Draft Integrated Natural Resources Management Plan

Moffett Air National Guard Base

August 2022

Prepared for:

Air National Guard
3501 Fetchet Avenue
Joint Base Andrews, MD 20762

California Air National Guard
129th Rescue Wing
Moffett Air National Guard Base
Moffett Federal Airfield, CA 94035

Under Contract With:
US Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

Contract:
W912DR19D0009; Task Order # W912DR21F0383

Prepared by:

AGEISS
7220 W. Jefferson
Suite 201
Lakewood, CO 80235

and

ARCADIS
7550 Teague Road
Suite 210
Hanover, MD 21076

SIGNATURE PAGE

The Integrated Natural Resources Management Plan (INRMP) has been prepared for the California Air National Guard (CAANG) at Moffett Air National Guard Base (hereafter Moffett ANGB), to manage significant natural resources in support of the training mission. Significant natural resources include the presence of state-listed protected species. The Moffett ANGB INRMP meets the intent of the Sikes Act (16 United States Code [USC] § 670a–670l, 74 Stat. 1052).

To the extent that resources permit, the US Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the Moffett ANGB, by signature of their agency representative, do hereby enter into an agreement to work together for the purposes of conserving, protecting, and managing the natural resources present on Moffett ANGB. This INRMP may be modified and amended by agreement of the authorized representatives of the three agencies. The agreement will become effective upon the date of the last signatory and shall continue in full force for a period of 5 years or until terminated by written notice to the other parties, in whole or in part, by any of the parties signing the agreement.

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

Approving Officials:

Colonel Jeffery H. Waldman Commander, 129th Rescue Wing Moffett Air National Guard Base	Date
XXXX US Fish and Wildlife Service	Date
Erin Chappell California Department of Fish and Wildlife	Date

ANNUAL REVIEW PROCEDURES

The Environmental Manager (EM) of the Moffett Air National Guard Base (ANGB) will review the Integrated Natural Resources Management Plan (INRMP) annually, prior to September 30, in cooperation with the US Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) to ensure the goals and objectives of the INRMP remain current. Prior to the annual meeting with the USFWS and the CDFW, the EM will schedule an internal stakeholder's meeting with the Installation Pest Management Coordinator (IPMC), the Safety Office, the US Department of Agriculture-Animal and Plant Health Inspection Service-Wildlife Services (USDA-APHIS-WS), and tenant organizations to obtain feedback on how implementation of the INRMP affected or did not affect their programs and to obtain any comments and recommendations they may have. Following the internal stakeholders meeting, the EM will prepare a summary of the actions taken in support of the INRMP over the past year, what actions were not completed with an explanation of why they were not implemented, and the actions planned for the coming year. The EM will send out invitations with the written summary to the USFWS, CDFW, National Guard Bureau (NGB)/A4VN Natural Resources Program Manager, Safety Office, USDA-APHIS-WS, IPMC, and other entities deemed necessary to participate in an annual meeting held in-person, via a conference call, or via a Teams meeting to discuss the written summary, to address any questions regarding implementation of the INRMP over the past year, and to discuss the planned actions for the coming year. The EM will document the meeting with the invitation, an agenda, meeting minutes, and a sign-in roster of attendees. Following the meeting, the EM will submit the documentation to the USFWS and the CDFW for their review and comment and for concurrence that the documentation reflects the discussions held and the agreements made during the annual meeting. The standards used for this evaluation are set forth in Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, Enclosure 5. The installation's natural resources management progress will be determined based on information obtained annually that supports the focus areas in the DoDI 4715.03 through the US Air Force/NGB biannual environmental quality data calls.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

DOCUMENT CONTROL

Record of Review – In accordance with the Sikes Act; Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*; Department of Defense Manual (DoDM) 4715.03, *INRMP Implementation Manual*; and Air Force Manual AFMAN 32-7003, *Environmental Conservation*, an Integrated Natural Resources Management Plan (INRMP) is required to be reviewed annually to ensure plans and projects remain current, and every 5 years for operation and effect. Annual reviews and updates are accomplished through annual meetings led by the base Environmental Manager (EM) and attended by the US Fish and Wildlife (USFWS), the California Department of Fish and Wildlife (CDFW) and, if required, the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). During the annual meetings, actions taken over the previous year are discussed and actions to be taken over the coming year are discussed and agreed to. The meeting is followed up in writing for concurrence by the EM and the representatives from the USFWS and the CDFW. As part of the annual and 5-year reviews, the EM shall hold meetings with internal stakeholders to ensure all personnel and tenants are informed of INRMP requirements.

19

20 # ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
129 RQW	129th Rescue Wing
AFI	Air Force Instruction
AFMAN	Air Force Manual
AGE	Aerospace Ground Equipment
ANG	Air National Guard
ANGB	Air National Guard Base
ANGRC	Air National Guard Readiness Center
AT/FP	Anti-terrorism / Force Protection
AvPORTS	Airfield Operations
BA	Biological Assessment
BASH	Bird/Wildlife Aircraft Strike Hazard
BCDC	Bay Conservation and Development Commission
BHWG	Bird Hazard Working Group
BMP	Best Management Practice
CAANG	California Air National Guard
Cal-IPC	California Invasives Plant Council
CATEX	Categorical Exclusion
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CE	Civil Engineer
CECOS	Civil Engineer Corps Officers School
CEQ	Council on Environmental Quality
CESA	California Endangered Species Act
CFR	*Code of Federal Regulations*
CNDDB	California Natural Diversity Database
CSAR	Combat Search and Rescue
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DEPARC	Defense Environmental Programs Annual Report to Congress
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DUSD	Deputy Under Secretary of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EM	Environmental Manager
EO	Executive Order

ESA	Endangered Species Act
ESC	Erosion and Sediment Control
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
FW	Fish and Wildlife
FY	Fiscal Year
GIS	Geographic Information System
GM	Grounds Maintenance and Landscaping
IFAW	International Fund for Animal Welfare
IN	Invasive Species
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMC	Installation Pest Management Coordinator
IRP	Installation Restoration Program
LEDPA	Least Damaging Practicable Alternative
MFA	Moffett Federal Airfield
Moffett ANGB	Moffett Air National Guard Base
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NGB/A4VN NRPM	NGB/A4VN Natural Resources Program Manager
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWR	National Wildlife Refuge
OPR	Office of Primary Responsibility
PAO	Public Affairs Office
PM	Program Management
RWQCB	Regional Water Quality Control Board
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
SWCP	State Wetland Conservation Policy
SWPPP	Storm Water Pollution Prevention Plan
TE	Threatened and Endangered
TUA	Temporary Use Area
US	United States
USACE	US Army Corps of Engineers
USAF	US Air Force
USC	United States Code
USDA	US Department of Agriculture

USDA-APHIS-WS	US Department of Agriculture-Animal and Plant Health Inspection Service-Wildlife Services
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UST	Underground Storage Tank
WA	Water Resource Protection
WOTUS	Waters of the United States
WQC	Water Quality Certification

21

1.0 EXECUTIVE SUMMARY

The Sikes Act Improvement Act of 1997, 16 United States Code (USC) § 670a et seq., as amended, (herein referred to as the Sikes Act) requires federal military installations with significant natural resources to develop a long-range Integrated Natural Resources Management Plan (INRMP) and implement cooperative agreements with other agencies. The Sikes Act is implemented through Department of Defense (DoD) and US Air Force (USAF) instructions and manuals. The conservation measures discussed in the INRMP help manage water resources, reduce bird/wildlife aircraft strike hazard (BASH) risk, manage state-listed species, and sustain natural resources.

This INRMP is intended to be in support of and consistent with the intent of the Sikes Act. This INRMP is the primary guidance document and tool for managing natural resources at Moffett Air National Guard Base (ANGB). Moffett ANGB, which is located within Moffett Federal Airfield (MFA), is composed of approximately 131 acres (55 hectares) containing parcels leased from the National Aeronautics and Space Administration (NASA). NASA is the ultimate land owner of the property; however, in 2014 Google Planetary Ventures LLC leased a portion of the MFA including land that the California Air National Guard (CAANG) uses. Google Planetary Ventures LLC is responsible for the management of the airfield, and Moffett ANGB is a tenant that uses the airfield. The 129th Rescue Wing (129 RQW) has a dual mission: one federal and one state. The primary mission of the 129 RQW is to provide the USAF with combat search and rescue operations on a worldwide basis during times of war or national emergency and to provide assistance to the State of California during local and statewide disasters or emergencies. Moffett ANGB, due to its geographic location and the nature of the facility, contains limited habitat but some species that require active natural resource management.

Natural resource management activities on Moffett ANGB must be conducted in a way that provides for sustainable land use, complies with applicable environmental laws and regulations, real estate leases and licenses, and provides for “no net loss” in the capability to support the military mission. This INRMP provides a structure and plan to manage natural resources effectively and ensures that facilities remain available to support the installation’s military mission into the future.

Specific actions in the INRMP are supported by its goals and objectives, the annual work plans, and the management strategies. Goals and objectives are listed in **Section 8**, and work plans are summarized in **Section 9**. The INRMP provides a description of the Moffett ANGB installation, the military mission, the environment on the installation, and specific plans and strategies for natural resource management designed for sustainable military training. The implementation of this INRMP will ensure the successful accomplishment of the military mission while promoting adaptive management that sustains ecosystem and biological integrity and provides for multiple uses of natural resources.

2.0 GENERAL INFORMATION

2.1 Purpose and Scope

This INRMP is the primary guidance document and tool for natural resource management at Moffett ANGB. It provides for sustainable, healthy ecosystems, complies with applicable environmental laws and regulations, real estate leases and licenses, and provides for “no net loss” in the capability of installation lands to support the military mission. The Installation Commander and the Environmental Manager (EM) can use this INRMP to manage natural resources more effectively to ensure that installation lands remain available and in good condition to support the

installation's military mission over the long term. The INRMP is consistent with the Sikes Act as required by the DoD, USAF, and the National Guard Bureau (NGB). A multiple-use approach is implemented to allow for the presence of mission-oriented activities, as well as protecting environmental quality through the efficient management of natural resources.

This INRMP solely directs lands under the management authority of the CAANG. If the CAANG acquires additional lands or transfers lands at some future time, updates of the INRMP will provide management direction for such land changes and any applicable natural resources management issues. The comprehensive planning process, which incorporates logistics and operations of Moffett ANGB, should incorporate the concerns presented in this INRMP, so that the growth of the installation can progress in a manner consistent with, and complementary to, the objectives of the USAF with respect to the protection of natural resources.

2.2 Management Philosophy

2.2.1 Ecosystem Management

Natural resources at Moffett ANGB are managed with an ecosystem management approach as directed by Air Force Manual (AFMAN) 32-7003, *Environmental Conservation*; Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*; and the Department of Defense Manual (DoDM) 4715.03, *INRMP Implementation Manual* (Table 1). Ecosystem management may be defined as management to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities. The goal of ecosystem management on military lands is to ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity.

Ecosystem management provides a means for the USAF to conserve biodiversity and to provide high-quality military readiness. This INRMP is a mechanism through which the 129 RQW can maintain sustainable land use through ecosystem management. Each of the management strategies described in this INRMP should be monitored so that modifications can be made during implementation as conditions change. Human communities are entirely and completely dependent on the goods and services provided by our diverse ecosystems (Bernstein 2008). Decline of these ecosystems, and the biodiversity within them, is one of the foremost limitations to human prosperity. Ecosystem sustainability is the key to both biological diversity and human existence. It is the goal of this INRMP to successfully integrate ecological sustainability with goals and objectives that will sustain human communities and the operational missions of the Moffett ANGB. This INRMP helps perpetuate viable, sustainable populations of native species, and the communities they compose. The protection of these species and communities, in turn, promotes the sustainability of functional ecosystems across the landscape.

Table 1. Elements and Principles of Ecosystem Management

DoDI 4715.03 Elements	
1	Avoid single-species management and implement an ecosystem-based multiple species management approach that is consistent with the requirements of the Endangered Species Act (ESA).
2	Use an adaptive management approach to manage natural resources-related issues such as climate change.
3	Evaluate and engage in the formation of local or regional partnerships that benefit the goals and objectives of the INRMP.
4	Use the best available scientific information in decision-making and adaptive management techniques in natural resource management.
5	Foster long-term sustainability of ecosystem services.
AFMAN 32-7003 Principles	
1	Maintain or restore native ecosystem types across their natural range where practical and consistent with the military mission.
2	Maintain or restore ecological processes such as wildland fires and other disturbance regimes where practical and consistent with the military mission.
3	Maintain or restore the hydrological processes in streams, floodplains, and wetlands when feasible and practical and consistent with the military mission.
4	Use regional approaches to implement ecosystem management on an installation by collaboration with other DoD components as well as other federal, state, and local agencies, and adjoining property owners.
5	Provide for outdoor recreation, agricultural production, harvesting of forest products, and other practical utilization of the land and its resources, provided that such use does not inflict long-term ecosystem damage or negatively impact the ANG mission.

2.2.2 Biodiversity

Biodiversity is the degree of variation of life within a given ecosystem, region, or even the entire planet. The DoD's challenge is to manage for biodiversity in a way that supports the military mission. Specific management practices identified in the Moffett ANGB INRMP have been developed to enhance and maintain biological diversity within the installation's ecosystems. Ecosystem management includes biodiversity conservation and invasive species control as integral parts of ecosystem management. Air National Guard (ANG) installations maintain or reestablish viable populations of all native species when practical and consistent with the military mission. ANG installations also identify the presence of exotic and invasive species, and implement programs to control and/or eradicate those species. Finally, when feasible, ANG installations develop joint control strategies with other federal, state, and local cooperating agencies and adjacent landowners to increase the effectiveness of control measures and for the benefits illustrated in Figure 1.

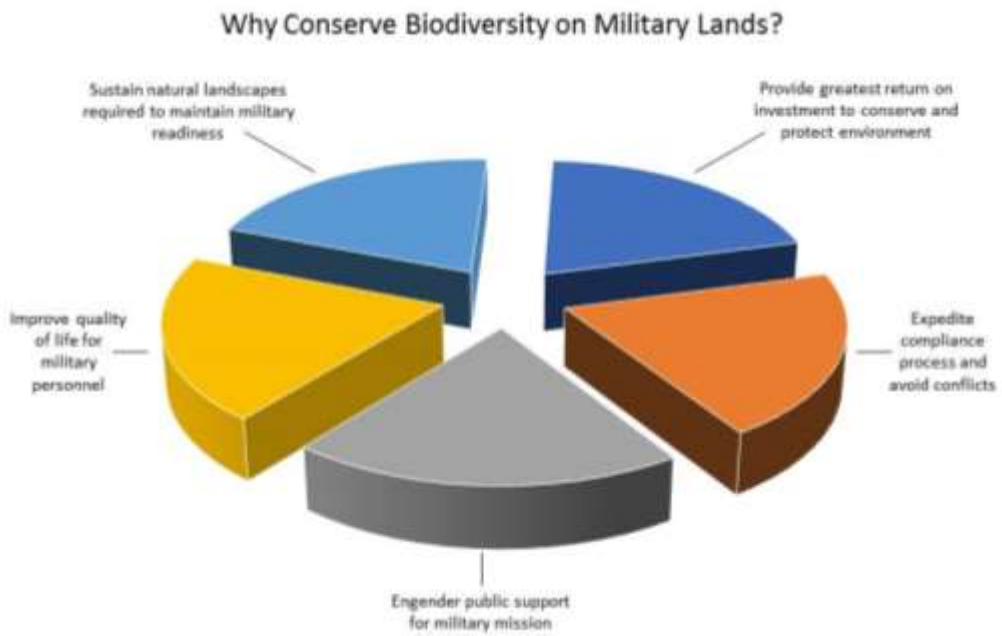


Figure 1. Why Conserve Biodiversity on Military Lands
**Adapted from Keystone Center, 1996.*

2.3 Authority

2.3.1 Natural Resources Law, Regulations & Policy

The ANG, US Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW) determined an INRMP was required for Moffett ANGB due to the presence of significant natural resources such as state-listed protected species, thereby necessitating conservation and management. To ensure proper consideration of fish, wildlife, and habitat needs, this INRMP was prepared in cooperation with the USFWS and CDFW. DoDI 4715.03, *Natural Resources Conservation Program*, identifies the DoD policies and procedures concerning natural resources management and INRMP reviews, public comment, and endangered species consultation. INRMPs are required to be jointly reviewed by the USFWS, CDFW, and the ANG installation for operation and effect on a regular basis, but not less often than every 5 years. Minor updates and continued implementation of an existing INRMP do not require need for public comment. Major revisions to an INRMP do require an opportunity for public review. Specific projects in the INRMP may need informal or formal consultation under the Endangered Species Act (ESA) Section 7 and the California Endangered Species Act (CESA; California Code of Regulations, Title 14, Chapter 6, Sections 783.0-787.9) depending on identifiable impacts to natural resources.

2.3.2 National Environmental Policy Act Compliance

The Environmental Impact Analysis Process (EIAP) is the process by which federal agencies facilitate compliance with environmental regulations. The primary legislation affecting these agencies' decision-making process is the National Environmental Policy Act of 1969 (NEPA; 42 USC § 4321 et seq.). NEPA requires that any organization using federal monies, proposing work on federal lands, or requiring a federal permit consider potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed decisions.

The Council on Environmental Quality (CEQ) was established under NEPA for the purpose of implementing and overseeing federal policies as they relate to the NEPA process. The adoption of an INRMP can be considered a major federal action as defined by Section 1502.4 of the CEQ regulations. This requires an analysis of potential environmental impacts for the implementation of an INRMP, although a complete environmental assessment (EA) is not necessarily required as individual projects for an INRMP typically undergo their own separate NEPA analysis.

The EIAP for the implementation of Moffett ANGB's November 2017 INRMP (129 RQW 2017) was conducted in accordance with NEPA, CEQ *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 *Code of Federal Regulations* [CFR] § 1500-1508), and 32 CFR Part 989. The EIAP and decision-making process for the Proposed Action (implementation of the 2017 Moffett ANGB INRMP) involved an examination of all environmental issues pertinent to the action proposed. Impact evaluations of the 2017 Moffett ANGB INRMP determined that no significant environmental impacts would result from implementation of the Proposed Action or any identified alternative. This determination was based on thorough review and analysis of existing resource information, and coordination with knowledgeable, responsible personnel from the Moffett ANGB and other relevant local, state, and federal agencies. A new EIAP is not required for this INRMP update as impacts to the environment have not changed since the initial EIAP analysis.

If a future project has the potential to impact the environment, the initial step in compliance with NEPA is to complete USAF Form 813 "Request for Environmental Impact Analysis" (Section 989.12 of 32 CFR Part 989) through ANG Readiness Center's (ANGRC's) online NEPA Tool. The form is prepared to aid in the development of the assessment, providing information on the proposed action and its alternatives, purpose, and potential environmental effects. This allows the proponent to identify potential environmental impacts early. The ANGRC reviews the Form 813 and associated information to determine if the proposed action requires a categorical exclusion (CATEX), EA, or environmental impact statement (EIS). Natural resources management actions in this INRMP at the time of implementation would be reviewed to determine if they qualify for a CATEX, EA, or would require an EIS depending on the impacts to the natural resources.

2.3.3 Responsibilities

The Moffett ANGB INRMP has been organized to ensure the implementation of year-round, cost-effective management activities and projects that meet the requirements of the installation. Various personnel and organizations internal and external to the ANG that are responsible for the implementation of this INRMP are described in the following subsections.

2.3.3.1 Installation Wing Commander

The Installation Wing Commander oversees the installation and is responsible for ensuring that the goals and objectives of this INRMP are implemented to the fullest extent practicable based on funding and manpower availability. The Installation Wing Commander is the official signatory for the INRMP.

2.3.3.2 Installation Vice Wing Commander

The Vice Wing Commander assists the Wing Commander. The Vice Wing Commander is the chairperson of the Bird Hazard Working Group (BHWG) and approves recommendations of the BHWG.

2.3.3.3 Base Civil Engineer

The Base Civil Engineer (CE) plans, budgets, approves, and oversees all maintenance and construction activities performed on the installation. All maintenance and construction-related projects or management activities proposed in this INRMP should be approved by the Base CE to ensure that funding is available and these projects are complementary to the installation's comprehensive planning processes. The Base CE identifies locations where pests pose a threat to the safety of personnel, infrastructure, and facilities. The Base CE prioritizes locations and schedules areas to be treated for extermination. A representative from civil engineering participates in the BHWG.

2.3.3.4 Maintenance Group

The primary mission of the Maintenance Group is to provide 24/7 aircraft maintenance in support of combat and peacetime search and rescue operations. A representative from aircraft maintenance participates in the BHWG. The Maintenance Group ensures all aircraft cavities and openings are inspected on the ramp or after undergoing maintenance in hangars for birds or nesting materials before returning to operation. The Maintenance Group Commander issues specific guidance to personnel for the reporting of all discovered bird strikes on aircraft to Quality Assurance and Safety.

2.3.3.5 NGB/A4VN Natural Resources Program Manager

The NGB/A4VN Natural Resources Program Manager (NGB/A4VN NRPM) is the technical point of contact on all natural resource related activities for the ANG. The NGB/A4VN NRPM tracks DoD and USAF policies and approves funding for projects identified as a priority in the Moffett ANGB INRMP. The development of projects included in the INRMP and any deviations from those projects will be submitted to the NGB/A4VN NRPM for review. Decisions resulting from those reviews will be a cooperative effort between the NGB/A4VN NRPM and the EM and/or the installation's Natural Resources Manager, when applicable.

2.3.3.6 Environmental Manager

The EM plans, budgets, approves, and oversees all environmental activities performed on the installation and is responsible for ensuring that activities associated with the implementation of this INRMP adhere to applicable federal, state, local, and USAF environmental regulations and guidelines. Projects proposed in the INRMP are reviewed by the EM and the NGB/A4VN NRPM. The EM should independently review deviation from the projects proposed in this INRMP. Persons responsible for implementation of the INRMP are required to attend the Civil Engineer Corps Officers School (CECOS) DoD Natural Resources Compliance course (https://www.denix.osd.mil/cecos/).

