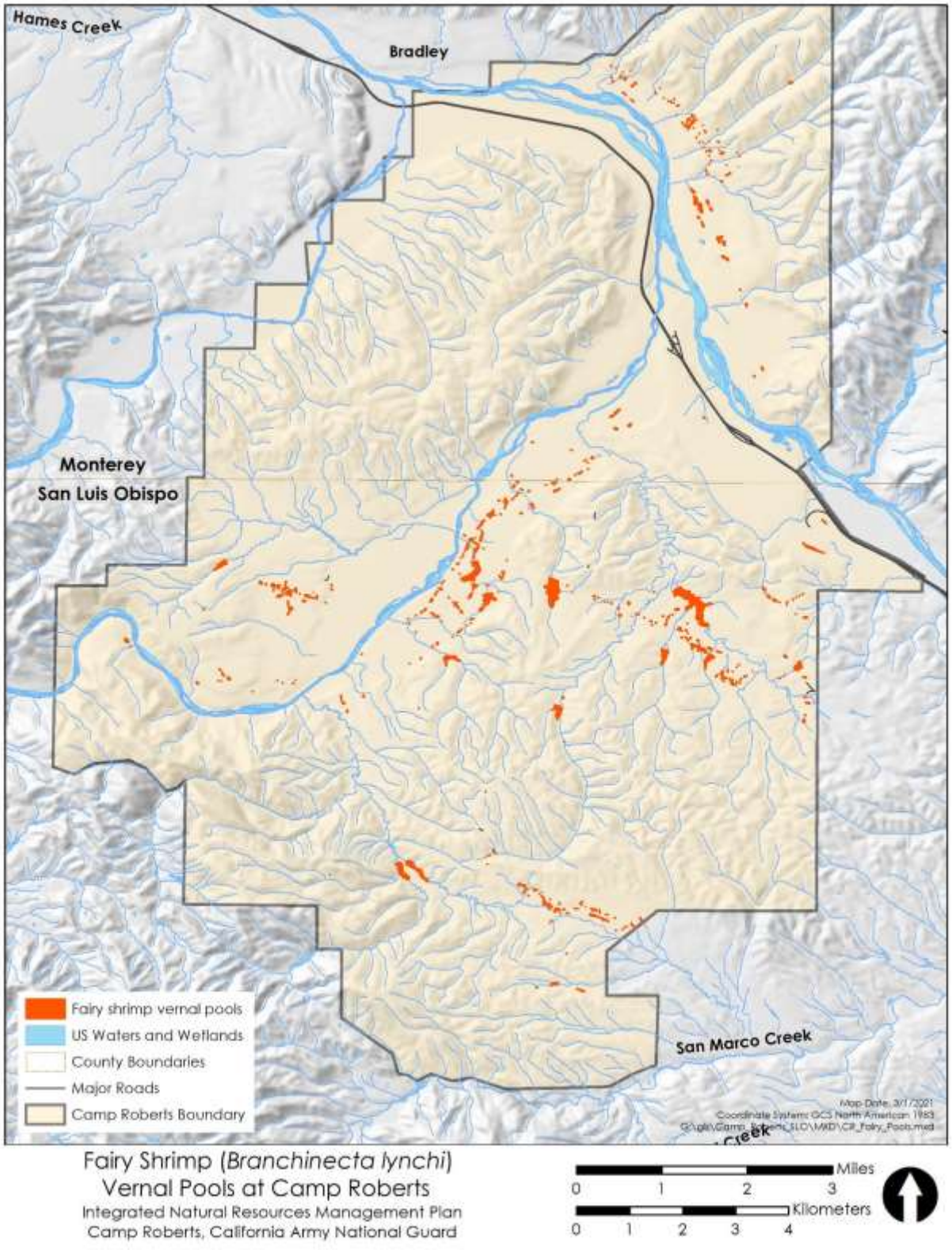
Vernal pool fairy shrimp are small crustaceans about one inch in length that inhabit seasonal wetlands. Vernal pool fairy shrimp hatch from cysts when pools fill with water in the winter. They mature in approximately 40 days after which the females produce thick shelled eggs (cysts) and then die. Cysts remain in the soil after the pool dries up and hatch when pools fill with water, repeating the short-life cycle of the species.

Pools occupied by vernal pool fairy shrimp tend to have grass or mud bottoms with clear to tea-colored water and are often in basalt flow depressional pools in unplowed grasslands (Eriksen and Belk 1999). Water characteristics such as alkalinity, total dissolved solids, and pH are among the most important factors in determining the distribution of fairy shrimp (Eriksen and Belk 1999). Vernal pool fairy shrimp also occur in other wetlands that provide habitat characteristics similar to those of vernal pools such as alkaline rain pools, rock outcrop pools, and some constructed sites (USFWS 1994; Eriksen and Belk 1999). Occupied pools range in size from 6 ft (0.6 square meter [m^2]) to pools exceeding 24 ac (9.7 ha) (Eriksen and Belk 1999). They do not occur in riverine, marine, or other permanent waters (USFWS 1994).

Primary threats to vernal pool fairy shrimp are conversion of vernal pool habitat to agricultural uses and urban development, water supply and flood control activities, direct destruction, and modification of pools from filling, grading, disking, leveling, and other activities. Modification of surrounding uplands that alter vernal pool hydrology may also result in habitat loss (USFWS 1994).

Critical Habitat

In August 2003, USFWS issued a final rule to designate CH for four vernal pool crustaceans and 11 vernal pool plants in California and Southern Oregon, including the vernal pool fairy shrimp (68 Fed. Reg. 46684 [03 August 2003]). Per section 4(b)(2) of the ESA, Camp Roberts was excluded from CH designation based on the



Map 3-10. Fairy shrimp vernal pools at Camp Roberts.

need to maintain mission-critical military training activities, the need to maintain positive working relationships, and economic considerations related to Section 7 consultation costs and other indirect effects.

In August 2005, USFWS issued another final rule designating CH for four vernal pool crustaceans and 11 vernal pool plants in California and Southern Oregon (70 Fed. Reg. 46924 [11 August 2005]) after re-evaluating economic exclusions made to the 2003 final rule. It was determined that Camp Roberts would remain excluded from CH designation per section 4(b)(2) for non-economic reasons.

Status at Camp Roberts—Known to Occur

Vernal pool fairy shrimp were first documented on CR in 1995 within 61 vernal pools (JSA 1997). Immature fairy shrimp, potentially also VPFS, were documented in an additional 119 pools. Since that time, CA ARNG has actively managed VPFS through consultations with the USFWS and per requirements in BOs. Annual surveys ceased in 2008 due to funding shortfalls and it wasn't until 2017 that VPFS surveys again took place. The 2017 surveys recorded vernal pool fairy shrimp in 40 pools with a total area of 38.3 ac (15.5 ha), primarily across the center of the installation (Map 3-10). The CA ARNG is currently preparing a revised VPFS monitoring plan to guide future annual monitoring efforts.

3.6.1.3 South-Central California Coast Steelhead

The SCCC steelhead is a federally threatened species (USFWS 1998b), as well as a CSSC. Steelhead are the anadromous, i.e. ocean-going form, of the species *Oncorhynchus mykiss*.

Federally Threatened, CDFW Species of Special Concern

First listed in 1997, the SCCC steelhead Distinct Population Segments (DPS) is one of ten currently designated as federally threatened (NMFS 2019) and is a CSSC. The DPS of the south-central California coast population, of which Camp Roberts is a part, extends from the Pajaro River in the north, to (but not including) the Santa Maria River in the south. Across its range within the DPS, steelhead numbers have declined precipitously from estimated annual runs totaling 27,000 adults around 1900, to below 5,000 adults in 1965, to several thousand total adults, with a large degree variability year to year (Busby et al. 1996; Good et al. 2005; Williams et al. 2011 as cited in NMFS 2013). The NMFS (2013) attributed the decline in steelhead trout to loss of freshwater and estuarine habitat, periodic poor ocean conditions, and a variety of land-use, flood control and water management practices impacting sedimentation and hydrologic processes which create and sustain essential steelhead habitats.

Juveniles develop initially in freshwater for one to two years before emigrating to the ocean where they sexually mature and then return as four to five-year- old adults to reproduce in freshwater rivers and streams. During spawning, females will excavate a nest in gravelly fast flowing and well-oxygenated streambeds wherein she deposits eggs (NMFS 2013). The eggs are then fertilized, and hatching can occur within three weeks to two months (NMFS 2013). After spending the first year or two in rivers, steelhead typically reside in marine waters for two to three years prior to returning to their natal stream to spawn as four or five year olds, and can spawn more than once before they die. Steelhead adults in the south-central California coast DPS enter rivers from late November through March, with spawning occurring from January through April. NMFS (2013) states that because steelhead employ several different life-history strategies that utilize all portions of a river system, they effectively serve as an indicator species, providing a measure of the health of their watersheds.

Flow regimes determine migratory access to and from spawning and rearing areas for steelhead. Spawning areas tend to be selected based on flow regime, water quality parameters, substrate size, and groundwater upwelling (Spence et al. 1996). Critical habitat components for breeding steelhead trout in the SCCC steelhead DPS consists of suitable spawning gravel and fine sediment deposition (Stillwater Sciences 2018). During spawning migrations, adequate flows and depths of water must be present to allow passage over barriers and provide the adequate resting ponds needed to reach spawning sites. After emergence, fry require shallow-water, low velocity habitats found along stream margins and in low-gradient riffles (Stillwater Sciences 2018). Three rivers (Nacimiento, Salinas, and San Antonio) provide habitat to the SCCC steelhead DPS at Camp Roberts.

Habitat loss and degradation of habitat quality threaten steelhead populations. Interruption of the water regime through water extraction and blockage of fish passage as a result of dams have contributed to the decline of steelhead. Introduction of silt from erosion associated with fire, existing roads, or other hillside activities can degrade steelhead-spawning beds and smother developing eggs, contributing further to the decline of the steelhead.

Critical Habitat

In February 2000, NMFS issued a final rule to designate CH for 19 populations of steelhead in Washington, Oregon, Idaho, and California (65 Fed. Reg. 7764 [16 February 2000]). On 30 April 2002, the U.S. District Court for the District of Columbia approved NMFS's consent decree withdrawing the 2000 CH designation for steelhead. In December 2004, NMFS re-proposed CH for seven DPSs of Pacific salmon and steelhead, including the SCCC steelhead DPS (69 Fed. Reg. 71879 [10 December 2004]). This DPS, which includes Camp Roberts, occurs in the geographic region north of the City of Santa Maria in Santa Barbara County extending northward to (and including the Pajaro River and its tributaries) in Santa Cruz County. Camp Roberts was exempted from the proposed CH designation (71 Federal Register 52523 [02 September 2005]), in accordance with the ESA (16 U.S.C. § 4[a][3]) because Camp Roberts had prepared a qualifying INRMP.

Status at Camp Roberts – Known to Occur

The Salinas and Nacimiento rivers at Camp Roberts are known to support small populations of SCCC Steelhead. Every monitoring effort at Camp Roberts between 2010-2014 has identified steelhead trout in at least one of these rivers (Cuthbert et al. 2010, 2011, 2013, 2014). Habitat for the steelhead trout along the Nacimiento River consists of a low gradient, gravel bedded channel with sparse riparian vegetation (Cuthbert et al. 2013) while habitat in the Salinas River at Camp Roberts is a low gradient sand-bedded stream that Cuthbert et al. (2013) considered not suitable for steelhead rearing. The NMFS five-year species status review found that small (generally < 10 fish) but persistent annual runs of steelhead are being monitored in a limited and diverse set of basins within the range of the SCCC DPS (NMFS 2016).

3.6.1.4 Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) are the second largest North American bird of prey (only the California condor is larger). Adult bald eagles are readily identifiable by their white heads and tails adjacent to their dark brown bodies and wings. Juvenile bald eagles are dark brown with white mottling and can be confused with juvenile and adult golden eagles (Buehler 2000).

Federal Delisted (Recovered) [Protected], State Endangered, CDFW Fully Protected, BGEPA

Its steep decline in the mid-20th century in America created lasting conservation concern for the species, though it has dramatically recovered and was removed from the federal Endangered Species List in 2007. In California bald eagles are still making a comeback, and the last decade has seen many new nests in central and southern California. Bald eagles are now a permanent resident and uncommon winter migrant in the State (Zeiner et al. 1990a; Fink et al. 2018). The overall population size of bald eagles along the Central Coast is still low, but increases in the winter and during migration, as bald eagles are much more abundant to the north. Bald eagles nest near water, as their primary food sources are fish, small mammals, and carrion (Buehler 2000).

Their nests are very large stick platforms constructed in one of the taller and more conspicuous trees in an area. Bald eagles are sensitive to nearby disturbance and avoid foraging where disturbance is likely and build their nests way from high levels of activity. The bald eagle breeding season lasts from early spring to fall. Nest construction begins one to three months before egg laying, though nests can be reused for many years once complete (Buehler 2020). One to three eggs are then laid and hatch after around 35 days. Eight to fourteen weeks later juveniles begin to take their first flights. Juvenile bald eagles take approximately 4.5 years to reach adulthood and mature plumage and could be mistaken for golden eagles in their first years. Under good circumstances, this species can live into its late 20s (Johnsgard 1990).

Status at Camp Roberts—Known to Occur

At Camp Roberts the first pair attempting to nest in recent decades were observed in 2003 (Camp Roberts Eagle Conservation Plan [ECP] 2016). Nesting attempts occurred in 2004 and 2005 but were also unsuccessful. Nesting was successful in 2007 and the eagle pair have successfully nested and fledged one to two young each year, except for one, through 2020. In 2012 another bald eagle pair built a nest along the Nacimiento River and successfully fledge one to two young each year. Migrants or individuals breeding elsewhere may be sighted using the Training Site for foraging or roosting as well (ECP 2016). They are routinely observed perching in large trees, such as old growth sycamores or cottonwoods, along the Nacimiento River. Roosting or foraging bald eagles may originate at Lake Nacimiento, where many both winter and breed, or from areas north and south along the Salinas River. The California National Guard places a high priority on protecting bald eagles because Camp Roberts provides breeding and foraging habitat for the species and they are protected under the MBTA, BGEPA, and the CFG Code.

3.6.1.5 California Condor

Federal Endangered, State Endangered

With a wingspan over just over 9 ft (2.8 m) the California condor (*Gymnogyps californianus*) is unmistakable and the largest soaring landbird in North America (Finklestein et al 2015). Environmental contaminants (DDT), shooting, and lead poisoning from scavenging on shot carcasses led to the decline of this species from most of its West Coast (Baja to British Columbia) range by 1940. In 1987 fewer than 30 condors remained, and all were in captivity at the San Diego and Los Angeles zoos. The first captive bred California condor chick was hatched by the San Diego Zoo in 1988, and by 2020 the global population of the California condor had reached 485, with 312 wild and 173 captive individuals (Ventana Wildlife Society [VWS] 2020). The population of California condors is still slowly increasing, thanks to intensive management efforts, but serious threats to the recovery of this species remain. The majority of the wild individuals live in California, and one of their primary foraging areas, Elkhorn-Carrizo, is in northeastern San Luis Obispo County (Finklestein et al. 2015). Most recently 90 wild Condors lived in the Central Coast

Ranges of California, this population is managed by the VWS (in the Santa Lucia Range) and the National Park Service. USFWS, the Peregrine Fund, San Diego Zoo, and the Mexican government manage othe populations in the southwestern United States and Baja California (VWS 2020).

Condors are carrion feeders that rely on the presence of other scavengers (e.g., common ravens [*Corvus corax*], turkey vultures [*Cathartes aura*], or golden eagles) to locate carcasses from the air (NatureServe Explorer 2008). Their diet consists largely of medium to large sized mammals, including cattle, sheep, deer, coyotes, and bobcats (Snyder and Schmitt 2002). A ban on lead ammunition went into full effect in July 2019 to ensure condors do not ingest spent ammunition as they scavenge hunters' game remains.

Condors are diurnal, typically leaving roost sites 3–5 hours after sunrise and returning 2–5 hours before sunset (Palmer 1988). Condors reach sexual maturity between five and seven years of age, are monogamous once paired, and possibly mate for life (Alsop 2001). Adults do not breed every year and when they do, they lay one egg, typically between the last week of January and the first week of April (Snyder and Schmitt 2002). Both parents participate in incubation of the egg, which lasts approximately 53–60 days, and both parents also share the responsibilities of rearing the hatchling. The chick is totally dependent on the parents for approximately one year (Snyder and Schmitt 2002).

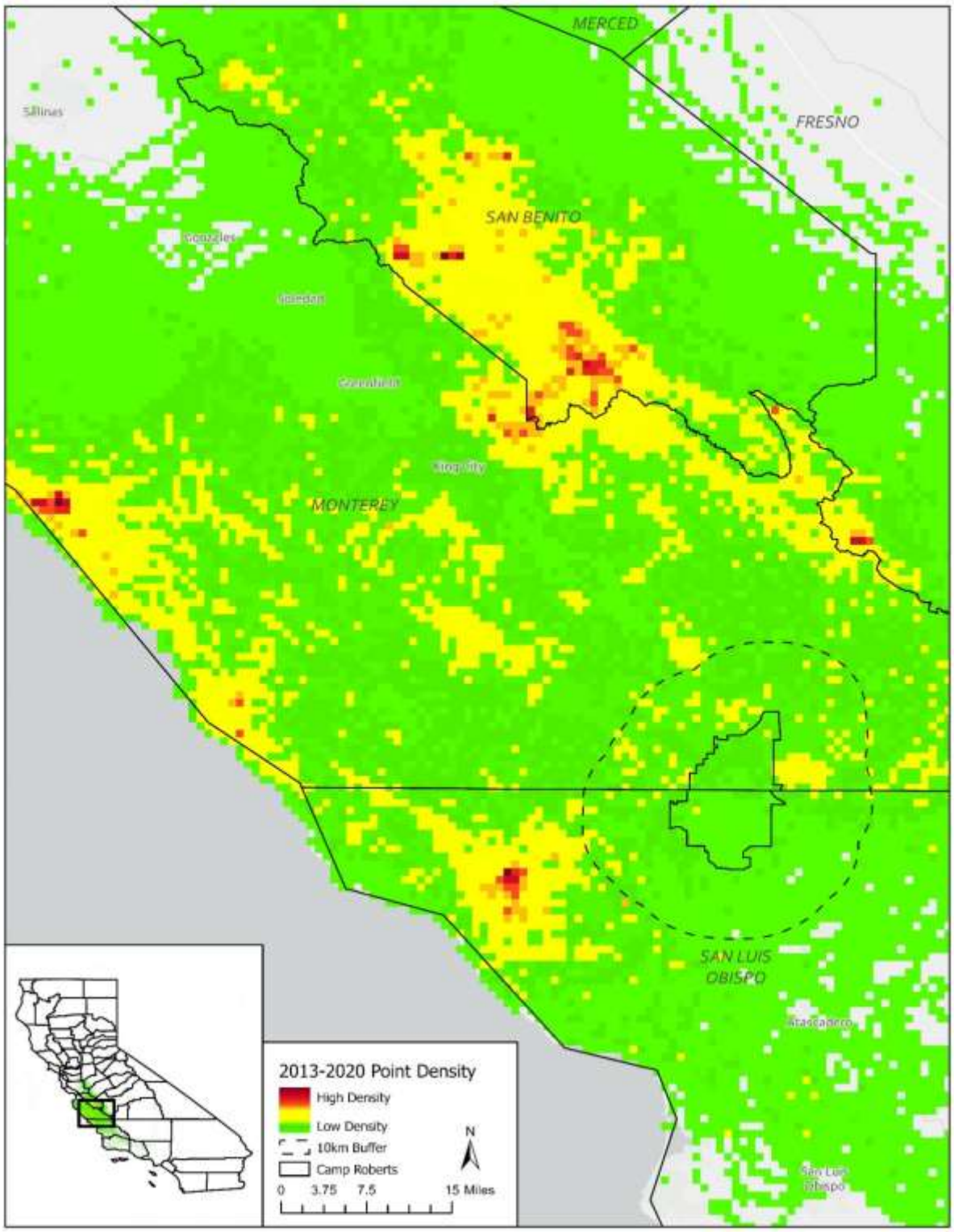
Captive-bred condors have been released at four locations in California, one in Arizona, and one in Baja California, Mexico (Zoological Society of San Diego 2009). Threats to California Condors include shooting, lead poisoning (from lead bullets in carcasses they eat), and collision with human-made objects (e.g., power lines) (USFWS 2009a).

Critical Habitat

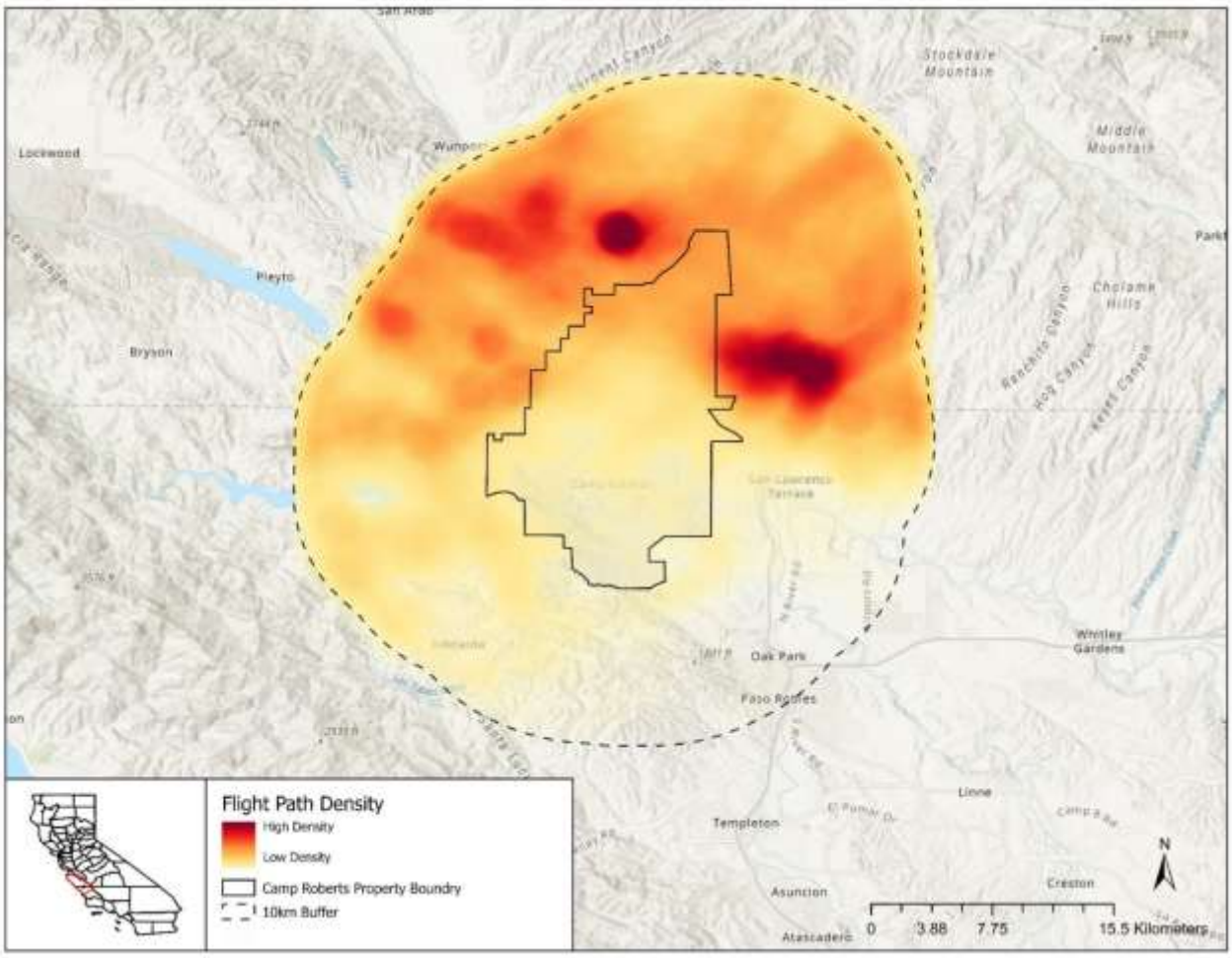
In September 1976, CH was designated for the California condor (41 Fed. Reg. 41914 [24 September 1976]). Camp Roberts is not located within designated CH for this species.

Status at Camp Roberts—Known to Occur

Camp Roberts is located within 65 miles of three condor release sites, Ventana Wilderness Society in Big Sur, Pinnacles National Park, and San Simeon, CA. In 2020, VWS completed an analysis of condor transmitter data from 2013-2020 to determine condor use and flyover frequency at Camp Roberts. It was found that while condors did occur at CR, condor location density was greater within the 6.2 mi (10 km) buffer of the installation (VWS 2020). The most condor activity was found to occur in the fall and the least amount of activity in the winter with the average condor visit to Camp Roberts lasting 22 minutes and 4 seconds (VWS 2020). The analysis also found that most of the condor occurrences at CR consisted of condors in flight (VWS 2020).



Map 3-11. California condor distribution in Central California.



Map 3-12. Density of California condor flight paths at Camp Roberts.

3.6.1.6 Swainson's Hawk

State Threatened

The Swainson's hawk is a medium sized hawk with a tout body, broad wings, and a long rounded tail. This migratory buteo of open spaces was once one of the most common hawks in the West, including California (Bechard et al. 2010). While it remains common in some parts of its range, in California it now only nests in the Central Valley and a few other locations, a result of a more than 90% decline in most of the state. Swainson's hawk breeds and forages in grasslands, shrublands, and small open woodlands. Nests are built in trees located within such a habitat matrix, often along stream courses or patches of open woodland. Typical nest trees include willows, black locusts, junipers, oaks, and cottonwoods.

Fire suppression, reduced grazing, vegetation changes and increased human populations have converted some areas away from appropriate habitat for Swainson's hawks in much of their breeding range, which historically extends from northern Mexico to eastern Alaska and from California to western Illinois. Shooting, poisoning, harassment, and changes to agricultural practices also threaten the species in its wintering grounds as far south as Argentina.

Status at Camp Roberts—Known to Occur

Swainson's hawks generally are not found as far west as Monterey and San Luis Obispo Counties (Zeiner et al. 1990a). However, Swainson's hawks have been observed perched or soaring over Camp Roberts on several occasions. The most recent documented observation was a single hawk soaring over the Impact Area shortly after a prescribed burn was conducted there in the summer of 2010 (CA ARNG 2010). The Swainson's hawk is not expected to nest at Camp Roberts but occasionally roosts or forages.

3.6.1.7 Least Bell's Vireo

Federal Endangered, State Endangered,

The least Bell's vireo (*Vireo bellii pusillus*) is the westernmost of four subspecies of Bell's vireo. They are grayish-green with pale yellow sides, have a pale eye ring, and one to two faint wing bars. The least Bell's vireo is a neotropical migrant, arriving from Mexico in late March to April and departing in the fall (Alsop 2001). Historically, least Bell's vireos were common throughout riparian woodlands in the Central Valley and low elevation river valleys in southern California and northern Baja California, Mexico (USFWS 1998b). The least Bell's vireo is a Federal and State endangered species.

The least Bell's vireo was listed as State Endangered in 1980 and Federally Endangered in 1986. By the time the species was federally listed, it had been extirpated from the Central Valley and numbered just 300 pairs statewide. Populations were restricted to three localities in Monterey, San Benito, and Inyo Counties and small populations in southern California and northwestern Baja California. By 1996, least Bell's vireo numbers had increased six-fold, and the taxon is expanding into its historic range (USFWS 1998b). Nesting vireos have recolonized areas in Ventura, San Bernardino, and Santa Clara Counties (Kus 2002). A pair of least Bell's vireos nested at the San Joaquin River National Wildlife Refuge in the Central Valley in 2005 and 2006. This is the first time that this vireo has nested in the Central Valley in over 60 years (USFWS 2006). A small and scattered group of least Bell's vireos continues to inconsistently breed in the Central Valley, for example a single pair is known to have nested in Contra Costa County in 2020 (eBird 2020).

Preferred habitats of this vireo range from semiarid scrub found bordering streams with sufficient surface or groundwater to permit growth of dense stands of willows, saltcedar (*Tamarisk* sp.), honey mesquite (*Prosopis* sp.), or other shrubby forms of vegetation. When feeding, the vireo is often found foraging within shrubby thickets in and adjacent to water courses, often seen utilizing all vertical strata within the forest as well as adjacent chaparral and oak woodlands. Nests are usually found in riparian habitat, typically near the edge of thickets, suspended approximately 3.3 ft (1 m) above ground in shrubs or trees (Hensley 1950; Kus et al. 2010).

The decline of least Bell's vireos is a result of their extreme vulnerability to cowbird parasitism in combination with habitat loss and degradation. The introduction of exotic plant species into riparian habitats increases habitat fragmentation and may decrease suitable nesting habitat (Kus 2002). Data on direct causes of mortality are not available, but predation has been identified. Because these vireos build their nests 1–5 ft (0.3–1.5 m) above the ground (Gray and Greaves 1984), they are accessible to a variety of terrestrial nest predators (Franzreb 1987).

Critical Habitat

Final CH was designated for least Bell's vireo in 1994 (59 Fed. Reg. 4845 [27 February 1994]). Camp Roberts is not located within designated CH for this species.

Status at Camp Roberts—Potential to Occur

Least Bell's vireo occurred within or very close to Camp Roberts regularly until the early 1980s. The last recorded occurrence of a singing male least Bell's vireo was in 1993, but there had been no evidence of successful nesting for ten years already at that point (Roberson and Tenney 1993). Currently, the LBVI population is rebounding and territories are becoming established north of Southern California (Preston et. al. 2019). Should the species continue to expand northward, LBVI could potentially occur in suitable habitat located along the Salinas and Nacimiento Rivers.

3.6.1.8 Tricolored Blackbird

State Threatened

The tricolored blackbird (*Agelaius tricolor*) is a medium sized passerine found in wetland and agricultural habitats. The plumage of adult males is glossy black with bright red and white wing bands. Tricolored blackbirds are highly social and nest in various types of wetland habitats in dense breeding colonies. This species was once the most abundant bird species in the Central Valley and in the coastal wetlands between Santa Barbara and San Diego (Grinnell 1915; UC Davis 2019). The current population of tricolored blackbirds remains 99% within California and is centered within the central valley, though scattered populations occur from Washington to Baja California. In California, the tricolored blackbird population has declined over 95% from its estimated abundance in the first half of the 20th century, leading to its listing as State Threatened in 2018.

The key driver of this decline is the reduction in wetlands in California due to water diversion, draining, agriculture and development (UC Davis 2019). With declines in wetland habitat across their breeding range, some populations of tricolored blackbird have switched to annual and perennial row crops in the Central Valley. This shift in breeding habitat brings new threat to the species, such as harvest of crops before chicks fledge, pesticides, conversion of these crop types to tree crops and predation by cattle egrets are newer threats to the largest populations of tricolored blackbirds in California (Riparian Habitat Joint Venture 2004; UC Davis 2019).

Status at Camp Roberts—Potential to Occur

Camp Roberts is well within the current and historical range of the tricolored blackbird, and small populations (tens to hundreds of birds) have been recorded breeding in the Salinas River Valley in recent years (eBird 2019). The tricolored blackbird is an itinerant breeder, populations "pop up" in new area and disappear from others every year (Hamilton 1998; Beedy et al. 2018). Individuals born in one part of the range, such as Southern California, can later turn up in the Central Valley, and vice-versa, indicating that the entire species range may act as a metapopulation and that factors that affect populations in one place have an effect on populations across the species range (Beedy et al. 2018). As a result, Camp Roberts management of potential or actively used habitat for the tricolored blackbird can directly affect the species success across its range.

3.6.1.9 Bank Swallow

State Threatened

The bank swallow (*Riparia riparia*) nests colonially in burrows within near vertical eroding river and stream banks. Alterations to stream flow and bank stabilization of many waterways in California has eliminated most of the bank swallow's breeding habitat in the state (Grinnell and Miller 1944). Isolated colonies occur in some of the small area of appropriate habitat left. In recent decades bank swallow colonies have been found in areas of their former range where habitat

conditions are appropriate, but the actively erosive nature of their habitat can make colonies ephemeral and habitat hard to locate. Bank swallows likely were once common in areas of the Salinas Valley, but it was nearly extirpated from the area and currently exists in a few small populations on tributaries to the Salinas River well away from the Camp.

Status at Camp Roberts—Potential to Occur

Bank swallow is rare in California but their tendency to move between habitats when conditions present themselves for a breeding opportunity means that if breeding habitat is available, the species could colonize. Camp Roberts is within the range of the species, and if suitable exposed faces of erodible soil occur on the Camp bank swallows could arrive and use them to nest.

3.6.1.10 San Joaquin Kit Fox

Federal Endangered, State Threatened

The San Joaquin kit fox (*Vulpes macrotis mutica*) is a federally endangered and California threatened species. The kit fox is the smallest canid species in North America. Female kit foxes weigh an average of 4.8 pounds, while male kit foxes weigh an average of 5.7 pounds (NGB and CA ARNG 1991). They measure approximately 12 inches (30 cm) tall at the shoulder. Its body is small and slim with large, close-set ears and a long bushy tail that tapers at the tip. Their fur varies in color and texture from buff to tan or yellowish-grey and its tail is distinctly black-tipped (USFWS 1998b). Kit foxes are primarily a nocturnal species subsisting on nocturnal rodents (kangaroo rats, pocket mice, ground squirrels), rabbits, hares, and ground-nesting birds. Kit fox populations appear to be most robust where kangaroo rats persist (USFWS 2010).

The kit fox is an arid-land adapted species. Optimal habitat in the San Joaquin valley includes arid shrublands and grasslands (e.g., valley sink scrub, saltbush scrub, non-native and remnant native grassland). Important habitat characteristics include sparse ground cover with patches of bare ground, short vegetative structure, flat topography, and sandy to sandy-loam soils (Smith et al. 2005; Cypher et al. 2007). Such physical characteristics are good for kit fox prey (kangaroo rats and ground squirrels), enable them to build dens (which may extend to 6 ft [1.8 m] or more below ground), and allow them to detect coyotes, a significant predator (USFWS 1998b, 2010; Warrick and Cypher 1998). They utilize subterranean dens throughout the entire year. The Recovery Plan for Upland Species of the San Joaquin Valley stresses the importance of conserving habitat for kit foxes.

Historically their range encompassed the San Joaquin Valley from Kern County at the southern extent to Contra Costa and Stanislaus Counties to the north. In the past century this range has been reduced at least by half, with the largest portion remaining in the southern and western parts of the San Joaquin Valley. Conversion of lands to agricultural, industrial and urban uses has led to extensive habitat degradation, fragmentation and loss. As a result, kit foxes now inhabit grazed, non-irrigated grasslands, but live next to and forage in tilled or fallow fields, irrigated row crops, orchards and vineyards (USFWS 2010). They were listed as an endangered species in 1967 under the Endangered Species Preservation Act, listed as a threatened species by the State of California in 1971, and federally protected under the ESA in 1973 (USFWS 2010).

Status at Camp Roberts—Potential to Occur

Kit foxes are known to occur at Camp Roberts; the first observation was due to unintentional trapping in 1960. Results from surveys conducted between 1986 and 1991 at Camp Roberts showed that kit fox were distributed throughout approximately 25,000 ac (10,117 ha) of the installation, excluding the steeper,

wooded slopes and chaparral areas. Focused surveys completed after 1991 showed a decline in population numbers and by early 2002 the known distribution of kit fox at Camp Roberts was reduced to a total area of approximately 400 ac (162 ha) in the East Garrison, and just over 6,000 ac (2,428 ha) in the Main Garrison (CA ARNG 2014). Focused SJKF surveys continue on the installation, however SJKF has not been observed since 2007. Current survey efforts consist of ongoing monitoring of camera stations.

3.6.2 Other Special Status Species

3.6.2.1 Special Status Plant Species

Aside from the purple amole, there are currently 27 special status plant species known to occur at Camp Roberts (Table 3-15). Descriptions for species which carry a CNPS sensitivity status of 1 or 2 are provided below. Species with CNPS statuses of 3 or 4 have been included in Table 3-15 so that their status may be tracked in the Camp Roberts' plants database. However, detailed descriptions are not provided here.

Indian Valley Spineflower

Indian valley spineflower (*Aristocapsa insignis*) is an annual herbaceous plant that grows in sandy soils in cismontane woodlands. It occurs at elevations of 980-1970 ft (300-600 m) (CNPS 2011; CDFW 2021).

CNPS 1B.2

Big Tarplant

Big tarplant (*Blepharizonia plumosa*) is an annual herbaceous plant that grows in valley and foothill grasslands and chaparral. It occurs at elevations of 100-1,980 ft (30-505 m) (CNPS 2011; CDFW 2020).

CNPS 1B.1

Dwarf Calycadenia

Dwarf calycadenia (*Calycadenia villosa*) is an annual herbaceous plant that grows in rocky, fine soils in chaparral, grasslands, meadows, seeps, and cismontane woodlands (e.g., oak woodlands). Dwarf calycadenia is known to occur at elevations of 787–4,429 ft (240–1,350 m) (CNPS 2011; CDFW 2020).

CNPS 1B.1

Hardham's Evening-Primrose

Hardham's evening-primrose (*Camissoniopsis hardhamiae*) is an annual herbaceous plant that grows in sandy or decomposed carbonate soils within disturbed or burned areas in chaparral and cismontane woodlands (e.g., oak woodlands). Hardham's evening-primrose is known to occur at elevations of 459–3,100 ft (140–945 m) above mean sea level (amsl) (CNPS 2011; CDFW 2020).

CNPS 1B.2

San Luis Obispo Owl's Clover

San Luis Obispo owl's clover (*Castilleja densiflora* ssp. *obispoensis*) is an annual herbaceous plant that inhabits grasslands, meadows, and seeps (sometimes in serpentine substrates) at elevations of 33–1,312 ft (10–400 m) in San Luis Obispo County (CNPS 2011; CDFW 2020).

CNPS 1B.2

Lemmon's Jewelflower

Lemmon's jewelflower (*Caulanthus lemmonii*) is an annual herbaceous plant that occurs in grasslands and pinyon-juniper woodlands. Lemmon's jewelflower is known to occur at elevations of 262–4,003 ft (80–1,220 m) amsl (CNPS 2011; CDFW 2020).

CNPS 1B.2

Table 3-15. Special status plant species at Camp Roberts.

