U. S. AIR FORCE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Kaena Point Satellite Tracking Station

(See INRMP signature pages for plan approval date)

ABOUT THIS PLAN

This installation-specific Environmental Management Plan (EMP) is based on the U.S. Air Force's (AF) standardized Integrated Natural Resources Management Plan (INRMP) template. This INRMP has been developed in cooperation with applicable stakeholders, which may include Sikes Act cooperating agencies and/or local equivalents, to document how natural resources will be managed. Non-U.S. territories will comply with applicable Final Governing Standards (FGS). Where applicable, external resources, including Air Force Instructions (AFIs); AF Playbooks; federal, state, local, FGS, biological opinion and permit requirements, are referenced.

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

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

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DOCUMENT CONTROL

Record of Review – The INRMP is updated not less than annually, or as changes to natural resource management and conservation practices occur, including those driven by changes in applicable regulations. In accordance with (IAW) the Sikes Act and AFI 32-7064, *Natural Resources Management*, the INRMP is required to be reviewed for operation and effect not less than every five years. Annual reviews and updates are accomplished by the base Natural Resources Manager (NRM), and/or an Installation Support Team Natural Resources Media Manager. The installation shall establish and maintain regular communications with the appropriate federal and state agencies. At a minimum, the installation NRM (with assistance as appropriate from the NR Media Manager) conducts an annual review of the INRMP in coordination with internal stakeholders and local representatives of the United States Fish and Wildlife Service (USFWS), state fish and wildlife agency, and National Oceanic and Atmospheric Administration (NOAA) Fisheries, where applicable, and accomplishes pertinent updates. Installations will document the findings of the annual review in an Annual INRMP Review Summary. By signature to the Annual INRMP Review Summary, the collaborating agency representative asserts concurrence with the findings. Any agreed updates are then made to the document, at a minimum updating the work plans.

INRMP APPROVAL/SIGNATURE PAGES

INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN

MEMORANDUM OF MUTUAL AGREEMENT

KAENA POINT SATELLITE TRACKING STATION, WAIANAE, HAWAII

This Integrated Natural Resources Management Plan (INRMP), has been prepared in accordance with regulations, standards, and procedures of the Department of Defense, the U.S. Air Force, and the Sikes Act Improvement Act of 1997 (16 U.S.C. §670a) in cooperation with the U.S. Fish and Wildlife Service and the Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife. This INRMP provides for management and stewardship of all natural resources present on the station.

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

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

Approving Officials:

SHUMAKER.ROBERT.FREDERICK.1245414710 Digitally signed by SHUMAKER.ROBERT.FREDERICK.1245414710 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=SHUMAKER.ROBERT.FREDERICK.1245414710 Date: 2016.09.27 14:09:50 -10'00'

27 Sep 2016

Robert F. Shumaker, Major, USAF
Commander

Date

INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN

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

Approving Officials:

Robert F. Shumaker, Major, USAF
Commander

Date

David F. Tessler
Deputy Field Supervisor,
U.S. Fish and Wildlife Service, Region 1

9/15/16
Date

Suzanne Case
Chairperson
Hawaii Department of Land and Natural Resources

9/16/16
Date

EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) has been developed for Kaena Point Satellite Tracking Station (KPSTS), Detachment 3, 21st Space Operations Squadron, 50th Space Wing and the Air Force Civil Engineering Center (AFCEC) in accordance with Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*; Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*; and the provisions of the Sikes Act, as amended (16 United States Code [U.S.C.] 670a et seq.). This INRMP provides KPSTS with a description of the installation and its surrounding environment, and presents various management practices designed to mitigate negative impacts and enhance the positive effects of the installation's mission on local and regional ecosystems. These recommendations have been balanced against the requirements of KPSTS to accomplish its mission at the highest possible level of efficiency. To obtain an accurate assessment of the installation's influences, analyses were conducted to determine the physical and biotic nature of KPSTS and its surrounding environment, as well as the operational activities taking place. In certain cases, the implementation of some of these recommendations for improvement of natural resources on KPSTS will need to be accommodated for safety and efficiency of the installation's mission.

This INRMP is a practical guide for the management and stewardship of all natural resources present on KPSTS, while ensuring the successful accomplishment of the military mission. The INRMP was developed using an interdisciplinary approach in which information was gathered from a variety of organizations. Guidance was also solicited from a variety of Federal, state, and local agencies and groups. A Task Force was formed, which included key installation personnel and individuals from various agencies. Representatives from the following Federal and state regulatory agencies were members of the Task Force: the U.S. Fish and Wildlife Service (USFWS) and the Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW). These varying perspectives allowed for an accurate portrayal of the status and management needs of local ecosystems, balanced against the requirement for the installation to accomplish its mission at the highest possible level of efficiency. As a result, the probable effects of installation operations on the surrounding natural resources were projected, allowing for the development of possible operational alternatives which could result in lessening impacts on the environment.

Participation on the Task Force by representatives from the USFWS and the DOFAW satisfies the provisions of the Sikes Act (16 U.S.C. §670a et seq.). The Sikes Act requires the preparation of an INRMP in cooperation with the USFWS and the appropriate state fish and wildlife agency (e.g., the DOFAW). In addition, the resulting INRMP must reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources.

The maintenance and enhancement of regional biological diversity and ecosystem function is particularly important in the management of natural resources and will be accomplished through the implementation of specific management practices identified in this INRMP. By protecting the riparian corridors and their associated habitats—areas which not only protect and support regional biodiversity, but also provide and protect important ecosystem functions—this INRMP will help perpetuate the form and function of native communities and natural processes, thus enhancing the long-term viability of KPSTS and ensuring its sustainability for military operations.

The INRMP presents practicable alternatives and recommendations that would minimize impact on KPSTS's missions while providing for management and stewardship of natural resources that would conserve and enhance the regional ecosystems in which the installation is embedded.

The overriding goals for this INRMP are as follows:

- Manage for no net loss in KPSTS's capability to support the military mission of the installation
- Minimize habitat fragmentation and promote the natural connectivity of habitats
- Protect native species and discourage nonnative, invasive species
- Protect rare and ecologically important species and unique or sensitive environments
- Maintain or mimic natural processes
- Protect genetic diversity
- Conserve and enhance species, communities, and ecosystems on a regional basis
- Monitor impacts on biodiversity.

From these goals, objectives and management actions were identified that structure this INRMP's guidance. However, each of the management strategies described in this INRMP should be monitored so that modifications can be made during implementation as conditions change.

Throughout the development of this INRMP, management issues were identified in a number of natural resources subject areas. Some of these natural resources topics of concern could have an adverse impact on KPSTS's mission or future planning operations. One of the purposes of this INRMP is to identify goals and objectives for the installation and to obtain workable and useful solutions for each topic of concern. The issues identified in the INRMP have a schedule for their resolution presented in the Summary of INRMP Actions for FY 2017 Through FY 2022 Appendix. The topics of concern involving natural resources constraints to planning and mission operations include land use/open space, soils, and vegetation cover. See Figure 1: Composite Natural Resources Constraints at KPSTS for a map of Composite Natural Resources Constraints at KPSTS.

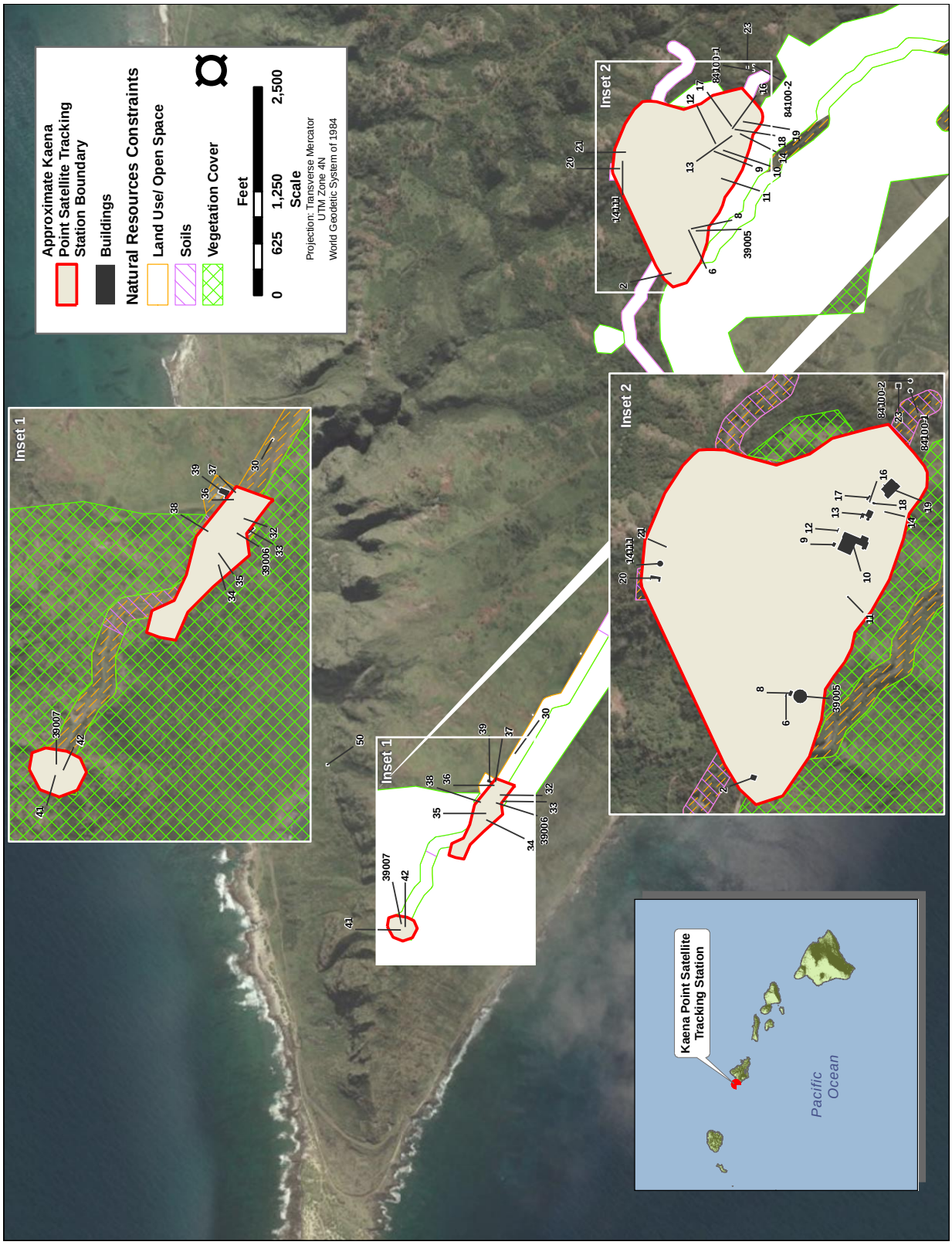


Figure 1: Composite Natural Resources Constraints at KPSTS

1.0 OVERVIEW AND SCOPE

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

1.1 Purpose and Scope

This INRMP has been developed for KPSTS and AFCEC in accordance with AFI 32-7064, *Integrated Natural Resources Management*; AFPD 32-70, *Environmental Quality*; and the provisions of the Sikes Act (16 United States Code [U.S.C.] 670a et seq.).

This INRMP provides KPSTS with a description of the installation (e.g., location, history, and mission), information about the surrounding physical and biotic environment, and an assessment of the impacts on natural resources as a result of mission activities. Furthermore, the INRMP recommends various management practices, in compliance with Federal, state, and local standards, designed to mitigate negative impacts and to enhance the positive effects of the installation's mission on local ecosystems.

This INRMP integrates all aspects of natural resources management with the rest of KPSTS's mission, and therefore becomes the primary tool for managing the installation's ecosystems while ensuring the successful accomplishment of the military mission at the highest possible levels of efficiency. The INRMP is a guide for the management and stewardship of all natural resources present on the installation. A multiple-use approach will be implemented to allow for the presence of mission-oriented activities, as well as environmental quality through the efficient management of natural resources.

Specific management practices identified in this INRMP have been developed to maintain biological diversity and ecosystem function within the installation. Specifically, management practices should adhere to the following:

- Minimize habitat fragmentation and promote the natural pattern and connectivity of habitats
- Protect native species and discourage nonnative, invasive species
- Protect rare and ecologically important species
- Protect unique or sensitive environments
- Maintain or mimic natural processes
- Protect genetic diversity
- Restore species, communities, and ecosystems
- Monitor impacts on biodiversity.

Each of the management strategies described in this INRMP should be monitored so that modifications can be made during implementation as conditions change.

Biodiversity is defined as variation occurring at the genetic, species, ecosystem, and landscape levels. Genetic diversity refers to the variation of genotypes (genetic makeup) within a species that influences different characteristics among individuals or populations. Species diversity refers to the number and relative proportions of different kinds of species within a given area. Ecosystem diversity refers to the number, relative proportions and interactions among communities within an ecosystem. Landscape diversity can be defined as the composition of and interactions among ecosystems across a defined landscape.

Human communities are entirely and completely dependent on the goods and services provided by diverse ecosystems. 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 mission of KPSTS. By protecting a corridor of sensitive habitat that supports a variety of species, this INRMP helps perpetuate, on a local and regional basis, 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.

The information presented in this INRMP will be incorporated into the KPSTS General Plan. The installation's comprehensive management planning process should incorporate the concerns presented in this INRMP so that the growth of the installation can progress in a manner consistent with, and complementary to, the objectives of the USAF with respect to the protection of natural resources. Note that the cultural resources present on KPSTS are addressed fully in a separate Integrated Cultural Resource Management Plan (ICRMP), and, as such, are only briefly discussed in the Cultural Resources Protection Section of this INRMP.

1.2 Management Philosophy

This INRMP was developed using an interdisciplinary approach and information gathered from a variety of organizations. Information and guidance were also solicited from a variety of Federal, state, and local agencies and groups. A Task Force was formed, which included key installation personnel, individuals from various agencies, and groups that have an interest in KPSTS and the management of its resources. Representatives from the U.S. Fish and Wildlife Service (USFWS) and the Hawaii Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) were included on the Task Force. Correspondence with these agencies was documented and satisfies the requirements of 32 Code of Federal Regulations (CFR) 989, as amended, *The Environmental Impact Analysis Process* (EIAP).

The Task Force ensured that information concerning the natural resources on or in the vicinity of the installation was accurate and presented with acknowledgment to local and regional management strategies. As a result, the probable effects of installation operations on the surrounding natural and cultural resources can be projected. This approach also allowed for insight into possible operational alternatives, which could result in reduced impacts on the natural resources on the installation and in surrounding areas.

Participation on the Task Force by representatives from the USFWS and the DOFAW satisfies the provisions of the Sikes Act (16 U.S.C. §670a et seq.). The Sikes Act requires the preparation of an INRMP in cooperation with the USFWS and the appropriate state fish and wildlife agency (e.g., the DOFAW). In addition, the resulting INRMP must reflect the mutual agreement of the parties concerning conservation,

protection, and management of fish and wildlife resources. The Sikes Act also requires public comment on the INRMP at its inception, as well as after each required 5-year revision.

This INRMP presents practicable alternatives and recommendations that allow for the protection and enhancement of natural resources and conservation of existing ecosystems, while minimizing impacts on the installation's missions. Consequently, the implementation of some of these recommendations will sacrifice improvement of the installation's natural resources in deference to the safety and efficiency of the support missions.

Ecosystem Management

The guiding philosophy of this INRMP is to take an ecosystems approach to managing the natural resources present on KPSTS. The interdisciplinary approach taken by this INRMP follows an ecosystems model, in which all appropriate components are integrated by their functions. This section addresses KPSTS's goal of being a leader in facility and natural resources management within the AFSPC and the USAF. Ecosystem management is emphasized because it is recognized that the mission of the USAF is inextricably linked to local, regional, and global ecological integrity. Sustaining ecosystem integrity is also the best way to protect biodiversity, ensure sustainable use, and minimize the effort and costs of management. Native and natural communities, and the processes that sustain them, are unique expressions of the evolutionary and geological histories that are essential to sustaining current system function and resilience. While habitat with the potential to dramatically alter ecosystem form and function is limited at KPSTS, it is still a priority of this base to manage according to this paradigm.

Ecosystem-based management also must consider human functions and needs within the foundation of establishing natural resources management actions. A useful perspective in modeling ecological and societal needs together into this INRMP is through the application of an ecological economics (EE) perspective. EE is not traditional natural resources and environmental economics (Costanza et al. 1997). Using EE is a departure from the traditional ways that ecologists, land managers, and economists consider the economic and ecological needs of a particular system by thinking about economic and ecological theory together from an interdisciplinary perspective. In the case of the AFSPC, the EE perspective can be applied to understand better the operational, social, and ecological requirements at unit locations. This INRMP brings together some of the insight from economic thought and operational necessity with the insight of ecology to present a clearer perspective on the relationship between AFSPC operations, crew morale, community responsibilities, and ecological functions and the interactions which bind them.

This EE perspective can be applied to merge the needs of the operational mission and the social environment of KPSTS with the ecological functions of the base and the region. From this perspective, six central themes have been developed to guide the ecological management perspective used in formulating the goals, objectives, and management actions in this INRMP. EE themes included in the development of the natural resources management actions are (1) sustainability, (2) broad ecological values, (3) uncertainty, (4) multiple methodologies, (5) cooperative efforts, and (6) a land ethic. These central themes are summarized in Table: Ecological Themes Used to Integrate Operational and Social Requirements.

Ecological Themes Used to Integrate Operational and Social Requirements

Ecological Theme	Description
Sustainability	Traditional economic analysis focuses on the goals of efficiency and growth. The integrity and sustainability of the ecosystem are essential for future operational success. The criterion of sustainability should be built into all USAF instructions and policies.
Broad Ecological Values	Economic value is limited to two narrow types: Value in exchange (market price) and value in use (willingness to pay or willingness to accept compensation). These types of values have often been applied when considering ecological functions. Instead, a much broader set of values including social, aesthetic, life support, intrinsic, and operational values must be associated with ecological functions.
Uncertainty	There are fundamental uncertainties and high levels of risk surrounding large-scale or irreversible changes in the environment.
Multiple Methodologies	Sole reliance on any one analytical framework or method would provide an incomplete picture of the relationships between ecosystems and requirements of the operational mission.
Cooperative Efforts	Cooperation among various shareholders in an ecosystem is necessary due to the fragmented ownership patterns throughout an ecosystem. Partnerships with landowners outside of the base boundary are necessary for management of the ecosystem that incorporates the requirements of the goals and missions of the various landowners or communities.
Land Ethic	Traditional economics and natural resources planning relied heavily on utilitarian approaches in analyses. This INRMP uses a land ethic as one of the fundamental underpinnings of the management prescribed. "All ethics rest upon a single premise: that the individual is a member of a community of interdependent parts…the land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively, the land." (Leopold 1949).

Ecosystems provide services that are of utility to wildlife, plants, and humans. Healthy ecosystem functions are often viewed separately from human communities; however, human society is inextricably linked to ecosystem structure and function. For example, regulation of hydrological flow is beneficial to human communities to provide drinking water, irrigation, or industrial applications that drive our society. A list of the ecosystem services and the functions they provide are presented in Table: Ecosystem Services and Functions.

Ecosystem Services and Functions

Ecosystem Service	Ecosystem Functions	Examples of Benefits
Gas regulation	Regulation of atmospheric chemical composition.	Carbon dioxide/oxygen balance, ozone for ultraviolet light protection and sulfur oxide levels.
Climate regulation	Regulation of global temperature, precipitation, and other biological mediated climatic processes at global or local levels.	Greenhouse gas regulation, dimethyl sulphide production affecting cloud formation.

Ecosystem Service	Ecosystem Functions	Examples of Benefits
Disturbance regulation	Capacitance, damping, and integrity of ecosystem response to environmental fluctuations.	Storm protection, flood control, drought recovery, and other aspects of habitat response to environment variability mainly controlled by vegetation structure.
Water regulation	Regulation of hydrological flows.	Provisioning of water for agricultural (e.g., irrigation) or industrial (e.g., milling) processes or transportation.
Water supply	Storage and retention of water.	Provisioning of water by watersheds, reservoirs, and aquifers.
Erosion control and sediment retention	Retention of soil within an ecosystem.	Prevention of loss of soil by wind, runoff, or other removal processes, storage of silt in lakes and wetlands.
Soil formation	Soil formation processes: weathering of rock and the accumulation of organic material.	Provisioning of soil for agricultural production and to support development of habitat for wildlife.
Nutrient cycling	Storage, internal cycling, processing, and acquisition of nutrients.	Nitrogen fixation and other elemental or nutrient cycles; potential sequestering of soil carbon to reduce greenhouse gas effect.
Waste treatment	Recovery of mobile nutrients and removal or breakdown of excess nutrients and compounds.	Waste treatment, pollution control, and detoxification.
Pollination	Movement of floral gametes.	Provisioning of pollinators for the reproduction of plant populations.
Biological control	Trophic-dynamic regulations of populations.	Keystone predator control of prey species and reduction of herbivory by top predators; competitive exclusion of nonnative species.
Refugia	Habitat for resident and transient populations.	Nurseries, habitat for migratory species, or regional habitats for locally harvested species or overwintering grounds.
Food production	That portion of gross primary production extractable as food.	Production of fish, game, crops, nuts, and fruits by hunting, gathering, subsistence farming, or fishing.
Raw materials	That portion of gross primary production extractable as raw materials.	The production of lumber, fuel, and fodder.
Genetic resources	Sources of unique biological materials and products.	Medicine, products for materials science, genes for resistance to plant pathogens and crop pests, and ornamental species.
Recreation	Providing opportunities for recreational activities.	Ecotourism, sport fishing, and other outdoor recreational activities.
Cultural	Providing opportunities for noncommercial uses.	Aesthetic, artistic, educational, spiritual, and scientific values of ecosystems.

Source: Costanza et al. 1997

The overarching goal of ecosystem management at KPSTS is to conserve regional biodiversity by managing the base's natural resources as a functional component of the surrounding regional ecosystem, while supporting efficient conduct of the base's operational missions. Ecosystem management goals established in this INRMP will provide the context within which the goals and objectives of the other INRMP subject areas (e.g., fish and wildlife management, grounds management) are defined.

1.3 Authority

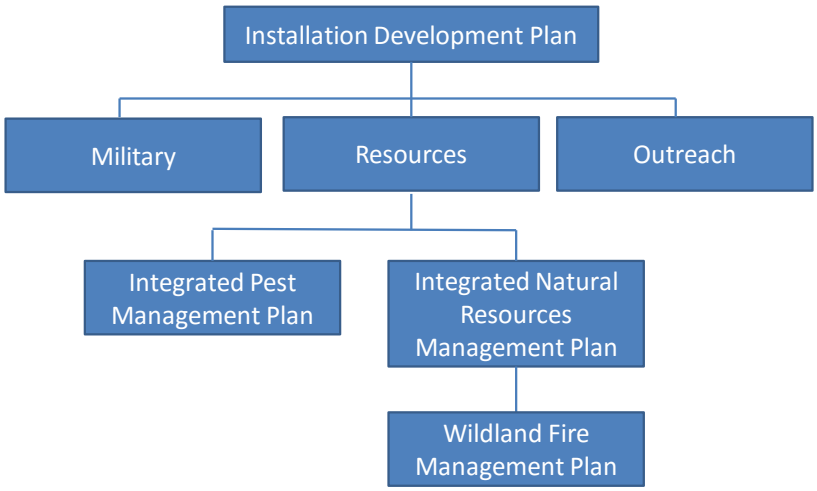
This INRMP is developed under, and proposes actions in accordance with, applicable Department of Defense (DOD) and USAF policies, directives, and instructions. AFI 32-7064, *Integrated Natural Resources Management*, provides the necessary direction and instructions for preparing an INRMP. Issues are addressed in this INRMP using guidance provided under legislation, Executive Orders (EOs), Directives, and Instructions that include DOD Directive 4715.3, *Environmental Conservation Program*; AFPD 32-70, *Environmental Quality*; AFI 32-7065, *Cultural Resources Management*; and AFI 32-7064. DOD Directive 4715.3 provides direction for DOD installations in establishing procedures for an integrated program for multiple use management of natural resources. AFPD 32-70 discusses general environmental quality issues, including proper cleanup of polluted sites, compliance with applicable regulations, conservation of natural resources, and pollution prevention. Finally, AFI 32-7065 provides guidance on the preservation of cultural resources at USAF installations.