2.3.3.7 Installation Pest Management Coordinator

The Installation Pest Management Coordinator (IPMC) is responsible for the control of undesirable and/or nuisance plants and animals (including insects), and prevention of damage to natural resources. Pest management personnel utilize Integrated Pest Management (IPM) approaches and are responsible for the implementation of the IPM Plan. The IPMC is also responsible for submitting monthly pesticide usage reports in the Pest Management Module in Enterprise Environmental, Safety, and Occupational Health Management Information System when pesticides are applied. The IPMC is also responsible for coordinating with the installation's Public Health Officer and/or Medical offices to ensure monitoring efforts and control methods for potential disease vectors or animals of other medical importance are specified in the IPM Plan and reported

on. The IPMC will coordinate pest management activities with the EM to ensure sensitive areas are identified and to ensure actions taken do not impact those sensitive areas. The IPMC will ensure the goals and objectives of pest management activities are explained in the INRMP and will report all pest management activities to the INRMP Working Group and when applicable, the BHWG.

2.3.3.8 Wing Safety Office

The Wing Safety Office is responsible for development, implementation, and management of the BASH Program at Moffett ANGB. The Wing Safety Office also ensures that bird/wildlife strikes resulting from aircraft assigned to transient units at Moffett ANGB are accurately documented and reported to the EM and the USAF BASH Team. The Wing Safety Office participates in Moffett ANGB's BHWG, which conducts meetings to evaluate and refine strategies for the reduction of BASH risk on Moffett ANGB. The Wing Safety Office is responsible for coordinating with and providing required information to the EM on BASH activities and ensures that the BHWG conducts meetings on the reduction of the BASH threat on the installation. They also monitor bird activity and strike statistics and advise the Vice Wing Commander when a BHWG meeting is deemed necessary.

2.3.3.9 Operations and Maintenance

Operations and Maintenance personnel are responsible for all grounds maintenance activities on the installation. Operations and Maintenance personnel will assist the IPMC and the EM in the implementation of natural resource management projects when applicable. The Operations and Maintenance personnel will also periodically review grounds maintenance equipment to determine if new or additional equipment is needed for the proper maintenance of the installation's landscapes.

The Operations Group Commander is responsible for declaring, disseminating, and terminating Bird Watch Conditions at CAANG training areas and deployed locations. They are also responsible for issuing specific guidance to aircrews and the command post concerning actions required to implement the BASH Plan.

2.3.3.10 US Department of Agriculture-Animal and Plant Health Inspection Service-Wildlife Services

The US Department of Agriculture-Animal and Plant Health Inspection Service-Wildlife Services (USDA-APHIS-WS) is responsible, with input from the 129 RQW Airfield Management Office, for monitoring hazardous wildlife that have the potential to create an aircraft strike hazard. USDA-APHIS-WS personnel support activities that pertain to the BASH Program and are responsible for wildlife depredation requirements within the airfield, as well as dispersal/harassment, capture and translocation, trapping and removal, and surveillance and monitoring. The USDA-APHIS-WS will coordinate efforts for the removal of species and studies needed with the EM.

2.3.3.11 Legal Office

The Legal Office (129th Judge Advocate) is responsible for ensuring the implementation of the management objectives contained within the Moffett ANGB INRMP meets all regulatory and statutory requirements that pertain to natural resources management. The Legal Office will review any future natural resources management proposals and alert the Installation Wing Commander and the EM should there be any regulatory conflicts or shortfalls. In addition, the Legal Office will keep participating INRMP parties informed of any new statutes or regulations that might affect natural resources management.

2.3.3.12 Public Affairs Office

The Public Affairs Office (PAO) is responsible for the coordination of public access for events at Moffett ANGB. The PAO serves as the point of contact to interface between the Installation Wing Commander and civilian groups interested in installations for environmental, educational, or other purposes.

2.3.3.13 US Fish and Wildlife Service

The USFWS is a signatory of the Moffett ANGB INRMP and provides input regarding natural resource projects and operational component plans. The USFWS reviews and comments on the operations and effect update of the INRMP every 5 years and, when feasible, attends the task force meeting. The USFWS, when feasible, attends the annual meetings to discuss the status of the projects identified in the Annual Work Plans. At both the 5-year operations and effect and the annual meetings, the USFWS advises on the status of any pending additions or deletions to the federal threatened and endangered species list that have the potential for inhabiting Moffett ANGB. When feasible the USFWS will support ANG wildlife and vegetation surveys conducted at Moffett ANGB.

2.3.3.14 California Department of Fish and Wildlife

The CDFW is the state fish and wildlife agency and is a signatory of the INRMP and provides input regarding natural resource projects and operational component plans. The CDFW reviews and comments on the operations and effect update of the INRMP every 5 years and, when feasible, attends the task force meeting. The CDFW, when feasible, also attends the annual meetings to discuss the status of the projects identified in the Annual Work Plans. At both the 5-year operations and effect and the annual meetings, the CDFW advises on the status of any pending additions or deletions to the state threatened and endangered species list that have the potential for inhabiting Moffett ANGB. When feasible, the CDFW will support ANG wildlife and vegetation surveys conducted at Moffett ANGB.

2.4 Integration with Other Plans

By its nature, an INRMP is multidisciplinary and provides a summary of natural resources and associated management at a specific installation. As a result, information from an INRMP is incorporated into other plans and other plans are written to support an INRMP. The Moffett ANGB plans include the following:

- BASH Plan. This plan establishes procedures for the reduction of bird and other wildlife strikes by aircraft at Moffett ANGB (129 RQW 2021).
- NASA Ames Research Center Storm Water Pollution Prevention Plan (SWPPP). The objective of this plan is to identify sources of pollution associated with NASA Ames Research Center activities that may potentially affect the quality of stormwater discharges. The plan also describes and ensures implementation of best management practices (BMPs) to minimize and control pollutants from entering stormwater discharges. The SWPPP also ensures compliance with the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) permit. The SWPPP for the NASA Ames Research Center includes Moffett ANGB (NASA 2020).
- IPM Plan. This plan provides a summary of management of pest species to minimize impact to mission, natural resources, and the environment (129 RQW 2022).

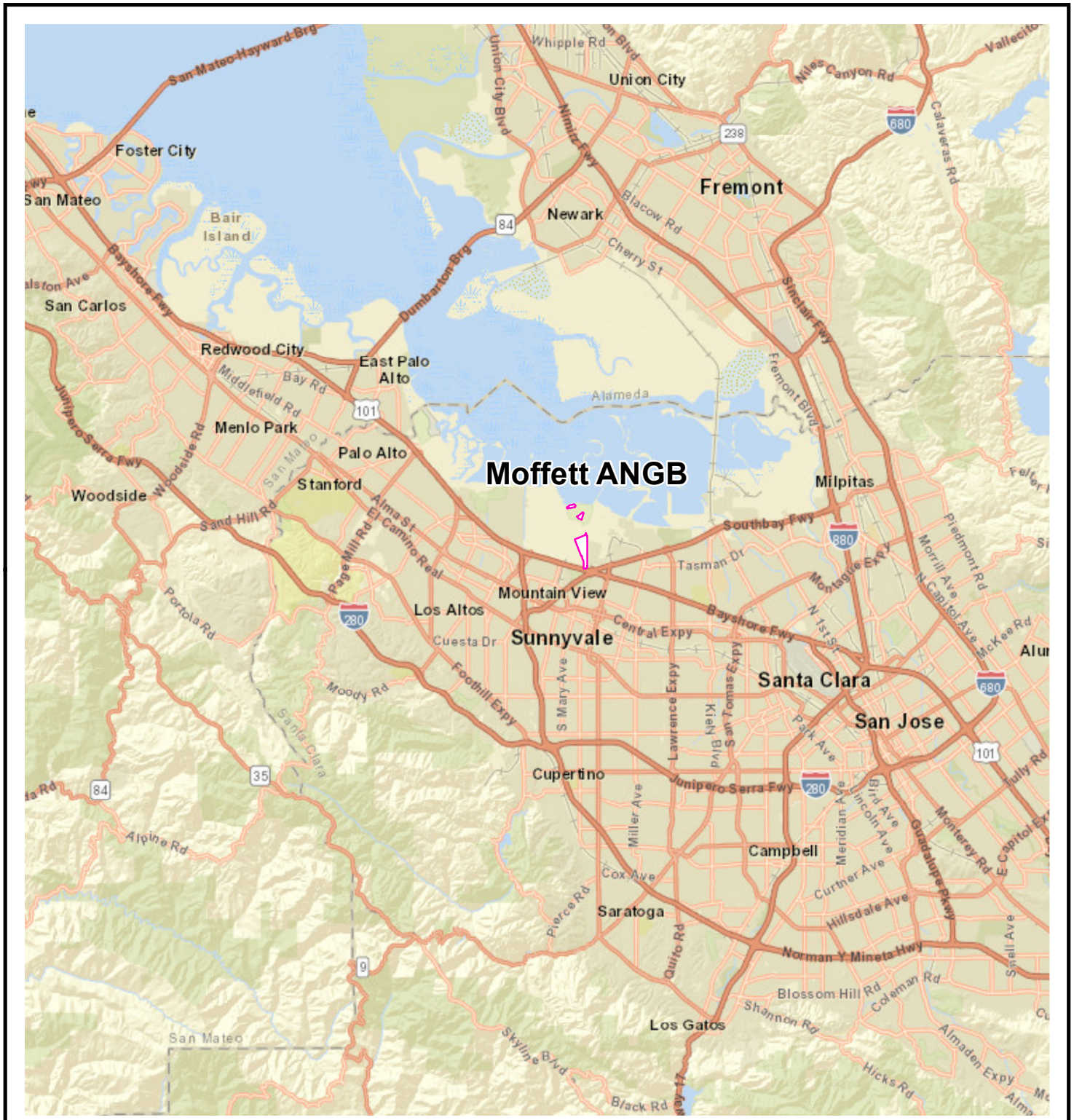
In addition, this INRMP reflects the goals and objectives of the California State Wildlife Action Plan (SWAP). The DoD and the ANG encourage integration of the SWAP into the installation's natural resources management program. The SWAP evaluates California's species and habitats in greatest need of conservation, the major stressors affecting native wildlife and habitats, and what actions are needed to restore and conserve California's wildlife. The plan discusses both state-wide issues as well as issues specific to each of California's nine regions. Moffett ANGB is located within the Central Coast region and major stressors identified in this region include growth and development, intensive agriculture, excessive livestock grazing, water management conflicts and degradation of aquatic systems, recreational pressures, and invasive species (CDFW 2015). The EM will consult with the regional CDFW office to determine areas where the installation can participate in future wildlife conservation partnerships with the CDFW in support of the SWAP. In addition, the CDFW is part of the development and implementation of the INRMP.

3.0 INSTALLATION OVERVIEW

3.1 Location and Area

Moffett ANGB is located along the south shore of San Francisco Bay in Santa Clara County, California between the cities of Mountain View and Sunnyvale (Figure 2). Moffett ANGB encompasses approximately 131 acres (55 hectares) located within the 2,354-acre (952.6-hectare) MFA. NASA has leased over 1,000 acres (400 hectares) of the airfield and airport hangers to Google Planetary Ventures LLC since 2014 for use as laboratories for the development of cutting-edge technology. MFA is divided into four sub-areas including the NASA Research Park, the Ames Research Campus, Bay View, and the Eastside/Airfield. Google Planetary Ventures LLC is responsible for the management of the airfield, and Moffett ANGB is a tenant that uses the airfield.

Moffett ANGB is located in the Eastside/Airfield sub-area of MFA (Figure 3). The Moffett ANGB cantonment area is located along the southeast border of the airfield and encompasses approximately 111 acres (45.0 hectares). Moffett ANGB also occupies two temporary use areas (TUAs): Munitions Storage Area 1 (10.5 acres [4.2 hectares]) and Munitions Storage Area 3-4 (9.5 acres [3.8 hectares]). These areas will be used temporarily until construction of new facilities within the cantonment area is completed and can support the 129 RQW mission.



Vicinity Map

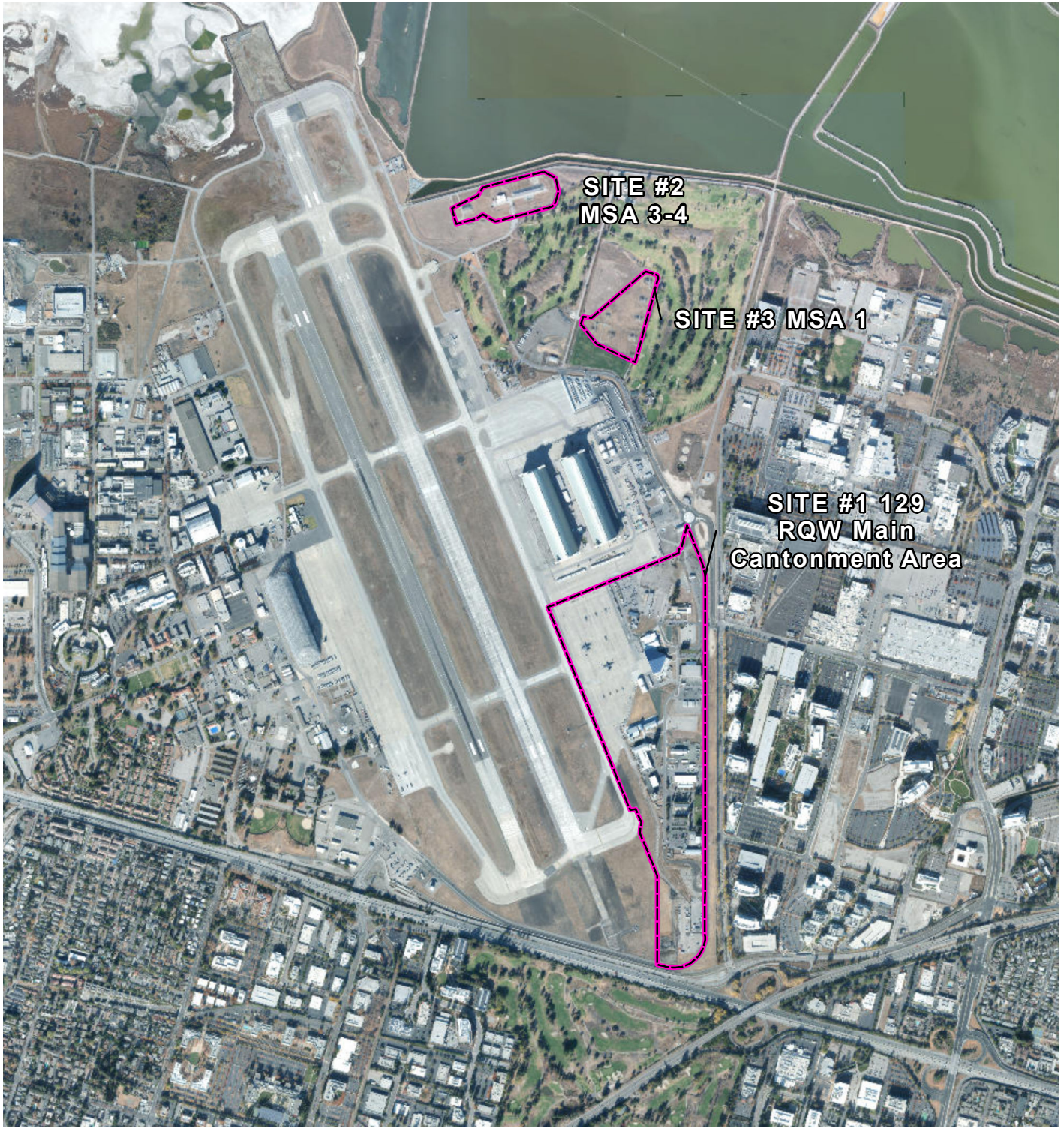
Legend

ANGB - Air National Guard Base

N

0 2.5 5 10 Miles

Figure 2. Moffett ANGB Regional Map



Legend

ANGB

129 RQW - 129th Rescue Wing
ANGB - Air National Guard Base
MSA - Munitions Storage Area

N

0 0.2 0.4 0.8 Miles

Figure 3. Moffett ANGB Installation Map

3.2 Installation History

MFA is a joint civilian-military facility formerly known as the Naval Air Station Moffett Field, which was established in 1933. In 1939 the National Advisory Committee for Aeronautics established the Ames Aeronautical Laboratory at Moffett Field (NASA 2022). NASA has maintained operation of MFA since 1994 when the airfield was decommissioned by the US Secretary of Defense and renamed MFA.

The CAANG 129 RQW was formed in 1955 as the 129th Air Resupply Group at Hayward Airport, California. The unit was initially formed under the United States Continental Air Command but was transferred to the United States Tactical Air Command less than a year after its formation. The unit's original mission was to airlift personnel and material using C-46 aircraft. While the unit underwent several name changes and aircraft conversion, the mission remained the same until 1975 when the unit became the 129th Aerospace Rescue and Recovery Group operating under the Aerospace Rescue and Recovery Service of Military Airlift Command. In 1984 the 129 RQW (at the time known as the 129th Aerospace Rescue and Recovery Group) relocated from Hayward Airport, California to MFA. In 1989, the 129th Aerospace Rescue and Recovery Group received the designation of the 129th Air Rescue Group and began converting from the HH-3E "Jolly Green Giant" helicopter to the HH-60G "Pave Hawk" helicopter. In March 1992, the name was shortened to the 129th Rescue Group, and in 1992 became the 129 RQW (129 RQW 2017).

3.3 Military Missions

Generally, the ANG mission is two-fold, with both federal and state components. The 129 RQW's federal mission is to support the USAF Air Combat Command by providing manpower, material, and equipment resources to conduct combat search and rescue (CSAR) operations on a worldwide basis as well as complete peacetime search operations. During peacetime, combat-ready units and support units are assigned to USAF major commands to carry out missions compatible with training, mobilization readiness, humanitarian, and contingency operations. When units are not mobilized, they report to the governor of their respective state. The state mission is to provide trained personnel to respond to state emergencies, such as natural disasters, and to assist civil authorities in the enforcement of the law. In addition to supporting the overall ANG mission above, the 129 RQW conducts CSAR operations on a global scale.

3.4 Surrounding Communities

Moffett ANGB is located in Santa Clara County, California. Santa Clara County has an estimated population of 1,936,259 (US Census Bureau 2021a) making it the sixth most populated county in California. The City of Mountain View (population 82,376; US Census Bureau 2021b) borders MFA to the south and west and the City of Sunnyvale (population 155,805; US Census Bureau 2021c) to the south and east. Land use in the areas adjacent to MFA is primarily suburban with a mixture of residential, commercial, and industrial uses. Areas immediately east, south, and west of the airfield are high density commercial and industrial uses followed by high density residential uses. The area to the north is the southern end of San Francisco Bay and is part of the Don Edwards San Francisco Bay National Wildlife Refuge (NWR). Immediately south of the airfield is the Sunnyvale Golf Course, an 18-hole golf course and restaurant operated by the City of Sunnyvale.

3.5 Local and Regional Natural Areas

The City of Mountain View maintains more than 40 urban parks, trails, and recreational facilities throughout the city. Approximately 3 miles (5 kilometers) northwest of MFA is Shoreline at Mountain View, a 750-acre (304-hectare) park which contains the Shoreline Golf Links golf course,

Shoreline Lake, a walking/biking path, natural areas, picnic areas, and environmental education activities. The golf course is also a bird sanctuary and contains a historic home and a café (Shoreline Golf Links 2022). Shoreline Lake is a 50-acre (20-hectare) man-made saltwater lake for recreational use (canoe, kayak, sailing, and windsurfing; Shoreline Golf Links 2022). The Stevens Creek Trail originates at Shoreline at Mountain View and continues south passing the entrance to the NASA Ames Research Center and along Stevens Creek for approximately 5 miles (8 kilometers).

The coastal habitat north of and adjacent to Moffett ANGB belongs to the Don Edwards San Francisco Bay NWR. The Don Edwards San Francisco Bay NWR is one of seven refuges that make up the San Francisco Bay NWR Complex (USFWS 2022a). The Don Edwards San Francisco Bay NWR contains 30,000 acres (12,141 hectares) of man-made ponds and marshes and the remaining areas are mudflats, vernal pools, and a small percentage of upland areas. The refuge provides habitat for migratory birds as well as endangered species such as Ridgway's rail (*Rallus obsoletus*), western snowy plover (*Charadrius alexandrinus nivosus*), and the salt marsh harvest mouse (*Reithrodontomys raviventris*; USFWS 2022b). The refuge has over 30 miles (48 kilometers) of trails for pedestrians and bicyclists, and during winter months waterfowl hunting is permitted within the tidal area and salt ponds.

The City of Sunnyvale maintains over 772 acres (312 hectares) of public open space. The largest park in Sunnyvale, Baylands Park, is located along the San Francisco Bay approximately 3 miles (5 kilometers) east of MFA. Over 70 acres (28 hectares) of the park are developed for recreational use including pathways and picnic areas. An additional 105 acres (42 hectares) of seasonal wetlands are protected as part of the Wetlands Preserve, providing habitat for plants and wildlife (City of Sunnyvale 2022). Natural areas near Moffett ANGB are shown on Figure 4.