Scientific Name	Common Name	Growth Form	Habitat	Blooming Period	CNPS Status	NatureServe Status
Family Asteraceae						
Blepharizonia plumosa	big tarplant	AH	Valley and foothill grassland	Jul-Oct	1B.1	G1G2/S1S2
Calycadenia villosa	dwarf calycadenia	AH	Valley Grassland, Foothill Woodland, Chaparral	May-Oct	1B.1	G3/S3
Hesperevax caulescens	hogwallow starfish	AH	Valley Grassland, Foothill Woodland, (Wetland-Riparian)	Mar-Jun	4.2	G3/S3
Malacothrix phaeocarpa	Central Coast malacothrix	AH	Openings, burned or disturbed areas. Closed-cone coniferous forest, Chaparral	Apr-Jun	4.3	G3/S3
Stebbinsoseris decipiens	Santa Cruz microseris	AH	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland	Apr-May	1B.2	G2/S2
Family Boraginaceae						
Amsinckia douglasiana	Douglas' fiddleneck	AH	Valley Grassland, Foothill Woodland	Mar-May	4.2	G4/S4
Plagiobothrys uncinatus	hooked popcorn flower	AH	Chaparral (sandy), Cismontane woodland, Valley and foothill grassland	Apr-May	1B.2	G2/S2
Family Brassicaceae						
Caulanthus lemmonii	Lemmon's jewelflower	AH	Pinyon and juniper woodland, Valley and foothill grassland	Mar-May	1B.2	G3/S3
Family Convolvulaceae						
Calystegia collina ssp. *venusta*	South Coast Range morning glory	PH	Serpentinite or sedimentary soils. Chaparral, Cismontane woodland, Valley and foothill grassland	Apr-Jun	4.3	G4S4
Family Funariaceae						
Entosthodon kochii	Koch's cord moss	MO	Cismontane woodland	n/a	1B.3	G1/S1
Family Juglandaceae						
Juglans californica	Southern California black walnut	TR	Southern Oak Woodland, (Wetlands and non-wetlands)	Mar-Jun	4.2	G4/S4
Family Malvaceae						
Malacothamnus davidsonii	Davidson's bush mallow	SH	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland	Jun-Jan	1B.2	G2/S2
Malacothamnus jonesii	Jones' bush mallow	SH	Foothill Woodland, Chaparral	May-Jul	4.3	G4/S4
Family Onagraceae						
Camissonia hardhamiae	Hardham's evening-primrose	AH	Sandy, decomposed carbonate, disturbed or burned areas. Chaparral, Cismontane woodland	Mar-May	1B.2	G2S2
Family Orobanchaceae						
Castilleja densiflora ssp. *obispoensis*	San Luis Obispo owl's clover	AH (hemiparasite)	Meadows and Seeps, Valley and Foothill Grassland, (Serpentine - Broad)	Mar-May	1B.2	G5T2/S2

Scientific Name	Common Name	Growth Form	Habitat	Blooming Period	CNPS Status	NatureServe Status
Family Papaveraceae						
Eschscholzia hypecoides	San Benito poppy	AH	Valley Grassland, Foothill Woodland, Chaparral, (Serpentine - Indicator)	Mar-Jun	4.3	G4/S4
Family Polemoniaceae						
Eriastrum luteum	yellow flowered eriastrum	AH	Sandy or gravelly soils. Broadleafed upland forest, Chaparral, Cismontane woodland	May-Jun	1B.2	G2/S2
Gilia tenuiflora ssp. amplifaucalis	greater yellowthroat gilia	AH	Sandy soils. Cismontane woodland, Valley and foothill grassland	Mar-Apr	4.3	G3/S3
Navarretia nigelliformis ssp. *radians*	shining navarretia	AH	Valley Grassland, Foothill Woodland, (Wetlands and non-wetlands)	Apr-Jul	1B.2	G4T2/S2
Navarretia prostrata	prostrate navarretia	AH	Coastal Sage Scrub, (Wetland-Riparian)	Apr-Jul	1B.2	G2/S2
Family Polygonaceae						
Aristocapsa insignis	Indian Valley spineflower	AH	Cismontane woodland	May-Sep	1B.2	G1/S1
Chorizanthe rectispina	straight-awned spineflower	AH	Chaparral, Cismontane woodland, Coastal scrub	Apr-Jul	1B.3	G2/S2
Mucronea californica	California spineflower	AH	Sandy soils. Chaparral, Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland	Mar-Jul	4.2	G3/S3
Family Portulaceae						
Calandrinia breweri	Brewer's calandrinia	AH	Sandy or loamy soils, disturbed sites and burns. Chaparral, Coastal scrub	Mar-Jun	4.2	G4/S4
Family Ranunculaceae						
Delphinium gypsophilum ssp. parviflorum	Pinoche Creek larkspur	PH	Rocky clay, sometimes serpentinite soils. Cismontane woodland, Valley and foothill grassland	Apr-Jun	3.2	G4/S2S3
Delphinium parryi ssp. *eastwoodiae*	Eastwood's larkspur	PH	Serpentinite, coastal. Chaparral (openings), Valley and foothill grassland	(Feb)Mar-Mar	1B.2	G4T2/S2
Family Scrophulariaceae						
Mimulus subsecundus	one sided monkeyflower	AH	Chaparral, Lower montane coniferous forest	May-Jul	4.3	G3G4/ S3S4

Growth Form:

MO: Moss; AH: Annual herb; PH: Perennial herb; SH: Shrub; TR: Tree

Straight-Awned Spineflower

CNPS 1B.3

Straight-awned spineflower (*Chorizanthe rectispina*) is an annual herbaceous plant that inhabits chaparral, coastal scrub, and cismontane woodlands (e.g., oak woodlands). Straight-awned spineflower is known to occur at elevations of 279–3,396 ft (85–1,035 m) amsl (CNPS 2011; CDFW 2020).

Eastwood's Larkspur

CNPS 1B.2

Eastwood's larkspur (*Delphinium parryi* ssp. *eastwoodiae*) is a perennial herbaceous plant that occurs in serpentine soils in openings of coastal chaparral and valley and foothill grassland. It is known to occur at elevations of 245-1,640 ft (75-500 m) (CNPS 2011; CDFW 2021).

Koch's Cord Moss

CNPS 1B.3

Koch's cord moss (*Entosthodon kochii*) is a moss that grows on soil in cismontane woodlands (e.g., oak woodlands). Koch's cord moss is known to occur at elevations of 590–3,281 ft (180–1,000 m) amsl (CNPS 2011; CDFW 2020).

Yellow Flowered Eriastrum

CNPS 1B.2

Yellow Flowered Eriastrum (*Eriastrum luteum*) is an annual herbaceous plant that occurs in sandy or gravelly soils in broad-leafed upland forest, chaparral, and cismontane woodland. It is known to occur at elevations of 950–3,280 ft (290–1,000 m) amsl (CNPS 2011; CDFW 2020).

Davidson's Bush Mallow

CNPS 1B.2

Davidson's bush mallow (*Malacothamnus davidsonii*) is a perennial, deciduous shrub that occurs in riparian woodlands, coastal scrub, chaparral, and cismontane woodlands (e.g., oak woodlands). Davidson's bush-mallow is known to occur at elevations of 607–2,805 ft (185–855 m) amsl (CNPS 2011; CDFW 2020).

Shining Navarretia

CNPS 1B.2

Shining navarretia (*Navarretia nigelliformis* ssp. *radians*) is an annual herbaceous plant that occurs in vernal pools, grasslands, and cismontane woodlands (e.g., oak woodlands). Shining navarretia is known to occur at elevations of 249–3,280 ft (76–1,000 m) amsl (CNPS 2011; CDFW 2020).

Prostrate Vernal Pool Navarretia

CNPS 1B.1

Prostrate vernal pool navarretia (*Navarretia prostrata*) is an annual herbaceous plant that occurs in vernal pools and mesic areas in alkaline grasslands, coastal scrub, meadows, and seeps. Prostrate vernal pool navarretia is known to occur at elevations of 49–5,577 ft (15–1,700 m) amsl (CNPS 2011; CDFW 2020).

Hooked Popcorn Flower

CNPS 1B.2

Hooked popcorn flower (*Plagiobothrys uncinatus*) is an annual herbaceous plant that inhabits grasslands, sandy soils in chaparral, and cismontane woodlands (e.g., oak woodlands). Hooked popcorn flower is known to occur at elevations of 984–2,493 ft (300–760 m) amsl (CNPS 2011; CDFW 2020).

Santa Cruz Microseris

CNPS 1B.2

Santa Cruz microseris (*Stebbinsoseris decipiens*) is an annual herbaceous plant that inhabits open areas, sometimes on serpentine soils, in forests, chaparral, coastal scrub and grasslands. It is known to occur at elevations of 30–1,640 ft (10–500 m) amsl (CNPS 2011; CDFW 2021).

3.6.2.2 Special Status Fish and Wildlife Species

Error! Reference source not found. lists special status fish and wildlife species that receive focused c onservation attention in this INRMP and for environmental impact. Special status rankings recognized by the ARNG are defined in AR 200-1.

Invertebrates

The vernal pool fairy shrimp is discussed in detail in *Section 3.6.1.2 Vernal Pool Fairy Shrimp.* The monarch butterfly is the only other sensitive invertebrate species with potential to occur at Camp Roberts.

Monarch Butterfly

Federal Candidate Species

Monarch butterfly (*Danaus plexippus*) is currently listed as a candidate species by the USFWS and is slated to be listed under the ESA in 2024. In North America there are generally two distinct monarch populations, the eastern group which migrates to wintering areas in Mexico and Florida, and the western group which migrates to wintering areas in the central and southern California coast. The western monarch butterfly population has declined by more than 99 percent since the 1980s. An estimated 4.5 million monarchs overwintered on the California coast in the 1980s, whereas in 2020, the population estimate for migratory overwintering monarchs was less than 2,000 butterflies. This extreme population decline is due to multiple stressors across the monarch's range, including the loss and degradation of overwintering groves; pesticide use, particularly insecticides; loss of breeding and migratory habitat; climate change; parasites and disease.

Historically, the majority of western monarchs spent the winter in forested groves near the coast from Mendocino County, California, south into northern Baja California, Mexico. In recent years, monarchs have not clustered in the southern-most part of their overwintering range, and they are likely year-round residents in some areas of the coast. This resident phenomenon is plausibly due to a combination of climate change, and an abundance of residential-planted non-native, evergreen tropical milkweed that is available for monarchs year-round. Migratory western monarchs leave the overwintering groves in mid-winter to early-spring. Throughout the spring and summer, monarchs breed, lay their eggs on milkweed, and migrate across multiple generations within California and other states west of the Rocky Mountains.

Camp Roberts is located within the Priority 1 early breeding zone of California (Xerxes Society 2021). Focused monarch butterfly surveys were completed on CR in 2020 and 2021. An assessment of overwintering habitat on CA ARNG properties in 2021 found there was no suitable overwintering habitat on CR (Althouse and Meade 2021). However, a natal survey completed in 2021 found 30 low to high density milkweed patches on CR that represent important breeding habitat for the species. Both Indian milkweed (*Asclepias eriocarpa*) and narrow-leaved milkweed (*Asclepias fascicularis*) were detected (Althouse and Meade 2021). Removing non-native milkweed, planting native, insecticide free milkweed and nectaring plants and avoiding the use

of pesticide which affect insects near plants that monarchs could use for reproduction, foraging or wintering would benefit this species at Camp Roberts.

Fish

In addition to the SCCC steelhead (described above in *Section 3.6.1.3)* there are two special status fish species known to occur at Camp Roberts.

Monterey Hitch

CDFW Species of Special Concern

The Monterey hitch (*Lavinia exilicauda harengus)* is a moderately elongated fish with a conical head can grow to over 350 mm. It has 54-62 rather large scales on their complete decurved lateral line. The Monterey hitch can sexually mature by their second summer when they are still rather small, 49 mm for males, and 54mm for females. Spawning occurs after large winter stream flows have subsided, starting May/June and continuing as late as August. Preferred spawning habitat is a mixture of sand and gravel bottom at about 1 m in depth with clear warm water (64-82°F [18-28°C] in late summer) underneath the cover of fallen trees and/or bushes.

While the Monterey hitch has been observed in both the Nacimiento and Salinas rivers its regional population status and distribution are uncertain (CDFW 2015). In addition to climate change potentially reducing summer flows, the CDFW has identified the physical alteration of the natural hydrological regime by dams and reservoirs, the chemical pesticides used in agricultural through the Salinas Valley, as well as other anthropogenic activities that increase sedimentation such as residential water withdrawal, grazing, and urbanization as threats to this species.

Monterey Roach

CDFW Species of Special Concern, SWAP Focal Species

The Monterey roach (*Lavinia symmetricus subditus)* is a small fish, rarely larger than 100 mm in length. Their bodies are stout, and their heads are relatively large with large eyes. They are usually a deep olive half on the top half of their bodies, with the lower half usually a dull white or silver. They usually have less than 43-67 small scales along their lateral line, which is more typical of the central California roach. Monterey roach typically mature at about 45-60 mm in their second or third year, spawning in March through early July when temperatures are higher than 16˚C. Monterey roach spawn on riffles over small rock substrates or in large groups over coarse substrates. Eggs hatch after three days, and larvae will remain in the gravel until they are large enough to swim. This species is well adapted to life in intermittent watercourses and often found in high densities in isolated pools. This species can tolerate a wide range of both temperatures and levels of dissolved oxygen.

This species has been located in both the Nacimiento and Salinas rivers. The CDFW has determined that the population of the Monterey roach is vulnerable to extirpation as a result of physical alterations to stream flows by large dams (CDFW 2015). Much like the Monterey hitch, the Monterey roach is also threatened by agricultural activities that divert water and pollute habitat with pesticides and fertilizers. Rural residential and urbanization also contribute to reduction in water availability and increases in pollution.

Reptiles and Amphibians

There are six reptiles or amphibians found at Camp Roberts that are species of special concern (see **Error! Reference source not found.**). Descriptions for the species are provided below. Naming conventions are according to the Society for the Study of Amphibians and Reptiles (2017).

Southwestern Pond Turtle

DoD SAR, SWAP Focal Species

The southwestern pond turtle *(Actinemys pallida*) is a CSSC. This turtle species is diurnal and aquatic, and is typically active between February and November. The southwestern pond turtle is considered small to medium -sized and is dark brown, black, or olive colored. Their diet is quite broad consisting of aquatic plants, various invertebrates, worms, frog and salamander eggs and larvae, crayfish, carrion, and occasionally frogs and fish (Calherps 2019c). It lays its eggs in the banks of creeks and can nest up to 0.5 mile (0.8 km) in adjacent uplands if suitable habitat exists. Hatchlings then migrate to the water where they require areas of shallow water with dense vegetation. This species can be found throughout California west of the Sierra-Cascade crest and is absent from desert regions, except along the Mojave River and some of its tributaries. The species is associated with permanent or nearly permanent water in a wide variety of habitat types (CWHR 2019).

Northern California Legless Lizard

CDFW Species of Special Concern

The northern California legless lizard (*Anniella pulchra*) is a shiny, secretive lizard that occurs in suitable habitats in the Coast Ranges from Contra Costa County in the north to Ventura County in the south, as well as more southern scattered locations (Calherps 2020). It may be found in moist warm loose soil with plant cover. This includes sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, and stream terraces with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas often indicate suitable habitat They are found in areas with loose organic soils or where there is plenty of leaf litter. Legless lizards eat insect larvae, small adult insects, and spiders (Stebbins 1954). Live young are born in the fall.

California Glossy Snake

CDFW Species of Special Concern

The California glossy snake (*Arizona elegans occidentalis)* is a medium-sized muscular snake with smooth, glossy scales that occurs from the eastern part of the San Francisco Bay Area south to northwestern Baja California (Calherps 2020). Adults range from 26-70 inches (66-178 cm) in length, with the average length ranging from 3-4 ft (0.9-1.2 m) (Stebbins 2003). It may be found in arid scrub, rocky washes, grasslands, and chaparral. They appear to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing (Calherps 2020). California glossy snakes primarily eat diurnal lizards, but also eat small snakes, terrestrial birds, and nocturnally-active mammals (Calherps 2020).

San Joaquin Coachwhip

CDFW Species of Special Concern

The San Joaquin coachwhip *(Masticophis flagellum ruddocki)* is a slender, fast-moving snake endemic to California. It occurs from Arbuckle in the Sacramento Valley in Colusa County southward to the Grapevine in the Kern County portion of the San Joaquin Valley and westward into the inner South Coast Ranges. An isolated population occurs in the Sutter Buttes (Calherps 2020). Adults range from 36-66 inches (91-167 cm) in length (Stebbins and McGinnis 2012). The San Joaquin coachwhip occurs in open, dry, treeless areas with little to no cover, including valley grassland and saltbush scrub. It avoids dense vegetation where it cannot move quickly, such as mixed oak chaparral woodland. The San Joaquin coachwhip also takes refuge in rodent burrows, under shaded vegetation, and under surface objects (Calherps 2020). San Joaquin coachwhips eat small mammals including bats, nestling and adult birds, bird eggs, lizards, snakes, amphibians, and carrion (Calherps 2020).

Coast Horned Lizard

CDFW Species of Special Concern, SWAP Focal Species

Like most horned lizards, the coast horned lizard (*Phrynosoma blainvillii)* is highly camouflaged and has a diet consisting mostly of ants. This species occurs in many different types of plant communities throughout its range including valley foothill hardwood, conifer, riparian, pine-cypress, juniper, and annual grassland habitats. It is found from in the Sierra Nevada foothills from Butte to Kern County and throughout central and southern California coast. In its northern distribution, this species inhabits an elevational range up to 4,000 ft (1,219 m) and up to 6,000 ft (1,829 m) in the parts of Southern California (CWHR 1990). Coast horned lizards are diurnal and their activity generally depends on daily conditions with somewhat narrow temperature windows. The species prefers habitats with open spaces and loose, sandy soils (Calherps 2020).

Western Spadefoot

CDFW Species of Special Concern, SWAP Focal Species

The western spadefoot (*Spea hammondii)* is a relatively smooth-skinned species of spadefoot toad with pale gold eyes that have vertical pupils, a distinctive trait among most co-occurring amphibians. They have a wedge-shaped black spade on each hind foot and adults are between 1.5 and 3 inches (3.8–7.5 cm) (Calherps 2020). The species ranges throughout the Central Valley of California and portions of Coastal Ranges, its populations being localized, but widespread. It is considered nearly endemic to central and southwestern California where it has been extirpated from many sites. Threats are primarily urbanization and agricultural development. Some populations may also be threatened by habitat fragmentation or exotic species (such as mosquitofish stocked for mosquito abatement and bullfrogs) (NatureServe 2013).

They prefer short-grass plains and sandy or gravelly soils (such as alkali flats, washes, and alluvial fans). The species is primarily nocturnal during which time they prey on a variety of insects. With the ability to migrate up to several hundred meters between nonbreeding and breeding, western spadefoots are most active during rains of winter-spring breeding. Adults tend to show high fidelity to specific breeding sites, which include vernal pools and slow-moving streams. They can also be active during summer storms or evenings with high soil moisture levels. For the rest of the year, they remain below ground, especially during dry and cold weather (NatureServe 2013).

Birds

Grasshopper Sparrow

CDFW Species of Special Concern

Grasshopper sparrows (*Ammodramus savannarum*) occur in open grassland habitats with scattered shrubs. They nest on the ground in small depressions at the base of clumps of grasses or forbs. Grasshopper sparrows forage on the ground for insects primarily, but also for seeds. This species is a summer resident and breeder in portions of the western half of the state. It sometimes winters in California, mostly along the southern coast (Zeiner et al. 1990a). A secretive bird with a high affinity for specific quality grasslands, this species is difficult to monitor, but has declined in much of the country including California. Prairies, other native or non-native grasslands, and agricultural grassland habitats replaced by urbanization, forest, shrubland, and other crops has eliminated habitat for the species (Grinnell and Miller 1944). The grasshopper sparrow weaves a grass nest on the ground in tall grass habitat that is not too dense, or short grass habitat that is dense enough. The grasshopper sparrow is a partial migrant, and often spends the non-breeding seasons in areas as close as Arizona, or areas further away, such as Mexico and El Salvador.

Golden Eagle

Golden eagles (*Aquila chrysaetos)* are one of the largest birds in North America. They occur primarily in rolling foothills, mountainous areas, sage- juniper flats, and deserts. Cliffs and large trees are used for nesting and cover. Golden eagles primarily eat rabbits, hares, and rodents, and hunt for them by soaring high above open terrain. This species breeds throughout California except for the Central Valley, where it only occurs during the winter (Zeiner et al. 1990a).

USFWS Bird of Conservation Concern, CDFW Fully Protected, CDFW Watch List

Short-Eared Owl

The short-eared owl (*Asio flammeus*), one of the most widely distributed owls in the world, is found in open areas such as meadows, marshes, grasslands, dunes, and irrigated areas. It glides over these open areas close to the ground and preys on small mammals, birds, reptiles, and amphibians. They are mostly active at dawn and dusk, at night, and on cloudy days, they tend to roost on the ground but occasionally in trees. This species nests on the ground in small depressions and requires dense vegetation such as tall grasses and shrubs for cover and protection of the nest site. The short-eared owl is a widespread winter migrant that occurs primarily in the Central Valley and western Sierra Nevada foothills, and along the coast of California. It occurs year-round in and occasionally breeds in portions of northern California, which are at the southern edge of its globe- spanning northern, as well as Hawaii, parts of South America and other islands, breeding range (Zeiner et al. 1990a).

CDFW Species of Special Concern

Long-Eared Owl

The long-eared owl (*Asio otus*) is found in riparian or woodland habitats. This medium sized owl is noticeably tall and thin and roosts in trees during the day, and forages in open areas at night. This owl requires densely vegetated woodlands for nesting and roosting and feeds on various rodents, vertebrates, and birds. This species is notable for roosting in groups during the non- breeding season. Breeding habitat requires a combination of these features: woodland such as riparian, conifer or oak for nest placement, and daytime roosting with open spaces or adjacent to open habitat (Grinnell and Miller 1944). This species is a winter visitor in the Central Valley and desert areas in the southeastern portion of the state. It is a resident east of the Sierra Nevada/Cascade crest, around San Francisco Bay, along a portion of the Central Coast, and in spotty locations in southern California (Zeiner et al. 1990a).

CDFW Species of Special Concern

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is the only owl species in North America to breed in burrows in the ground. The species uses prairie dog or ground squirrel burrows and stands alert on a small rise during breeding (approximately April 15 to July 15), while during the non-breeding season they are more widely dispersed but continue to roost in burrows and spend much time on the ground in vegetation short enough to provide visibility of the surrounding area.

USFWS Bird of Conservation Concern, CDFW Species of Special Concern

Burrowing owls are unlikely to breed at Camp Roberts but disperse widely across the region of the Camp between fall and spring. Cleared areas such as construction sites can attract wintering burrowing owls,

and the potential for wintering owls to roost in uncovered pipes, boreholes and similar structures should be considered. There are published California protocol survey methods for wintering burrowing owls.

Oak Titmouse

USFWS Bird of Conservation Concern

The oak titmouse (*Baeolophus inornatus*) is closely tied to open oak and oak/pine woodlands in California. With the clearing of oak woodlands for development, fuel and agriculture as California's population has expanded this species population has declined, but it is still the most common passerine in many oak woodlands in the state. Oak titmouse breeds in tree cavities, which primarily occur in old or dead oak trees in its habitats (nesting occurs approximately March 15 to July 15). A tree canopy cover of 40-70% with a slightly lower cover in the shrub layer supported a good population of oak titmouse in blue oak woodland at Camp Roberts in the 1990s (Tietje and Vreeland 1997). Largely very old and sick or dying oak trees provide nesting cavities, so when possible, management for oak titmouse should favor retaining these trees in appropriate habitats. Invasive starlings are also tree cavity nesters, so the population of oak titmice should be monitored for declines when starlings breed in the same habitat.

Ferruginous Hawk

USFWS Bird of Conservation Concern, CDFW Watch List

The ferruginous hawk *(Buteo regalis*) is the largest *Buteo* species in North America and a characteristic hawk of wide-open spaces. Ferruginous hawk only breeds at the extreme northeastern tip of California, and it winters in much of the rest of the state. This species has never been common, but declines on its breeding grounds in Canada have led to a listing of nationally Threatened there. The population trends of the species are more varied by generally increasing across the United States. Upgrades to the power line system at Camp Roberts benefits ferruginous hawk as it often forages within the "power lines and windmills" altitude range. The key determinant of productive habitat quality for this hawk of open spaces is the availability of medium sized mammal prey such as ground squirrels or prairie dogs.

Northern Harrier

CDFW Species of Special Concern

The northern harrier (*Circus hudsonius*) occurs in a variety of open habitats including grasslands, meadows, and rangelands. This slender raptor forages by flying low over grasslands, shrublands and wetlands including vernal pools. The sexually dimorphic species (males are light gray, females are brown) nests on the ground, usually in dense vegetation in undisturbed areas (Grinnell and Miller 1944). It most frequently nests in shrubby vegetation in emergent wetlands and marshes or along rivers or lakes, but it may also nest in grassland, grain fields, or on sagebrush flats away from water. It forages for small mammals, birds, small reptiles, and frogs by flying low or hovering over open areas and diving down to catch prey. The northern harrier is a year-round resident in the Modoc Plateau, Central Valley, and along the coast, and is a winter resident or migrant throughout the rest of California except for heavily wooded areas of the Sierra Nevada and Cascade Ranges (Zeiner et al. 1990a).

Olive-Sided Flycatcher

USFWS Bird of Conservation Concern, CDFW Species of Special Concern

The olive-sided flycatcher (*Contopus cooperi*) breeds in montane and northern coniferous forests, at forest edges and openings such as meadows and ponds. It winters at forest edges and clearings where tall trees or snags are present, similar to its breeding habitat (Altman and Sallabanks 2000). It feeds on flying insects over the forest canopy, and in meadows, forest clearings, or shrub covered slopes. It is a summer resident in forest and woodlands throughout California below 9,000 ft (2,743 m) (Zeiner et al. 1990a).

White-Tailed Kite

CDFW Fully Protected

White-tailed kites (*Elanus leucurus*) are found in herbaceous and other open habitats and are rarely found far from agricultural areas. It nests near the top of trees with dense canopy cover and feeds primarily on voles and other diurnal mammals by hovering and then swooping down on its prey. This species occurs in coastal and valley lowlands west of the Sierra Nevada (Zeiner et al. 1990a).

Prairie Falcon

USFWS Bird of Conservation Concern, CDFW Watch List

The prairie falcon (*Falco mexicanus*) is a medium sized pale falcon of cliffs and dry environments. Between the species small overall population size, isolated nesting environments and complex seasonal movements it is difficult to assess population trends for this species, but it may be declining in the Western US. It is unlikely that a prairie falcon would nest at Camp Roberts, as the terrain is likely too subtle, but this species could forage during the winter or movements in the spring/fall. Prairie falcon eats almost entirely medium sized ground mammals such as ground squirrels, so maintaining a healthy population of small/medium mammals would benefit the species when it forages at Camp Roberts.

Yellow Breasted Chat

CDFW Species of Special Concern

The yellow-breasted chat *(Icteria virens)* is found in valley foothill riparian and desert habitats. It requires thick riparian vegetation near watercourses for nesting, cover, and feeding. Yellow-breasted chats feed on insects, spiders, berries, and other fruit. This species is an uncommon summer resident and migrant throughout the Klamath Mountains and the Cascade Range, western Sierra Nevada Foothills, and along the coast from San Francisco south to Baja California (Zeiner et al. 1990a). The yellow-breasted chat is an aberrant warbler with a strong affinity for thickets. It is typically very secretive within its dense habitat, but during the breeding season will occasionally perch above the thicket layer and sing a distinctly loud, variable, and eventually repetitive song (Grinnell and Miller 1944). Likely never as common as yellow warbler in most regions, it has undergone a similar but more extreme decline in much of California. It largely nests in riparian thickets and benefits from increases in this habitat and the removal of brown-headed cowbirds.

Loggerhead Shrike

USFWS Bird of Conservation Concern, CDFW Species of Special Concern

Loggerhead shrikes (*Lanius ludovicianus*) occur in open habitats with short vegetation including grasslands, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands (Yosef 1996). Nests are built in trees or shrubs with dense foliage and usually are hidden well. This species feeds primarily on large insects, but also eats small mammals, birds, reptiles, amphibians, fish, and carrion. It often skewers its prey on a wire barb or thorn to feed on or to store for later feeding. The loggerhead shrike is a common resident throughout most of the state except in the Sierra Nevada and northwest California (Zeiner et al. 1990a).

Lewis's Woodpecker

USFWS Bird of Conservation Concern

The Lewis's woodpecker (*Melanerpes lewis*), named after Merriweather Lewis of the Lewis and Clark expedition is an unusual woodpecker that breeds primarily in large conifer snags. Changes to forest management and other challenges to pine forest habitat have led to declines in this species populations. This woodpecker is rare and spread out enough that it is unlikely to breed or winter at Camp Roberts, though its southern range limit in California is near Paso Robles, so this is a possibility. Maintaining snags of any large tree species near water would provide potential habitat for this species.

Yellow-Billed Magpie

USFWS Bird of Conservation Concern

The yellow-billed magpie (*Pica nuttalli*) is one of two bird species endemic to California, and an indicator species for open oak woodland habitat. Yellow-billed magpie is fairly large, noisy, and generally conspicuous where it occurs, but loss of habitat and a high degree of susceptibility to West Nile virus have led to contractions in range and declines in the species abundance. Yellow-billed magpie occurs at Camp Roberts, and continuing the preservation of oak savanna habitats, limiting the use of pesticides on insects in the foraging areas of yellow-billed magpies and avoiding poisoning of rodents will all benefit the bird, as will best practices to avoid breeding of West Nile virus transmitting mosquitos in managed areas.

Purple Martin

CDFW Species of Special Concern

The largest swallow in North America, the purple martin (*Progne subis*) is a well-known and gregarious backyard migrant in much of the east of the country, where it has nested almost entirely in human built "purple martin houses" for over a century. In the west, by comparison, the species has declined from most human-populated and agricultural areas, and still nests in tree cavities, often in montane forests (Grinnell and Miller 1944). The arrival of non-native European Starlings, also cavity nesters, played a role in their disappearance from most human populated areas of the west. Both the eastern and western groups of the species migrate to South America in the winter. Purple martins inhabit valley-foothill woodland, montane woodland, coniferous, and riparian habitats. It hunts for insects by gliding above the ground. The purple martin is a summer migrant throughout the Coast Ranges, Klamath Mountains and Cascade Range, and western Sierra Nevada foothills (Zeiner et al. 1990a). In central coastal California small numbers of purple martins appear to now be confined to the coastal ranges and breed in conifer forest and sycamore. Purple martins were once present but likely never very common in the Western Transverse Range valleys.

Yellow Warbler

USFWS Bird of Conservation Concern, CDFW Species of Special Concern

Yellow warblers (*Setophaga petechial)* breed in riparian woodland, montane chaparral, and in brushy areas within open ponderosa pine and mixed conifer habitats. It forages for insects in the upper canopy of deciduous woodlands and nests in the dense understory vegetation. This species is a summer resident throughout mountainous areas of California (Zeiner et al. 1990a). The "sweet-sweet-I'm so sweet" song of the yellow warbler is a familiar riparian area refrain in the spring and early summer across the United States. This species was locally common in the Salinas Valley and across California in the 1940s (Grinnell and Miller 1944) but is nearly extirpated from the Central Valley and has declined moderately across much of the rest of the state. It has come back rapidly in Southern California, benefitting from habitat restoration and brown-headed cowbird trapping to reduce impacts to least Bell's vireo. This species responds rapidly and positively to management that would also positively benefit least Bell's vireo.

Mammals

Pallid Bat

CDFW Species of Special Concern; Western Bat Working Group (High)

The pallid bat (*Antrozous pallidus)* can be found in a variety of habitats including grasslands, shrublands, and woodlands but are most common in open, dry habitats with rocky ledges for roosting. This is a resident species that occurs throughout the entire state. Pallid bats are unusual in that they forage almost entirely on ground dwelling species, primarily invertebrates but sometimes small lizards and rodents. The pallid bat is included on the CDFW's Special Animals List (CDFW 2020) as a CSSC and a Western Bat Working Group species of high priority.

Townsend's Big-Eared Bat

CDFW Species of Special Concern; Western Bat Working Group (High)

The Townsend's big-eared bat (*Corynorhinus townsendii)* is an uncommon resident found in all habitat types except for subalpine and alpine areas and requires caves, tunnels, mines, or other human-made structures for roosting. This bat feeds primarily on moths but will eat a variety of soft-bodied insects. This species occurs throughout the state. Townsend's big-eared bat is included on the CDFW's Special Animals List (CDFW 2020) as a CSSC and a Western Bat Working Group species of high priority.

Western Red Bat

Western Bat Working Group (High)

Western red bats (*Lasiurus blossevillii*) are widespread throughout much of western North America; they are relatively common in some parts of California, occurring west of the Pacific Crest from Shasta County to the Mexican border, excluding desert habitats. This nocturnal species is primarily solitary; coming together only to mate (August-September) and migrate (Spring/Fall). Western red bats typically roost in trees and sometimes in shrubs; the species is closely associated with cottonwoods in riparian areas below 6,500 ft (1,981 m). They feed on a variety of insects along forest edges, in small clearings, or around lights where prey may gather. Like most bat species, western red bats have two foraging peaks, the first one to two hours after sunset and the second just before sunrise (CDFW 1990). This species has a slow and erratic foraging flight pattern feeding at ground level to the above treetops. Western red bats hibernate, though it is not known

exactly where; it is possible they may burrow into leaf litter or dense grass. In addition to suitable trees and cover for roosting/hibernating along with plentiful insects for foraging, western red bats also require access to water. The species appears to have declined throughout its range primarily due to the loss of lowland riparian forests due to human influences (Bat Conservation International 2013). The western red bat is included on the CDFW's Special Animals List (CDFW 2020) and is a Western Bat Working Group species of high priority.

Long-Legged Myotis

Western Bat Working Group (High)

The long-legged myotis *(Myotis volans)* is a small insectivore that primarily feeds on moths that it catches in flight. This species is common in California; only absent from low regions in the desert, the Central Valley and eastern Lassen and Modoc counties. Long-legged myotis tend to have different day and night roosting locations, favoring trees in the daytime and caves/mines at night. Much like other co-occurring bat species, they migrate locally and hibernate only temporarily as needed based on seasonal conditions (Zeiner 1990).

Monterey Dusky-Footed Woodrat

CDFW Species of Special Concern

The Monterey dusky-footed woodrat (*Neotoma macrotis luciana)* is found in forests of moderate canopy, moderate to dense understory, as well as chaparral habitats. This species requires an abundance of plant material with which it builds conspicuous stick nests. These nests are usually located at the base of an oak tree or in the tree canopy. The dusky footed woodrat occurs throughout the Coast Ranges and the western Sierra Nevada Range.

American Badger

CDFW Species of Special Concern

American badgers (*Taxidea taxus)* are heavy-bodied, short-legged, aggressive mammalian carnivores with long fore claws, variable fur, and a short bushy tail. The species is solitary and found in a wide-range of habitats including croplands, desert, grassland, savannah, and shrubland/chaparral, generally preferring open areas. When inactive, badgers remain underground in burrows they can readily create with their long claws. Prey primarily includes small rodents they captured by digging them out of their burrows. They also hunt ground squirrels, pocket gophers, kangaroo rats, prairie dogs and mice, and occasionally insects, snakes, lizards, and birds. Its range is wide, covering much of the Western United States and the Midwest, as well as southern parts of Canada and a large portion of Mexico (Cannings and Hammerson 1994). Populations of this species in California have declined drastically in the 20th century. Although this species has few natural enemies, it is in decline throughout much of its range. Continued threats include impacts related to agricultural and urban development, direct and secondary poisoning, as well as shooting and trapping for control (Sullivan 1996).

Table 3-16. Special Status Wildlife Species at Camp Roberts.

Scientific Name	Common Name	Special Status	NatureServe Status
Invertebrates			
Danaus plexippus	Monarch butterfly	---	G4T2T3/S2S3
Fish			
Lavinia exilicauda harengus	Monterey hitch	CSSC	G4T2T4/S2S4
Lavinia symmetricus subditus	Monterey roach	CSSC	G4T2T3/S2S3
Reptiles and Amphibians			
*Actinemys pallida**	southwestern pond turtle	SAR	G3G4/S3
Anniella pulchra	northern California legless lizard	CSSC	G3/S3
Arizona elegans occidentalis	California glossy snake	CSSC	G5T2/S2
Masticophis flagellum ruddocki	San Joaquin coachwhip	CSSC	G5T2T3/S2?
Phrynosoma blainvillii	coast horned lizard	CSSC	G3G4/S3S4
Spea hammondii	western spadefoot	CSSC	G3/S3
Birds			
Ammodramus savannarum	grasshopper sparrow	CSSC	G5/S3
Aquila chrysaetos	golden eagle	BCC, FP, WL	G5/S3
Asio flammeus	short-eared owl	CSSC	G5/S3
Asio otus	long-eared owl	CSSC	G5/S3?
Athene cunicularia	burrowing owl	BCC, CSSC	G4/S3
Baeolophus inornatus	oak titmouse	BCC	G4/S4
Buteo regalis	ferruginous hawk	BCC, WL	G4/S3S4
Circus hudsonius	northern harrier	CSSC	G5/S3
Contopus cooperi	olive-sided flycatcher	BCC, CSSC	G4/S4
Elanus leucurus	white-tailed kite	FP	G5/S3S4
Falco mexicanus	prairie falcon	BCC, WL	G5/S4
Icteria virens	yellow-breasted chat	CSSC	G5/S3
Lanius ludovicianus	loggerhead shrike	BCC, CSSC	G4/S4
Melanerpes lewis	Lewis's woodpecker	BCC	G4/S4
Pica nuttalli	yellow-billed magpie	BCC	G3G4/S3S4
Progne subis	purple martin	CSSC	G5/S3
Setophaga petechia	yellow warbler	BCC, CSSC	G5/S3S4
Mammals			
Antrozous pallidus	pallid bat	CSSC, WBWG:H	G5/S3
Corynorhinus townsendii	Townsend's big-eared bat	CSSC, WBWG:H	G3G4/S2
Eumops perotis californicus	western mastiff bat	CSSC, WBWG:H	G5T4/S3S4
Lasiurus blossevillii	western red bat	CSSC, WBWG:H	G5/S3
Myotis volans	long-legged myotis	WBWG:H	G5/S3
Neotoma macrotis luciana	Monterey dusky-footed woodrat	CSSC	G5T3/S3
Taxidea taxus	American badger	CSSC	G5/S3

*Naming conventions are according to the Society for the Study of Amphibians and Reptiles (2017), which has *Actinemys pallida* (southwestern pond turtle). The DoD SARs Lists identified *Clemmys marmorata pallida* (southwestern pond turtle) as Imperiled; this INRMP therefore treats *A. pallida* as a DoD SAR.*

Listing Status: **BCC** = USFWS Bird of Conservation Concern; **CSSC** = CDFW Species of Special Concern; **FP** = CDFW Fully Protected Species; **SAR** = DoD Species at Risk; **WBWG** = Western Bat Working Group (**H** = High Priority; **LM** = Low-Medium Priority); **WL** = CDFW Watch List Species.

4.0 Natural Resources Management Strategy

4.1 Management with an Ecosystem Approach

This chapter analyzes the context and trend of each resource on Camp Roberts in relation to DOD policies to "conserve the environment for mission sustainability") and consistency with INRMP policy. Goals and objectives are presented for each resources and have been designed to enhance and maintain resources, align with DoD guidelines, and comply with relevant laws and regulations.

> *Ecosystem-based management implements a multiple species approach consistent with the ESA; uses an adaptive approach to manage natural resources; evaluates and forms local/regional partnerships benefitting INRMP goals and objectives; uses the best available scientific information in decision- making and adaptive management; fosters long-term sustainability of ecosystem services (DoDI 4715.03).*

The activities in the sections below reflect Camp Roberts' current approaches to ecosystem health and provision of ecosystem services as required for INRMPs. An ecosystem approach aligns with the need for climate adaptation at a landscape and regional scale. All DoD installation shall utilize tools to assess the potential impacts of climate change to natural resources, and when not in conflict with mission objectives, take steps to implement adaptive management to ensure the long-term sustainability of those resources. In this chapter, climate resilience is integrated into subject matter areas within this broad framework: (1) Ensure the wildland fire regime is sustained as far as possible within the range of natural community resilience; (2) Promote soil health and its relation to long-term carbon sequestration; (3) Restore woody and herbaceous perennials where they have been impacted at every opportunity; (4) Restore large habitat patches and connectivity of patches, including watersheds and floodplains to reduce future effects of extreme drought/flood cycles; and (5) Act at effective scale through with watershed, ACUB, and INRMP regional partners.

The following sections include a general discussion of current management strategies for each resource area and goals and objectives are identified for ongoing and future management actions on the installation. Actions to achieve goals and objectives are broken down into conservation measures and conservation projects which are listed in Appendices A and B, respectively. Conservation measures are a broad category of policies, procedures, and actions necessary to address day to day activities for each resource area. Conservation measures are actions that are routinely implemented and do not require extraneous time or funding and are critical in benefitting natural resources or offsetting potential adverse impacts. Conservation projects are actions that CA ARNG currently implements or plans to implement in the future and will ultimately result in a benefit to the natural resource. In many cases, conservation projects are funding dependent and require contracted services. Funding requirement, project recurrence, and estimated implementation schedule is defined for each project in the Project Implementation Table (Appendix A2). Conservation measures and conservation projects are identified in appendices to provide resource managers a quick reference to management actions and also allow for greater ease in completing annual reviews and project programming.

4.2 Soil Resources

Soil types define and constrain the potential growth of many plant communities. Soils are living systems that cycle nutrients supporting native plants and wildlife, including nitrogen and carbon cycling. Understanding soil capability and soil health is fundamental to land use management. Soil properties affect construction, water retention, flood potential, moisture and nutrient availability, and the distribution and productivity of many plant communities as well as their resilience to disturbance (Ehleringer 1985; Smith et al. 1995; Hamerlynck et al. 2002).

Soil quality initiatives are increasing in California and in federal agencies. Healthy soils are a critical component of productive and resilient ecosystems. Targeted improvement in soil quality is seen as one path towards climate adaptation. Degraded soils store less carbon, contributing to climate change, and area also less drought tolerant which makes them more vulnerable to climate change.

Soil conservation includes a combination of practices such as surface stabilization, decompaction, protection of nutrient and carbon cycling and other ecosystem functions that soils provide, and that maximize the capability for soils to self-recover after disturbance. . Prescribed grazing has been identified as one vehicle to improving soil quality on annual rangelands as these areas are easily degraded by overuse and poor grazing practices. Short-term, high-intensity grazing has been shown to improve soil health in rangelands as grazers enhance the structural diversity of rangelands, which influences floral and faunal diversity and nutrient cycling (Rook and Tallowin 2003). Grazing management that involves appropriate stocking rates, livestock rotation, grazing intensity, and pasture rest result in more productive grassland ecosystems because of healthy soils (NRCS 2016).

Impacts to soils are managed cooperatively by Environmental Directorate, ITAM, and Land, Rehabilitation and Maintenance (LRAM) through training site regulation, best practices, and the CA ARNG site approval process, whereby avoidance and minimization measures, and conservation measures, are considered under NEPA and CEQA. Any project that may disturb the soil (such as digging, grading, stockpiling, dumping, staging, or establishing a laydown area) must go through a screening process to receive a site approval. Erosion control structures such as check dams, hardened crossings, hardened/graveled firing points and other BMPs are used to secure loose soils and reduce erosion potential.