Installation-Specific Policies (including State and/or Local Laws and Regulations)	
Feeding of Feral Species	AFI 32-7064
MOU with USFWS & DLNR	Memorandum of Understanding with USFWS and DLNR on management of Natural Resources

1.4 Integration with Other Plans

The INRMP supports the natural resources component by integrating all aspects of natural resources management with each other and with the site's military mission as well by establishing goals and objectives. The figure below, Relationship between Base Management Plans, depicts the relationship among the various management plans on KPSTS and how they jointly support the INRMP.

The INRMP is directly supportive of and integral to the other resource management plans. For example, the primary programs of the INRMP are the Invasive Species Management plan, the Pest Management plan and the Wildland Fire Management plan.



GUIDANCE FROM AFI 32-7064 (REVIEW AND REPLACE WITH INSTALLATION-SPECIFIC CONTENT):

- *Discuss how the INRMP integrates into the Installation Development Plan (see AFI 32-7062, Comprehensive Planning)*
- *Discuss how the INRMP integrates with and supports the installation Air Installation Compatible Use Zone (AICUZ) program*
- *Discuss how the INRMP and the Bird/Wildlife Aircraft Strike Hazard (BASH) Plan are mutually supportive*
- *Discuss how the INRMP and the Integrated Pest Management Plan are mutually supportive*
- *Discuss how the INRMP integrates with and support other relevant plans, such as Range Management Plans, Landscape Plans, etc.*

Example/boilerplate language (to be updated/replaced with installation-specific content):

INRMP revisions and concurrence with the final plan must be coordinated through the installation chain of command and the USFWS and the DLNR DOFAW. The NRM must ensure that the INRMP, IPMP, WLFMP, Invasive Species Plan, Base General Plan, ICRMP, CERCLA/RCRA cleanup plans, Grounds

Maintenance contract, Refuse contract, and any other plans that may affect natural resources, are mutually supportive and not in conflict

2.0 INSTALLATION PROFILE

Office of Primary Responsibility	Det 3, 21 SOPS/CE has overall responsibility for implementing the Natural Resources Management program and is the lead organization for monitoring compliance with applicable federal, state and local regulations
Natural Resources Manager/POC	Name: Lance H. Hayashi Phone: 808-697-4312 Email: lance.hayashi@us.af.mil
State and/or local regulatory POCs (For US-bases, include agency name for Sikes Act cooperating agencies)	Colorado State University- Environmental Support Name: Lynn Cruz Phone: 808-697-4318 Email: linda.cruz.ctr@us.af.mil
Total acreage managed by installation	153 acres
Total acreage of wetlands	N/A
Total acreage of forested land	24 acres
Does installation have any Biological Opinions? (If yes, list title and date, and identify where they are maintained)	No
NR Program Applicability (Place a checkmark next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	☑ Threatened and endangered species ☑ Invasive species ☐ Wetlands Protection Program ☑ Grounds Maintenance Contract/SOW ☐ Forest Management Program ☑ Wildland Fire Management Program ☐ Agricultural Outleasing Program ☑ Integrated Pest Management Program ☐ Bird/Wildlife Aircraft Strike Hazard (BASH) Program ☑ Coastal Zones/Marine Resources Management Program ☑ Cultural Resources Management Program

2.1 Installation Overview

2.1.1 Location and Area

KPSTS is situated approximately 40 miles west of Honolulu in the westernmost portion of the Island of Oahu. KPSTS lies on the Kuaokala Ridge at the northwestern end of the Waianae Mountain Range (USAF 2008b). The installation is located at 21.57 degrees north latitude and 158.25 degrees west longitude. KPSTS is relatively isolated and its location near the top of a steep ridge system removes it from proximity to most public land activity (USAF 1996) and there is no resident population within 1 mile of the station (USAF 2007b). The installation is part of an unincorporated area of Oahu (USAF 2008b). The population of the encompassing census track is approximately 8,000 (USAF 2008a). Makaha, 7 miles south of KPSTS, and Waialua, 7 miles east of KPSTS, are the nearest population centers (USAF 2007b). The area surrounding the installation is mostly unimproved forest and shrublands and is primarily state-owned land, composed of two Natural Area Reserves (NARs), a State Park, and a State of Hawaii Game Management Area (USAF 1996). Figure 2: KPSTS and the Surrounding Region shows a map of KPSTS and the surrounding region.

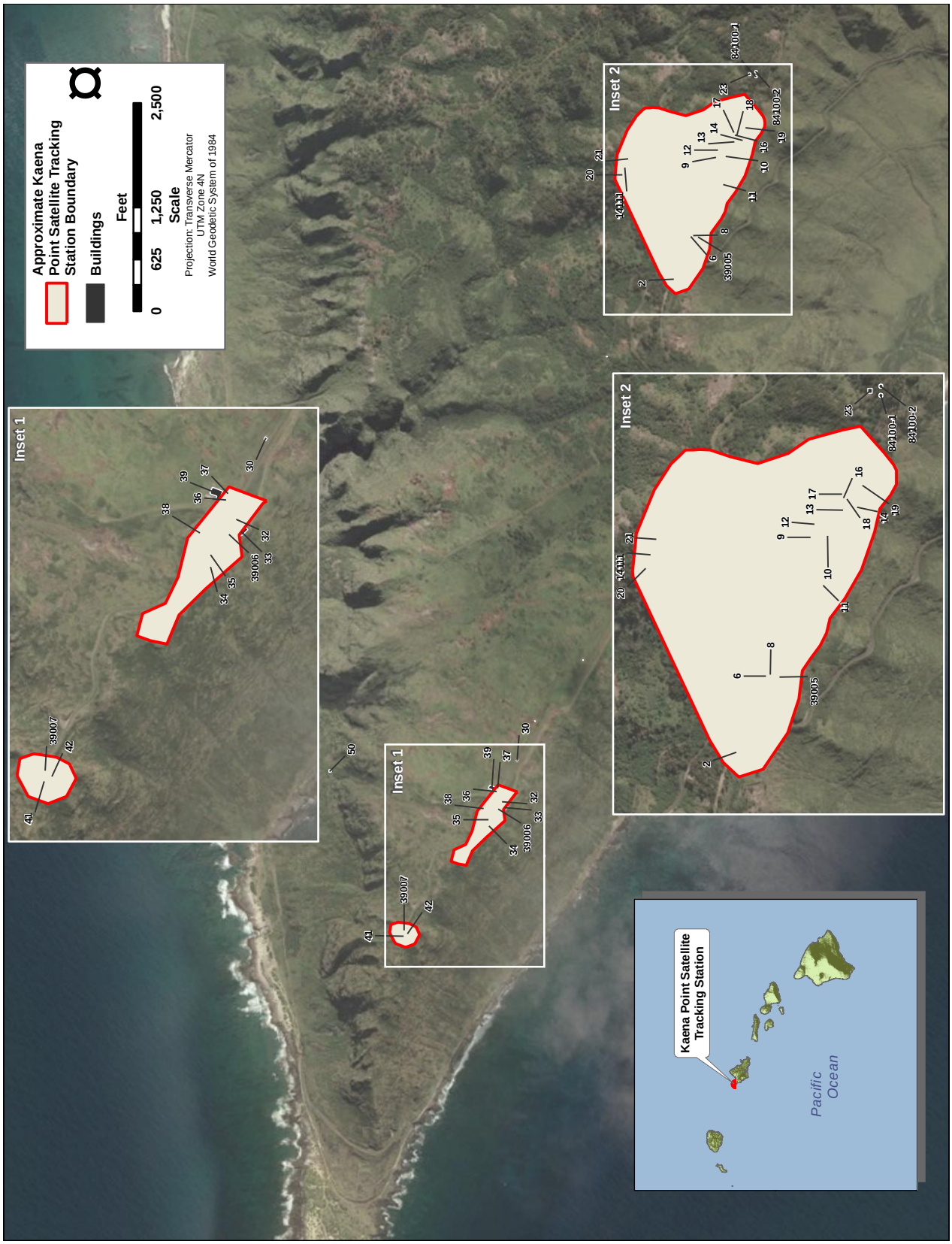


Figure 2: KPSTS and the Surrounding Region

Installation/GSU Location and Area Descriptions

Base/GSU Name	Main Use/Mission	Acreage	Addressed in INRMP?	Describe NR Implications
KPSTS	Detachment 3, 21st Space Operations Squadron executes on-demand, real-time command and control sorties for launch and operation of over 150 Department of Defense, allied, and civil space systems as part of the Air Force Satellite Control Network. Detachment 3, 21st Space Operations Squadron also provides facilities maintenance, communications, utilities, and other base support services to various tenants on the installation	153	*Yes, 2.1.3*	

2.1.2 Installation History

The original site for KPSTS consisted of 106 acres that were leased from the Territory of Hawaii and private landowners in 1958 (USAF 2008a). The installation was originally designed to provide a radio receiving and radio transmitting area separated by sufficient distance to eliminate interference in the radio bands of interest. USAF activity at the installation has increased continuously since its establishment (USAF 1996).

Activity at the installation began with the hiring of the first support personnel by the Lockheed Missile and Space Company in June 1958 and the installation of initial systems, including acquisition, telemetry receiver, and vehicle commanding antennas. At this time, the 6593rd Instrumentation Squadron was activated and assumed responsibility for the tracking station. These systems were installed as part of a five-station network to support the Discoverer Satellite Program, launched on February 28, 1959, which utilized low-flying vehicles to photograph foreign assets. The KPSTS mission during this time was to command the orbiting vehicle, track the re-entering film canister, and coordinate retrieval operations (USAF 2008a).

As the station's mission changed during the 1960s and 1970s, equipment became more automated and compact and existing facilities were modified to support mission changes. The installation began participating in several other DOD space programs, including a satellite communications network (Advent), the Missile Detection and Alarm System, and Missile Observation System. During the late 1960s and early 1970s, the two Space Ground Link Subsystem antennas and AN/FPQ-14 fixed radar were constructed at KPSTS. Until 2007, the FPQ-14 facility was part of the Western Range and also provided support to the North American Aerospace Defense Command. In 2010, the Air Force Weather Agency became a tenant of the Detachment 3, 21st Space Operations Squadron at KPSTS.

In 1968, a civilian contractor assumed full operations and maintenance functions at KPSTS, with the USAF retaining overall management responsibility for the site. In 1973, following contract competition, the operations and maintenance functions at all of the remote tracking stations were consolidated under a single civilian contractor. In 1978, the TLM-18 antenna was taken out of service and dismantled and a new commercial uplink antenna was installed to provide weather satellite data relay. In 1979, the 6593rd Instrumentation Squadron was redesignated as Detachment 6, Air Force Satellite Control Facility (Det 6, AFSCF) (USAF 2008a).

Between 1987 and 1992, the station saw a gradual reduction in military manning and several redesignations and reorganizations. In October 1987, Air Force Space Command assumed responsibility for satellite operations. Det 6, AFSCF was again redesignated as Detachment 6, 2nd Satellite Tracking Group (Det 6, 2 STG) under the 2nd Space Wing. In January 1992, when the 2 STG was redesignated the 750th Space Group (750 SGP), KPSTS became Detachment 6, 750th Space Group (Det 6, 750 SGP) (USAF 2008a).

Until 2003, KPSTS was under the stewardship of the 15th Airlift Wing (formerly the 15th Air Base Wing) at Hickam Air Force Base (AFB).

In 1994, a new lease was executed to respond to growing mission needs, increasing the total leased area to approximately 200 acres. Some of the leased land has since been returned to the State of Hawaii, and KPSTS now occupies approximately 153 acres. State land is not re-leased to other entities by KPSTS.

In June 1997, Det 6, 750 SGP was redesignated Detachment 4, 22nd Space Operations Squadron of the 50th Space Wing, USAF due to the realignment of the 750th Space Group (USAF 2008a).

In October 2011, Detachment 4 was redesignated as Detachment 3, 21st Space Operations Squadron due to a realignment of the network operating group structure.

2.1.3 Military Missions

The current mission of KPSTS is to provide uninterrupted support, including telemetry, tracking, command, and data retrieval functions, for DOD space vehicles, including weather, early warning, navigation, communications, and other high-priority space programs supported by the Air Force Satellite Control Network (AFSCN). KPSTS is one of eight satellite tracking stations that make up the common user segment of the AFSCN, providing launch and on-orbit operational support to more than 150+ satellites. The installation also provides support to a monitoring station for the Global Positioning System. These DOD space systems provide prevailing weather and precise navigation data to operational users, respectively (USAF 2008a).

Listing of Tenants and NR Responsibility

Tenant Organization	NR Responsibility
Detachment 5, 2 Weather Squadron (Kaena Point Solar Observatory (KPSO))	*Det 3, 21 SOPS is responsible for managing tenants impact to/by natural resources. This is executed through the AF813 process or the independent work order program.*

2.1.4 Surrounding Communities

Surrounding Land Use

KPSTS is situated on a high ridge overlooking the Pacific Ocean. The areas surrounding KPSTS are mostly unimproved forest and shrublands. Due to the spread-out configuration of facilities at KPSTS, there is much interface between the installation and the surrounding land managed by the state (USAF 1997). The community areas neighboring KPSTS are mostly in contact with KPSTS through recreational use of Kaena Point public beach areas, approximately 1 mile from KPSTS, and the natural areas that surround Kaena Point. Kaena Point is a popular area for hiking, biking, hunting, and other recreational activities (USAF 1997). KPSTS is not included in this recreational activities area, but serves as a corridor for access to the Kuaokala trail and lands to the north and east of KPSTS.

DOFAW manages most of the land north of KPSTS and the Division of State Parks manages the lands to the south (USAF 2005). The installation is in the vicinity of two state Natural Area Reserves (NAR): Kaena Point NAR and Pahole NAR. Kaena Point State Park, is a recreational facility used year-round for hiking, shore fishing, surfing, picnicking, and wildlife watching, is directly below KPSTS along the southwestern shore of Kaena Point. Directly adjacent to KPSTS is Kuaokala Game Management Area, a State of Hawaii Game Management Area used by recreational hunters and hikers.

Other land uses within 5 miles of KPSTS include a few sparsely scattered residences, small farms, and military training grounds (USAF 1996). Much of the land to the north and east of KPSTS had previously been under grazing leases operated by the Hawaii Department of Land and Natural Resources, Division of Land Management (USAF 1996).

2.1.5 Local and Regional Natural Areas

KPSTS is directly adjacent to the Kuaokala Game Management Area and Mokuleia Forest Reserve, owned by the State of Hawaii and used by recreational hunters and hikers who are allowed to cross installation property to access state lands. Those areas are periodically stocked with game species for hunting.

The Kaena Point NAR is at the shoreline of Kaena Point, approximately 1 mile west of the westernmost antenna of KPSTS. Kaena Point NAR, a significant and sensitive habitat, protects one of the last wild stretches of coastline on Oahu. The NAR protects coastal dunes and is designated as critical habitat for seven endangered species of plants: ʻohai (*Sesbania tomentosa*), ʻāwiwi (*Centaurium sebaeoides*), ʻakoko (*Chamaesyce celastroides* var. *kaenana*), *Vigna o-wahuensis*, puʻukʻaa (*Cyperus trachysanthos*), maʻo hau hele (*Hibiscus brackenridgei*), and *Schiedea kealiae*. Kaena Point NAR also provides important habitat for nesting seabirds, in particular the Laysan albatross (*Phoebastria immutabilis*), and is commonly used by the endangered Hawaiian monk seal (*Monachus schauinslandi*) (Hawaii DOFAW 2007).

Pahole NAR is 4 miles southeast of KPSTS and consists of native forest plant communities and valuable habitat for native birds. The entire Pahole NAR is considered to be a sensitive habitat, particularly for the endangered Oahu ʻelepaio (*Chasiempis sandwichensis ibidis*), one species of the endangered Oahu tree snail (*Achatinella mustelina*), three snail species of concern, and many rare native plant species. Pahole NAR has been designated as critical habitat for the ʻelepaio and for 25 threatened and endangered plants on Oahu by the USFWS. The NAR also includes lowland native mesic and dry forests, which are becoming increasingly rare in Hawaii (Hawaii DOFAW 2003).

Kaena Point State Park, an 853-acre strip of land that wraps 9 miles around the western point of Oahu between Dillingham Airfield and Makua Military Reservation, is located directly below KPSTS along the shore of Kaena Point. This undeveloped park is home to numerous seabirds and rare native plants (HawaiiWeb, Inc. 2008, Hawaii State Parks 2008).

2.2 Physical Environment

2.2.1 Climate

KPSTS is located in a relatively dry, lowland climate that remains mild and relatively consistent throughout the year. Precipitation and temperature records from the Waialua climate station (No. 847), approximately 6 miles east of KPSTS, were collected to characterize climatic conditions at the installation. August is the warmest month of the year at Kaena Point with mean daily highs of 86 degrees Fahrenheit (°F) and mean daily lows of about 67 °F. February is the coldest month of the year with mean daily highs and lows ranging

from 78 °F to 61 °F, respectively (WRCC 2006). Slightly cooler temperatures prevail at KPSTS due to the higher elevation (USAF 2007b).

The Kaena Point region receives an average of 30 inches of precipitation per year. Precipitation is distributed throughout the year, with monthly averages ranging from 0.7 inches in June to 5.4 inches in January. The months with greatest rainfall are December through March (WRCC 2006). Table: Climate Summary for Waialua, Hawaii, from 1949 to 2001 provides a summary of temperature and precipitation data for Waialua, Hawaii, near KPSTS.

Climate Summary for Waialua, Hawaii, from 1949 to 2001

Month	Normal Temperature (°F) – Mean Daily			Normal Precipitation (Inches) – Mean Monthly
	Maximum	Minimum	Mean	
January	78.7	61.0	69.9	5.4
February	78.3	60.5	69.4	3.9
March	78.9	61.4	70.2	3.7
April	80.1	62.8	71.5	2.3
May	82.2	63.9	73.1	1.5
June	84.3	65.8	75.1	0.7
July	85.0	66.9	76.0	0.9
August	85.9	67.3	76.6	1.1
September	86.2	66.5	76.4	1.0
October	84.6	65.9	75.3	2.3
November	81.8	65.1	73.5	3.2
December	79.3	62.8	71.1	4.3
Mean	**82.1**	**64.2**	**73.2**	**2.5**
			Total	**30.3**

Source: WRCC 2006

Constant trade winds, which generally blow from a northeasterly direction, buffet the ridgetops along Kaena Point (USAF 2005). Annual average wind speeds range from approximately 17 to 20 miles per hour at Kaena Point (Hawaii DBEDT 2004). During the summer, trade winds generally prevail in the Hawaii Islands more than 90 percent of the time, sometimes persisting throughout an entire month. However, in the winter (January through March), trade winds can occur only 40 to 60 percent of the time (PDC 2008).

2.2.2 Landforms

Elevations at KPSTS range from approximately 800 feet above mean sea level (AMSL) at the western extent to more than 1,400 feet AMSL further inland. KPSTS is situated on Kuaokala Ridge, a plateau that drops sharply along the western and southern sides of the installation approximately 1,000 feet to the Pacific Ocean (USAF 2008b). Toward the north, the plateau extends beyond KPSTS and is dissected by several short, steep gulches (small canyons). Toward the east of the installation, Kuaokala Ridge merges with the western end of the Waianae Mountain Range (USAF 2005). Figure 3: Topographic Map of KPSTS and Surrounding Region shows a topographic map of KPSTS and the surrounding region.

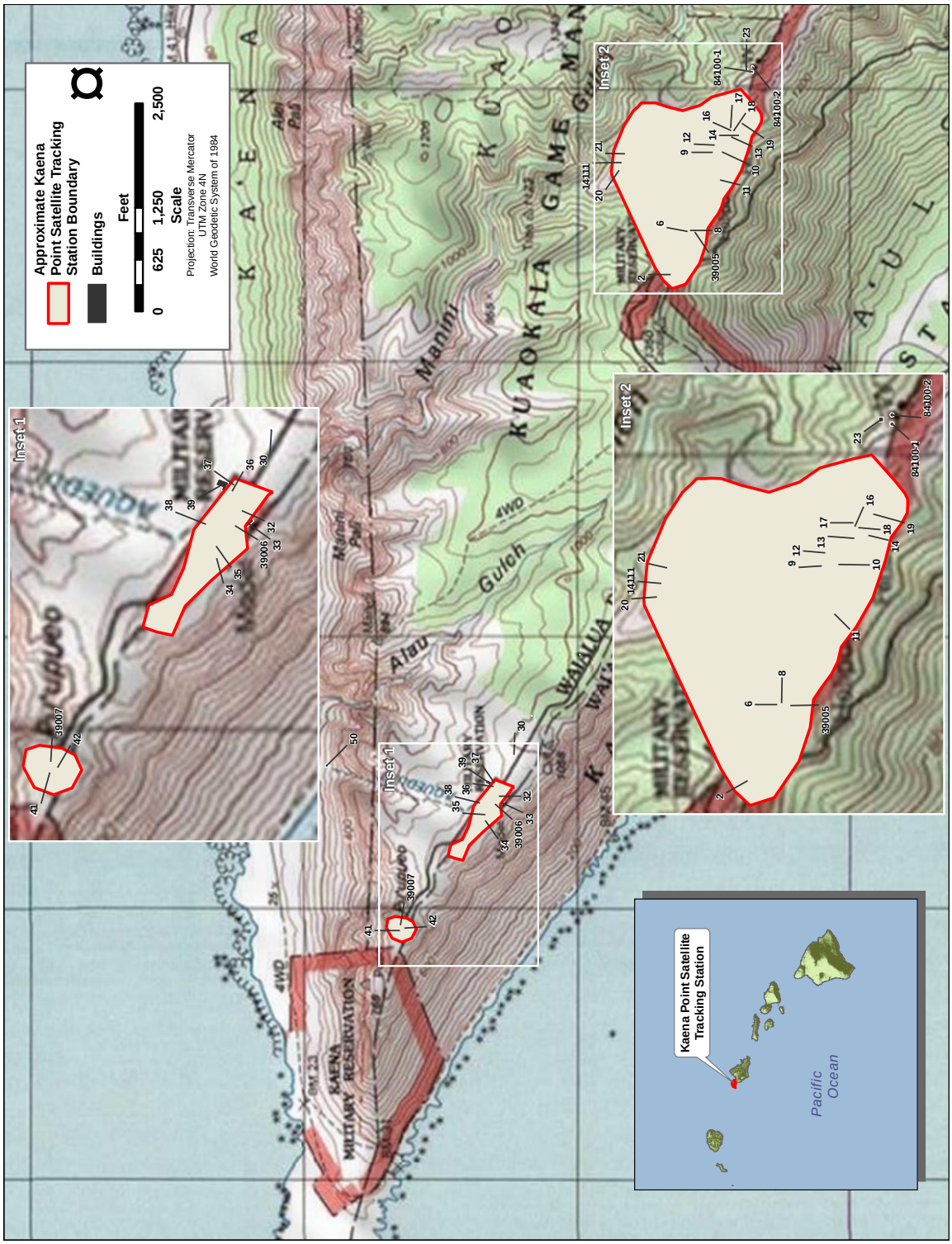


Figure 3: Topographic Map of KPSTS and Surrounding Region

2.2.3 Geology and Soils

The geology of the Kaena Point area is dominated by basalts of the Waianae Volcanic Series. The unit consists of more than 6,000 feet of andesite flows (dense, blocky lava) in the upper section and thin-bedded pahoehoe (basaltic lava with smooth surface) in the older members. Surface rocks have weathered in place, forming saprolitic soils with rock outcrops in the steeper gully walls and escarpment faces (USAF 1996).