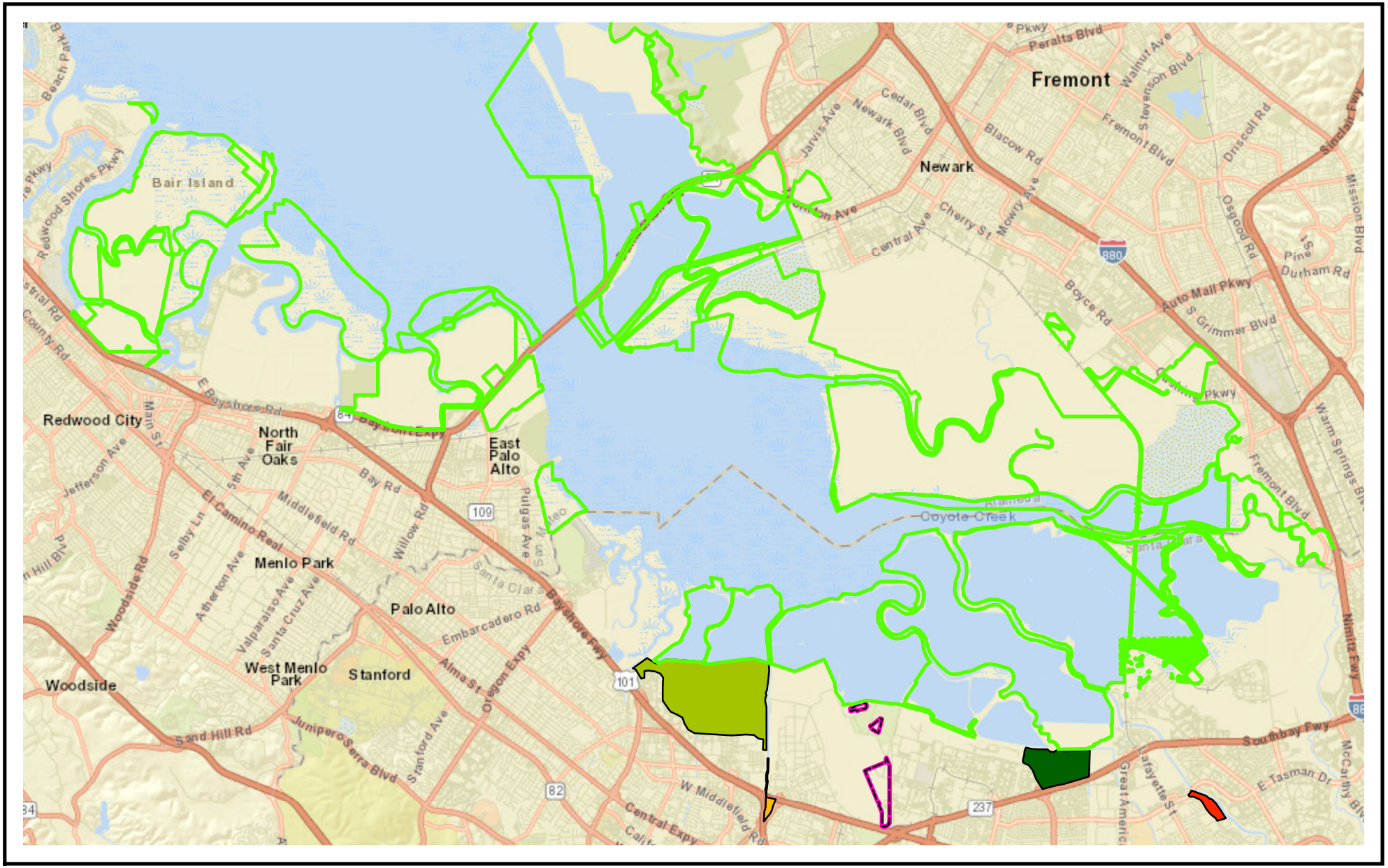


Figure 4. Local and Regional Natural Areas near Moffett ANGB

4.0 PHYSICAL ENVIRONMENT

4.1 Climate

The San Francisco Bay and the Pacific Ocean have a moderating effect on the climate at Moffett ANGB. The climate is characterized by warm, dry summers and cool, moist winters. During the warmer months of the year (normally June through October) the installation is subject to morning and evening low clouds and fog with primarily sunny conditions occurring during the day.

The nearest National Weather Service weather station measuring both temperature and precipitation is located at the San Francisco International Airport, approximately 22 miles (35 kilometers) northwest of Moffett ANGB. Average temperatures range from an average low of approximately 44 degrees Fahrenheit (°F) (6 degrees Celsius [°C]) in January to an average high of approximately 74 °F (23 °C) in September. Average annual precipitation totals approximately 20 inches (51 centimeters) and the majority of the annual rainfall occurs between November and April. Snow is very rare in the San Francisco region; there has been no snow accumulation in the last 30 years (Table 2).

Table 2. Average Monthly Temperature and Precipitation for the San Francisco Airport, California (1991-2020)

Month	Average Low Temperature (°F)	Average High Temperature (°F)	Average Rain Precipitation (inches)
January	44.5	58.0	3.89
February	46.1	60.8	3.96
March	47.6	63.4	2.73
April	49.1	65.6	1.36
May	51.6	68.3	0.48
June	53.6	71.5	0.14
July	55.3	72.6	0.00
August	56.4	73.4	0.04
September	55.9	74.8	0.07
October	53.4	72.3	0.79
November	48.5	64.3	2.04
December	44.6	58.2	4.14

Source: National Weather Service 2022
°F degrees Fahrenheit

Climate Change

DoDI 4715.03, *Natural Resources Conservation Program*, requires the INRMP to assess the potential impacts of climate change on natural resources and to adaptively manage such resources to minimize adverse mission impacts.

The Climate Explorer, along with the U.S Climate Resilience Toolkit, is an interactive online tool providing graphs and maps which display climate projections for counties across the United States. Climate Explorer shows projections for two scenarios: a lower emissions and a higher emissions scenario. In the lower emissions scenario, global emissions of heat-trapping gases are drastically reduced and stabilized whereas in the higher emissions scenario emissions continue to increase through the end of the 21st century (NOAA 2021). It provides data for temperature, precipitation, and related climate variables. The Climate Explorer was developed by an interagency team of climate model experts at the US Environmental Protection Agency (USEPA), NASA, National Oceanic and Atmospheric Administration (NOAA), and the US Geological Survey (USGS) and is overseen through the U.S. Global Change Research Program.

By 2100, the average daily maximum temperature in degrees Fahrenheit in Santa Clara County is expected to increase an average of 2.6 °F (range -0.5 to 6.2 °F) [1.4 °C (range -0.3 to 3.4 °C)] in the low emissions scenario while the daily maximum temperature would increase by an average 6.3 °F (range 2.9 to 12.2 °F) [3.5 °C (range 1.6 to 6.8 °C)] in the high emissions scenario. The number of days with the maximum temperature above 90 °F would increase to an average between 36.8 and 63.1, an increase of between 25.6 and 51.9 days annually. Additionally, the annual precipitation is expected to increase to 23.43 or 25.31 total inches (59.5 or 64.3 centimeters; US Federal Government 2021). The Climate Explorer does not include sea-level rise predictions, but the number of high-tide flooding days is expected to be 345 days, an increase of 47 days. Sea levels in California are projected to increase 21 to 55 inches (53 to 140 centimeters) by 2100 (CNRA 2009).

In 2008, California Executive Order (EO) S-13-08 was signed, requiring the development of a state Climate Adaptation Strategy in coordination with local, regional, state, and federal public and private groups. In 2009, the California Natural Resources Agency completed the California Climate Adaptation Strategy (CNRA 2009) which used the most recent climate change science to assess vulnerability across the state and identified possible solutions to be implemented. Adaptation strategies focused on seven areas: public health, ocean and coastal resources, water supply and flood protection, agriculture, forestry, biodiversity and habitat, and transportation and energy infrastructure (CNRA 2009). The California Climate Adaptation Strategy is currently being updated; the public comment review period ended 17 November 2021 (CNRA 2022).

4.2 Landforms

The United States is separated into physiographic provinces based on their physical features, landform processes, and their relation to geologic structures (NPS 2017). All of coastal California is in the Pacific Border physiographic province. This province is one of the youngest provinces, geologically, and the one with the most tectonic activity. It is characterized by lowlands on the eastern side of the region with north-south mountain ranges to the west. The mountain ranges in this province have been deformed by ongoing fault activity and are composed of Cretaceous sedimentary and metamorphic rocks with Mesozoic granitic intrusions (NPS 2017).

California is further divided into 11 geomorphic provinces (CGS 2002). Moffett ANGB is located in the Coast Range province which is naturally divided by the San Francisco Bay into northern and southern ranges. The mountain ranges in the Coast Range province trend northwest and are on average 2,000 to 4,000 feet (610 to 1,219 meters) above sea level. These mountain ranges roughly run parallel to the San Andreas Fault (CGS 2002). The San Andreas Fault is the tectonic boundary between the Pacific and North American plates, and extends for approximately 800 miles (1,287 kilometers) through California (Geology Page 2012); it runs to the west of the City of Palo Alto and Moffett ANGB.

Moffett ANGB is located at the southern end of San Francisco Bay on a relatively flat alluvial plain; the topography ranges from an elevation of approximately 40 feet (12 meters) above sea level at the southern end of the installation to sea level at the northern end (129 RQW 2017). Significant topographic features at MFA include a series of flood control levees along the northern border of the facility that provide protection from tidal flooding of the San Francisco Bay (129 RQW 2017). These levees are located outside of the Moffett ANGB property.

4.3 Geology and Soils

The San Francisco Bay occupies a structural depression which dates to the Pliocene epoch (approximately 5.3 million years ago) and which flooded several times due to Pleistocene glaciations. Moffett ANGB is located on younger alluvium deposits from the Quaternary period, approximately 1.8 million years ago (USACE 1961). Quaternary alluvium deposits cover approximately 27 percent of Santa Clara County (USGS 2022). These deposits contain clay, silt, sand, gravel, or other unconsolidated material; and were deposited by streams or other water bodies including marine sources near the coast (USGS 2022).

Based on a review of the United States Department of Agriculture (USDA) soil survey, Moffett ANGB has three soil map units within the installation: Urbanland-Hangerone complex, Urbanland-Bayshore complex, and Embarcadero silty clay loam (USDA NRCS 2022; Figure 5). A soil map unit represents an area that is dominated by one major kind of soil or an area dominated by several types of soils (a complex).

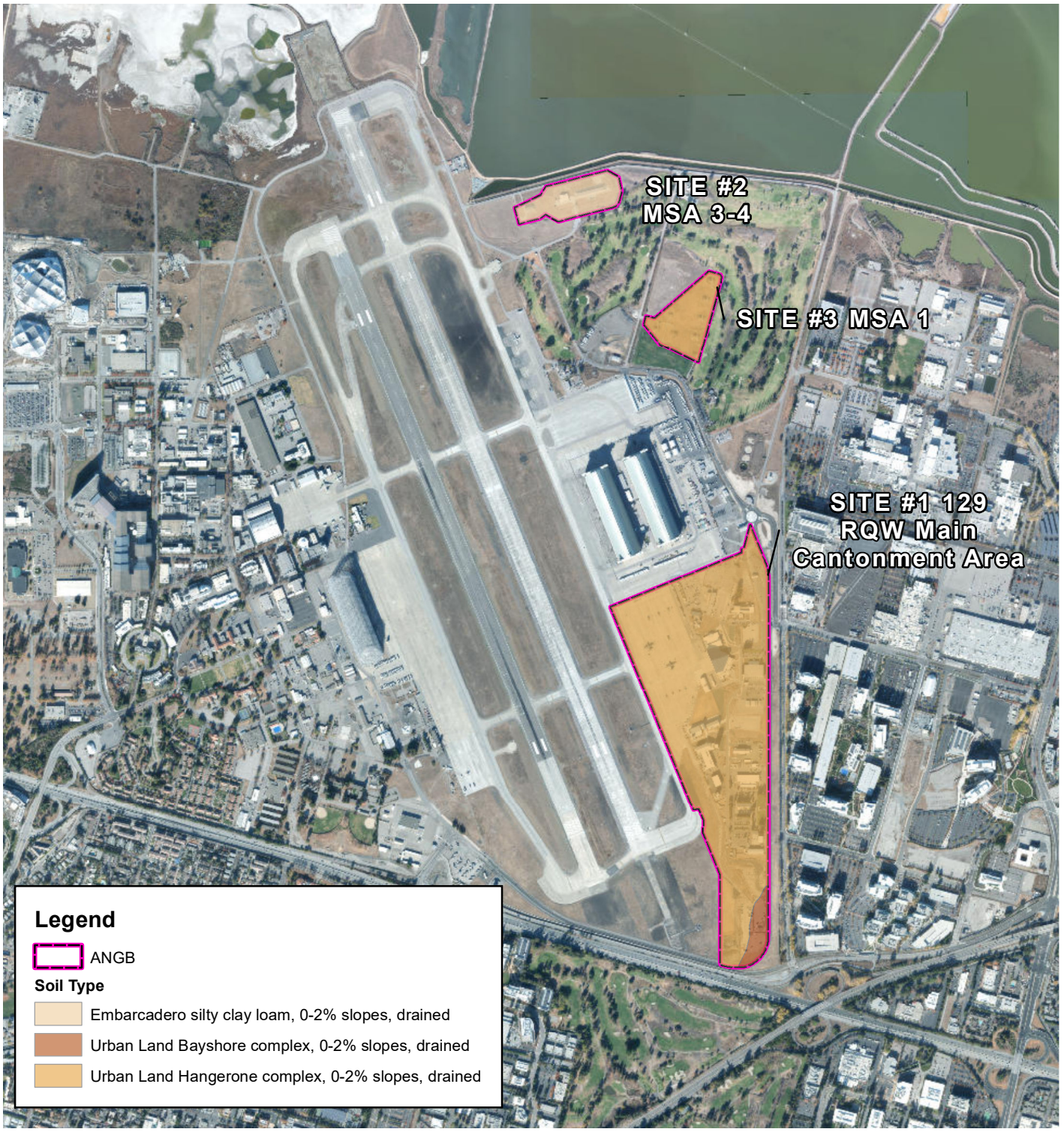
All three soil map units within Moffett ANGB have 0 to 2 percent slope, are poorly drained, and are considered hydric soils. The Urbanland-Hangerone complex occupies 133.1 acres (90.8 percent); the Urbanland-Bayshore Complex occupies 3.6 acres (2.5 percent); and the Embarcadero silty clay loam soils occupy 9.8 acres (6.7 percent) within Moffett ANGB (Figure 5).

4.4 Hydrology

4.4.1 Groundwater

Moffett ANGB is located within the Santa Clara Valley groundwater basin, which covers 153,600 acres (62,160 hectares). There are several subbasins within this groundwater basin. Moffett ANGB is located in the Santa Clara Valley subbasin, which occupies a structural trough at the southern end of San Francisco Bay (CDWR 2015). There are two water-bearing formations within the Santa Clara Valley basin, the Santa Clara Formation (Plio-Pleistocene age) and the alluvial deposits (Pleistocene-Quaternary age). The alluvial deposits overlay the Santa Clara Formation and together these two formations likely exceed 1,500 feet (457 meters; CDWR 2004).

From the early 1900s through the 1960s, the groundwater level in the Santa Clara subbasin declined more than 200 feet (61 meters) which caused saltwater intrusion from the San Francisco Bay and further degraded the subbasin (CDWR 2004). Due to these declines in groundwater levels, surface water was imported through the Hetch Hetchy and South Bay aqueducts and an artificial recharge program was introduced to the subbasin. Groundwater in the Santa Clara Valley basin is generally good to excellent in mineral composition and good for most uses (CDWR 2004). Drinking water standards are met at public supply wells without the use of treatment methods, although several wells with elevated mineral levels were identified in the northern portion of the basin; these levels are likely associated with historical saltwater intrusion (CDWR 2004).



129 RQW - 129th Rescue Wing
ANGB - Air National Guard Base
MSA - Munitions Storage Area

N

0 0.2 0.4 0.8 Miles

Figure 5. Soil Map for Moffett ANGB

4.4.2 Surface Water

Moffett ANGB is located along the southern shore of San Francisco Bay within the Lower Peninsula Watershed (Santa Clara Valley Water District 2022). There are no surface water features within the installation boundary; however, surface water features are located on the MFA property (Figure 6). San Francisco Bay and associated saltwater evaporation ponds, stormwater retention ponds, and wetlands are located to the north of Moffett ANGB. Other surface water features include Coyote Creek and Guadalupe Slough to the east of the installation and Stevens Creek to the west.

Surface water runoff on the installation is dominated by a series of constructed ditches, storm drains, and drainage swales. MFA is divided into two drainage areas: the western and the eastern drainage areas. The western drainage area encompasses approximately 680 acres (275 hectares) and discharges into a stormwater pond north of the NASA Bay View Area. The eastern drainage area is approximately 1,010 acres (409 hectares) and encompasses the southeast portion of the NASA Research Park area, the Ames Campus facilities west of the runway, the Eastside/Airfield, and Moffett ANGB. There is no direct connection between the eastern drainage area and the stormwater pond in the western drainage area (129 RQW 2017). A series of flood control levees north of the installation provide marginal protection from tidal flooding of the Bay; however, flooding occurs in this area during peak rainfall events (129 RQW 2017).

5.0 ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

5.1 Ecosystem Classification

Moffett ANGB is in the Mediterranean California Ecoregion (CEC 1997) which extends from Oregon in the north to Baja California Norte in the south. This ecoregion is characterized by patches of chaparral, oak woodland, grassland, and some coniferous forest. At lower elevations coastal sagebrush is more abundant. Common shrubs in this ecoregion include chamise (*Adenostoma fasciculatum*), ceanothus (*Ceanothus* spp.), and manzanita (*Arctostaphylos* spp.) (CEC 1997). Moffett ANGB can be further divided into the Central California Foothills and Coastal Mountains (Level III), and Bay Flats (Level IV) ecoregions (Griffith et al. 2016). Bay Flats are also characterized by salt tolerant plant species such as pickleweed (*Salicornia* sp.) and saltgrass (*Distichlis spicata*).

5.2 Vegetation

5.2.1 Historic Vegetative Cover

In the San Francisco Bay in 1850, salt marshes covered approximately 543,631 acres (2,200 square kilometers), nearly twice as much area as the surrounding bays. Between 1850 and 1980, approximately all but 21,000 acres (85 square kilometers) of these marshes were leveed or filled in and converted to farmland; salt ponds; or industrial, recreational, or residential areas (Atwater et al. 1979).

Figure 6. Hydrology Map for Moffett ANGB

5.2.2 Current Vegetative Cover

The majority of Moffett ANGB is developed and includes buildings, roadways, and an aircraft hangar. There is very little natural vegetation or habitat remaining. Due to land practices involved with installation construction and maintenance, much of the installation's native vegetation has been removed and is actively maintained (i.e., mowed or landscaped) to minimize BASH potential. Vegetation within the Moffett ANGB cantonment area includes landscaped areas around buildings and along roadsides. Non-native (disturbed) grassland areas occur within the cantonment area and within two TUAs north of the cantonment. Ornamental trees and brush throughout the installation attract birds as feeding, nesting, perching, or roosting sites as well as provide cover and other resources for small mammals. Plant species observed at Moffett ANGB during the 2022 flora survey are listed in Table 3.

Table 3. Plant Species Observed at the Moffett ANGB

Scientific Name	Common Name	Habitat Type(s) Observed	Origin[1]
Forbs			
Bellis perennis	Common daisy	Disturbed grasslands	Introduced
Carduus pycnocephalus	Italian plumeless thistle	Disturbed grasslands	State noxious
Centaurea melitensis	Tocalote	Disturbed grasslands	State noxious
Convolvulus arvensis	Field bindweed	Disturbed grasslands	State noxious
Eschscholzia californica	California poppy	Disturbed grasslands	Native
Epilobium brachycarpum	Willow herb	Disturbed grasslands	Native
Erodium cicutarium	Red-stemmed filaree	Disturbed grasslands; Landscaped	Introduced
Geranium dissectum	Cutleaf geranium	Landscaped	Introduced
Hedera helix	English ivy	Landscaped	Ornamental
Helminthotheca echioides	Bristly oxtongue	Disturbed grasslands	Introduced
Hirschfeldia incana	Summer mustard	Disturbed grasslands	Introduced
Iva axillaris	Povertyweed	Disturbed grasslands	Native
Lotus corniculatus	Bird's foot trefoil	Landscaped	Introduced
Lysimachia (Anagallis) arvensis	Scarlet pimpernel	Disturbed grasslands	Introduced
Melilotus indicus	Sourclover	Landscaped	Introduced
Plantago lanceolata	English plantain	Disturbed grasslands	Introduced
Pseudognaphalium luteoalbum	Jersey cudweed	Disturbed grasslands	Introduced
Rumex transitorius	Willow dock	Landscaped	Native
Salsola tragus	Russian thistle	Disturbed grasslands	State noxious
Silybum marianum	Milk thistle	Disturbed grasslands	Introduced
Taraxacum officinale	Dandelion	Disturbed grasslands	Both
Tragopogon dubius	Yellow salsify	Disturbed grasslands	Introduced
Trifolium hirtum	Rose clover	Disturbed grasslands	Introduced
Typha sp.	Cattail	Landscaped	Native
Graminoids			
Avena barbata	Slender wild oat	Disturbed grasslands	Introduced
Bromus hordeaceus	Soft brome	Disturbed grasslands	Introduced
Bromus rubens	Red brome	Disturbed grasslands	Introduced
Bromus catharticus	Rescue grass	Disturbed grasslands	Introduced

Scientific Name	Common Name	Habitat Type(s) Observed	Origin[1]
Cortaderia jubata	Pampas grass	Disturbed grasslands	State noxious
Cynodon dactylon	Bermudagrass	Landscaped	Introduced
Cyperus involucratus	Umbrella plant	Disturbed grasslands	Introduced
Festuca myuros (Vulpia myuros)	Rattail fescue	Disturbed grasslands	Introduced
Festuca perennis	Italian ryegrass	Disturbed grasslands	Introduced
Hordeum murinum	Foxtail barley	Disturbed grasslands; Landscaped	Introduced
Juncus effusus	Soft rush	Landscaped	Native, Ornamental
Poa pratensis	Kentucky bluegrass	Landscaped	Both
Polypogon monspeliensis	Rabbitsfoot grass	Disturbed grasslands	Introduced
Shrubs			
Baccharis pilularis	Coyote brush	Disturbed grasslands	Native
Nerium oleander	Oleander	Landscaped	Introduced, Ornamental
Pittosporum tobira	Japanese pittosporum	Landscaped	Introduced, Ornamental
Quercus agrifolia	Coast live oak	Disturbed grasslands	Native
Rhamnus alaternus	Italian/Mediterranean buckthorn	Landscaped	Ornamental
Rhaphiolepis indica	Indian hawthorn	Landscaped	Ornamental
Trees			
Acacia auriculiformis	Earpod acacia	Landscaped	Ornamental
Alnus cordata	Italian alder	Landscaped	Introduced, Ornamental
Laurus nobilis	Bay laurel	Landscaped	Introduced, Ornamental
Liquidambar styraciflua	American sweetgum	Landscaped	Native
Platanus hispanica	London plane tree	Landscaped	Ornamental
Prunus cerasifera	Purple-leaf plum	Landscaped	Introduced, Ornamental
Sequoia sempervirens	Coast redwood	Landscaped	Native, Ornamental

1 Ornamental plants may be native to California or North America, or non-native (introduced), but all have been planted.
Source: Moffett ANGB 2022

5.2.2.1 Landscaped Areas

Landscaped areas occurred within the cantonment area around buildings and along roadsides and include landscaped/ornamental vegetation or landscaped mowed grass (Figure 7). Landscaped vegetation was comprised primarily of ornamental trees and shrubs with a non-native herbaceous understory. The majority of the tree species are non-native ornamentals including bay laurel (*Laurus nobilis*), purple-leaf plum (*Prunus cerasifera*), earpod acacia (*Acacia auriculiformis*), and London plane tree (*Platanus hispanica*). Tree species that are native to North America and California but that are presumably cultivated varieties have been planted as ornamentals including coast redwood (*Sequoia sempervirens*) and American sweetgum (*Liquidambar* styracifula). Shrub species around buildings and along roads are common ornamentals including oleander (*Nerium oleander*) and pittosporum species (*Pittosporum* sp.) as well as ornamental buckthorn and hawthorn (*Rhamnus alaternus* and *Rhaphiolepis indica*). The herbaceous layer includes mowed non-native grasses with non-native forbs including Bermudagrass (*Cynodon dactylon*), foxtail barley (*Hordeum murinum*), bird's foot trefoil (*Lotus corniculatus*), sourclover (*Melilotus indicus*), and red-stemmed filaree (*Erodium cicutarium*), as well as English ivy (*Hedera helix*) planted as ground cover around buildings. In addition to upland trees, shrubs, and herbaceous species, there were three areas planted with ornamental and native wetland species within constructed rocky areas designed as catch basins and planted with graminoid species including sedges (*Juncus* sp.), cattails (*Typha* sp.), and perennial ornamental grasses.