Goal: *Conserve soil productivity, nutrient and carbon functioning, water quality, and plant and wildlife habitat through effective conservation practices.*

Objective 1: *Reduce or eliminate areas of barren soil by maintaining adequate vegetative cover.*

Objective 2: *Use proper grading techniques and BMPs to control and prevent erosion.*

4.3 Watershed and Water Resources

This section addresses regulated waters and wetlands, surface water quality and groundwater resource supply and water quality. The protection and management of water resources as habitat is described under *Section 4.5: Vegetation and Wildlife Habitat*, and under *Section 4.6: Fish and Wildlife* for individual special status aquatic species.

Camp Roberts lies within the footprint of the Nacitone Watersheds Management Plan covering southern Monterey County and the northern portion of San Luis Obispo County. The plan was prepared for the MCWRA and the SWRCB. This Plan identifies the existing conditions of and stresses in these watersheds as they relate to water quality and recommend methods for reducing or eliminating those stressors.

Major water-related challenges for the region include groundwater and surface water quality degradation, groundwater basin overdraft, flood risk, seawater intrusion, and aging infrastructure. The Camp Roberts hydrologic region is considered the most groundwater-dependent hydrologic region in California (California Department of Water Resources 2018; Regional Summary 2013). Regional groundwater supplies are supplemented by stream recharge, percolation from agricultural return flows and precipitation, and subsurface inflow from adjacent groundwater basins (MCRMA 2015). Camp Roberts was required to reduce its use of groundwater, including achieving more than a 20% reduction in water use, in compliance with EO 13123 "Strengthening Federal Environmental, Energy, and Transportation Management," in collaboration with neighboring water users.

Effective and thoughtful water conservation strategies provide multiple benefits to watershed health. Reduction in non-point source pollution and soil stabilization techniques improves water quality. Conservation strategies such as reduced consumption through drought-tolerant landscaping, rainwater catchment and re-use, and grey water harvesting improve overall water supply. Stormwater management techniques to reduce runoff and increase percolation augments groundwater resources, recharges the aquifer, and increases stream flow levels for aquatic wildlife. Retaining healthy riparian and wetland habitats reduces flood risk by slowing flows and stabilizing soils and contributes to biodiversity. Implementation of a multi-faceted water conservation strategy enhances the ecological function and resiliency of water resources and the watershed.

Management of water resources at Camp Roberts involves the use, permitting, protection, restoration and enhancement of surface waters and groundwater. Protecting groundwater resources is a key program element for Camp Roberts, as groundwater provides the only source of potable drinking water. Impacts to jurisdictional waters and wetlands must be mitigated under the federal Clean Water Act. Consultation with the USACE, RWQCB, and CDFW is necessary for activities such as filling, dredging, or clearing of streams as detailed in *Section 1.7 Regulatory Context and Natural Resources Consultation*.

Goal: *Ensure a reliable, safe, and sustainable water supply. Protect surface and groundwater resources and enhance as practicable.*

Objective 1: *Practice water conservation techniques throughout the installation.*

Objective 2: *Reduce pollutant and sediment loading into wetlands and waterways.*

Objective 3: *Slow runoff rates and increase percolation of stormwater to aid in groundwater re-charge.*

Objective 4: *Align water management on CR with regional water management strategies.*

4.4 Wildland Fire

It is required under the Army's Wildland Fire Policy to consider a comprehensive, integrated strategy for fire management to achieve ecosystem sustainability, to incorporate mitigation, burned-area rehabilitation, and fuels reduction and restoration activities that contribute to ecosystem management.

Remaining unassessed are vulnerabilities to soil health, soil loss, drought, and the adaptation of specific plant communities to fire regime beyond their tolerance range for natural recovery. Problem fire regimes include short- interval fires in shrublands, and large watershed-scale fires affecting riparian values or water quality. The annual burning of the training lands and the network of firebreaks has reduced the potential for fire to escape off the installation and improved the controllability of ignitions; so, planning for the resilience of soils and vegetation health becomes a management need. Prescribed fire can be a management tool in this regard, as it has been in the past for meeting habitat objectives.

Fire is a natural component of California ecosystems with many habitats requiring fire for renewed growth and seed germination. Fires create new habitat by creating open spaces, thinning and clearing forest debris, returning nutrients to the soil, and killing disease and harmful insects (Pausas and Keeley 2019). If timed properly, prescribed burning can be used to control invasive plants, thin overgrown vegetation, and enhance overall biodiversity (Block et. Al. 2016).

Under climate change, hazardous fuel conditions are expected to increase, and regional fire season is expected to lengthen. The risk of unplanned ignitions will increase with military training pressure, alongside human population, and increased activities in the region. U.S. 101, which bisects Camp Roberts, is a primary potential ignition source.

Per Army wildland fire guidance ((15 March 2021) and AR 200-1 Chapter 4, Section 3.d.12 Wildland Fire Management, the CA ARNG Headquarters Environmental Division has developed an Integrated Wildland Fire Management Plan (IWFMP) for Camp Roberts and Camp San Luis Obispo (CA ARNG 2015), This plan is currently being updated to align with the new 2021 Wildland Fire Policy Guidance which is anticipated for completion in March 2022. An IWFMP is a strategic document that guides the full range of fire management related decisions, consistent with interagency Federal Wildland Fire Policy (USDA & U.S. Department of the Interior 2009), which was adopted by the DoD through DoDI 6055.06. DoD states that responses to wildfire shall be conducted in a manner that preserves health, safety, and air quality; protects facilities; and facilitates the health and maintenance of natural systems. This management shall reduce the potential for wildfires, function as an ecosystem- based management tool, and integrate applicable state and local permit and reporting requirements (DoDI 4715.03).

There are also external partners and stakeholders in CR wildland fire management. These include other agencies, departments, nearby private landowners, and communities who may be affected by fire and smoke from Camp Roberts, and also may be the source of burns coming onto the installation.

Prescribed fire is used preemptively before fire season to manage vegetative fuels, primarily within the CA ARNG impact areas, and during suppression to control active fires. All prescribed burning and fire suppression activities are conducted by the Camp Roberts fire department in collaboration with DPOTS, Range Control, and CAEV.

> *Installations with unimproved grounds that present a wildfire hazard and/or installations that utilize prescribed burns as a land management tool will develop and implement an IWFMP that is compliant and integral with the INRMP, the installations' existing fire and emergency services program plan(s), and the ICRMP (AR 200-1).*

Goal: *Promote the natural role of fire in the Camp Roberts ecosystem and prescribed fire as an ecosystem-based management tool.*

Objective 1: *Reduce wildfire potential using appropriate management practices such as prescribed burning and firebreak/fuelbreak maintenance.*

Objective 2: *Improve integration of wildland fire planning with ecosystem objectives, to restore resilient and healthy ecosystem processes.*

4.5 Vegetation and Wildlife Habitat

Vegetation and wildlife habitat management is a critical component of overall natural resources management on Camp Roberts. Vegetation is managed to maintain plant and animal biodiversity and retain full native ecosystem function. Sustaining natural functions of training lands allows for sustainable, ongoing, realistic military training opportunities. Fire regime management, clean water, soil conservation, carbon sequestration, and habitat for protected fish and wildlife are important vegetation function that are regulatory as well as stewardship needs. Management considerations should be prioritized at the local level, even while the threats may be driven or exacerbated by larger scale conditions such as climate change, urban development, annual grass and forb invasion, or wildland fire regime that stresses natural community resilience.

As described in Chapter 3, each vegetation community offers habitat to a variety of wildlife species and contributes unique functions and benefits to the ecosystem.

The CA ARNG manages vegetation to conserve native ecosystem values and ensure disturbance processes take place within the tolerance range of the resource to recover without long-term degradation or loss. Specific vegetation management activities include: buffering and fencing of sensitive habitats; protecting vulnerable periods; treating vegetation fuel loads through prescribed fire and mechanical treatment; habitat enhancement; firebreak and fuel break maintenance; invasive plant control; environmental awareness briefings; and vegetation condition monitoring through LRAM for adaptive management. Vegetation communities are addressed separately in the following sections as each community requires different management strategies.

4.5.1 General Vegetation, Grasslands, and Shrublands

Grasslands are a focus for their potential to sequester carbon, especially long-term carbon storage through soil humus development (CARB 2019) and offer an avenue to combat climate change. Native perennial grasslands should be preserved at every opportunity for their benefit to fire management (higher fuel moisture longer in the season, and natural spacing), long-term soil carbon storage potential, and other benefits. Prescribed grazing is a recommended tool for climate adaptation (CARB 2019).

Goal: *Conserve and enhance the ecological integrity of each vegetation community to promote its beneficial functions such as wildlife support, food webs, biodiversity, watershed protection, productivity, and nutrient/carbon storage and cycling.*

Objective 1: *Reduce threats to native vegetation.*

Objective 2: *Restore and enhance native vegetation communities and promote their resilience.*

4.5.2 Forest and Woodlands

Forest and woodland areas are some of the most ecologically valuable vegetation communities and play an important role in producing oxygen, storing carbon, purifying water, conserving soil, and cycling

nutrients. Oak woodlands have higher levels of biodiversity than most other terrestrial ecosystems in California (Bernhardt and Swiecki 2001).

Climate change is likely to increase the amplitude of drought and flood extremes in this region, and further drying of some streams. The riparian corridors of CR are important for thermal refuge and shading of streams, inputs of organic matter, and protective filtering capacity from overland runoff. Climate change impacts to riparian corridors would narrow stream corridors and wetland zones, reducing the benefits conferred from intact riparian areas. Targeted restoration practices may enhance riparian adaptation and provide "hotspot" opportunities for offsetting climate impacts (Capon et al. 2013).

Riparian areas are dynamic ecosystems, driven primarily by flood events, which help revitalize them by depositing new sediment, and by opening the site for new growth, both vegetatively and by seed. In order to preserve sensitive habitat and promote healthy stream stabilization, riparian areas should remain undisturbed and natural flood events should be unhindered and encouraged. It is important to preserve riparian areas not only for their biological integrity, but also to prevent catastrophic flooding, erosion, and to act as a natural fuel break for fighting fire.

Goal: *Protect and maintain oak and riparian woodlands and their natural ecosystem roles such as wildlife habitat, migration corridors, watershed function, thermal cover, and carbon sequestration.*

Objective 1: *Prevent loss and degradation of forest and woodlands.*

Objective 2: *Encourage native tree recruitment and forest and woodland regeneration.*

Objective 3: *Prevent the spread of SODS disease in coast live oak, a deadly arboreal disease caused by an invasive plant pathogen from Europe, P. ramorum.*

4.5.3 Native Trees

Native trees and woodlands are essential elements of the ecosystem at CR. They provide habitat for wildlife and other plants, are an important wildlife food source, prevent erosion, contribute to nutrient cycling, and provide an aesthetic viewshed for CR. Trees also provide cover and concealment for military training activities.

Current Camp Roberts native tree management requirements have been derived from the previous Camp Roberts Tree Management Policy (2009), Oak Replacement Policy (2001), Monterey County Ordinance 21.64.260 (2020) and San Luis Obispo County Ordinance 23.05.062 (2020).

Goal: *Protect native trees to preserve both the ecological and mission-critical benefits they provide to CR.*

Objective: *Ensure replacement and protection of existing native trees.*

4.5.4 Wetlands and Aquatic Habitat

Wetlands are crucial to the protection and maintenance of living resources, since they provide essential breeding, spawning, nesting, and wintering grounds for numerous wildlife species. Wetlands store water and minimize flooding. They filter sediments, excess nutrients, and other impurities from water as it is stored. Aquatic vegetation found in wetlands protects soils from eroding and provide food and cover for wildlife. Wetlands also provide habitat for micro and macro invertebrates that use or break down

nutrients and contaminants. Wetlands management and protection is an essential component of ecosystem management. Research has shown that buffering wetlands from 50 to 150 feet (15 m to 45 m) is necessary to protect wetlands from human disturbance (Castelle et. al. 1992).

Most streams and aquatic habitats on CR are protected as waters of the U.S. and waters of the State and fall under the jurisdiction of USACE, RWQCB, and CDFW. Additionally, wetlands and waters are protected under EO 11990 (Protection of Wetlands). Consultation with the USACE, RWQCB, and CDFW is necessary for activities such as filling, dredging, or otherwise altering a waterway or riparian and aquatic vegetation.

Goal: *Preserve and enhance wetland and aquatic habitat and the ecosystem services they provide such as fish and wildlife habitat, water quality improvement, flood control, and groundwater replenishment.*

Objective 1: *Protect wetland and aquatic habitat.*

Objective 2*: Restore and enhance wetland and aquatic habitat.*

4.5.5 Constructed Habitats

Roads act as prime habitats and corridors for invasive plants and can contribute significantly to the spread and establishment of invasive species (Meunier and Lavoie 2012). Transportation and utility corridors provide routes for the introduction and spread of invasive plants by way of seeds and other propagules transported by vehicular traffic (California Invasive Plant Council [Cal-IPC] 2012). Construction and maintenance activities can also introduce or spread invasive plants through project materials and ground disturbance.

Refer to *Section 5.3 Developed Areas, Landscape and Grounds.*

4.5.6 Invasive Plants

EO 13112 defines invasive species as a non-native species likely to cause economic or environmental harm or harm to human health. It directs all federal agencies to address invasive species concerns by refraining from actions likely to increase invasive species problems. The Plant Protection Act of 2000 (Pub. L. 106-224, Title IV) prohibits introducing any animal, plant, or material considered harmful to this country's agriculture. The USDA Plant Protection and Quarantine Division is the enforcement authority for this Act. The Act consolidated and modernized all major statutes pertaining to plant protection and quarantine (Federal Noxious Weed Act, Plant Quarantine Act). AR 200-1 specifies management practices to control the establishment and spread of invasive species.

CR has prioritized the control of specific invasive plants based on their invasiveness, ability to disrupt native habitat, and their impacts on sensitive species and training activities (See section 3.4.3 Invasive Plant Species, Table 3-12 and Appendix E). The following invasive plants are those whose control is of the highest priority: arundo, yellow starthistle (*Centaurea solstitialis*), and perennial pepperweed (*Lepidium latifolium*). Invasive species, especially the aquatic and riparian species, have the potential to migrate onto CR from adjacent properties. The CA ARNG is a participant in the MOU for the San Luis Obispo County WMA to coordinate the activities necessary to prevent the introduction, establishment, and spread of noxious weeds in San Luis Obispo County.

The CA ARNG controls invasive plants to sustain land available for military training, improve habitat, and provide for health and safety. CA ARNG uses its Statewide IPMP as a framework for invasive plant control policies in accordance with AR 200-1 and DoDI 4150.7. Integrated pest management utilizes both non-chemical and chemical control to suppress or prevent non-native species from exceeding an acceptable population or damage threshold. Emphasis is placed on minimizing environmental disruption. Integrated pest management strategies depend on surveillance to identify the need for control and to monitor the effectiveness of management efforts (CA ARNG 2005). Physical, cultural, biological, and chemical components of integrated pest management are considered or may be used to manage invasive plant species on CR.

Invasive plant control at CR is a cooperative effort between Environmental Directorate, ITAM, and partners such as the Weed Management Area (WMA) of San Luis Obispo County, and the San Luis Obispo County Agricultural Commissioner's Office. CR works closely with its partners and the Cal-IPC to ensure the most efficient and up to date use of control methods.

Goal: *Use integrated pest management strategies to control the spread and introduction of invasive plants to protect natural resources, improve habitat, sustain land available for military training, and provide for health and safety.*

Objective 1: *Control or eradicate existing invasive populations to prevent further spread throughout the installation.*

Objective 2: *Prevent and control new introductions of invasive plants.*

4.6 Fish and Wildlife

Species management is an important component of the overall ecosystem management strategy on Camp Roberts. In this INRMP, a habitat-first approach is taken to manage fish and wildlife populations, consistent with DoD policy to facilitate a shift from single species to multi species approached. Combining this approach with regional partnerships and the use of indicator or management focus species ensures conservation approaches take place at an appropriate scale. Ecosystem-wide management of sensitive resources requires mutual cooperation of regional land managers, regulators and scientific groups, which facilitates cost-efficiencies and prioritization of work toward common goals.

This section has been broken down into a discussion of general fish and wildlife species and populations and pollinators. Although management for general fish and wildlife species will also benefit pollinators, the specific ecological function of pollinators warrants a specific and separate management strategy. Management for invasive and feral animals is also discussed here.

4.6.1 General Fish and Wildlife

Invertebrates

Invertebrate conservation is critical as these species constitute a significant portion of the food web and are the main food source for many wildlife species. They also facilitate decomposition and nutrient cycling. The ecosystem level benefits of invertebrates are becoming much more appreciated considering recent well-documented declines. Many are pollinators, such as bees, butterflies, moths, flies, and

beetles. Some are pathogenic, and carry disease for humans, wildlife, or trees. Invertebrate conservation occurs primarily through management of their habitat and pesticide use.

Fish

Fish are important components of freshwater ecosystems and often serve as biological indicators of stream health. Anadromous fish are particularly important for nutrient transport from one system to another. Waterways, and thus fish that reside in them, are impacted by surrounding land uses. Fish passage and habitat connectivity are essential to the viability of fish populations. Dams and low flow areas both upstream and downstream of Camp Roberts present critical limitations to fish passage. Management of invasive species is also critical to maintaining healthy native fish populations.

> *According to AR 200-1, management of resources on Army properties should: (a) Promote biodiversity and ecosystem sustainability consistent with the mission and INRMP objectives. (b) Manage flora and fauna consistent with accepted scientific principles and in accordance with applicable laws and regulations, and…for conservation of indigenous flora and fauna. (c) Manage habitat to conserve and enhance existing flora and fauna consistent with the Army goal to conserve, protect, and sustain biological diversity while supporting the accomplishment of the military mission.*

Reptiles and Amphibians

Reptiles and amphibians are both important members of aquatic and terrestrial habitats. CR is home to a variety of herpetofauna due to the diverse wetland and upland habitats that exists on the installation. Relatively high levels of amphibian and reptilian diversity contribute to the significant biodiversity in this region, because many amphibian species reach their southern range limit, and reptilian species with desert affinities reach their northern range limit (Tershy et al. 2016). Protections offered to wetland, aquatic, and riparian areas on CR benefit multiple herpetofauna species. Amphibians are good indicators of wetland conditions and changes to their populations often indicate a decrease in overall ecosystem health. Herpetofauna are among the most imperiled species on Earth and are threatened by habitat loss and degradation, invasive species, contaminants, disease, and climate change. CR routinely follows guidelines and conservation recommendations established by the DoD Partners in Amphibian Conservation (PARC) network, USFWS, and other herpetofauna conservation groups.

Birds

Military lands provide some of the best remaining habitats for migratory and resident birds. DoD recognizes that bird conservation is a critical component of natural resource management and sustaining the military mission. Resident bird species perform important ecological roles in their communities year-round and serve as good indicators of local habitat health, as migratory species can be affected by both local habitat quality and the quality of habitats in their winter range. Birds fill a variety of ecological roles (e.g., seed dispersers, pollinators, insect predators, and food for other species) and their declines signal a broad deterioration in overall ecosystem health (Evans 1995).

Virtually all birds found at CR throughout the year are protected under the MBTA, which provides protection for most non-game native birds, whether or not they migrate. The MBTA authorizes incidental take of migratory birds by military readiness activities, however CSLO considers potential impacts to migratory birds and minimizes or avoids impacts whenever possible. CR also implements land management and migratory bird conservation in accordance with the ESA, BGEPA, EO 13186 (“Responsibilities of Federal Agencies to Protect Migratory Birds,” 10 January 2001), and the MOU

between DoD and USFWS ("Promote the Conservation of Migratory Birds," 31 July 2006) while providing the greatest flexibility to the installation's training mission.

The goals and objectives detailed below follow Partners in Flight (PIF) guidance and other relevant bird conservation plans. The DoD PIF program is intended to assist military installations with establishing programs to sustain and enhance the military mission by maintaining healthy landscapes and training lands through proactive, habitat- based conservation and management strategies. The DoD PIF program also works beyond installation boundaries to facilitate cooperative partnerships, determine current status of migratory birds and causes of population fluctuations, identify and maintain priority habitats for migratory birds, and proactively manage DoD lands to prevent the listing of additional birds as threatened or endangered. By identifying species of concern and managing habitats for those species, future listings can be minimized or eliminated.

An in-depth discussion of migratory bird management on CA ARNG lands is included in Appendix I.

Mammals

A diverse population of mammals can be found on CR. Small mammals and rodents offer a rich prey base for raptors and larger predatory mammals. Contributing to the mammal diversity on the installation are species commonly associated with urban areas such as raccoons and opossums as well as species associated with rural landscapes such as deer and bobcats.

Tule elk are the primary ungulate grazers on CR. Unverified population counts are estimated at 200-300 animals. The current Camp Roberts population has expanded considerably from a transplant of 21 elk in 1978 and 13 elk in 1982. An accurate population count will be necessary in the near future as the carrying capacity of Camp Roberts may be exceeded. The population appears to continue to expand and neighboring properties increasingly report elk sightings or damage to fencing.

Of particular management concern at CR are bats. Eight bat species have been documented on the installation. Bats can eat their body weight in flying insects in a single night. Some are pollinators. Certain of these insectivorous creatures migrate to warmer areas to winter. Others are winter residents in rock and tree hollows and in structures where temperature and humidity are favorable. They roost by day in tree cavities, rocky caves, and eaves or attics of wooden buildings.

Management of bat populations at CR is primarily achieved through management of their habitat elements. The following measures currently in effect promote the protection of bats: environmental review prior to proceeding with application of pesticides/herbicides and any pest management activities involving bats; surveys are conducted in and around buildings and bridges proposed for demolition and replacement; roosting bat buffers are implemented when and where necessary; and bat exclusion replacement structures are established for impacted bat roosts. .

Threats to bats are generally from intrusion or destruction of roost sites and degradation of water sources and foraging habitat. Bats currently use CR for both roosting and foraging. Of particular concern is bat roosting in dilapidated buildings slated for demolition. As a result, protection and mitigation of roosting and foraging sites, water sources and food supply are keys to management of healthy bat populations.

Management of fish and wildlife species is an important component of the overall ecosystem management strategy on Camp Roberts. In this INRMP, a habitat-first approach is taken to manage fish and wildlife populations, consistent with DoD policy to facilitate a shift from single species to multi species approached. Combining this approach with regional partnerships and the use of indicator or management focus species ensures conservation approaches take place at an appropriate scale.

Goal: *Conserve the natural ecological role of native fish and wildlife populations on Camp Roberts. .*

Objective 1: *Protect fish and wildlife species and their habitats on CR.*

Objective 2: *Assess fish and wildlife status and trends. Maintain accurate and up-to-date records on fish and wildlife distribution and abundance to aid in future management decisions.*

4.6.2 Pollinators

> *Pursuant to DoDI 4715.03, each INRMP shall maintain a relevant and updated baseline list of plant and animal species located at each installation for all pertinent taxonomic and regionally important groups.*

Pollinators aid reproduction in over 75 percent of flowering plants and contribute significantly to the U.S. economy. Causes of decline include habitat loss, fragmentation, and alteration; "pathogen spillover;" interspecific competition among bees; changes in plant community composition with the spread of invasive plants; genetically modified crops; non- synchronous changes in pollinator and plant phenology; and pesticide use (DoD 2018). Proactive conservation of declining pollinator species may help reduce the likelihood of future listings under the ESA and associated regulatory requirements.

Of particular concern to pollinators and the plants that depend on them are impacts from climate change. As warmer temperatures arrive earlier in the season, there can be a mismatch between when plants flower and when pollinators arrive, and this disconnect resonates across entire ecosystems impacting everything from forage availability to biodiversity. Inefficient pollination directly influences plant population dynamics; and this can indirectly influence other species that rely on fruits or seeds that require successful pollination. The consequences of this phenomenon will likely be subtle at first; however, overtime the impacts could be widespread with varying degrees of severity.

The DoD participates in the North American Pollinator Protection Campaign (NAPPC) and has established a policy (Office of the Under Secretary of Defense Acquisitions, Technology and Logistics, Sept 2014) to use BMPs specifically to protect populations and habitat of pollinators and to coordinate with partners on pollinator concerns. Working cooperatively with agencies and non-governmental organizations, such as the USFWS, BLM, EPA, P2, and Bat Conservation International would enhance knowledge of pollinator abundance on CR and guide future management.

Management for pollinators on CR occurs primarily through management of natural vegetation communities. Landscapes in developed areas also offer opportunities to benefit local pollinators. Adherence to DoD directives and Pollinator Partnership guidance further protect pollinator species on the installation and inform management decisions. Pollinator management has become more of a focus area on CR as the benefits of pollinators have become better understood. The rich diversity in CR vegetation offers ample opportunity to enhance pollinator productivity.

Goal: *Conserve pollinator populations and their habitat on CR.*

Objective 1: *Improve understanding of pollinator use on CR.*

Objective 2*: Protect and enhance pollinator habitat.*

4.6.3 Invasive and Feral Animals

Invasive and feral animal control at CR is focused primarily on protecting natural resources, enhancing habitats, sustaining viable military training land, and improving human health and safety. CR staff work collaboratively with various partners to achieve these goals. The Statewide IPMP is used as a framework for control policies in accordance with AR 200-1 and DoDI 4150.7. The IPMP is intended to ensure that the most up-to-date, effective, environmentally sound, and least hazardous combination of methods is used to control each invasive species and that all applicable laws and regulations are followed. Monitoring in combination with control efforts provide for increased natural resources protection and improved habitat while also sustaining training lands.

CR has prioritized the control of specific pest species based on their ability to disrupt habitat, their impact on sensitive species and training activities, and the potential risk they pose to human health. As detailed in Chapter 3, several pest species occur on the installation, however active control only occurs for feral pigs, ground squirrels, brown-headed cowbirds and feral cats. Control efforts for other pest species will occur if deemed necessary.

Goal: *Control existing populations and prevent the spread and further introduction of invasive species and pests.*

Objective: *Follow IPM and pest control guidelines to control invasive and feral animals.*

4.7 Threatened and Endangered Species

Federally and state-listed threatened and endangered species are a prominent concern at Camp Roberts. Maintaining current management plans and survey information on threatened and endangered species at Camp Roberts is mandated by AR 200-1, DODI 4715.03, and DODM 4715.03 and is important for maintaining the military mission. CA ARNG must comply with both federal and state environmental rules.

Compliance with the ESA is met through informal and formal USFWS and NMFS Section 7 consultation. Consultation requirements of the ESA have been met on both programmatic (base-wide) and project-by-project basis for a variety of actions on Camp Roberts. To date, USFWS has issued eight BOs, including four programmatic and four for localized actions at Camp Roberts. In addition, NMFS has issued one BO for one action. These BOs are detailed in Appendix E: for each relevant species.

The CA ARNG also conducted one informal consultation with USFWS regarding a controlled burning and grazing plan for the vernal pool fairy shrimp habitat exclosures. In a letter dated 23 May 2000, USFWS concurred with the CA ARNG that implementation of the controlled burning and grazing plan and monitoring was not likely to adversely affect the vernal pool fairy shrimp. CA ARNG also provided USFWS with a letter to formalize a mutual agreement between CA ARNG and USFWS regarding the management of purple amole at Camp Roberts. This letter was dated 10 July 2002 and summarized the locations and sizes of management areas, the use of these areas by hunters, and monitoring and adaptive management measures.

4.7.1 Purple Amole

Within the last two decades, reduced activities within purple amole habitat have resulted in adverse effects, including a type conversion from mostly low growing grasses and forbs to taller grasses and few forbs, especially annual Mediterranean grasses, which produces a thick thatch layer. This conversion adversely affects purple amole by increased competition for light and moisture as well as interfering with seedling establishment and plant growth. The increase in these annual grasses and thatch has also increased the risk of damage to purple amole plants due to wildfire. Additionally, increases in the number of feral pigs has resulted in large areas of ground disturbance and direct predation of purple amole plants by their rooting behavior.

Since its discovery in 2000, activities within purple amole habitat have been restricted. Current management for purple amole at Camp Roberts involves protections to its habitat through the Purple Amole Protection Area (PAPA) and restrictions to the activities that can occur there. The 2009 PBO describes mitigation measures, terms and conditions, and other management guidelines which are summarized below. An updated Programmatic Biological Assessment (PBA) is currently being developed and will include updated management and conservation strategies for purple amole. Updated management will be incorporated into the INRMP during annual review.

Goal: *Conserve the purple amole population and contribute to species recovery on Camp Roberts.*

Objective 1: *Protect purple amole plants and habitat.*

Objective 2: *Enhance purple amole habitat.*

4.7.2 Vernal Pool Fairy Shrimp

Since a variety of training activities occur throughout Camp Roberts that may affect vernal pool fairy shrimp, including bivouacking, live-fire exercises, construction of fortifications, emplacements, and obstacles; and maneuvers, a programmatic BO was issued to address these (USFWS 2009). A number of other BOs have been issued covering specific activities. Approximately 22 acres of VPFS habitat has been protected to mitigate for impacts to vernal pools. These areas as well as other vernal pools throughout the installation are delineated as sensitive resource areas. If vernal pool fairy shrimp habitat is left undisturbed by grazing herbivores and fires for an extended time pools become filled with vegetation and the habitat quality declines (USFWS 2009). However, the amount and timing of rainfall and the topographic aspects of a habitat site are likely the main determinants of vernal pool fairy shrimp numbers when pools are protected (Helix 2018). An updated VPFS monitoring program is currently being developed and will guide future management strategies for VPFS.

Current management for vernal pool fairy shrimp at Camp Roberts focuses on protecting high quality habitat and designated mitigation areas from disturbance by training activities, and avoiding impacts to any other vernal pool fairy shrimp individuals or habitats. Protective measures identified in the 2009 USFWS BO have been incorporated below.

Goal: *Promote conservation of vernal pool fairy shrimp on CR.*

Objective 1: *Protect vernal pool fairy shrimp and their habitat.*

Objective 2*: Enhance vernal pool fairy shrimp habitat on CR.*

4.7.3 South-Central California Coast Steelhead

The Salinas River watershed is the largest watershed in the SCCC steelhead Interior Coast Range BGP. The Interior Coast Range BGP occurs in a landscape where precipitation is low which results in extensive intermittent streams. The steelhead must also navigate the long alluvial valley migration corridor through the Salinas Valley which can preclude steelhead migration for adults and smolts, particularly in dry years. Nonetheless, many of the watersheds belonging to the Interior Coast Range BGP naturally contained high-quality spawning and rearing habitat (NMFS 2013). The 10.7 mile section of Nacimiento River that runs through CR currently offers good steelhead habitat (Stillwater Sciences 2018).

Climate change and its expected changes in temperature and precipitation have the potential to alter fire regime, flow regime, and floodplain function. Rising temperatures, alterations in the frequency and intensity of droughts, as well as rainfall patterns present potential challenges to maintaining habitat quality for the SCCC steelhead. SCCC steelhead will likely be exposed to higher water temperatures and more flow variability (Wade et al. 2013). Thus, identification and prioritization of cool water refugia is needed throughout core watersheds in the DPS for cataloging and protection (NMFS 2011). Moreover, hotter and longer drought periods could weaken vegetation, creating enhanced risks of wildland fire damage. Large fires have closed access to several regional watersheds, reduced recruitment of logs to streams, and increased sedimentation thus reducing habitat quality (NMFS 2018). Fire can also remove large wood elements that shade instream cover for all life stages of steelhead and cause extensive sedimentation and smothering of substrates after rains (Thompson et al. 2008, 2012). Fish passage must be addressed on a broad and coordinated scale to allow juvenile outmigration and adult steelhead to access high quality habitat in the upper main stems and tributaries of core watersheds (NMFS 2013).

An Endangered Species Management Component (ESMC) for steelhead was developed in 2018 (Stillwater Sciences) which detailed overall management for SCCC steelhead on CR. Current management hinges around avoiding disturbances to the river during the SCCC spawning season of January to April. Conservation measures and SCCC steelhead conservation projects identified in the ESMC are included below.

Goal: *Promote the recovery, long-term health, and resilience of SCCC on Camp Roberts.*

Objective 1: *Protect SCCC steelhead and enhance steelhead habitat on CR.*

Objective 2: *Enhance steelhead habitat on CR.*

4.7.4 Bald Eagle

The USFWS identified three categories of risk to bald and golden eagles in 2013, depending on the presence of an important eagle use area or migration concentration site, the annual eagle fatality estimate as a percentage of the local population size, and the possibility of eliminating avoidable take of eagles. Camp Roberts is identified as a Category 2 site, characterized by high or moderate risk to eagles, with opportunities to mitigate impacts. USFWS has identified Advance Conservation Practices to mitigate impacts. The 2016 Camp Roberts ECP determined that the annual bald eagle fatality rate at Camp Roberts was below a threshold of 5% of the estimated local population size and that with additional practices the fatality rate could be reduced further. The ECP details describes the refitting of power poles to prevent collisions and electrocutions. This is largely completed. Measures are also described for establishing appropriate training, recreation, and land use buffers; preventing collisions with aerial and ground vehicles; reducing exposure to lead poisoning; and protecting nesting, roosting, and foraging habitat.

Current management for the state endangered bald eagle at Camp Roberts is focused on minimizing disturbance and mortality for eagles that nest, roost, or pass through the Camp. Nesting eagles are monitored annually throughout the breeding season and observations are recorded to track breeding success.

Goal: *Promote conservation of bald eagles on Camp Roberts.*

Objective: *Protect bald eagles and their habitat on Camp Roberts.*

4.7.5 California Condor

California condors do not regularly utilize CR for foraging or roosting, however condor flyovers do occur. Camp Roberts coordinates with private and governmental agencies to contribute to the understanding and tracking of the California condor. Coordination with the USFWS and the VWS takes place to record the locations and dates of any sightings, share data, and on occasion, assist in radio tracking Condors while they are at Camp Roberts.

Natural resources staff work with partners for the conservation and management of the California condor in and around Camp Roberts and continue to build new partnerships. Current partnerships include PIF, VWS, and Pinnacles National Monument.

California condors are unlikely to nest at Camp Roberts, however management strategies are implemented to provide foraging grounds free of contaminants and trash. The 2009 PBO identifies measures to protect California condors, should they occur at Camp Roberts.

Measures to avoid take of California condors in place at Camp Roberts include the regulation of weapons firing by the Range Control Office and prohibition on firing at condors or any other unauthorized target. More critically, Camp Roberts follows and promotes the Ridley Tree Condor Conservation Act of 2008 and AB711 of 2013 which mandate the use of non-lead ammunition. Camp Roberts has used non-lead ammunition since July 1, 2007. Additionally, at Camp Roberts:

Goal: *Promote the conservation of California condors on CR.*

Objective: *Protect the California condor and its habitat on CR.*

4.7.6 Swainson's Hawk

The primary issues currently facing Swainson's hawks in California vary somewhat with each population (Bechard 2010). The largest population of Swainson's hawks in California, located in the Central Valley relies on the small numbers of tall trees that often grow near streams for nest sites and on preferred kinds of agriculture, such as alfalfa, for foraging area (Bloom 1980; Estep 1989). Development and agricultural consolidation which removes trees and changes to crop types such as wheat remove habitat for the hawk. While Swainson's hawks no longer have a substantial population in the Central Coast Ranges, there are many more trees and potential nest sites, and a matrix of agriculture and open land still occur for potential breeding habitat (Bloom 1980).

Due to the lack of occurrence data on CR, the CA ARNG does not directly manage Swainson's hawk. However, management of other bird species and habitats will also benefit the Swainson's hawk such as preactivity

surveys and protective buffers. Other beneficial measures in place are those that protect large trees in riparian areas (all trees in riparian areas can be important nesting locations: cottonwood, sycamore, willow and oak are common nest trees in California [Bloom 1980]). Should the Swainson's hawk occur regularly at CR, more detailed conservation measures will be developed.

Goal: *Promote the conservation of Swainson's hawk on CR.*

Objective: *Protect Swainson's hawk and its habitat on CR.*

4.7.7 Least Bell's Vireo

Least Bell's vireo has not been observed on or adjacent to Camp Roberts since a single calling male was observed in 1993 at the Salinas River Bridge near Bradley (eBird 2019). Since then, it has been reported in 2005 and 2009 about 4 miles (6 km) south of the southeastern corner of the Camp (Diel pers. Comm.; California Natural History Database 2011). Least Bell's vireos have been observed more recently in Big Sur (2013) and in Montana de Oro State Park (2016, eBird 2019).

Current management strategies for least Bell's vireo are focused on habitat restoration, monitoring, and the removal of brown-headed cowbirds from occupied habitats (USFWS 2006). Management of LBVI on CR consists primarily of general bird protection and protection of riparian habitat. The CA ARNG proposes to continue conducting USFWS protocol surveys and should LBVI occur on the installation, a more intensive management plan will be developed.

Goal: *Promote conservation and recovery of least Bell's vireo on CR.*

Objective: *Conserve and enhance least Bell's vireo habitat on CR.*

4.7.8 Tricolored Blackbird

There are no known breeding occurrences of tricolored blackbird on CR. However, tricolored blackbird occurs in the area and suitable habitat exists on the installation. There is potential for this species to occur on CR.

Due to the lack of occurrence data on CR, the CA ARNG does not directly manage the tricolored blackbird. However, management of other bird species and measures to protect wetland habitats will also benefit the tricolored blackbird. Should the tricolored blackbird occur regularly at CR, more detailed conservation measures will be developed.

Goal: *Promote the conservation of tricolored blackbird on CR.*

Objective: *Protect the tricolored blackbird and its habitat on CR.*

4.7.9 Bank Swallow

As of 2020, the bank swallow likely does not breed at Camp Roberts. However, it may have bred at Camp Roberts in the past and if any suitable habitat appears, it could become a breeding site in the future.

No direct conservation specifically for the bank swallow has been undertaken at Camp Roberts; however, measures taken to avoid impacts to wetlands, water quality, and stream banks all are beneficial to the species.

Goal: *Promote the conservation of the bank swallow on CR.*

Objective: *Protect the bank swallow and its habitat on CR.*

4.7.10 San Joaquin Kit Fox

The loss of large tracts of grasslands and shrublands within the San Joaquin kit fox's range has reduced the habitat available for the species and increased its interactions with humans. Predators and competitors that are associated with humans such as coyotes, red foxes and dogs have contributed to the species decline.

Current management of the San Joaquin kit fox is guided by USFWS BOs; however, the species steep historical decline has not been reversed. The San Joaquin kit fox is an umbrella species for the grassland ecosystem, such that improved conservation of kit fox habitat will improve the habitat for many other species.

Goal: *Promote conservation of San Joaquin kit fox on Camp Roberts.*

Objective: *Protect San Joaquin kit foxes and their habitat on Camp Roberts.*

4.8 Special Status Species

> *Pursuant to DoDI 4715.03, each INRMP shall maintain a relevant and updated baseline list of plant and animal species located at each installation for all pertinent taxonomic and regionally important groups.*

DoDI 4715.03 states that the DoD shall, to the best of its ability, implement conservation and management efforts to further the conservation of state-listed species when such action is practicable and does not conflict with legal authority, military mission, or operational capabilitiesCA ARNG recognizes that it is prudent to protect rare species as a proactive strategy to prevent future federal listings. As described in Section 3.6, special status species are not listed under State or Federal ESA, but have been designated by other agencies and organizations as species with increased conservation concern.

These lists serve as watch lists for species that may be deserving of formal listing. CSSC status applies to animals not listed under the federal ESA or CESA, but which nonetheless: (1) are declining at a rate that could result in listing, or (2) historically occurred in low numbers and known threats to their persistence remain. All California Species of Special Concern can be found on the CNDDB, a highly valuable repository of rare plant and animal information maintained by the Habitat Conservation Division of CDFW. The primary function of the CNDDB is to provide the most current information available on the state's most imperiled elements of natural diversity and to provide tool to analyze these data (Bittman 2001).

There are 35 plants, two fish, six reptiles and amphibians, 12 birds, and seven mammal species considered sensitive that occur or are likely to occur at Camp Roberts. These species are described in *Section 3.6.2: Other Special Status Species* of this INRMP. To the extent that resources are available to support the management of these species, Camp Roberts intends to implement the following objectives and strategies.

Goal: *Provide for the conservation, enhancement, and protection of special status species as a proactive strategy to prevent federal and state listings.*

Objective 1: *Determine special status species distribution and abundance on CR to aid in future management.*

Objective 2: *Protect existing special status species and their habitat on CR.*

5.0 Sustainability and Compatible Use

5.1 Sustainability of the Military Mission and the Natural Environment

The purpose of this section is to address how mission requirements are met while meeting natural resources compliance responsibilities. A successfully implemented INRMP will meet two basic purposes: (1) It will ensure the sustainability of natural resources at an installation, and (2) it will ensure no net loss of the capability of installation lands to support the DoD mission.

5.1.1 Climate Change

The effects of a changing climate are currently and will continue to be a national security issue, impacting Department of Army installations, operational plans, and overall missions. The Army recently released a memo directing installations to plan for energy and climate resilience efforts by identifying the installation's vulnerability to climate-related risks and threats. This memo is consistent with DoD guidance per 10 USC § 2864 (Master plans for major military installations, April 2020), DoDD 4715.21, and DoDD 5111.13, which require the DoD understand the threat posed by climate change to the national security of the United States and improve the resilience of impacted installations. Assessments under Army Directive 2017-07, Installation Energy and Water Security Policy, also require information about future conditions.