Although surface water and groundwater quality with respect to soil characteristics (e.g., erosion potential) do not currently pose a problem for existing or proposed development, protection of soil and water resources is required under the following laws, regulations, and policies:

- Clean Water Act of 1977, as amended
- Executive Order 11514, Protection and Enhancement of Environmental Quality
- Federal Land Policy and Management Act of 1976
- Federal Water Pollution Control Act of 1977
- Soil and Water Conservation Act
- Food Security Act of 1975.

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) mapped soils in the vicinity of KPSTS (NRCS 2008b). Figure 4: Location of Soils Mapped on KPSTS shows the locations of soils mapped on the installation. The following text provides general descriptions of the soil series mapped on KPSTS.

Soils in the vicinity of KPSTS are primarily in the Mahana series and also include rocky areas mapped as rock outcrop, rock land, and stony steep land. The Mahana soil series consists of very deep, well-drained soils that formed in material weathered from volcanic ash. Mahana soils are on dissected uplands at elevations of 1,000 to 3,000 feet AMSL and on slopes ranging from about 6 to 35 percent. Annual rainfall is between 30 to 45 inches. Mahana soils have slow to very rapid runoff, depending on slope, and moderately rapid permeability (NRCS 2008a).

The most prevalent map unit near the installation is Mahana-Badland complex, which consists of 40 to 70 percent Mahana soils and 30 to 60 percent Badland soils. Badland soils are found on steep to very steep, nearly barren land where the soil forming material is generally soft or hard saprolite. Mahana soils in this complex have a silty clay loam texture and are similar to Mahana silt loam. Runoff is rapid and the erosion hazard is moderate to very severe (USAF 1996).

There are scattered areas of Mahana silty clay loam with 6 to 12 percent slopes and 12 to 20 percent slopes. These soils are well-drained and largely eroded (NRCS 2008a, NRCS 2008b). Runoff in these areas is rapid and the erosion hazard is severe where slopes are greater than 12 percent (USAF 1996).

Areas mapped as rock outcrop and rock land are primarily along the western-facing escarpment of KPSTS. Rock outcrop occurs on steeper slopes, where exposed rock covers more than 90 percent of the land area. Rock land occurs on nearly level to steep land types and has exposed rock covering 25 to 90 percent of the surface. Stony steep land occurs along the northern and southern slopes of Kaena Point, along side-slopes of drainageways where boulders and rocks are deposited by water and gravity (NRCS 2008a, USAF 1996).

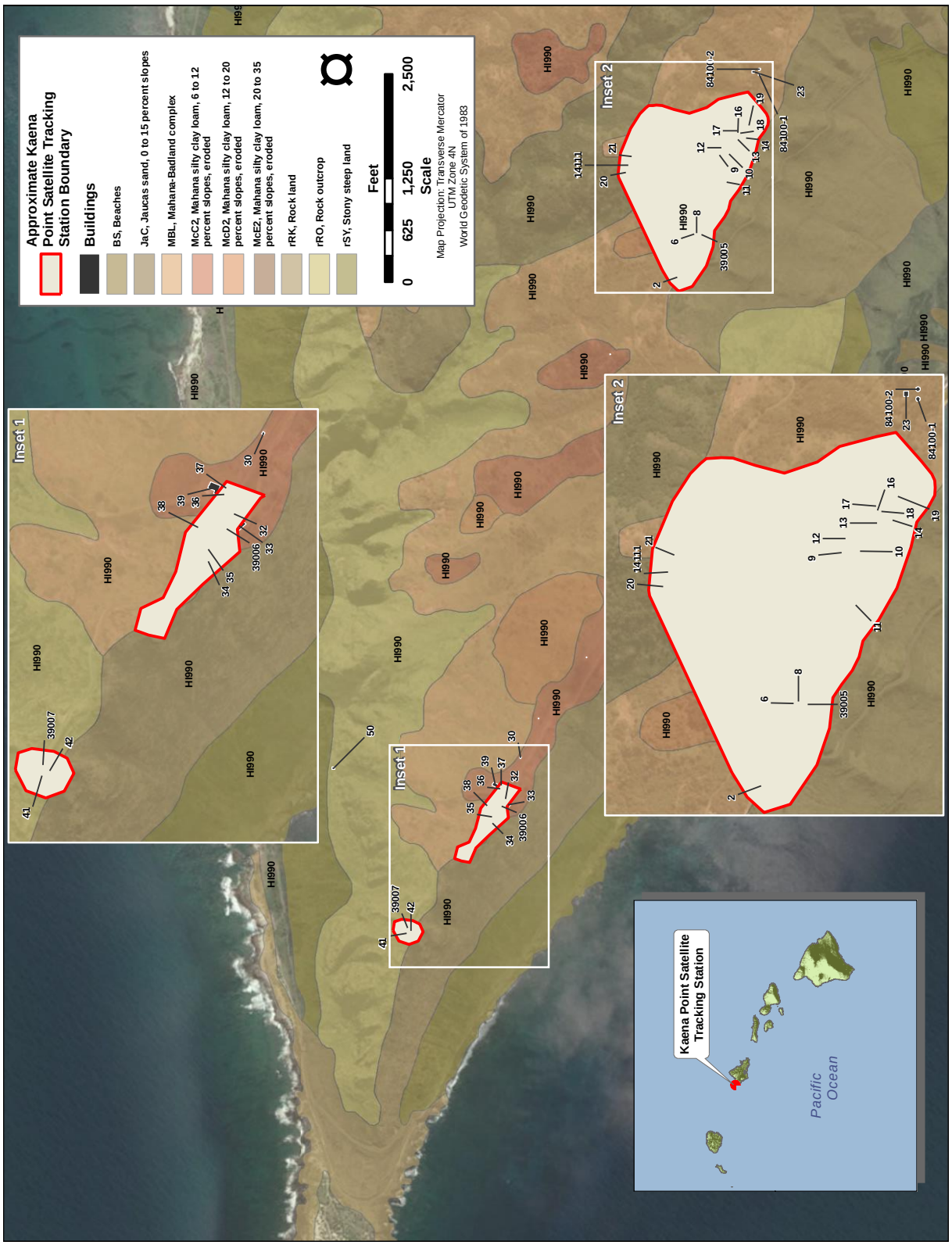


Figure 4: Location of Soils Mapped on KPSTS

2.2.4 Hydrology

Watersheds and Installation Drainage Pattern

Much of KPSTS lies within the Manini watershed and Alau Gulch watersheds, which drain north into the Pacific Ocean, and might partially lie within the Kaluakauila watershed, which drains west/southwest into the Pacific Ocean (CRAMP 2008). There are no water courses within the installation's boundaries (USAF 1997). Surface drainage from KPSTS closely follows topography, flowing downslope to the north, west, and south to the Pacific Ocean (USAF 1996).

Areas that generate storm water runoff at KPSTS are generally paved areas that produce sheet flow runoff. Some locations have gutters, drop inlets, culverts, and outfalls to direct runoff away from buildings and other facilities. During typical rainfall events, storm water drains to, accumulates in, and ultimately passes through low-lying areas (swales and gulches) and does not discharge directly into the Pacific Ocean. There is no formal storm sewer at KPSTS that connects to a municipal separate storm sewer system (MS4) (USAF 2007b). The State of Hawaii has determined that KPSTS should be regulated as a small MS4 (USAF 2007b).

KPSTS discharges storm water to 11 receiving waters, all classified as Inland Class 2, under its National Pollutant Discharge Elimination System (NPDES) general permit (USAF 2007b). The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The uses to be protected in Class 2 waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters (Hawaii DOH 2004). Figure 5: Surface Hydrology in the Regions Surrounding KPSTS shows the surface hydrology in the region surrounding KPSTS.

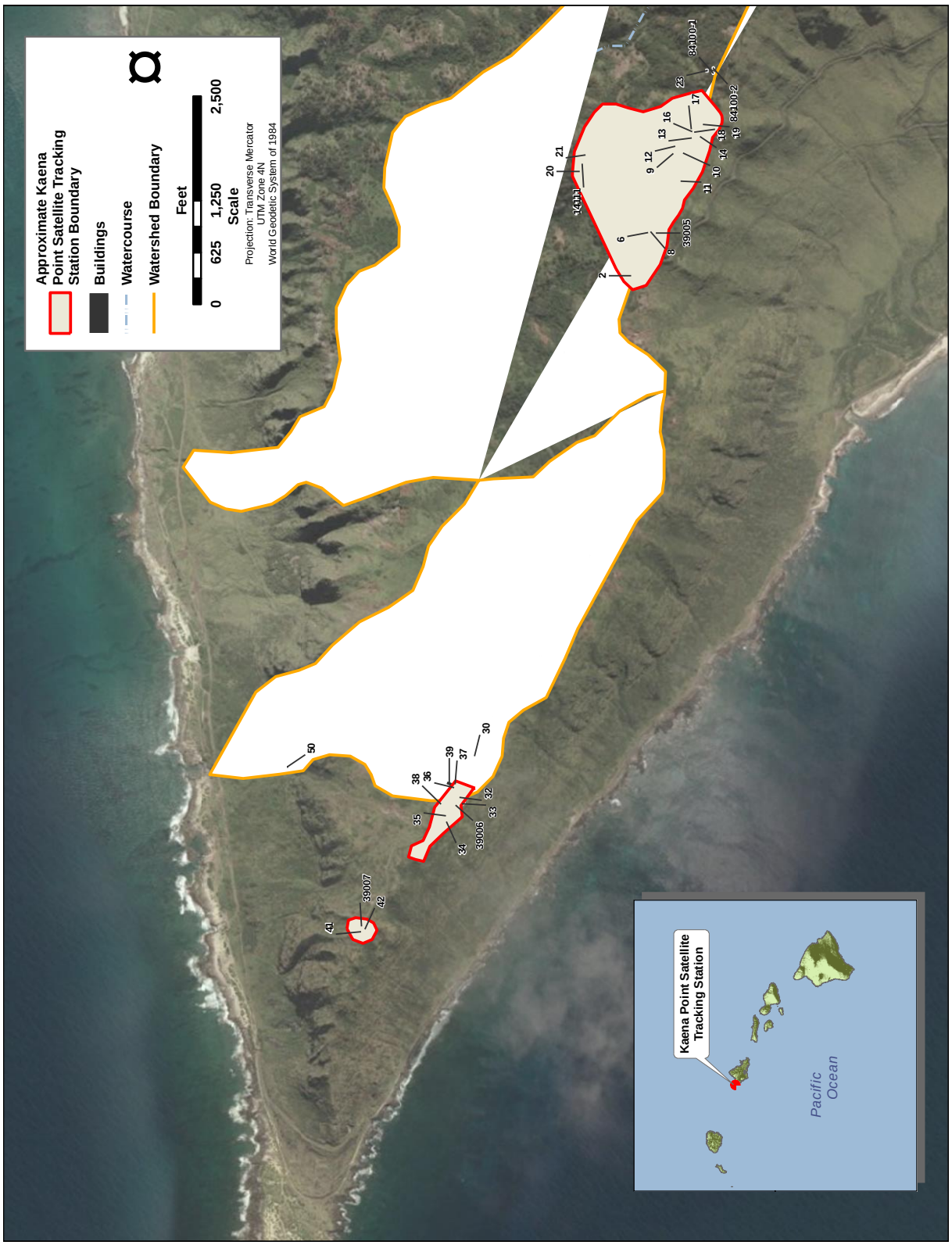


Figure 5: Surface Hydrology in the Regions Surrounding KPSTS

Water Quality

The Federal government has granted the authority to implement the NPDES program to state governments. Hawaii Department of Health (DOH) has assumed that role, and has tailored its control programs for storm water discharge to address the state's water quality needs and objectives. Under DOH's program, sites may discharge storm water under a general or individual NPDES permit. If a general permit is applicable to the discharge, the owner must submit a Notice of Intent (NOI) to seek coverage under the general permit. Hawaii DOH has determined that KPSTS should be regulated as a small MS4. KPSTS filed a NOI, submitted its Storm Water Management Plan (SWMP), and received a Notice of General Permit Coverage by the Hawaii DOH (Hawaii DOH 2004). KPSTS applied for renewal of the Notice of General Permit Coverage in 2016. As a general permit holder, KPSTS has developed and implemented a SWMP and enforces its SWMP to reduce the discharge of pollutants to the maximum extent practicable. The SWMP describes the best management practices (BMPs) and minimum control measures that will be implemented to protect water quality (USAF 2007b).

40 CFR §122.34(b) stipulates, and KPSTS' SWMP requires, that minimum control measures for an NPDES MS4 permit include the following: (1) public education and outreach on storm water impacts, (2) public involvement and participation, (3) illicit discharge detection and elimination; (4) construction site storm water runoff control, (5) post-construction storm water management in new development and redevelopment, and (6) pollution prevention and good housekeeping for operations.

No industrial wastewater is generated at KPSTS. The following authorized potential discharges of non-storm water are known to occur at KPSTS:

- Flushing of water lines is conducted infrequently and presents an insignificant source of runoff and contributor of pollution.
- Irrigation of lawns and landscaping is minimal and presents an insignificant source of runoff and contributor of pollution. No fertilizers are used.
- Condensate from air conditioners represents an insignificant source of runoff and contributor of pollution.
- KPSTS facilities are occasionally used by firefighters for staging equipment and personnel when needed in the area. Examples of firefighting water that could be exposed to storm water include testing of hydrants, spillage from filling tanker trucks, and helicopter operations from portable basins.
- Sanitation facilities handling wastewater from each building at KPSTS are located underground and include cesspools, septic tanks, and leach fields. These are utilized under capacity due to the relatively low installation population.
- Floor drains that serve areas (e.g., lavatories and condensate floor sinks) are known to flow to the septic tank systems. Floor drains that receive incidental storm water or that serve water heater vents drain into vegetated swales.
- Uncontaminated groundwater (e.g., well flushing).

It is important to maintain good surface water quality at KPSTS to protect and preserve off-installation surface water resources. Off-installation surface waters include Alau Gulch and Manini Gulch, two ephemeral coastal streams that drain toward the north coast of Kaena Point; several short, steep streams to the north; and the Pacific Ocean (USAF 1996). Each of these waterways supports diverse wildlife and aquatic populations that could be detrimentally affected by contaminated surface water.

KPSTS has several BMPs in place to provide pollution prevention from point sources and sheet flow runoff, including covering outdoor garbage containers; the use of soil retaining walls for erosion prevention; secondary containment for POL and other hazardous chemicals; and the use of alarms, visual indicators, and a kill-switch to prevent overfilling and spills from gasoline and diesel storage tanks at the onsite fueling station (USAF 2007b).

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

The Hierarchical Framework of Ecological Units is an established classification and mapping system that identifies land and water areas at different levels of resolution with similar capabilities and potentials for management. Depending on scale, ecological units are designed to exhibit similar patterns in potential natural communities, soils, hydrologic function, landform and topography, lithology, climate, and natural processes such as nutrient cycling, productivity, succession, and natural disturbance regimes associated with flooding, wind, or fire. Maps of these units may be used to delineate ecosystems, assess resources, conduct environmental analyses, and manage and monitor natural resources (Cleland et al. 1997).

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources (U.S. Environmental Protection Agency 2005). At this scale, ecological units are recognized by differences in global, continental, and regional climatic regimes and gross physiography (Cleland et al. 1997). Four levels of ecoregions, adapted from Bailey (1995), are identified in the hierarchy: domains, divisions, provinces, and sections. The descriptions for KPSTS adapted from Baily (1995) are as follows:

The humid tropical domain is characterized by equatorial and tropical air masses. Every month of the year has an average temperature above 64F and there is no winter season. In these tropical systems, the primary periodic energy flux is diurnal: temperature variation from day to night is greater than from season to season. Average annual rainfall is heavy and exceeds annual evaporation, but varies in amount and in seasonal and areal distribution. Two types of climates are differentiated on the basis of seasonal distribution of precipitation. The tropical wet (or rainforest) climate has ample rainfall through 10 or more months of the year and the tropical wet-and-dry (or savanna) climate has a dry season more than 2 months long. KPSTS further would be classified as a tropical wet (or rainforest) climate.

The rainforest regime mountains division is a region classified as wet equatorial or rainforest climate. Average annual temperatures are close to 80 deg F; seasonal variation is virtually imperceptible. Rainfall is heavy throughout the year, but monthly averages vary considerably due to seasonal shifts in equatorial convergence zone and a consequent variation in air mass characteristics. The forest is evergreen, but individual species have various leaf-shedding cycles. It is a home to small forest animals able to live and travel in the continuous forest canopy, bird species are numerous and spectacularly plumaged. Not all equatorial rainforest areas have low topographic relief. Hilly or mountainous belts have very steep slopes; frequent flows, slides, and avalanches of soil and rock strip away surfaces down to the bedrock.

The Hawaiian Islands province is the classification for the Hawaiian Islands which occupy a tropical oceanic position south of the Tropic of Cancer. The five principal islands and four smaller ones are all volcanoes in various stages of erosion. The islands are hilly and mountainous, KPSTS is located on the island of Oahu which has more of a coastal plain then the other islands. Like all the islands, Oahu has a tropical climate. At any given location, temperature and precipitation remain nearly constant year round. The Hawaiian Islands are isolated, their flora are unique; many species were endemic before human

settlement. Native plants form a variety of community types, including shrubland, forest, and areas of bog and moss-lichen.

These areas are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernmental organizations that are responsible for different types of resources within the same geographical areas.

2.3.2 Vegetation

Vegetation associations are classified by dominant species in the area. Defining habitats is necessary to assess the potential presence of wildlife, threatened and endangered species, and other sensitive species. In turn, these evaluations make it possible to identify areas that require preservation or management attention.

2.3.2.1 Historic Vegetative Cover

Much of the area to the North and East of KPSTS has been under grazing leases operated by the State of Hawaii, Department of Land and Natural Resources (DLNR). The ironwood, silk oak and christmas berry trees are the result of plantings and subsequent spread of these species as part of forestry programs dating back to the 1890s (Cuddihy and Stone 1990).

2.3.2.2 Current Vegetative Cover

KPSTS is in a relatively dry, lowland climate. As is common in many mid-to lowland areas in Hawaii, much of the native vegetation around the installation has been removed by forest cutting and grazing and has been replaced largely by introduced species. These species are now the predominate vegetation on the installation and on most of Oahu. Extensive barren areas (see Figure 6: Example of a Mostly Barren Area on the Western Edge of KPSTS) on the installation probably resulted from human disturbance of the vegetative cover, wildfire, and erosion, and have been exacerbated by the constant trade winds that buffet the ridgetops. There are no native-dominated vegetation cover types occurring within the fenced portions of KPSTS. Native species do occur scattered throughout the disturbed cover types surrounding the installation. Native vegetation is most prevalent in the rock outcroppings on steep slopes near the west end of the site, presumably due to the low level of human disturbance in these areas (see Figure7: ‘Ilima Growing Near the Western Edge of KPSTS) (USAF 1996, USAF 2005). Table: Native Vegetation Species on KPSTS and in Surrounding Region provides descriptions of the native vegetation species within and surrounding the installation.

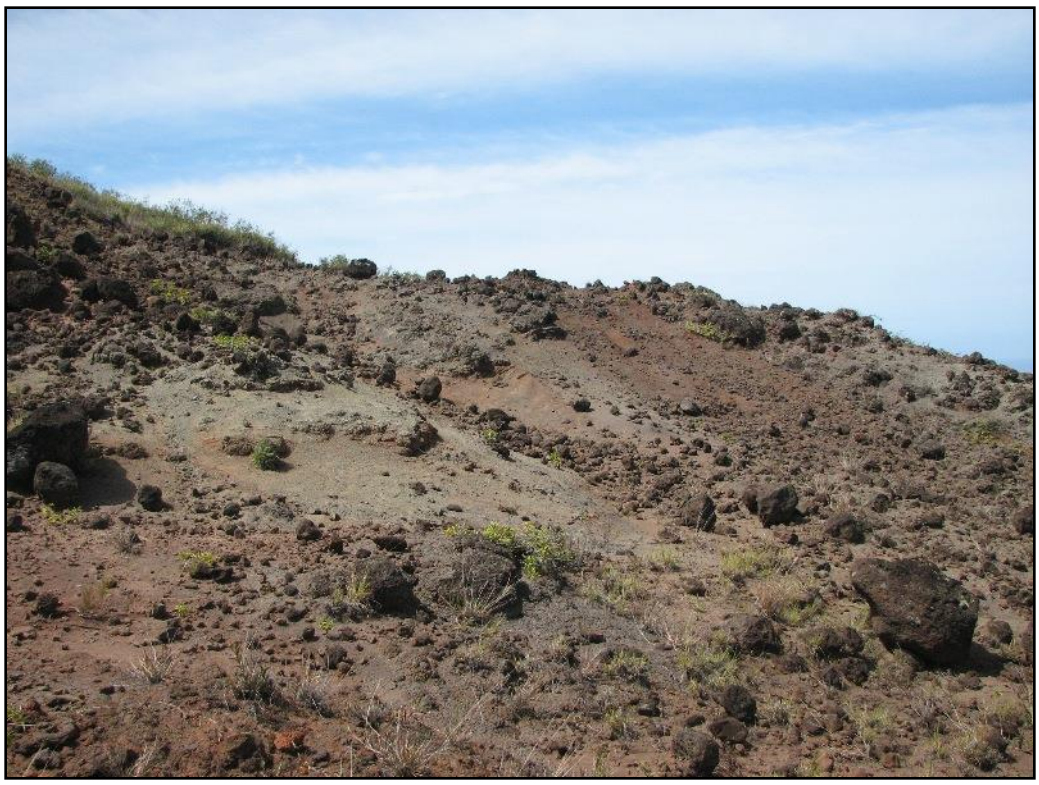


Figure 6: Example of a Mostly Barren Area on the Western Edge of KPSTS
Source: e²M 2008

Figure 7: 'Ilima Growing Near the Western Edge of KPSTS
Source: e²M 2008

Native Vegetation Species on KPSTS and in Surrounding Region

Common Name	Scientific Name	Description/Habitat
Alahe'e Shiny-leaved canthium	*Canthium odoratum*	A shrub scattered throughout Koa-Haole Shrubland vegetation type on leeward facing slopes around site installation perimeter and near west end of installation on windward facing slopes.
'A'ali'i Florida hopbush	*Dodonaea viscosa*	A medium-sized shrub found on all the main islands except Kaho'olawe in almost every habitat ranging from almost sea level to 7,500 feet. It is often found in open locations such as ridges and is an early colonizer of lava fields and pastures.
Piligrass	*Heteropogon contortus*	A grass found in shallow pockets that have developed in rock outcroppings in leeward areas.
'Ilima	*Sida fallax*	A shrub on windward-facing slopes and shallow pockets that have developed in rock outcroppings in leeward areas
False sandalwood	*Myoporum sandwicense*	A shrub on windward facing slopes.
'Aweoweo	*Chenopodium oahuense*	A shrub on windward-facing slopes. Behaves as a colonizer on old lava flows following site disturbance.
Triangleleaf lipfern	*Doryopteris decipiens*	A fern found on windward-facing slopes.
Succulent-leaved spur flower	*Plectranthus parviflorus*	A forb found on windward-facing slopes. Occurs on dry, exposed, often rocky locations.
Emoloa (Kawelu)	*Eragrostis variabilis*	A native bunchgrass found on windward-facing slopes.
'Ahinahina Oahu wormwood	*Artemisia australis*	A shrub found on exposed windward-facing slopes and cliff faces.
Ko'oko'olau	*Bidens amplectans*	A forb/subshrub found on windward-facing slopes.

Source: USAF 1996, USAF 2005, UH Manoa 2007

Fireshed Ecology

Prescribed burns are fires which are intentionally set under planned conditions to accomplish specific management objectives. Prescribed burning is an effective and inexpensive tool for disposing of undesirable vegetation. Additionally, prescribed burns can benefit site preparation by returning soil nutrients and reducing soil acidity problems. Prescribed burns are a good way of controlling disease and pests in a forest stand and to promote better wildlife habitat. Additionally, prescribed burns can minimize the damage from a wildfire that could otherwise cause serious damage to native vegetation by reducing the present fuel load.