5.2.2.2 Non-native Grassland

Non-native grassland areas occur within the cantonment area and within the two TUAs north of the cantonment area (Figure 7). Non-native grassland within the cantonment area and the northern most TUA is mowed in areas along paths, roads, storage yards, and around the munitions bunkers. Non-native grasslands are not maintained within the TUA adjacent to the golf course and grasses and non-native annual and perennial species reach up to 4 feet (1.2 meters) in some areas. Dominant species in this vegetation community include wild slender oat (*Avena barbata*), foxtail barley (*Hordeum murinum*), and soft brome (*Bromus hordeaceus*), with red brome (*Bromus rubens*), rattail fescue (*Festuca myuros*) and Italian ryegrass (*Festuca perennis*). Associated herbaceous species include Italian thistle (*Carduus pycnocephalus*), red-stemmed filaree (*Erodium cicutarium*), and summer mustard (*Hirschfeldia incana*). A few native species also occur within the non-native grassland including California poppy (*Eschscholzia californica*), and willow herb (*Epilobium brachycarpum*), as well as one shrub-sized coast live oak (*Quercus agrifolia*) along the TUA fence adjacent to the golf course.

5.3 Fish and Wildlife

Wildlife species known to occur or have the potential to occur at Moffett ANGB include species that are adaptable to human presence and disturbance. A total of 31 birds, five mammals, one amphibian species (Sierran treefrog [*Pseudacris sierra*]), and one mollusk (milk snail [*Otala lacteal*]) were observed on Moffett ANGB during the 2022 survey (Tables 4 and 5). In addition, avian species documented during the 2020 BASH survey are included in Table 4.

Legend

ANGB

Habitat

Notes

Landscape / Ornamental

Landscaped

Non-native grassland

129 RQW - 129th Rescue Wing
ANGB - Air National Guard Base
MSA - Munitions Storage Area

N

0 0.2 0.4 0.8 Miles

Figure 7. Habitat Distribution at Moffett ANGB

633 **Table 4.** Bird Species Documented at Moffett ANGB

Scientific Name	Common Name	Scientific Name	Common Name
Agelaius phoeniceus	Red-winged blackbird	*Melozone crissalis*	California towhee
Anas platyrhynchos	Mallard	*Mimus polyglottos*	Northern mockingbird
Ardea alba	Great egret	*Molothrus ater*	Brown-headed cowbird
Ardea herodias	Great blue heron	*Nannopterum auritum*	Double-crested cormorant
Branta canadensis	Canada goose	*Nycticorax nycticorax*	Black-crowned night heron
Buteo jamaicensis	Red-tailed hawk	*Pelecanus erythrorhynchos*	American white pelican
Calypte anna	Anna's hummingbird	*Petrochelidon pyrrhonota*	Cliff swallow
Cathartes aura	Turkey vulture	*Pipilo maculatus*	Spotted towhee
Chaetura vauxi	Vaux's swift	*Poecile rufescens*	Chestnut-backed chickadee
Charadrius vociferous	Killdeer	*Psaltriparus minimus*	Bushtit
Columba livia	Rock pigeon	*Sayornis nigricans*	Black phoebe
Corvus brachyrhynchos	American crow	*Sialia mexicana*	Western bluebird
Fulica americana	American coot	*Spinus psaltria*	Lesser goldfinch
Haemorhous mexicanus	House finch	*Sterna forsteri*	Forster's tern
Hirundo rustica	Barn swallow	*Streptopelia decaocto*	Eurasian collared dove
Icterus bullockii	Bullock's oriole	*Sturnella neglecta*	Western meadowlark
Larus argentatus	Herring gull	*Sturnus vulgaris*	European starling
Larus californicus	California gull	*Tachycineta thalassina*	Violet-green swallow
Leiothlypis celata	Orange-crowned warbler	*Zenaida macroura*	Mourning dove

634

635 **Table 5.** Mammal Species Documented at Moffett ANGB

Scientific Name	Common Name
Didelphis virginiana	Virginia opossum
Felis catus	Feral cat
Lepus californicus	Black-tailed jackrabbit
Mephitis mephitis	Striped skunk
Otospermophilus beecheyi	California ground squirrel

636 Additionally, the NASA Ames Research Center Wildlife Hazard Management Plan includes a list
637 of wildlife species that have been observed within the vicinity, including those considered a high
638 aircraft strike hazard. Other wildlife species observed through BASH include vesper bat
639 (Vespertilionidae), Mexican free-tailed bat (*Tadarida brasiliensis*), barn owl (*Tyto alba*), short-
640 eared owl (*Asio flammeus*), white-throated swift (*Aeronautes saxatalis*), fox sparrow (*Passerella*
641 *iliaca*), and Wilson's snipe (*Gallinago delicata*); however, these species have not been documented
642 on Moffett ANGB (NASA 2014).

643 ***5.4 Threatened and Endangered Species and Species of Concern***

644 Federal status as a threatened or endangered species is derived from the ESA of 1973 (16 USC
645 §1531 et seq.) and administered by the USFWS or the National Marine Fisheries Service (NMFS).
646 According to the USFWS, there are 11 federally listed species potentially occurring on Moffett
647 ANGB (Table 6; USFWS 2022c). In addition, the CESA (amended in 1997) provides a list of
648 native wildlife species listed as endangered, threatened, and of special concern as well as state
649 regulations related to listed species (CDFW 2022). In California, state-listed species are managed
650 by the CDFW. The list of rare, threatened, and endangered species, as well as species with unique
651 or specific habitat needs or declining populations, are inventoried and maintained in the California
652 Natural Diversity Database (CNDDB).

Table 6. State and Federally Listed Species Occurring or with the Potential to Occur at Moffett ANGB

Scientific Name	Common Name	Listing
Amphibians		
Ambystoma californiense	California tiger salamander	FT
Rana draytonii	California red-legged frog	FT
Birds		
Charadrius alexandrinus nivosus	Western snowy plover	FT
Haliaeetus leucocephalus	Bald eagle	SE
Laterallus jamaicensis coturniculus	California black rail	SE
Rallus longirostris obsoletus	California clapper rail	FE, SE
Sterna antillarum browni	California least tern	FE, SE
Crustaceans		
Lepidurus packardi	Vernal pool tadpole shrimp	FE
Fish		
Hypomesus transpacificus	Delta smelt	FT
Spirinchus thaleichthys	Longfin smelt	ST
Insects		
Danaus plexippus	Monarch butterfly	C
Mammals		
Reithrodontomys raviventris	Salt marsh harvest mouse	FE, SE
Plants		
Suaeda californica	California seablite	FE
Reptiles		
Chelonia mydas	Green sea turtle	FT

Source: USFWS 2022c; CDFW 2022

FE = Federally endangered FT = Federally threatened C = Federal candidate

SE = Endangered (state) ST = Threatened (state)

5.5 Waters of the US, Wetlands, and Floodplains

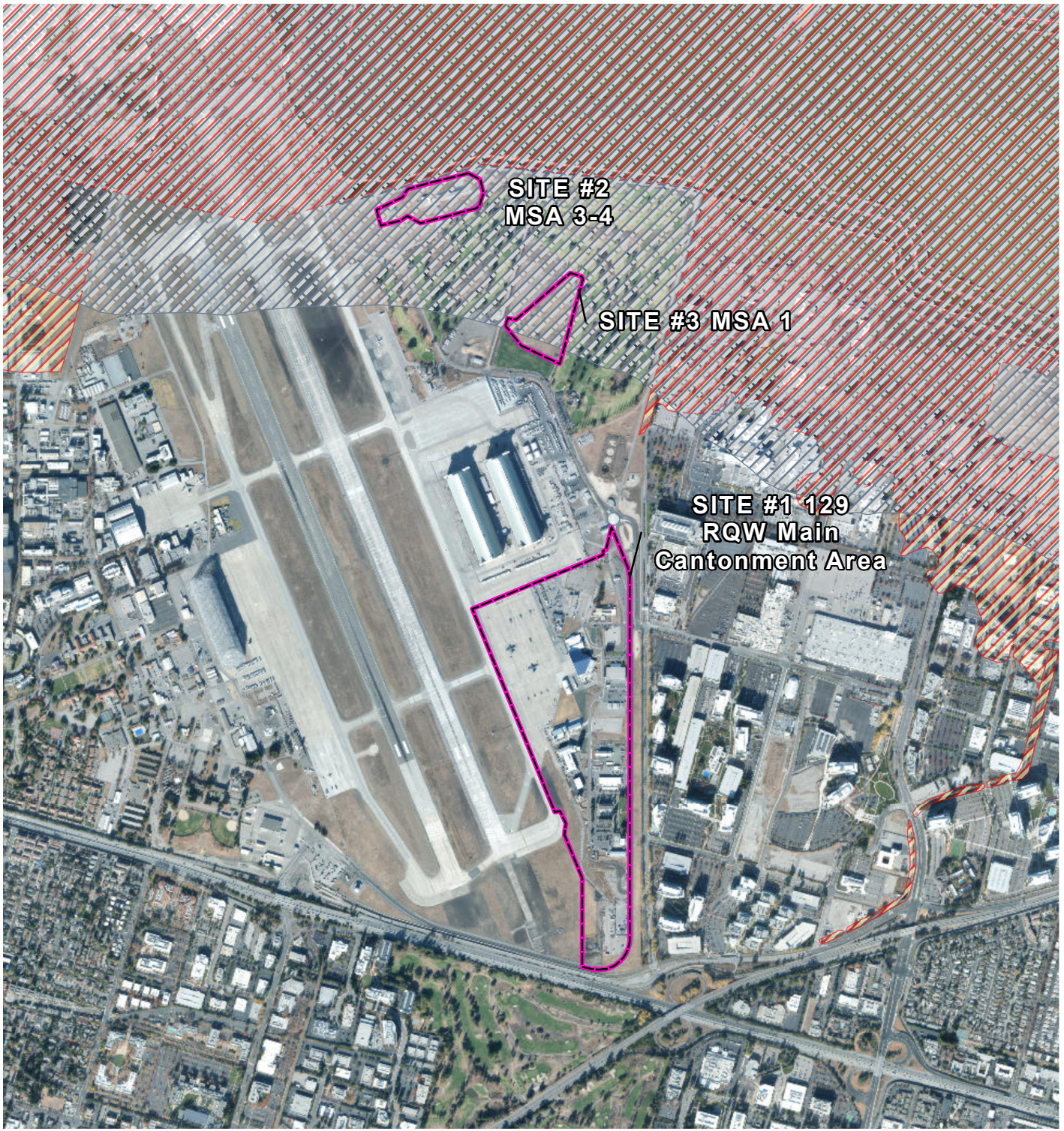
5.5.1 Waters of the US

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE 1987). No wetlands occur on Moffett ANGB.

5.5.2 Floodplains

Floodplains are lowlands and relatively flat areas adjoining waters that are subject to flooding. The 100-year floodplain is designated based on different factors on the Federal Insurance Rate Maps (FIRMs) along with other flooding and storm surge information. With respect to occurrence, a 100-year flood has a one percent chance of occurring in any given year and the 500-year flood has a 0.2 percent chance in any given year. The limits to which that flood reaches defines the floodplains. Floodplains are regulated by the Federal Emergency Management Agency (FEMA) with standards outlined in 44 CFR Part 60.3. EO 11988, *Floodplain Management*, requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains.

A review of the FEMA FIRM panels indicates that Moffett ANGB is located outside of the identified 100-year floodplain (Figure 8) and is located within Zone D (FIRM Panel 06085C0045H) (FEMA 2022). Zone D is defined as areas in which flood hazards are undetermined, but possible. Munitions Storage Area 3-4 is directly adjacent to the 100-year floodplain boundary.



Legend

- ANGB
- County Dike Failure Flooding Hazard Zones
- 100 Year Floodplain

129 RQW - 129th Rescue Wing
ANGB - Air National Guard Base
MSA - Munitions Storage Area

N

0 0.2 0.4 0.8 Miles

Figure 8.
Flood Hazard Zones
at Moffett ANGB

6.0 MISSION IMPACTS ON NATURAL RESOURCES

6.1 Natural Resources Needed to Support the Military Mission

Missionscape refers to the condition of the landscape best suited to support the various missions and varies depending upon the type of training. The mission of the 129 RQW is to provide a trained and equipped rescue force able to respond to and sustain the state and federal missions. The 129 RQW requires operation areas to support tactical air operations, surrounding areas to serve as a buffer to reduce BASH risk and provide support facilities and functions, and vegetated buffers to reduce impacts to water and soil resources. The military mission and training requirements are dynamic and can change over time, requiring potential changes to natural resource needs to support the mission. Thus, natural resources needed to support the 129 RQW mission include vegetated buffers for water quality preservation and some open space for security and safety clear zones associated with antiterrorism / force protection (AT/FP) and training exercises.

6.2 Natural Resources Constraints to Mission and Mission Planning

The natural resources constraints to installation planning and mission are summarized as:

- The area around Moffett ANGB (such as the San Francisco Bay, Don Edwards San Francisco Bay NWR, and golf courses) possesses populations of, and habitat features that are attractive to, high BASH threat species (species that have historically caused the greatest damage).
- Moffett ANGB must manage, when present, state and federally listed species without impacting the mission. Any new activities or infrastructure could be limited in areas where state or federally listed species are known to occur or where there is state priority habitat.

6.2.1 Land Use

Moffett ANGB occupies 131 acres (55 hectares) on the east side of MFA, a 2,354-acre (953-hectare) facility located at the southern end of San Francisco Bay. The City of Sunnyvale is located to the south, the City of Mountain View to the west, the city of Alviso to the east, and San Francisco Bay to the north.

The Moffett ANGB cantonment area is approximately 111 acres (45 hectares) and is located in the southeast corner of MFA. This area is used for 129 RQW aircraft operations and maintenance, base headquarters, logistics, and base civil engineering. The 129 RQW uses two additional areas (TUAs) located in the northeast corner of MFA, both within the golf course. Munitions Storage Area 1 is approximately 10.5 acres (4.2 hectares) located in the middle of the golf course. Munitions Storage Area 3-4 is approximately 9.5 acres (3.8 hectares) located within the golf course adjacent to the North Patrol Road.

6.2.2 Current Major Impacts

The mission of the 129 RQW is to provide a trained and equipped rescue force able to respond to and sustain the state and federal missions. The major operations performed at the base include aircraft maintenance, aerospace ground equipment (AGE) maintenance, ground vehicle maintenance, facilities maintenance, structural repairs, and fuel testing. In addition, the 129 RQW stores, maintains, and uses a range of munitions required for performance of its mission. The 129 RQW operates four MC-130P Combat Shadow aircraft, five HH-60G Pave Hawk helicopters, and the Guardian Angel pararescue weapon system.

The current major impacts to natural resources from the Moffett ANGB military mission include:

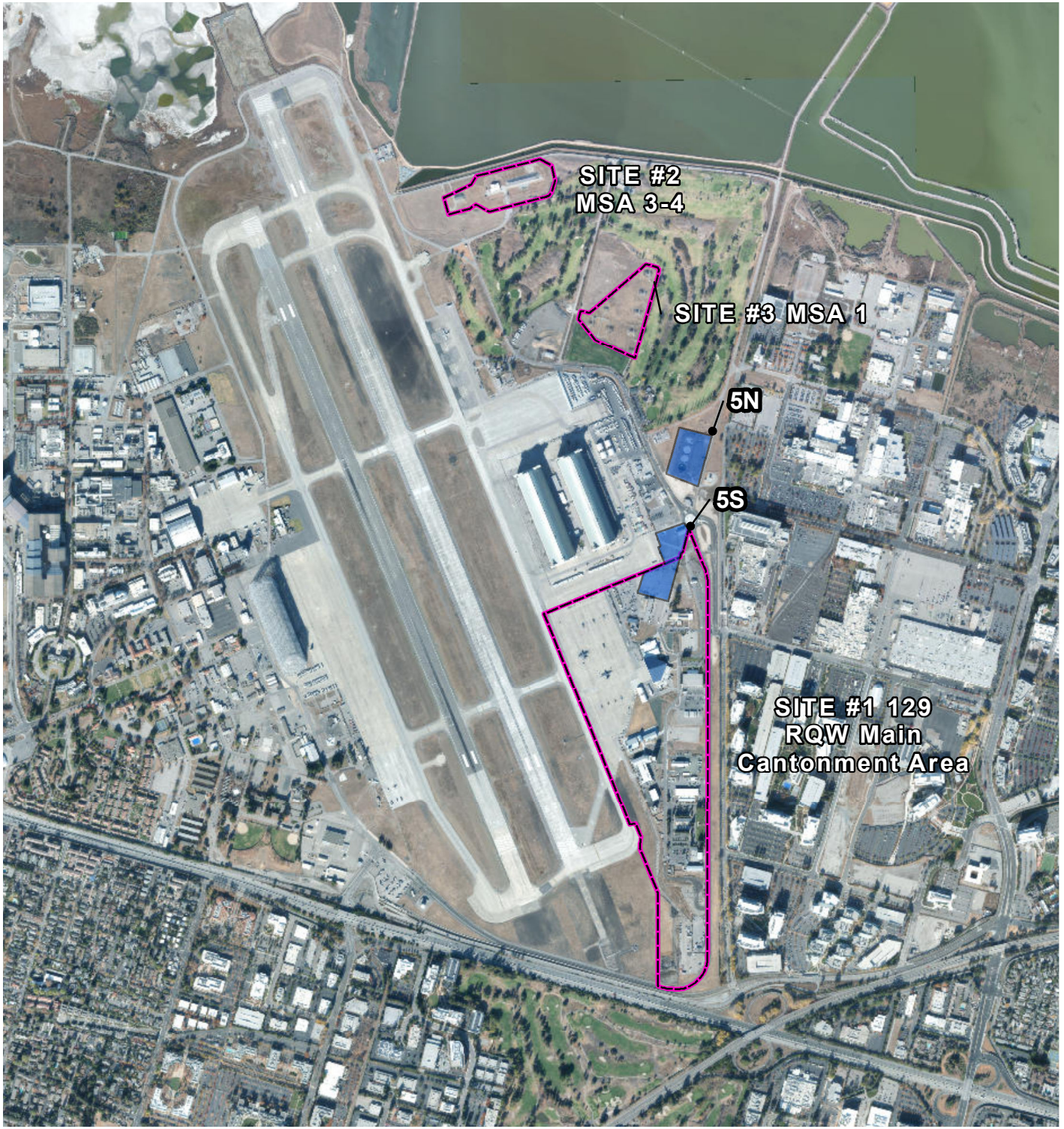
- Impacts to migratory birds managed through the BASH Program.
- Impacts to the environment from the potential misuse of hazardous materials and pesticides.
- Impacts from aircraft operations through noise.
- Impacts from construction in the southern end of the cantonment area where grassland habitat occurs.

6.2.2.1 Installation Restoration Sites

The Defense Environmental Restoration Program (DERP) was developed by the DoD to investigate and clean up hazardous substances, pollutants, and contaminants that pose environmental health and safety risks at active military installations and formerly used defense sites. Future development of sites identified through the DERP might be constrained depending on the severity of the contamination or the extent of the remedial action required. The overall objective of the DERP is to identify potential environmental problems and provide timely remedies to protect public health and the environment. The installation restoration program (IRP) established under DERP is a comprehensive program to identify and address environmental contamination from past military operations.

Soil and groundwater contaminated with volatile organic compounds, polychlorinated biphenyls, and pesticides are located beneath MFA. The Moffett Field Naval Air Station Superfund Site is located in the northeastern portion of MFA, although outside of Moffett ANGB (USEPA 2002). Initial clean-up activities included closing abandoned wells, bioremediation of contaminated soil, and carbon adsorption treatment of groundwater; these activities were finished in 1996. The USEPA, in coordination with the Regional Water Quality Control Board (RWQCB), oversees the Navy and NASA's cleanup activities (USEPA 2022).

One IRP site, the former Navy fuel farm, remains under the control of the 129 RQW at Moffett ANGB (Figure 9). Site 5 is divided into two areas: Site 5 North (bulk storage area) and Site 5 South (underground storage tank [UST] area). In 1995, six USTs were removed from this location: two 25,000-gallon (94,635-liter) concrete tanks, two 50,000-gallon (189,271-liter) concrete tanks, and two 150,000-gallon (567,812-liter) steel tanks. Petroleum contaminated soil and groundwater from former leaking USTs has been documented. The RWQCB has directed the Navy to complete an investigation for petroleum contamination in a gravel channel that extends from the former fuel farm and into the golf course (US Department of the Navy 2009). The Navy concluded that no further action was required for the channel deposit. However, the RWQCB did not concur and is currently in the process of addressing Site 5 as one unit for remedial action and/or closure. The Navy is also currently developing a sampling plan to carry out additional investigation work for Site 5 South (NASA 2009). In addition, the Defense Energy Service Center is currently assessing releases from the bulk fuel tanks as part of closure activities for these tanks. Therefore, Site 5 is actively being investigated/monitored.



Legend

IRP Site

ANGB

129 RQW - 129th Rescue Wing
ANGB - Air National Guard Base
IRP - Installation Restoration Program
MSA - Munitions Storage Area

N

0 0.2 0.4 0.8 Miles

Figure 9. Installation Restoration Program Sites at Moffett ANGB

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

7.1 Natural Resources Program Management

The guiding philosophy of the INRMP is to take an ecosystems approach to managing natural resources. Ecosystem management is based on clearly stated goals and objectives, and associated projects. This INRMP identifies goals and objectives, and presents the means to accomplish them as well as the methodologies to monitor results.