Hotter temperatures have already contributed to reductions of seasonal maximum snowpack and its water content over the past 30-65 years, partially attributed to human-caused climate change. Increased temperatures most strongly affect snowpack water content, snowmelt timing, and the fraction of precipitation falling as snow. The increase in heat and reduction of snow under climate change have amplified recent hydrological droughts in California. Periods of low precipitation from natural variations in the climate system are the primary cause of major hydrological droughts in the Southwest region, particularly in California and the upper Colorado River Basin. Projected hotter temperatures increase probabilities of decadal to multi-decadal mega droughts, which are persistent droughts lasting longer than a decade, even when precipitation increases. Increases in temperature would also contribute to aridification (a potentially permanent change to a drier environment) in much of the Southwest.

Aridity is a long-term reduction in climatic wetness in a region and has significant impacts on soil moisture, vegetation type and density, available water supply, and wildfire risk. This in turn has impacts on air quality, changes in storm frequency, stream bank erosion and gullying, increased dust, protected species stress and potential for more species placed at risk, and spread of invasive species.

Environmental impacts of rising temperatures are likely to include shifts in vegetation communities including rare, threatened, and endangered species they support; increased invasive species; increased vector-borne and zoonotic (animal to human) diseases. Increase in temperatures and drought also contribute to wildfires as there is less moisture in the soil and vegetation. The change in snow-pack melt and shifting rain patterns further exacerbate dry conditions and increase fire risk. Once a fire starts,

warmer temperatures and extensive dry conditions promote wildfire growth and make them harder to put out.

The projected increase in one-day precipitation amounts will contribute to flooding, as over saturation of upper soils layers reduces the ability of the ground to absorb the rainfall and leads to a greater runoff for a given amount of precipitation. The net result of this is higher flood peaks that occur more rapidly, and a reduction in the amount of rainfall that penetrates the sub-surface to the rooting depth of plants.

Direct impacts to CR may include increased maintenance costs for roads, utilities, and runways; reduced live-fire training; reduced water availability and greater competition for limited water resources; reduced training carrying capacity; operational health surveillance and risks; and increased flood control/erosion prevention measures. Other impacts include military personnel safety; temporary or prolonged disruption of military operations or test and training activities due to storm damage; increased maintenance costs, and infrastructure damage.

Managing climate related risks will be critical in sustaining the CR installation and maintaining military readiness. The CA ARNG has identified and will continue to implement sound natural resources strategies and adaptive management that provide benefits to the ecosystem and training abilities, regardless of how climate changes occur. Strategies to combat climate change have been incorporated into management actions for natural resources on CR.

Goal: *Combat the implications of climate change by promoting landscape resiliency and reducing fossil fuel dependency.*

Objective: *Integrate climate adaptation strategies into natural resource management.*

5.1.2 Encroachment Partnering

Encroachment has emerged in recent years as a major issue for the DoD as population growth continues near military installations. Encroachment refers to all external influences threatening or constraining training activities required for force readiness. Such encroachment stems from (1) environmental (2) social (such as urban sprawl), and (3) economic (such as changing land values) influences. Impacts include, but are not limited to, restrictions on available training locations; restrictions on available times and duration for testing and training; reduced effectiveness of testing and training activities; and restrictions on weapons systems, equipment, and munitions used during testing and training. From an environmental perspective, the loss of natural habitats through development on areas adjacent to military installations can negatively impact the biodiversity on military lands.

Healthy, sustainable ecosystems support realism in military training by providing unencumbered open space and buffers, stable and productive soils, clear air, clean water, and a range of natural cover and environmental conditions available for the indefinite future.

As part of the 2003 DoD Authorization Act, the Army developed the ACUB program. This program allows acquisition of development rights or fee title for the establishment of conservation easements on adjoining installation properties to protect training lands from encroachment. Funded up to 75% by DoD, acquisitions are accomplished through a partnership agreement between DoD, a public or private conservation organization, and the private property owner.

The regional importance of Camp Roberts to the counties, local communities, and federal and state natural resource agencies is reflected in a strong history of cooperation and partnership projects, and strong regional planning framework for conservation (described in Chapter 2).

The CA ARNG continues to successfully participate in the ACUB program. The ACUB program at Camp Roberts has managed encroachment with the purchase of property and/or development rights for 1,900 ac critical to the sustainability of specific military training and testing operations.

Goal: *Sustain military readiness and installation biodiversity by proactive encroachment planning. .*

Objective: *Continue to participate in the ACUB program.*

5.2 Outdoor Recreation and Environmental Awareness

The Sikes Act requires that DoD lands shall be available to the public and DoD employees for enjoyment and use of suitable land and waters whenever possible and not in conflict with the mission.

Federally-owned installations can charge fees for recreational activities and use the revenues to fund conservation projects as part of the DoD Conservation Reimbursable Fee Collection Program. Currently, public access is restricted outside of special events targeting the public or other collaborative uses of Camp Roberts' lands, such as partnerships with local organizations or natural resources research and studies. These restrictions are based on security and safety requirements, given the mission of Camp Roberts and to minimize impacts to natural resources.

The principal forms of natural resources-based outdoor recreation at Camp Roberts includes hunting. Fishing is not currently permitted on the installation. The Camp Roberts hunting program is facilitated by the installation and is open to military personnel, dependents, civilian employees, and the public. Hunters are provided access only during special hunting days which are determined by the Camp Roberts Morale, Welfare, and Recreation (MWR) department. Hunt days are determined by military training operations and occur approximately one weekend per month from July to April. Hunts are species specific, to include dove, quail, turkey, pig, and deer. Hunters must have appropriate hunting license and tags from the State of California and a Camp Roberts Hunting Permit. Members of the public may sign-up to be put into the lottery to come out on a hunt day. Other hunting events include veteran and active military hunting days. Hunters must register each day and must return their registration forms with harvest results to the MWR office at the close of each day. The MWR office shares harvest information with the Environmental Directorate who then coordinates with CDFW to manage game populations to achieve countywide population objectives.

Goal: *Improve the quality of life for soldiers training at Camp Roberts, staff, and the local community by providing compatible natural resource–based recreational opportunities.*

Objective: *Plan and promote recreational opportunities when consistent with the military mission and sound ecosystem management principles.*

5.3 Developed Areas, Landscape and Grounds

Activities on improved grounds include annual mowing, irrigation, fertilization, seeding, spraying, pruning, trimming, weed, dust and erosion control, drainage, planting for landscape effect, and other intensive practices. Landscaped areas supply many ecosystem benefits for people and can as well play a secondary but important beneficial role for wildlife. These areas include hedgerows, visual screens, roadsides, and road medians. They can impede or facilitate movement of animals or invasive plants, depending on how they are treated. They can provide a biosecurity buffer, assist climate adaptation, regulate flooding, resist non-native species invasion, reduce the threat of wildlife mortality due to roadkill or powerline kill, and provide aesthetic value.

Construction and maintenance activities occur on buildings, roads, utilities, and other infrastructure on a routine basis. Current Army guidance promotes sustainable practices regarding building construction and upgrades, reusable energy consumption, and water conservation strategies to incorporate as current practices on Army installations. Such practices minimize adverse effects on the natural environment.

Goal: *Enhance the role developed and landscaped habitats play in water quality, declining wild species, native pollinators, and the health of wetlands and waterways, and other natural communities.*

Objective: *Incorporate innovation and best science in decisions about construction and its connection to natural resource sustainability. Utilize low-impact design and green infrastructure approaches to improve natural resource function and value while improving ecosystem services.*

5.4 Beneficial Partnerships and Collaborative Planning

It is DoD's policy to promote collaborative partnerships and integration of INRMP activities with external stakeholders, including consistency with state and regional natural resources plans. Coordinating with partner agencies is a guiding principle of ecosystem management for federal agencies (DoDI 4715.03).

CR continues to enhance resource management capabilities through effective partnerships. An array of multiple partnerships are needed, from local to regional to national, to effectively implement the ecosystem framework of an INRMP. Camp Roberts has a legacy of participating and benefitting from these collaborative efforts for several decades.

Goal: *Regularly engage in cooperative resources planning partnerships to create regional conservation, ecosystem-based solutions of mutual benefit. .*

Objective: *Participate in regional conservation and ecosystem planning efforts, in collaboration with other governmental agencies and non-governmental organizations.*

5.5 NEPA and CEQA Compliance

Compliance with NEPA requires federal agencies to consider and document the potential environmental effects of federal actions. The Army's guidance for implementing NEPA is contained in Environmental Analysis of Army Actions (AR 200-2), 32 Code of Federal Regulations (C.F.R.) Part 651 (2002). Similarly, CEQA also requires environmental documentation of actions that are state funded or occur on state

property. Because the CA ARNG acts as both a federal and state agency, it must comply with the requirements of both acts. Actions subject to NEPA/CEQA include virtually all activities undertaken, funded, or supported by the federal/state government.

NEPA specifies three types of environmental documentation (note: the CEQA equivalent documents, which are prepared jointly with the NEPA document, immediately follow the NEPA document types in italics): the Categorical Exclusion (Categorical Exemption); the Environmental Assessment (Initial Study [IS]); and the Environmental Impact Statement (Environmental Impact Report).

All projects and training activities near sensitive resources are reviewed by CAEV prior to implementation. Project proponents submit a project information packet (PIP) that contains information on project details and training requests are reviewed and approved via the Range Facility Management Support System (RFMSS). Potential environmental impacts per NEPA and CEQA guidelines are determined and mitigation measures to offset impacts are documented in an Environmental Determination (ED) before a project or training may proceed.

Goal: *Apply NEPA and CEQA requirements and policies to enhance mission-related use and conservation of natural resources.*

Objective: *Continue to assess the environmental consequences of proposed actions using the existing CA ARNG integrated NEPA/CEQA process.*

5.6 Law Enforcement

Areas of concern that can adversely affect natural resources include trespassing for recreational purposes, illegal dumping, speeding, poaching, and removal of cultural resources from the training site. Illegal trespass for recreation is a concern for both natural resources and military training. It is also hazardous to the perpetrator due to natural hazards and those related to use of surface danger zones associated with training activity.

The CA ARNG coordinates with appropriate agencies to support conservation law enforcement to enforce federal and applicable state laws and regulations pertaining to the management of the natural resources under their jurisdiction. Impacts to natural resources are assessed and appropriate mitigation measures are identified when applicable.

Goal: *Provide for enforcement of natural resources laws and regulations by professionally trained personnel, taking proper safety and security measures.*

Objective: *Ensure that installation users practice environmental stewardship in accordance with AR 200-1 and CA ARNG Regulation 200-1 (Camp Roberts Regulation 350-1).*

5.7 Training of Natural Resources Personnel

Training of CA ARNG natural resources personnel is an important aspect of the ARNG-ILE. Recognizing the need for personnel to have up to date knowledge of technical and policy issues, NGB provides annual funding to all states. Staff training focuses on both technical and policy training. Technical training occurs

at a variety of venues including government training centers, universities, and nonprofit and private organizations.

Policy training occurs primarily through the annual Programming Guidance Course held by the NGB. This workshop provides updates on current and emerging National Guard and Army policy, as well as discussions of funding and regulatory issues. Further policy training is also provided in-house through dissemination of important information at staff meetings and electronic training courses (2011 CSLO INRMP).

Goal: *Continue to improve the success of natural resources management activities through professional development and training.*

Objective: *Continue to provide professionally trained personnel for enforcement of conservation laws and regulations.*

6.0 INRMP Implementation

6.1 Successful Implementation

Formal adoption of an INRMP by the State Guard Adjutant General and the Chief, Army National Guard Installations and Environment Directorate (ARNG G-9) constitutes a commitment to seek funding and execute projects and activities in accordance with timeframes identified in the INRMP. The INRMP is implemented by (DoDM 4715.03 CH-2):

- Programming projects by actively requesting and using funds in support of INRMP strategic goals and objectives.
- Ensuring that sufficient numbers of professionally trained natural resources personnel are available to perform the tasks required by the INRMP.
- Coordinating feedback on INRMP effectiveness from the USFWS and CDFW each year.
- Documenting specific INRMP annual accomplishments.
- Evaluating the effectiveness of past and current management activities and adapting those activities as needed.

This INRMP will become effective upon the acceptance and signatory release described in *Section 3: Responsibilities and Staffing*. As this plan serves as a formal structuring and integration of the existing natural resources management program, existing projects, activities, and plans have been incorporated into the INRMP and the Project Implementation Table (Appendix A), which is to be updated each year in collaboration with internal and external stakeholders and partners. The projects are scheduled by looking ahead five years, and by their priority ranking.

Priorities identified in this INRMP will generally determine the order of implementation. Future work identified will be implemented as funding becomes available. The Environmental Directorate will determine what projects and activities are appropriate to initiate, given funding, at any particular time. The INRMP is meant to be flexible, dynamic, and adaptable to the immediate and emergent needs of natural resources management and the ARNG mission. Programming for INRMP implementation generally occurs in one- to three-year budget cycles; this is how the DoD allocates resources and links INRMP objectives to budgets and execution.

> *ARNG-IEZ INRMP policy requires that INRMPs include a "Project Table, with all natural resources projects and the goals/objectives they support for the next five fiscal years." The Table summarizes the INRMP's "[s]pecific natural resource management goals, objectives, and projects with an implementation schedule" (ARNG-IEZ Memorandum, 20 March 2019).*

6.2 Funding and Project Implementation Sources

The Army views natural resource investments as a means of supporting its military mission. "Army organizations will make prudent investments in environmental initiatives that support mission accomplishment, enhance readiness, reduce future funding needs, prevent or mitigate pollution, improve compliance, and reduce the overall cost of compliance with applicable environmental requirements" (AR 200-1).

Funding for INRMP implementation is not limited to environmental funds. Responsibility for funding natural resource management activities is outlined in the Army Sustainable Range/Installation Environmental Responsibilities Matrix, and is clarified in Memorandum, NGB-ARI, 17 APR 06: Clarification of Funding Responsibilities.

Implementation and execution of the INRMP are shared responsibilities among those stakeholders that use or have a land management responsibility for ARNG installations. Regardless of funding source, all State ARNG natural resources management projects must be included in the INRMP Implementation Table (Appendix A). Some work is funded by project proponents or ARNG tenants, others through general operations and maintenance funds.

In order to implement the various research, surveys, and programs necessary to fulfill the INRMP goals and objectives, funding must be identified and acquired. Most environmental projects are funded through the Environmental Management Decision Evaluation Packages (MDEP VENQ) and managed through the U.S. Army Installation Management Command (IMCOM). Projects are programmed through the Status Tool for the Environmental Program (STEP). There are also several avenues of funding available, beyond the ARNG operational budgets that allow the inclusion of additional projects or activities to assist the Environmental Directorate in their beyond-compliance stewardship endeavors. The Environmental Directorate must continually assess the priority and level of budgetary needs to fulfill regulatory requirements and to sustain overall program goals. These funding sources are discussed below in general terms, as this process is dynamic and is dependent on the INRMP's continuously developing program.

DoD Legacy Funds

The Legacy Resource Management Program (LRMP) was enacted in 1990 to provide financial assistance to military natural and cultural resources management. The program assists with protection and enhancement of natural resources while supporting military readiness. Legacy projects may involve regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, and/or monitoring, and predicting migratory patterns of bird and other animals.

Special Initiatives

The DoD or Army may establish special initiatives to fund natural resource projects. Funding is generally available only for a limited number of projects.

DoD Conservation Reimbursable Fee Collection Program

Under this program, revenue from the CR Hunting Program can be used to fund natural resource management projects.

Contractor Support

Contractors give Camp Roberts access to a wide variety of specialties and fields. This includes CEQA and NEPA review and documentation for large projects, vegetation surveys, species surveys, invasive species management, grounds maintenance, management plans, and similar activities.

Memoranda of Understanding

MOUs can provide valuable services to Camp Roberts that benefit both sustainability of the military mission and natural resources management.

Memoranda of Agreement/Cooperative Agreements

Cooperative Agreements are legal relationships between the Army and States, local governments, institutions of higher education, hospitals, non-profit organizations, or individuals. The responsibility for awarding grants and cooperative agreements is vested in the Head of each DoD Component that has such authority (32 C.F.R. § 21.210). Priority shall be given for the procurement of INRMP implementation and enforcement services to Federal and State agencies having responsibility for the conservation or management of fish and wildlife in accordance with the Sikes Act (DoDI 4715.03).

The Camp Roberts has implemented an ACUB agreement in this regard.

Cooperative Ecosystem Studies Units

The Cooperative Ecosystem Studies Units (CESU) program is a working collaboration among federal agencies, universities, state agencies, non- governmental organizations, and other nonfederal institutional partners. The CESU National Network provides multidisciplinary research, technical assistance, and education to resource and environmental managers. Although the overall program is overseen by the U.S. Department of the Interior, one of the participating agencies is DoD.

University Assistance

Universities are an excellent source of research assistance. Camp Roberts has used several universities in the past to help with specialized needs (particularly natural resources research), such as California State University Fresno and the UC Berkeley. Work with these two universities was accomplished through CESU.

Use of Volunteers

Installations may use appropriate partnerships and volunteers to enhance natural resources conservation programs, when practicable, in accordance with DoDI 1100.21 (“Voluntary Services in the Department of Defense,” March 11, 2002, as amended). Work shall be performed under the direction of Federal employees and, when practicable, under the direction of professionally trained natural resources personnel.

6.3 Responsibilities and Staffing

The Sikes Act specifically requires that there be “sufficient numbers of professionally trained natural resources management and natural resources enforcement personnel to be available and assigned responsibility” to implement an INRMP. The responsibility for implementation of INRMPs is shared at many levels among different command elements between Sacramento and Camp Roberts. The defined roles of various parties ensure that the programming of work takes place that is necessary to establish and support an integrated

natural resources program consistent with legislative requirements, DoD policy, and stewardship. *Section 1.3.2: Roles and Responsibilities* describes some of the high-level ARNG roles in INRMP execution.

6.4 Sikes Act Coordination

Both internal and external coordination requirements are contained in the Sikes Act.

Internal Coordination

Internal stakeholders are, at a minimum, all those with roles described in *Section 1.3.2: Roles and Responsibilities*. Natural resources managers are to engage internal stakeholders (e.g. operations and training, public works, planners) in developing, reviewing and updating the INRMP to ensure goals, objectives, and actions are in line with mission requirements; to identify potential project conflicts or opportunities for cooperative program implementation; to establish specific goals and measurable objectives for all elements of the INRMP, pursuant to the Sikes Act (as amended [16 U.S.C. § 670(a)(1)(B)]); and to establish installation-specific objectives and measure progress toward achieving those objectives, as appropriate.

External Coordination

The CA ARNG will engage USFWS and the CDFW in scoping, designing, preparing, and reviewing periodically the INRMP. Consistent with the Sikes-Tripartite MOU, a field office reviews the INRMP and provides preliminary agreement concerning the conservation, protection, and management of fish, wildlife, and plant resources. The parties review the INRMP for technical adequacy of the content and to secure mutual agreement from all signatories. Installations will consult with federally recognized Indian tribes, where tribal treaty rights, sacred sites, burial sites, or other rights to natural and cultural resources may be affected (DoD 4715.03).

Signatures

A compliant plan must include documentation evidencing mutual agreement. Mutual agreement is attained when the INRMP is signed by each of the individuals listed below:

- The USFWS regional director or their designee.
- CDFW director or their designee.
- State Military Service representative (The Adjutant General).
- ARNG Directorate (ARNG G-9 Chief).

6.5 INRMP Review

The Sikes Act and Army policy (AR 200-1) require that the INRMP establish specific goals and measurable objectives for all components of the INRMP, and that metrics be established to measure progress towards achieving the objectives. In order to assess and document progress and determine if an INRMP Update or Revision is necessary, the INRMP is reviewed annually. Annual reviews are completed in cooperation with internal partners (i.e. DPW, ITAM, DPTMS) as well as external partners (USFWS, CDFW, and NMFS).

As detailed in the 2019 ARNG G-9 INRMP policy guidance and DoDI 4715.03 (2018), annual reviews address the considerations in the Annual Review Template (Table 6-1) and include an update to the

Project Implementation Table (Appendix A). Annual reviews are documented in a memorandum for record which includes the names and offices of all attendees, responses to the Annual Review Template (Table 6-1), and whether an Update or Revision is necessary. A copy of the memorandum for record and the update project table is forwarded to ARNG I&E at the end of each fiscal year.

Table 6-1. Annual Review Template.

INRMP Project Implementation	
1	Are INRMP projects, including follow-up inventorying and monitoring work, properly identified, developed, and submitted for funding?
2	Has project funding been received, obligated, and expended?
3	What projects have been completed and do they meet expected objectives?
4	What new projects are proposed?
Federal ESA Listed Species and Critical Habitat	
1	Are conservation efforts effective?
2	Does the INRMP provide conservation benefits necessary to preclude USFWS Critical Habitat designation?
3	Are Species at Risk identified and are steps being undertaken to preclude listing?
Partnerships Effectiveness	
1	Has the INRMP review team (State ARNG, USFWS, ARNG G-9, and the State Wildlife Agency) been effective in ensuring the INRMP's implementation?
2	Are other partnerships needed to meet the INRMP goals?
3	Have other partnerships been effectively used to meet INRMP goals?
4	Are internal stakeholders (training, facilities, etc.) effectively coordinating projects?
Fish and Wildlife Management and Public Use	
1	Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to soldiers and employees?
2	Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to the public?
3	Does the INRMP and site offer opportunities or facilities for disabled sportsmen?
Staffing and Training	
1	Is the State ARNG's natural resources team adequately resourced to fully implement the INRMP?
2	Is the State ARNG's natural resources team adequately trained to fully implement the INRMP?

Annual reviews are tracked and reported in the annual AEDB–EQ data submission. AEDB–EQ submission are due by the end of the 4th fiscal quarter (September 30) of each year. Per the requirements of the Sikes Act, DoD compiles this information and provides a report to Congress on INRMP status and implementation.

In addition to annual reviews, each INRMP must be reviewed for Operation and Effect at least once every five years by the state ARNG, USFWS, State Wildlife Agency and ARNG I&E. This comprehensive review assesses whether the INRMP is being implemented effectively and contributing to the conservation and rehabilitation of natural resources on ARNG lands. Specific guidelines for five year reviews are detailed in the 2019 ARNG G-9 INRMP policy guidance which ultimately results in an INRMP Update or Revision and new signature page.

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Appendix A. Project Implementation Table

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Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Soil Resources	4.2. Soil Resources				
	Goal: Conserve soil productivity, nutrient and carbon functioning, water quality, and plant and wildlife habitat through effective conservation practices.				
	Objective 1: Reduce or eliminate areas of barren soil by maintaining adequate vegetative cover.				
	•	Conduct a post-wide evaluation to determine the erosivity of soils on the installation to guide vegetation and soil management strategies. 9632147	2025	C	Once
	Objective 2: Use proper grading techniques and BMPs to control and prevent erosion.				
	•	Continue to participate in partnership grant opportunities to implement the MBNEP CCMP.	2022	IH	As needed
Watershed and Water Resources	4.3. Watershed and Water Resources				
	Goal: Ensure a reliable, safe and sustainable water supply. Protect surface and groundwater resources and enhance as practicable.				
	Objective 1: Practice water conservation techniques throughout the installation.				
	•	Re-vegetate landscaped areas with native, drought-tolerant vegetation.	2023	C	As needed
	•	Install rain catchment and grey water systems to supply landscape irrigation where needed.	2024	C	As needed
	Objective 2: Reduce pollutant and sediment loading into wetlands and waterways.				
	•	Conduct an annual assessment of unpaved roads to determine erosion potential.	2023	IH	Annually
	•	Conduct an assessment of stormwater structures and culvert conditions and determine erosion and flood risk; identify priority treatment areas.	2022	IH	Once
	•	Conduct a watershed assessment to identify sources of pollution and erosion and prioritize their control.	2024	C	Once
	Objective 3: Slow runoff rates and increase percolation of stormwater to aid in groundwater re-charge.				
	•	Implement LID projects and strategies to conserve water, improve water quality, enhance stream flow, and augment groundwater resources.	TBD	IH	As needed
	Objective 4: Align water management on CR with regional water management strategies.				
	•	Work with local watershed agencies to stay current on watershed objectives and participate in development, review, and updates of local water management plants.	Ongoing	IH	As needed
Wildland Fire	4.4 Wildland Fire				
	Goal: Promote the natural role of fire in the CR ecosystem and prescribed fire as an ecosystem-based management tool.				
	Objective 1: Reduce wildfire potential using appropriate management practices such as prescribed burning and firebreak/fuelbreak maintenance.				
	•	Obtain and maintain accurate burn records; map and retain GIS data on burn plots, dates and acreages	Ongoing	IH	Annually
	Objective 2: Improve integration of wildland fire planning and ecosystem objectives to restore resilient and healthy ecosystem processes.				

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Wildland Fire	•	Review the IWFMP annually and certify as current by the installation commander. Annual reviews will be documented in a MFR and appended to the IWFMP as required by updated Army policy.	2022	IH/C	Annually
	•	Attend appropriate wildland fire trainings and obtain NWCG qualifications for ENV staff involved with wildland fire planning and/or implementation.	2022	IH	Annually
Vegetation and Wildlife Habitat	**4.5.1 General Vegetation , Grassland, and Shrublands**				
	Goal: Conserve and enhance the ecological integrity of each vegetation community to promote its beneficial functions such as wildlife support, food webs, biodiversity, watershed protection, productivity, and nutrient/carbon storage and cycling.				
	Objective 1: Reduce threats to native vegetation.				
	•	Control invasive species to prevent degradation of native plant communities.	2022	C	Annually
	•	Conduct vegetation surveys every five years and update data and maps accordingly.	2022	IH/C	Annually
	Objective 2: Restore and enhance native vegetation communities and promote their resilience.				
	•	Install fencing, signage, and Siebert stakes around sensitive resources or degraded areas needing rehabilitation.	Ongoing	C	As needed
	•	Conduct an assessment of fuel conditions in relation to desired community composition and desired fire regime. Design prescribed fire treatments for ecological benefit to reduce any threat to the community.	2024	C	Once
	•	Develop multiple restoration plant palettes for a range of vegetation communities that is based on the species composition of intact, native, vegetative stands located in close proximity to the area(s) being affected prior to development.	2023	IH	Once
	4.5.2 Forest and Woodlands				
	Goal: Protect and maintain oak and riparian woodlands and their natural ecosystem roles such as wildlife habitat, migration corridors, watershed function, thermal cover, and carbon sequestration.				
	Objective 1: Prevent loss and degradation of forest and woodlands.				
	•	Install and maintain riparian fencing to control rouge cattle and feral pig activity in riparian habitat.	Ongoing	IH/C	As needed
	•	Remove non-native trees and control other invasive species in forests and woodlands.	2022	C	Annually
	•	Conduct routine surveys of riparian habitats to document and assess habitat quality and identify areas in need of habitat enhancement activities.	2022	IH	Annually
	•	Restore, maintain, and enhance riparian corridors with native vegetation that will improve bank stability and structure and biological productivity.	Ongoing	IH/C	As needed
	Objective 2: Encourage native tree recruitment and forest and woodland regeneration.				
	•	Plant acorns at every chance and promote sapling growth where possible to aid in oak regeneration.	2022	IH	Annually

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Vegetation and Wildlife Habitat		• Install fencing or tree tubes around saplings to protect young trees from browsers.	Ongoing	IH	As needed
		Objective 3: Prevent the spread of Sudden Oak Death Syndrome (SODS) disease in coast live oak, a deadly arboreal disease caused by an invasive plant pathogen from Europe, *P. ramorum*.			
		• Educate staff on how to notice signs of Sudden Oak Death Syndrome (SODS) disease and how to report infections to the California Oak Mortality Task Force.	Ongoing	IH	As needed
		4.5.3 Native Trees			
		Goal: Protect native trees to preserve both the ecological and mission-critical benefits they provide to CSLO.			
		Objective: Ensure replacement and protection of existing native trees.			
		• Collect local acorns and propagate as needed. Maintain seedlings for re-vegetation efforts.	2022	IH	Ongoing
		4.5.4 Wetlands and Aquatic Habitat			
		Goal: Preserve wetland and aquatic habitat and the ecosystem services they provide such as fish and wildlife habitat, water quality improvement, flood control, and groundwater replenishment.			
		Objective 1: Protect wetland and aquatic habitat.			
		• Repair eroded roads, trails, firebreaks and other areas to prevent sedimentation of wetlands and aquatic areas on CR.	Ongoing	IH/C	As needed
		• Install and maintain Seibert stakes around wetland areas to protect from intrusion and disturbance.	Ongoing	IH	As needed
		• Monitor species dependent on wetland ecosystems and evaluate effects of management on species and their habitats.			
		Objective 2: Restore and enhance wetland and aquatic habitat.			
		• Remove nonnative and invasive species	Ongoing	C	Annually
		• Conduct an analysis and feasibility study to determine potential for increasing the holding capacity of ponds and reservoirs to enhance water supplies for wildlife	2025	C	Once
		4.5.6 Invasive Plants			
		Goal: Use integrated pest management strategies to control the spread and introduction of invasive plants to protect natural resources, improve habitat, sustain land available for military training, and provide for health and safety.			
		Objective 1: Control or eradicate existing invasive populations to prevent further spread throughout the installation.			
		• Develop a rapid response plan for immediate invasive control actions	2023	IH	Once
		• Map and maintain a geodatabase of invasive plant populations.	2022	IH/C	Annually

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
	Objective 2: Prevent and control new introductions of invasive plants.				
	•	Review the IPMP every year and update every five years.	2022	IH/C	1 year/5 years
	•	Develop an invasive species control plan for CR that identifies invasive weed control priorities, strategies, methods, and tools. Update annually.	2023	IH/C	Annually
	•	Identify areas occupied by special status species, mission critical areas, or areas that are currently lacking invasion to keep clear of pest plants.	2023	IH	2 years
Fish and Wildlife	**4.6.1 General Fish and Wildlife**				
	Goal: Conserve the natural ecological role of native fish and wildlife populations on CR.				
	Objective 1: Protect fish and wildlife species and their habitats on CR.				
	•	Control invasive plant and animal species	2022	C	Annually
	•	Retrofit power structures to protect raptors and other large birds when possible.	Ongoing	IH/C	As needed
	•	Develop a comprehensive Bird Management Program that details survey and monitoring protocols and best management practices for nesting birds.	2023	IH	Once
	•	Develop a comprehensive Bat Management Program that details mitigation strategies and creates and/or enhances high quality roosting habitat.	2024	C	Once
	•	Purchase and install bat boxes at every opportunity.	Ongoing	IH	As needed
	•	Participate in regional partnerships and working groups that focus on wildlife conservation.	Ongoing	IH	Annually
	•	Perform targeted planning level surveys for invertebrates, herpetofauna, birds, mammals, and fish at CR.	2022	C	Annually
	•	Routinely monitor fish and wildlife populations on the installation.	2022	IH/C	Annually
	•	Map habitat values for each group of animals so habitat elements may be protected.	2023	IH/C	2 years
	•	Install wildlife guzzlers or rehabilitate existing guzzlers to enhance water sources for wildlife species.			
	Objective 2: Assess fish and wildlife status and trends. Maintain accurate and up-to-date records on fish and wildlife distribution and abundance to aid in future management decisions.				
	•	Contribute survey data to community, regional, state, and federal databases and tracking systems (i.e. ebird, inaturalist, HerpMapper)	Ongoing	IH	Annually
	•	Maintain accurate and user-friendly databases.	Ongoing	IH	Annually
	•	Work with regional universities or educational organizations to assist in identification of species or in surveys at CR.	2023	IH	Annually

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Fish and Wildlife		• Utilize new technology to conduct or assist with biological surveys and monitoring when available.	2023	IH	As needed
		• Participate in DoD Partners for Amphibian and Reptile Conservation (PARC) and Partners in Flight (PIF).	Ongoing	IH	Annually
		• Supplement annual bird surveys with Christmas bird counts or other annual counts.	2022	IH	Annually
		• Work with CDFW to investigate the carrying capacity for tule elk on CR.			
	4.6.2 Pollinators				
	Goal: Conserve pollinator populations and their habitat on CR.				
	Objective: Improve understanding of pollinator use on CR.				
		• Conduct a pollinator inventory. Establish the baseline conditions of pollinators, the plants that depend on them, and the benefits they provide.	2023	C	Once
		• Develop a pollinator monitoring program and conduct routine monitoring.	2024	C	Once/as determined
		• Actively participate in pollinator partnerships and other local pollinator conservation organizations.	Ongoing	IH	Annually
	Objective 2: Protect and enhance pollinator habitat.				
		• Plant pollinator friendly gardens whenever possible and use gardens as an opportunity for education and outreach.	Ongoing	IH/C	As needed
		• Develop habitat appropriate pollinator plant mixes for revegetation projects.	2023	IH	Once
	4.6.3 Invasive and Feral Animals				
	Goal: Control existing populations and prevent the spread and further introduction of invasive species and pests.				
	Objective: Follow IPM and pest control guidelines to control invasive and feral animals.				
		• Continue pig eradication efforts. Increase hunting opportunities for the public to assist in controlling pig populations.	2022	C	Annually
		• Install pig fencing around sensitive resources (i.e. riparian habitat, PUAM habitat) to arrest feral pig damage.			
		• Remove feral cats from the installation and prevent entry and development of new feral cat populations. Remove feral cat feeding stations and refuge areas once discovered.	Ongoing	IH	As needed
		• Educate installation users about the ecological impact of feral cats	Ongoing	IH	As needed
	4.7.1 Purple Amole				
	Goal: Conserve the purple amole population and contribute to species recovery on CR.				
	Objective 1: Protect purple amole plants and habitat.				

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Threatened and Endangered Species		• Coordinate with USFWS to update and revise the purple amole monitoring protocol.	2022	C	Once
		• Conduct routine monitoring as defined in the updated monitoring protocol.	2023	C	Annually
		• Conduct studies related to soils, biological crusts, and demography.	2023	C	Annually
		• Maintain Siebert stakes and signage in the PAPA.	2022	IH	Ongoing
		• Monitor the effects of fire on purple amole productivity, seed germination, and recruitment.	2023	C	Annually
		• Monitor the level of feral pig disturbance.	2022	IH	Ongoing
		• Continue to conduct feral pig eradication and consider the feasibility and effectiveness of pig fencing in the PAPA.	2022	C	Annually
		Objective 2: Enhance purple amole habitat.			
		• Conduct periodic prescribed burning and/or grazing as permitted by USFWS to reduce thatch density.	2023	IH	As needed
		• Conduct routine invasive plant eradication per findings from opportunistic surveys and focused monitoring efforts.	2023	C	Annually
		• Conduct studies to determine the most effective methods to manage invasive weeds and non-native that accumulation within the PAPA.	2023	C	Annually
		• Create and execute a targeted habitat management plan to reduce threats to purple amole from non-native thatch accumulation.	2023	C	Annually
		4.7.2 Vernal Pool Fairy Shrimp			
		Goal: Promote conservation of vernal pool fairy shrimp on CR.			
		Objective 1: Protect vernal pool fairy shrimp and their habitat.			
		• Conduct routine surveys of VPFS to monitor population levels.	2023	C	3 years
		• Install informational signage at vernal pool fairy shrimp mitigation areas.	2024	C	Once
		• Develop a vernal pool habitat management plan.	2024	C	Once
		Objective 2: Enhance vernal pool fairy shrimp habitat on CR.			
		• Control excessive vegetation within potential and known fairy shrimp habitat with measures such as prescribed burns and livestock grazing.	2024	C	As needed
		4.7.3 South-Central California Coast Steelhead			
		Goal: Promote the recovery, long-term health, and resilience of SCCC steelhead on CR.			
		Objective 1: Protect SCCC steelhead and its habitat on CR.			

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Threatened and Endangered Species		• Monitor steelhead distribution, abundance, and habitat enhancement effectiveness.	2023	C	Annually
	Objective 2: Enhance SCCC steelhead habitat on CR.				
		• Enhance juvenile rearing habitat in side channels by increasing habitat complexity to provide refuge from high water velocity, and cover from invasive species. Place engineered large woody debris and boulder structures in side channels inundated during summer flows.	2024	C	Once
		• Control invasive riparian and aquatic plants and animals.	2023	C	Annually
		• Rehabilitate and enhance riparian habitat along stream corridors to improve soil stabilization and provide shade and cover for aquatic species.	2024	C	As needed
		• Assess fish passage conditions for adult steelhead and juvenile steelhead and submit results to the CDFW Fish Passage Assessment Database.	2023	C	Once
	4.7.4 Bald Eagle				
	Goal: Promote the conservation of bald eagles on CR.				
	Objective: Protect bald eagles and their habitat on CR.				
		• Continue annual nest monitoring.	2022	IH	Annually
		• Conduct annual surveys for new nest sites.	2022	IH	Annually
		• Install nest cameras to monitor breeding success remotely and provide educational outreach to the public.	2024	C	Once
		• Continue to retrofit powerpoles and powerlines to reduce the risk of avian electrocution.	2022	IH	As needed
		• Update the Eagle Conservation Plan if new management guidance comes out or if management strategies require adjustment.	2023	C	As needed
	4.7.5 California Condor				
	Goal: Promote the conservation of the California condor on CR.				
	Objective: Protect the California condor and its habitat on CR.				
		• Continue to work with the VWS, USFWS and other non-governmental organizations and agencies which actively promote the recovery of the California condor.	2022	IH	Ongoing
		• Conduct an assessment of condor use and flyover data for CR.	2022	C	5 years
		• Contribute to science-based, unified data reporting by partners in cooperation with USFWS.	2022	IH	Ongoing
		• Promote the use of non-lead ammunition across the region through education of personnel and the regional community, as well as endorsement or other promotion of lead-free events and ammunition giveaways.	2022	IH	Ongoing

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Threatened and Endangered Species	**4.7.6 Swainson's Hawk Management**				
	Goal: Promote the conservation of Swainson's hawk on CR.				
	Objective: Protect Swainson's hawk and its habitat on CR.				
		• Retrofit powerpoles and powerlines at every opportunity to reduce the risk of electrocution and line strikes.	Ongoing	IH	As needed
	4.7.7 Least Bell's Vireo				
	Goal: Promote the conservation of least Bell's vireo on CR.				
	Objective: Conserve and enhance least Bell's vireo habitat on CR.				
		• Conduct USFWS protocol level surveys for least Bell's vireo to determine presence/absence at CR.	2023	C	2 years
		• Determine level of threat due to cowbird presence. Conduct cowbird trapping if it is determined eradication would be of benefit to LBVI.	2025	C	As needed
		• Enhance riparian habitat as detailed in the draft USFWS LBVI habitat restoration plan, to include non-native plant removal, planting of native trees, installation of pig fencing, and restoration of areas disturbed by feral pigs in areas of mid to high quality LBVI habitat.	2024	C	Annually
	4.7.8 Tricolored Blackbird				
	Goal: Promote the conservation of tricolored blackbird on CR.				
	Objective: Protect the tricolored blackbird and its habitat on CR.				
		• Conduct focused surveys annually to detect presence of breeding colonies on CR.	2022	IH	Annually
	4.7.9 Bank Swallow				
	Goal: Promote the conservation of the bank swallow on CR.				
	Objective: Protect the bank swallow and its habitat on CR.				
		• Conduct focused surveys of suitable nesting habitats to detect breeding colonies on CR.	2022	IH	Annually
	4.7.10 San Joaquin Kit Fox				
	Goal: Promote conservation of San Joaquin kit fox on Camp Roberts				
	Objective: Protect San Joaquin kit foxes and their habitat on Camp Roberts.				
		• As possible, consider habitat enhancement for kit foxes in concert with prescribed fire regime or other restoration work. Kit foxes benefit from open grasslands or shrublands in sandy or sandy-loam soils.	2023	IH	Annually
		• Develop a SJKF monitoring plan focused on passive monitoring via use of wildlife cameras.	2022	IH	Once

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
	• Conduct routine monitoring via wildlife cameras.		2022	IH	Ongoing
Special Status Species	**4.8 Special Status Species**				
	Goal: Provide for the conservation, enhancement, and protection of special status species as a proactive strategy to prevent federal and state listings.				
	Objective 1: Determine special status species distribution and abundance on CR to aid in future management.				
	• Conduct focused surveys and habitat assessments for special status species on CR.		2022	C	Annually
	• Report milkweed and monarch observations from all life stages, including breeding butterflies, to the Monarch Milkweed Mapper or via the project portal in the iNaturalist smartphone app.		2022	IH	Annually
	• Maintain accurate and up to date records and GIS data on special status species occurring on CR.		2022	IH	Annually
	• Submit special status species occurrence information to the CDFW CNDDB on a routine basis.		2022	IH	Annually
	Objective 2: Protect existing special status species and their habitat on CR.				
	• Install floating structures (i.e. wood, logs) in Avery reservoir to improve basking habitat for southwestern pond turtles.		2023	IH	Once
	• Enhance monarch butterfly foraging and breeding habitat by planting native milkweed (*Aesclepias californica*) and other blooming plants.		2023	IH	Annually
	• Control invasive plant and animal species.		2022	C	Annually
Sustainability of the Military Mission and the Natural Environment	**5.1.1 Climate Change**				
	Goal: Combat the implications of climate change by promoting landscape resiliency and reducing fossil fuel dependency.				
	Objective: Integrate climate adaptation strategies into natural resource management.				
	• Continue to incorporate climate resiliency into management actions for all natural resources management on CR.		Ongoing	IH/C	Annually
	• Participate in local climate initiatives to align management actions with regional efforts.		2022	IH	Annually
	5.1.2 Encroachment Partnering				
	Goal: Sustain military readiness and installation biodiversity by proactive encroachment planning.				
	Objective: Continue to participate in the ACUB program.				
	• Continue to identify mutual objectives with neighboring and regional agencies and landowners for land conservation to prevent development of critical open areas.		Ongoing	IH	As needed
	• Provide accurate information and recommendations based on the land's condition to range managers and trainers.		Ongoing	IH	As needed

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
	•	Conduct environmental outreach events for the public (such as Earth Day), nonmilitary training site users such as school/community groups.	2022	IH	Annually
Outdoor Recreation and Environmental Awareness	5.2 Outdoor Recreation and Environmental Awareness				
	Goal: Improve the quality of life for soldiers training at CR, staff, and the local community by providing compatible natural resource–based recreational opportunities.				
	Objective: Plan and promote recreational opportunities when consistent with the military mission and sound ecosystem management principles.				
	•	Coordinate with the hunting program manager to obtain and track information on harvested animals and fish.	2022	IH	Annually
	•	Host recreational hiking events, bird surveys, and wildflower tours or other public events to enjoy CR natural resources when possible.	2022	IH	Annually
	•	Identify potential sites for a wildlife viewing area on CR consistent with and to support DoD's commitment to the Watchable Wildlife Program.	2025	IH	Once
Developed Areas, Landscape, and Grounds	5.3 Developed Areas, Landscape and Grounds				
	Goal: Enhance the role developed and landscaped habitats play in water quality, declining wild species, native pollinators, the health of wetlands and waterways, and other natural communities.				
	Objective: Incorporate innovation and best science in decisions about construction and its connection to natural resource sustainability. Utilize low-impact design and green infrastructure approaches to improve natural resource function and value while improving ecosystem services.				
	•	Develop a revised planting list for horticultural species at CR that includes regionally appropriate species that comply with the Presidential Memorandum to conserve and protect water resources, use locally adapted native plants, avoid using invasive species, and minimize the use of pesticides and supplemental watering.	2023	IH	Once
	•	Develop an installation-wide water plan that includes measurable objectives, defined methods and implementation timelines for improving efficient water use and conservation in the landscape and encouraging innovative techniques and technologies.	2026	C	Once
Beneficial Partnerships and Collaborative Planning	5.5 Beneficial Partnerships and Collaborative Planning				
	Goal: Regularly engage in cooperative resources planning partnerships to create regional conservation, ecosystem-based solutions of mutual benefit.				
	Objective: Participate in regional conservation and ecosystem planning efforts, in collaboration with other governmental agencies and non-governmental organizations.				
	•	Continue the use of Cooperative Agreements to achieve natural resources management objectives, especially natural resource management research of mutual interest.	On going	IH	As needed
	5.5 NEPA and CEQA Compliance				
	Goal: Apply NEPA and CEQA requirements and policies to enhance mission-related use and conservation of natural resources.				