Fire threatens KPSTS on an almost annual basis. Wildfire threatens the mission of KPSTS as well as the existing populations of native vegetation species. Fires beginning in coastal areas can race rapidly uphill (USAF 1997); therefore, vegetation management at the installation perimeter is a major concern for fire protection. Much of the grounds maintenance effort at the installation is directed towards providing fire buffers around all developed areas. KPSTS must maintain firebreak clearances and control vegetation around all structures.

KPSTS must support firefighting efforts conducted by Federal, state and local organizations. The Honolulu Fire Department (HFD) responds to any report of fire at KPSTS. The HFD is supported by response if needed from the Federal Fire Department located at several locations on Oahu. If State lands are involved, the DLNR will respond with its firefighting resources as well.

KPSTS does not currently conduct prescribed burns or have a prescribed burn plan. Prescribed burning is not recommended for invasive vegetation removal in the *Invasive Plant Species Control Plan* for KPSTS due to the small size of the installation and its ineffectiveness as a control for certain species (see the following section) (USAF 2005).

Nonnative, Invasive, and Pest Species

Nonnative, invasive, and pest species have the potential to be a major contributor to ecosystem destabilization. Nonnative species, as the name indicates, are species from other regions of the world that have been artificially introduced to the region, primarily through human activities. Invasive species are those that, whether native or nonnative, tend to become established in disturbed systems and competitively exclude native species. These aggressive species typically occur on disturbed sites where past or current land uses have resulted in disturbed soils and loss of native vegetative cover. Invasive, nonnative species have also been intentionally introduced for erosion control, aesthetics, or wildlife food plots. Pest species are typically native species that, for one reason or another (e.g., removal of natural controls, enhancement of habitats), have negative impacts on natural ecosystems or on human health.

As is common in many mid-to lowland areas in Hawaii, much of the native vegetation around the installation has been removed by forest cutting and grazing and has been replaced largely by introduced species. These species are now the predominate vegetation on the installation and on most of the island. There are no native-dominated vegetation cover types occurring within the fenced portions of KPSTS. The following six nonnative-dominated, unmanaged cover types exist on KPSTS:

> Koa-Haole Shrubland (30 acres). Koa-haole or white lead tree (*Leucaena leucocephala*) was introduced into the Hawaiian Islands in 1837 and is now the dominant component in many dry, lowland, and disturbed habitats (see Figure 8: Koa-haole Growing on the West End of KPSTS). Koa-haole shrubs form a dense shrubland (4 to 8 feet tall) along leeward-facing slopes around the installation's perimeter. This habitat also occurs on the windward-facing slopes near the west end of the installation where it supports more native plant species. Koa-haole shrubs are low-growing (1 to 3 feet tall), wind-swept, and rounded on windward-facing slopes. Common invasive plants species in the leeward shrublands include Guinea grass (*Panicum maximum*), swollen fingergrass (*Chloris barbata*), Australian saltbush (*Atriplex semibaccata*), buffelgrass (*Cenchrus ciliaris*), hairy spurge (*Chamaesyce hirta*), and hairy abutilon (*Abutilon gradifolium*). Scattered native shrubs and grasses are found within these leeward shrublands (USAF 1996).

Figure 8: Koa-haole Growing on the West End of KPSTS
Source: e²M 2008

Ironwood/Silk Oak Forest (24 acres). Ironwood/silk oak (see Figure 9: Ironwood on KPSTS) forest occurs on the higher elevation portions of KPSTS on ridge tops, and in gulches to the north of the installation. This vegetation type consists of large plantings of common ironwood (*Casuarina equisetifolia*), 20 to 40 feet high, with smaller, scattered stands of silk oak trees (*Grevillea robusta*). Ground cover is sparse underneath the ironwood trees due to smothering effect and potential allelopathic effects (i.e., chemicals in fallen leaves that are toxic to other species) from an often dense mat of fallen foliage from these trees. In the open areas along the ridge tops, the ground cover is a mixture of molasses grass (*Melinis minutiflora*), lantana (*Lantana camara*), and koa-haole shrubs with smaller patches of various weedy species (USAF 1996).

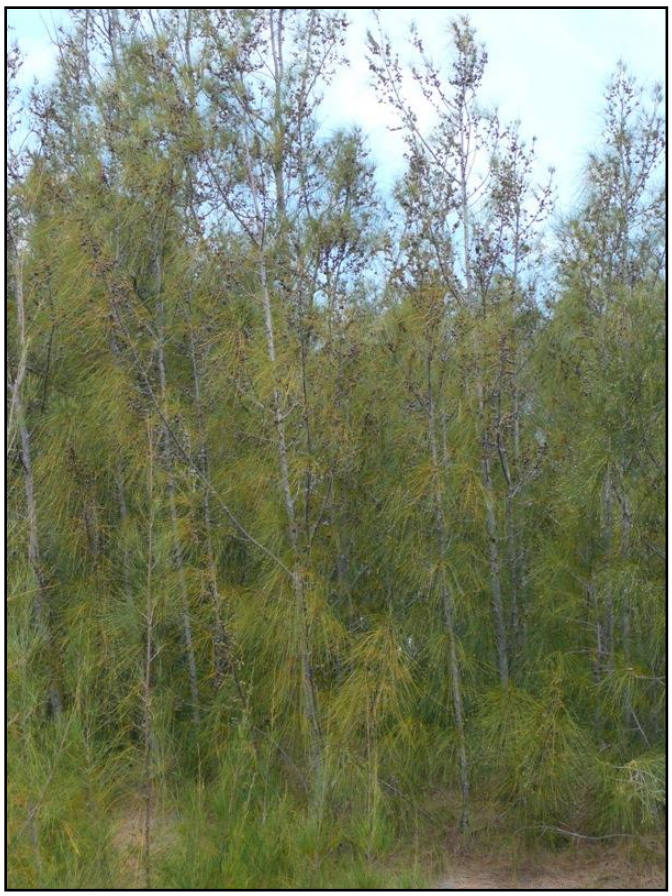


Figure 9: Ironwood on KPSTS
Source: e²M 2008

Lantana Shrubland (10 acres). Lantana (see Figure 10: Lantana on KPSTS) shrubland occurs on the upper portions of the windward-facing slopes to the north and west of the Control Area at KPSTS. This vegetation type is characterized by low-growing, open vegetation dominated by lantana shrubs, 1 to 3 feet tall. In some places, a low, scrubby mix of lantana, molasses grass, partridge pea (*Chamaecrista nictitans*), and 'ulei (*Osteomeles anthyllidifolia*) can be found. Scattered among the lantana are a few short trees and shrubs of silk oak, common ironwood, 'a'ali'i (*Dodonea viscosa*), and waiawi (*Psidium cattleianum* var *lucidum*).

Figure 10: Lantana on KPSTS
Source: e²M 2008

Mixed Grass/Koa-Haole Mosaic (5 acres). The mixed grass/koa-haole mosaic is the predominant cover type on former pasture lands that lie on gently rolling, windward-facing hills dissected by small gullies. This cover type consists of large, open grassy areas with scattered koa-haole thickets and small clumps of trees. The grassy areas are dominated by Guinea grass, pangola grass (*Digitaria pentzii*), pitted beardgrass (*Bothriochloa pertusa*), and green panicgrass (*Panicum maximum*), varying in height from 1 to 3 feet. The woody components are most common on the higher elevations, decreasing gradually downslope to the north.

Mixed Shrubland (6 acres). Mixed shrubland occurs primarily on the slopes of the large gully to the north of the Control Area of KPSTS. Christmas berry (see Figure 11: Christmas Berry at KPSTS) (*Schinus terebinthifolius*), koa-haole, and lantana are the dominant species. Scattered clusters of silk oak, java plum (*Syzygium javanicum*), and common ironwood trees are subdominant species. These shrubs form dense thickets and allow little light through to the ground, resulting in sparse ground cover.

Figure 11: Christmas Berry at KPSTS
Source: e²M 2008

Barren Ground (7 acres). Largely barren, eroded areas are fairly common on the ridgetops of KPSTS. Plant cover is primarily limited to the edges of these barren areas and typically consists of a mix of a few natives, such as piligrass, and introduced grasses including natal redtop grass (*Rhynchelytrum repens*), feathery pennisetum (*Pennisetum polystachyon*), broomsedge (*Andropogon virginicus*), and thatching grass (*Hyparrhenia rufa*). Herbaceous species and shrubs that seem to prefer these eroded areas include ‘uhaloa (*Waltheria indica*), three-flowered beggarweed (*Desmodium triflorum*), red pualele (*Emilia fosbergii*), spiny bur (*Acanthospermum australe*), and ‘ulei.

Three plant species listed as noxious weeds for eradication or control purposes by the Hawaii Department of Agriculture were found at KPSTS during recent invasive plant surveys (see the *Invasive Plant Species Control and Monitoring Plan*) in 2004 (USAF 2005). The following species are among those listed on the June 18, 1992, *List of Plant Species Designated as Noxious Weeds for Eradication or Control Purposes by the Hawaii Department of Agriculture* under Hawaii Administrative Rule (HAR*)* §4-68, *Noxious Weed Rules.*

Spiny tree cactus *(Cereus hildmannianus).* This species belongs to the Cactaceae (Cactus Family). The west point of KPSTS had a spiny tree cactus infestation that was overtaking the fence

surrounding the old radar. The installation hired contractors to remove the cactus (see Figure 12: Spiny Tree Cactus Removal Site on the Western Edge of KPSTS). The infestation appeared to be from an escaped ornamental plant. Spiny tree cactus is controlled by manual removal or herbicide control.

Figure 12: Spiny Tree Cactus Removal Site on the Western Edge of KPSTS
Source: e²M 2008

Comb hyptis *(Hyptis pectinata).* This species is a member of the Lamiaceae (mint) family. Comb hyptis was found at a single location along Road C next to the gate leading into the wildlife feeding station and was subsequently manually removed. It is likely that there are additional isolated individuals of this species present on the installation. Manual removal of this species is the most cost-effective means of control. Removal of individuals should occur prior to seed set and plants should be disposed of at an offsite location. If larger populations of this species are found, a broadleaf herbicide might be a more feasible control method.

Sacramento bur (*Triumfetta semitriloba*). This species is a member of the Tiliaceae (Basswood Family). A single individual of Sacramento bur was found in July 2004 growing along Road C and was subsequently removed. It is likely that there are additional individuals of this species present on the installation. Typical manual removal methods, such as hand pulling, are effective controls. Mechanical methods such as mowing, cultivating, and grubbing have also been effective at controlling this species; however, exposed soils created by mechanical removal actions must be reseeded to prevent its reestablishment. Broadleaf herbicides can also be used. Because the population of Sacramento bur on KPSTS is small, burning, grazing, and other biological controls are not feasible (USAF 2005).

The following four plant species not listed in the noxious weed list, but designated by the Hawaii State Alien Species Coordinator as invasive, are also commonly found on KPSTS.

Lantana. This species is a member of the Verbeneaceae (Verbena Family). Lantana is a commonly found plant along roadsides and in mowed lawns at KPSTS. It was also found growing in some of the small flower gardens and around abandoned facilities. Lantana is classified as a "transformer," the most damaging type of environmental weed. These plants can dominate or replace any canopy or sub-canopy layer of a natural ecosystem, thereby altering its structure. It is particularly difficult to control, as it is a perennial plant that will regrow and form denser thickets if it is just cut and left. Therefore, a combination of mechanical and herbicide controls is most effective at controlling this species. Controlling lantana with prescribed fire is not recommended due to the small geographical size of KPSTS and the small population size of lantana located on the installation.

Common ironwood. This species is a member of the Casuarinaceae (Beefwood Family). Common ironwood is regularly found at KPSTS growing in dense groves. It is especially common around the entrance facility and water tanks. Common ironwood is an extremely aggressive and densely rooted species that freely self seeds in disturbed areas. Once established, it can inhibit the growth of native species by forming dense stands that smother its competitors under a heavy blanket of needle-like litter. The few stands of common ironwood at KPSTS appear to have been deliberately planted as part of the landscaping activities around many of the buildings. Manual removal is best for the small infestations of common ironwood on KPSTS. Raking and removal of leaf litter, cones, and seeds should also be done whenever possible. Applying a systemic type herbicide to bark, cut stumps, or foliage appears to be the most effective management tool for heavy infestations of common ironwood. In other locations herbicide use has been discontinued in favor of the more cost-effective mechanical methods of removal. Controlled burning is not a feasible control method for this species at KPSTS because of the small infestation size.

Strawberry guava *(Psidium cattleianum).* This species is a member of the Myrtaceae (Myrtle Family). Strawberry guava is a shrub or small tree that was commonly found at KPSTS, especially along the road leading to the water well. Strawberry guava displays broad environmental tolerances, occurring in dry to moist forests and in tropical and subtropical climates. It survives in disturbed areas (e.g., along roadsides), is highly shade-tolerant, and can also invade undisturbed, intact forests. Strawberry guava produces an abundance of fruits that are eaten by birds and feral pigs, resulting in prevalent seed dispersal. Because of the large quantities of seed that are dispersed by feral pigs, another invasive species, feral pig control is the first step in strawberry guava control. Pig control must be followed by manual, mechanical, or herbicide control for strawberry guava.

Christmas berry. This species is a member of the Anacardiaceae (Cashew/Sumac Family). Christmas berry is a fairly common evergreen shrub or small tree at KPSTS, growing in dense monotypic or mixed-species clumps. Christmas berry forms dense, tangled thickets that completely shade-out and displace native vegetation. Seeds are spread by wildlife, particularly birds. It produces allelopathic agents that can suppress other plants' growth and irritate human skin and respiratory passages. Christmas berry can be controlled by cutting and treating the remaining stumps with herbicide. Christmas berry forms dense thickets that do not burn readily; therefore, prescribed burning would not be an effective means of control.

The following two additional species designated as noxious weeds have been identified in previous surveys on KPSTS (Higginbotham/Briggs & Associates 1993). However, these species were not observed at previously documented locations during the surveys in July 2004.

Creeping mistflower (*Ageratina riparia*). This species is a member of the Asteraceae (Sunflower Family). Mistflower is a low-growing, scrambling perennial herb that grows up to 3 feet high. Mistflower spreads in several ways, but most commonly by wind dispersal of seeds. Mistflower can be controlled physically by clearing the land it occupies, taking care to remove all rootstock, and disposing of the material off site in an approved location. The area that is cleared or where individuals are removed should be revegetated to prevent mistflower from reinvading the area. Biological control of mistflower in Hawaii has had outstanding success. Three species have been predominantly used in Hawaii to reduce infestations: the plume moth (*Oidematophorus beneficus*), gall wasp (*Procecidochares alani*), and smut fungus (*Entyloma ageratinae*). Of the three agents, the fungus is the most effective. Herbicides can also be used to control small infestations of the species.

Broomsedge (*Andropogon virginicus*). This species is a member of the Poaceae (Grass Family). Broomsedge is a warm season, perennial bunchgrass. This species was previously described as occurring along the roadcuts off Road C at KPSTS. As with many grasses, broomsedge is difficult to control through manual removal. However, small infestations can be hand removed by removing all rhizomes. Effective control of broomsedge can be achieved through application of herbicides. Broomsedge is actually fire-stimulated; therefore, prescribed burning would not be an effective means of control (USAF 2005).

Table: Summary of Noxious Weeds and Invasive Plant Species Currently or Previously Found on KPSTS gives a summary of the designated noxious weed and invasive plant species currently or previously found on KPSTS.

Summary of Noxious Weeds and Invasive Plant Species Currently or Previously Found on KPSTS

Species	Hawaii Designation	Year Last Documented at KPSTS	Vegetation Type Occurring In at KPSTS	Recommended Control Methods
Spiny tree cactus	Noxious Weed	2014	K	Manual, herbicide
Comb hyptis	Noxious Weed	2013	M	Manual, herbicide
Sacramento bur	Noxious Weed	2013	M	Manual, mechanical, herbicide
Lantana	Invasive	2013	K, I, S, M, E	Mechanical, herbicide
Common ironwood	Invasive	2014	I, S, E	Manual, mechanical, herbicide, rake ground litter
Strawberry guava	Invasive	2013	I	Feral pig control, manual, mechanical, herbicide
Christmas berry	Invasive	2014	K, I, S, M, E	Mechanical, herbicide
Creeping mistflower	Noxious Weed	1993	S	Biological controls, herbicide
Broomsedge	Noxious Weed	1993	E	Herbicide

Source: USAF 1996, USAF 2005

Notes:

K = Koa-Haole Shrubland

I = Ironwood/Silk Oak Woodland

S = Shrub vegetation

M = Mixed Grass/Shrub Community

E = Eroded areas

2.3.2.3 Turf and Landscaped Areas

Landscaped areas at KPSTS consist of irrigated turf grasses, non-native grass plantings, and ornamental shrubs and trees. The landscaped areas include all manned buildings and around parking areas. Ornamental shrubs and trees are mostly found around the administration Building 10.

2.3.3 Fish and Wildlife

Birds

No native land bird species have been documented within KPSTS. Several Pacific golden-plovers (*Pluvialis fulva*), a migratory shorebird, were observed along Road C between the KPSTS facilities during the 1996 survey. Two seabirds, the Layson albatross and white-tailed tropicbird (*Phaethon lepturus*), were also observed during the survey flying over the installation. Laysan albatross nesting colonies have been documented in the vicinity, including one downslope of the installation at the Kaena Point NAR, and one upslope of KPSTS (USAF 1996).

Anecdotal observations of the pueo (*Asio flammeus sandwicensis*), or Hawaiian short-eared owl, have been made on or near KPSTS (USAF 2008c). This species is endemic to Hawaii. A field survey should be conducted to verify the presence of the pueo on the installation.

Neotropical migrants are bird species that winter primarily south of the United States (e.g., West Indies, South America), and migrate to the United States and Canada to nest during the summer. With a few exceptions, all birds occurring in North America are protected under the Migratory Bird Treaty Act (MBTA). Table: Native or Migratory Bird Species Potentially Occurring on KPSTS shows the native and migratory avian species with potential to occur on KPSTS.

Native or Migratory Bird Species Potentially Occurring on KPSTS

Scientific Name	Common Name
Arenaria interpres [a]	Ruddy turnstone ('Akekeke)
Asio flammeus sandwichensis	Hawaiian owl (Pueo)
Calidris alba [a]	Sanderling (Huna kai)
Chasiempis sandwichensis gayi [b]	Oahu 'Elepaio
Diomedea immutabilis	Laysan albatross
Fregata minor palmerstoni	Great frigatebird
Hemignathus flavus	Oahu amakihi
Heteroscelus incanus	Wandering tattler (Ulili)
Himatione sanguinea	'Apapane
Paroreomyza maculate [b]	Oahu alauahio (Oahu creeper)
Pheathon lepturus dorotheae	White-tailed tropicbird
Pluvialis fulva	Pacific golden-plover
Vestiaria coccinea	Scarlet honeycreeper ('I'iwi)

Source: USAF 1996

Notes:

[a] Neotropical migratory species

[b] Federally listed endangered species

Mammals

Two native mammalian species exist within the Hawaiian Islands, including the Hawaiian monk seal and the Hawaiian hoary bat (*Lasiurus cinereus semotus*). The Hawaiian hoary bat is the only native terrestrial mammal on Oahu and is a federally endangered species. A 2015 Natural Resource Assessment identified the presence of the Hawaiian hoary bat at the station. Both species are endemic to the Hawaiian Islands.

Examples of nonnative mammalian species that occur on KPSTS include feral pigs (*Sus scrofa*), cats (*Felis domesticus*), mongoose (*Herpestes auropunctatus*), rats (*Rattus* sp.), feral goats (*Capra hircus*), and domestic dogs (*Canis lupus familiaris*)

Reptiles and Amphibians

Lizards and geckos are observed frequently on KPSTS. However, a formal survey has not been conducted to identify the population, nor is it warranted. No federally-protected reptiles or amphibians are expected to occur on KPSTS.

Fish

There are no surface waters within KPSTS to support fish populations.

Fish and Wildlife Habitat

KPSTS has a diversity of habitat features, but because the installation is relatively small in size, it provides limited opportunity for wildlife to inhabit the installation. However, due to the dominance of natural areas in the surrounding region, the installation can provide an important corridor between habitats.

Four distinct habitats have been identified at KPSTS, including turf, second-growth forest, shrubland, and grassland/shrubland mosaic. Turf areas, including lawn and roadside buffers with ornamental shrubs, are widely used by nonnative species such as sparrows, doves, game birds, and other ground-feeders. Second-growth forest and shrubland at KPSTS are often intermixed and are used by a variety of nonnative species for foraging, nesting, and cover. The western end of KPSTS is primarily composed of a mosaic of grassland and shrubland, used primarily by introduced land birds (USAF 1996).

Nonnative and Pest Species

Twenty nonnative landbird species have been observed on KPSTS (see Table: Nonnative Bird Species Observed on KPSTS). The State of Hawaii Game Management Area periodically releases game birds in this area, and recent stockings of wild turkey (*Meleagris gallopavo*) (see Figure 13: Wild Turkey near Building 10 on KPSTS) and black francolin (*Francolinus francolinus*) have been confirmed (USAF 1996).

Figure 13: Wild Turkey near Building 10 on KPSTS
Source: e²M 2008

Nonnative Bird Species Observed on KPSTS

Scientific Name	Common Name
Acridotheres tristis	Common myna
Bubulcus ibis	Cattle egret
Cardinalis cardinalis	Northern cardinal
Carpodacus mexicanus	House finch
Cettia diphone	Japanese bush warbler
Copsychus malabaricus	White-rumped shama
Estrilda astrild	Common waxbill
Francolinus erckelli	Erckel's francolin
Francolinus francolinus	Black francolin
Gallus gallus	Domestic/feral chicken
Geopelia striata	Zebra or barred dove
Lonchura punctulata	Nutmeg mannikin
Meleagris gallopavo	Wild turkey
Mimus polyglottus	Northern mockingbird
Padda oryzivora	Java sparrow
Paroaria coronate	Red-crested cardinal
Phasianus colchicus	Ring-necked pheasant
Pycnonotus cafer	Red-vented bulbul
Sicalis flaveola	Saffron finch
Streptopelia chinensis	Spotted or lace-necked dove
Zosterops japonicas	Japanese white-eye

Source: USAF 1996

Feral pigs (see Figure 14: Feral Pig on KPSTS), feral cats, mongoose, feral goats, rats, and occasional dogs are the only mammal species that occur on KPSTS. Feral pigs pose a major ecological threat by consuming and destroying native understory plants, creating conditions favoring nonnative plant infestation and establishment, preventing the establishment of ground-rooting native plants, and disrupting soil nutrient cycling. The cumulative effect of these activities is the decline of native forests, watersheds, and suitable habitat for native plants and animals (Hawaii DOFAW 2003). Protective fencing for especially rare plants in the nearby Pahole NAR is often the only way to protect them from feral pigs and other threats. A public hunting program for local hunters also helps remove feral pigs from the NAR. Traps are set year-round in the State owned portions and are checked every 72 hours. Cats, mongoose, rats, and mice (*Mus* sp.) are also expected to occur on the installation (USAF 1996). A USDA WS employee who is contracted by the DOFAW conducts daily surveys of KPSTS for feral pigs, cats, dogs (*Canis lupus familiaris*), and mongoose. Problem animals are eradicated as needed.

Figure 14: Feral Pig on KPSTS
Source: e²M 2008

2.3.4 Threatened and Endangered Species and Species of Concern

Threatened and endangered species are federally protected plants and animals that are in danger of becoming extinct without such protection. These species might be rare because of specialized habitat needs or habitat destruction. The Federal Endangered Species Act (ESA) of 1973 protects listed species against killing, harming, harassment, or any action that could damage their habitat. All DOD installations are required to perform threatened and endangered species surveys periodically and prior to any activities that disturb the land.