7.2 Fish and Wildlife Management

Wildlife management involves manipulating various aspects of an ecosystem to benefit chosen wildlife species. Management of habitats generally is focused to benefit native species, particularly listed species and game species. Habitat management could be required to decrease the abundance of certain wildlife species or to reduce animal damage or bird strike hazards. The installation's limited size necessitates implementation of wildlife management options that do not increase the potential for wildlife mission conflicts but still conserve regional biodiversity. Moffett ANGB will manage the wildlife and its habitat by implementing the strategies listed below:

- Attempt to deter animals from foraging or roosting in areas near or adjacent to the flightline and other mission-critical areas.
- Limit the amount of pesticides used for invasive species control and use mechanical methods whenever possible.
- Maintain grasslands for wildlife, while avoiding activities during the nesting season from 1 April – 15 August.
- Provide for wildlife movement between natural areas where possible.

The DoD and the ANG encourage support of SWAPs as part of a comprehensive installation natural resources program. The implementation of this INRMP and some of the proposed projects will support the goals of the California SWAP. The goals of the plan are to conserve the breadth of biodiversity of the state.

7.2.1 Federal Wildlife Policies and Regulations

Endangered Species Act

The ESA of 1973, as amended (16 USC §1531 et seq.) provides for the identification and protection of threatened and endangered plants and animals, including their critical habitats. The ESA requires federal agencies to conserve threatened and endangered species and cooperate with state and local authorities to resolve water resources issues in concert with the conservation of threatened and endangered species. This law establishes a consultation process involving federal agencies to facilitate avoidance of agency action that would adversely affect species or habitat. Further, it prohibits all persons subject to U.S. jurisdiction from taking, including any harm or harassment, endangered or threatened species.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act prohibits, unless permitted by regulations, the pursuit, hunting, take, capture, killing or attempting to take, capture, kill, or possess any migratory bird included in the Act, including any part, nest, or egg of any such bird (16 USC § 703). The DoD has a Memorandum of Understanding (MOU) with the USFWS pursuant to EO 13186, *Responsibilities of Federal*

Agencies to Protect Migratory Birds, which outlines a collaborative approach to promote the conservation of migratory bird populations. This MOU specifically pertains to natural resource management activities, including, but not limited to, habitat management, erosion control, forestry activities, invasive weed management, and prescribed burning. It also pertains to installation support functions, operation of industrial activities, construction and demolition activities, and hazardous waste cleanup. In February 2007, the USFWS finalized regulations for issuing incidental take permits to the DoD. If any of the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of migratory bird species, then they must confer and cooperate with the USFWS to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects (50 CFR Part 21). At this time, the DoD MOU is under review.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668-668c), enacted in 1940 and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously-used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

7.2.2 Nuisance Wildlife and Wildlife Diseases

Wildlife species that pose a moderate to high risk are identified in the installation's BASH Plan (129 RQW 2021). Steps to reduce bird airstrikes are outlined and followed per the BASH guidelines. Aside from those species, there are few nuisance wildlife species at the installation. Any large-scale wildlife deaths and unnatural behavior occurring on the installation will be reported, recorded, and investigated in conjunction with the USFWS, USEPA, and CDFW personnel, if appropriate. Moffett ANGB cooperates with USDA-APHIS-WS for BASH management.

7.2.3 Management of Threatened and Endangered Species and Habitats

This section presents information about the management of priority species that are located within or have the potential to occur at Moffett ANGB, along with requirements and strategies for their management. As additional surveys and natural resources management activities are conducted, it is possible other species may be added in the future.

7.2.3.1 Federally-listed Special Status Wildlife Species

Ten federally listed species and one candidate species were noted as potentially occurring at Moffett ANGB according to the USFWS Information for Planning and Consultation system (USFWS 2022c). Aquatic habitat is not available to support the Delta smelt (*Hypomesus transpacificus*) or the green sea turtle (*Chelonia mydas*) on Moffett ANGB. Vernal pool tadpole shrimp (*Lepidurus packardi*) and California tiger salamanders (*Ambystoma californiense*) rely on vernal or ephemeral pools for all or part of their life history which are not available on Moffett ANGB. Several federally

listed species rely on salt marshes or coastal habitats that are not found on Moffett ANGB and are therefore, unlikely to occur on the installation: salt marsh harvest mouse (*Reithrodontomys raviventris*), California clapper rail (*Rallus longirostris obsoletus*), California least tern (*Sterna antillarum browni*), and western snowy plover (*Charadrius nivosus nivosus*). In addition, the lack of aquatic habitat such as ponds or streams with cover precludes the possibility for the installation to support California red-legged frogs (*Rana draytonii*). California seablite (*Suaeda californica*), which prefers coastal zones, is found west of the installation in wetlands and saltmarshes, but that habitat does not exist on Moffett ANGB. Only one candidate species may have the potential to occur at Moffett ANGB: monarch butterfly (*Danaus plexippus*).

Monarch Butterfly: In 2020, the USFWS determined that listing the monarch under the ESA is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing (USFWS 2021). The monarch butterfly can be found in a variety of habitats, especially those supporting milkweed plants (*Asclepias* sp.), the primary food source of the caterpillars. These butterflies feed on nectar sources found in grasslands, prairies, meadows, and wetlands.

Monarch butterfly populations have declined more than 90 percent over the past 20 years (MDNR 2015). Herbicide and pesticide use as well as the loss of habitat supporting milkweed and adequate nectar sources have contributed to the decline of the species. The following management strategies for the monarch butterfly are recommended:

- Allow common milkweed to grow and potentially expand into field edges where feasible.
- Consider landscaping with native fall-blooming flowers and allowing the species to expand where feasible. This will also help attract other pollinators such as native bees.

Figure 10. Monarch butterfly

Photo courtesy of Conserve Wildlife Foundation of New Jersey

At Risk Species: In addition to the candidate species, the USFWS National Listing Workplan (USFWS 2022d) was reviewed to determine if any species documented at Moffett ANGB could be considered "at risk". The species that are considered "at risk" have a timeline for a listing decision to be made in the next five years and conservation measures are recommended. Only one species has the potential to occur on Moffett ANGB: western bumblebee (*Bombus occidentalis*). Western bumblebees exist on a diverse range of habitats and typically nest underground in abandoned rodent burrows (COSEWIC 2014). Mowing practices may, however, limit the availability of flowering plants within the installation.

7.2.3.2 State Special Status Species

Three state species of greatest conservation need (SGCN; CDFW 2015) have been documented at Moffett ANGB.

Vaux Swift's: The Vaux's swift (*Chaetura vauxi*) is a summer resident (mid-April through mid-October) or migrant in California (Shuford and Gardali 2008). This small (4.3 inches [11 centimeters]) brownish bird has very narrow, swept-back wings that curve (Cornell University 2019a). The species nests in tree cavities in large trees found in mature and old-growth coniferous and mixed forests as well as in artificial structures and forages over lakes, fields, and rivers (Cornell University 2019a). The primary threat to the Vaux's swift is the loss of nest and roost sites often associated with the reduction of old-growth forested habitat (Shuford and Gardali 2008). The species was observed as a fly-over during the 2022 surveys. Forested habitat does not occur on Moffett ANGB and this species is likely a transient through the installation nesting off site.

Figure 11. Vaux's swift

Photo courtesy of National Audubon Society

The following management strategies for the Vaux's swift are recommended:

- Educate about chimney nesting and migratory roosts and protect where possible.
- Install devices such as grills on hazardous smokestacks and other facilities.

American White Pelican: Observed during the 2020 BASH survey, the American white pelican (*Pelecanus erythrorhynchos*) is a large (50- to 65-inch [127- to 165-centimeter]), snowy white bird with black flight feathers. The species forage on the water's surface dipping their beaks in the water (Cornell University 2019b). This aquatic species prefers coastal waters and bays during the winter and islands on shallow wetlands in the interiors of the continent for breeding habitat (Cornell University 2019b). The presence of this avian species at Moffett ANGB was more likely a transient in route to the San Francisco Bay since no aquatic habitat is available at the installation.

Figure 12. American white pelican

Photo courtesy of Cornell Lab of Ornithology

The following management strategies for the American white pelican are recommended:

- Continue BMPs that reduce impacts from run-off to the San Francisco Bay.

Burrowing owl: The burrowing owl (*Athene cunicularia*) occupies open grassland, desert, or shrub-steppe habitats with short vegetation and bare ground. This species nests and roosts in prairie dog or ground squirrel burrows (USFWS 2003). Burrowing owls are a small species of owl that are mottled brown and white, have yellow eyes, and long legs. Both male and female adult burrowing owls are approximately the same size, 7.5 to 10 inches (19 to 25 centimeters) in height and 5.3 to 5.9 ounces (150 to 170 grams) in weight. Burrowing owls require large open tracts of grassland, with vegetation under about 9 inches (23 centimeters) in height and areas with ground squirrel burrows (NASA 2002). Owls tend to abandon their burrows if vegetation becomes too dense or tall. Unlike other owl species, burrowing owls are active during the day. Their prey includes arthropods, small mammals, birds, amphibians, and reptiles; arthropods may be taken more frequently during the summer while vertebrates are more commonly eaten in the winter (USFWS 2003).

Figure 13. Burrowing owl

Photo courtesy of Frank Sxhulenburg, Wikimedia commons

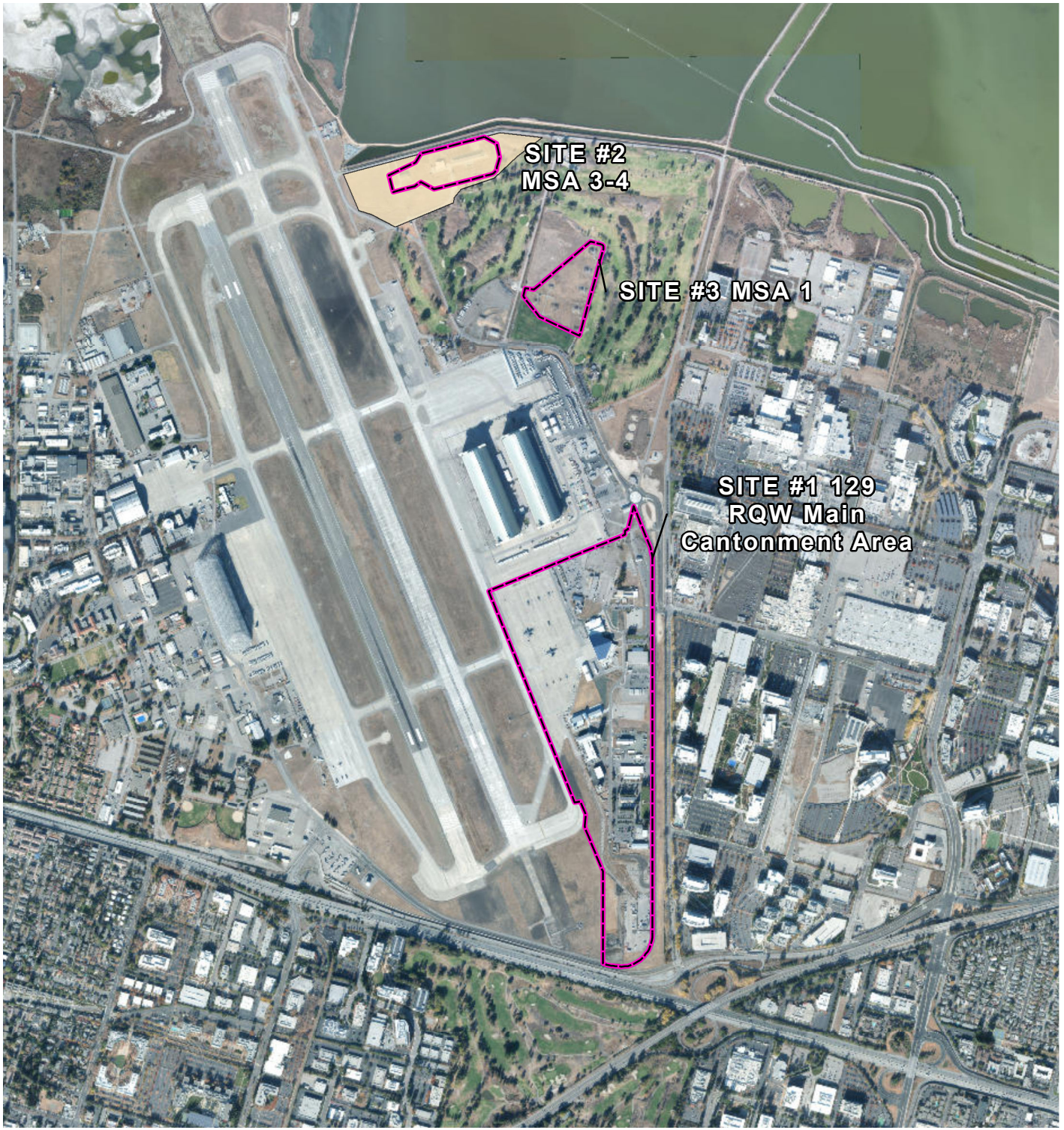
Burrowing owls are a species of special concern in California and are protected by the California Fish and Game Code 3503.5 (Birds of Prey) as well as the Migratory Bird Treaty Act. In addition, the CDFW has prepared the Santa Clara Valley Habitat Plan which outlines a conservation strategy for the burrowing owl in the study area and an expanded study area that includes MFA of which Moffett ANGB is a tenant on a small portion of the property (SCVHA 2012). Breeding populations in central California have been reduced to three isolated populations: approximately 720 pairs in the Central Valley, approximately 143 pairs at the southern end of the San Francisco Bay, and approximately 10 pairs near Livermore (USFWS 2003). From 1998-2021, the number of breeding pairs on MFA has ranged from 1-12 (NASA 2002; Talon 2021). Owl numbers have varied throughout the years within the Moffett ANGB cantonment area as well (Table 7). During 2020 and 2021, populations were low across the MFA (Chromczak 2020; Talon 2021) and no owls were detected during survey efforts on lands managed by Moffett ANGB (Chromczak 2020; HTH 2020; Talon 2021). In April 2022, reconnaissance-level surveys to support the INRMP also failed to document owls on Moffett ANGB. Limited grassland habitat occurs on land managed by Moffett ANGB. The Munitions Storage Area 3-4 currently used by Moffett ANGB, but owned by NASA, is included in a 24-acre (9.7-hectare) burrowing owl nesting habitat preserve identified by NASA (ESA #7; Figure 14). Management of owls in the TUAs falls to NASA and on the airfield to Google Planetary Ventures LLC. Habitat enhancement areas have been suggested (Chromczak 2020) in several areas across MFA.

Table 7. Burrowing Owl Numbers on the Moffett ANGB Cantonment Area

Date	Number of Owls	Chicks
2016	4	6
2017	2	0
2018	1[a]+2	5
2019	0	0
2020	0	0
2021	0	0

Source: Chromczak 2016, 2017, 2018, 2019, and 2020; Talon 2021

a Passively relocated in January 2018



Legend

ANGB

Burrowing Owl Nesting Habitat Preserve ESA #7

129 RQW - 129th Rescue Wing
ANGB - Air National Guard Base
MSA - Munitions Storage Area

N

0 0.2 0.4 0.8 Miles

Figure 14.
Burrowing Owl Nesting
Habitat Preserve

The following management strategies for the burrowing owl are recommended:

- When feasible commence construction outside the nesting season (1 February through 31 August).
- Conduct pre-construction surveys in cooperation with NASA's certified biologist for new construction to determine nesting in construction areas.
- Conduct biological monitoring during construction activities.
- Coordinate with NASA Environmental Office, USFWS, and CDFW to passively relocate individuals, outside the breeding season, found on Moffett ANGB in areas where construction activities would occur.
- Provide a 160-foot (49-meter) environmentally sensitive buffer distance between occupied burrows and construction during the non-nesting season and a 656-foot (200-meter) buffer during the nesting season when feasible.
- If grassland mowing is required, when practical conduct outside of the breeding season (preferably after September, but can consider mowing after July to allow at least one brood of young). Maintain grassland vegetation where practical to a height of 7-14 inches (18-36 centimeters).
- Work with NASA, who is responsible for pest control, to conduct any ground squirrel control outside of burrowing owl nesting season (1 February through 31 August) where feasible.
- Support the NASA Ames Research Center burrowing owl management plan where feasible.

7.2.3.3 Climate Change and Special Status Species Vulnerability

Climate change vulnerability assessments are a means of preparing for and coping with the effects of climate change. Vulnerability is defined as the susceptibility of a species or habitat to the negative effects of climate change and other stressors (Boesch 2008). Climate change vulnerability for special status species is related to each species' expected exposure to climate change stressors, the sensitivity of that species to the stressors, and the adaptive capacity of the species to cope with the stressors related to climate change. Although not all species have been examined, Table 7 indicates which species have been identified as vulnerable to climate change according to the vulnerability assessment conducted by the CDFW (CDWF 2015).

Table 8. Climate Change Vulnerability of Special Status Species

Species	Status	Climate Vulnerability
Monarch butterfly (*Danaus plexippus*)	FC	None
American white pelican (*Pelecanus erythrorhynchos*)	SGCN	Vulnerable
Vaux's swift (*Chaetura vauxi*)	SGCN	None
Burrowing owl (*Athene cunicularia*)	SGCN	None

Source: CDFW 2015
FC = Federal candidate
SGCN = Species of Greatest Conservation Need (state)

7.3 Water and Wetland Resource Protection

There are no surface water features within the Moffett ANGB. However, surface water features are located on the surrounding MFA property. The San Francisco Bay and the associated saltwater evaporation ponds, stormwater retention ponds, and wetlands are located adjacent to and north of Moffett ANGB. Other surface water features include Coyote Creek and Guadalupe Slough to the east of Moffett ANGB and Stevens Creek to the west. Moffett ANGB does not have a SWPPP; they currently follow the NASA Ames Research Center SWPPP.

7.3.1 Regulatory and Permitting

The Clean Water Act (CWA 33 USC 1251 et seq.) is the primary federal statute that protects the nation's waters. The intent of the CWA is to prevent, reduce, and eliminate pollution in the nation's waters for the purposes of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Waters of the United States (WOTUS) include, but are not limited to, coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, and wetlands. See 33 CFR Part 328.3(a) for the full list of WOTUS.

The three primary sections of the CWA that may affect day to day operations are Sections 404, 401, and 402. The US Army Corps of Engineers (USACE) is the regulatory agency responsible for implementation of the CWA and the USEPA has oversight of the CWA. Section 404 regulates the discharge of dredged or fill material into WOTUS, including wetlands. When impacts to WOTUS, including wetlands, cannot be avoided, a Section 404 permit must be obtained from the USACE. When a Section 404 permit is required, a Section 401 Water Quality Certification (WQC) from the state is also required.

Section 10 of the Rivers and Harbors Act (33 USC 403) regulates the placement of any obstructions in and the excavation or fill in any navigable WOTUS. The USACE is the regulatory agency responsible for implementation of the Rivers and Harbors Act.

Management of wetlands on federal lands, including military installations, is further governed by EO 11990, *Protection of Wetlands*, and DoDI 4715.03, *Natural Resources Conservation Program*. Under EO 11990 and DoDI 4715.03, wetlands are required to be managed for "no net loss". This means short- and long-term impacts to WOTUS, including wetlands, must be avoided. If they cannot be avoided, the impacts must be minimized to the least environmentally damaging practicable alternative (LEDPA). When impacts cannot be avoided, they must be mitigated to ensure there is no net loss of acreage.

To obtain Section 404 and Section 10 permits and Section 401 WQC, applicants are, depending on the state in which the installation is located, required to submit permit applications to the USACE and the state agency responsible for implementation of Section 401 or through a Joint Permit Application. There are different types of Section 404 and Section 10 permits that include but are not limited to individual and Nationwide Permits. The specific type of permit is based on the total area of impact and the overall impact to the system. WQCs can be individual or they can be issued as part of a Nationwide Permit. In California, the state agency responsible for implementation of Section 401 is the State Water Resources Control Board (State Water Board) and the RWQCBs (Regional Water Boards) (collectively Water Boards).

Applications for Section 404 permits must include an avoidance and minimization analysis that addresses the USEPA Section 404(b)(1) Guidelines (40 CFR Part 230.10). The analysis must demonstrate the effort made to first avoid the impacts and then the rationale for the selected LEDPA. The analysis must also demonstrate the impacts will not cause or contribute to violations

of state water quality standards and the activity does not jeopardize listed species or sensitive cultural resources (33 CFR Part 320.3 [e] and [g]). The analysis must also identify mitigation requirements and the preferred alternative selected to meet mitigation requirements.

Wastewater, construction, stormwater, and pretreatment discharges, also known as point source discharges, are managed through the NPDES permit program as authorized by Section 402 of the CWA. The Water Boards implement Section 402 for the state of California. All point source discharges must have a NPDES permit. NPDES permits require specific actions including monitoring and analysis work that must be conducted during the lifetime of the permit. NASA and its tenants (including the 129 RQW) operate under NPDES permits including NPDES No. CAS000001 General Permit for Industrial Activities Excluding Construction Activities; NPDES General Permit No. CAS000002, State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, and NPDES No. CAS000004 General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems adopted by the State of California Water Resources Control Board.

In California, the Water Boards administer the Section 401 WQC program. Section 401 WQCs are required for all projects that require a Section 404 permit that may result in a discharge to water bodies, including wetlands. The California State Wetland Conservation Policy (SWCP; EO W-59-93) was signed into effect in 1993 which established a "no net loss" policy for wetlands in the state. It also provided comprehensive direction for the coordination of state-wide activities for the preservation and protection of wetland habitats. On April 2, 2019, the State Water Board adopted the State Wetland Definition and Procedures for the Discharge of Dredged or Fill Material to Waters of the State to conform with the executive order. Applicants proposing to discharge dredged or fill material to waters of the state are required to comply with the procedures unless an exclusion applies, or the discharge qualifies for coverage under a general order (CDWR 2022). Projects may fall under the terms and conditions of a general order (USACE Nationwide Permit) or an individual WQC. If WOTUS will be impacted, a Section 404 permit from the USACE and a 401 WQC from the state are required. If WOTUS are not impacted then only an application for WQC and Waste Discharge Requirements are required.

EO 11988, *Floodplains Management*, requires all federal agencies to provide leadership and take action to reduce the risk of floodplain loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of federal lands. In addition, if action is taken that permits an encroachment within the floodplain that alters the flood hazards on a national FIRM (e.g., changes to the floodplain boundary), Moffett ANGB must submit an analysis reflecting those changes to FEMA. FEMA headquarters can be contacted at 202-646-3461 to obtain booklet MT-2, *Revisions to National Flood Insurance Program Maps*, for further guidance. The California Department of Water Resources administers the National Flood Insurance Program for the state of California.