Management Area	Section/ Project	Project	Implementation Date	Implementation Method	Frequency
Support for NEPA and CEQA Compliance	**Objective:** Continue to assess the environmental consequences of proposed actions using the existing CA ARNG integrated NEPA/CEQA process.				
	•	Continue utilizing the Project Information Packet (PIP) process to facilitate environmental review.	2022	IH	Annually
	•	Continue to implement NEPA/CEQA programmatically for ongoing actions to avoid unnecessary project delay.	2022	IH	Annually
	•	Update the PIP submittal form and/or portal for greater ease of use and enhanced transparency and communication with project proponents.	2024	IH/C	Once
	•	Make available to project planners updated GIS maps of sensitive resources to assist in project planning.	2022	IH	Once
Training of Natural Resources Personnel	**5.7 Training of Natural Resources Personnel**				
	Goal: Continue to improve the success of natural resources management activities through professional development and training.				
	Objective: Continue to provide professionally trained personnel for enforcement of conservation laws and regulations.				
	•	Ensure environmental staff receive ongoing training and professional development through attendance at workshops, classes, training, and conferences.	2022	IH	Annually

IH: In House
C: Contract
TBD: To Be Determined

Appendix B. Conservation Measures

Management Area	Conservation Measure
Soil Resources	**4.2 Soil Resources**
	Goal: Conserve soil productivity, nutrient and carbon functioning, water quality, and plant and wildlife habitat through effective conservation practices.
	Objective 1: Reduce or eliminate areas of barren soil by maintaining adequate vegetative cover.
	• Re-vegetate recently disturbed or burned areas with native seed.
	• Rotate use of bivouac areas to allow disturbed vegetation to regenerate.
	Objective 2: Use proper grading techniques and BMPs to control and prevent erosion.
	• Locate physically intensive land disturbing military activities on the least erodible soils and backfill any military training excavations. Ensure that physically intensive land disturbing activities occurring on previously undisturbed soils are located on the least erodible soils and backfill military training excavations from current training activities.
	• Install BMPs where necessary to eliminate erosion potential.
Watershed and Water Resources	**4.3 Watershed and Water Resources**
	Goal: Ensure a reliable, safe and sustainable water supply. Protect surface and groundwater resources and enhance as practicable.
	Objective 1: Practice water conservation techniques throughout the installation.
	• Educate installation users on water conservation and benefits.
	• Ensure that watershed assessments and management plans are integrated with the installation master plan, and other plans.
	• Maintain compliance with water quality laws and regulations.
	Objective 2: Reduce pollutant and sediment loading into wetlands and waterways.
	• Implement BMPs to eliminate or minimize nonpoint sources of water pollution.
	• Ensure agricultural leases contain soil and water conservation and pollution prevention measures.
	• Promote use of rolling dips and outsloping during trail maintenance to reduce erosion potential.
	• Implement a 100 ft (30m) buffer from the edge of aquatic or wetland habitats to reduce impacts to wetlands (including seasonal wetlands, i.e. vernal pools).
	• Implement waterway buffers that extend to the outer edge of riparian vegetation.
	Objective 3: Slow runoff rates and increase percolation of stormwater to aid in groundwater re-charge.
	• Promote Low Impact Development (LID) strategies in project design.
	Objective 4: Align water management on CR with regional water management strategies.
	• Ensure CAEV staff stay current on regional water management efforts.
Wildland Fire	**4.4 Wildland Fire**
	Goal: Promote the natural role of fire in the CR ecosystem and prescribed fire as an ecosystem-based management tool.
	Objective 1: Reduce wildfire potential using appropriate management practices such as prescribed burning and firebreak/fuelbreak maintenance.
	• Follow guidelines for prescribed burns, suppression operations, and other fire management activities as detailed on the IWFMP.

Management Area	Conservation Measure
Wildland Fire	• Coordinate with the CR fire department annually to develop and implement rotating burn plots for wildfire management and fire training opportunities.
	Objective 2: Improve integration of wildland fire planning and ecosystem objectives to restore resilient and healthy ecosystem processes.
	• Conduct firebreak maintenance when invasive plants are not actively producing seed.
	• Limit annual burning to no more than 30 percent of the total acreage of any vegetation community, aside from the impact area.
	• Reestablish native vegetation after successfully prescribed burn to minimize erosion and prevent establishment of invasive plant species.
	• Monitor burn areas after prescribed burns for invasive plant seedlings and control as necessary.
	• Install BMPs where necessary after fires to prevent soils from entering waterways and wetlands.
	• When possible, conduct prescribed burning outside of nesting bird season.
	• Conduct post-fire vegetation monitoring and record any changes to vegetation community composition.
	• Maintain adequate buffers around wetlands and waterways (including seasonal wetlands, i.e. vernal pools), during prescribed burns to eliminate erosion and sedimentation potential unless burning is part of an approved habitat enhancement plan for VPFS. Buffers will be determined by CAEV prior to prescribed burning and will be based on fuel conditions, season, weather, and slope (EPA 2005). Do not conduct prescribed burning in riparian habitat. .
	• Avoid the use of chemical retardants for wildfires in vernal pool habitats to the extent feasible.
Vegetation and Wildlife Habitat	**4.5.1. General Vegetation, Grassland, and Shrublands**
	Goal: Conserve and enhance the ecological integrity of each vegetation community to promote its beneficial functions such as wildlife support, food webs, biodiversity, watershed protection, productivity, and nutrient/carbon storage and cycling.
	Objective 1: Reduce threats to native vegetation.
	• Confine road and firebreak maintenance and vegetation trimming to the existing road footprint.
	• Restrict maneuver training to existing trails.
	Objective 2: Restore and enhance native vegetation communities and promote their resilience.
	• Rehabilitate or revegetate areas subjected to surface- disturbing activities to protect areas from erosion and invasion by invasive species. Revegetation should be done using locally-adapted, native plant species appropriate to the area and/or vegetative type to protect.
	• Vegetate with pollinator friendly species when and where possible.
	• Use locally selected seed stock during revegetation projects when possible.
	• Coordinate with the CR Fire Department annually to identify burn plots consistent with IWFMP targets.
	• Conduct post-activity monitoring after training, construction, or maintenance activities to determine level of impacts and revegetate or designate off-limits for rehabilitation as needed.
	4.5.2 Forest and Woodlands
	Goal: Protect and maintain coast live oak and riparian woodlands and their natural ecosystem roles such as wildlife habitat, migration corridors, watershed function, thermal cover, and carbon sequestration.
	Objective 1: Prevent loss and degradation of oak and riparian woodlands.
	• Restrict heavy military use or large training events in oak woodlands to reduce impacts to oak roots, understory plants and leaf litter decomposition.
	• Restrict high impact activities in riparian areas. Military training activities shall be restricted to dismounted activities. No ground disturbing activities are allowed within riparian areas.
	• Restrict vehicle movement to designated roads and trails in riparian zones.
	• Employ erosion control BMPs for road maintenance and construction activities to reduce direct and indirect impacts on riparian areas.

Management Area	Conservation Measure	
Vegetation and Wildlife Habitat	• Comply with Native Tree Management guidelines and requirements (*Section 4.5.3 Native Tree Management*) for all damaged or removed oak or riparian trees.	
	• Conduct environmental awareness briefings to installation users that details the ecological importance of forests and woodlands.	
	Objective 2: Encourage native tree recruitment and forest and woodland regeneration.	
	• Allow snags and logs to subsist to provide wildlife habitat and nutrient cycling through decomposition.	
	Objective 3: Prevent the spread of Sudden Oak Death Syndrome (SODS) disease in coast live oak, a deadly arboreal disease caused by an invasive plant pathogen from Europe, *P. ramorum*.	
	• Disinfect trimming and pruning tools with bleach or other disinfectant to eliminate disease spread.	
	• Conduct pruning or trimming during the dry season as the pathogen spreads via water.	
	• If working in wet conditions, keep equipment on paved or dry surfaces and avoid mud.	
	• Do not remove infested plant debris from site. Chip small material and leave on-site to decompose and use larger pieces for firewood if possible.	
	• Stay up-to-date with online mapping resources showing the pathogen's distribution and proximity to CR.	
	• Remove infected oaks.	
	• Inspect nursery plants and ensure they are disease free prior to planting.	
	4.5.3 Native Trees	
	Goal: Protect native trees to preserve both the ecological and mission-critical benefits they provide to CR.	
	Objective: Ensure replacement and protection of existing native trees.	
	• Install exclusionary fencing around native trees in need of protection during military training or construction activities and periodically monitor fencing to ensure functionality while training is ongoing.	
	• Restrict hand digging, mechanical digging, and blade work under the drip line of native trees.	
	• Do not cut, move, or disturb dead and downed logs. This does not apply to downed trees or logs that are blocking roads or trails. No dead and downed logs shall be used for barricades or camouflage.	
	• No native trees will be cut or used as camouflage.	
	• Restrict parking under the drip line of native trees.	
	• Native tree pruning of limbs greater than three (3) inches in diameter must be done by a qualified arborist or by oversight of Environmental or ITAM staff.	
	• Removal of oak trees with a diameter at breast height (DBH) of eight inches or greater or removal of any size riparian tree will be mitigated per the following:	
	1	Any native trees removed for purposes other than disease or safety concerns shall be replaced at a ratio of 3:1 with the same native species and include a monitoring program to ensure establishment, early growth, and installation success. Small trees, seedlings, or acorns shall be planted at appropriate densities in areas approved by CAEV.
	2	Trees/seedlings/acorns shall be watered at a frequency to ensure survival.
	3	Plantings shall occur during the appropriate season (i.e. oak acorns should be planted in January or February) within one year of tree removal.
	4	If possible, acorns to be planted as mitigation should be collected from the area where trees are to be removed during October and November.
	5	Trees planted should be monitored for a minimum of five years.
	6	If a 3:1 survivorship ratio (i.e. three surviving trees or seedlings for each tree removed) is not attained by the end of each year, sufficient numbers of additional trees, seedlings, or acorns shall be planted and monitored until the desired success ratio is attained.
	7	As part of the monitoring program, the project proponent shall supply an annual monitoring report, which describes actions taken, the number of trees/seedlings/acorns planted, and the number of trees/seedlings/acorns remaining alive at the end of the season.

Management Area	Conservation Measure
Vegetation and Wildlife Habitat	**4.5.4 Wetland and Aquatic Habitat**
	Goal: Preserve wetland and aquatic habitat and the ecosystem services they provide such as fish and wildlife habitat, water quality improvement, flood control, and groundwater replenishment.
	Objective 1: Protect wetland and aquatic habitat.
	• Maintain a 100 ft (30 m) buffer from the edge of wetlands. Activities to occur with the buffer area must be reviewed and approved by CAEV prior to the activity taking place.
	• Store all hazardous materials at least 100 ft (30 m) from wetland areas, in designated locations, with appropriate containment to avoid accidental spills.
	• Require all proposed pesticide application activities to be reviewed by the environmental staff for potential impacts on sensitive resources, including wetlands, before they are implemented.
	• Utilize BMPs to stabilize loose soils and prevent sedimentation of wetland and aquatic areas.
	• Promote use and implementation of out-sloping, water bar, and other water conveyance techniques during annual trail maintenance activities to reduce erosion and prevent sedimentation of wetlands and waterways.
	• Install and/or maintain fencing, signage, or Seibert stakes delineating sensitive habitat areas.
	• Comply with all wetland regulations.
	• Conduct environmental review of all ground disturbing activities that may impact wetlands and perform pre-activity surveys as needed.
	Objective 2: Restore and enhance wetland and aquatic habitat.
	• Monitor presence of invasive species and thatch buildup and remove as necessary.
	4.5.6 Invasive Plants
	Goal: Use integrated pest management strategies to control the spread and introduction of invasive plants to protect natural resources, improve habitat, sustain land available for military training, and provide for health and safety.
	Objective 1: Control or eradicate existing invasive populations to prevent further spread throughout the installation.
	• All pesticide applications will be applied by a certified pest control applicator and conducted in compliance with the directions on the pesticide label and the IPMP.
	• Monitor and document treatment areas to ensure re-growth does not occur.
	• Use chemical treatment methods as a last resort method.
	• Coordinate with and obtain approval from CAEV before conducting any type of invasive removal in or near riparian or wetland areas (including seasonal wetlands, i.e. VPFS habitat) to avoid impacts to sensitive species.
	• Conduct invasive plant removal prior to seed set.
	• Ensure noxious seeds are contained, do not blow off in the wind, or germinate in green waste piles during eradication efforts.
	• Prioritize invasive plant removal in areas where sensitive and/or listed species occur or have the potential to occur.
	Objective 2: Prevent and control new introductions of invasive plants.
	• Require washing of undercarriage or tracks/wheels of tactical or construction vehicles prior to maneuvering or grading in training areas. Disinfect all pruning, boots, gloves, and other plant removal equipment to eliminate spread of pathogens or noxious seeds/roots.
	• Conduct road and firebreak grading activities in or near invasive plant populations prior to seed set.
	• Ensure straw wattles, jute netting, and hay bales are weed free certified prior to use.
	4.6.1 General Fish and Wildlife
	Goal: Conserve the natural ecological role of native fish and wildlife by protecting existing populations and maintaining their habitat on CR.
	Objective 1: Protect fish and wildlife species and their habitats on CR.

Management Area	Conservation Measure
Fish and Wildlife	• Conduct environmental review and pre activity surveys of all training, construction, maintenance, and prescribed burn plans for potential adverse effects on fish and wildlife prior to conducting the activity. If impacts will occur, environmental staff will work with the project proponent to minimize impacts by altering or rescheduling the proposed activity.
	• Conduct environmental awareness briefings to installation users that details requirements to protect fish and wildlife and their habitats.
	• Conduct environmental review of proposed pesticide use and evaluate potential adverse impacts to fauna.
	• Install BMPs when and where necessary to reduce sediment loading of waterways.
	• Ensure that all hoses used for water purification training are fitted with screens to prevent fish from being injured or removed from the river.
	• Restrict activities within 100 feet (30 m) from the edge of wetlands and waterways and within riparian habitats.
	• Conduct pre-activity surveys for nesting birds and roosting bats.
	• Obtain appropriate authorization (that is, take permits) from the USFWS before intentionally and directly taking any migratory bird species.
	• To the extent possible, conduct prescribed burns after June 15 (Kershner, personal communication May 27, 2010).
	• Use and maintain nest deterrence on buildings to prevent impacts from cliff swallow (*Petrochelidon pyrrhonota*) nesting prior to nest construction. Constructed nests or nests undergoing construction cannot be destroyed.
	• Designate appropriate setback buffers around active bird nests. Nesting bird buffers must remain in place until young are no longer reliant on the nest.
	• Retrofit power structures to protect raptors and other large birds when possible.
	• Promote passive relocation of roosting bats prior to roost disturbance or destruction by creating less hospitable roost environments (i.e. increase light and air circulation) or installing bat exclusion devices (bats can leave, but not return).
	• Designate appropriate setback buffers for maternity bat roosts. Maternity roosts must not be disturbed until young are no longer dependent.
	• During new developments and retrofits, advocate for facility lighting that has less negative impact on bat habitat, such as night-sky compliant lights and lights focused downward as opposed to broadcast lighting.
	• Ensure wildlife guzzlers contain ramps or ladders to prevent accidental wildlife drownings
	Objective 2: Assess fish and wildlife status and trends. Maintain accurate and up-to-date records on fish and wildlife distribution and abundance to aid in future management decisions.
	• Monitor and evaluate effects of military training activities on fish and wildlife populations through pre-activity and opportunistic surveys.
	• Ensure environmental staff remains educated and informed about relevant natural resource laws and regulations.
	• Ensure environmental staff stay current on taxonomic changes to fish and wildlife species.
	• Ensure environmental staff stay current on changes to conservation status of fish and wildlife species
	4.6.2 Pollinators
	Goal: Conserve pollinator populations and their habitat on CR.
	Objective 1: Improve understanding of pollinator use on CR.
	• Document incidental pollinator observations at every chance.
	Objective 2: Protect and enhance pollinator habitat.
	• Conduct landscape maintenance activities to avoid bloom periods of plants whenever possible.
	• Do not apply herbicide on blooming plants, unless those plants are invasive species. Herbicide application should be targeted and not broad application. Implement mechanical plant removal rather than herbicide use whenever possible.
	• Screen all classes of pesticides for pollinator risk to avoid harmful applications, including biological pesticides such as *Bacillus thuringiensis*.

Management Area	Conservation Measure
Fish and Wildlife	• Avoid the use of neonicotinoids or other systemic insecticides, including coated seeds, any time of the year in monarch and other pollinator habitat due to their ecosystem persistence, systemic nature, and toxicity.
	• Avoid the use of soil fumigants.
	• Consider non-chemical weed control techniques, when feasible (Cal-IPC non chemical BMPs).
	• Apply herbicides during young plant phases, when plants are more responsive to treatment, and when monarchs and other pollinators are less likely to be nectaring on the plants.
	• Separate habitat areas from areas receiving treatment with a pesticide-free spatial buffer and/or evergreen vegetative buffer of coniferous, non-flowering trees to capture chemical drift. The appropriate monarch and pollinator habitat spatial buffer size should be a minimum of 40 feet from ground-based pesticide applications, 60 feet from air-blast sprayers, and 125 feet from any systemic insecticide applications or seed-treated plants.
	• Revegetate barren or degraded areas with native pollinator friendly plants.
	• Work with post-construction and facility maintenance personnel to establish and promote pollinator-friendly plants and landscapes during construction and maintenance activities.
	• Coordinate with local bee-keepers to relocate bee colonies instead of eradicating colonies.
	• Educate installation users about the benefits of pollinators.
	4.6.3 Invasive and Feral Animals
	Goal: Control existing populations and prevent the spread and further introduction of invasive species and pests.
	Objective: Follow IPM and pest control guidelines to control invasive and feral animals.
	• Monitor and document pest species populations and identify priority control actions.
Threatened and Endangered Species	**4.7.1 Purple Amole**
	Goal: Conserve the purple amole population and contribute to species recovery on CR.
	Objective 1: Protect purple amole plants and habitat.
	• Comply with conservation measures for purple amole at Camp Roberts from the 2009 Programmatic BO (USFWS 2009).
	• No military training related ground disturbance will be allowed within purple amole occupied habitat.
	• The number of troops training within the PAPA will be limited to brigade level or below.
	• Use of tracked vehicles for maintenance and military training activities within the PAPA will be restricted to a single tank trail and no off-road use of tracked vehicles will be allowed.
	• Maintain signs and fencing delineating the PAPA.
	• The tank trail and designated roads within the PAPA will be clearly marked by signage. Signs and fencing shall be periodically monitored to ensure that it is maintained intact and visible.
	• Fence installation shall be designed to be wildlife friendly and include “elk crossings” to eliminate adverse impacts to elk and other wildlife species.
	• Survey the PAPA prior to any training or maintenance project to ensure plants are not in bloom.
	• Fire vehicles utilized in vegetation management burns may only travel off-road during fire mop-up activities. Fire suppression vehicles may be used on and off roads only during emergency wildfire suppression activities. Wildfire suppression may take place from established roads and the tank trail to preclude fires from leaving the installation. No new firebreaks will be created within purple amole occupied habitat.
	• Vehicles utilized in depredation hunting will be restricted to the minimum off-road travel required to recover pig carcasses.
	• Travel by maintenance vehicles and equipment as well as cultural and natural resource vehicles will be restricted to existing roads and the tank trail. Foot traffic during natural and cultural resource management activities will be kept at the minimum necessary to conduct the activities.
	• Road and tank trail improvements, and maintenance activities will be conducted in the fall when purple amole plants are dormant and soils are hard and dry, typically September into November.

Management Area	Conservation Measure
Threatened and Endangered Species	• Persons conducting military training; road, tank trail, and firebreak improvements; maintenance activities; and natural and cultural resource management within the PAPA will be given a briefing on applicable conservation measures prior to utilizing the area.
	Objective 2: Enhance purple amole habitat.
	• Document invasive plants during opportunistic surveys or monitoring and incorporate findings into the invasive plant eradication plan for implementation.
	4.7.2 Vernal Pool Fairy Shrimp
	Goal: Promote the conservation of vernal pool fairy shrimp on CR.
	Objective 1: Protect vernal pool fairy shrimp and their habitat.
	• Avoid and control soil erosion in vernal pool upland watersheds which could lead to sedimentation of vernal pools.
	• Avoid refueling or spills of fuel, chemicals, or other contaminants in upland watersheds of vernal pools that could lead to their contamination.
	• Avoid the introduction of water into vernal pools during the dry season which could stimulate resting eggs at times when VPFS would not be likely to complete their life cycle.
	• Ensure that ruts and tank trails that have become established VPFS habitat are not graded or filled without proper consultation with USFWS.
	• No pesticides or herbicides will be applied in seasonal wetlands or other locations determined to be habitat for VPFS.
	• Conduct environmental briefings for troops describing conservation of the vernal pool fairy shrimp.
	• Conduct pre-activity surveys prior to the onset of construction or other ground-disturbing activities (including land rehabilitation activities) for potential adverse effects on vernal pool fairy shrimp. Work with the project proponent to minimize impacts by altering or rescheduling proposed activities.
	• Restrict ground-disturbing training, maintenance, and construction activities during the wet season (generally November 1 through April 30).
	• Restrict cross-country travel, especially during the wet season (generally November 1 through April 30).
	• Herbicides and pesticides will not be used within 250 ft (76 m) of potential or known fairy shrimp habitat.
	Objective 2: Enhance VPFS habitat on CR.
	• Conduct prescribed burns to improve VPFS habitat as detailed in the VPFS grazing and burn plan. Update plan as needed to meet habitat enhancement objectives.
	4.7.3 South-Central California Coast Steelhead
	Goal: Promote the recovery, long-term health, and resilience of SCCC steelhead on CR.
	Objective 1: Protect SCCC steelhead and its habitat on CR.
	• Continue to implement management actions (best practices and avoidance/minimization measures) described in the SCCC ESMC.
	• Do not locate soakage pits, field mess facilities, field shower points, decontamination points, laundry points, and water purification points within 100 ft (30 m) of the edge of surface waters or streambeds.
	• Prohibit portable latrines and hazardous materials within 100 ft (30m) of the edge of surface water or streambeds.
	• Limit stream fording to designated sites during December through May to avoid impacts to steelhead adult migration, spawning, and fry emergence.
	• Ensure that all pump intakes used for water purification training are screened in accordance with NMFS juvenile fish screen criteria (NMFS 1996).
	• Avoid ground-disturbing activities, to the maximum extent feasible, during the wet season, which typically extends from November 1 through April 30 (USFWS 2009).

Management Area	Conservation Measure
Threatened and Endangered Species	• Maintain adequate buffers around wetlands and waterways during prescribed burns to eliminate erosion and sedimentation potential. Buffers will be determined by CAEV prior to prescribed burning and will be determined based on fuel conditions, season, weather, and slope (EPA 2005). Do not conduct prescribed burning in riparian habitat.
	• Use BMPs during maintenance activities to reduce harmful runoff from entering adjacent rivers and streams.
	• Continue to control access to the Nacimiento River for fishing, and support CDFW freshwater fishing regulations.
	Objective 2: Enhance SCCC steelhead habitat on CR.
	• Continue current riparian management such as maintaining riparian buffers, limiting the types of training activities that may occur within riparian areas, and restricting ground disturbing activities.
	• Leave downed woody debris in place whenever possible to increase protective cover for SCCC steelhead.
	4.7.4 Bald Eagle
	Goal: Promote conservation of bald eagles on Camp Roberts.
	Objective: Protect bald eagles and their habitat on Camp Roberts.
	• All military, recreational, grazing, and construction activities will take place outside of an appropriate setback buffer of 1,640 ft (500 m) during the breeding season (January 1 to August 15).
	• In open areas, artillery/tank fire, explosives and other loud, intermittent noise will not occur within a 1-mile (1,600-m) buffer around an active bald eagle nest or known communal roosts. The buffer can be reduced to 0.5 mile (800 m) in forested areas.
	• Aircraft activities will occur no closer than 1,000 ft (305 m) vertical or horizontal distance from known communal roost sites.
	• Preserve known and potential nesting and roosting sites for Bald Eagles. Potential sites include trees or snags 65 ft (20 m) or more in height, at least 1,640 ft (500 m) from human development, and within 1.25 miles (2 km) of suitable aquatic foraging habitat (Buehler 2000).
	• Conduct environmental briefings for troops.
	4.7.5 California Condor
	Goal: Promote the conservation of California condors on CR.
	Objective: Protect the California condor and its habitat on CR.
	• If a condor is observed foraging or roosting within a project or training area, activities that may adversely affect the condor will cease until a CA ARNG biologist has determined that the condor has vacated the area on its own.
	• Any animal carcass found within training areas of active use that could potentially attract a foraging condor with be removed or transferred to a location on post where there is no threat of death or harassment by military activities.
	• No trash shall be left in the training areas.
	• Conduct environmental awareness training to users of the installation.
	• Ensure Environmental staff stays current on condor occurrences in the area and continue communication and collaborate with VWS and other agencies and organizations.
	4.7.6 Swainson's Hawk
	Goal: Promote conservation of the Swainson's hawk on CR.
	Objective: Protect Swainson's hawk and its habitat on CR.
	• Conduct pre-activity surveys for actions that may have the potential to impact Swainson's hawk.
	• Implement appropriate setback buffers for any Swainson's hawk observed on CR.
	• Record any sightings and report information to CDFW.
	• Check local occurrence data regularly to stay up to date on species presence in the area.
	4.7.7 Least Bell's Vireo

Management Area	Conservation Measure
Threatened and Endangered Species	**Goal:** Promote conservation and recovery of least Bell's vireo on CR.
	Objective: Conserve and enhance least Bell's vireo habitat on CR.
	• Restrict military training activities in riparian habitat. Dismounted maneuver activities may only occur after review and approval by CAEV.
	• Conduct a nesting bird survey for LBVI for any action occurring within 100 ft (30 m) of suitable riparian habitat. Conduct a nesting bird survey for LBVI for any use of heavy equipment or noise-generating activities within 300 ft (90 m) of suitable habitat. If nesting least Bell's vireo are detected, USFWS will be contacted and a 300 -350 ft (90 m to 106 m) buffer will be established for any activity until young are no longer reliant on the nest.
	• CA ARNG will record any least Bell's vireo observation gathered during pre-activity or opportunistic surveys and information will be reported to USFWS and CDFW.
	• If nesting LBVI are documented on CR, USFWS will be contacted to discuss appropriate buffer distances for prescribed burns. Once determined, buffer distances will be incorporated into annual burn plans.
	• Conduct environmental awareness training to users of the installation
	• Ensure Environmental staff stays current on LBVI occurrences in the area and continues communication and collaboration with USFWS.
	4.7.8 Tricolored Blackbird
	Goal: Promote conservation of the tricolored blackbird on CR.
	Objective: Protect the tricolored blackbird and its habitat on CR.
	• Restrict activities within 100 feet (30m) from the edge of wetland habitats.
	• Conduct pre-activity surveys for actions that may impact the tricolored blackbird.
	• Implement appropriate setback buffers for nesting colonies on CR.
	• Check local occurrence data regularly to stay up to date on species presence in the area.
	• Record any sightings and report info to CDFW.
	4.7.9 Bank Swallow
	Goal: Promote the conservation of the bank swallow on CR.
	Objective: Protect the bank swallow and its habitat on CR.
	• Conduct a nesting bird survey for activities occurring in or near bank swallow habitat.
	• Restrict activities within 100 feet (30 m) of the outer edge of riparian habitats.
	4.7.10 San Joaquin Kit Fox
	Goal: Promote the conservation of San Joaquin kit fox on CR.
	Objective: Protect San Joaquin kit foxes and their habitat on CR.
	• Conduct pre-activity surveys for any ground-disturbing construction or other work. Surveys will be conducted within the project area and within a buffer zone (15 m around project boundary) around the project area, no greater than 60 days prior to construction activities.
	• Destruction of any known natal/pupping den is not permitted without consultation with USFWS. If a den is found to be active, a 50 ft (15.2 m) exclusion zone will be placed around the den while activity is being monitored. Den(s) will be monitored for three days via wildlife camera to confirm use. If a den is found to be active and in use by SJKF, USFWS will be contacted for guidance.
	• Conduct environmental awareness briefings for Camp Roberts employees and contractors to include a description of San Joaquin kit fox and their life history traits.
	• Chemicals to control pests at Camp Roberts will only be applied by a California State Certified pest control applicator or by trained personnel directly under the certified applicators' supervision. Use of poison baits in not permitted on CR. Areas treated for rodent control via fumigation or gassing will be surveyed daily for three days following treatment and any carcasses found will be disposed of in a trash dumpster to avoid potential for secondary poisoning.

Management Area	Conservation Measure
	• Ensure environmental staff stays current with local SJKF sightings.
	• Record any observations of red foxes and conduct periodic monitoring of occurrence locations to determine species persistence in the area. Incorporate red fox into feral animal control program if warranted.
	• Any canid showing signs of disease such as rabies or mange shall be recorded and reported to CDFW and/or USFWS.
Special Status Species	**4.8 Special Status Species**
	Goal: Provide for the conservation, enhancement, and protection of special status species as a proactive strategy to prevent federal and state listings.
	Objective 1: Determine special status species distribution and abundance on CR to aid in future management.
	• Conduct pre-activity surveys for any activity that may impact sensitive species and work with the project proponent to alter the activity or establish appropriate mitigation measures.
	Objective 2: Protect existing special status species and their habitat on CR.
	• Schedule mowing and vegetation management activities to occur outside the bloom period of sensitive annual plants.
	• Restrict prescribed burning, mowing, and weed whacking activities within a 50 ft (15 m) buffer around serpentine outcrops to protect sensitive endemic plants.
	• Remove tropical milkweed that is detected, and replace it with native, insecticide-free milkweed and native, insecticide-free nectar plants appropriate for the location.
	• Do not permit planting of non-native tropical milkweed to minimize the spread of the pathogen *Ophryocystis elektroscirrha* (OE). OE can build up on tropical milkweed and infect monarchs, because these plants are evergreen and do not die back in the winter. OE can be lethal to monarchs.
	• Conduct management activities such as mowing, burning, and grazing in monarch breeding and migratory habitat outside of the timeframe when monarchs are likely to be present (1 Nov to 1 April).
	• Implement 800 m (0.5 mi) protective buffers around nesting golden eagles.
	• Conduct environmental awareness briefings to installation users that describes special status species and their habitat on the installation.
	• Ensure Environmental staff stay updated on agency decisions, published material, and meetings that change the listing status of species.
Outdoor Recreation and Environmental Awareness	**5.2 Outdoor Recreation and Environmental Awareness**
	Goal: Improve the quality of life for soldiers training at CR, staff, and the local community by providing compatible natural resource–based recreational opportunities.
	Objective: Plan and promote recreational opportunities when consistent with the military mission and sound ecosystem management principles.
	• Develop site-specific guidelines for recreational activities to reduce or eliminate impacts on natural resources.
	• Educate users about environmental resources on the installation.
	• Prevent public and military intrusion into sensitive areas via signage and fencing when necessary.
	• Ensure hunters are aware of and comply with Camp Roberts regulations and State hunting and fishing regulations.
	• Continue to require the use of on-lead ammunition.
Developed Areas, Landscape, and Grounds	**5.3 Developed Areas, Landscape and Grounds**
	Goal: Enhance the role developed and landscaped habitats play in water quality, declining wild species, native pollinators, the health of wetlands and waterways, and other natural communities.
	Objective: Incorporate innovation and best science in decisions about construction and its connection to natural resource sustainability. Utilize low-impact design and green infrastructure approaches to improve natural resource function and value while improving ecosystem services.

Management Area	Conservation Measure
Developed Areas, Landscape, and Grounds	• Incorporate principles and objectives from the IPMP. Strive to reduce reliance on chemical means of invasive species control, per DoDI 4150.07.
	• Integrate consideration of natural and cultural resources early in the planning process through early coordination with environmental staff.
	• Utilize invasive control BMPs to minimize introduction and spread of noxious species.
	• Design buildings and utility infrastructure to reduce bird and bat nesting potential.
	• Do not use invasive species in landscaping or land rehabilitation and management projects (EO 13112). All plants on the Cal-IPC Invasive Plant Inventory (2006) and all non-native grasses (except those used for turf/lawns or those included in the approved plant list) are unacceptable for landscaped areas.
	• Landscape with native, drought tolerant, pollinator and wildlife friendly plants at every opportunity.
	• Reduce the use of grass as a groundcover except for recreational or ceremonial purposes
	• Pursue and conduct training in sustainability for engineers, construction and design professionals, contracting and natural resource personnel.
	• Maximize use of rainwater runoff from buildings and surface flow for landscape irrigation and other non-potable uses. Recycle wastewater for use in the landscape and habitat restoration. Reduce water use in the landscape with smart irrigation practices.
	• Promote the use of permeable hardscape, which can be used in large parking facilities and other areas using existing technology. Bio-swales can be combined with permeable surfacing to filter and direct any excess water during a heavy rain event.
	• Encourage planting three trees for every landscaped tree removed during construction projects in cantonment areas.
Beneficial Partnerships and Collaborative Planning	**5.4 Beneficial Partnerships and Collaborative Planning**
	Goal: Regularly engage in cooperative resources planning partnerships to create regional conservation, ecosystem-based solutions of mutual benefit.
	Objective: Participate in regional conservation and ecosystem planning efforts, in collaboration with other governmental agencies and non-governmental organizations.
	• Continue to seek partnerships with other institutions, organizations, and researchers to study distribution and habitat needs of plant and wildlife populations that may be affected by climate change and other regional or migratory pathway concerns.
	• Continue existing partnerships and participating in areas pertinent to DoD ecosystem management objectives (per DoDI 4715.03).
	• Continue the use of Cooperative Agreements to achieve natural resources management objectives, especially natural resource management research of mutual interest.
Law Enforcement	**5.6 Law Enforcement**
	Goal: Provide for enforcement of natural resources laws and regulations by professionally trained personnel, taking proper safety and security measures.
	Objective: Ensure that installation users practice environmental stewardship in accordance with AR 200-1 and CA ARNG Regulation 200-1 (CR Regulation 350-1).
	• Provide environmental briefings to all installation users.
	• Reports environmental damage or noncompliance to Range Operations for investigation.
	• Maintain effective working relationships with federal and state agencies to resolve non-compliance issues efficiently.
Training of Natural Resources Personnel	**5.8 Training of Natural Resources Personnel**
	Goal: Continue to improve the success of natural resources management activities through professional development and training.
	Objective: Continue to provide professionally trained personnel for enforcement of conservation laws and regulations.

Management Area	Conservation Measure
	• Ensure environmental staff stays current on available training opportunities.