A previous rare, threatened, and endangered species plant survey of Kaena Point was conducted in 1976 for the Department of the Army. This inventory covered the coastal strand and the talus slopes at the base of the steep cliffs on Kaena Point. Lands on top of the cliffs where KPSTS is located were not inventoried. Four federally listed endangered or threatened plant species were found in an area on the north side of the point at the base of the cliffs. These include nehe (*Lipochaeta integrifolia* var. *integrifolia*), 'akoko (*Chamaesyce celastroides* var. *kaenana*), Oahu riverhemp (‘Ohai, *Sesbania tomentosa*), and coastal sandalwood ('iliahialo’e, *Santalum ellipticum* var. *littorale*) (USAF 1996).

Two endangered species for KPSTS and vicinity were last officially noted as occurring in the area in 1991, including the 'akoko and round chaff-flower (*Achyranthes splendins* var. *rotundata*). The locations of these plants and proximity to KPSTS are unknown. A field study conducted in 1996 revealed no rare, threatened, or endangered species at KPSTS; however, it is possible that some might occur in the area immediately surrounding the installation. Of the threatened and endangered species that have been found in the vicinity of Kaena Point during previous studies, two could potentially occur adjacent to the installation based on their habitat requirements. These include 'akoko, which grows in coastal areas and in mesic forests up to 2,000 feet in elevation, and Oahu riverhemp, which occurs in coastal areas and soil pockets on lava up to an elevation of 900 feet. See Figure 15: 'Akoko and Figure 16: Oahu Riverhemp for pictures of these species. The remaining rare, threatened, and endangered species identified at Kaena Point are restricted to coastal habitats (USAF 1996).

Figure 15: 'Akoko
Source: Center for Plant Conservation.org

Figure 16: Oahu Riverhemp
Source: Native Hawaiian Flora.com

A natural resource assessment was conducted in 2015 that identified using search phase call detections the Hawaiian hoary bat transiting through KPSTS and possibly foraging in the area (SWCA 2015). Given that KPSTS is considered a lowland site, detections of bats at KPSTS during the non-breeding period is an indication that bats can be expected to be more active at the station during the breeding period (SWCA 2015). Endangered land snails (*Achatinella* sp.) are located at higher elevations in the Waianae Range, but are not known to occur or likely to occur on KPSTS (USAF 1996).

Although few threatened or endangered species have actually been documented on KPSTS, a potential for supporting more of these species exists due to the installation's proximity to Kaena Point NAR, Pahole NAR, and other state-owned natural areas. A list of federally threatened, endangered, and candidate species and species of concern that occur in Kaena Point NAR and Pahole NAR has been produced based on information from USFWS and DOFAW (see Table: Federally Listed Species Found in Kaena Point NAR and Pahole NAR). In the State of Hawaii, all federally listed threatened and endangered species are given the same status by the state, with a few exceptions.

Federally Listed Species Found in Kaena Point NAR and Pahole NAR

Species		Status [1]
Common/Hawaiian Name	**Scientific Name**	**Federal**
Mammals		
Hawaiian monk seal (ʻīlioholoikauaua) [b]	*Monachus schauinslandi*	E
Oʻahu ʻElepaio [a]	*Chasiempis sandwichensis ibidis*	E
Laysan albatross [b]	*Phoebastria immutabilis*	SOC
Black-footed albatross [b]	*Phoebastria nigripes*	SOC
Green sea turtle (Honu)	*Chelonia mydas*	T
Invertebrates		
Amastrid land snail [a]	*Amastra rubens*	SOC

Species		Status [1]
Common/Hawaiian Name	**Scientific Name**	**Federal**
Achatinellid land snail (Pupu Kani Oe) [a]	*Achatinella mustelina*	E
None (snail) [a]	*Leptachina* sp.	SOC
Helicinid land snail [a]	*Pleuropoma sandwichiensis*	SOC
Plants		
Round chaff-flower [b]	*Achyranthes splendens* var. *rotunda*	E
Hawai'i alectryon (Mahoe) [a]	*Alectryon macrococcus* var. *macrococcus*	E
Waianae Range alsinidendron [a]	*Alsinidendron obovatum*	E
Kokolau (Ko'oko'olau) [b]	*Bidens amplectens*	E
Native caper (Maiapilo) [b]	*Capparis sandwichiana*	SOC
Lavaslope centuary ('Awiwi) [b]	*Centaurium sebaeoides*	E
'Akoko [b]	*Chamaesyce celastroides* var. *kaenana*	E
Herbst's sandmat (Akoko) [a]	*Chamaesyce herbstii*	E
Ridge rollandia (Haha) [a]	*Cyanea longiflora*	E
Papery cyanea (Haha) [a]	*Cyanea membranacea*	SOC
Umbrella sedge (Pu'uka'a) [b]	*Cyperus trachysanthos*	E
Mountain cyrtandra (Haiwale) [a]	*Cyrtandra dentata*	E
Koolau Range delissia [a]	*Delissea subcordata*	E
Sickle island spleenwort [a]	*Diellia falcata*	E
Mehamehame [a]	*Flueggea neowawraea*	E
Maui island-aster [a]	*Hesperomannia arbuscula*	E
Brackenridge's rosemallow (Ma'o hau hele) [b]	*Hibiscus brackenridgei*	E
Waianae Range labordia (Kamakahala) [a]	*Labordia kaalae*	SOC
Kunana pepperwort ('Anaunau) [b]	*Lepidium bidentatum* var. *o-waihiense*	SOC
Niihau lobelia [b]	*Lobelia niihauensis*	E
Manena (Alani) [a]	*Melicope cinerea*	SOC
Mt. Kaala melicope (Alani) [a]	*Melicope sandwicensis*	SOC
Kaala rockwort (Kulu'i) [b]	*Nototrichium humile*	E
Holei [a]	*Ochrosia compta*	SOC
Carter's panicgrass [b]	*Panicum fauriei* var. *carteri*	E
Kaala phyllostegia [a]	*Phyllostegia kaalaensis*	E
Oahu pilo kea [a]	*Platydesma cornuta* var. *decurrens*	C
Ridged pteralyxia (Kaulu) [a]	*Pteralyxia macrocarpa*	C
Dwarf naupaka [b]	*Scaevola coriacea*	E
Waianae Range schiedea (Ma'oli'oli) [b]	*Schiedea kealiae*	E
Valley schiedea [a]	*Schiedea nuttallii*	E
Oahu riverhemp ('Ohai) [b]	*Sesbania tomentosa*	E
Oahu cowpea [b]	*Vigna owahuensis*	E

Species		Status [1]
Common/Hawaiian Name	**Scientific Name**	**Federal**
Nehe [b]	*Wollastonia remyi*	SOC

Sources: Hawaii DOFAW 2003, Hawaii DOFAW 2007
Notes:
[1] Status: E – listed as endangered by the USFWS
T – listed as threatened by the USFWS
C – candidate species by USFWS
SOC – species of concern by USFWS
[a] Species observed at Pahole NAR
[b] Species observed at Kaena Point NAR

2.3.5 Wetlands and Floodplains

Wetlands

Wetlands are areas found along streams, rivers, springs, ponds, and drainage ditches. Riparian areas refer to banks associated with ponds and streams that support a variety of water-dependent vegetation not found in drier upland areas and are often a subset of the wetlands classification. Vegetation along riparian corridors supports a variety of habitats and associated plant and wildlife species. Riparian zones serve as nutrient filters, sediment traps, climatic regulators, and wildlife refuges; thus, their disturbance can have far-reaching effects on the structure and function of stream and watershed ecosystems.

A wetland inventory was undertaken during a 1996 field survey to determine the location and approximate boundaries of any potential jurisdictional wetlands that might occur on KPSTS. The field inventory confirmed that no wetlands occur on or adjacent to KPSTS. The closest wetlands lie along the marine shoreline at the bottom of steep cliffs, approximately 1,000 to 1,300 feet lower than the installation (USAF 1996).

Floodplains

According to a 2004 report by FEMA, KPSTS is within Zone D, an area with possible but undetermined flood hazards. No flood hazard analysis has been conducted for this area (FEMA 2004). Flooding on Oahu is generally associated with severe rainstorms, high waves, and tsunamis. The island is subject to severe tropical storms and hurricanes. Since the majority of the facilities of KPSTS are located along Kuaokalo Ridge at elevations ranging from 800 feet AMSL to greater than 1,400 feet AMSL, the potential for coastal flooding is low; however, Building 1 (Entry Control Point area) is near sea level and could potentially be subject to high storm or tidal surges and tsunami damage. Manini Gulch, located in close proximity to an onsite water well, is the only watercourse that could pose a flood hazard to KPSTS facilities. The specific flood hazard posed by Manini Gulch has not been delineated (USAF 1996).

2.3.6 Other Natural Resource Information

GUIDANCE FROM AFI 32-7064 (REVIEW AND REPLACE WITH INSTALLATION-SPECIFIC CONTENT): *Describe, summarize, and reference any other biological inventories and surveys conducted on the installation that provide information applicable to natural resources program management.*

2.4 Mission Impacts on Natural Resources

2.4.1 Natural Resource Constraints to Mission and Mission Planning

Some of the natural resources topics of concern mentioned in the previous sections could have an adverse impact on the KPSTS's mission or future planning operations. The natural resources constraints to KPSTS's planning and missions are presented below.

- Any projects which are anticipated to impact off-installation wetlands must acquire approval and the appropriate permits from the U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (USEPA), and the Hawaii Department of Land and Natural Resources. At minimum jurisdictional delineations must be accomplished for each potentially affected wetland.
- Any projects that are anticipated to significantly impact floodplains must undergo the National Environmental Policy Act (NEPA) process per 32 Code of Federal Regulations (CFR) 989. Any projects that permanently alter the hydrology of a floodplain must be reported to the Federal Emergency Management Agency (FEMA).

2.4.2 Land Use

KPSTS occupies approximately 153 acres of leased land from the State of Hawaii, including easements and rights of way. Of this area, approximately 83 acres include fenced facilities, roadways, and a 50-foot buffer zone (USAF 1997). The installation consists of several building clusters of satellite tracking radio communication facilities connected by an access road extending approximately 2 miles along Kuaokala Ridge (USAF 2005). Light industrial land use areas encompass basically all of installation that is not in semi-natural open space. This land use includes administration buildings, computer processing and satellite tracking buildings, antennas, and ancillary structures such as maintenance shops and pumphouses. The primary land use considerations are personnel access and military security. The open space area at KPSTS includes unimproved areas surrounding the installation, antenna separation, and rights of way. The primary land use considerations of open space areas pertain to securing the borders around the station and preventing interference with antennas (USAF 1996).

Approximately 27 acres of the installation are classified as improved, including lawns, buildings, antennas, ancillary structures, roads, parking areas, and a helicopter landing pad. The remaining grounds (approximately 126 acres) are classified as landscaped or semi-improved (e.g., areas with periodic maintenance activities such as mowing along the road shoulders) and natural resources multiple use or unimproved (e.g., forested areas, shrublands, and grasslands) areas (USAF 2005). Figure 17: Management Emphasis Areas on KPSTS provides the locations of these Management Emphasis Areas.

Approximately 70 personnel work at KPSTS, including military personnel, USAF civilian employees who perform civil engineering and real property maintenance for KPSTS, and contractor personnel supporting mission operations (USAF 2007b). Most activities are confined to the buildings except for grounds maintenance and surveillance and maintenance of the antennas and their linkages (USAF 1997).

Approximately 91 acres of KPSTS are established as Management Emphasis Areas, 75 acres of which are designated as Natural Resources Multiple Use, 8 acres are Landscaped High Maintenance, and 8 acres are Landscaped Low Maintenance (USAF 1997).

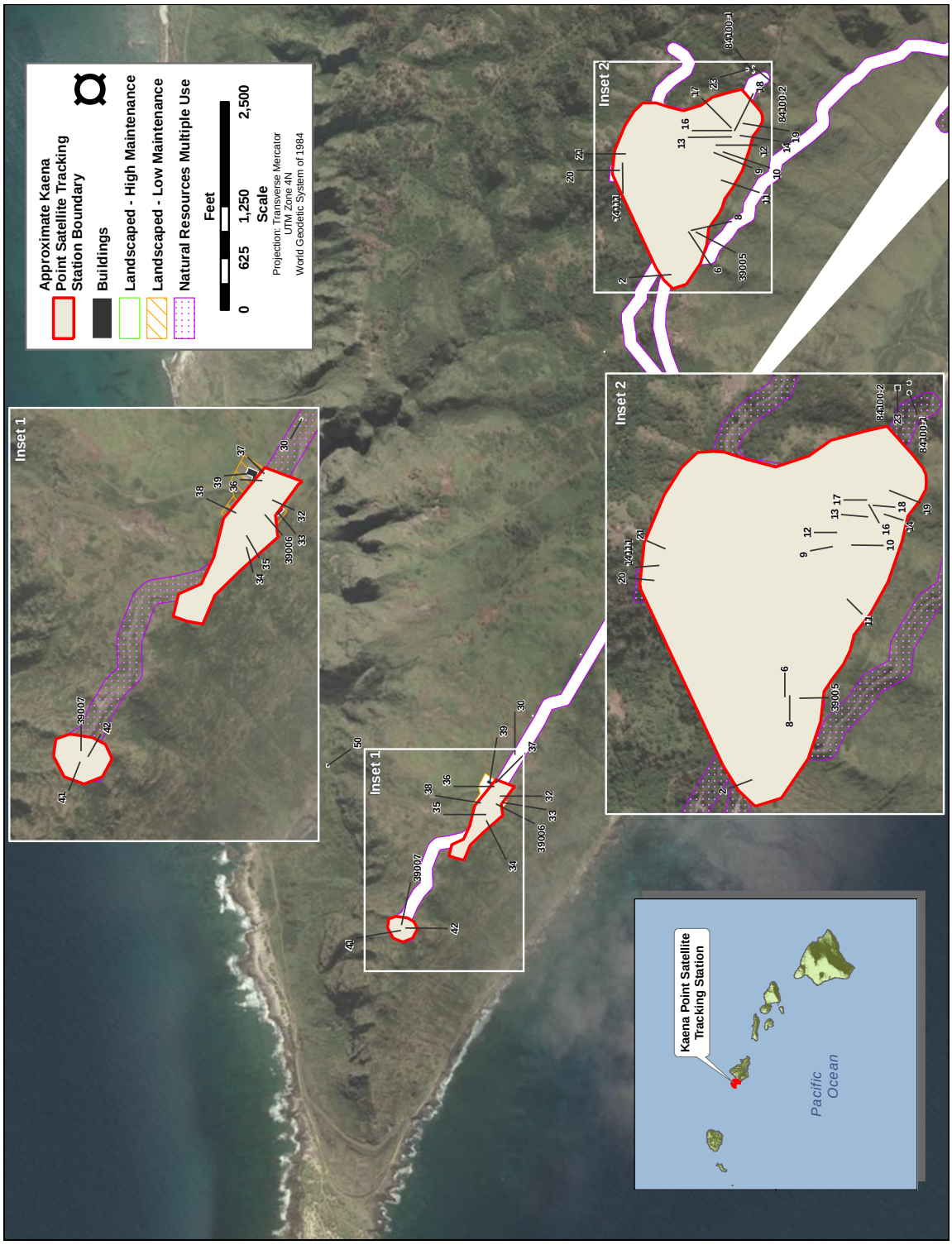


Figure 17: Management Emphasis Areas on KPSTS

2.4.3 Current Major Impacts

This discussion focuses on KPSTS's current major impacts on the local environment, including hazardous materials and hazardous wastes, the Environmental Restoration Program (ERP), water quality, noise, air pollution, fire, and pest management.

Hazardous Materials and Hazardous Wastes

The operation of vehicles and equipment at KPSTS requires the use of a variety of hazardous and non-hazardous materials including fuels, lubricants, and solvents. If released to the environment, these materials have the potential to harm by impacting air, soil, and water quality. KPSTS produces minimal quantities of hazardous waste and is categorized by USEPA as a conditionally exempt small-quantity generator (USEPA 2008). A fueling station with two 500-gallon storage tanks (diesel and gasoline) is located near Building 19 for use by government-owned vehicles. These tanks are filled by fuel transport trucks and include float-type level indicators to help prevent overfilling, fuel dispensers with automatic shut-offs to prevent overfilling vehicles, and an auxiliary kill switch. Spill kits are stored at the filling station to clean any spills. Limited quantities of petroleum, oil, and lubricants (POL) and other chemicals are stored in several buildings at KPSTS with proper secondary containment where needed. Each of these buildings has no floor drains and is either staffed or kept locked. Table: Summary of Buildings on KPSTS with POL and HM Storage provides a summary of buildings on KPSTS that store POL or hazardous materials (HM).

Summary of Buildings on KPSTS with POL and HM Storage

Building Number	POL/HM
6	POL
10	POL/HM
12	POL
14	POL/HM
19	HM
35	HM
36	POL/HM
39	POL/HM
41	POL/HM
39005	POL/HM
39006	POL/HM
39009	POL/HM
39010	POL/HM

Used or waste chemicals including POL and solvents generated during maintenance operations are fully contained and removed off station for recycling or proper disposal. Pesticide usage at KPSTS is minimal and is handled by U.S. Navy Facilities Engineering Command (NAVFAC). A Pesticide Management Plan is in effect for the station (USAF 2007b).

Environmental Restoration Program

The ERP was established by DOD to ensure that military installations identify and evaluate suspected problems associated with past waste disposal actions. Within the ERP, the Installation Restoration Program

(IRP) addresses the releases of hazardous substances, pollutants, or contaminants from past commonly accepted practices on DOD installations that pose environmental health and safety risks. The IRP was initiated by the DOD to cost effectively assess and remediate environmental contamination at DOD facilities that occurred prior to 1984. Following the passage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, a.k.a. Superfund) of 1980, the DOD issued Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6 in June 1980, which mandated identification of hazardous waste disposal sites on DOD facilities. The USAF implemented DEQPPM 80-6 in December 1980 (USAF 1997).

As of November 2008, KPSTS has one active IRP site (remediation site ST01). Eight Areas of Concern (AOCs) were identified in 1996. Five of these AOCs were determined NFRAP, two were administratively closed, and one was incorporated into IRP site ST01 (USAF 2007a). IRP site ST01 is located near Building 39 and was associated with a fuel leak from a former 25,000-gallon underground storage tank (UST) and its associated piping. The former UST was installed in 1965 to service Building 39's power plant. Approximately 1,800 gallons of diesel fuel was reportedly released to the ground in 1972. The areas of contamination in ST01 are considered to be subsurface (3 to 9 feet below ground surface). Surface soils were found to be unaffected and sampling near Building 39 indicated possible contamination of the subsurface soils and a perched ground water feature with POL constituents. This site was not believed to have impacted storm water (USAF 2007b). A summary of active and previous IRP and AOC sites is presented in Table: Summary of Current IRP and AOC Sites.

Summary of Current IRP and AOC Sites

WIMS Site Code	Site Type	Description	Material Disposed/ Discovered	Remedial Actions	Status	Date of Final Action
ST01	IRP	UST Spill/Leak	Approximately 1,800 gallons of diesel fuel	Record of Decision	Active	Feb 2010
EA02	AOC	Day Tank Spill Area	See ST01	See ST01	Incorporated into IRP site ST01	NA
EA06	AOC	Base of Metal Platform	Lead and Chromium detected in surface soils	None	Administrati vely closed	N/A
EA08	AOC	500-gallon UST abandoned	Gasoline	Site Closure	Active	2014
TU500		3000 gallon UST removed in 1997, release of fuel occurred	Diesel Fuel	Site Closure	Active	2014
OT501		6 buildings built between 1959 & 1968 have peeling lead based paint	Lead and Chromium detected in surface soils	None	N/A	N/A
OT502		Discarded items observed on hillside down slope of Bldg 19	Chromium, Lead, Mercury, & Isopropyl toluene	Site Closure	Active	2014

WIMS Site Code	Site Type	Description	Material Disposed/ Discovered	Remedial Actions	Status	Date of Final Action
			detected in surface soils			
OT503		Discarded items observed on cliff side behind bldg. 33.	Chromium, Lead & Mercury, detected in surface soils	Site Closure	Active	2014

Sources: USAF 2007a, Hawaii DOH 2003, USAF 2003a, USAF 2003b, USAF 2003c, USAF 2010

Water Quality

Water quality changes in the surface drainages could occur during storm events. An increase in sedimentation might occur during construction activities; however the use of BMPs to minimize loose soils from leaving the site ameliorates any potential impacts that could occur. Hazardous materials are managed according to all applicable regulations and, therefore, should not affect water quality. Several BMPs are used at KPSTS to provide pollution prevention and good housekeeping.

KPSTS was issued a Notice of General Permit Conditions by the Hawaii DOH and maintains its SWMP. There are no known sources of illicit discharges at KPSTS. Should KPSTS become aware of any illicit discharges, steps will be taken immediately to correct the problem and to take measures to prevent any recurrence. Personnel at KPSTS have been made aware of the locations of drainage features and the drainage points for the various on-station facilities (USAF 2007b).

Control measures are in place at KPSTS to reduce pollutants in storm water runoff from any future construction activities that disturb an area greater than or equal to 1 acre, or that are part of a larger construction plan or development that disturbs 1 acre or more. It should be noted that there are no ongoing construction activities or anticipated plans for construction projects of this magnitude at KPSTS. If construction projects of this size do arise in the future, construction contractors will be required to conform to 40 CFR §122-124 regarding control of runoff from the construction site. Designers (i.e., Naval Facilities Engineering Command (NAVFAC) or the U.S. Army Department of Public Works) use the United Facilities Guide Specifications as a basis of contract requirements for the construction contractor. The specifications can be viewed at: *http://www.wbdg.org/ccb/browse_org.php?o=70*. The specifications require the construction contractor to provide BMPs for erosion and sediment control during construction, and for handling wastes including discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site. During the construction phase of such projects, these BMPs will be monitored by KPSTS personnel to ensure compliance with contractual requirements (USAF 2007b).

40 CFR §122.34(b)(6) mandates that for any storm water management program, there must be an operations and maintenance (O&M) program that includes a training component so that employees receive information on preventing and reducing storm water pollution. Due to the critical importance of the mission at KPSTS, there are rigorous O&M inspection programs in place, including frequent and periodic preventive maintenance inspections (USAF 2007b).

Noise

Noise is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Formal noise studies have not been conducted for KPSTS because there is no

regular air traffic for the installation. Helicopters are authorized to land at the installation for emergency evacuation of personnel (USAF 1997). KPSTS has applied to the Hawaii DOH for, and has been granted, a variance to its noise permitting requirements for operating the power plant.

Air Quality

The Hawaii Air Pollution Control Act (Hawaii Revised Statutes, Chapter 342B, Air Pollution Control) and Hawaii Administrative Rule (HAR), Title 11, Chapter 59, Ambient Air Quality Standards, and HAR, Title 11, Chapter 60.1, Air Pollution Control regulate the emissions of air pollutants into the atmosphere. These regulations cover emissions of any air contaminants, which include solid particles, liquid particles, vapors, or gases. The State of Hawaii, Department of Health, Clean Air Branch is the state's air quality regulatory authority. The primary services of the branch are provided by its three sections: Engineering, Monitoring, and Enforcement. These sections conduct engineering analysis and permitting, perform monitoring and investigations, and enforce the Federal and state air pollution control laws and regulations.

In 2004, it was determined that KPSTS should apply for an air permit to allow operation of its power plant generators as non-emergency sources. The application was completed and Hawaii DOH issued the permit in 2006, allowing KPSTS to operate the diesel-powered generators up to 100,000 gallons of fuel usage annually. KPSTS monitors the permit conditions and has maintained compliance, submitted its required periodic reports, and is regularly inspected by the Hawaii DOH.

Pest Management

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, regulates pesticide use. In 1996, the DOD signed a Memorandum of Understanding with USEPA to reduce the potential risks to human health and the environment associated with pesticides by adopting Integrated Pest Management (IPM) strategies. IPM is "a comprehensive approach to pest control or prevention that considers various chemical, physical, and biological suppression techniques; the habitat of the pest; and the interrelationship between pest populations and the ecosystem" (AR 200-5). The DOD committed to fully implementing IPM as a tool to help achieve a 50 percent reduction in its pesticide use by the end of FY 2000. The adoption of the IPM approach has been accepted as a policy approach that will reduce problems associated with pesticides.