This INRMP focuses mainly on the potential impacts to water resources related to ground disturbance and stormwater associated with changes in impervious areas. Moffett ANGB implements the following specific watershed protection measures:

- Obtaining a Construction General Permit for Discharge of Stormwater and Dewatering Wastewaters through the Water Boards, for construction that disturbs greater than 1 acre (0.4 hectare) and ensuring BMPs designated under the regulations are implemented.
- Obtaining a Section 404 permit and a Section 401 WQC prior to the commencement of any land disturbance. Mitigation may be required for the loss of acreage.

- Managing invasive species to promote desirable native species.
- Maintaining vegetated buffers between the San Francisco Bay and the installation.
- Adhering to BMPs during construction and operational activities as described in applicable manuals, plans, and permits.

7.3.2 Coastal Management Zones

The California Coastal Act was signed into effect in 1976 which included policies on terrestrial and marine habitat protection, water quality, and a variety of other policies impacting coastal waters and resources pursuant to the requirements of the Coastal Zone Management Act (CZMA § 304[12]; 15 CFR § 930.11[k]). California's Coastal Management Program was federally approved in 1977 and contains two designated coastal zone management agencies that implement the federal consistency provisions: (1) the California Coastal Commission for all coastal areas outside San Francisco Bay; and (2) the San Francisco Bay Conservation and Development Commission (BCDC) for the coastal areas in San Francisco Bay (California Coastal Commission 2019). The BCDC, whose jurisdiction runs 100 feet (30 meters) inland of the shoreline, oversees coastal development that may affect the Bay as well as mudflats, marshes, and wetlands. For federal consistency reviews under the CZMA, the BCDC reviews activities that affect the coastal zone.

7.3.3 Vegetation Buffers

Vegetated buffers are also referred to as riparian management zones, riparian buffers, wetland buffers, lake buffers, buffer strips, filter strips, or streamside management areas. Buffers can take many forms and may vary in size and function depending on the upland land use and the type of water resource being protected. They can either be grassland or forest, and may or may not be mowed and maintained occasionally. One of the primary purposes of a vegetated buffer is for water quality protection by providing vegetation to interrupt water flow and to trap and filter out suspended sediments, nutrients, chemicals, and other polluting agents before they reach the body of water. Vegetated buffers should be maintained along all perennial and intermittent streams, wetlands, lakes, or ponds where nearby management activities result in surface/soil disturbance, earth changes, and where erosion and sediment transport occur during rain events.

There are no riparian areas or wetlands located on Moffett ANGB. Moffett ANGB will maintain vegetation buffers to the south of the San Francisco Bay on lands they manage if applicable to reduce the influx of sedimentation and other materials into water resources in compliance with the CWA and the California SWCP.

7.4 Grounds Maintenance

Given that large parts of Moffett ANGB consist of grasslands and landscaped areas, the management and design of those areas have significant implications for water quality and native species. Native species, including state-listed species, are considered during mowing and landscaping activities. Grounds maintenance operations include chemical treatment (pesticides, fertilizers, and herbicides), utility maintenance, road maintenance, mowing of open areas, and target repair and replacement. Mowing is completed one to two times per week. Concerns for ground maintenance staff include animal burrows, which can cause safety hazards and damage maintenance equipment. Pest species may also damage wiring, buildings, and paved areas. Extensive burrowing activity from the ground squirrel population has complicated grounds maintenance at the installation and the population is currently being controlled and monitored.

The following recommended landscaping practices would also benefit the environment and generate long-term savings in cost and maintenance time. The use of native plants not only protects biodiversity and provides wildlife habitat, but it can also reduce demands for fertilizer, pesticides, and irrigation and their associated costs.

General recommendations to promote environmentally beneficial landscaping include:

- Maximize use of regionally native plant species and avoid introduction of invasive, non-native species in revegetation and landscaping activities.
- Choose plantings with climate change resiliency in mind. Implement water-efficient practices, use efficient irrigation systems and recycled water, and use landscaping to conserve energy.
- Design landscaping to be suitable to the specific site and appropriate for the use and operation of the facility.

7.5 Wildland Fire Management

The threat of wildfire to the mission and natural resources is extremely low and a wildland fire management plan for Moffett ANGB is not required.

7.6 Soil Conservation and Sediment Management

The soils at the installation are susceptible to water erosion if not protected with vegetation or other cover. Maintenance of key ecosystem functions, such as erosion control and sediment retention, require a healthy, uniform ground cover be established as quickly as possible following land use conversion or disturbance, and that interim soil stabilization measures be implemented. Two main types of soil erosion exist: wind erosion and water erosion. Several factors affect water erosion. These factors include rainfall, slope steepness and length, soil texture or erodibility, cover protecting the soil, and special practices such as terracing or planting on the contour. Sediment resulting from erosion affects surface water quality and aquatic organisms. None of the three soil types at Moffett ANGB (Urbanland-Hangerone complex, Urbanland-Bayshore complex, and Embarcadero silty clay loam) have a high susceptibility for soil erosion. Construction activities that disturb the ground surface can accelerate erosion by removing vegetation, compacting or disturbing the soil, changing natural drainage patterns, and by covering the ground with impermeable surfaces (pavement, concrete, buildings). When the land surface is impermeable, stormwater can no longer infiltrate, resulting in larger amounts of water that can move more quickly across a site and which can carry larger amounts of sediment and other pollutants into stormwater drains and drainage basins and ultimately into streams and rivers. As soil quality declines, adverse impacts to on-site and off-site environments increase. Therefore, the maintenance of soil quality is important for efficient and productive land management and utilization.

Stormwater discharges from Moffett ANGB are covered under the NASA Ames Research Center NPDES permit, including NPDES No. CAS000001 General Permit for Industrial Activities Excluding Construction Activities; NPDES General Permit No. CAS000002, State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, and NPDES No. CAS000004 General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems adopted by the State of California Water Resources Control Board. Construction activities that disturb one or more acres are regulated under USEPA's NPDES construction stormwater program and would need a Construction Stormwater Permit. The SWPPP identifies sources of pollution associated with NASA Ames Research Center

activities that may potentially affect the quality of stormwater discharges. It also describes and ensures BMPs are implemented to minimize and control pollutants from entering stormwater discharges. The SWPPP ensures compliance with the terms and conditions of the NPDES permit (NASA 2020).

To protect water quality, Moffett ANGB implements the following strategies:

- Monitoring surface water quality.
- Implementing BMPs for construction and industrial activities.
- Preventing surface water pollution by ensuring environmental plans (e.g. SWPPP) are implemented when appropriate.
- Minimizing the use of pesticides.
- Maintaining vegetation buffers south of the San Francisco Bay.
- Re-seeding disturbed areas after construction with native grasses and plant species.

7.7 Outdoor Recreation, Public Access, and Public Outreach

Outdoor recreation and public access to the natural resources at Moffett ANGB are not available to the general public. The sites are manned 24 hours a day and access is strictly USAF mission-related only. Several recreational areas are located at the MFA outside the areas leased by the ANG. The Golf Course at MFA is an 18-hole golf course located adjacent to Moffett ANGB's munitions storage areas and Pararescue & AGE building, and it is open to the public. However, the public does not have access to military areas while golfing. Outdoor recreation opportunities for installation personnel include athletic fields and fitness courses. Two basketball courts and three tennis courts are located on MFA; these are located outside of Moffett ANGB west of the Transportation and Maintenance Facility. A 1.5-mile (2.4-kilometer) asphalt fitness course runs along the southern and eastern boundaries of MFA. The trail begins east of the Moffett ANGB Transportation and Maintenance Facility and continues adjacent to the eastern boundary of the cantonment area. The last 0.25 mile (0.4 kilometer) of the fitness trail is gravel and is called the Bay Trail; it is located adjacent to the main cantonment area.

Opportunities for public outreach are limited at Moffett ANGB due to the high security of the installation. However, Moffett ANGB personnel do participate in public events. Staff perform flyovers at aviation-related public events such as airport dedications and aviation shows. Non-aviation related events in observance of national patriotic holidays, such as Armed Forces Day, Memorial Day, Independence Day, Veterans Day, and POW/MIA Day, are eligible for flyovers as well.

7.8 Geographic Information Systems

Geographic Information System (GIS) is used to manage and catalog information acquired in natural resources research. GIS assists in planning by charting areas of environmental concern and providing a baseline for analyzing the potential impacts of any proposed natural resources management action. Managers can implement the capabilities of a GIS to watershed, wetlands, wildlife, and various other natural resource management applications. GIS needs and requirements will be addressed through the ANG GeoBase Program.

7.9 Other Plans

7.9.1 Integrated Pest Management Plan

DoDI 4150.07, *Pest Management Program*, implements policy, assigns responsibilities, and prescribes procedures for the DoD IPM Program according to DoD Directive 4715.1E, *Environment, Safety, and Occupational Health*; Air Force Instruction (AFI) 32-1053, *Integrated Pest Management Program*; and DoDI 4715.03, *Natural Resources Conservation Program*. The purpose of IPM is to prevent or control pests and disease vectors that may adversely impact readiness or military operations by affecting the health of personnel, or by damaging structures, material, or property. The Moffett ANGB IPM Plan (129 RQW 2022) outlines the control of pest species.

Rodents, specifically the California ground squirrel (*Otospermophilus beecheyi*), have caused issues and concerns at the installation over the past few years. California ground squirrels have been seen to burrow near pavement and structures such as underground drainage systems. This behavior can damage wiring and piping and undermine the integrity of pavements and overruns. In addition, rodents attract a variety of predators including red-tailed hawks (*Buteo jamaicensis*), golden eagles (*Aquila chrysaetos*), American kestrels (*Falco sparverius*), and coyotes (*Canis latrans*) which feed on them, creating a BASH hazard. California ground squirrel populations are controlled, by NASA, through removal of animals. Removal by trapping or pesticides is in accordance with California law and conducted by Pest Management staff or under contract with USDA-APHIS-WS.

7.9.2 Invasive Species

Non-native, invasive, and pest species have the potential to be a major contributor to ecosystem destabilization. Non-native species, as the name indicates, are species from other regions of the world which have been artificially introduced to the region, primarily through human activities. Invasive species are those that, whether native or non-native, tend to become established in disturbed systems and competitively exclude native species. Invasive plant species should be eradicated to prevent further spread and infestation. Information on invasive species in California can be found from various sources:

- California Department of Food and Agriculture state-noxious weeds: https://www.cdfa.ca.gov/plant/IPC/encycloweedia/winfo_weedratings.html
- California Department of Fish and Wildlife – Invasive Species Program: https://wildlife.ca.gov/Conservation/Invasives
- California Invasive Plant Council: https://www.cal-ipc.org/plants/inventory/

The California Invasives Plant Council (Cal-IPC) categorizes plants that threaten California's natural areas. The inventory includes plants that currently cause damage in California (invasive plants) as well as "Watch" plants that are a high risk of becoming invasive in the future (Cal-IPC 2022). The California Department of Food and Agriculture (CDFA) maintains a California noxious weeds list (CDFA 2021). The CDFA derives its authority under California Code of Regulations 4500 (Title 3, Division 4, Chapter 6, Subchapter 6). Five flora species observed at Moffett ANGB are on the California noxious weeds list.

1243 **Table 9**. Invasive/Noxious Species Observed During the Flora and Fauna Surveys

Scientific Name	Common Name	Plant Status Cal-IPC rating/CDFA rating[1]	Habitat Type(s) Observed
Avena barbata	Slender wild oat	Moderate	Disturbed grasslands
Bromus rubens	Red brome	High	Disturbed grasslands
Carduus pycnocephalus	Italian thistle	Moderate; State noxious[2]	Disturbed grasslands
Centaurea melitensis	Tocalote	Moderate; State noxious[2]	Disturbed grasslands
Convolvulus arvensis	Field bindweed	State noxious[2]	Disturbed grasslands
Cortaderia jubata	Pampas grass	High; State noxious[2]	Disturbed grasslands
Cynodon dactylon	Bermudagrass	Moderate	Disturbed grasslands
Erodium cicutarium	Red-stemmed filaree	Limited	Disturbed grasslands
Festuca myuros	Rattail fescue	Moderate	Disturbed grasslands
Festuca perennis	Italian ryegrass	Moderate	Disturbed grasslands
Geranium dissectum	Cutleaf geranium	Limited	Landscaped
Hedera helix	English ivy	High	Landscaped
Helminthotheca echioides	Bristly oxtongue	Limited	Disturbed grasslands
Hirschfeldia incana	Summer mustard	Moderate	Disturbed grasslands
Hordeum murinum	Foxtail barley	Moderate	Disturbed grasslands
Plantago lanceolata	English plantain	Limited	Disturbed grasslands
Poa pratensis	Kentucky bluegrass	Limited	Landscaped
Polypogon monspeliensis	Rabbitsfoot grass	Limited	Disturbed grasslands
Salsola tragus	Russian thistle	Limited; State noxious C-rated	Disturbed grasslands
Silybum murinum	Milk thistle	Limited	Disturbed grasslands
Trifolium hirtum	Rose clover	Limited	Disturbed grasslands

1244 Source: Cal-IPC 2022

1245 1 Cal-IPC (California Invasive Plant Council) ratings: High – These species have severe ecological impacts on physical
1246 processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are
1247 conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
1248 Moderate – These species have substantial and apparent-but generally not severe-ecological impacts on physical
1249 processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are
1250 conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological
1251 disturbance. Ecological amplitude and distribution may range from limited to widespread.
1252 Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough
1253 information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of
1254 invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent
1255 and problematic.
1256 2 CDFA (California Department of Food and Agriculture) definitions: This plant is included in the CCR Section 4500 list
1257 of California State Noxious Weeds, but is otherwise not rated.

1258 EO 13112, *Invasive Species*, requires all federal agencies to prevent the introduction of invasive
1259 species and provide for their control and to minimize the economic, ecological, and human health
1260 impacts that invasive species cause. Moffett ANGB's IPM Plan details the control of invasive
1261 species.

1262 Invasive species are typically non-native species that have negative impacts on natural ecosystems
1263 or on human health. The objectives of the IPM Plan are to establish and maintain safe, effective,

and environmentally sound IPM practices to control pests that may adversely impact readiness of military operations by affecting the health of personnel or damaging structures, material, or property. Management strategies outlined for implementation of this INRMP are to ensure "no net loss" of military training capabilities.

General management strategies are as follows:

- Controlling invasive and exotic species, and noxious weeds through early detection and isolation of infested areas.
- Establishing and maintaining systematic and pest-specific surveillance and monitoring programs to determine the status of pest presence at the installation and if and when treatments are needed rather than by a predetermined schedule.
- Implementing BMPs to minimize land disturbances that favor invasion of non-native species and re-vegetating disturbed areas with native species.
- Avoiding pesticide use in and around wetlands and other surface waters.
- Avoiding use of invasive, non-native species in landscaping.
- Implementing judicious use of both non-chemical and chemical control techniques to achieve effective pest management that minimizes economic, health, and environmental risks. Emphasizing the use of mechanical, biological, and cultural control techniques, using chemical techniques sparingly with caution. Using chemical controls only after careful consideration of alternative controls.
- Educating site users.
- Ensuring all pest management operations involving the application of pesticides on the installation are performed by DoD or state certified pesticide applicators and by licensed commercial pest management companies.
- Ensuring all pesticides used at Moffett ANGB are stored in accordance with the product labels, their safety data sheets, and in accordance with DoDI 4150.07, *Pest Management Program*, and federal, state, and local regulations.
- Ensuring the IPMC and Pest Management Quality Assurance Evaluator monitor contracts for pest management at Moffett ANGB.

7.9.3 Stormwater Management

Stormwater runoff is produced when rainfall during a storm exceeds the infiltration capacity of the soil or encounters an impervious surface. Stormwater runoff can be a significant source of pollutants as well as sediments to surface waters, especially in areas with impervious surface cover or where groundcover has been disturbed. Sources of stormwater runoff and pollution could originate from operational, maintenance, and/or administrative areas within Moffett ANGB. The state of California has legal authority to implement and enforce the provisions of the CWA, while the USEPA retains oversight responsibilities.

NASA and its tenants (including the 129 RQW) operate under NPDES permits including NPDES No. CAS000001 General Permit for Industrial Activities Excluding Construction Activities; NPDES General Permit No. CAS000002, State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, and

NPDES No. CAS000004 General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems adopted by the State of California Water Resources Control Board (NASA 2020). The 129 RQW manages stormwater collection and discharge in accordance with a SWPPP. The two Urban soil complexes found on the installation are not rated and have an unknown potential for runoff while the third soil type has a low runoff potential; therefore, groundwater pollution is a low hazard. Impervious surfaces at Moffett ANGB include roads, parking lots, sidewalks, and buildings. Although Moffett ANGB does not have a SWPPP, the base follows the SWPPP for the NASA Ames Research Center.

7.9.4 Bird/Wildlife Aircraft Strike Hazard

Moffett Field ANGB has a BASH plan to address potential hazards to the ANG including but not limited to resident and migratory bird species and other wildlife. Daily and seasonal bird movements create various hazardous conditions. The BASH Plan (129 RQW 2021) establishes procedures to minimize hazards to the CAANG and deployed aircraft at the installation and in their operating areas. MFA, located on property administered by NASA, is a special-use federal airfield serving NASA, military, law enforcement, FEMA, and various civilian organizations.

Google Planetary Ventures LLC is responsible for the management of the airfield and implements an IPM strategy through its Airfield Operations staff (AvPORTS) and an AvPORTS-funded USDA-APHIS-WS Biologist. AvPORTS has developed their own Wildlife Hazards Management Plan. As a tenant on MFA, the 129 RQW works closely with the other stakeholders on wildlife hazard management. The 129 RQW is authorized to perform non-lethal wildlife management on the unit's leasehold as necessary as well as authority to conduct basic harassment on the airfield when needed and coordinates with AvPORTS. However, any depredation measures are entrusted to USDA-APHIS-WS.

The MFA property encompasses an area of approximately 2,200 acres (890 hectares). The most significant/high risk attractant in the immediate area is the San Francisco Bay, located directly to the north of the airfield, which includes the 30,000-acre (12,140-hectare) Don Edwards San Francisco Bay NWR directly adjacent to the airport (129 RQW 2021). From 2005-2019, the MFA experienced 30 strikes reported in the Federal Aviation Administration database, with 30 percent of those strikes being large bodied birds such as gulls. Peak strike periods included early summer (May) and late fall. For the 129 RQW, 76 strike reports were documented in the Air Force Safety Automated System database with peaks also occurring in May, mainly passerines, and a larger one in September involving larger-bodied species. Bird strikes to aircraft involved California gulls (*Larus californicus*), ring-billed gulls (*Larus delawarensis*), rock doves (*Columba livia*), horned larks (*Eremophila alpestris*), red-tailed hawks, American kestrels, western meadowlarks (*Sturnella neglecta*), common nighthawks (*Chordeiles minor*), killdeer (*Charadrius vociferus*), cliff swallows (*Petrochelidon pyrrhonota*), barn swallows (*Hirundo rustica*), western burrowing owls, mourning doves (*Zenaida macroura*), lesser scaup (*Aythya affinis*), and other shorebirds, passerines, and raptors. Wildlife aircraft strikes included a Mexican free-tailed bat and an unidentified bat species (129 RQW 2017).

Animal and bird populations, both migratory and resident, are controlled on the flightline area to prevent wildlife/aircraft collisions. This will be accomplished by habitat modification, fence maintenance around the flightline, ground squirrel control, noise and distress calls, and as a last resort, depredation removal by the USDA-APHIS-WS. Flightline vegetation will be maintained between 7 and 14 inches (18 and 36 centimeters) in height to discourage birds and limit the number of mowings required. The BASH Plan covers procedures and techniques for preventing bird aircraft strikes and hazards and provides a list of species that pose a risk.

7.9.5 State Wildlife Action Plan

During the INRMP development process, Moffett ANGB consulted with the CDFW to ensure INRMP goals, objectives, and strategies are consistent with California's overall statewide and habitat-specific plans. The California SWAP is a comprehensive statewide plan for conserving the state's fish and wildlife and their natural habitats for future generations. California is the nation's most biologically diverse state, and the SWAP focuses on conservation of the wildlife resources in harmony with a growing human population and the need for resilience in the face of climate change. The purpose of the SWAP is to support state actions that benefit wildlife and habitats, but particularly the SGCN. The SWAP assesses the health of California's wildlife and habitats, identifies the problems they face, and outlines the actions needed to conserve them (CDFW 2015).

The SWAP identifies 1,153 SGCN: 414 fish and wildlife species, 264 invertebrate species, and 475 plant species. Species that are listed under the CESA and the ESA are also included as SGCN in the SWAP. The SWAP also identifies seven provinces to aid in conservation planning. SGCN are identified for each of the provinces (CDFW 2015).

8.0 MANAGEMENT GOALS AND OBJECTIVES

Goals and objectives provide the framework for natural resources management programs. Goals provide a general guiding direction for each technical area and objectives are more specific actions that facilitate achieving those goals. The objectives then drive the development of specific activities and projects to achieve those objectives. Management goals and objectives for the INRMP were developed by a thorough evaluation of the natural resources present at Moffett ANGB in accordance with AFMAN 32-7003, *Environmental Conservation*, and the principles of adaptive ecosystem management by an interdisciplinary team of biologists, planners, and environmental scientists. Goals and objectives should be revised over time to reflect evolving environmental conditions, adaptive management, and the completion of tasks as the INRMP is implemented.

GOAL – Natural Resources Program Management (PM): Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable federal and state laws, and USAF regulations and policies.

- OBJECTIVE PM1: Ensure Environmental Management staff are trained in accordance with the requirement of AFMAN 32-7003. At a minimum, members of the Environmental Management Office must attend the CECOS Natural Resources Compliance Course as part of their training requirements for implementation of the INRMP. When feasible, members of the Environmental Management Office will attend the annual National Military Fish and Wildlife Association Training Meeting.

- OBJECTIVE PM2: Prepare a budget and identify project needs to implement the natural resources management program at Moffett ANGB. Project needs are to be submitted to the NGB/A4VN NRPM for budget and contracting.

- OBJECTIVE PM3: Conduct an annual INRMP review meeting with internal stakeholders. The Moffett ANGB EM will promote discussion with Installation Command, installation personnel, the IPMC, the Safety Office, and other internal stakeholders to identify operational needs relative to natural resources management. The EM will document, in writing, the discussions held and agreements made and will address the document at the annual meeting with the USFWS, state, and NGB/A4VN NRPM.