Appendix C. ITAM Annual Workplan

Project	Project Description	FY22 Status
Tactical Concealment Enhancement	Continuation of native oak tree propagation and planting program to maintain concealment training opportunities at Camp Roberts. Program goal is to establish tree vegetative cover to meet concealment requirements within the training areas. Project aim is to successfully plant approximately 500 trees annually. Local collection of Blue and Valley Oak acorns are conducted within the training areas of Camp Roberts. These acorns are planted at Camp Roberts by LRAM staff within approved concealment areas during the winter months.	NGB/DA Approved
Repair 61 miles of Maneuver Trails on East Garrison (Training Areas H & I) Trail Project	These trails have been neglected for decades, and will require significant repair in order to bring to a usable state. This total project will shape and grade approximately 61 miles of maneuver trails on East Garrison (Training Areas H & I) at Camp Roberts. In the past, the only maintenance done on these trails was flattening the trail with a bulldozer, pushing unwanted material onto the shoulders. This material will be reused, the trail bed will be repaired with appropriate sized gravel, and the trail will be graded and shaped to current trail standards which will meet commander's training intent for that area. The CAARNG LRAM Program trail standards are aimed at producing efficient, low-cost, low impact trails that have a minimal effect on the stream of a watershed. The commander's intent will be met through these standards by the ability to support increased convoy access, and utilization of Armor and Stryker units.	NGB/DA Approved
On-demand Maneuver Trail Maintenance	Situational maneuver trail maintenance grading or other required repair as needed at Camp Roberts. The maintenance of these trails may include grading, out-sloping, compacting, berm removal, installation of rolling dips/water bars/diversion ditches. This activity may include hardening of the trail with appropriate sized aggregate to provide all season access to the training areas. The CAARNG LRAM Program trail standards are aimed at producing efficient, low-cost, low impact trails that have a minimal effect on the stream of a watershed. Approximately 104 miles of trails may be maintained annually on or as needed basis by LRAM in coordination with DPW and/or engineering unit's onsite for annual training (1401st).	NGB/DA Approved
Maneuver Trail Dust Control	Application of water for dust control purposes along select Training Area Maneuver Trails to reduce safety hazards. Approximately 20 miles of maneuver trails are scheduled for dust control annually.	NGB/DA Approved
Vegetation Management Control on Maneuver Trails	Mowing and tree trimming to remove unwanted vegetation along maneuver trail edges. These efforts greatly increase line of site around this trail network. Removal of vegetation allows the heavy equipment operator unobstructed access to implement trail maintenance erosion control standards. 104 miles annually of maneuver trail vegetation will be maintained through these efforts.	NGB/DA NOT Approved
On-demand Maneuver Land Rehabilitation	Situational maneuver land maintenance support as needed. These maneuver land rehabilitation sites may require grading/ripping efforts to return to a stable slope/grade. Other treatments may include reseeding or hydro-seeding to establish ground cover and some spraying of herbicides to reduce impeding noxious weeds. Approximately 40 acres of maneuver land may be maintained on an as needed basis.	NGB/DA Approved

Project	Project Description	FY22 Status
In-house Vegetation Control on 150 Acres	LRAM In-House support to control approximately 150 acres of vegetation at Camp San Luis Obispo and Camp Roberts Maneuver Areas. Yellow Star Thistle (YST) impedes dismounted maneuvers and bivouac opportunities. Lack of control can lead to the infestation spreading to other training areas. The YST thistle requires 5 to 8 years of herbicide treatment for complete eradication. YST has shown up to 95 percent eradication after one herbicide treatment when treatment is conducted post fire. This project may entail working with DPW and emergency services who will conduct prescribed burning where ITAM conducts Yellow Star Thistle Control within the Training Areas.	NGB/DA Approved
Vegetation Control Contract	Service contract to control approximately 632 acres of vegetation at Camp San Luis Obispo and Camp Roberts Maneuver areas. Yellow Star Thistle (YST) impedes dismounted maneuvers and bivouac opportunities. Lack of control can lead to the infestation spreading to other training areas. The YST thistle requires 5 to 8 years of herbicide treatment for complete eradication. YST has shown up to 95 percent eradication after one herbicide treatment when treatment is conducted post fire. This project may entail working with DPW and emergency services who will conduct prescribed burning where ITAM conducts Yellow Star Thistle Control within the Training Areas.	NGB/DA Approved
Maintenance of Bivouac Sites	Maintain existing Training Area bivouac sites. These bivouac sites may require grading/ripping efforts to return to a stable slope/grade. Other treatments may include mowing, spraying of herbicides, reseeding or hydro-seeding to establish ground cover. Approximately 100 acres require maintenance annually.	NGB/DA Approved

Appendix D. Species Lists

D.1 Plant Species Recorded at Camp Roberts

Family	Scientific Name	Common Name
MOSSES		
Funariaceae	*Entosthodon kochii*	Koch's cord moss
Selaginellaceae	*Selaginella bigelovii*	Bigelow's spike moss
FERNS		
Azollaceae	*Azolla filiculoides*	mosquito fern, duckweed fern
Dryopteridaceae	*Dryopteris arguta*	wood fern
Pteridaceae	*Adiantum jordanii*	California maiden-hair
	Pellaea andromedifolia	coffee fern
	Pellaea mucronata var. mucronata	bird's foot fern
	Pentagramma triangularis	gold-back fern
	Pentagramma triangularis ssp. *triangularis*	gold-back fern
MONOCOTS		
Agavaceae	*Chlorogalum pomeridianum*	common soap plant
	Chlorogalum pomeridianum var. *pomeridianum*	soap plant
	Chlorogalum purpureum var. *purpureum*	purple amole
	Hesperoyucca whipplei	our lord's candle
Alliaceae	*Allium crispum*	crinkled onion
	Allium haematochiton	red skinned onion
Asphodelaceae	*Asphodelus fistulosus*	asphodel
Cyperaceae	*Bolboschoenus robustus*	seacoast bull-rush
	Carex barbarae	sedge
	Carex serratodens	two tooth sedge
	Cyperus eragrostis	tall cyperus
	Cyperus erythrorhizos	redroot flat-sedge
	Cyperus esculentus	yellow nut-grass, chufa
	Cyperus rotundus	purple nut-sedge
	Eleocharis macrostachya	common spike-rush
	Schoenoplectus americanus	three-square
	Schoenoplectus pungens	common three-square
	Scirpus microcarpus	small-fruited bull-rush
Equisetaceae	*Equisetum laevigatum*	smooth scouring rush
	Equisetum telmateia ssp. *braunii*	giant horsetail
Hydrocharitaceae	*Elodea canadensis*	broad water-weed
Iridaceae	*Sisyrinchium bellum*	blue-eyed grass
Juncaceae	*Juncus balticus*	white rush
	Juncus bufonius var. *bufonius*	toad rush
	Juncus macrophyllus	rush
	Juncus patens	common rush
	Juncus phaeocephalus var. *phaeocephalus*	brown headed rush
	Juncus xiphioides	iris-leaved rush

Family	Scientific Name	Common Name
Liliaceae	*Calochortus albus*	white globe lily, fairy lantern
	Calochortus argillosus	clay mariposa lily
	Calochortus venustus	butterfly mariposa lily
	Fritillaria biflora var. biflora	chocolate lily
Melanthiaceae	*Toxicoscordion fremontii*	death camas
Orchidaceae	*Epipactis gigantea*	stream orchid
Poaceae	*Arundo donax*	giant reed
	Avena barbata	slender oats
	Avena fatua	wild oats
	Brachypodium distachyon	false brome
	Bromus arenarius	Australian brome
	Bromus berteroanus	Chilean chess
	Bromus carinatus	California brome
	Bromus diandrus	ripgut brome
	Bromus hordeaceus	soft chess brome
	Bromus madritensis ssp. *madritensis*	foxtail chess
	Bromus madritensis ssp. *rubens*	red brome
	Bromus psuedolaevipes	woodland brome
	Bromus sterilis	poverty brome
	Bromus tectorum	cheatgrass, downy brome
	Cenchrus incertus	coast sandbur
	Cynodon dactylon	Bermuda grass
	Deschampsia danthonioides	annual hairgrass
	Digitaria ischaemum	smooth crabgrass
	Distichlis spicata	saltgrass
	Echinochloa crus-galli	barnyard grass
	Elymus caput-medusae	Medusa head
	Elymus condensatus	giant wild rye
	Elymus elymoides	squirrel tail
	Elymus glaucus	blue wildrye
	Elymus glaucus ssp. *glaucus*	blue wildrye
	Elymus glaucus ssp. *virescens*	blue wildrye
	Elymus multisetus	big squirrel tail
	Elymus trachycaulus ssp. *trachycaulus*	slender wheatgrass
	Festuca bromoides	brome fescue
	Festuca microstachys	ciliate fescue
	Festuca myuros	rattail fescue
	Festuca perennis	Italian ryegrass
	Hordeum jubatum	foxtail barley
	Hordeum marinum ssp. *gussoneanum*	Mediterranean barley
	Hordeum murinum	wall barley
	Hordeum murinum ssp. *leporinum*	hare barley
	Hordeum murinum ssp. *murinum*	wall barley
	Hordeum vulgare	cultivated barley
	Koeleria gerardii	annual June grass
	Lamarckia aurea	goldentop
	Leptochloa fusca	sprangletop
	Melica bulbosa	onion grass

Family	Scientific Name	Common Name
Poaceae	*Melica californica*	California melic
	Melica imperfecta	little California melica
	Muhlenbergia rigens	deer grass
	Paspalum dilatatum	Dallis grass
	Paspalum distichum	knot grass
	Phalaris californica	California canary grass
	Phalaris paradoxa	hood canary grass
	Poa annua	annual blue grass
	Poa bulbosa	bulbous blue grass
	Poa pratensis ssp. *pratensis*	Kentucky blue grass
	Poa secunda ssp. *secunda*	one-sided blue grass
	Polypogon interruptus	ditch beard grass
	Polypogon monspeliensis	annual beard grass
	Polypogon viridis	water beard grass
	Schismus arabicus	Arabian grass
	Schismus barbatus	Mediterranean schismus
	Stipa cernua	nodding needle grass
	Stipa lepida	foothill needle grass
	Stipa miliacea	smilo grass
	Stipa speciosa	desert needle grass
Potamogetonaceae	*Stuckenia pectinata*	fennel-leaf pondweed
Themidaceae	*Bloomeria crocea*	common gold star
	Brodiaea jolonensis	brodiaea
	Dichelostemma capitatum ssp. *capitatum*	blue dicks
	Typha angustifolia	narrow-leaf cattail
	Typha domingensis	southern cattail
	Typha latifolia	broad-leaved cattail
DICOTS		
Adoxaceae	*Sambucus nigra* ssp. *caerulea*	blue elderberry
Aizoaceae	*Carpobrotus chilensis**	sea fig
Amaranthaceae	*Amaranthus albus*	tumbleweed
	Amaranthus retroflexus	pigweed
Anacardiaceae	*Rhus aromatica*	fragrant sumac
	Rhus ovata x integrifolia	sugar bush
	Schinus molle	Peruvian pepper tree
	Toxicodendron diversilobum	western poison oak
Apiaceae	*Apiastrum angustifolium*	wild celery
	Bowlesia incana	hoary bowlesia
	Conium maculatum	poison hemlock
	Daucus carota	wild carrot, Queen Anne's lace
	Daucus pusillus	rattlesnake weed
	Eryngium vaseyi var. *vaseyi*	button celery, Vasey's coyote thistle
	Foeniculum vulgare	fennel
	Lomatium dasycarpum ssp. *dasycarpum*	lomatium
	Lomatium utriculatum	common lomatium
	Sanicula bipinnata	poison sanicle
	Sanicula bipinnatifida	purple sanicle
	Sanicula crassicaulis	Pacific sanicle

Family	Scientific Name	Common Name
Apiaceae	*Scandix pecten-veneris*	Venus' needle
	Torilis nodosa	knotted hedgeparsley
Apocynaceae	*Apocynum cannabinum*	Indian hemp
	Asclepias eriocarpa	kotolo, Indian milkweed
	Asclepias fascicularis	narrow-leaf milkweed
	Asclepias vestita	woolly milkweed
Asteraceae	*Achillea millifolium*	yarrow
	Achyrachaena mollis	blow-wives
	Acourtia microcephala	sacapellote
	Agoseris grandiflora	bigflower agoseris
	Agoseris heterophylla	annual agoseris
	Agoseris retrorsa	spearleaf mountain dandelion
	Ambrosia acanthicarpa	annual bur-sage
	Anthemis cotula	mayweed
	Artemisia biennis	biennial wormword
	Artemisia californica	California sagebrush
	Artemisia douglasiana	mugwort
	Artemisia dracunculus	tarragon
	Baccharis pilularis	coyote brush
	Baccharis salicifolia	mule fat
	Blepharizonia plumosa	big tarplant
	Blepharizonia laxa	white tarweed
	Calycadenia villosa	dwarf calycadenia
	Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle
	Centaurea iberica	Iberian star-thistle
	Centaurea melitensis	tocolote
	Centaurea solstitialis	yellow star thistle
	Centromadia pungens ssp. *pungens*	common tarweed
	Chaenactis glabriuscula	yellow pincushion
	Cichorium intybus	chicory
	Cirsium brevistylum	Indian thistle
	Cirsium vulgare	bull thistle
	Corethrogyne filaginifolia	California aster
	Deinandra fasciculata	tarplant, tarweed
	Deinandra pentactis	Salinas River tarplant
	Erigeron canadensis	Canada horseweed
	Erigeron foliosus	slender fleabane
	Erigeron foliosus var. *foliosus*	leafy fleabane
	Erigeron philadelphicus var. *philadelphicus*	Philadelphia fleabane
	Eriophyllum confertiflorum	yellow yarrow
	Eriophyllum confertiflorum var. *confertiflorum*	golden-yarrow
	Euthamia occidentalis	western goldenrod
	Gnaphalium palustre	lowland cudweed
	Grindelia hirsutula	hairy gumweed
	Hazardia squarrosa	sawtooth goldenbush
	Helenium puberulum	sneezeweed
	Helianthus annuus	sunflower
	Helminthotheca echioides	bristly ox-tongue

Family	Scientific Name	Common Name
Asteraceae	*Hemizonia congesta* ssp. *luzulifolia*	hayfield tarweed
	Hesperevax acaulis	short-stalk evax
	Hesperevax caulescens	hogwallow starfish
	Hesperevax sparsiflora var. *sparsiflora*	erect dwarf cudweed
	Heterotheca grandiflora	telegraph weed
	Heterotheca sessiliflora	golden aster
	Heterotheca sessiliflora var. *echioides*	bristly golden aster
	Holocarpha virgata	virgate tarweed
	Hypochaeris glabra	smooth cat's-ear
	Hypochaeris radicata	hairy cat's ear
	Lactuca saligna	slender lettuce
	Lactuca serriola	prickly wild lettuce
	Lagophylla ramosissima	branched lagophylla
	Lasthenia californica	goldfields
	Lasthenia leptalea	Salinas Valley goldfields
	Layia glandulosa	white layia
	Layia heterotricha	pale yellow layia
	Lepidospartum squamatum	scale-broom
	Lessingia glandulifera	sticky lessingia
	Lessingia spp.	lessingia
	Logfia gallica	narrowleaf cottonrose
	Madia gracilis	slender tarweed
	Malacothrix californica	desert dandelion
	Malacothrix phaeocarpa	Central Coast malacothrix
	Malacothrix saxatilis var. *commutata*	malacothrix
	Matricaria discoidea	pineapple weed
	Micropus californicus	slender cottonweed
	Microseris bigelovii	Bigelow's microseris
	Microseris douglasii	Douglas’ silverpuffs
	Microseris douglasii ssp. *douglasii*	Douglas’ silverpuffs
	Microseris elegans	elegant microseris
	Monolopia lanceolata	common monolopia
	Packera breweri	groundsel, ragwort, butterweed
	Pseudognaphalium californicum	California everlasting
	Pseudognaphalium luteoalbum	Jersey cudweed
	Pseudognaphalium stramineum	cottonbatting plant
	Psilocarphus brevissimus var. *brevissimus*	dwarf wooly-heads
	Psilocarphus oregonus	Oregon wooly-heads
	Psilocarphus tenellus	slender woolly marbles
	Rafinesquia californica	California chickory
	Rigiopappus leptocladus	wireweed
	Senecio californicus	groundsel
	Senecio flaccidus var. *douglasii*	brush groundsel
	Senecio vulgaris	common groundsel
	Silybum marianum	milk thistle
	Sonchus asper ssp. *asper*	prickly sow thistle
	Stebbinsoseris decipiens	Santa Cruz microseris
	Stephanomeria virgata	twiggy wreath plant

Family	Scientific Name	Common Name
Asteraceae	*Symphyotrichum chilense*	California aster
	Symphyotrichum subulatum	eastern annual saltmarsh aster
	Tragopogon porrifolius	oyster plant
	Uropappus lindleyi	silver puffs
	Wyethia glabra	mules ears
	Xanthium spinosum	spiny cocklebur
Betulaceae	*Alnus rhombifolia*	white alder
Boraginaceae	*Amsinckia douglasiana*	Douglas' fiddleneck
	Amsinckia intermedia	common fiddleneck
	Amsinckia lycopsoides	tarweed fiddleneck
	Amsinckia menziesii	small flowered fiddleneck
	Amsinckia spectabilis	seaside fiddleneck
	Amsinckia tessellata var. *tessellata*	devil's lettuce
	Cryptantha intermedia var. *intermedia*	common cryptantha
	Cryptantha muricata	prickly forget-me-not
	Eriodictyon californicum	California yerba santa
	Eriodictyon tomentosum	wooly yerba santa
	Eriodictyon traskiae ssp. *smithii*	Trask's yerba santa
	Eucrypta chrysanthemifolia var. *chrysanthemifolia*	eucrypta
	Heliotropium curassavicum var. *oculatum*	seaside heliotrope
	Nemophila menziesii var. *menziesii*	baby blue-eyes
	Pectocarya heterocarpa	chuckwalla pectocarya
	Pectocarya linearis ssp. *ferocula*	slender pectocarya
	Pectocarya penicillata	winged pectocarya
	Phacelia cicutaria	caterpillar phacelia
	Phacelia distans	common phacelia
	Phacelia douglasii	Douglas' phacelia
	Phacelia egena	rock phacelia
	Phacelia imbricata ssp. *imbricata*	imbricate phacelia
	Phacelia ramosissima	branching phacelia
	Phacelia viscida	sticky phacelia
	Pholistoma auritum	fiesta flower
	Pholistoma membranaceum	white fiesta flower
	Plagiobothrys acanthocarpus	adobe popcorn flower
	Plagiobothrys arizonicus	Arizona popcorn flower
	Plagiobothrys canescens	valley popcorn flower
	Plagiobothrys nothofulvus	rusty popcorn flower
	Plagiobothrys stipitatus var. *micranthus*	small stipitate popcorn flower
	Plagiobothrys tenellus	Pacific popcorn flower
	Plagiobothrys uncinatus	hooked popcorn flower
Brassicaceae	*Brassica nigra*	black mustard
	Brassica rapa	field mustard
	Capsella bursa-pastoris	shepherd's purse
	Cardamine californica	milk maids
	Caulanthus coulteri	jewel flower
	Caulanthus lasiophyllus	shaggy-leaved jewel flower
	Caulanthus lemmonii	Lemmon’s jewelflower
	Descurainia pinnata	western tansy mustard

Family	Scientific Name	Common Name
Brassicaceae	*Descurainia sophia*	tansy mustard
	Erysimum capitatum var. capitatum	western wallflower
	Hirschfeldia incana	short-pod mustard
	Lepidium lasiocarpum ssp. lasiocarpum	peppergrass, pepperwort
	Lepidium nitidum	peppergrass
	Nasturtium officinale	watercress
	Raphanus sativus	radish
	Sinapis arvensis	charlock mustard
	Sisymbrium altissimum	tumble mustard
	Sisymbrium orientale	Indian hedge-mustard
	Streptanthus glandulosus ssp. *glandulosus*	uncommon jewel-flower
	Thysanocarpus laciniatus	narrow leaved fringe-pod
	Tropidocarpum gracile	slender tropidocarpum
Cactaceae	*Opuntia ficus-indica*	tuna cactus
Campanulaceae	*Githopsis diffusa*	bluecup
Caprifoliaceae	*Lonicera interrupta*	chaparral honeysuckle
	Lonicera subspicata var. *denudata*	honeysuckle
	Symphoricarpos mollis	creeping snowberry
Caryophyllaceae	*Cerastium fontanum* ssp. *vulgare*	common chickweed
	Cerastium glomeratum	mouse-ear chickweed
	Herniaria hirsuta var. *cinerea*	hairy rupturewort
	Polycarpon tetraphyllum	four-leaved allseed
	Sagina apetala	dwarf pearlwort
	Silene gallica	catchfly, campion
	Silene laciniata ssp. *lacinata*	cardinal
	Spergularia sp.	sand spurrey
	Spergula arvensis	stickwort, starwort
	Spergularia bocconii	sticky sand-spurrey
	Spergularia rubra	red sand-spurrey
	Spergularia villosa	hairy sand-spurrey
	Stellaria media	chickweed
	Stellaria pallida	pale starwort
Chenopodiaceae	*Atriplex lentiformis*	Brewer's saltbush
	Chenopodium album	lamb's quarters
	Chenopodium californicum	pit-seed goosefoot
	Dysphania ambrosioides	Mexican tea
Convolvulaceae	*Calystegia collina* ssp. *venusta*	South Coast Range morning glory
	Calystegia macrostegia ssp. *cyclostegia*	morning glory
	Calystegia malacophylla ssp. *pedicellata*	Sierra false bindweed
	Calystegia occidentalis ssp. *fulcrata*	woolly morning-glory
	Convolvulus arvensis	bind weed, orchard morning glory
	Cuscuta spp.	California dodder
Crassulaceae	*Crassula aquatica*	water pygmy stonecrop
	Crassula connata	sand pygmy stonecrop
	Dudleya abramsii ssp. *murina*	dudleya
Cucurbitaceae	*Cucurbita palmata*	coyote melon
	Marah fabaceus	California man-root
Cupressaceae	*Hesperocyparis sargentii*	Sargent cypress

Family	Scientific Name	Common Name
Dipsacaceae	*Dipsacus sativus*	Fuller's teasel
Ericaceae	*Arctostaphylos glauca*	big berry manzanita
Euphorbiaceae	*Chamaesyce ocellata*	little eye spurge
	Croton californicus	dove weed
	Croton setigerus	turkey-mullein
	Euphorbia spathulata	spurge
	Ricinus communis	castor bean
Fabaceae	*Acmispon americanus*	birds foot trefoil
	Acmispon brachycarpus	short-podded lotus
	Acmispon glaber var. *glaber*	deerweed
	Acmispon junceus	rush lotus
Fabaceae	*Acmispon junceus* var. *junceus*	rush lotus
	Acmispon parviflorus	desert deervetch
	Acmispon strigosus	hairy lotus
	Acmispon wrangelianus	California lotus
	Amorpha californica var. *californica*	false indigo
	Astragalus asymmetricus	San Joaquin milk-vetch
	Astragalus curtipes	astragalus
	Astragalus didymocarpus var. *didymocarpus*	two-seeded milkvetch
	Astragalus didymocarpus var. *obispoensis*	Obispo double-fruited milk-vetch
	Astragalus douglasii var. *douglasii*	Jacumba milk-vetch
	Astragalus gambelianus	Gambel's milk vetch
	Astragalus trichopodus var. *phoxus*	Santa Barbara milk-vetch
	Glycyrrhiza lepidota	wild licorice
	Lathyrus odoratus	sweet pea
	Lathyrus vestitus var. *vestitus*	wild pea
	Lupinus albifrons var. *albifrons*	silver lupine
	Lupinus albifrons var. *douglasii*	Douglas' silver lupine
	Lupinus bicolor	miniature lupine
	Lupinus concinnus	bajada lupine
	Lupinus microcarpus var. *horizontalis*	chick lupine
	Lupinus microcarpus var. *microcarpus*	chick lupine
	Lupinus succulentus	arroyo lupine
	Medicago minima	burclover
	Medicago polymorpha	California burclover
	Medicago sativa	alfalfa
	Melilotus albus	white sweet-clover
	Melilotus indica	sour clover
	Melilotus spp.	sweet clover
	Robinia pseudoacacia	black locust
	Thermopsis californica var. *californica*	golden pea
	Trifolium albopurpureum	Indian clover
	Trifolium ciliolatum	tree clover
	Trifolium depauperatum	cow-bag clover
	Trifolium depauperatum var. *amplectens*	balloon sack clover
	Trifolium depauperatum var. *truncatum*	dwarf sack clover
	Trifolium gracilentum	graceful clover
	Trifolium microcephalum	hairy clover

Family	Scientific Name	Common Name
Fabaceae	*Trifolium oliganthum*	Oregon clover
	Trifolium repens	white clover
	Trifolium variegatum	white tip clover
	Trifolium willdenovii	tomcat clover
	Trifolium wormskioldii	coast clover
	Vicia ludoviciana var. *ludoviciana*	slender or Louisiana vetch
	Vicia villosa ssp. *villosa*	vetch
Fagaceae	*Quercus agrifolia*	coast live oak
	Quercus agrifolia var. *agrifolia*	coast live oak
	Quercus berberidifolia	scrub oak
	Quercus chrysolepis	canyon live oak
	Quercus douglasii	blue oak
	Quercus durata var. *durata*	leather oak
	Quercus garryana var. *garryana*	Garry's or Oregon oak
	Quercus lobata	valley oak
	Quercus palmeri	Palmer's oak
	Quercus wislizeni	interior live oak
	Quercus wislizeni var. *wislizeni*	interior live oak
	Quercus x alvordiana	Alvord Oak
Gentianaceae	*Zeltnera exaltata*	centaury
	Zeltnera venusta	beautiful centaury, canchalagua
Geraniaceae	*Erodium botrys*	storkbill filaree
	Erodium brachycarpum	filaree
	Erodium cicutarium	redstem filaree
	Erodium moschatum	broadleaf filaree
	Geranium dissectum	geranium
Grossulariaceae	*Ribes malvaceum* var. *viridifolium*	chaparral currant
	Ribes quercetorum	oak gooseberry
	Ribes speciosum	fuchsia-flowered gooseberry
Juglandaceae	*Juglans californica*	Southern California black walnut
	Juglans hindsii	Northern California black walnut
Lamiaceae	*Clinopodium douglasii*	yerba buena
	Lamium amplexicaule	henbit
	Marrubium vulgare	horehound
	Mentha arvensis	mint
	Mentha spicata	spearmint
	Mentha suaveolens	pineapple mint
	Monardella villosa ssp. *obispoensis*	coyote-mint
	Pogogyne serpylloides	pogogyne
	Salvia columbariae	chia
	Salvia mellifera	black sage
	Salvia spathacea	California hummingbird sage
	Stachys albens	whitestem hedgenettle
	Stachys bullata	hedge nettle
	Stachys pycnantha	short-spiked hedge nettle
	Stachys rigida	rigid hedge nettle
	Trichostema lanatum	woolly bluecurls
	Trichostema lanceolatum	vinegar weed

Family	Scientific Name	Common Name
Lauraceae	*Umbellularia californica*	California bay
Linaceae	*Hesperolinon micranthum*	dwarf flax
Loasaceae	*Mentzelia laevicaulis*	blazing star
Lythraceae	*Lythrum californicum*	California loosestrife
	Lythrum hyssopifolia	hyssop loosestrife
Malvaceae	*Eremalche parryi*	mallow
	Malacothamnus davidsonii	Davidson's bush mallow
	Malacothamnus jonesii	Jones' bush mallow
	Malva nicaeensis	bull mallow
	Malva parviflora	cheese-weed
	Sidalcea malvaeflora ssp. *laciniata*	checker mallow
Molluginaceae	*Mollugo verticillata*	carpet-weed, Indian chickweed
Montiaceae	*Calyptridium monandrum*	pussypaws
	Claytonia parviflora ssp. *parviflora*	claytonia
	Claytonia perfoliata	miner's lettuce
Montiaceae	*Claytonia perfoliata* ssp. *perfoliata*	miner's lettuce
Myrtaceae	*Eucalyptus camaldulensis*	red gum
	Eucalyptus globulus	blue gum eucalyptus
Mysrinaceae	*Lysimachia arvensis*	scarlet pimpernel, poor-man's weatherglass
Oleaceae	*Fraxinus dipetala*	flowering ash
Onagraceae	*Camissonia campestris*	San Luis Obispo sun cups
	Camissonia hardhamiae	Hardham's evening primrose
	Camissonia strigulosa	sun cup, primrose
	Clarkia affinis	chaparral clarkia
	Clarkia cylindrica ssp. *cylindrica*	speckled clarkia
	Clarkia purpurea ssp. *quadrivulnera*	purple clarkia
	Clarkia rhomboidea	diamond clarkia
	Clarkia speciosa ssp. *speciosa*	redspot clarkia
	Clarkia unguiculata	elegant clarkia
	Epilobium canum	California fuchsia
	Epilobium canum ssp. *canum*	California fuchsia
	Epilobium ciliatum ssp. *watsonii*	fireweed
	Eremothra boothii ssp. *decorticans*	shredding evening-primrose
	Ludwigia repens	yellow water-primrose
	Tetrapteron graciliflorum	hill sun cup
Orobanchaceae	*Bellardia trixago*	bellardia
	Castilleja affinis ssp. *affinis*	Indian paintbrush
	Castilleja attenuata	valley tassels
	Castilleja densiflora ssp. *gracilis*	owl's clover
	Castilleja densiflora ssp. *obispoensis*	San Luis Obispo Indian paintbrush
	Castilleja exserta ssp. *exserta*	purple owl's clover
	Castilleja foliolosa	wooly Indian paintbrush
	Triphysaria pusilla	triphysaria
Oxalidaceae	*Oxalis corniculata*	oxalis
	Oxalis pes-caprae	Bermuda buttercup
Paeoniaceae	*Paeonia californica*	California peony
Papaveraceae	*Dendromecon rigida*	bush poppy
	Eschscholzia caespitosa	poppy

Family	Scientific Name	Common Name
Papaveraceae	*Eschscholzia californica*	California poppy
	Eschscholzia hypecoides	San Benito poppy
	Hesperomecon linearis	narrowleaf queen poppy
	Papaver heterophyllum	wind poppy
	Platystemon californicus	cream cups
Phrymaceae	*Diplacus aurantiacus*	sticky monkeyflower
	Erythranthe guttata	yellow monkey flower
	Erythranthe latidens	monkeyflower
Pinaceae	*Pinus coulteri*	Coulter pine
	Pinus radiata	Monterey pine
	Pinus sabiniana	gray pine
Plantaginaceae	*Callitriche heterophylla var. bolanderi*	Bolander's water-starwort
	Callitriche marginata	California water-starwort
	Collinsia bartsiifolia var. davidsonii	Davidson’s collinsia
	Collinsia heterophylla	Chinese houses
	Collinsia sparsiflora var. collina	collinsia
	Keckiella breviflora var. breviflora	gaping keckiella
Plantaginaceae	*Penstemon centranthifolius*	scarlet bugler
	Penstemon heterophyllus var. heterophyllus	beardtongue
	Plantago elongata	annual coastal plantain
	Plantago erecta	plantain
	Plantago lanceolata	English plantain
	Plantago major	common plantain
	Veronica anagallis-aquatica	water speedwell
	Veronica catenata	chain speedwell
	Veronica peregrina ssp. *xalapensis*	purselane speedwell
Platanaceae	*Platanus racemosa*	western sycamore
Polemoniaceae	*Eriastrum luteum*	yellow flowered eriastrum
	Gilia achilleifolia ssp. *achilleifolia*	gilia
	Gilia achilleifolia ssp. *multicaulis*	gilia
	Gilia angelensis	gilia
	Gilia clivorum	many-stemmed gilia
	Gilia tenuiflora ssp. *amplifaucalis*	greater yellowthroat gilia
	Gilia tricolor	bird's eyes gilia
	Leptosiphon bicolor	baby stars
	Leptosiphon liniflorus	phlox
	Leptosiphon parviflorus	phlox
	Leptosiphon pygmaeus	linanthus
	Linanthus dichotomus	evening snow
	Microsteris gracilis	phlox
	Navarretia atractyloides	rough navarettia
	Navarretia mitracarpa	Paso Robles navarretia
	Navarretia nigelliformis	adobe navarretia
	Navarretia nigelliformis ssp. *radians*	shining navarretia
	Navarretia prostrata	prostate navarretia
	Navarretia pubescens	purple navarretia
Polygonaceae	*Aristocapsa insignis*	Indian valley spineflower
	Chorizanthe membranacea	pink spine flower

Family	Scientific Name	Common Name
Polygonaceae	*Chorizanthe rectspina*	prickly spineflower
	Eriogonum elongatum var. elongatum	wild buckwheat
	Eriogonum fasciculatum var. fasciculatum	California buckwheat
	Eriogonum fasciculatum var. foliolosum	California buckwheat
	Eriogonum fasciculatum var. polifolium	California buckwheat
	Eriogonum fasiculatum	California buckwheat
	Eriogonum nudum var. nudum	bare stem buckwheat
	Eriogonum parvifolium	seacliff buckwheat
	Eriogonum roseum	wild buckwheat
	Eriogonum vimineum	annual wild buckwheat
	Mucronea californica	California spineflower
	Mucronea perfoliata	perfoliate spine flower
	Persicaria amphibia	water smartweed
	Persicaria hydropiperoides	water pepper
	Persicaria lapathifolia	willow weed
	Persicaria maculosa	lady's thumb
	Polygonum aviculare ssp. *depressum*	knotweed
	Pterostegia drymarioides	buckwheat
	Rumex conglomeratus	dock
	Rumex crispus	curly dock
	Rumex salicifolius	willow dock
Polypodiaceae	*Polypodium californicum*	California polypody
Portulaceae	*Calandrinia breweri*	Brewer’s calandrinia
Primulaceae	*Dodecatheon clevelandii*	Cleveland's shooting star
	Dodecatheon clevelandii ssp. *clevelandii*	shooting star
	Dodecatheon clevelandii ssp. *insulare*	Cleveland's shooting star
Ranunculaceae	*Aquilegia eximia*	serpentine columbine
	Clematis lasiantha	pipestems
	Clematis ligusticifolia	virgin's bower
	Delphinium gypsophilum	small-flowered gypsum- loving larkspur
	Delphinium gypsophilum ssp. *parviflorum*	Pinoche Creek larkspur
	Delphinium parryi ssp. *eastwoodiae*	larkspur
	Delphinium parryi ssp. *parryi*	Parry's larkspur
	Ranunculus aquatilis	water buttercup
	Ranunculus californicus	California buttercup
	Thalictrum fendleri	meadow-rue
Rhamnaceae	*Ceanothus cuneatus var. cuneatus*	buck brush
	Ceanothus foliosus var. medius	La Cuesta ceanothus
	Ceanothus leucodermis	chaparral whitethorn
	Ceanothus spinosus	greenbark ceanothus
	Frangula californica	California coffeeberry
	Frangula californica ssp. *tomentella*	hoary coffeeberry
	Rhamnus crocea	spiny redberry
	Rhamnus ilicifolia	holly-leaf redberry
Rosaceae	*Adenostoma fasciculatum*	chamise
	Aphanes occidentalis	aphanes
	Cercocarpus betuloides	mountain mahogany
	Cotoneaster pannosus	cotoneaster

Family	Scientific Name	Common Name
Rosaceae	*Heteromeles arbutifolia*	Christmas berry or toyon
	Holodiscus discolor	oceanspray
	Prunus ilicifolia	holly-leaved cherry
	Rosa californica	California rose
	Rosa spithamea	ground rose
	Rubus ursinus	California blackberry
Rubiaceae	*Galium andrewsii* ssp. *andrewsii*	phlox-leaved bedstraw
	Galium angustifolium ssp. *angustifolium*	narrow-leaf bedstraw
	Galium aparine	goose grass
	Galium nuttallii ssp. *nuttallii*	San Diego bedstraw
	Galium porrigens	climbing bedstraw
	Galium porrigens var. porrigens	climbing bedstraw
Salicaceae	*Populus fremontii* ssp. *fremontii*	Fremont cottonwood
	Salix breweri	Brewer's willow
	Salix laevigata	red willow
	Salix lasiolepis	arroyo willow
Sapindacaeae	*Acer negundo*	box elder
Saxifragaceae	*Lithophragma cymbalaria*	woodland star
	Lithophragma heterophyllum	hill star
	Micranthes californica	California saxifrage
Scrophulariaceae	*Mimulus subsecundus*	one sided monkeyflower
	Scrophularia californica	California figwort
	Verbascum virgatum	wand mullein
Simaroubaceae	*Ailanthus altissima*	tree of heaven
Solanaceae	*Datura stramonium*	jimson weed
	Datura wrightii	tolguacha
	Nicotiana glauca	tree tobacco
	Nicotiana quadrivalvis	Indian tobacco
	Solanum americanum	black nightshade
	Solanum douglasii	Douglas' nightshade
	Solanum umbelliferum	blue witch nightshade
	Solanum xanti	nightshade
Tamaricaceae	*Tamarix ramisissoma*	saltcedar, tamarisk
Urticaceae	*Urtica dioica*	American stinging nettle
	Urtica dioica ssp. *gracilis*	hoary nettle
	Urtica dioica ssp. *holosericea*	stinging nettle
	Urtica urens	dwarf nettle
Valerianaceae	*Plectritis ciliosa*	long-spur plectritis
	Plectritis macrocera	white plectritis
Verbenaceae	*Phyla nodiflora*	common lippia
	Verbena lasiostachys var. *lasiostachys*	verbena
	Verbena lasiostachys var. *scabrida*	verbena
Violaceae	*Viola pedunculata*	Johnny-jump-up
	Viola purpurea ssp. *quercetorum*	oak violet
Viscaceae	*Phoradendron leucarpum* ssp. *macrophyllum*	bigleaf mistletoe
	Phoradendron leucarpum ssp. *tomentosum*	oak mistletoe

Notes:
*Denotes species not native to California.

D.2 Macroinvertebrate Species Recorded at Camp Roberts

Class	Order	Family	Scientific Name	Common Name
Phyllum Mollusca				
Gastropoda	Basommatophora	Ancylidae	*Ferrisia californica*	fragile limpet
		Lymnaeidae	*Pseudosuccinea columella*	mimic lymnaea
		Physidae	*Physella* sp.	pouch snail
		Planorbidae	*Gyraulus parvus*	ash gyro
			Planorbella subcrenata	rough rams-horn
			Planorbella tenuis	Mexican rams-horn
Bivalvia	Veneroida	Corbiculidae	*Corbicula fluminea**	Asian clam
		Pisidiidae	*Pisidium casertanum*	ubiquitous peaclam
			Pisidium compressum	ridged-beak peaclam
			Pisidium insigne	tiny peaclam
Phyllum Arthropoda				
Malacostraca	Amphipoda	Hyalellidae	*Hyalella azteca*	amphipod, scud
	Decapoda	Astacidae	*Pacifastacus leniusculus**	signal crayfish
		Cambaridae	*Procambarus clarkia**	red swamp crawfish
Branchiopoda	Anostraca	Branchinectidae	*Branchinecta lynchi*	vernal pool fairy shrimp
			Branchinecta lindahli	versatile fairy shrimp
Arachnida	Trombidiformes	Limnocharidae	*Limnochares americana*	red freshwater mite
	Araneae	Theraphosidae	*Aphonopelma chalcodes*	desert tarantula
Insecta	Coleoptera	Dytiscidae	*Agabus brevicollis*	river beetle
			Agabus confertus	river beetle
			Agabus lineellus	river beetle
			Agabus sp.	river beetle
			Dytiscus sp.	river beetle
			Hydroporus striatellus	river beetle
			Hydroporus sp. 1	river beetle
			Hydroporus sp. 2	river beetle
			Hygrotus sp.	river beetle
			Laccophilus decipiens	river beetle
			Rhantus hoppingi	river beetle
		Elmidae	*Optioservus divergens*	riffle beetle
		Gyrinidae	*Gyrinus consobrinus*	whirligig beetle
		Haliplidae	*Peltodytes simplex*	crawling water beetle
		Hydrophilidae	*Berosus fraternus*	water scavenger beetle
			Berosus infuscatus	water scavenger beetle
			Enochrus conjunctus	water scavenger beetle
			Helichus sp.	water scavenger beetle
			Laccobius sp.	water scavenger beetle
			Tropisternus californicus	water scavenger beetle
			Tropisternus lateralis	water scavenger beetle
		Psephenidae	*Eubrianax edwardsii*	Edward's water penny
	Diptera	Ceratopogonidae	*Culicoides unicolor/utahensis/ palmerae (complex)*	punkies
			Forcipomyia townesi	punkies

Class	Order	Family	Scientific Name	Common Name
Insecta	Diptera	Chaoboridae	*Chaoborus puctinpennis*	phanton midges
		Chironomidae	*Chironomus matures*	water midges, lake flies
			Cricotopus sp. 1	water midges, lake flies
			Cricotopus sp. 2	water midges, lake flies
	Diptera	Chironomidae	*Micropsectra sp.*	water midges, lake flies
			Nanocladius sp.	water midges, lake flies
			Procladius bellus	water midges, lake flies
			Procladius freemani	water midges, lake flies
			Tanypus stellatus	water midges, lake flies
			Tanytarsus sp. 1	water midges, lake flies
			Tanytarsus sp. 2	water midges, lake flies
			Tanytarsus sp. 3	water midges, lake flies
		Simuliidae	*Prosimulium impostor*	black flies
			Simulium argus	black flies
			Simulium donovani	black flies
			Simulium vittatum (complex)	black flies
			Simulium sp.	black flies
		Stratiomyidae	*Odontomyia sp.*	soldier flies
			Stratiomys sp.	soldier flies
		Tabanidae	*Chrysops sp.*	deer fly
			Tabanus sp.	horse fly
		Tipulidae	*Antocha sp.*	crane fly
			Tipula sp.	crane fly
	Ephemeroptera	Baetidae	*Baetis sp.*	mayfly
			Callibaetis sp.	mayfly
		Caenidae	*Caenis tardata*	spotted mayfly
		Ephemerellidae	*Ephemerella maculate*	blue-winged dun
		Leptophlebiidae	*Leptophlebia sp.*	blue-winged dun
		Siphlonuridae	*Siphloneurus spectabilis*	blue-winged dun
		Tricorythidae	*Tricorythodes fallax*	blue-winged dun
	Hemiptera	Belostomatidae	*Lethocerus americanus*	electric light bug
		Corixidae	*Corisella inscripta*	water boatmen
			Graptocorix abdominalis	water boatmen
			Graptocorixa californica	water boatmen
			Graptocorixa uhleri	water boatmen
		Gelastocoridae	*Gelastocoris oculatus*	toad bug
		Gerridae	*Gerris remigis*	water strider
		Mesoveliidae	*Mesovelia mulsanti*	water treader
		Naucoridae	*Ambrysus californicus/ bohartorum (complex)*	California creeping water bug
		Notonectidae	*Buenoa margaritacea*	backswimmer
			Notonecta kirbyi	Kirby's backswimmer
			Notonecta shooteri	backswimmer
		Veliidae	*Microvelia* sp.	minute riffle bug
	Odonata	Coenagrionidae	*Argia vivida*	vivid dancer
			Enallagma civile	bluet
			Ischnura denticollis	fork-tail

Class	Order	Family	Scientific Name	Common Name
Insecta	Odonata	Libellulidae	*Sympetrum illotum*	dusty skimmer
	Plecoptera	Capniidae	*Mesocapnia werneri*	winter stonefly
		Isoperlidae	*Isoperla* sp.	winter stonefly
		Perlodidae	*Calineuria californica*	yellow-banded stonefly
	Trichoptera	Hydropsychidae	*Hydropsyche californica*	web-spinning caddisfly
		Hydroptilidae	*Hydroptila xera*	web-spinning caddisfly
		Leptoceridae	*Nectopsyche lahontanensis*	long-horned caddisfly

Notes:
*Indicates an introduced species.