Pests encountered at KPSTS are typical of the region and include black ants, roaches, centipedes, bees and wasps, rodents (i.e., mice and rats), spiders, and various weed plants. An *Integrated Pest Management Plan* was prepared for KPSTS in June 2006 (USAF 2006). NAVFAC Hawaii has been contracted by KPSTS to provide pest management services at KPSTS (USAF 2006). Pest management programs at KPSTS have the potential to affect natural resources. Presently, there is use of pesticides, herbicides, rodenticides, and insecticides to control pest populations. These chemicals are inherently toxic to most biological systems and, as such, often have no natural degradation pathways and can persist for long periods in the environment. The presence of such compounds can degrade the quality of soil, surface water, and groundwater. Wildlife and plant life could be detrimentally affected by any inadvertent contact with pest management chemicals.

Restricted Use pesticides are not generally used at KPSTS. The least toxic IPM techniques are used prior to the use of restricted pesticides. Typically, only nonchemical methods or General Use pesticides from the *Standard DOD Pesticide List* are used (AFPMB 2008). Pest management activities at KPSTS are accomplished in a manner that prevents these actions from impacting storm water or groundwater and that prevents drift of chemical pesticides onto, or runoff into, surface water or drainage ways. KPSTS uses pest management techniques that have the lowest possible chance of impacting endangered or protected species and environmentally sensitive areas through the selection of the most effective, least toxic formulations and

application techniques. Least toxic IPM techniques (i.e., mechanical removal, mulching) are used unless chemical herbicides are required to manage noxious weeds (USAF 2006).

NAVFAC Hawaii pest management personnel are trained in the proper handling, mixing, and application of chemical pesticides and in the proper methods and reporting requirements associated with an accidental release and cleanup of chemical pesticides. Pest management vehicles are equipped with spill kits.

USAF installations receive guidance for pest management programs from DODI 4150.07, *DOD Pest Management Program*, and Air Force Instruction (AFI) 32-1053, *Pest Management Program*, which meets or exceeds DODI 4150.07. DODI 4150.07 states that it is DOD policy to establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that might adversely impact readiness or military operations by affecting the health of personnel or damaging structures, material, or property. It sets the Measures of Merit for base pest management, which are as follows: Merit 1—all DOD bases will have a Pest Management Plan prepared, reviewed, and updated annually by the end of FY 1997; Merit 2—by the end of FY 2000, DOD bases will reduce the amount of pesticides applied annually by 50 percent from the fiscal year (FY) 1993 baseline in pounds of active ingredients; and Merit 3—by the end of FY 1998, all DOD Base pesticide applicators will be properly certified within 2 years of use. IPM should use mechanical, physical, cultural, biological, and educational methods to maintain pests at populations low enough to prevent undesirable damage or annoyance. In addition, application of the least toxic chemical should be used as a last resort.

Typical Installation Pest Management Plans outline and describe policies, standards, and requirements for personnel (e.g., KPSTS and NAVFAC Hawaii) in performing all operations in connection with the Pest Management Program at an installation and are consistent with DODI 4150.7. See the *Integrated Pest Management Plan* for details.

Socioeconomics and Environmental Justice

Socioeconomics

Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Socioeconomic data permit characterization of baseline conditions and trends in a given area. The population of the area surrounding the installation in 2000 (Census Tracts 98.01 and 99.01 of Honolulu County, Hawaii) was 8,117 (U.S. Census Bureau 2008). The average per capita income in 2000 in these two census tracts was approximately $19,432 and $19,509, respectively, and the unemployment rate was approximately 7.4 percent and 4.1 percent, respectively. The Kaena Point region has a diverse work force with the majority distributed evenly among the management/professional sector, service sector, and sales sector (U.S. Census Bureau 2008).

Environmental Justice

On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The essential purpose of the EO is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies. Consideration of environmental justice concerns includes

race, ethnicity, and the poverty status of populations in the vicinity of where a proposed action would occur. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

On April 21, 1997, the President issued EO 13045, Protection of Children from Environmental Health Risks and Safety Risks. This EO requires Federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. The EO further requires Federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. The order defines environmental health and safety risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on, and the products we use or are exposed to)." Such information aids in evaluating whether a proposed action would render vulnerable children targeted for protection in the EO.

The percentage of the population in the region of influence considered to be potentially impacted in relation to environmental justice concerns is considered negligible. No minority or low-income populations would be expected to be adversely or disproportionately impacted. Accordingly, a detailed examination of environmental justice of the surrounding areas has been dismissed from further analysis.

EO 13045 requires that Federal agencies identify and assess environmental health and safety risks that might disproportionately affect children. The Proposed Action of implementing the INRMP would not pose any adverse or disproportionate environmental health risks or safety risks to children in the areas associated with the Proposed Action. The likelihood of the presence of children at KPSTS would be considered minimal, which further limits the potential for any impacts. Accordingly, a detailed examination of health and safety risks that might disproportionately affect children has been dismissed from further analysis.

2.4.4 Potential Future Impacts

Known future mission impacts at KPSTS would include continuation of current impacts as described above, and additional impacts due to new missions or mission components.

2.4.5 Natural Resources Needed to Support the Military Mission

Natural resources needed to support the military mission at KPSTS include areas that maintain flexibility for future mission requirements; water quality functions; stable soils for future development and mission support; and habitat and species that provide positive aesthetic, social, and recreational attributes, which substantially contribute to the overall quality of life. Their management is addressed in this INRMP and its associated operational component plans.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The AF environmental program adheres to the Environmental Management System (EMS) framework and it's Plan, Do, Check, Act cycle for ensuring mission success. Executive Order (EO) 13693, *Planning for Federal Sustainability in the Next Decade*, U.S. Department of Defense Instruction (DoDI) 4715.17, *Environmental Management Systems*, AFI 32-7001, *Environmental Management*, and international standard, ISO 14001:2004, provide guidance on how environmental programs should be established, implemented, and maintained to operate under the EMS framework.

The natural resources program employs EMS-based processes to achieve compliance with all legal obligations and current policy drivers, effectively managing associated risks, and instilling a culture of

continuous improvement. The INRMP serves as an administrative operational control that defines compliance-related activities and processes.

4.0 GENERAL ROLES AND RESPONSIBILITIES

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

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
Installation Commander	The Commander of the Detachment 3, 21st Space Operations Squadron (Det 3, 21 SOPS) serves as the Chairman of the KPSTS ESOHC. In this capacity, the Det 3, 21 SOPS Commander (CC) will ensure the implementation of the INRMP to the fullest extent practicable based on funding and manpower availability. The final approval of the INRMP and any future changes rest with Det 3, 21 SOPS CC.
AFCEC Natural Resources Media Manager/Subject Matter Expert (SME)/ Subject Matter Specialist (SMS)	Kevin Porteck, AFCEC…
Installation Natural Resources Manager/POC	Lance H. Hayashi, Det 3, 21 SOPS/CE/Chief of Civil Engineer
Installation Security Forces	MSgt Barry Karpinski, Det 3, 21 SOPS/Security Manager
Installation Unit Environmental Coordinators (UECs); see AFI 32-7001 for role description	Primary: Lynn Cruz, Det 3, 21 SOPS/CEV Environmental Support Contractor Alt: Lance Hayashi, Det 3, 21 SOPS/CE
Installation Wildland Fire Program Manager	Lance H. Hayashi, Det 3, 21 SOPS/CE
Pest Manager	LeeRoy Wymer, Det 3, 21 SOPS/CEO, Chief of Civil Engineer Operations
Range Operating Agency	N/A
Conservation Law Enforcement Officer (CLEO)	N/A
NEPA/Environmental Impact Analysis Process (EIAP) Manager	Lance H. Hayashi, Det 3, 21 SOPS/CE Chief of Civil Engieer
National Oceanic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS)	N/A
US Forest Service	N/A
US Fish and Wildlife Service	The USFWS may provide technical assistance to KPSTS. Specifically, this agency will alert the Det 3, 21 SOPS Environmental Staff whenever new species that have the potential for inhabiting the station are added to the Federal or state endangered species lists. In addition, this agency should support KPSTS personnel during scheduled wildlife and vegetation surveys. This agency is a signatory on this INRMP.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
US Department of Agriculture – Wildlife Services	The DOFAW contracts the U.S. Department of Agriculture Wildlife Services (USDA-WS) to monitor nuisance wildlife at KPSTS and eradicate individuals as needed.
Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW)	The DOFAW may provide technical assistance to KPSTS. Specifically, this agency will alert the Det 3, 21 SOPS Environmental Staff whenever new species that have the potential for inhabiting the station are added to the Federal or state endangered species lists. In addition, this agency should support KPSTS personnel during scheduled wildlife and vegetation surveys. This agency is a signatory on this INRMP.
Chief of Civil Engineer— Det 3, 21 SOPS	The Det 3, 21 SOPS Civil Engineer (CE), together with the 50th Space Wing Civil Engineering Squadron Site Support, plans, budgets, approves, and oversees all maintenance, environmental, and construction activities performed on the installation. All projects or management activities proposed in this INRMP should be approved by the installation CE to ensure that (1) funding is available, and (2) these projects are complementary to the installation comprehensive planning process.
Environmental— Det 3, 21 SOPS	The Environmental Staff has responsibility for ensuring that activities associated with the implementation of this INRMP adhere to applicable Federal, state, local, and Air Force environmental regulations and guidelines. Deviation from the projects proposed in this INRMP should be independently reviewed by the installation CE. The Environmental Staff will be responsible for the overall implementation of the INRMP. Environmental Staff will be assisted by key installation personnel from the host unit (i.e., the 50th Space Wing). The Environmental Staff will meet and coordinate frequently with other established committees/working groups to ensure the implementation of the INRMP. The Environmental Staff, in conjunction with the Public Affairs Office (PA), is responsible for establishing and implementing a conservation education program to instruct installation personnel on the protection and enhancement of biological diversity on KPSTS. The Environmental Staff directs most of the ongoing natural resources management activities presented in this INRMP. Environmental Staff will act as a technical point-of-contact for those natural resources-related activities for which the Environmental Staff is not directly responsible.
Legal—50th Space Wing	The Legal Office is responsible for ensuring that the implementation of the management objectives contained within this INRMP meet regulatory and statutory requirements. The Legal Office will review any future natural resources management proposals and alert the Det 3, 21 SOPS CC and the Det 3, 21 SOPS CE should there be any regulatory conflicts or shortfalls. In addition, the legal office will keep staff informed

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
	of any new statutes or regulations that might affect natural resources management on the installation.
Public Affairs—15th Airlift Wing	The 15 AW/PA at Hickam AFB is tasked with public relations and media interface for KPSTS through a host tenant support agreement. Although Public Facilities/Recreation land is not present within KPSTS, the installation provides public access, via Road A and Road B, to adjacent State lands for hunters or hikers who have obtained the proper hunting license or permit from the Hawaii Department of Land and Natural Resources.
KPSTS Operations and Maintenance Office — Det 3, 21 SOPS	The KPSTS Operations and Maintenance Office is responsible for majority of grounds maintenance activities on the installation. In addition, this office will ensure that the habitat management protocols established in this INRMP for the conservation of biodiversity on KPSTS are followed. The Operations and Maintenance Office will also periodically review the types and condition of grounds maintenance equipment to determine if new or additional equipment is needed for the proper maintenance of the installation's landscapes.

5.0 TRAINING

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

Installation Supplement – Training

Guidance from AFI 32-7064

Natural resource management (NRM) personnel must take the course, DoD Natural Resources Compliance, endorsed by the DoD Interservice Environmental Education Review Board and offered for all DoD Components by the Naval School, Civil Engineer Corps Officers School (CECOS).

NRM personnel shall be encouraged to attain professional registration, certification, or licensing for their related fields, and may be allowed to attend appropriate national, regional, and state conferences and training courses.

All individuals who will be enforcing fish, wildlife and natural resources laws on AF lands must receive specialized, professional training on the enforcement of fish, wildlife and natural resources in compliance with the Sikes Act. This training may be obtained by successfully completing the Land Management Police Training course at the Federal Law Enforcement Training Center (http://www.fletc.gov/).

Individuals participating in the capture and handling of sick, injured, or nuisance wildlife should receive appropriate training, to include training that is mandatory to attain any required permits.

The DoD supported publication Conserving Biodiversity on Military Lands -- A Handbook for Natural Resources Managers (http://dodbiodiversity.org) provides guidance, case studies and other information regarding the management of natural resources on DoD installations.

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

- Protecting Natural Resources at KPSTS: From the Spread of Invasive Species

6.0 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

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

Installation Supplement – Recordkeeping

N/A

6.2 Reporting

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

Installation Supplement –Reporting

N/A

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

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

Installation Supplement –Natural Resources Program Management

Natural resources program management involves the integration of numerous management areas, including coordination among stakeholders, geographic information systems (GIS), fish and wildlife management, threatened and endangered species management, water resources and wetlands protection, grounds maintenance, management of the urban forest, agricultural outleasing, wildland fire management, integrated pest management, outdoor recreation, cultural resources protection, enforcement, and public outreach. This section describes current management practices employed at KPSTS and identifies management issues that need to be addressed to preserve and protect the natural resources. Through a

holistic approach, management goals and objectives as well as projects can be identified to address these key areas.

7.1 Fish and Wildlife Management

Applicability Statement

This section applies to all AF installations that maintain an INRMP. KPSTS **IS** required to implement this element.

Program Overview/Current Management Practices

For the purposes of this INRMP, wildlife management is defined as manipulation of the environment and wildlife populations to produce desired objectives. The installation's habitats are primarily used by a variety of nonnative species rather than by native species. The primary goal of wildlife management at KPSTS is to establish native species on the installation.

The basis of managing a rich assemblage of wildlife is to provide a mosaic of habitats that are structurally and biologically diverse. In managing for a diversity of habitats and diversity within those habitats, the potential exists for numerous species to be found. KPSTS should employ five basic techniques for managing wildlife.

- Controlling Invasive Species. KPSTS should continue to control and monitor invasive species at the station. Control of invasive species at sites should halt or reverse the degradation of habitat and enhance biological diversity at the sites.
- Controlling Predators and Nonnative Species. KPSTS should continue to coordinate predator and nonnative species control efforts with the USDA WS and the DOFAW.
- Monitoring Wildlife. Implement monitoring surveys. Creating, monitoring, and updating GIS data on wildlife species will allow KPSTS to store, retrieve, present, and analyze the data to make informed management decisions.
- Restoring Barren Areas. Environmental Office Staff should identify barren areas and restore them using native species.
- Managing for Migratory Birds. MBTA provides for a year-round closed season for nongame birds and prohibits the taking of migratory birds, nests, and eggs, except as permitted by the USFWS. The USFWS recommends avoiding impacts on birds protected under the MBTA by surveying for nesting birds in areas proposed for disturbance and, if necessary, waiting until the nesting and fledging process is complete. Alternatively, the USFWS recommends that conducting activities outside of nesting areas or outside of the general migratory bird nesting season that extends from March through August can help avoid direct impacts.

Techniques for managing rare, threatened, or endangered species will be discussed in the Management of Threatened and Endangered Species, Species of Concern and Habitats Section. In addition, it is DOD policy to promote and support a partnership role in the protection and conservation of neotropical migratory birds and their habitat by protecting vital habitat, enhancing biological diversity, and maintaining healthy and productive natural systems on DOD lands consistent with the military missions. Therefore, the DOD is a participant in the Partners in Flight program.

A summary of the Wildlife and Fisheries management goals is provided in Table: Summary of Fish and Wildlife Management Goals.

Summary of Fish and Wildlife Management Goals

Fish and Wildlife Management Goals
• Manage based on an ecosystem-management approach, rather than from a single-species paradigm. • Employ a systematic approach to managing wildlife resources, utilizing a process that includes inventory, monitoring, modeling, management, and assessment. • Balance the management needs of the ecosystem (e.g., nongame species, biodiversity, ecosystem functions) with a sustainable wildlife harvest program. • Minimize wildlife-related health risks, safety risks, and environmental damage. • Continue to remain in compliance with Federal, state, and local laws and regulations governing fish and wildlife. • Maintain and involve partnerships with agencies and groups involved in wildlife management. • Ensure that fish and wildlife management, and the entire INRMP, support the State of Hawaii's Comprehensive Wildlife Conservation Strategy.

FWM-1: Establish a Flora and Fauna Monitoring Program

Concern: KPSTS is lacking in biological information to effectively manage wildlife.

Objective: Protect, restore, and maintain viable populations of native species found in the ecosystem, including rare, threatened, or endangered flora and fauna species, in accordance with state and Federal laws and regulations, and adhering to the principles of ecosystem management. Establish and conduct planning-level surveys on the installation as deemed necessary.

Actions:

1. Conduct surveys to assess, at a minimum, floral, avian, mammalian, and insect species and populations. This survey should include the following:
    a. Detailed survey protocols and established timelines for their completion to ensure that KPSTS personnel maintain the most current data available concerning the resources they are managing.
    b. A comparison of previous survey data to assess temporal trends in population and habitat conditions.
    c. Information from the USFWS, DOFAW, and other local experts.
2. Incorporate biological survey data into the INRMP as they are collected.

Monitoring Criteria: Continue to monitor plant and wildlife populations (at least once every five years) and conduct new biological surveys as needed (at a minimum, prior to permanently impacting vegetated habitat).

FWM-2: Predator and Nonnative Species Control

Concern: The installation's habitats are primarily used by nonnative species. The reestablishment of native species could be limited by the presence of predators such as feral cats and nonnative species such as feral pigs. Feral pigs are not considered a pest outside of KPSTS since the area is classified as a Game Management Area.

Objectives: Reduce predation on native species by predator species such as mongoose, feral cats, and dogs. Reduce the impact of nonnative species such as the feral pig to native species.

Actions:

1. Continue to coordinate with the USFWS, the USDA WS program, and the DOFAW for ongoing control on the installation.
2. Determine effective trapping methodologies and hunting strategies.
3. Survey for predator and nonnative species activity.
4. Ensure perimeter fence is re-enforced.

Monitoring Criteria: Continue to monitor wildlife populations and predator and nonnative species activity.

FWM-3: Periodic Review of the State of Hawaii's Comprehensive Wildlife Conservation Strategy

Concern: The State of Hawaii's Comprehensive Wildlife Conservation Strategy (Hawaii DOLNR 2005) is used as a management tool for the adjacent state lands.

Objectives: Ensure the installation's activities support the Comprehensive Wildlife Conservation Strategy.

Actions:

1. Periodically review the Comprehensive Wildlife Conservation Strategy. It is available online at: http://dlnr.hawaii.gov/wildlife/cwcs/
2. Coordinate with DOFAW to insure management actions on the installation support the goals of the Comprehensive Wildlife Conservation Strategy.

Monitoring Criteria: Conduct periodic reviews of the Comprehensive Wildlife Conservation Strategy which is revised every 10 years. The next revision will be in 2010.

7.2 Outdoor Recreation and Public Access to Natural Resources

Applicability Statement

This section applies to all AF installations that maintain an INRMP. The installation **IS** required to implement this element.

Program Overview/Current Management Practices

People and social uses/needs are an integral part of ecosystem management. The outdoor recreation program is based on providing quality experiences while sustaining ecosystem integrity. Activities that have a direct effect on species populations such as game harvest or soil erosion from hiking trails will be monitored to determine effects, and adaptive management incorporated to mitigate negative impacts. From these general outdoor recreation management philosophies have been developed a series of goals and objectives that have been used to identify management issues and actions to address them. A summary of the goals used for managing outdoor recreation resources is provided in Table: Summary of Outdoor Recreation/Public Access Management Goals.

Summary of Outdoor Recreation/Public Access Management Goals

Outdoor Recreation and Public Access Management Goals
• Provide the public access to adjacent game management area while sustaining ecosystem integrity.

Outdoor Recreation and Public Access Management Goals
• Ensure that public access and the related activities are not in conflict with mission priorities.

OR-1: Public Access, General Safety, and Security

Concern: The consequences of public access regarding general safety and the operational security of the mission should be evaluated.

Objective: Ensure the public access protocol is compatible with KPSTS's mission.

Action:

1. Evaluate the public access protocol.
2. A DOFAW training manual for hunting regulations should be incorporated into the security protocol.

Monitoring Criteria: Continually review the public access protocol to ensure that a safe, secure environment compatible with KPSTS's mission is being maintained.

OR-2: Establish a Watchable Wildlife Site

Concern: Public recreation on the installation is limited as an access point for the Kuaokala Game Management Area.

Objective: Establish a Watchable Wildlife bird and whale watching site at the installation, as outlined in AFI 32-7064, para 10-4.

Action:

1. Erect interpretive signs that include information on birds that commonly occur in the area, an explanation and diagrams of wind dynamics near coastal bluffs, and information on whale migration patterns and whale species that can be seen from the bluff, and native plant species that occur on the nearby rock outcroppings.
2. Install a safety rail and a picnic table.

Monitoring Criteria: Continually review the public's interest in the Watchable Wildlife site and possible impacts this site can have on the natural resources at the installation.

7.3 Conservation Law Enforcement

Applicability Statement

This section applies to all AF installations that maintain an INRMP. KPSTS **IS** required to implement this element.

Program Overview/Current Management Practices

The Sikes Act makes the Secretary of each military department responsible for employing sufficient numbers of professionally trained natural resources personnel, and ensures natural resources law enforcement personnel are available and assigned responsibility to carry out all of Title 16 – Conservation, including the preparation and implementation of INRMPs (16 USC 670e-2). It also authorizes DoD to enforce all federal environmental laws, including the National Historic Preservation

Act, Archeological Resources Protection Act, Migratory Bird Treaty Act, Clean Water Act, and Endangered Species Act when violations occur on the installation. DoDI 4715.03 (March 18, 2011) further states that "DoD components shall coordinate with appropriate agencies to support conservation law enforcement to enforce Federal and applicable State laws and regulations pertaining to the management and use of the natural resources under their jurisdiction." Historically, no conservation law enforcement measures or activities have been conducted on KPSTS due to an apparent lack of violations of natural resource laws and regulations. This lack of natural resources law enforcement implementation on the installation has negated the need for conservation law enforcement training and certifications.

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

Applicability Statement

This section applies to AF installations that have threatened and endangered species on AF property. This section **IS** applicable to KPSTS.