- OBJECTIVE PM4: Conduct an annual INRMP review meeting with the USFWS, the CDFW, the IPMC, the NGB/A4VN NRPM, USDA-APHIS-WS, and the Safety Office. The annual meeting can be conducted as an in-person meeting, via a teleconference, via Teams, or via email. The EM will present the status of the project actions taken over the previous year, any changes that occurred and identify the project actions to be undertaken over the coming year. The EM will record the discussions held and the agreements made and will provide an attendance roster for attendees to sign. The EM will submit the written record and attendance roster to the attendees and will request review and concurrence with the documents provided. Receipt of written concurrence from the USFWS and the CDFW will constitute conclusion of the annual meeting.

GOAL – Fish and Wildlife Monitoring (FW): Establish a general wildlife and plant population trend monitoring program as a component of long-term ecological trend monitoring.

- OBJECTIVE FW1: Based on the findings contained in the Final Flora/Fauna Report (Moffett ANGB 2022), identify any additional surveys that are deemed necessary and resource and conservation management projects to be included in the annual work plans.
- OBJECTIVE FW2: Determine the intervals, typically 3-5 years, needed to ensure populations and conditions of flora and fauna species and their habitats are thriving.
- OBJECTIVE FW3: Maintain an updated inventory of plants and animals present on Moffett ANGB.
- OBJECTIVE FW4: Assist NASA in the management the California ground squirrel population at Moffett ANGB. The EM should coordinate with the Safety Office and USDA-APHIS-WS to manage the California ground squirrel population to ensure a safe working environment and reduce potential BASH hazards.
- OBJECTIVE FW5: Coordinate with the Safety Office to support BASH efforts with the USDA-APHIS-WS.

GOAL – Invasive Species (IN): Establish survey and monitoring protocols to identify and address invasive, nonnative, and noxious species. Implement an invasive and nonnative species survey and plan.

- OBJECTIVE IN1: Based on the results of the Final Flora and Fauna Surveys (Moffett ANGB 2022) for the Moffett ANGB, determine what actions are needed to address the presence of non-native, invasive, and noxious species on the installation.
- OBJECTIVE IN2: Ensure pest management projects and invasive species projects undertaken by either the Pest Management Office or the Environmental Office are coordinated and provide mutual benefit.
- OBJECTIVE IN3: Develop a management program for identified invasive species.

GOAL – Threatened and Endangered Species (TE): Identify the presence of federally and state threatened and endangered species to include any SGCN identified in California's SWAP.

- OBJECTIVE TE1: Using the Final Flora and Fauna Surveys (Moffett ANGB 2022) for the Moffett ANGB, as well as state and federal websites identifying state and federally listed species, determine what additional survey work and actions may be needed to protect and conserve onsite state and federally listed species.
- OBJECTIVE TE2: Annually review state and federal lists of endangered, threatened, and species of concern with potential to occur on the installation. Maintain current lists of federal and state species.
- OBJECTIVE TE3: Develop and implement management actions to protect and enhance identified rare species and their habitats.
    - Moffett ANGB will contract with the NASA wildlife biologist to monitor the cantonment area before construction commences and during all phases of construction to ensure the western burrowing owls do not establish active nests within the cantonment area.
    - If western burrowing owl nests are found, they will be passively relocated by the NASA wildlife biologist and/or other relocation experts in consultation with the USFWS and the CDFW.

GOAL – Grounds Maintenance and Landscaping (GM): Manage vegetative cover and soil to minimize sediment loss and erosion, while protecting water quality.

- OBJECTIVE GM1: Develop and implement a revegetation plan, with interim mechanisms to stabilize the soil until vegetative cover has become established, to reclaim disturbed areas following land use conversion and other disturbances.
    - Ensure use of native seed mixtures and flora on new landscaping projects and disturbed areas. Re-seed exposed soils after ground disturbing activities using a certified weed-free native grass mix or native plant species. Use native plantings for all future landscaping projects on the installation. The California Native Plant Society maintains lists of water-conserving, drought-tolerant California native plants by regions. Plant lists can be found at: http://www.cnps.org/cnps/grownative/lists.php.
    - Monitor revegetation efforts to ensure successful plant growth and ground cover and modify as needed.
- OBJECTIVE GM2: Improve effectiveness of grounds maintenance to the overall ecosystem.
    - Develop natural resources plan/grounds maintenance plan that contains an evaluation of improved and semi-improved lands with potential for conversion to unimproved. Plan should also include a list of suitable native plants for on base landscape projects.
    - Mow natural grassland vegetation restoration areas annually to control woody vegetation growth.

GOAL – Water Resource Protection (WA): Manage water resources to prevent potential degradation in water quality with no net loss of acreage or functions and values.

- OBJECTIVE WA1: Review all land disturbing activities proposed on the installation to ensure such work is done in accordance with applicable permits and other approvals required.
- OBJECTIVE WA2: Ensure all ground disturbance activities are conducted in accordance with state or local erosion and sediment control (ESC) laws and regulations to prevent erosion from disturbed areas causing sediment to enter waterways and/or wetlands.
    - Identify, inventory, and map areas at high risk for erosion in order of priority (i.e., areas adjacent to runways, road banks, and unvegetated areas).
    - Review California's ESC program to determine feasibility of having Environmental and Grounds personnel attend ESC courses/trainings and having installation personnel become certified ESC inspectors.
    - Educate key personnel on erosion and sediment control BMPs.
- OBJECTIVE WA3: Implement and maintain ESC measures during all phases of construction and maintenance projects to prevent disturbed soils from entering into streams and wetlands adjacent to the base.

9.0 ANNUAL WORK PLANS

The INRMP Annual Work Plans contain projects listed by fiscal year (FY). For each project, a specific timeframe for implementation is provided (as applicable), as well as the office of primary responsibility (OPR), funding source, and priority for implementation (Tables 10-14). Priorities are defined as follows:

- High: The INRMP signatories assert that if the project is not funded the INRMP is not being implemented and the USAF is non-compliant with the Sikes Act; or that it is specifically tied to an INRMP goal and objective and is part of a "Benefit of the Species" determination necessary for ESA Sec 4(a)(3)(B)(i) critical habitat exemption.

- Medium: Project supports a specific INRMP goal and objective, and is deemed by INRMP signatories to be important for preventing non-compliance with a specific requirement within a natural resources law or EO 13112, *Invasive Species*. However, the INRMP signatories would not contend that the INRMP is not be implemented if not accomplished within the programmed year due to other priorities and/or funding shortfalls.

- Low: Project supports a specific INRMP goal and objective, enhances conservation resources or the integrity of the installation mission, and/or supports long-term compliance with specific requirements within natural resources law; but is not directly tied to specific compliance within the programmed year.

Table 10. Work Plans FY 2024

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with installation stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and CDFW.	PM4	Annual	NGB	High
Review natural resource studies conducted at Moffett ANGB to identify potential project/studies to be conducted.	FW1	Ongoing		Medium
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual		High
Federal and/or State EMs to attend CECOS Natural Resources Compliance Course.	PM1	Once		Medium
Support coordination with the Safety Office and USDA in implementation of the BASH Plan.	FW5	Ongoing		High
Support the IPM Plan.	IN2	Ongoing		High

1510 **Table 11.** Work Plans FY 2025

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with internal stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and CDFW.	PM4	Annual	NGB	High
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual	NGB	High
Support coordination with the Safety Office and USDA in implementation of the BASH Plan.	FW5	Ongoing		High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at Moffett ANGB.	PM2	Annual		Medium
Support the IPM Plan.	IN2	Ongoing		High
Support the NASA Ames Research Center burrowing owl survey effort if applicable.	TE3	Annual		Low

1511

1512

1513

1514 **Table 12.** Work Plans FY 2026

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with internal stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and CDFW.	PM4	Annual	NGB	High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at Moffett ANGB.	PM2	Annual		Medium
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual		High
Support the IPM Plan.	IN2	Ongoing		High
Support the Safety Office and USDA in implementation of the BASH Plan.	FW5	Ongoing		High
Support the NASA Ames Research Center burrowing owl survey effort if applicable.	TE3	Annual		Low

1515

1516
1517

1518

1519

Table 13. Work Plans FY 2027

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with internal stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and CDFW.	PM4	Annual	NGB	High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at Moffett ANGB.	PM2	Annual		Medium
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual		High
Support the IPM Plan.	IN2	Ongoing		High
Support coordination with the Safety Office and USDA in implementation of the BASH Plan.	FW5	Ongoing		High

1525 **Table 14.** Work Plans FY 2028

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with installation stakeholders.	PM3	Annual	NGB	Medium
Complete update of the INRMP with USFWS and CDFW.	PM4	Annual	NGB	High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at Moffett ANGB.	PM2	Annual		
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual		High
Review the INRMP, studies completed, and the written documents generated from the annual meetings to determine what updates and projects will be needed for the 5-year operations and effect review.	PM4	Once		Medium
Support the IPM Plan.	IN2	Ongoing		High
Support coordination with the Safety Office and USDA in implementation of the BASH Plan	FW5	Ongoing		High

1526

1527

10.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

10.1 INRMP Implementation

In accordance with AFMAN 32-7003, *Environmental Conservation*, an INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for "must fund" projects and activities as defined by Chapter 4 of AFI 32-7001, *Environmental Quality Programming and Budgeting*.
- Executes all "must fund" projects and activities in accordance with specific time frames identified in the INRMP.
- Prepares the INRMP in cooperation with appropriate stakeholders. Notifies stakeholders when a new or revised INRMP will be prepared, and solicits participation and input to the INRMP development and review process.
- Ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP.
- Ensures the INRMP has been approved in writing by the appropriate representative from each cooperating agency within the past 5 years.
- Reviews the INRMP annually and coordinates annually with cooperating agencies.
- Establishes and maintains regular communications with the appropriate federal and state agencies for the region where the installation is located.
- Documents specific INRMP action accomplishments undertaken each year.
- Ensures INRMP updates and reviews are conducted in cooperation with the USFWS, CDFW, and NOAA, where applicable.
- Ensures the INRMP implements ecosystem management on ANG installations by setting goals for attaining a desired land condition.

Natural resource and land use management issues are not the only factors contributing to the development and implementation of this INRMP. Facility management and other seemingly unrelated issues affect implementation. It is important to the implementation of this INRMP that Moffett ANGB personnel take ownership of this INRMP to provide the necessary resources (e.g. personnel and equipment), and to utilize the appropriate funding allocated by the ANG NGB/A4VN NRPM to implement the INRMP. It is extremely important that the INRMP Working Group continue to participate in the implementation of this INRMP. The INRMP Working Group is made up of the key Moffett ANGB personnel, and has an oversight role to ensure the effective implementation of this INRMP. Top and middle-level management representation as well as representation from individuals with daily on-site experience will provide the INRMP Working Group with the leadership and structure necessary for the successful implementation of this INRMP.

10.1.1 Monitoring INRMP Implementation

10.1.1.1 Moffett ANGB INRMP Implementation Analysis

Implementation of the Moffett ANGB INRMP will be monitored by the EM in cooperation with the NGB/A4VN NRPM for meeting the legal requirements of the Sikes Act as well as for other mission and biological measures of effectiveness. The ultimate successful implementation of this INRMP is realized in "no net loss" in the capability of the Moffett ANGB training lands to support the military mission while at the same time providing effective natural resources management.

In order to monitor and evaluate the effectiveness of the INRMP implementation the following will be reviewed, as applicable, and discussed within the context of the annual review and/or a formal review of operation and effect:

- Impacts to and from military mission
- Conservation program budget
- Staff requirements
- Program budget
- Compliance with regulatory requirements
- Program and project implementation
- Feedback from military trainers, the USFWS, CDFW, and others
- Trends in species and habitat diversity as evidenced by recurring biological surveys, land use changes, and opinions of natural resource experts

Some of these areas may not be reviewed every year due to lack of data or pertinent information. The effectiveness of this INRMP as a mission enabling conservation tool will be decided by mutual agreement of the USFWS, the CDFW, and 129 RQW during annual reviews and/or reviews for operation and effect.

10.1.1.2 USAF and DoD INRMP Implementation Monitoring

The USAF uses the Defense Environmental Programs Annual Report to Congress (DEPARC) to monitor Sikes Act compliance. DEPARC is the automated system used to collect installation environmental information for reporting to DoD and Congress. Established to fulfill an annual requirement to report the status of DoD's Environmental Quality program to Congress, DEPARC collects information on enforcement actions, inspections, and other performance measures for high-level reports and quarterly reviews. DEPARC also helps the USAF track fulfillment of DoD measures of merit requirements. The Deputy Under Secretary of Defense's (DUSD's) Updated Guidance for Implementation of the Sikes Act also includes an updated section, Conservation Metrics for Preparing and Implementing INRMPs. Progress toward meeting these measures of merit is reported in the annual report to Congress.

10.1.2 Priorities and Scheduling

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP, as required by the Sikes Act, to be a high priority. However, the reality is that not all projects and programs identified in this INRMP will receive immediate funding. Therefore, projects need to be funded consistent with timely execution to meet future deadlines. Projects are generally

prioritized with respect to compliance. Highest priority projects are projects related to recurring or current compliance, and these are generally scheduled earliest. The prioritization of the projects is based on need, legal drivers, and ability to further implement the INRMP.

Current compliance includes projects and activities needed because an installation is currently or will be out of compliance if projects or activities are not implemented in the current program year. Examples include:

- Environmental analyses, monitoring, and studies required to assess and mitigate potential effects of the military mission on conservation resources
- Planning documents
- Baseline inventories and surveys of natural resources (historical and archaeological sites)
- Biological assessments (BAs), surveys, or habitat protection for a specific listed species
- Mitigation to meet existing regulatory permit conditions or written agreements
- Wetland delineations in support of subsequent jurisdictional determinations
- Efforts to achieve compliance with requirements that have deadlines that have already passed

Maintenance requirements include those projects needed that are not currently out of compliance but shall be out of compliance if projects are not implemented in time to meet an established deadline beyond the current program year. Examples include:

- Compliance with future requirements that have deadlines
- Conservation and GIS mapping to be in compliance
- Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives
- Wetlands enhancement, in order to achieve the executive order for “no net loss” or to achieve enhancement of existing degraded wetlands
- Public education programs that explain the importance of protecting natural resources

Lower priority projects include those that enhance conservation resources of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or executive order, and are not of an immediate nature. These projects are generally funded after those of higher priority are funded. Examples include:

- Community outreach activities such as Earth Day and Historic Preservation Week activities
- Educational and public awareness projects such as interpretive displays, nature trails, wildlife checklists, and conservation teaching materials
- BAs, biological surveys, or habitat protection for a non-listed species
- Restoration or enhancement of natural resources when no specific compliance requirement dictates a course or timing of action
- Management and execution of volunteer and partnership programs

10.1.3 Funding

Implementation of this INRMP is subject to the availability of annual funding. Funding for specific projects can be grouped into three main categories by source: federal ANG or NGB funds, other federal funds, and non-federal funds. When projects identified in the plan are not implemented due to lack of funding, or other compelling circumstances, the installation will review the goals and objectives of this INRMP to determine whether adjustments are necessary. Funding options include:

- The Legacy Resource Management Program provides financial assistance to DoD efforts to conserve natural and cultural resources on federal lands. Legacy projects could include regional ecosystem management initiatives, habitat preservation efforts, archeological investigations, invasive species control, and/or flora or fauna surveys. Project proposals are submitted to the Legacy program during their annual funding cycle (https://www.denix.osd.mil/legacy/home).

- Grant and assistance programs are administered by other federal agencies that could be accessed for natural resources management at Moffett ANGB. Examples include funds associated with the CWA and endangered species.

- Other non-federal funding sources that could be considered include The Public Lands Day Program, which coordinates volunteers to improve the public lands they use for recreation, education, and enjoyment, and the National Environmental Education and Training Foundation, which manages, coordinates, and generates financial support for the program (https://www.neefusa.org/npld).

- The 129 RQW may also consider entering into cooperative or mutual aid agreements with states, local governments, non-governmental organizations, and other individuals.

10.1.4 Cooperative Agreements

The DoD and subcommand entities have MOUs, Memorandums of Agreement (MOAs), and other cooperative agreements with other federal agencies, conservation and special interest groups, and various state agencies in order to provide assistance with natural resources management at installations across the United States. Generally, these agreements allow installations and agencies, or conservation and special interest groups to obtain mutual conservation objectives. The DoD agreements applicable to Moffett ANGB include:

- MOU between DoD and USFWS/International Fund for Animal Welfare (IFAW) to promote the conservation of migratory birds (2011).

- MOU between DoD and USFWS/IFAW for a Cooperative Integrated Natural Resource Program associated with the ecosystem-based management of fish, wildlife, and plant resources on military lands (2006).

- MOU between the DoD and USEPA to form a working partnership to promote environmental stewardship by adopting IPM strategies to reduce the potential risks to human health and the environment associated with pesticides (2012).

- MOA for federal Neotropical Migratory Bird Conservation Program and addendum (Partners in Flight-Aves De Las Americas) among DoD, through each of the Military Services, and over 110 other federal and state agencies and non-governmental organizations (1991).

- MOU between the DoD and Ducks Unlimited, Inc. to provide a foundation for cooperative development of selected wetlands and associated uplands in order to maintain and increase waterfowl populations and to fulfill the objectives of the North American Waterfowl Management Plan, within the context of DoD's environmental security and military missions (2006).
- MOU between DoD and Natural Resources Conservation Service to promote cooperative conservation, where appropriate (2006).
- MOU with Watchable Wildlife Incorporated (2002).
- MOU between the DoD and Bat Conservation International to identify, document, and maintain bat populations and habitats on DoD installations (2011).
- MOA between Federal Aviation Administration, USAF, US Army, USEPA, USFWS, and USDA to address aircraft-wildlife strikes (2003).

10.1.5 Consultation Requirements

The Moffett ANGB has multiple natural resources consultation requirements in addition to the INRMP development and review requirements as identified in the Sikes Act. Federally-listed species management requires ESA Section 7 consultation with the USFWS. State-listed species management, as well as game species management, requires consultation with the CDFW.

10.2 Annual INRMP Review and Coordination Requirements

Per DoD policy, the EM of the Moffett ANGB will review the INRMP annually, prior to September 30, in cooperation with the USFWS and CDFW to ensure the goals and objectives of the INRMP remain current. The standards used for this evaluation are set forth in DoDI 4715.03, *Natural Resources Conservation Program*, Enclosure 5. The installation's natural resources management progress will be determined based on information obtained annually that supports the focus areas in the DoDI 4715.03 through the USAF/NGB biannual environmental quality data calls. Prior to the annual meeting with the USFWS and the CDFW, the EM will schedule an internal stakeholders meeting with the Safety Office, IPMC, and tenant organizations to obtain feedback on how implementation of the INRMP affected or did not affect their programs and to obtain any comments and recommendations they may have. Following the internal stakeholders meeting, the EM will prepare a summary of the actions taken in support of the INRMP over the past year, what actions were not completed with an explanation of why they were not implemented, and the actions planned for the coming year. The EM will send out invitations with the written summary to the USFWS, CDFW, NGB/A4VN NRPM, Safety Office, USDA-APHIS-WS, IPMC, and other entities deemed necessary to participate in an annual meeting held in-person, via a conference call, or via a Teams meeting to discuss the written review summary, to address any questions regarding implementation of the INRMP over the past year, and to discuss the proposed actions for the coming year. The EM will document the meeting with the invitation, an agenda, meeting minutes, and a sign-in roster of attendees. Following the meeting, the Moffett ANGB EM will submit the documentation to the USFWS and the CDFW for their review and comment and for concurrence that the documentation reflects the discussions held and the agreements made during the annual meeting.

At this annual meeting the need for updates or revisions will be discussed. If updates are needed, the 129 RQW will initiate the updates and, after agreement of all three parties, they will be incorporated in the INRMP. If it is determined that major changes are needed, all three parties will

provide input and an INRMP revision will be initiated with 129 RQW acting as the lead coordinating agency. The annual meeting will be used to expedite the more formal review for operation and effect and, if all parties agree and document their mutual agreement, it can fulfill the requirement to review the INRMP for operation and effect.

If not already determined in previous annual meetings, by the fourth-year annual review a determination will be made jointly to continue implementation of the existing INRMP with updates or to proceed with a revision. If the parties feel that the annual reviews have not been sufficient to evaluate operation and effect and they cannot determine if the INRMP implementation should continue or be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

As part of the annual review, the 129 RQW will specifically:

- Invite feedback from USFWS and CDFW on the effectiveness of the INRMP.
- Inform USFWS and CDFW which INRMP projects are required to meet current natural resources compliance needs.
- Document specific INRMP action accomplishments from the previous year.

10.3 INRMP Update and Revision Process

10.3.1 Review for Operation and Effect

Not less than every 5 years, the INRMP will be reviewed for operation and effect to determine if the INRMP is being implemented as required by the Sikes Act and contributing to the management of natural resources at Moffett ANGB. The review will be conducted by the three cooperating parties to include the Commander responsible for the INRMP, the Regional Director of the USFWS Pacific Southwest Region, and Director of the CDFW. While these are the responsible parties, technical representatives generally are the personnel who conduct the review.

The review for operation and effect will either conclude that the INRMP is meeting the intent of the Sikes Act and only needs an update and implementation can continue; or that it is not effective in meeting the intent of the Sikes Act and it must be revised. The conclusion of the review will be documented in a jointly executed memorandum, meeting minutes, or in some way that reflects mutual agreement.

If only updates are needed, they will be completed in a manner agreed to by all parties. The updated INRMP will be reviewed by the USFWS Pacific Southwest Region and CDFW. Once concurrence letters or signatures are received from the Regional Director of the USFWS Pacific Southwest Regional Office and the CDFW Director, the update of the INRMP will be complete and implementation will continue. Generally, the environmental impact analysis will continue to be applicable to updated INRMPs, and a new analysis will not be required.

If a review of operation and effect concludes that an INRMP must be revised, there is no set time to complete the revision. The existing INRMP remains in effect until the revision is complete and USFWS and CDFW concurrence on the revised INRMP is received. The 129 RQW will endeavor to complete such revisions within 18 months, depending upon funding availability. Revisions to the INRMP will go through a detailed review process similar to development of the initial INRMP to ensure military mission, USFWS, and CDFW concerns are adequately addressed, and the INRMP meets the intent of the Sikes Act.

APPENDIX A. REFERENCES

129 RQW (129th Rescue Wing). 2017. Integrated Natural Resources Management Plan. Moffett Air National Guard Base.

129 RQW. 2021. California Air National Guard 129 Rescue Wing Bird/wildlife Aircraft Strike Hazard (BASH) Plan 91-212.

129 RQW. 2022. Integrated Pest Management Plan. 129 Rescue Wing, Moffett Air National Guard Base, California Air National Guard.