D.3 Fish Species Recorded at Camp Roberts

Family	Scientific Name	Common Name
Order Cypriniformes (Carps)		
Catostomidae (Suckers)	*Catostomus occidentalis*	Sacramento sucker
Cyprinidae (Cyprinids)	*Carassius auratus**	goldfish
	*Cyprinus carpio**	common carp
	Lavinia exilicauda	hitch
	Ptychocheilus grandis	Sacramento pikeminnow
	Rhinichthys osculus	speckled dace
Order Cyprinodontiformes (Rivulines, Killifishes and Live Bearers)		
Poecillidae (Live Bearers)	*Gambusia affinis*	western mosquitofish*
Order Gasterosteiformes (Sticklebacks and Seamoths)		
Gasterosteidae (Stickleback)	*Gasterosteus aculeatus*	threespine stickleback
Order Perciformes (Perch-Likes)		
Centrarchidae (Sunfishes)	*Lepomis cyanellus*	green sunfish
	*Lepomis macrochirus**	bluegill
	*Morone chrysops**	white bass
	*Micropterus salmoides**	largemouth bass
	*Pomoxis nigromaculatus**	black crappie
Order Petromyzontiformes (Lampreys)		
Petromyzontidae (Northern Lampreys)	*Lampetra tridentata*	Pacific lamprey
Order Salmoniformes (Salmons)		
Salmonidae (Salmon)	*Oncorhynchus mykiss irideus*†	South-Central California Coast steelhead
Order Scorpaeniformes (Scorpionfishes and Flatheads)		
Cottidae (Sculpins)	*Cottus asper*	prickly sculpin
Order Siluriformes (Catfish)		
Ictaluridae (North American Freshwater Catfishes)	*Ameiurus melas**	black bullhead

Notes:
*Indicates an introduced species.
† Denotes a SWAP Focal Species.

D.4 Amphibian Species Recorded at Camp Roberts

Family	Scientific Name	Common Name
Order Anura (Frogs)		
Bufonidae (True Toads)	*Anaxyrus boreas*	western toad
	Anaxyrus boreas halophilus	Southern California toad
Hylidae (Tree Frogs & Allies)	*Pseudacris sierra*	Sierran treefrog
Ranidae (True Frogs)	*Lithobates catesbeianus**	American bullfrog
Scaphiopodidae (Spadefoot Toads)	*Spea hammondii*†	western spadefoot
Order Urodela (Salamanders)		
Plethodontidae (Lungless Salamanders)	*Batrachoseps nigriventris*	black-bellied slender salamander
	Batrachoseps pacificus	Channel Islands slender salamander
	Ensatina eschscholtzii	ensatina

Notes:
* Indicates an introduced species.

D.5 Reptile Species Recorded at Camp Roberts

Family	Scientific Name	Common Name
Order Squamata (Scaled Reptiles)		
Anguidae (Glass & Alligator Lizards)	*Elgaria multicarinata multicarinata*	woodland alligator lizard
Anniellidae (American Legless Lizards)	*Anniella pulchra*†	Northern California legless lizard
Colubridae (Colubrid Snakes)	*Arizona elegans occidentalis*	California glossy snake
	Coluber constrictor mormon	western yellow-bellied racer
	Masticophis flagellum ruddocki	San Joaquin coachwhip
	Coluber lateralis lateralis	California striped racer
	Diadophis punctatus vandenburgii	Monterey ring-necked snake
	Hypsiglena ochrorhyncha nuchalata	California nightsnake
	Lampropeltis californiae	California kingsnake
	Pituophis catenifer catenifer	Pacific gophersnake
	Thamnophis atratus atratus	Santa Cruz gartersnake
	Thamnophis sirtalis infernalis	California red-sided gartersnake
Phrynosomatidae (North American Spiny Lizards)	*Phrynosoma blainvillii*	coast horned lizard
	Sceloporus occidentalis occidentalis	northwestern fence lizard
	Uta stansburiana elegans	western side-blotched lizard
Scinidae (Skinks)	*Plestidon skiltonianus skiltonianus*	Skilton's skink
Viperidae (Pit Vipers)	*Crotalus oreganus oreganus*	northern Pacific rattlesnake
Order Testudines (Turtles)		
Emydidae (Box & Water Turtles)	*Actinemys pallida*†	southwestern pond turtle

Notes:
† Denotes a SWAP Focal Species.

D.6 Bird Species Recorded at Camp Roberts

Family	Scientific Name	Common Name
Order Anseriformes (Ducks, Geese & Waterfowl)		
Anatidae (Ducks, Geese, & Swans)	*Aix sponsa*	wood duck
	Anas acuta	northern pintail
	Mareca americana	American wigeon
	Spatula cyanoptera	cinnamon teal
	Anas platyrhynchos	mallard
	Mareca strepera	gadwall
	Aythya affinis	lesser scaup
	Aythya collaris	ring-necked duck
	Branta canadensis	Canada goose
	Bucephala albeola	bufflehead
	Bucephala clangula	common goldeneye
	Anser caerulescens	snow goose
	Mergus merganser	common merganser
	Oxyura jamaicensis	ruddy duck
	Spatula clypeata	northern shoveler
Order Caprimulgiformes (Nightjars, Swifts, Hummingbirds & Allies)		
Apodidae (Swifts)	*Aeronautes saxatalis*	white-throated swift
Caprimulgidae (Nightjars)	*Phalaenoptilus nuttallii*	common poorwill
Trochilidae (Hummingbirds)	*Archilochus alexandri*	black-chinned hummingbird
	Calypte anna	Anna's hummingbird
Order Cathartiformes (New World Vultures)		
Cathartidae (New World Vultures)	*Cathartes aura*	turkey vulture
	Gymnogyps californianus†	California condor
Order Charadriiformes (Shorebirds)		
Charadriidae (Plovers & Lapwings)	*Charadroius vociferous*	killdeer
Recurvirostridae (Avocets)	*Recurvirostra americana*	American avocet
Scolopacidae (Sandpipers & Allies)	*Actitis macularius*	spotted sandpiper
	Calidris mauri	western sandpiper
	Calidris minutilla	least sandpiper
	Calidris pusilla	semipalmated sandpiper
	Gallinago delicata	Wilson’s snipe
	Limnodromus griseus	short-billed dowitcher
	Limnodromus scolopaceus	long-billed dowitcher
	Phalaropus tricolor	Wilson's phalarope
	Tringa melanoleuca	greater yellowlegs
	Tringa semipalmata	willet
Order Ciconiiformes (Storks)		
Ciconiidae (Storks)	*Ciconia abdimii*	white-bellied stork
Order Columbiformes (Pigeons & Doves)		
Columbidae (Pigeons & Doves)	*Patagioenas fasciata*	band-tailed pigeon
	Columba livia	rock pigeon
	Streptoprlia decaocto	Eurasian collared dove
	Zenaida macroura	mourning dove
Order Coraciiformes (Kingfishers)		
Alcedinidae (Kingfishers)	*Megaceryle alcyon*	belted kingfisher

Family	Scientific Name	Common Name
Order Cuculiformes (Cuckoos)		
Cuculidae (Cuckoos)	*Geococcyx californianus*	greater roadrunner
Order Falconiformes (Diurnal Birds of Prey)		
Accipitridae (Hawks, Kites, & Eagles)	*Accipiter cooperii*	Cooper's hawk
	Accipiter striatus	sharp-shinned hawk
	Aquila chrysaetos†	golden eagle
	Buteo jamaicensis	red-tailed hawk
	Buteo lagopus	rough-legged hawk
	Buteo lineatus	red-shouldered hawk
	Buteo regalis	ferruginous hawk
	Buteo swainsoni†	Swainson's hawk
	Circus hudsonius†	northern harrier
	Elanus leucurus†	white-tailed kite
	Haliaeetus leucocephalus†	bald eagle
	Pandion haliaetus	osprey
Falconidae (Falcons & Caracaras)	*Falco columbarius*	merlin
	Falco mexicanus	prairie falcon
	Falco peregrinus	peregrine falcon
	Falco sparvicus	American kestrel
Order Galliformes (Guans, Quails, Pheasants & Allies)		
Odontophoridae (New World Quail)	*Callipepla californica*	California quail
Phasianidae (Pheasants, Grouse & Allies)	*Alectoris chukar*	chukar
	Meleagris gallopavo	wild turkey
Order Gaviiformes (Loons)		
Gaviidae (Loons)	*Gavia immer*	common loon
Order Gruiformes (Limpkin, Cranes, Rails & Allies)		
Rallidae (Rails, Coots & Gallinules)	*Fulica americana*	American coot
Order Passeriformes (Perching Birds)		
Aegithalidae (Long-Tailed Tits)	*Psaltriparus minimus*	bushtit
Alaudidae (Larks)	*Eremophila alpestris*	horned lark
	Eremophila alpestris actia	California Coastal Range horned lark
Bombycillidae (Waxwings)	*Bombycilla cedrorum*	cedar waxwing
Cardinallidae (Cardinals & Allies)	*Piranga ludoviciana*	western tanager
	Pheucticus melanocephalus	black-headed grosbeak
	Passerina caerulea	blue grosbeak
Certhiidae (Creepers)	*Certhia americana*	brown creeper
Corvidae (Crows, Jays, & Magpies)	*Aphelocoma californica*	California scrub jay
	Corvus brachyrhynchos	American crow
	Corvus corax	common raven
	Pica nuttalli	yellow-billed magpie
Fringillidae (Finches, Euphonias, & Allies)	*Spinus lawrenci*	Lawrence's goldfinch
	Spinus psaltria	lesser goldfinch
	Spinus tristis	American goldfinch
	Haemorhous mexicanus	house finch
	Haemorhous purpueus	purple finch
Hirundinidae (Swallows)	*Hirundo rustica*	barn swallow
	Petrochelidon pyrrhonota	cliff swallow
	Stelgidopteryx serripennis	northern rough-winged swallow
	Tachycineta bicolor	tree swallow
	Tachycineta thalassina	violet-green swallow

Family	Scientific Name	Common Name
Icteridae (New World Blackbirds)	*Euphagus cyanocephalus*	Brewer's blackbird
	Agelaius phoeniceus	red-winged blackbird
	Agelaius tricolor†	tricolored blackbird
	Icterus galbula	Baltimore oriole
	Icterus bullockii	Bullock's oriole
	Molothrus ater	brown-headed cowbird
Icteriidae (Yellow-Breasted Chat)	*Icterus virens*†	yellow-breasted chat
Laniidae (Shrikes)	*Lanius ludovicianus*†	loggerhead shrike
Mimidae (Mockingbirds & Thrashers)	*Mimus polyglottos*	northern mockingbird
	Toxcostoma redividum	California thrasher
Motacillidae (Pipits)	*Anthus rubescens*	american pipit
Paradoxornithidae (Parrotbills, Wrentit & Allies)	*Chamaea fasciata*	wrentit
Paridae (Tits, Chickadees & Titmice)	*Baeolophus inornatus*	oak titmouse
	Baeolophus ridegwayi	juniper titmouse
	Poecile rufescens	chestnut-backed chickadee
Parulidae (New World Warblers)	*Setophaga coronata*	yellow-rumped warbler
	Setophaga fusca	blackburnian warbler
	Setophaga nigrescens	black-throated gray warbler
	Setophaga occidentalis	hermit warbler
	Setophaga petechia†	yellow warbler
	Setophaga townsendi	Townsend's warbler
	Geothlypis trichas	common yellowthroat
	Mniotilta varia	black-and-white warbler
	Oreothlypis celata	orange-crowned warbler
	Oreothlypis ruficapilla	Nashville warbler
	Cardellina pusilla	Wilson's warbler
Passerellidae (New World Sparrows)	*Artemisiospiza belli*	Bell's sparrow
	Aimophila ruficeps†	rufous-crowned sparrow
	Ammodramus savannarum†	grasshopper sparrow
	Chondestes grammacus	lark sparrow
	Junco hyemalis	dark-eyed junco
	Melozone crissalis	California towhee
	Pipilo maculatus	spotted towhee
	Melospiza lincolnii	Lincoln's sparrow
	Melospiza melodia	song sparrow
	Spizella passerina	chipping sparrow
	Sturnella neglecta	western meadowlark
	Zonotrichia atricapilla	golden-crowned sparrow
	Zonotrichia leucophrys	white-crowned sparrow
	Passerculus sandwichensis†	savannah sparrow
	Passerella iliaca	fox sparrow
Polioptilidae (Gnatcatchers)	*Polioptila caerulea*	blue-gray gnatcatcher
Ptilogonatidae (Silky Flycatchers)	*Phainopepla nitens*	phainopepla
Regulidae (Kinglets)	*Regulus celandula*	ruby-crowned kinglet
	Regulus satrapa	golden-crowned kinglet
Sittidae (Nuthatches)	*Sitta canadensis*	red-breasted nuthatch
	Sitta carolinensis	white-breasted nuthatch
Sturnidae (Starlings & Mynas)	*Sturnus vulgaris*	European starling*
Troglodytidae (Wrens)	*Catherpes mexicanus*	canyon wren
	Salpinctes obsoletus	rock wren

Family	Scientific Name	Common Name
Troglodytidae (Wrens)	*Thryomanes bewickii*	Bewick's wren
	Troglodytes aedon	house wren
Turdidae (Thrushes)	*Catharus guttatus*	hermit thrush
	Catharus ustulatus†	Swainson's thrush
	Sialia currucoides	mountain bluebird
	Sialia mexicana	western bluebird
	Turdus migratorius	American robin
Tyrannidae (Tyrant Flycatchers)	*Contopus cooperi*	olive-sided flycatcher
	Contopus sordidulus	western wood-pewee
	Empidonax difficilis	Pacific-slope flycatcher
	Myiarchus cinerascens	ash-throated flycatcher
	Sayornis nigricans	black phoebe
	Sayornis saya	Say's phoebe
	Tyrannus verticalis	western kingbird
	Tyrannus vociferans	Cassin's kingbird
Vireonidae (Vireos & Allies)	*Vireo gilvus*	warbling vireo
	Vireo huttoni	Hutton's vireo
	Vireo cassinii	Cassin's vireo
Order Pelecaniformes		
Ardeidae (Herons, Egrets, & Bitterns)	*Ardea herodias*	great blue heron
	Butorides virescens	green heron
	Ardea alba	great egret
	Egretta thula	snowy egret
	Nycticorax nycticorax	black-crowned night-heron
Pelicanidae (Pelicans)	*Pelecanus erythrorhynchos*	American white pelican
Order Piciformes (Woodpeckers)		
Picidae (Woodpeckers)	*Colaptes auratus*	northern flicker
	Melanerpes formicivorus	acorn woodpecker
	Melanerpes lewis	Lewis's woodpecker
	Dryobates nuttallii	Nuttall's woodpecker
	Dryobates pubescens	downy woodpecker
	Dryobates villosus	hairy woodpecker
	Sphyrapicus nuchalis	red-naped sapsucker
	Sphyrapicus ruber	red-breasted sapsucker
Order Podicipediformes (Grebes)		
Podicipedidae (Grebes)	*Aechmophorus occidentalis*	western grebe
	Podilymbus podiceps	pied-billed grebe
Order Strigiformes (Owls)		
Strigidae (Owls)	*Asio otus*	Long-Eared Owl
	Athene cunicularia†	burrowing owl
	Bubo virginianus	great horned owl
	Glaucidium gnoma	Northern Pygmy-Owl
	Glaucidium sp.	Pygmy-Owl
	Megascops kennicottii	western screech-owl
Tytonidae (Barn-Owls)	*Tyto alba*	barn owl
Order Suliformes (Cormorants, Frigatebirds, Boobies, Gannets & Anhingas)		
Phalacrocoracidae (Cormorants)	*Phalacrocorax auritus*	double-crested cormorant

Notes:
† Denotes a SWAP Focal Species.

D.7 Mammals Species Recorded at Camp Roberts

Family	Scientific Name	Common Name
Order Artiodactyla (Even-Toed Ungulates)		
Bovidae (Sheep)	*Ovis aries*	domestic sheep
Cervidae (Deer)	*Cervus elaphus*†	tule elk
	Odocoileus hemionus columbianus	black-tailed deer
Suidae (Pigs)	*Sus scrofa*	wild pig
Order Carnivora (Carnivores)		
Canidae (Dogs)	*Canis latrans*	coyote
	Urocyon cinereoargenteus	gray fox
	Vulpes macrotis mutica	San Joaquin kit fox
	Vulpes vulpes	red fox
Felidae (Cats)	*Felis concolor*	mountain lion
	Felis domesticus	house cat
	Felis rufus	bobcat
Mustelidae (Weasels & Allies)	*Mephitis mephitis*	striped skunk
	Mustela frenata	long-tailed weasel
	Spilogale gracilis†	western spotted skunk
	Taxidea taxus†	American badger
Procyonidae (Raccoons & Allies)	*Bassariscus astutus*†	Ringtail
	Procyon lotor	raccoon
Order Chiroptera (Bats)		
Molossidae (Free-Tailed Bats)	*Eumops perotis californicus*†	western mastiff bat
	Tadarida brasiliensis	Mexican free-tailed bat
Vespertilionidae (Evening or Common Bats)	*Antrozous pallidus pacificus*	pallid bat
	Corynorhinus townsendii	Townsend's big-eared bat
	Eptesicus fuscus	big brown bat
	Lasionycteris noctivagans	silver-haired bat
	Lasiurus blossevillii†	western red bat
	Lasiurus cinereus	hoary bat
	Myotis californicus	California myotis
	Myotis ciliolabrum melanorhinus	western small-footed myotis
	Myotis evotis evotis	northern long-eared myotis
	Myotis volans†	long-legged myotis
	Myotis yumanensis	Yuma myotis
	Pipistrellus hesperus hesperus	western pipistrelle
Order Didelphimorphia (American Marsupials)		
Didelphidae (Opossums)	*Didelphis virginiana*	Virginia opossum
Order Lagomorpha (Hares, Pikas & Rabbits)		
Leporidae (Hares & Rabbits)	*Lepus californicus*	black-tailed jackrabbit
	Sylvilagus audubonii	desert cottontail
Order Rodentia (Rodents)		
Castoridae (Beavers)	*Castor canadensis*†	Beaver
Cricetidae (New World Rats & Mice)	*Microtus californicus*	California vole
	Neotoma fuscipes	dusky-footed woodrat
	Neotoma fuscipes bullatior	San Miguel dusky-footed woodrat

Family	Scientific Name	Common Name
Cricetidae (New World Rats & Mice)	*Neotoma macrotis luciana*	Monterey dusky-footed woodrat
	Neotoma fuscipes macrotis	San Diego dusky-footed woodrat
	Neotoma lepida	desert woodrat
	Peromyscus boylii	brush mouse
	Peromyscus californicus	California mouse
	Peromyscus maniculatus	deer mouse
	Peromyscus truei	pinyon mouse
	Reithrodontomys megalotis	western harvest mouse
Geomyidae (Pocket Gophers)	*Thomomys bottae*	Botta's pocket gopher
Heteromyidae (Pocket Mice & Kangaroo Rats)	*Chaetodipus californicus*	California pocket mouse
	Chaetodipus inornatus psammophilus	Salinas Pocket Mouse
	Dipodomys heermanni	Heermann's kangaroo rat
	Dipodomys sp.	unidentified kangaroo rat
Muridae (Old World Rats & Mice)	*Neotoma floridana*	eastern woodrat
	Ochrotomys nuttalli	golden mouse
	Peromyscus gossypinus	cotton mouse
	Podomys floridanus	Florida mouse
	Reithrodontomys humulis	eastern harvest mouse
	Sigmodon hispidus	hispid cotton rat
Sciuridae (Squirrels)	*Sciurus griseus*	western gray squirrel
	Spermophilus beecheyi	California ground squirrel

Notes:
† Denotes a SWAP Focal Species.

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Appendix E. Invasive Plants List

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Scientific Name (Common Name)	Cal-IPC/CDFA Rating	Common Habitat Type	CDFW Sensitive Natural Communities Effected (S1-S3)	CA SWAP Target Conservation Vegetative Communities Effected	TES Habitat Affected
	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Ailanthus altissima (Tree of Heaven)	Cal-IPC Moderate, CDFA "C"	Disturbed areas, riparian areas, grasslands, woodlands	Valley Oak Woodland S3 California Sycamore Woodland S3	Perennial Grasslands Warm Southwestern Riparian Forest California Woodlands	San Joaquin Kit Fox: FE; SCCC Steelhead: FT; Purple Amole: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Bald Eagle: FP
	Medium—monitor, prevent spread. Medium priority, can form dense stands outcompeting natives in riparian habitat.	Mechanically eradicate from riparian areas and treat stumps with herbicide.	Heavily shaded areas suppress Ailanthus growth	One tree can produce more than 325,000 seeds annually. Fast growing tree. Also reproduces through rhizomes. Seeds do not last more than a year in seed banks.	
Arundo donax (Giant Reed, Arundo)	Cal-IPC High, CDFA "B"	Disturbed areas, riparian areas, wetlands	California Sycamore Woodland S3	Warm Southwestern Riparian Forest Western North American Freshwater Marsh	Bald Eagle: FP; Least Bell's Vireo: FE; SCCC Steelhead: FT; Swainson's Hawk: ST
	High—monitor, eradicate. High priority, Chokes out riparian and wetland areas. Lowers water table due to high transpiration.	Mechanically eradicate all Arundo from the base and treat stumps with herbicide.	Goats have shown success in riparian areas. Burning or cutting can be used followed by herbicide treatment. Could benefit from a watershed partnership approach beneficial.	Arundo quickly establishes sites after disturbance. Species availability made possible through dispersal of rhizomes forming dense stands which interfere with native growth. Plant fragments disperse downstream and form new colonies.	
Atriplex semibaccata (Australian Saltbush)	Cal-IPC Moderate	Disturbed areas, grasslands, mixed chaparral, woodlands	Valley Oak Woodland S3	California Chaparral California Woodlands Perennial Grassland	San Joaquin Kit Fox: FE; California Condor: FE; Swainson's Hawk: ST; Purple Amole: FT
	Medium—monitor, prevent spread. Medium priority, can invade the boundaries of wetlands.	Mechanically eradicate from all wetland areas.	Grazing has shown success in rangelands. Mechanical weeding produces great results.	Only produces one seed per fruit but can germinate under saline and alkaline conditions. Primarily drops near parent plant and spreads farther by animals.	
Asphodelus fistulosus (Onionweed)	Cal-IPC Moderate, CDFA "B", FNW	Disturbed areas, Grasslands		Perennial Grassland	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium- monitor, prevent. Low priority. Primarily contained within disturbed areas.	Hand pull onion weed in sensitive habitat.	Burning and grazing is not feasible.	Reproduces by seed and spreads primarily through water, animals, and human activities. Seeds last for many years in the soil seedbank.	

Scientific Name (Common Name)	Cal-IPC/CDFA Rating	Common Habitat Type	CDFW Sensitive Natural Communities Effected (S1-S3)	CA SWAP Target Conservation Vegetative Communities Effected	TES Habitat Affected
	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Avena barbata (Slender Wild Oat)	Cal-IPC Moderate	Grasslands, woodlands, disturbed areas, non-wetlands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Cannot contain, management a low priority.	Mechanically eradicate via hand pulling in perennial grasslands and Purple Amole habitat	Burning can reduce seed viability. Competitive stand of perennial vegetation discourages growth.	Plants only reproduce by seed. Seeds are viable for 10 years in the soil.	
Avena fatua (Wild Oats)	Cal-IPC Moderate	Disturbed areas, understory of woodlands, grasslands, non-wetlands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium – monitor, prevent spread. Cannot contain, management a low priority.	Mechanically eradicate via hand pulling in perennial grasslands and Purple Amole habitat	Same as slender wild oats.	Same as slender wild oats.	
Bellardia trixago (Bellardia)	Cal-IPC Limited	Disturbed areas, grasslands, serpentine grasslands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Low – monitor, prevent spread. Medium priority. Hemi-parasitic plant that can crowd out rare native plants that are endemic to serpentine soils.	Chemically treat with selective contact herbicide in serpentine grasslands.	Extra consideration necessary since the plant is hemi-parasitic.	Spreads by seed.	
Brachypodium distachyon (False Brome)	Cal-IPC Moderate, CDFA "A"	Grasslands, understory of woodlands with rocky soils.	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium – monitor, prevent spread. Low priority. Primarily within grasslands with rocky soils.	None – monitor populations.	Prescribed burn, mowing, tilling and cultivation all provide good control. Poor forage quality for grazing.	Plants reproduce only by seed. Dispersal is facilitated by animals, and human activities. Germination occurs in fall or early winter. Seeds typically last a couple of years in the soil.	

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	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Brassica nigra (Black Mustard)	Cal-IPC Moderate	Disturbed areas, grasslands non-wetlands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Medium priority, grows profusely and produces allelopathic chemicals that prevent germination of native plants.	Mechanically eradicate dense populations yearly via mowing before seed sets.	Mowing and tilling are very effective at mustard control. Grazing control is fair	Reproduces only by seed. Seeds typically fall near parent plants and persist for up to 50 years.	
Brassica rapa (Field Mustard)	Cal-IPC Limited	Disturbed areas, grasslands, non-wetlands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Low – monitory, prevent spread. Medium priority. Grows profusely and may produce allelopathic chemicals that inhibit germination of native plants.	Mechanically eradicate dense populations yearly via mowing before seed sets.	Mowing and tilling are very effective at mustard control. Grazing control is fair.	Reproduces only by seed. Seeds typically fall near parent plants and persist for up to 50 years.	
Bromus diandrus (Ripgut Brome)	Cal-IPC Moderate	Disturbed areas, woodlands, grasslands, non-wetlands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Cannot contain, management a low priority.	Mechanically eradicate via hand pulling in perennial grasslands and Purple Amole range	Burn before seeds mature in the late spring. Tilling & cultivation can be effective	Seeds spread short distances by wind and greater distances by animals and people. Reproduces by seed only. Seeds can last up to 5 years in the seedbank. Thatch accumulation promotes germination.	
Bromus hordeaceus (Soft Chess)	Cal-IPC Limited	Disturbed areas, grasslands, woodlands, serpentine grasslands	Valley Oak Woodland S3	California Woodlands Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Medium priority, grows on serpentine soils home to rare plants.	Mechanically pull in wetlands, serpentine grasslands, and perennial grasslands	Burning and grazing has been shown to temporarily reduce populations. Promoting perennial grassland establishment out competes brome.	Reproduction is only by seed. Dispersal is mainly focused primarily around the parent plant with longer dispersal being accomplished through animals and people. Seeds can last between 2 to 5 years.	

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	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Bromus madritensis ssp. *rubens* (Red Brome)	Cal-IPC High	Disturbed areas, woodlands, grasslands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Cannot contain, management a low priority.	Mechanically pull small patches in wetlands, perennial grasslands, and Purple Amole range. Chemically treat larger patches.	Burning is not very effective. Moderate grazing mixed with herbicide has shown success. Tilling and cultivation can be effective.	Seeds spread short distances by wind and greater distances by animals and people. Reproduces by seed only. Seeds can last up to 5 years in the seedbank. Thatch accumulation promotes germination.	
Bromus tectorum (Cheatgrass)	Cal-IPC High	Grasslands, woodlands, disturbed areas, non-wetlands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Medium priority, prevent spread into perennial grasslands.	Mechanically pull small patches in perennial grasslands, and Purple Amole range. Chemically treat larger patches.	Burning is not very effective. Moderate grazing mixed with herbicide has shown success. Tilling and cultivation can be effective.	Seeds spread short distances by wind and greater distances by animals and people. Reproduces by seed only. Seeds can last up to 5 years in the seedbank. Thatch accumulation promotes germination.	
Carduus pycnocephalus ssp. *pycnocephalus* (Italian Thistle)	Cal-IPC Moderate, CDFA "C"	Grasslands, disturbed areas, non-wetlands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Low priority, mainly contained in disturbed areas.	Mechanically remove entire plant in Purple Amole habitat and perennial grasslands. Big populations can be mowed and treated with herbicide.	Thistles compete poorly with healthy established grasses and other vegetation. Grazing and fire has varied results.	Can form dense colonies around parent plant and disperse farther by wind. Seeds do not last more than a few years in the soil bank.	
Carduus tenuiflorus (Slenderflower Thistle)	Cal-IPC Limited, CDFA "C"	Grasslands, disturbed areas, non-wetlands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Low—monitor, prevent spread. Low priority, mainly contained in disturbed areas.	Mechanically remove entire plant in Purple Amole habitat and perennial grasslands. Mowing can help with larger populations.	Thistles compete poorly with healthy established grasses and other vegetation. Grazing and fire has varied results.	Can form dense colonies around parent plant and disperse farther by wind. Seeds typically do not persist in the soil bank.	

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	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Carthamus lanatus ssp. *lanatus* (Woolly Distaff Thistle)	Cal-IPC High, CDFA "B"	Disturbed areas, non-wetlands, grasslands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium priority – can form dense populations and injury grazing animals	Manually remove small populations in sensitive habitat before flowering. Mowing can help reduce large populations.	Thistles compete poorly with healthy established grasses and other vegetation.	Can form dense colonies around parent plant and disperse farther by wind or human/animal activity. Seeds can remain viable for up to 8 years in the soil bank.	
Centaurea calcitrapa (Purple Starthistle)	Cal-IPC Moderate, CDFA "B"	Disturbed areas, grasslands, woodlands, riparian areas	Valley Oak Woodland S3 California Sycamore Woodland S3	Perennial Grasslands Warm Southwestern Riparian Forest California Woodlands	San Joaquin Kit Fox: FE; SCCC Steelhead: FT; Purple Amole: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Bald Eagle: FP
	High—monitor, eradicate. Medium priority, may produce allelopathic chemicals that outcompete native vegetation.	Mechanically remove entire plant in Purple Amole habitat and perennial grasslands. Chemically treat large isolated patches.	Grazing and fire promote purple starthistle growth. Fertility management is best utilized along with perennial grassland establishment.	Plants only reproduce by seed which disperses with the seed head as a unit. Most fall just below the parent plant but can disperse farther with human/animal activity. Seeds last about 3 years in the seedbank.	
Centaurea melitensis (Tocalote, Malta Starthistle)	Cal-IPC Moderate, CDFA "C"	Disturbed areas, grasslands, open woodlands, non-wetlands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	San Joaquin Kit Fox: FE; Purple Amole: FT; Swainson's Hawk: ST
	Medium—monitor, prevent spread. Medium priority, may produce allelopathic chemicals that outcompete native vegetation.	Mechanically remove entire plant in Purple Amole habitat and perennial grasslands. Chemically treat large isolated patches.	Grazing and fire are not effective tools. Mowing for 2-4 years can eliminate seedbank.	Spreads quickly by producing great quantities of seed. Reproduces only by seed and forms dense colonies around parent plant. Seeds typically last about 4 years in soil.	
Centaurea solstitialis (Yellow Starthistle)	Cal-IPC High, CDFA "C"	Disturbed areas, open woodlands, grasslands, non-wetlands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	San Joaquin Kit Fox: FE; Purple Amole: FT; Swainson's Hawk: ST
	High—monitor, eradicate. High priority, highly competitive and can produce allelopathic chemicals that outcompete native vegetation.	Mechanically remove entire plant in Purple Amole habitat and perennial grasslands. Chemically treat large isolated patches.	Goats have shown success in grazing small infestations. Properly timed burns can provide control. Mowing or tilling for 2-4 years can eliminate seedbank & populations.	Propagates rapidly by seed with large plants producing nearly as much as 75,000 seeds per plant most germinating and forming dense colonies around the parent plant. Seeds typically last about 4 years in soil.	

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	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Cirsium vulgare (Bull Thistle)	CAL-IPC Moderate, CDFA "C"	Disturbed areas, grasslands, open woodlands, wetlands, riparian areas	Valley Oak Woodland S3 California Sycamore Woodland S3	Perennial Grasslands California Woodlands Warm Southwestern Riparian Forest Western North American Freshwater Marsh	San Joaquin Kit Fox: FE; SCCC Steelhead: FT; Purple Amole: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Bald Eagle: FP
	Medium- monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Mechanically remove all above ground portions of plant in Purple Amole habitat, perennial grasslands and wetlands. Larger isolated patches can be treated with herbicide.	Goats have shown success in controlling bull thistle populations. Fires control is unpredictable. Mowing & other mechanical control effective at the start of flowering.	Reproduces only by seed with most seeds only falling a few feet from the parent. Plants can produce as much as 75,000 seeds per plant. Potential to form dense colonies in freshly disturbed areas. Seeds survive for about 3 years in soil.	
Conium maculatum (Poison Hemlock)	Cal-IPC Moderate	Disturbed areas, woodlands, riparian areas	Valley Oak Woodland S3 California Sycamore Woodland S3	California Woodlands Warm Southwestern Riparian Forest	San Joaquin Kit Fox: FE; SCCC Steelhead: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Bald Eagle: FP; Purple Amole: FT
	Medium—monitor, prevent spread. Medium priority, highly competitive and shades out natives.	Mechanically remove all above ground portions of plant in Purple Amole habitat, perennial grasslands and wetlands. Larger isolated patches can be treated with herbicide.	Burning or grazing not feasible due to toxic nature of plant. Cultivation can prevent population establishment.	Reproduces only by seed with most seeds falling near the parent plant which can form dense colonies. Seed dispersal occurs from late summer through winter. Seeds survive up to three years in the soil.	
Cortaderia jubata (Pampas Grass)	Cal-IPC High, CDFA "B"	Disturbed areas, grasslands, woodlands, riparian areas, wetlands	Valley Oak Woodland S3 California Sycamore Woodland S3	Perennial Grasslands Warm Southwestern Riparian Forest California Woodlands Western North American Freshwater Marsh	San Joaquin Kit Fox: FE; SCCC Steelhead: FT; Purple Amole: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Bald Eagle: FP
	High – colonizes bare ground very quickly and other areas not needing fertilizers.	Hand remove plants with shovels in wetland areas and spray stumps with herbicide.	Heavily mulching or planting bare or freshly disturbed sites can prevent establishment.	Plants reproducing only by seed with each plume producing up to 100,000 seeds a year all of which are widely dispersed by wind (up to 20 miles) and develop without fertilization. Seeds usually do not persist for long in the seedbank	

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Cotoneaster pannosus (Cotoneaster)	Cal-IPC Moderate	Disturbed areas, grasslands, woodlands	Valley Oak Woodland S3	Perennial Grasslands California Woodlands	San Joaquin Kit Fox: FE; Purple Amole: FT; Swainson's Hawk: ST
	Medium – monitor, prevent spread. Medium priority, can outcompete coastal scrub, grassland and forest species.	Mechanically remove above ground vegetation and treat stumps with herbicide in sensitive habitat.	Fruit provides a good food source for some birds. Grazing/ burning not feasible.	Each plant can produce thousands of fruits every year which can be widespread through animals/humans and water. Plant will re-sprout from roots if cut.	
Cotula coronopifolia (Brass Buttons)	Cal-IPC Limited	Disturbed areas, wetlands, vernal pools,	Vernal Pools S2	Western North American Vernal Pool Western North American Freshwater Marsh	Vernal Pool Fairy Shrimp: FE
	Low—monitor, prevent spread. Medium priority, spreads slowly in vernal pools and wetlands.	Treat with selective herbicides in vernal pools and other wetlands.	Tilling can work in areas compatible with the method. Grazing/ burning not feasible.	Plants reproduce by seed and via vegetation. Birds and water can widely disperse seeds. Vegetative growth is slow.	
Crataegus monogyna (Hawthorn)	Cal-IPC Limited	Riparian areas, woodlands, grasslands	Valley Oak Woodland S3 California Sycamore Woodland S3	Perennial Grasslands Warm Southwestern Riparian Forest California Woodlands	San Joaquin Kit Fox: FE; SCCC Steelhead: FT; Purple Amole: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Bald Eagle: FP
	Low—monitor, prevent spread. Medium priority, spreads slowly in riparian areas and woodlands.	Mechanically remove in riparian areas and treat stump with herbicide.	Grazing and burning are not feasible. Fruit provides good forage for small animals.	Produces fruit which are eaten and dispersed by small animals or human activity and water. Plant will re-sprout from roots or stump if cut.	
Cynodon dactylon (Bermuda Grass)	Cal-IPC Moderate, CDFA "C"	Disturbed areas, riparian areas, wetlands	California Sycamore Woodland S3	Western North American Freshwater Marsh Warm Southwestern Riparian Forest	SCCC Steelhead: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Bald Eagle: FP
	Medium—monitor, prevent spread. Moderate, out competes native riparian species.	Hand weed in wetland habitat and purple amole habitat. Herbicide can be used to eradicate dense clusters.	Shading by other plants, mulches, or cloth can suppress growth. Tilling is effective.	Reproduces and spreads vegetatively from its rhizomes & stolons or by seeds. Rhizome and stolon fragments spread with soil movement and seeds spread with water or human activity. Seeds can last up to 4 years in the soil.	

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	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Delairea ordorata (Cape Ivy)	Cal- IPC High, CDFA "B"	Riparian areas, oak woodlands	California Sycamore Woodland S3 Valley Oak Woodland S3	Warm Southwestern Riparian Forest California Woodlands	Bald Eagle: FP; SCCC Steelhead: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Purple Amole: FT; San Joaquin Kit Fox: FE
	High priority - forms dense mats of vegetation outcompeting native vegetation and is toxic to animals. Fish can be killed when materials are soaking in waterways.	Manually remove plant and spot treat re-sprouts with herbicide	Grazing and burning are not feasible. Watershed partnership approach beneficial.	Plants primarily reproduce vegetatively through fragments of stem, rhizome, and stolon. Most seeds are not viable but when they are, they can spread long distances by wind.	
Descurainia sophia (Tansy Mustard)	Cal – IPC Limited	Disturbed areas, grasslands, chaparral, open woodlands	Valley Oak Woodland S3	California Woodlands Perennial Grasslands California Chaparral	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; California Condor: FE
	Low – monitor, prevent spread. Low priority, not very prevalent in Camp Roberts habitat types.	Hand pull in sensitive habitats.	Tilling can provide excellent control during seedling and rosette stage.	Produces abundant seeds which can be spread by water movement, animal movement, and human activity. Rate of spread is very slow except in disturbed areas.	
Dittrichia graveolens (Stinkwort)	Cal-IPC Moderate	Disturbed areas, wetlands, vernal pools, riparian areas	California Sycamore Woodland S3 Vernal Pools S2	Warm Southwestern Riparian Forest Western North American Freshwater Marsh Western North American Vernal Pools	Bald Eagle: FP; SCCC Steelhead: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE; Vernal Pool Fairy Shrimp: FE
	Moderate – is shown to be rapidly expanding its range and can grow in vernal pools.	Hand pull all weeds located in vernal pools and treat larger patches near riparian areas with herbicide.	Due to the species oils it is difficult to treat with herbicide. Minimize disturbance and facilitate competitive perennial grass populations.	Flowers in the fall and winter. Seeds are readily distributed by wind water or animals. Seeds have a short lifespan in soil, less than 3 years.	

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Elymus caput-medusae (Medusa Head)	Cal-IPC High, CDFA "C"	Disturbed areas, grasslands, chaparral, oak woodlands	Valley Oak Woodland S3	California Woodlands Perennial Grasslands California Chaparral	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; California Condor: FE
	High—monitor, eradicate. High priority highly competitive and persists as a dense litter layer that prevents germination and survival of native species. Grows on same clay soil as Purple Amole.	Mechanically remove dense litter layers and treat patches with herbicide in all areas except nonnative grasslands	Prescribed burns in the central valley/ foothills are extremely effective. Grazing is typically not effective. Thatch removal can favor establishment of desirable plants.	Seed production is usually prolific with some florets remaining attached to spikes allowing them to be dispersed by animals or human activity. Usually does not persist for long in the seedbank. Seeds germinate in dense litter with low moisture conditions.	
Erodium cicutarium (Redstem Filaree)	Cal-IPC Limited	Disturbed areas, grasslands, vernal pools	Vernal pools S2	Perennial Grasslands Western North American Vernal Pools	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; Vernal Pool Fairy Shrimp: FE
	Low—monitor, prevent spread. Cannot contain, low priority.	Hard to contain, remove only by either hand or herbicide in sensitive habitats.	Provides good forage before it matures. Burning not feasible. Cultivation can help control.	Plants reproduce only by seed which are found typically a short distance from the parent plant. Or can disperse further through animal/ human activity. Seeds can form extensive seed banks.	
Eucalyptus camaldulensis (Red Gum)	Cal-IPC Limited	Riparian areas, wetlands, disturbed areas	California Sycamore Woodland S3	Warm Southwestern Riparian Forest Western North American Freshwater Marsh	Bald Eagle: FP; SCCC Steelhead: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE
	Low - monitor, prevent spread. Low priority, spreads slowly and typically contained. Prevent spread in riparian areas.	None – monitor stands and remove only when critical.	Seedlings do not tolerate shade. Re-sprouting will occur when cut.	Prolific seed producer. Seeds do not spread far from parent plant besides when done through water. Seeds can remain dormant for several years.	
Eucalyptus globulus (Tasmanian Blue Gum, Blue Gum Eucalyptus)	Cal-IPC Limited	Disturbed areas, riparian areas,	California Sycamore Woodland S3	Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Swainson's Hawk: ST; Least Bell's Vireo: FE
	Medium—monitor, prevent spread. Low priority, spreads slowly and typically contained.	None – monitor stands and remove only when critical	Grazing and burning not effective. Resprouting occurs when cut. Dense groves accumulate highly combustible litter.	Reproduces by seed with most falling within 300' from the parent plant. Some are dispersed farther through animal & human activity. Seeds can remain dormant for several years.	