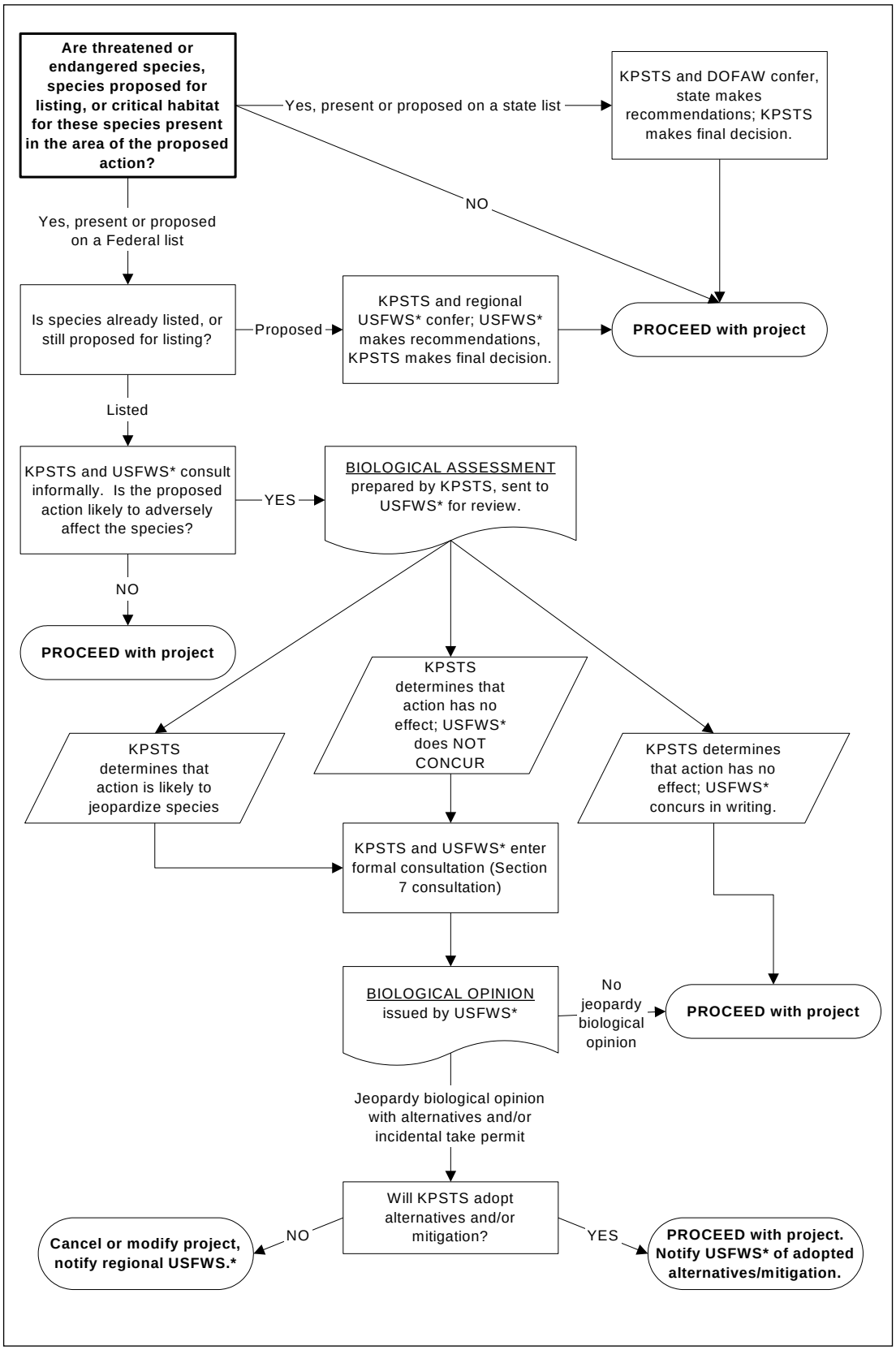
Program Overview/Current Management Practices

The Endangered Species Act (ESA) of 1973 (P.L. 93-205) protects fish, wildlife, and plants that are considered federally threatened or endangered. Endangered and threatened species may be in jeopardy due to destruction, modification, or curtailment of habitat, over utilization, effects of disease, pollution, or predation. Species likely to become threatened in the foreseeable future may be listed as rare, protected, candidate, or species of special concern. In addition to individual species, some rare, natural vegetation ecosystems may also be protected.

Table: Federally Listed Species Found in Kaena Point NAR and Pahole NAR provides a list of federally listed species found in Kaena Point NAR and Pahole NAR. As summarized in Table: Summary of Threatened and Endangered Species Protection Management Goals, the goal for this section is to manage KPSTS on a regional ecosystem-based approach that manages potential habitat for such species while protecting the operational functionality of the installation's missions. For future reference should federally listed species or their critical habitat be documented on the base, Figure: Threatened and Endangered Species Coordination Chart presents an endangered species coordination decision chart that would be followed as part of the planning process for projects that would impact those species or habitats on the installation.

Summary of Threatened and Endangered Species Protection Management Goals

Threatened and Endangered Species Management Goals
• Manage KPSTS on a regional ecosystem-based approach that manages for potential sensitive species habitat while protecting the operational functionality of the base's missions. • Ensure that KPSTS remains in compliance with ESA and appropriate state regulations. • Promote natural resources and ecosystem management in the local region that benefits the functionality of KPSTS ecosystems.



Threatened and Endangered Species Coordination Chart

TE-1: Update Biological Inventory

Concern: A resource inventory report of KPSTS was conducted in 1996 (USAF 1996). This report included surveys for threatened and endangered species.

Objective: As part of the annual INRMP review, determine if new species have been listed in the vicinity of KPSTS as Federal threatened or endangered species. Refer to the USFWS Web site: http://www.fws.gov/endangered/ to obtain this information. If new species have been added, consider conducting an update to the base biological survey at the time of the 5-year INRMP revision.

Actions:

1. Conduct an updated survey of potential occurring federally listed threatened and endangered species. Given the extent of the 1996 survey, this effort need not be extensive and should focus only on a reconnaissance of the potential habitats on the installation where newly listed species of concern might likely occur.

Incorporate findings into relevant planning documents and the INRMP as part of the annual review.

Monitoring Criteria: Updated surveys of potentially occurring federally listed threatened and endangered species, state-listed species, and species of special concern. If federally listed species are found, initiate informal consultation with the USFWS, as required by Section 7 of the ESA.

7.5 Water Resource Protection

Applicability Statement

This section applies to AF installations that have water resources. This section **IS** applicable to KPSTS.

Program Overview/Current Management Practices

Watershed protection is important to natural resources management because it directly affects surface water quality and the value of aquatic habitats. KPSTS currently protects the surrounding watershed through compliance with its SWMP, as well as a number of Federal, state, local, and USAF environmental regulations that require the installation to have detailed spill control and response procedures and to implement storm water pollution prevention BMPs. The objective of these regulations is to prevent pollutants (e.g., fuels, solvents, sediments) from entering the watershed, thus protecting surface waters. The watershed protection management objectives and actions presented in this INRMP are designed to reduce/control nutrient and sediment inputs into the surrounding watershed. A summary of the watershed management goals is presented in Table: Summary of Watershed Protection Management Goals.

Summary of Watershed Protection Management Goals

Watershed Protection Management Goals
• Reduce/control nutrient and sediment inputs into the watershed that degrade water quality. • Manage and repair existing and new roads in a manner that minimizes the potential for erosion and sedimentation. • Minimize nonpoint source pollution of both surface and groundwater in the watershed through the implementation of BMPs and the ongoing maintenance of existing BMPs. • Minimize, to the extent practicable, impervious surfaces within the installation and consider use of permeable pavement materials for future construction of parking areas, helipad surfaces, etc. • Gain an understanding of ecosystem dynamics within the watershed in an effort to prevent and respond to threats to its integrity.

In addition, several topics of concern have been identified. The following watershed topics of concern, objectives, and actions are designed to meet the watershed management goals of this INRMP.

WP-1: Erosion Prevention Program

Concern: On-installation land-disturbing activities could cause erosion and sedimentation if disturbed areas are not protected by adequate erosion and sedimentation controls.

Objective: Continue the implementation of the SWMP to avoid, minimize, or mitigate impacts from erosion.

Actions:

- Identify, inventory, and map areas at high risk for erosion in order of priority (i.e., road banks, unvegetated areas). Gathered data should then be entered into the AutoCAD / Geographical Information System (GIS) database and monitored to identify any new erosion problems.
- Consult with the NRCS on conservation practices and assistance with prioritizing problem areas.
- Promptly revegetate exposed areas after construction or maintenance activates. Only native species, derived from local seed sources (if available) should be used for these purposes. Consult with the local office of the USFWS or DOFAW for additional guidance
- Monitor revegetation efforts annually.

Monitoring Criteria: Disturbed areas and areas with high erosion potential are stabilized with appropriate native vegetation.

WP-2: Implement the Control Measures Presented in the Storm Water Management Plan

Concern: The discharge of pollutants can adversely affect local water quality and put the installation in violation of its storm water permit issued by the State of Hawaii Department of Health, Clean Water Branch.

Objective: Continue to implement the six control measures presented in the SWMP. Reduce the discharge of pollutants to the maximum extent practicable. Implement BMPs and minimum control measures to protect local water quality.

Actions:

1. Control Measure 1 – Public Education and Outreach
2. Control Measure 2 – Public Participation and Involvement
3. Control Measure 3 – Illicit Discharge Detection and Elimination
4. Control Measure 4 – Construction Site Storm Water Runoff Control
5. Control Measure 5 – Post-Construction Storm Water Management
6. Control Measure 6 – Pollution Prevention and Good Housekeeping.

Monitoring Criteria: Control measures are implemented and the discharge of pollutants is reduced.

7.6 Wetland Protection

Applicability Statement

This section applies to AF installations that have existing wetlands on AF property. This section **IS NOT** applicable to KPSTS.

Program Overview/Current Management Practices

There are no wetlands or floodplains on KPSTS, but the installation should be aware of the regulations associated with the wetlands or water bodies in the vicinity of the installation. The goal for wetland and floodplain management is summarized in Table: Summary of Wetlands and Floodplains Management Goals.

Summary of Wetlands and Floodplains Management Goals

Wetlands and Floodplains Management Goals
• Remain in compliance with USACE, USEPA, and State of Hawaii regulations regarding wetlands, water bodies, or floodplains on properties adjacent the installation.

WT-1: Remain in compliance with USACE, USEPA, and State of Hawaii's wetland regulations.

Concern: There are no wetlands or floodplains on KPSTS, but the installation should be aware of the regulations associated with the wetlands or water bodies in the vicinity of the installation.

Objective: Remain in compliance with USACE, USEPA, and the State of Hawaii's wetland regulations.

Actions:

1. Comply with the CWA, NEPA and other applicable EOs and regulations when planning and completing construction activities.

Monitoring Criteria: KPSTS activities have no adverse effect on wetlands in the vicinity of the installation and remain in compliance with federal and state regulations.

7.7 Grounds Maintenance

Applicability Statement

This section applies to AF installations that perform ground maintenance activities that could impact natural resources. This section **IS** applicable to KPSTS.

Program Overview/Current Management Practices

Environmentally and economically beneficial landscaping practices can reduce maintenance costs while also providing wildlife habitat. Planting windbreaks around buildings and parking areas, establishing wildflower areas, reducing mowing, and use of IPM techniques are all ways to spend dollars more wisely, educate the public about the benefits of reduced maintenance, and become better stewards of the environment. To ensure compliance with the 1994 Memorandum on Environmentally and Economically Beneficial Practice on Federal Landscaped Grounds; EO 13112, Invasive Species; and EO 13148, Greening the Government Through Leadership in Environmental Management, only native vegetation will be used in grounds landscaping.

The following are guidelines for grounds management:

- Use selective landscaping and vegetative management, including pruning, cutting, or planting, to provide for regeneration, shrub development, pest hazard reduction, and site stabilization.
- Where appropriate, plant shelter belts of shrubs around the borders of parking lots and near buildings. Choose shrubs that provide food and cover for wildlife, with preference for native species. Shrubs should be spaced about 4 to 6 feet apart. To create shelter belts, plant several rows of larger shrubs and smaller shrubs with rows about 15 feet apart.

- Native species should be considered for use in landscape plantings.

In the process of identifying grounds maintenance and land management actions, a list of goals (see Table: Summary of Grounds Maintenance Management Goals) was generated that was used to create management objectives for ecological sustainability.

Summary of Grounds Maintenance Management Goals

Grounds Maintenance Management Goals
• Lessen or avoid adverse effects from project activities to the overall ecosystem and its sensitive resources. • Make maximum use of regionally native plant species and avoid introduction of invasive, nonnative species in revegetation and landscaping activities. • Reduce chemical usage, and maintenance inputs in terms of energy, water, manpower, equipment, and chemicals. • Ensure compliance with environmental legislation, regulations, and guidelines. • Control pest and invasive species on the installation. • Manage for wild fire prevention.

Based on these goals, a series of items have been identified in the following subsection that provides workable management actions through which the grounds maintenance goals can be reached. The topics of concern and associated goals and objectives involving grounds maintenance are presented below.

GM-1: Landscape and Revegetation Plan

Concern: The soils on KPSTS have a moderate to severe erosion hazard and 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.

Objective: Avoid erosion and sediment transport following activities that disturb the vegetative cover or the soil surface.

Actions:

1. 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, brush removal, and other disturbances.
1. Seed areas that are currently bare with native grass mix. Only native species, derived from local seed sources (if available) should be used for these purposes.
2. Monitor revegetation efforts for effectiveness and modify as needed.

Monitoring Criteria:

1. A revegetation plan that is understood and implemented by the various installation organizations and contractors involved in disturbance activities on the installation.
2. Conversion of bare areas to uniform coverage with native grasses.

3. Documented monitoring activities (e.g., evaluation of ground cover establishment, amount of bare ground not covered with vegetation/other stabilization mechanisms, evidence of erosion) show successful revegetation and no evidence of erosion or sediment transport into local waterways.

GM-2: IPM Plan

Pest management objectives at KPSTS include the protection of real estate, control of potential disease vectors or animals of other medical importance, control of undesirable or nuisance plants and animals (including insects), and prevention of damage to natural resources.

DODI 4150.07 states that it is DOD policy to establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that might adversely impact readiness or military operations by affecting the health of personnel or damaging structures, material, or property. KPSTS currently implements an IPM Program. This method of pest management involves four primary control strategies: mechanical and physical control (physical removal or exclusion of pests), cultural control (altering the environment to make it less suitable or attractive to the pest), biological control (use of other organisms that control the pest), and chemical control (use of pesticides and herbicides). AFI 32-1053, *Pest Management Program*, defines a policy to conduct effective pest management programs, and establishes responsibilities and procedures for pest management at USAF installations.

Protection of Real Estate

Protection of real estate from depreciation requires that animals (including insects) that seek refuge or other life necessities within human dwellings in a manner that causes damage to structures be controlled or prevented from entering the dwellings. Animals seek refuge inside human dwellings because the dwellings can provide warmth, protection from the elements, and materials or locations for nest building.

Many animals are attracted to human dwellings, including rodents, birds, and feral cats. However, those that enter and cause damage at KPSTS are not numerous. Rodents cause damage to structures and fixtures within buildings at KPSTS in their search for food, nesting materials or sites, warmth, or shelter. They can gain entry through small openings, but often enlarge these openings to suit their needs. They also use materials found within human dwellings, such as insulation for nesting material, and gnaw on loose or obstructive objects, such as electrical wiring or the outside corners of structures, in an effort to make their surroundings more suitable to themselves. The odors from their feces and urine also can be damaging to the value of the structures. Pest management at KPSTS includes control of these animals to prevent serious structural damage.

Control of Potential Disease Vectors or Animals of Other Medical Importance

The control of potential disease vectors or animals of other medical importance is important for the protection of human life and well-being. Animals that carry diseases or can cause other medical problems are attracted to human dwellings in search of food and shelter or egg-laying sites. They also might be transported to human dwellings by people themselves or by other animals. Transmission of disease to humans is passive, and nondisease medical problems (e.g., bites and stings) are the result of an animal's need for food or self-protection.

Flies are attracted to human dwellings by odors in their search for food and organic materials on which to lay eggs. Cockroaches establish themselves in human dwellings in search of food and shelter. Fleas are transported to human dwellings by other animals and might establish themselves in carpeting or furniture if a continuing source of food (i.e., blood) is available. Birds might seek nesting sites in protected locations on the outside of buildings and occasionally in protected locations inside buildings. Their nests can harbor

disease-carrying organisms. All of these types of animals, although they themselves are not harmful to humans, can potentially transmit diseases to humans. Their establishment in human dwellings or in close proximity to humans must, therefore, be prevented or controlled to the extent that the likelihood of disease transmission is very small.

Rodents can carry diseases internally, and pass them to humans through bites that might occur if the animals are disturbed or threatened. Rodent nests and rodent feces also can harbor other disease-carrying organisms or disease vectors.

Bees and wasps that nest on or near human dwellings will sting or bite humans when disturbed or threatened. Generally, these injuries are only painful and do not cause long-term problems, although some individuals might be sensitive to the stings of certain insects, and the bites of poisonous snakes can be dangerous.

Control of Undesirable Nuisance Animals (including insects)

Animals that are nuisances when in human dwellings are controlled to make the dwellings more enjoyable to inhabit, but these animals generally do not pose any real threat to humans. Spiders, ants, earwigs, crickets, stray bees, wasps, or hornets that gain entry to dwellings can be nuisances. Moths or beetles might create a nuisance if they establish themselves in stored food products, and some species can damage fabrics. Birds that nest on dwellings or that search for food in the materials of dwellings are sometimes a nuisance. Stray dogs and cats can become nuisances if they become accustomed to the presence of humans or to finding food near human dwellings, cause damage to grounds around dwellings, or gain entrance to dwellings. .

Some animals mostly constitute a nuisance but have the potential to cause other problems, such as structural damage or the spread of disease. These animals include cockroaches, flies, fleas, some ants, and rodents. The problems associated with these animals are discussed elsewhere in this section.

Most animals that are no more than nuisances only need to be controlled when their presence is substantial enough that they affect morale or the comfort of dwellings, or they present a potential danger to installation personnel. Their presence might be seasonal, and they can generally be controlled on a case-by-case basis. A plan for their control is generally not necessary.

Prevention of Damage to Natural Resources

Wetlands, birds, mammals, amphibians, reptiles, and insects can be negatively affected by pesticide use. For example, neotropical migratory birds, which pass through KPSTS, feed primarily on insects and fish. Pesticides that are sprayed to kill insects can accumulate in the tissues of higher mammals that eat the insects and fish. This process is called bioaccumulation and can eventually lead to the death of the bioaccumulator. For this reason, nonchemical means of control for insects should be used if possible. The guidelines for pest management operations are provided below:

- Use mechanical or biological control methods whenever feasible and economical. Only apply pesticides when no biological or mechanical control method can be found, or such controls are prohibitively expensive.
- By law, all pesticides must be applied according to label specifications. Never exceed the manufacturer's recommended dosage for pesticides, apply only to the target pests identified on the label, wear required safety clothing, and apply the lowest labeled pesticide rate that adequately controls pests. Lower rates reduce the total amount of chemical in the environment. Rotate

pesticides among chemical families to minimize pest resistance. IPM does not rely on continuous use of a single pesticide or pesticide family.

- Apply all chemicals according to manufacturer's instructions and away from drainages.
- Only certified pesticide applicators are authorized to purchase and spray pesticides. All applicators must become certified and should remain current in new developments in pest management.
- Use rapidly degrading pesticides, which are less likely to contaminate soil and groundwater.
- Pesticides should be applied at a time when they will be most effective against the pest. Pest cycles are influenced by temperature and moisture conditions. In many cases, pests under dormant or stressed conditions might not be susceptible to pesticide treatments. Avoid pesticide applications during adverse weather, especially windy, wet conditions. Do not apply volatile chemicals under high-temperature conditions.
- Keeping accurate records of all agricultural chemicals applied on the site will help KPSTS make informed management decisions. By law, records of all restricted use pesticides must be maintained by operators for at least 2 years. Records of nonrestricted chemicals can be maintained on the same form as the required records with minimal additional effort. This information has further value for use with crop and pest modeling programs and economic analyses.
- No pesticides are applied directly to sensitive areas (e.g., critical habitat to endangered, threatened, or rare flora or fauna species; unique geological and other natural features; wetlands; ponds; standing water; or other water areas) unless use in such an area is specifically approved on the label.

Concern: Pest management objectives at KPSTS include the protection of real estate, control of potential disease vectors, control of undesirable or nuisance plants and animals (including insects), and prevention of damage to natural resources.

Objective: The IPM will continue to be implemented on the Installation.

Actions:

1. Continue to implement the IPM Plan.
2. Implement actions to prevent the destruction of the structures by pests at KPSTS such as the following:
    a. Prevent the entry of pests into buildings by closing holes, cracks, and crevices.
    b. Apply tracking powder or other poisons to eliminate rodents that have established themselves in building interiors.
    c. Capture burrowing mammals that pose a threat to building or infrastructure integrity for release or euthanasia. Any pest mammals captured are considered feral or invasive, and should be destroyed or euthanized.
3. Implement management measures to control pests posing a potential threat to human health to include the following:
    a. Ensure proper sanitation and housekeeping to remove any food sources that might be attractive to interior pests (e.g., cockroaches, ants, flies).
    b. Practice proper personal hygiene, wear proper clothing, and wear repellants to reduce or eliminate problems associated with sucking insects (fleas, ticks, and mosquitoes).

c. Remove the excrement of bats and birds from underneath their roosts to prevent the growth of harmful bacteria.

d. Eliminate artificial breeding and larval habitat for flies and mosquitoes.

e. Destroy the nests of bees and wasps where their locations present a hazard to people.

f. Apply insecticides for the control of ticks, mosquitoes, and ants for large infestations.

4. General management measures that should be used to control nuisance pests include the following:

   a. Capturing individual large animals (e.g., feral pigs) for removal, euthanasia, or re-introduction into the Game Management Area.

   b. Using snap traps and glue boards to trap rodents.

   c. Placing pesticide baits along the paths of ants and cockroaches.

5. Incremental updates to the plan will be conducted every 5 years to ensure that the plan reflects changes in pest populations and current management issues.

6. Management of wildlife and the effective elimination of concentrated and diseased populations will be fully implemented.

Monitoring Criteria: Monitor pest species populations. Track usage of active ingredients (e.g., pesticides and herbicides) and man-hours spent controlling pest species to ensure that the management strategies are efficient and sufficient. Each eradication measure used will be evaluated to determine its level of success.

7.8 Forest Management

Applicability Statement

This section applies to AF installations that maintain forested land on AF property. This section **IS NOT** applicable to KPSTS.

Program Overview/Current Management Practices

N/A.

7.9 Wildland Fire Management

Applicability Statement

This section applies to AF installations with unimproved lands that present a wildfire hazard and/or installations that utilize prescribed burns as a land management tool. This section **IS** applicable to KPSTS.

Program Overview/Current Management Practices

Concern: Wild fires threaten the mission of KPSTS and the existing native vegetation at the installation.

Objective: Prevent wildfires on the installation and respond effectively in instances of wildfires at the installation or nearby areas.

Actions:

1. Maintain firebreak clearances and control vegetation around all structures and utilities.
2. Develop and implement a Wildland Fire Management Plan and train personnel accordingly.
3. Support firefighting efforts conducted by Federal, state and city/county organizations.

7.10 Agricultural Outleasing

Applicability Statement

This section applies to AF installations that lease eligible AF land for agricultural purposes. This section **IS NOT** applicable to KPSTS.

Program Overview/Current Management Practices

N/A.

7.11 Integrated Pest Management Program

Applicability Statement

This section applies to AF installations that perform pest management activities in support of natural resources management, e.g. invasive species, forest pests, etc. This section **IS** applicable to KPSTS.

Program Overview/Current Management Practices

Invasive species management is a large part of pest management activities. The Federal Noxious Weed Act and EO 13112 requires Federal agencies to control noxious and invasive species on Federal lands. The Federal Noxious Weed Act, enacted January 3, 1975, established a Federal program to control the introduction and spread of foreign noxious weeds into the United States. Amendments in 1990 established management programs for undesirable plants (including noxious weeds) on Federal lands. There are several plant species that are considered noxious and control is mandatory for those found on the Federal list. EO 13112 requires that Federal agencies prevent the introduction of invasive species, detect and control populations of invasive species, and restore native species and habitat conditions in ecosystems that have been invaded. Invasive species are alien species (not native to the ecosystem) whose introduction does, or is likely to, cause economic or environmental harm, or harm to human health.

Integrated Pest Management Program Goals
• Protection and restoration of native habitat diversity. • Enhance habitat for native species by removing invasive vegetation.

The following concerns have been identified, and objectives and management actions designed to meet the habitat management goals in light of those concerns.

IPM-1: Protection and Revegetation of Native Plant Species

Concern: Koa-haole shrubland located along the leeward-facing slopes around the installation perimeter includes some native shrubs. More native species can be found near the west end of the installation. Due to the high level of invasive and nonnative species on the installation, native plant species are an important natural resource.

Objective: Protection and revegetation of the native species found in these areas would provide a potential opportunity for the preservation and enhancement of these species.

Actions:

1. Focus invasive and nonnative plant species eradication projects in these areas of the installation.

2. Protect and plant native species such as alah'e (*Canthiurn odoratum*) and 'a'ali'i (*Dodonaea viscose*).

Monitoring Criteria: Continue to monitor invasive and nonnative plant species infestation levels in the koa-haole shrubland and on the west end of the installation.