Atwater et al. (Atwater, B.F., S.G. Conrad, J.N. Dowden, C.W. Hedel, R.L. MacDonald, and W. Savage). 1979. History, Landforms, and Vegetation of the Estuary's Tidal Marshes. Pacific Division of the American Association for Advancement of Science. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/swrcb/swrcb_atwater1979.pdf. Accessed 19 January 2022.

Bernstein, B.A. 2008. Sustaining life: How human health depends on biodiversity. *Oxford University Press*.

Boesch, D.F. (editor). 2008. Global warming and the free state: Comprehensive assessment of climate change impacts in Maryland. Report of the Scientific and Technical Working Group of the Maryland Commission on Climate Change. University of Maryland Center for Environmental Science, Cambridge, Maryland.

California Coastal Commission. 2019. Federal Consistency. Available at: https://www.coastal.ca.gov/fedcd/fedcndx.html. Accessed 9 June.

Cal-IPC (California Invasive Plant Council). 2022. The Cal-IPC Inventory. Available at: https://www.cal-ipc.org/plants/inventory/. Accessed 27 May 2022.

CDFA (California Department of Food and Agriculture). 2021. CDFA Weed Pest Ratings and CCR 4500 Noxious Weeds as of June 22, 2021. Available at: https://www.cdfa.ca.gov/plant/ipc/encycloweedia/pdf/CaliforniaNoxiousWeeds.pdf. Accessed 26 January 2022.

CDFW (California Department of Fish and Wildlife). 2015. California State Wildlife Action Plan. Available at: https://wildlife.ca.gov/SWAP/Final. Accessed 26 January 2022.

CDFW. 2022. Threatened and Endangered Species. Available at: https://wildlife.ca.gov/Conservation/CESA. Accessed 31 March 2022.

CDWR (California Department of Water Resources). 2004. California's Groundwater Bulletin 118: Santa Clara Valley Groundwater Basin, Santa Clara Subbasin. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/2_009_02_SantaClaraSubbasin.pdf. Accessed 19 January 2022.

CDWR. 2015. California's Groundwater Update, San Francisco Bay Hydrologic Region. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/Statewide-Reports/GWU2013_Ch4_SanFranciscoBay_Final.pdf. Accessed 19 January 2022.

CDWR. 2022. 401 Water Quality Certification and Wetlands Program. Available at: https://www.waterboards.ca.gov/water_issues/programs/cwa401/. Accessed 26 April 2022.

CEC (Commission for Environmental Cooperation). 1997. Ecological Regions of North America, Toward a Common Perspective. Available at: https://gaftp.epa.gov/EPADataCommons/ORD/Ecoregions/cec_na/CEC_NAeco.pdf. Accessed 14 January 2022.

CGS (California Department of Conservation, Geological Survey). 2002. California Geomorphic Provinces. Available at: https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-36.pdf. Accessed 18 January 2022.

Chromczak, D. 2016. NASA Ames Research Center Burrowing Owl Ecology Study. Moffett Field Breeding Season Summary Report.

Chromczak, D. 2017. NASA Ames Research Center Burrowing Owl Ecology Study. Moffett Field Breeding Season Summary Report.

Chromczak, D. 2018. NASA Ames Research Center Burrowing Owl Ecology Study. Moffett Field Breeding Season Summary Report.

Chromczak, D. 2019. NASA Ames Research Center Burrowing Owl Ecology Study. Moffett Field Breeding Season Summary Report.

Chromczak, D. 2020. NASA Ames Research Center Burrowing Owl Ecology Study. Moffett Field Breeding Season Summary Report.

City of Sunnyvale. 2022. Baylands Park. Available at: https://sunnyvale.ca.gov/community/parks/baylands.htm. Accessed 18 January 2022.

CNRA (California Natural Resources Agency). 2009. 2009 California Climate Adaptation Strategy, A report to the Governor of the State of California in Response to Executive Order S-13-2008. Available at: https://resources.ca.gov/CNRALegacyFiles/docs/climate/Statewide_Adaptation_Strategy.pdf. Accessed 18 January 2022.

CNRA. 2022. 2021 California Climate Adaptation Strategy. Available at: https://resources.ca.gov/Initiatives/Building-Climate-Resilience/2021-State-Adaptation-Strategy-Update. Accessed 20 January 2022.

Cornell University. 2019a. All About Birds- Vaux's Swift. Available at: https://www.allaboutbirds.org/guide/Vauxs_Swift/id. Accessed 3 May 2022.

Cornell University. 2019b. All About Birds- American White Pelican. Available at: https://www.allaboutbirds.org/guide/American_White_Pelican/id. Accessed 3 May 2022.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2014. Assessment and Status Report on the Western Bumblebee (*Bombus occidentalis*). Available at: https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Western%20Bumble%20Bee_2014_e.pdf. Accessed 6 May 2022.

FEMA (Federal Emergency Management Agency). 2022. FEMA Flood Map Service Center: Search by Address. Available at: https://msc.fema.gov/portal/search?AddressQuery=Mountain%20View%2C%20CA#searchresultsanchor. Accessed 24 January 2022.

Geology Page. 2012. San Andreas Fault. August 9, 2012. Available at: https://geologypage.com/2012/08/san-andreas-fault.html. Accessed 20 January 2022.

Griffith et al. (Griffith, G.E., J.M. Omernik, D.W. Smith, T.D. Cook, E. Tallyn, K. Moseley, and C.B. Johnson). 2016. Ecoregions of California (poster): US Geological Survey Open-File Report 2016-1021, with map, scale 1:1,100,000. Available at: http://dx.doi.org/10.3133/ofr20161021. Accessed 19 January 2022.

HTH (H.T. Harvey and Associates). 2020. Letter to Cindy Fong, CBRE at Google. Moffett Federal Airfield – Site-Wide Burrowing Owl Surveys, September 17-23, 2020 (HTH #3475-33). September 25, 2020.

Keystone Center. 1996. Keystone Center Policy Dialogue on DoD Biodiversity Management Strategies. Final report.

MDNR (Michigan Department of Natural Resources). 2015. Michigan's Wildlife Action Plan. Available at: https://www.michigan.gov/dnr/0,4570,7-350-79136_79608_83053---,00.html. Accessed 22 February 2021.

Moffett ANGB (Air National Guard Base). 2022. Flora and Fauna Survey. Air National Guard – 129th Rescue Wing, Moffett Air National Guard Base, Moffett Federal Airfield, California.

NASA (National Aeronautics and Space Administration). 2002. NASA Ames Development Plan. Final Programmatic EIS. Burrowing Owl Habitat Management Plan. NASA Ames Research Center.

NASA. 2014. Wildlife Hazard Management Plan, Moffett Federal Airfield, California. NASA Ames Research Center. Available at: https://www.nasa.gov/sites/default/files/files/Wildlife-Hazard-Management-Plan.pdf. Accessed 26 January 2022.

NASA. 2020. Stormwater Pollution Prevention Plan. National Aeronautics and Space Administration Ames Research Center, Moffett Field, CA.

NASA. 2022. Moffett Field History. Available at: https://history.arc.nasa.gov/moffett.htm. Accessed 27 July 2022.

National Weather Service. 2022. Monthly Temperature and Precipitation Data for San Francisco International Airport, California, 1991-2020. Available at: https://www.weather.gov/wrh/Climate?wfo=mtr. Accessed 18 January 2022.

NOAA (National Oceanic and Atmospheric Administration). 2021. U.S. Climate Resilience Toolkit Climate Explorer. Available at: https://crt-climate-explorer.nemac.org/. Accessed 14 January 2022.

NPS (National Park Service). 2017. Physiographic Provinces. Available at: https://www.nps.gov/subjects/geology/physiographic-provinces.htm. Accessed 14 January 2022.

Santa Clara Valley Water District. 2022. Watersheds of Santa Clara Valley. Available at: https://www.valleywater.org/learning-center/watersheds-santa-clara-valley. Accessed 26 January 2022.

SCVHA (Santa Clara Valley Habitat Agency). 2012. Santa Clara Valley Habitat Plan. Available at: https://scv-habitatagency.org/178/Santa-Clara-Valley-Habitat-Plan. Accessed 25 July 2022.

Shoreline Golf Links. 2022. Park amenities. Available at: https://www.shorelinelinks.com/park_amenities/. Accessed 18 January 2022.

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=10410. Accessed 3 May 2022.

Talon (Talon Ecological Research Group). 2021. NASA Ames Research Center Moffett Field 2021 Annual Burrowing Ecology Study Report. Prepared for NASA Ames Research Center.

US Census Bureau. 2021a. Quick facts Santa Clara County, California. Available at: www.census.gov/quickfacts/fact/table/santaclaracountycalifornia,US/PST045221. Accessed 18 January 2022.

US Census Bureau. 2021b. Quick facts City of Mountain View, California. Available at: https://www.census.gov/quickfacts/mountainviewcitycalifornia. Accessed 20 April 2022.

US Census Bureau. 2021c. Quick facts City of Sunnyvale, California. Available at: https://www.census.gov/quickfacts/sunnyvalecitycalifornia. Accessed 20 April 2022.

US Federal Government. 2021. U.S. Climate Resilience Toolkit Climate Explorer. Available at: https://crt-climate-explorer.nemac.org/. Accessed 14 January 2022.

USACE (US Army Corps of Engineers). 1961. Geologic Map of California, San Francisco Sheet. Available at: https://www.conservation.ca.gov/cgs/Documents/Publications/Geologic-Atlas-Maps/GAM_016-Map-1961.pdf. Accessed 18 January 2022.

USACE. 1987. Corps of Engineers Wetland Delineation Manual. Available at: https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download/?cid=nrcseprd1603428&ext=pdf. Accessed 18 January 2022.

USDA NRCS. (US Department of Agriculture, Natural Resources Conservation Service). 2022. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed 1 March 2022.

USEPA (US Environmental Protection Agency). 2002. EPA Superfund Record of Decision: Moffett Naval Air Station, EPA ID CA2170090078. Available at: https://semspub.epa.gov/work/HQ/188255.pdf#:~:text=SITE%20NAME%20AND%20LOCATION%20Site%2022%20Landfill%20Moffett,ID%20Number%200902734%20STATEMENT%20OF%20BASIS%20AND%20PURPOSE. Accessed 24 January 2022.

USEPA. 2022. Superfund Site: Moffett Field Naval Air Station, Moffett Field, CA, Cleanup Activities. Available at: https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0902734#Status. Accessed 24 January 2022.

USFWS (US Fish and Wildlife Service). 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. Biological Technical Publication BTP-R6001-2003. Available at: https://digitalcommons.unl.edu/usfwspubs/483/. Accessed 6 May 2022.

USFWS. 2021. Monarch Butterfly. Available at: https://www.fws.gov/savethemonarch/FAQ-Section7.html. Accessed 29 September 2021.

USFWS. 2022a. Don Edwards San Francisco Bay National Wildlife Refuge, California. About the Complex. Available at: https://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/cosa/about_complex.html. Accessed 18 January 2022.

USFWS. 2022b. Don Edwards San Francisco Bay National Wildlife Refuge, California. Wildlife. Available at: https://www.fws.gov/refuge/Don_Edwards_San_Francisco_Bay/wildlife.html. Accessed 18 January 2022.

USFWS. 2022c. Information for Planning and Conservation Trust Resources Report. Available at: https://ecos.fws.gov/ipac. Accessed 22 April 2022.

USFWS. 2022d. National Listing Workplan. Available at: https://www.fws.gov/sites/default/files/documents/national-domestic-listing-workplan_0.pdf. Accessed 25 April 2022.

USGS (US Geological Service). 2022. Geologic units in Santa Clara County, California. Available at: https://mrdata.usgs.gov/geology/state/fips-unit.php?code=f06085. Accessed 20 January 2022.

APPENDIX B. LAWS, REGULATIONS, POLICIES, AND EXECUTIVE ORDERS

Federal Laws

American Indian Religious Freedom Act of 1978 (Public Law 95-341; 42 USC §1196) – requires the United States, where appropriate, to protect and preserve religious rights of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

Animal Damage Control Act of 1931 (7 USC §426 et seq.) – provides broad authority for investigation, demonstrations, and control of mammalian predators, rodents, and birds.

Anti-Deficiency Act of 1982 (31 USC §1341 et seq.) – provides that no federal official or employee may obligate the government for the expenditure of funds before funds have been authorized and appropriated by Congress for that purpose.

American Antiquities Act of 1906 (Public Law 59-209; 16 USC §431-433) – authorizes the President to designate historic and natural resources of national significance, located on federal lands, as National Monuments for the purpose of protecting items of archeological significance.

Archeological and Historical Preservation Act of 1974 (Public Law 95-96; 16 USC §469 et seq.) – provides for the preservation of historical and archeological data, including relics and specimens, threatened by federally funded or assisted construction projects.

Archeological Resources Protection Act of 1979 (16 USC §470 et seq.) – prohibits the excavation or removal from federal or Indian lands any archeological resources without a permit.

Bald Eagle Protection Act of 1940 (Public Law 87-884; 16 USC §668a-d) – prohibits the taking or harming (i.e. harassment, sale, or transportation) of bald eagles or golden eagles, including their eggs, nests, or young, without appropriate permit.

Clean Air Act of 1970 (42 USC §7401 et seq.) – regulates air emissions from stationary, area, and mobile sources. This law authorizes the USEPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

Clean Water Act of 1972 (Public Law 92-500; 33 USC §1251 et seq.) – aims to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters. Under Section 401, states have authority to review federal permits that may result in a discharge to wetlands or water bodies under state jurisdiction. Under Section 404, a program is established to regulate the discharge of dredged or fill material into the Nation’s waters, including wetlands.

Coastal Zone Management Act of 1972 (Public Law 92-583; 16 USC §1451 et seq.) – provides incentives for coastal states to develop coastal zone management programs. Federal actions that impact the coastal zone must be consistent to the maximum extent practicable with the state program.

Conservation and Rehabilitation Program on Military and Public Lands (Public Law 93-452; 16 USC §670 et seq.) – provides for fish and wildlife habitat improvements, range rehabilitation, and control of off-road vehicles on federal lands.

Conservation Programs on Military Reservations (Public Law 90-465; 16 USC §670 et seq.) – requires each military department to manage natural resources and to ensure that services are provided which are necessary for management of fish and wildlife resources on each installation; to provide their personnel with professional training in fish and wildlife management; and to give priority to contracting work with federal and state agencies that have responsibility for conservation or management of fish and wildlife. In addition it authorizes cooperative agreements (with states, local governments, non-governmental organizations, and individuals) which call for each party to provide matching funds or services to carry out natural resources projects or initiatives.

Endangered Species Act of 1973, as amended (16 USC §1531 et seq.) – provides for the identification and protection of threatened and endangered plants and animals, including their critical habitats. Requires federal agencies to conserve threatened and endangered species and cooperate with state and local authorities to resolve water resources issues in concert with the conservation of threatened and endangered species. This law establishes a consultation process involving federal agencies to facilitate avoidance of agency action that would adversely affect species or habitat. Further, it prohibits all persons subject to US jurisdiction from taking, including any harm or harassment, endangered species.

Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (Public Law 92-516; 7 USC §136 et seq.) – governs the use and application of pesticides in natural resource management programs. This law provides the principal means for preventing environmental pollution from pesticides through product registration and applicator certification.

Federal Land Policy and Management Act of 1976 (43 USC §1701) – establishes public land policy and guidelines for its administration and provides for the management, protection, development, and enhancement of the public lands.

Federal Noxious Weed Act of 1974 (Public Law 93-629; 7 USC §2801) – provides for the control and eradication of noxious weeds and their regulation in interstate and foreign commerce.

Fish and Wildlife Conservation Act of 1980 (Public Law 96-366; 16 USC §2901 et seq.) – encourages management of non-game species and provides for conservation, protection, restoration, and propagation of certain species, including migratory birds threatened with extinction.

Fish and Wildlife Coordination Act of 1934 (16 USC §661 et seq.) – provides a mechanism for wildlife conservation to receive equal consideration and coordinate with water-resource development programs.

Land and Water Conservation Act of 1965 (16 USC §4601 et seq.) – assists in preserving developing, and assuring accessibility to outdoor recreation resources.

Migratory Bird Conservation Act of 1929 (16 USC §715 et seq.) – establishes a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds.

Migratory Bird Treaty Act of 1918 (Public Law 65-186; 16 USC §703 et seq.) – provides for regulations to control taking of migratory birds, their nests, eggs, parts, or products without the appropriate permit and provides enforcement authority and penalties for violations.

National Environmental Policy Act of 1969 (Public Law 91-190; 42 USC §4321 et seq.) – mandates federal agencies to consider and document environmental impacts of proposed actions and legislation. In addition, it mandates preparation of comprehensive environmental impact statements where proposed action is “major” and significantly affects the quality of the human environment.

Native American Graves Protection and Repatriation Act of 1990 (Public Law 101-601; 25 USC §§3001-3013) – addresses the recovery, treatment, and repatriation of Native American and Native Hawaiian cultural items by federal agencies and museums. It includes provisions for data gathering, reporting, consultation, and issuance of permits.

Resource Conservation and Recovery Act of 1976 (42 USC §6901 e 1860 t seq.) – establishes a comprehensive program which manages solid and hazardous waste. Subtitle C, Hazardous Waste Management, sets up a framework for managing hazardous waste from its initial generation to its final disposal. Waste pesticides and equipment/containers contaminated by pesticides are included under hazardous waste management requirements.

Sikes Act Improvement Act of 1997 (Public Law 105-85; 16 USC §670a et seq.) – amends the Sikes Act of 1960 to mandate the development of an INRMP through cooperation with the Department of the Interior (through the USFWS), DoD, and each state fish and wildlife agency for each military installation supporting natural resources.

Soil Conservation Act of 1935 (16 USC §590a et seq.) – provides for soil conservation practices on federal lands.

Federal Regulations

40 CFR 1500-1508 – CEQ Regulations on Implementing NEPA Procedures
40 CFR 6 – USEPA Regulations on Implementation of NEPA Procedures
40 CFR § 122.26(b)(16) and 122.32(a)(1) – Stormwater Discharge
40 CFR 162 – USEPA Regulations on Insecticide, Fungicide, and Rodenticide Use
15 CFR 930 – Federal Consistency with Approved Coastal Management Programs
50 CFR 17 – USFWS List of Endangered and Threatened Wildlife
50 CFR 10.13 – List of Migratory Birds
32 CFR 190 – Natural Resources Management Program

Federal Executive Orders (EOs)

Energy Efficiencies and Water Conservation at Federal Facilities (EO 12902) – directs federal agency use of energy and water resources towards the goals of increased conservation and efficiency.

Environmental Safeguard for Activities for Animal Damage Control on Federal Lands (EO 11870) – restricts the use of chemical toxicants for mammal and bird control.

Exotic Organisms (EO 11987) – restricts federal agencies in the use of exotic plant species in any landscape and erosion control measures.

Energy Efficiencies and Water Conservation at Federal Facilities (EO 12902) – directs federal agency use of energy and water resources towards the goals of increased conservation and efficiency.

Floodplain Management (EO 11988) – specifies that agencies shall encourage and provide appropriate guidance to applicant to evaluate the effects of their proposals in floodplains prior to submitting applications. This includes wetlands that are within the 100-year floodplain and especially discourages filling.

Indian Sacred Sites (EO 13007) – provides for the protection of and access to Indian sacred sites.

Intergovernmental Review of Federal Programs (EO 12372) – structures the federal government's system of consultation with state and local governments on its decisions involving grants, other forms of financial assistance, and direct development.

Invasive Species (EO 13112) – directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

Off-Road Vehicles on Public Lands (EO 11989) – specifies that the respective agency shall determine if the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands, and immediately close such areas or trails to the type of off-road vehicle causing such effects, until such time as it determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

Protection and Enhancement of Environmental Quality (EO 11514) – provides for environmental protection of federal lands and enforces requirements of NEPA.

Protection of Wetlands (EO 11990) – directs all federal agencies to take action to minimize the destruction loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. This applies to the acquisition, management, and disposal of federal lands and facilities; to construction or improvements undertaken, financed, or assisted by the federal government; and to the conduct of federal activities and programs which affect land use.

Responsibilities of Federal Entities to Protect Migratory Birds (EO 13186) – directs all federal agencies taking actions that have a potential to negatively affect migratory bird populations to develop and implement a MOU with the USFWS by January 2003 that shall promote the conservation of migratory bird populations.

DoDI, AFI, & Air Force Pamphlets (PAM)

DoDI 4715.03 – Natural Resources Conservation Program
DoDI 4165.57 – Air Installations Compatible Use Zones
DoDI 4150.07 – Pest Management Program
DoDI 6055.06 – Fire and Emergency Services Program
DoDI 4150.03 – Integrated Pest Management Program
DoDM 4715.03 – INRMP Implementation Manual
DoDM 4150.07 – DoD Pest Management Program Manual Volumes 1-3
AFMAN 32-1053 – DoD Pest Management Program
AFI 32-7001 – Environmental Quality Programming and Budgeting
AFI 32-7060 – IICEP
AFI 32-7061 – The Environmental Impact Analysis Process
AFI 32-7062 – Air Force Comprehensive Planning
AFMAN 32-7003 – Environmental Conservation
AFPAM 91-212 – BASH Techniques

Department of Defense Memoranda

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 20 Sept 11, Subject: *Interim Policy on Management of White Nose Syndrome in Bats.*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 3 Apr 07, Subject: *Guidance to Implement the Memorandum of Understanding to Promote the Conservation of Migratory Birds.*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 14 Aug 06, Subject: *Integrated Natural Resource Management Plan (INRMP) Template*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 17 May 05, Subject: *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 1 Nov 04, Subject: *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning INRMP Reviews*

Memorandum, DUSD (Installations and Environment), 10 Oct 02, Subject: *Implementation of Sikes Act Improvement Act: Updated Guidance*

Memorandum, Assistant DUSD (Environment), 5 Aug 02, Subject: *Access to Outdoor Recreation Programs on Military Installations for Persons with Disabilities.*

Memorandum, Assistant Secretary of Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety and Occupational Health), 20 Sep 11, Subject: *Interim Policy on Management of White Nose Syndrome in Bats.*

State and Local Statutes

Aquatic Invasive Species: Fish and Game Code (FGC) § 2300 – 2302
California Endangered Species Act: 14 California Code of Regulations (CCR), Division 1, §670
California Endangered Species: Fish and Game Code § 2050 - 2115.5
California Noxious Weeds: 3 CCR §4500
California State Wetland Conservation Policy: Executive Order W-59-93
California State Water Resources Control Board and Regional Water Quality Control Boards: 23 CCR, Division 3