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Festuca myuros (Rattail Fescue)	Cal-IPC Moderate	Disturbed areas, grasslands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, control. Medium priority, control in wetlands, purple amole habitat, perennial grasslands.	Hand remove small clusters in wetlands and purple amole habitat. Treat with herbicide dense clusters.	Grazing and burning have produced varying results. Typically, not feasible to control on a landscape level.	Reproduces by seed only with most falling near the parent plant. Some have potential to spread further through animal and human activity.	
Festuca perennis (Italian Ryegrass)	Cal-IPC Moderate	Disturbed areas, grasslands, wetlands		Perennial Grasslands Western North American Freshwater Marsh	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Medium, control in wetlands, purple amole habitat, perennial grasslands.	Hand remove small clusters in wetlands and purple amole habitat. Treat with herbicide dense clusters.	Grazing and burning have produced varying results. Typically, not feasible to control on a landscape level.	Reproduces by seed only with most falling near the parent plant. Some have potential to spread further through animal and human activity. Seeds typically do not persist for long in seedbanks.	
Foeniculum vulgare (Wild Fennel)	Cal-IPC Moderate	Disturbed areas, grasslands, riparian areas, wetland	California Sycamore Woodland S3	Perennial Grasslands Western North American Freshwater Marsh Warm Southwestern Riparian Forest	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE
	High—monitor, eradicate. High priority, drastically alters the composition and structure of many plant communities, including grasslands, coastal scrub, riparian, and wetland communities.	Hand shlash all clusters in sensitive areas. Revisit later if necessary. Treat dense clusters with herbicide.	Grazing is not effective and spreads the population. Fall burns followed by herbicide treatment can be effective.	Plants reproduce by seed and sometimes vegetatively through root or crown fragments. Seeds typically do not fall far from the parent but can travel further through animal & human activity. Forms dense colonies. Seeds persist for several years in soil.	

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Genista monspessulana (French Broom)	Cal-IPC High, CDFA "C"	Disturbed areas, grasslands, shrublands, woodlands, riparian areas	California Sycamore Woodland S3 Valley Oak Woodland S3	Perennial Grasslands Warm Southwestern Riparian Forest California Woodlands California Chaparral	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; California Condor: FE;
	High priority, forms dense stands that exclude native plants and wildlife.	Mechanically remove all above ground biomass and treat stumps with herbicide	Populations best suppressed by the establishment of competitive natives. Goats can be utilized to eat seedlings. Burning has varied results.	Produces copious amounts of seed forming dense stands. Will reproduce vegetatively from the stump or roots if cut. Seed bank is viable for up to 30 years.	
Geranium dissectum (Geranium)	Cal-IPC Limited	Disturbed areas, grasslands, shrublands, open woodlands	Valley Oak Woodland S3	Perennial Grasslands California Chaparral California Woodlands	California Condor: FE; Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Low – monitor, prevent spread. Low priority, primarily contained in disturbed areas.	Hand pull only the plants in sensitive habitat.	Grazing and burning are not effective means of control. Exclusion most likely the best control. Cultivation is effective.	Reproduces only by seed with most falling close to the parent pant but some spreading further through animal and human activity. Seeds form a seed bank viable for up to 10 years.	
Helminthotheca echioides (Bristly Ox-Tongue)	Cal- IPC Limited	Disturbed areas, grasslands, wetlands, riparian areas	California Sycamore Woodland S3	Warm Southwestern Riparian Forest Western North American Freshwater Marsh Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE
	Low – monitor, prevent spread. Low priority, primarily contained in disturbed areas.	Hand pull only the plants in sensitive habitat	Grazing and mowing have shown to facilitate bristly ox tongue growth.	Reproduces exclusively by seed with most falling close to the parent plant forming dense colonies in disturbed areas. Some spread further through animal and human activity.	
Hirschfeldia incana (Mediterranean or Short-Pod Mustard)	Cal-IPC Moderate	Disturbed areas, grasslands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium—monitor, prevent spread. Medium priority, fairly abundant in grasslands and coastal scrub.	Hand pull plants in sensitive habitat. Treat with herbicide dense clusters.	Grazing and fire are not effective. Will reproduce vegetatively through the base if damaged.	Reproduce primarily by seed with most falling close to the parent plant. Seed production is high with seeds likely to survive in the soil for several years.	

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Hordeum marinum ssp. *gussoneanum* (Mediterranean Barley)	Cal-IPC Moderate	Disturbed areas, vernal pools. grasslands, wetlands	Vernal Pools S2	Perennial Grasslands Western North America Vernal Pool Western North American Freshwater Marsh	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; Vernal Pool Fairy Shrimp: FT
	Medium—monitor, prevent spread. Moderate, outcompetes plants in wetlands – fairly abundant.	Hand pull plants in sensitive habitat. Treat with herbicide dense clusters in wetlands.	Burning is an effective control for Hordeum species. Thick mulches can reduce germination.	Reproduction is only by seed with most falling close to the parent pant to form dense colonies. Some have potential to move further with animal/ human activity. Seed bank is short-lived.	
Hordeum murinum (Wall Barley)	Cal-IPC Moderate	Disturbed areas, grasslands		Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Medium – monitor, prevent spread.	Hand pull plants in sensitive habitat. Treat with herbicide dense clusters in wetlands.	Burning is an effective control for *Hordeum* species. Thick mulches can reduce germination.	Reproduction is only by seed with most falling close to the parent pant to form dense colonies. Some have potential to move further with animal/ human activity. Seed bank is short-lived.	
Hypochaeris glabra (Smooth Cat's Ear)	Cal-IPC Limited	Disturbed areas, grasslands, woodlands, chaparral	Valley Oak Woodland S3	Perennial Grasslands California Chaparral California Woodlands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE; California Condor: FE
	Low—monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Hand pull only plants in sensitive areas.	Cultivation can be used to control smooth cat's ear but grazing and burning are not feasible.	Seeds are dispersed primarily by wind but also through animal and human activity. Seeds generally do not persist in the seedbank. Can also reproduce vegetatively through offsets from the crown.	
Hypochaeris radicata (Rough Cat's Ear)	Cal-IPC Moderate	Disturbed areas, grasslands, open woodlands	Valley Oak Woodland S3	California Woodlands Perennial Grasslands	Purple Amole: FT; Swainson's Hawk: ST; San Joaquin Kit Fox: FE
	Low—monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Hand pull only plants in sensitive habitat.	Cultivation can be used to control rough cat's ear but grazing and burning are not feasible.	Seeds are dispersed primarily by wind but also through animal and human activity. Seeds generally do not persist in the seedbank. Can also reproduce vegetatively through offsets from the crown.	

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Lepidium latifolium (Perennial Pepperweed)	Cal-IPC High, CDFA "B"	Disturbed areas, wetlands, riparian areas, vernal pools	Vernal Pools S2 California Sycamore Woodland S3	Western North America Vernal Pool Western North American Freshwater Marsh Warm Southwestern Riparian Forest	Vernal Pool Fairy Shrimp: FT; Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	High—monitor, control. High priority, grows very aggressively, forming dense colonies that exclude native species in wetlands.	Mow or cut dense stands in all wetland habitat and treat cut stems with herbicide.	Grazing can suppress populations but will re-sprout once stopped. Best control is through the establishment of desirable competitive vegetation.	Forms dense colonies that exclude native species. It reproduces by seed and vegetatively through root fragments. Dispersal is accomplished through animal and human activity. Produces large amounts of seed which do not remain viable in the soil for long – appears to reproduce primarily vegetatively through root and root fragments.	
Ludwigia peploides (Creeping Water-Primrose)	Cal-IPC High	Disturbed areas, wetlands, riparian areas	California Sycamore Woodland S3	Western North American Freshwater Marsh Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	High—monitor, eradicate. High priority, forms very dense mats which out competes native aquatic plants.	Mechanically remove dense stands in wetland habitat and treat remaining vegetation with herbicide.	Preventing accumulation of nutrients and sediment can reduce spread.	Forms dense impenetrable mats in aquatic settings. Plants reproduce by seed but primarily through vegetation by creeping stems, stem fragments, and rhizomes.	
Lythrum hyssopifolia (Hyssop Loosestrife)	Cal-IPC Moderate	Disturbed areas, wetlands, riparian areas, vernal pools	Vernal Pools S2 California Sycamore Woodland S3	Western North American Freshwater Marsh Warm Southwestern Riparian Forest Western North America Vernal Pool	Vernal Pool Fairy Shrimp: FT; Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	Low—monitor, prevent spread. Medium priority, invades wetlands.	Treat plants found in wetland habitat with herbicide.	Grazing, tilling, and burning are all poor sources of control for this weed.	Spreads vegetatively through rhizomes and roots. Also, can spread by seed, falling primarily around the parent plant.	

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Marrubium vulgare (White Horehound)	Cal-IPC Limited	Disturbed areas, grasslands, chaparral, riparian areas, wetlands	California Sycamore Woodland S3	Western North American Freshwater Marsh Warm Southwestern Riparian Forest Perennial Grasslands California Chaparral	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE; California Condor: FE
	Low—monitor, prevent spread. Low priority, primarily occurs in disturbed areas and has low impact on natives.	Hand pull or treat with herbicide plants found in sensitive habitat.	Grazing and burning alone are not effective controls. Deep cultivation can control the species.	Reproduces primarily by seed with most falling directly under the parent plant and some being moved long distances through animal and human activity. Has potential to form dense stands and the seed bank is viable for up to 10 years.	
Medicago polymorpha (California Burclover)	Cal-IPC Limited	Disturbed areas, grasslands, disturbed wetlands		Perennial Grasslands Western North American Freshwater Marsh	Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low—monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Monitor population. Hand pull plants in sensitive habitat if needed.	Tilling provides good control of burclover. Grazing and burning provide varied results.	Reproduces only by seed which can be spread long distances through animal and human activity.	
Nicotiana glauca (Tree Tobacco)	Cal-IPC Moderate	Disturbed areas, riparian areas, grasslands, woodlands	California Sycamore Woodland S3 Valley Oak Woodland S3	Warm Southwestern Riparian Forest California Woodlands Perennial Grasslands	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low—monitor. Low priority, primarily contained within disturbed areas.	Mechanically remove tree in wetlands and treat stump with herbicide.	Burning and grazing are not effective controls. Plants will re-sprout from the base if cut.	Individual trees can produce 10,000-1,000,000 seeds per year with viability approaching 100%. Water and animals are the primary dispersal agents. Seed banks typically are not long lived.	
Oxalis pes-caprae (Bermuda Buttercup)	Cal-IPC Moderate	Disturbed areas, oak woodlands	Valley Oak Woodland S3	California Woodlands	Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low—monitor. Low priority, primarily contained within disturbed areas.	Monitor populations in native habitats and treat with chemical when necessary.	Burning and grazing are not considered effective control options. Repeated tillage is effective.	Does not produce seeds but reproduces vegetatively by bulbs which spread with cultivation, and other forms of soil movement.	

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Pennisetum setaceum (Fountain Grass)	Cal-IPC Moderate	Disturbed areas, chaparral, non-wetlands		California Chaparral	California Condor: FE; Swainson's Hawk: ST
	High—monitor, control. Moderate priority, forms dense stands out competing natives.	Remove plants in sensitive habitat by hand pulling or weed eating.	Plants can increase in density after burns. Grazing also is not an effective control.	Plants reproduce only by seed which is produced in abundance. Seeds are primarily dispersed by wind and animals. Seeds have been shown to live up to 6 years in soil banks.	
Phalaris aquatica (Harding Grass)	Cal-IPC Moderate	Disturbed areas, riparian areas, disturbed wetlands	California Sycamore Woodland S3	Warm Southwestern Riparian Forest Western North American Freshwater Marsh	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	Medium—monitor, control. Moderate priority, outcompetes natives in wetland habitats.	Hand remove small populations in sensitive habitat/ wetlands and treat larger clusters with herbicide.	Burning or grazing can successfully suppress the species if followed up with a herbicide.	Most reproduction is by seed which typically falls near the parent plant forming dense stands. Seeds generally last less than two years in the soil bank.	
Plantago lanceolata (English Plantain)	Cal-IPC Limited	Disturbed areas, wetlands, riparian areas, grasslands, open woodlands	California Sycamore Woodland S3 Valley Oak Woodland S3	Warm Southwestern Riparian Forest California Woodlands Perennial Grasslands Western North American Freshwater Marsh	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low – monitor. Moderate priority, primarily contained within disturbed areas, but is found on clay and serpentine soils (purple amole)	Hand pull small populations in sensitive habitat/ wetlands and treat larger clusters with herbicide.	Grazing, burning and cutting are all ineffective. Tilling populations produces good results.	Most reproduction is by seed which typically fall near the parent plant forming dense stands.	
Polypogon monspeliensis (Rabbitsfoot Grass)	Cal-IPC Limited	Disturbed areas, wetlands, vernal pools, riparian areas	California Sycamore Woodland S3 Vernal Pools S2	Warm Southwestern Riparian Forest Western North American Freshwater Marsh Western North America Vernal Pools	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Vernal Pool Fairy Shrimp: FT
	Low—monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Hand pull small populations in sensitive wetlands and treat with herbicide larger clusters.	Grazing produces varied results while prescribed burns and tilling offers good control if timed correctly.	Mainly reproduces by seed which typically does not fall far from the parent plant. Some get transported farther through animals and human activity. Can form dense colonies. Seeds generally do not last long in soil.	

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Pyracantha angustifolia (Pyracantha)	Cal-IPC Limited	Disturbed areas, riparian areas	California Sycamore Woodland S3	Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	Low—monitor. Low priority, primarily contained within disturbed areas and spreads slowly.	Mechanically remove trees along riparian areas and treat stumps with herbicide.	Will re-sprout if burned or cut. Weed wrench offers good control over young plants.	Reproduces primarily by seeds which are dispersed through water, small mammals and birds. Successful new introductions are rare unless it occurs in a cool moist climate.	
Raphanus sativus (Radish)	Cal-IPC Limited	Disturbed areas, grasslands, open woodlands, riparian areas, wetlands	California Sycamore Woodland S3 Valley Oak Woodland S3	Warm Southwestern Riparian Forest Western North American Freshwater Marsh California Woodlands Perennial Grasslands	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low – monitor, prevent spread. Low priority, primarily contained within disturbed areas and spreads slowly.	Hand pull small populations in wetland habitat. Treat larger populations with herbicide.	Burning and grazing are typically not practical. Maintaining competitiveness of grasses will exclude the species. Tilling is generally effective.	Reproduce only by seed which typically falls to the base of the parent plant. The seeds have a long dormancy and can stay viable in the soil for years.	
Ricinus communis (Castor Bean)	Cal-IPC Limited	Disturbed areas, riparian areas	California Sycamore Woodland S3	Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	Medium—monitor, control. Moderate, seeds are toxic and outcompetes some wetland vegetation.	Hand pull small populations in wetland habitat. Treat larger populations with herbicide.	Grazing and burning are not effective forms of control. Shallow, repeated cultivation provides control.	Plants reproduce by seed that disperse short distances when capsules snap open at maturity. Can disperse farther when moved by wildlife or human activity. Castor bean does not form persistent seedbanks.	
Robinia pseudoacacia (Black Locust)	Cal-IPC Limited	Disturbed areas, riparian areas, woodlands	California Sycamore Woodland S3 Valley Oak Woodland S3	Warm Southwestern Riparian Forest California Woodlands	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low—monitor, prevent spread. Low priority, primarily contained within disturbed areas and spreads slowly.	Monitor population.	Seeds do not perform well in shade or compete well with established vegetation	Produces numerous suckers from roots and form dense colonies. Can also reproduce by seed which are viable in the seedbank for up to 10 years or more.	

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Rumex crispus (Curly Dock)	Cal-IPC Limited	Disturbed areas, grasslands, riparian areas, wetlands, vernal pools	California Sycamore Woodland S3 Vernal Pools S2	Warm Southwestern Riparian Forest Western North American Freshwater Marsh Perennial Grasslands Western North American Vernal Pools	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE; Vernal Pool Fairy Shrimp: FT
	Low—monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Cut below soil with shovel in wetland habitat. Treat dense clusters with herbicide.	Improving drainage can help control the species. Grazing and burning are not feasible. Resprouts when cut. Tilling is effective were viable.	Plants reproduce primarily by seed which falls close to the plant or is dispersed long distances by water. Plants are prolific seed producers which are viable for over 20 years in seed banks.	
Salsola tragus (Russian Thistle)	Cal-IPC Limited, CDFA "C"	Disturbed areas			
	Low—monitor, prevent spread. Low priority, low density and primarily contained within disturbed areas.	Hand pull entire plant from wetland habitats.	Species does poorly in areas dominated by other vegetation.	Plants reproduce primarily by seed which is dispersed as the plant dies then tumbles with the wind. Seeds only viable in the seedbank for about one year.	
Schinus molle (Peruvian Peppertree)	Cal-IPC Limited	Riparian areas	California Sycamore Woodland S3	Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	Medium—monitor, control. Low priority, low density and primarily contained within disturbed areas.	Mechanically remove tree in wetland habitats and treat stump with herbicide.	Burning kills seeds but promotes tree coppicing.	Plants reproduce by seed and sometimes vegetatively through root sprouts. Most seeds remain viable for less than a year in seedbanks.	
Schismus arabicus (Arabian Grass)	Cal-IPC Limited	Disturbed areas, non-wetlands			
	Medium—monitor, control. Low priority, primarily within disturbed areas and outside of its primary range.	Monitor population. Treat dense populations in sensitive habitat with herbicide.	Grazing and burning can increase the spread of this species. Cultivation is also ineffective.	Reproduce only by seed which typically fall near the parent plant with some dispersing by wind. Seeds typically do not remain viable in seedbanks for very long.	

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Schismus barbatus (Mediterranean Grass)	Cal-IPC Limited	Disturbed areas, non-wetlands			
	Medium—monitor, control. Low priority, primarily within disturbed areas and outside of its primary range.	Monitor population. Treat dense populations in sensitive habitat with herbicide.	Grazing and burning can increase the spread of this species. Cultivation is also ineffective.	Reproduce only by seed which typically fall near the parent plant with some dispersing by wind. Seeds typically do not remain viable in seedbanks for very long.	
Silybum marianum (Blessed Milk Thistle)	Cal-IPC Limited	Disturbed areas, chaparral, woodlands	Valley Oak Woodland S3	California Woodlands California Chaparral	Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE; California Condor: FE
	Medium—monitor, control. Low priority, primarily contained within disturbed areas.	Monitor populations. Hand remove dense populations in sensitive habitat.	Grazing and burning are not feasible methods of control. Tilling can work on younger plants.	Can form dense stands. Plants reproduce only by seed which are dispersed short distances by seed or longer distances by human activities. Seeds can survive for up to 9 years in the seed bank.	
Sinapis arvensis (Charlock Mustard)	Cal-IPC Limited	Disturbed areas, non-wetlands			
	Low – monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Monitor populations. Hand remove dense populations in sensitive habitat.	Grazing and burning are not effective. Mowing during the bud stage can help suppression.	Plants reproduce only by seed with most falling near the parent plants causing them to form dense stands. Seeds can survive up to 11 years in seed banks.	
Sisymbrium irio (London Rocket)	Cal-IPC Limited	Disturbed areas, riparian areas	California Sycamore Woodland S3	Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	Medium—monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Monitor populations. Hand remove dense populations in sensitive habitat	Burning, grazing and mowing are effective if done before seed production. Cultivation is very effective if done before seed production.	Reproduce only by seed and can produce several thousand seeds per plant. Seeds typically do not fall far from the parent plant. Seeds are viable for up to about 10 years in the seedbank.	

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Spartium junceum (Spanish Broom)	Cal-IPC High, CDFA "C"	Disturbed areas, grasslands, chaparral, woodlands, riparian areas	Valley Oak Woodland S3 California Sycamore Woodland S3	California Woodlands California Chaparral Warm Southwestern Riparian Forest Perennial Grasslands	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE; California Condor: FE
	High priority, forms dense stands that exclude native plants and wildlife.	Mechanically remove all above ground biomass and treat stumps with herbicide	Burning and grazing alone are not effective controls. Will resprout from the root crown when cut or grazed.	Produce copious amounts of seed and form dense monospecific stands. Reproduce by seed only. Seeds eject several feet from plant and can remain viable in the soil for up to 30 years.	
Stipa miliacea var. *miliacea* (Smilo Grass)	Cal-IPC Limited	Disturbed areas, riparian areas, woodlands, chaparral, grasslands	Valley Oak Woodland S3 California Sycamore Woodland S3	California Woodlands California Chaparral Warm Southwestern Riparian Forest Perennial Grasslands	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE; California Condor: FE
	Low—monitor. Low priority, primarily contained within disturbed areas. Eradicate from wetlands.	Hand remove plants in wetland habitats.	Grazing and burning alone are not effective controls due to resprouting.	Reproduces only by seed with most falling near the parent plant and some dispersing farther due to animal and human activity. Seeds do not remain viable for long in seedbanks.	
Tamarix parviflora (Small Flower Tamarisk)	Cal-IPC High, CDFA "B"	Disturbed areas, riparian areas, wetlands	California Sycamore Woodland S3	Warm Southwestern Riparian Forest Western North American Freshwater Marsh	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	High—monitor, eradicate. High priority, causes dramatic changes in geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity.	Remove all Tamarix trees mechanically and treat cut stumps with herbicide.	Any mechanical, grazing, or burning control must be followed up with herbicide to be successful & prevent resprouting. Watershed partnership approach beneficial.	Reproduce primarily by seed and sometimes vegetatively through root sprouts and stem fragments. One plant can produce about 500,000 seeds per year which are primarily dispersed with wind and water. Seeds germinate within 24 hours of contacting water and only survive for 5 weeks.	

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Tamarix ramosissima (Tamarisk, Salt Cedar)	Cal-IPC High, CDFA "B"	Disturbed areas, riparian areas, wetlands	California Sycamore Woodland S3	Warm Southwestern Riparian Forest Western North American Freshwater Marsh	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	High—monitor, eradicate. High priority, causes dramatic changes in geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity.	Remove all Tamarix trees mechanically and treat cut stumps with herbicide.	Any mechanical, grazing, or burning control must be followed up with herbicide to be successful & prevent resprouting. Watershed partnership approach beneficial.	Reproduce primarily by seed and sometimes vegetatively through root sprouts and stem fragments. One plant can produce about 500,000 seeds per year which are primarily dispersed with wind and water. Seeds germinate within 24 hours of contacting water and only survive for 5 weeks.	
Torilis arvensis (Hedge Parsley)	Cal-IPC Moderate	Disturbed areas, woodlands, Grasslands	Valley Oak Woodland S3	California Woodlands Perennial Grasslands	Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low—monitor, prevent spread. Low priority, primarily contained within disturbed areas.	Monitor population. Hand pull plants in sensitive habitat.	Mowing or grazing at the flowering stage can provide good control but may require a second visit.	Reproduction is entirely by seed with fruits having a small hook on them allowing them to be dispersed long distances. Seed is expected to last a few years in soil.	
Trifolium hirtum (Rose Clover)	Cal-IPC Limited	Disturbed areas, grasslands		Perennial Grasslands	Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Low—monitor, prevent spread. Low priority primarily contained within disturbed areas.	Monitor population. Hand remove in sensitive habitat.	Grazing burning and cutting all provide inadequate control while tilling can provide excellent control.	May reproduce either by vegetatively sprouting from rhizomes or by seed. Most seeds do not far fall from the parent plant and can persist a few years in the seedbank.	
Verbascum thapsus (Woolly Mullein)	Cal-IPC Limited	Disturbed areas, riparian areas	California Sycamore Woodland S3	Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST
	Low—monitor, prevent spread. Low priority, outside of primary range and primarily contained within disturbed areas.	Hand pull plants in wetland habitat.	Promoting competitive vegetation and minimizing soil disturbance is the best control.	Plants reproduce primarily by seed with plants producing up to 100,000 per plant. Seeds can live up to 100 years in the soil making management difficult. Populations can form dense stands.	

Scientific Name (Common Name)	Cal-IPC/CDFA Rating	Common Habitat Type	CDFW Sensitive Natural Communities Effected (S1-S3)	CA SWAP Target Conservation Vegetative Communities Effected	TES Habitat Affected
	Management Priority*	Management Recommendations (Small-Scale)	Other Considerations (Landscape-Level Management)	Reproduction & Dispersal Mechanism(s)	
Vinca major (Periwinkle)	Cal-IPC Moderate	Riparian areas, woodlands, disturbed areas	California Sycamore Woodland S3 Valley Oak Woodland S3	California Woodlands Warm Southwestern Riparian Forest	Bald Eagle: FP; SCCC Steelhead: FT; Least Bell's Vireo: FE; Swainson's Hawk: ST; Purple Amole: FT; San Joaquin Kit Fox: FE
	Medium—monitor, control. Moderate priority grows as a dense vine choking out natives in riparian and upland communities.	Hand pull small infestations in wetland habitat and follow removal with herbicide treatment.	Mowing, grazing, and burning are not effective. Watershed partnership approach beneficial.	Reproduces only vegetatively through stem fragments which disperse through human activities and water. Seeds are not viable.	

Appendix F. Agency Consultations

Biological Opinions
USFWS Formal Endangered Species Consultation Concerning Annual Training at Camp Roberts, California. 1-1-89-F-40. 1989 This BO addressed impacts on the San Joaquin kit fox, on a proposed training program, called Annual Training 1989, to be conducted at Camp Roberts. The purpose of the Annual Training 1989 program was to train military personnel in constructing, operating, and defending basecamps that provide support services to soldiers stationed at front lines during wartime conditions. Two basecamps were established and utilized during this training program. Each basecamp consisted of an area that is circumscribed by a defended perimeter and occupied by groups of soldiers.
USFWS Formal Section 7 Consultation Concerning Military Training Activities by the California Army National Guard at Camp Roberts, Monterey and San Luis Obispo Counties, California. 1-1-90-F-22. 1990 This consultation addressed the effects of military training activities on the San Joaquin kit fox. Measures to avoid and minimize impacts on San Joaquin kit fox were established, and the program to monitor San Joaquin kit fox was continued. A non-jeopardy BO was issued for this action.
USFWS Biological Opinion for Activities and Projects Conducted on Camp Roberts, Monterey and San Luis Obispo Counties, California. 1-6-92-F-26. 1992 This BO addressed the effects of ongoing and planned activities and projects on San Joaquin kit fox. Previously implemented avoidance and minimization measures as well as additional avoidance and minimization measures were established. In addition, USFWS made several recommendations including avoidance of undisturbed habitat, continuation of the population monitoring program, and investigating the possibility of creating a migration path between Main Garrison and East Garrison. A non-jeopardy BO was issued for this action.
USFWS Biological Opinion for Normal Operations and Construction Activities in Support of the Satellite Communications (SATCOM) Facility at Camp Roberts, San Luis Obispo and Monterey Counties, California. 1-8-96-F-25. 1996 This BO addressed the potential effects of vehicle traffic, construction, repair, and pest control activities at the SATCOM facility on San Joaquin kit fox, bald eagle, and vernal pool fairy shrimp. Reasonable and prudent measures to minimize incidental take included minimizing take of kit foxes and their habitat during normal operations and construction activities, installing raptor exclusion devices on power poles to minimize electrocution of bald eagles, avoiding all impacts on vernal pool fairy shrimp habitat, and implementing worker education programs and defined work areas and operational procedures to avoid take of listed species. The BO specified terms and conditions based on the reasonable and prudent measures that the Army was responsible for implementing.
USFWS Biological Opinion for Combined-Forces Training Activities, Use of New Equipment, and Range Modernization Program at Camp Roberts, Army National Guard Training Site, San Luis Obispo and Monterey Counties, California. 1-8-96-F-32. 1997 This BO addressed the impacts on San Joaquin kit fox and vernal pool fairy shrimp from increasing the intensity of training activities, using four new types of equipment, and upgrading existing and constructing new ranges. Avoidance and minimization measures for San Joaquin kit fox from previous consultations were implemented,

and protected areas and a monitoring program for vernal pool fairy shrimp were established. In their BO, the USFWS determined that the activities proposed at Camp Roberts would have no adverse effect on San Joaquin kit fox and vernal pool fairy shrimp.

USFWS Biological Opinion for Uninhabited Aerial Vehicle Operational Enhancements to the McMillan Airstrip at Camp Roberts National Guard Training Site in Monterey and San Luis Obispo Counties, California. 1-8-98-F-51. 2000

This BO addressed the effects from the expansion and use of the airstrip at McMillan Airfield on San Joaquin kit fox and vernal pool fairy shrimp. Avoidance and minimization measures for San Joaquin kit fox and vernal pool fairy shrimp, and protection of habitat for vernal pool fairy shrimp were established. A non-jeopardy BO was issued.

USFWS Biological Opinion for the Building Demolition and Landfill Improvement Project at Camp Roberts and Camp San Luis Obispo, California. 1-8-08-F-18. 2008

This BO addressed the effects from the proposed building demolition and landfill improvement project at Camp Roberts and Camp San Luis Obispo, California, and its effects on the federally threatened vernal pool fairy shrimp.

USFWS Programmatic Biological Opinion for Multiple Activities at Camp Roberts, San Luis Obispo and Monterey Counties, California. 1-8-08-F-24. 2009

This BO addressed impacts on California condor, San Joaquin kit fox, vernal pool fairy shrimp, and purple amole from continued military training activities; construction of an engineer training area; road, tank trail, and firebreak improvements; operations and maintenance activities; livestock grazing; and natural and cultural resources management. Measures to minimize and avoid effects on California condor, San Joaquin kit fox, vernal pool fairy shrimp, and purple amole were established. In addition, mitigation for impacts on vernal pool fairy shrimp was implemented. In its BO, USFWS determined that the effects of the activities were not likely to jeopardize the continued existence of these four species.

NMFS Biological Opinion for the Installation of a Hardened Low Water Crossing in the Nacimiento River, Monterey County, California. 151422SWR01SR957. 2005

This BO addressed the effects of constructing a 20-foot (6.1-m) wide articulated cable-concrete mat across the Nacimiento River and grading the approaches on the south-central California coast steelhead DPS. The BO required avoidance, minimization, and monitoring efforts and NMFS determined that the effects of the activity would not jeopardize the continued existence of the south-central California coast steelhead DPS.

NMFS Biological Opinion for the South-Central California Coast Steelhead Endangered Species Management Component for Camp Roberts. #WCRO-2019-02686. 2020.

This BO addressed the effects of implementing the Camp Roberts South-Central California Coast Steelhead Endangered Species Management Component (ESMC). The ESMC included various steelhead management and conservation actions on CR. The BO required avoidance, minimization, and monitoring efforts and NMFS determined that the effects of the activities would not jeopardize the continued existence of the south-central California coast steelhead DPS.

Informal Consultations

USFWS. Informal Consultation Regarding Placement of Fence at Camp Roberts, California. February 28, 1995.

This informal consultation addressed the potential effects of installation of 4,586 feet of chain-link fence around the SATCOM facility. USFWS concurred that the project was not likely to adversely affect the bald eagle, peregrine falcon, least Bell's vireo or San Joaquin kit fox.

USFWS. Concurrence on the Proposal to Demolish Buildings at Camp Roberts National Guard Training Site, San Luis Obispo and Monterey Counties, California. July 30, 1998.

This informal consultation addressed the potential effects of demolishing 460 buildings on CR. USFWS concurred

that the project would not adversely affect the vernal pool fairy shrimp.

USFWS. Informal Consultation for the Controlled Burning and Grazing of Vernal Pool Fairy Shrimp Habitat Exclosures at Camp Roberts, San Luis Obispo and Monterey Counties, California. May 23, 2000.

This informal consultation addressed the potential effects of grazing and burning of vernal pool fairy shrimp habitat. USFWS concurred that the project would have discountable negative effects on vernal pool fairy shrimp.

USFWS. Request for Concurrence for the Proposed High Water Bridge Replacement at Camp Roberts, Monterey and San Luis Obispo Counties, California. December 22, 2009.

This informal consultation addressed potential effects of bridge removal from the Nacimiento River. USFWS concurred that the project would not adversely affect vernal pool fairy shrimp, California red-legged frog, blunt-nosed leopard lizard, or arroyo toad.

USFWS. Informal Consultation to Increase the Speed Limit and Conduct Non-Game Hunting on Camp Roberts. December 30, 2014

This informal consultation addressed the potential effects of increasing the speed limit and hunting coyotes at Camp Roberts on San Joaquin kit fox. USFWS concurred that the project would not adversely affect San Joaquin kit fox.

NMFS. Informal Consultation for Debris Removal at High Water Bridge. May 5, 2015

This informal consultation addressed the potential effects of debris removal from the footings of High Water Bridge at Camp Roberts on the South-central California coast steelhead. NMFS concurred that the project was not likely to adversely affect the species.

Appendix G. Integrated Pest Management Plan

Please refer to the digital copy of the Integrated Pest Management Plan or the link provided below:

https://ngcasp16.ng.army.mil/sites/CAEV/NR/Shared%20Documents/Forms/AllItems.aspx

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Appendix H. Migratory Bird Management

Each INRMP must address the conservation of birds and their habitat to promote and support migratory birds in compliance with the MBTA, EO 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds" (2001), and subsequent rules and agreements. Recognizing the important role military lands play in bird conservation worldwide, it is the DoD policy that, during annual reviews of INRMPs, installations will discuss with the USFWS conservation measures implemented and the effectiveness of these measures in avoiding, minimizing, or mitigating the take of migratory birds.

Two legal drivers pertain to different types of activity affecting birds on military lands:

(1) Military readiness activities fall under a Military Readiness Waiver entitled the "Migratory Bird Rule" under the MBTA.
(2) All other activities affecting migratory birds on military lands fall under a USFWS/DoD MOU (71 Fed. Reg. 51580 [30 August 2006]) on implementing EO 13186.

The DoD has entered into agreements with the USFWS with respect to how the take and the management of migratory birds is documented and reported under these legal drivers during INRMP reviews. The purpose of this Appendix is to facilitate that responsibility under the MBTA and EO 13186 (2001).

Military Readiness Waiver and the Migratory Bird Rule

The Migratory Bird Rule under the MBTA relates to military readiness activities and was established in accordance with Section 315 of the National Defense Authorization Act for FY 2003. The final rule, "Migratory Bird Permits: Take of Migratory Birds by the Armed Forces," was published as 72 Fed. Reg. 8931 (28 February 2007). It authorizes the military to "take" migratory birds under the MBTA without a permit, but if the military determines that the activity will "significantly" affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize the effects.

While under the Rule the ARNG is authorized to take migratory birds during readiness activities, it is incumbent upon the ARNG to remain cognizant of the possibility that certain readiness activities may result in a significant adverse effect on a migratory bird species at a population level. In remaining aware of this possibility, it is necessary to understand the terms below.

- Population, as used in Section 21.15: a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.
- Significant adverse effect on a population, used in Section 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is "biologically viable" when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem are not significantly harmed. This effect may be characterized by increased risk to the population from

actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should account for yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

Conservation measures undertaken under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces must report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

Executive Order 13186 and DoD-USFWS MOU on Migratory Birds

The USFWS/DoD MOU (71 Fed. Reg. 51580 [30 August 2006]) addresses the conservation of migratory birds on military lands in relation to all activities except readiness. In contrast to the MBTA, it does not authorize any take. The "MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186 (17 January 2001)" is a guidance document on how the DoD will conserve migratory birds. This MOU covers all activities on CA ARNG property including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. It emphasizes interdisciplinary collaboration in framework of NABCI Bird Conservation Regions, collaborative inventory and long-term monitoring.

A Council for the Conservation of Migratory Birds was established to help the various agencies implement the EO. The EO requires that advance notice or annual reports must be made to the USFWS concerning actions that result in the taking of migratory birds. The EO also requires agencies to control the establishment of exotic species that may endanger migratory birds and their habitat. Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within Administration budgetary limits, and in harmony with agency missions:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance the habitat of migratory birds, as practicable;
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- Design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;
- Within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance, ensure that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as PIF, U.S. National Shorebird Plan, NAWMP, North American Colonial Waterbird Plan, and other

planning efforts, as well as guidance from other sources, including the Food and Agricultural Organization's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;

- Ensure that environmental analyses of federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;
- Provide notice to USFWS in advance of conducting an action that is intended to take migratory birds, or annually report to USFWS on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control;
- Minimize the intentional take of species of concern by: (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. With respect to intentional take, the MOU shall be consistent with the appropriate sections of 50 C.F.R. Parts 10, 21, and 22;
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;
- Within the scope of its statutorily-designated authorities, control the import, export, and establishment in the wild of live exotic animals and plants that may be harmful to migratory bird resources;
- Promote research and information exchange related to the conservation of migratory bird resources, including coordinated inventorying and monitoring and the collection and assessment of information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with USFWS, the USGS–Biological Resources Division, and other appropriate repositories of such data (e.g., the Cornell Laboratory of Ornithology);
- Provide training and information to appropriate employees on methods and means of avoiding or minimizing the take of migratory birds and conserving and restoring migratory bird habitat;
- Recognize and promote economic and recreational values of birds, as appropriate; and
- Develop partnerships with non-federal entities to further bird conservation.

Landscape and Ecosystem Level Management for Migratory Birds

This INRMP provides landscape-scale recommendations that contribute to bird conservation and promote restoration of the natural health and integrity of the CR ecosystem, its ecological connections to watershed

and bioregion, and its resiliency to current and future disturbance such as military training, drought, flood, fire, invasion by nonnative species, and climate change. The following are some of those guidelines:

- Restore resilient and healthy ecosystem processes such as fire patterns, soil health, carbon and nutrient cycles, hydrologic processes, migration, to the extent practicable, to their natural potential and range of variation
- Leverage all opportunities to contribute to ecosystem services, including in developed areas. Promote ecosystem restoration that is climate adaptive (California Water Plan 2018).
- Continue to restore stream functions in compliance with TMDL standards and for recovery of riparian species, as a cooperator in the MBNEP CCMP.
- Promote deep-rooted herbaceous perennials, and an increase in woody elements in grasslands (California Air Resources Board 2019). Protect native perennial grassland where it currently exists and restore it where and whenever practicable. Perennial grasses are more fire resilient and build soil carbon stores better than annual grasses. Take advantage of opportunities with projects that disturb ground, such as utility line installation and maintenance, to restore to native herbaceous perennials such that invasive grasses are excluded. Use prescribed grazing and prescribed fire as restoration tools.
- Ensure recruitment of oak trees where it has been impaired, and a healthy understory that facilitates natural recruitment.
- Take advantage of opportunities to reconnect streams to their historic floodplains as part of new flood management approaches.
- Expand riparian forest acreage along watercourses.
- Promote multidisciplinary approaches to water and flood management.
- Expand woodlands, ensuring recruitment of trees and shrubs, as well as a fire safe understory. Continue the use of prescribed fire for ecosystem benefit.
- Avoid the proliferation of roads.
- Manage vegetative fuel biomass and structure. Reduce fire starts and keep fires small for safety, watershed health, air quality, and recovery of native communities.
- Address long-term, ecosystem-level, primary stressors to wildlife and habitat.
- Control the proliferation of non-native species, especially as they affect fire regime (see *Section 4.4.3: Management Strategy—Wildland Fire*) and vegetation type conversion. Control invasive plant species through early detection, maintenance of healthy soils, diverse native plant communities, intact hydrology, and management towards a resilient fire regime for natural communities. Continue, through partnerships, to control predation by non-native aquatic species with priority on those that may affect SAR.
- Reduce wildlife mortality and habitat degradation due to infrastructure practices, such as roadkill, powerline kill, or agricultural or mowing practice by defining best practices.
- Use the best available scientific information in decision-making and adaptive management, such as climate change (DoDI 4715.03), through data sharing with partner agencies.
- Monitor resources over sufficiently long time periods to allow for adaptive management and assessment of changing ecosystem dynamics (DoDI 4715.03). Monitor biologically or geographically significant or sensitive natural communities, ecosystems or species, for their protection and long-term sustainability.

- Implement a coordinated monitoring program that can be implemented cost-effectively over time and that facilitates reporting on natural resources conditions and annual INRMP program review questions. This would help address the Ecosystem Integrity Metric which asks (DoDI 4715.03): (1) To what extent are the installation's native ecological systems currently intact? (2) In what ways are an installation's various habitats susceptible to change or damage from different stressors? (3) What stressors affect each habitat type?
- As appropriate, take part in public awareness initiatives to manage ecosystems more successfully. Promote the continued rural character and land use of the surrounding region.
- Prevent encroachment on natural resources crucial to sustaining the military mission under the above climate change scenarios.

Appendix I. Integrated Wildland Fire Management Plan

Please refer to the digital copy of the Integrated Wildland Fire Management Plan or the link provided below:

https://ngcasp16.ng.army.mil/sites/CAEV/NR/Shared%20Documents/Forms/AllItems.aspx

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