IPM-2: Revegetation of Barren Areas with a Diverse Range of Shrubs, Brushes, Grasses and Other Native Species

Concern: Barren areas and the lack of native plant species contribute to soil erosion on the installation.

Objective: Revegetation of barren areas with a diverse range of shrubs, brushes and native grasses would provide a potential opportunity for the preservation and enhancement of these species and the reduction of soil erosion.

Actions:

1. Plant barren areas with piligrass (*Heteropogon contortus*), lovegrass (*Eragrostis variabilis*), Javanese flatsedge (*Cyperus javanicus*), Ilima (*Sida fallax*), ‘A’ali’i Florida hopbush (*Dodonaea viscosa*) and other native species.

Monitoring Criteria: Monitor the planted areas for invasive and nonnative plant species and native species survival.

IPM-3: Continue Nonnative and Invasive Species Eradication per the Invasive Plant Species Control Plan

Concern: Nonnative and invasive species are endangering populations of native species and creating lower quality habitat available for wildlife.

Objective: Continue nonnative and invasive species eradication per the Invasive Plant Species Control Plan. Eradicate nonnative and invasive species utilizing methods that will cause the least disturbance of native species that might be present. Develop and adopt proactive management measures to control the proliferation of nonnative and invasive species.

Actions:

1. Develop specific management actions for nonnative and invasive species identified in the control plan.
2. Continue to monitor the spiny cactus treatment area for new growth and treat as necessary.
3. Do not purchase or use nonnative and invasive species in landscaping, or for land restoration or erosion-control projects.
4. For landscaping, use plants that are native to the local region as much as possible or those that are not known to be invasive.
5. Notify adjacent land managers of nonnative and invasive plant occurrences and offer to assist in nonnative and invasive plant removal projects.

Monitoring Criteria: Continue to survey as necessary for new nonnative and invasive species and continue to implement the control plan. Update plan as needed.

7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)

Applicability Statement

This section applies to AF installations that maintain a BASH program to prevent and reduce wildlife-related hazards to aircraft operations. This section **IS NOT** applicable to KPSTS.

Program Overview/Current Management Practices

N/A.

7.13 Coastal Zone and Marine Resources Management

Applicability Statement

This section applies to AF installations that are located along coasts and/or within coastal management zones. This section **IS NOT** applicable to KPSTS.

Program Overview/Current Management Practices

N/A.

7.14 Cultural Resources Protection

Applicability Statement

This section applies to AF installations that have cultural resources that may be impacted by natural resource management activities. This section **IS** applicable to KPSTS.

Program Overview/Current Management Practices

The ICRMP for KPSTS (in the process of review and approval at the time of this INRMP) is a 5-year compliance and management document that provides guidelines and procedures for preserving and protecting cultural resources on the installation, pursuant to AFI 32 7065, *Cultural Resources Management Program*, dated 19 November 2014.

The ICRMP provides the installation with information that will assist in planning, developing, and implementing a program for effective cultural resources management and it provides a foundation for coordinating and consulting with the Hawaii State Historic Preservation Officer, the Advisory Council on Historic Preservation, and other groups in order to assess the importance of and afford adequate protection for historic properties on the installation. Cultural resources at and near KPSTS include 13 archaeological sites, one World War II-era concrete structure, four Cold War-era facilities, and possible cultural places/sacred sites.

Areas of cultural resources concern at KPSTS are discussed by resource identification and evaluation, activities that could affect cultural resources, CRM coordination and training, GIS mapping and consultation with Native Hawaiians. The ICRMP also provides Standard Operating Procedures for activities that can be considered routine occurrences, makes recommendations to address the areas of cultural resources, and identifies cultural resources management projects to be carried out through the life span of the ICRMP in order to achieve the goals and objectives for KPSTS cultural resources management. Details of these cultural resources and management recommendations can be found in the 2016 ICRMP.

7.15 Public Outreach

Applicability Statement

This section applies to all AF installations that maintain an INRMP. KPSTS **IS** required to implement this element.

Program Overview/Current Management Practices

Public access to the base is restricted because KPSTS is a closed installation, scheduled visitors are required to sign in at the main gate with photo identification. Developing outreach programs for military personnel and the general public is a high priority at KPSTS as long as such programs can be accomplished within military mission constraints.

7.16 Geographic Information Systems (GIS)

Applicability Statement

This section applies to all AF installations that maintain an INRMP, since all geospatial information must be maintained within the AF GeoBase system. KPSTS **IS** required to implement this element.

Program Overview/Current Management Practices

KPSTS currently has no GIS data for the installation. The use of a GIS is to manage and catalog information acquired in natural resources research. The 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, wildlife, and various other natural resources management applications. The goals for establishing GIS management issues and actions are summarized in Table: Summary of GIS Management Goals.

Summary of GIS Management Goals

Geographic Information Systems Management Goals
• Collect, store, and maintain data about historical conditions, trends, and current status for critical indicators of ecological integrity and sustainability. • Use GIS information as benchmarks for developing future natural resources management goals and objectives. • Train, as necessary, the personnel responsible for the maintenance of environmental data.

GIS-1: Create GIS Database for KPSTS

Concern: KPSTS has no GIS data for the installation.

Objective: Acquire a GIS and train Environmental Office Staff in ArcView methods to ensure the accuracy and relevance of data collection and manipulation. Develop and implement written standards and procedures for GIS administration, including managing metadata. Define how GIS should be used by KPSTS Environmental, Facilities, and Training staffs. Acquire necessary core database layers. Once acquired, develop GIS to allow for integrated presentation of management alternatives (all data will be in accordance with the Federal Geographic Data Committee guidelines [FGDC Format]).

Action:

1. Acquire a GIS and train Environmental Office Staff in ArcView methods to ensure the accuracy and relevance of data collection, and manipulation.
2. Develop and implement written standards and procedures for GIS administration, including managing metadata.
3. Define questions to be answered by GIS, comparisons that should be made, and what formats for GIS output are necessary for KPSTS staff.

4. Educate decisionmakers about the capabilities and limitations of the GIS.
5. Acquire necessary GIS layers.
6. Maintain and operate GIS database to provide current, site-specific information.
7. Develop an annual report that clearly states the condition and trends within KPSTS.

Monitoring Criteria: Ensure properly trained Environmental Office Staff are on hand to use and manage the GIS. Continue to input new layers as they become available.

8.0 MANAGEMENT GOALS AND OBJECTIVES

The installation establishes long term, expansive goals and supporting objectives to manage and protect natural resources while supporting the military mission. Goals express a vision for a desired condition for the installation's natural resources and are the primary focal points for INRMP implementation. Objectives indicate a management initiative or strategy for specific long or medium range outcomes and are supported by projects. Projects are specific actions that can be accomplished within a single year. Also, in cases where off-installation land uses may jeopardize AF missions, this section may list specific goals and objectives aimed at eliminating, reducing or mitigating the effects of encroachment on military missions. These natural resources management goals for the future have been formulated by the preparers of the INRMP from an assessment of the natural resources, current condition of those resources, mission requirements, and management issues previously identified. Below are the integrated goals for the entire natural resources program.

The installation goals and objectives are displayed in the 'Installation Supplement' section below in a format that facilitates an integrated approach to natural resource management. By using this approach, measurable objectives can be used to assess the attainment of goals. Individual work tasks support INRMP objectives. The projects are key elements of the annual work plans and are programmed into the conservation budget, as applicable.

Installation Supplement – Management Goals and Objectives

INRMP Review, Update, and Implementation Goals

GOAL 1: DEVELOP AN INRMP FOR KPSTS THAT IS IN COMPLIANCE WITH DOD AND USAF DIRECTIVES.

GOAL 2: ENSURE THAT INRMP IS DEVELOPED IN COOPERATION WITH THE STATE OF HAWAII DOFAW AND USFWS.

GOAL 3: REVIEW INRMP AT LEAST ANNUALLY AND UPDATE AND REVISE EVERY 5 YEARS.

GOAL 4: ESTABLISH AN ANNUAL BUDGET PROCESS TO IMPLEMENT THE INRMP.

Ecosystem Management Goals

GOAL 5: MANAGE THE INSTALLATION USING A REGIONAL ECOSYSTEM APPROACH THAT CONSERVES BIODIVERSITY.

GOAL 6: IDENTIFY NATURAL RESOURCES AND OPERATIONAL ACTIONS THAT COMPROMISE THE FUNCTION AND COMPOSITION OF ECOSYSTEMS AND DEVELOP REMEDIES THROUGH ADAPTIVE MANAGEMENT.

GOAL 7: IMPLEMENT MANAGEMENT STRATEGIES WITH CONSIDERATION OF ECOLOGICAL UNITS AND TIME FRAMES.

GOAL 8: SUPPORT SUSTAINABLE, MULTIPLE-USE HUMAN ACTIVITIES.

GOAL 9: APPLY ECOSYSTEM-BASED MANAGEMENT THROUGH IMPLEMENTATION AND INTEGRATION OF THIS INRMP WITH OTHER INSTALLATION PLANS AND PROGRAMS.

Fish and Wildlife Management Goals

GOAL 10: MANAGE BASED ON AN ECOSYSTEM-MANAGEMENT APPROACH, RATHER THAN FROM A SINGLE-SPECIES PARADIGM.

GOAL 11: EMPLOY A SYSTEMATIC APPROACH TO MANAGING WILDLIFE RESOURCES, UTILIZING A PROCESS THAT INCLUDES INVENTORY, MONITORING, MODELING, MANAGEMENT, AND ASSESSMENT.

GOAL 12: BALANCE THE MANAGEMENT NEEDS OF THE ECOSYSTEM (E.G., NONGAME SPECIES, BIODIVERSITY, ECOSYSTEM FUNCTIONS) WITH A SUSTAINABLE WILDLIFE HARVEST PROGRAM.

GOAL 13: MINIMIZE WILDLIFE-RELATED HEALTH RISKS, SAFETY RISKS, AND ENVIRONMENTAL DAMAGE.

GOAL 14: CONTINUE TO REMAIN IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS GOVERNING FISH AND WILDLIFE.

GOAL 15: MAINTAIN AND INVOLVE PARTNERSHIPS WITH AGENCIES AND GROUPS INVOLVED IN WILDLIFE MANAGEMENT.

GOAL 16: ENSURE THAT FISH AND WILDLIFE MANAGEMENT, AND THE ENTIRE INRMP, SUPPORT THE STATE OF HAWAII'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Threatened and Endangered Species Goals

GOAL 17: MANAGE KPSTS ON A REGIONAL ECOSYSTEM-BASED APPROACH THAT MANAGES FOR POTENTIAL SENSITIVE SPECIES HABITAT WHILE PROTECTING THE OPERATIONAL FUNCTIONALITY OF THE BASE'S MISSIONS.

GOAL 18: ENSURE THAT KPSTS REMAINS IN COMPLIANCE WITH ESA AND APPROPRIATE STATE REGULATIONS.

GOAL 19: PROMOTE NATURAL RESOURCES AND ECOSYSTEM MANAGEMENT IN THE LOCAL REGION THAT BENEFITS THE FUNCTIONALITY OF KPSTS ECOSYSTEMS.

Habitat Management Goals

GOAL 20: PROTECTION AND RESTORATION OF NATIVE HABITAT DIVERSITY.

GOAL 21: ENHANCE HABITAT FOR NATIVE SPECIES BY REMOVING INVASIVE VEGETATION.

Wetlands and Floodplains Management Goals

GOAL 22: REMAIN IN COMPLIANCE WITH USACE, USEPA, AND STATE OF HAWAII REGULATIONS REGARDING WETLANDS, WATER BODIES, OR FLOODPLAINS ON PROPERTIES ADJACENT THE INSTALLATION.

Watershed Protection Goals

GOAL 23: REDUCE/CONTROL NUTRIENT AND SEDIMENT INPUTS INTO THE WATERSHED THAT DEGRADE WATER QUALITY.

GOAL 24: MANAGE AND REPAIR EXISTING AND NEW ROADS IN A MANNER THAT MINIMIZES THE POTENTIAL FOR EROSION AND SEDIMENTATION.

GOAL 5: MINIMIZE NONPOINT SOURCE POLLUTION OF BOTH SURFACE AND GROUNDWATER IN THE WATERSHED THROUGH THE IMPLEMENTATION OF BMPS AND THE ONGOING MAINTENANCE OF EXISTING BMPS.

GOAL 26: MINIMIZE, TO THE EXTENT PRACTICABLE, IMPERVIOUS SURFACES WITHIN KPSTS.

GOAL 27: GAIN AN UNDERSTANDING OF ECOSYSTEM DYNAMICS WITHIN THE WATERSHED IN AN EFFORT TO PREVENT AND RESPOND TO THREATS TO ITS INTEGRITY.

Grounds Maintenance Goals

GOAL 28: LESSEN OR AVOID ADVERSE EFFECTS FROM PROJECT ACTIVITIES TO THE OVERALL ECOSYSTEM AND ITS SENSITIVE RESOURCES.

GOAL 29: MAKE MAXIMUM USE OF REGIONALLY NATIVE PLANT SPECIES AND AVOID INTRODUCTION OF INVASIVE, NONNATIVE SPECIES IN REVEGETATION AND LANDSCAPING ACTIVITIES.

GOAL 30: REDUCE CHEMICAL USAGE, AND MAINTENANCE INPUTS IN TERMS OF ENERGY, WATER, MANPOWER, EQUIPMENT, AND CHEMICALS.

GOAL 31: ENSURE COMPLIANCE WITH ENVIRONMENTAL LEGISLATION, REGULATIONS, AND GUIDELINES.

GOAL 32: CONTROL PEST AND INVASIVE SPECIES ON THE INSTALLATION.

GOAL 33: MANAGE FOR WILD FIRE PREVENTION.

Outdoor Recreation / Public Access Management Goals

GOAL 34: PROVIDE THE PUBLIC ACCESS TO ADJACENT GAME MANAGEMENT AREA WHILE SUSTAINING ECOSYSTEM INTEGRITY.

GOAL 35: ENSURE THAT PUBLIC ACCESS AND THE RELATED ACTIVITIES ARE NOT IN CONFLICT WITH MISSION PRIORITIES.

Surrounding Lands Management Goals

GOAL 36: COORDINATE WITH SURROUNDING LANDOWNERS ON ECOSYSTEM-BASED MANAGEMENT OF RESOURCES AND ENCOURAGE COOPERATIVE EFFORTS ON ADJACENT LANDS THAT ARE COMPLEMENTARY TO THE INRMP.

GOAL 37: MINIMIZE THREATS TO KPSTS NATURAL RESOURCES FROM OFF-INSTALLATION LAND USE.

Geographic Information System (GIS) Management Goals

GOAL 38: COLLECT, STORE, AND MAINTAIN DATA ABOUT HISTORICAL CONDITIONS, TRENDS, AND CURRENT STATUS FOR CRITICAL INDICATORS OF ECOLOGICAL INTEGRITY AND SUSTAINABILITY.

GOAL 39: USE GIS INFORMATION AS BENCHMARKS FOR DEVELOPING FUTURE NATURAL RESOURCES MANAGEMENT GOALS AND OBJECTIVES.

GOAL 40: TRAIN, AS NECESSARY, THE PERSONNEL RESPONSIBLE FOR THE MAINTENANCE OF ENVIRONMENTAL DATA.

9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

INRMP Implementation

The purpose of this section is to present a road map for the implementation of specific management actions to satisfy the goals and objectives for several natural resources subject areas. The Summary of INRMP Actions for FY 2017 Through FY 2023 Appendix summarizes the management actions identified in the Natural Resources Program Management Section and proposes priorities for their implementation. The taskings proposed for this INRMP are aggressive, and might not be accomplished within the established timelines due to a number of factors (e.g., budget and manpower constraints, wartime taskings). However, their importance to the proper management of the base's natural resources cannot be understated. Therefore, the management actions presented in the Summary of INRMP Actions for FY 2017 Through FY 2023 Appendix should be modified as part of the annual review of this INRMP by the INRMP Working Group to ensure that these taskings are continually emphasized and accomplished when practicable. Table: Estimated Total Oversight Man-Hours of Implementing INRMP provides a brief summary of the estimated oversight required to accomplish the actions identified in the Management Goals and Objectives Section and incorporated in the Summary of INRMP Actions for FY 2017 Through FY 2023 Appendix (i.e., to implement this INRMP).

Estimated Total Oversight Man-Hours of Implementing INRMP

INRMP Funding Category	Oversight Estimated Man-Hours
INRMP Review and Update	240
Ecosystem Management	108
Fish and Wildlife Management	600
Threatened and Endangered Species	400

INRMP Funding Category	Oversight Estimated Man-Hours
Habitat Management	560
Wetlands and Floodplains	24
Watershed Protection	160
Grounds Maintenance	360
Outdoor Recreation and Public Access	80
Surrounding Land Use	80
Geographical Information System	160
Total	**2,772**

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP, as required by the Sikes Act, and the associated NEPA analysis and documentation to be a high priority. However, the reality is that not all of the projects and programs identified in this INRMP will receive immediate funding. As such, the actions identified in this INRMP (Management Goals and Objectives Section and Summary of INRMP Actions for FY 2017 Through FY 2023 Appendix) have been placed into four priority categories based on guidance provided in AFI 32-7064 and AFI 32 7001 Environmental Budgeting. These four priority ranks or categories are briefly described as follows:

- Level 0 – "Natural resources management actions recurring on an annual or more frequent basis that are 'must do' activities. Ongoing natural resources management activities identified in an approved INRMP are Level 0 requirements if they are essential for the successful implementation of the goals and objectives stated in the plan….Level 0 requirements include funding for personnel, travel, training, and supply costs, as well as recurring inventories, surveys, sampling, monitoring, reporting and record keeping, …." (AFI 32-7064).
- Level 1 – "A non-recurring requirement, occurring only one time or less frequently than once a year, that corrects an out-of-compliance condition and references a valid statutory driver in the year programmed. Valid drivers include federal laws, regulatory mandates, and state laws applicable to federal activities….Level 1 projects include the initial preparation and five-year revisions of an INRMP" (AFI 32-7064). Level 1 projects also include those needed for compliance with EOs 11988 (Floodplain Management) and 11990 (Protection of Wetlands) such as wetlands and floodplains surveys and inventories, and actions to protect, develop, monitor, and restore wetlands and floodplains (AFI 32-7001).
- Level 2 – "A non-recurring requirement for activities and projects programmed in a fiscal year which is in advance of the year in which compliance is mandatory and necessary to prevent non-compliance beyond the program year. Legal drivers are the same as for Level 1." (AFI 32-7064). These actions are characterized by AFI 32-7001 as actions which would "prevent noncompliance."
- Level 3 – "Non-recurring activities and projects that are not explicitly required by an applicable legal driver, but are needed to enhance the environment beyond statutory compliance." (AFI 32 7064)

Funding sources are also identified in AFI 32-7064 and AFI 32-7001. While some of the actions described in this INRMP could potentially be funded under "Environmental Compliance" in addition to "Conservation Resources Management" (sensu AFI 32-7001) such as Legacy funds, the most probable funding sources for the majority of the actions are O&M Funds, and Reimbursable Conservation Program (RCP) Funds (AFI 32-7064). While the above provides a brief summary of budget priorities and funding sources, it is the responsibility of the installation's CE and Environmental Staff to carefully examine and adhere to the entirety of the two referenced AFIs, and any subsequent supplements or revisions, in preparing each year's budget for implementation of the actions identified in this INRMP.

This INRMP reflects the commitment set forth by KPSTS to conserve, protect, and enhance the natural resources present on the installation. This INRMP is the final plan that will direct the natural resources management at KPSTS from FY 2016 through FY 2021. An ecosystem approach was used to develop the management measures for each resource area. Implementation of the management measures will maintain and conserve the ecological integrity of the base and the biological communities inhabiting the base. In addition, the natural resources management measures described in this INRMP will protect KPSTS ecosystems and their components from unacceptable damage or degradation. The estimated man-hours needed to implement the INRMP are provided in the Summary of INRMP Actions for FY 2017 Through FY 2023 Appendix.

Natural resources and land use management issues are not the only factors contributing to the development and implementation of the INRMP. Installation management and other seemingly unrelated issues affect the implementation of this INRMP. It is of utmost importance to the implementation of this INRMP that base personnel take "ownership" of the INRMP (i.e., individual or organizational responsibility to implement the INRMP), to provide the necessary resources (e.g., personnel and equipment), and to allocate the appropriate funding to enact the plan. It is extremely important that an INRMP Working Group be established to aid in the continued development of and commitment to the implementation of this INRMP. The INRMP Working Group shall be made up of the key base and host unit personnel, and will assume an oversight role to ensure the effective implementation of this Plan. Top- and middle-level management representation, as well as representation from several individuals with day-to-day on-base field experience, will provide the INRMP Working Group with the leadership and structure necessary for the successful implementation of this INRMP.

This INRMP is a "living" document that is based on several short-, medium-, and long-term planning goals. Short-range goals include activities that are planned to occur in 0 to 5 years, while medium-range goals include activities in a 6- to 10-year period. Long-range goals are usually scheduled beyond 10 years. A majority of the goals and objectives discussed in this INRMP are based on short-term natural resources management goals. Because an INRMP is a "living" document, goals can be revised over time to reflect evolving environmental conditions and mission demands. In addition, medium- and long-range planning goals could eventually become short-range activities that also require implementation.

Currently, KPSTS personnel are responsible for implementing programs at the installation other than the natural resources management responsibilities that will be necessary to implement this INRMP. Additional sources of temporary labor, such as seasonal employees (e.g., summer hires), could be utilized to augment current staff. Outside agency reimbursable hires and guardsman, reservists, or active-duty USAF personnel assigned to KPSTS on temporary duty are another source of supplemental labor. Implementation of a number of projects discussed in this INRMP will require active outside assistance. The outside assistance might come from state and Federal agencies, private consortiums and organizations, universities, and contractors. Using these resources is the most efficient and cost-effective method for acquiring expertise on a temporary basis. The INRMP Working Group should assess the level of additional resources necessary to fully implement this INRMP during the INRMP annual review process and determine the extent to which outside assistance will be required.

9.2 Monitoring INRMP Implementation

The tasks identified in Chapter 10, Work Plans, will be reviewed annually for completion in each respective fiscal year. This exercise will be undertaken in conjunction with the annual review process with Sikes Act cooperators, namely the USFWS and CPW.

The Environmental Office must monitor the progress of natural resource projects to measure their success and recommend adjustments in management actions, if necessary, that increase progress toward achieving the goals and objectives outlined in this INRMP

9.3 Annual INRMP Review and Update Requirements

To ensure that this INRMP properly addresses all aspects of the natural and cultural resources present on the installation and proposes actions that are in accordance with USAF goals and objectives, this INRMP and all its components are subject to approval by the Installation Commander.

Similarly, all changes to be incorporated into this INRMP must be approved by the Installation Commander. This INRMP must also be approved by the USFWS and the DOFAW.

This INRMP is effective for 5 years from the date of approval; however, the Operational Component Plans must be updated annually during preparation of the KPSTS environmental budgets.

This INRMP should be reviewed annually to assess the suggested management practices in terms of their appropriateness for current conditions at the installation. In addition, the INRMP should be updated whenever there is a modification to the installation's mission, or when there is a substantial change to the installation's natural or cultural resources.

10.0 ANNUAL WORK PLANS

The INRMP Annual Work Plans are included in this section. These projects are listed by fiscal year, including the current year and four succeeding years. For each project and activity, a specific timeframe for implementation is provided (as applicable), as well as the appropriate funding source, and priority for implementation. The work plans provide all the necessary information for building a budget within the AF framework. 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 Air Force 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 by EO 13112 on Invasive Species. However, the INRMP signatories would not contend that the INRMP is not be implemented if not accomplished within programmed year due to other priorities.
- Low: Project supports a specific INRMP goal and objective, enhances conservation resources or the integrity of the installation mission, and/or support long-term compliance with specific requirements within natural resources law; but is not directly tied to specific compliance within the proposed year of execution.

Annual Work Plans (FY17-23)	**OPR**	**Funding Source**	**Priority Level**
TE 1.1.1 Conduct an updated survey of potential occurring federally listed threatened and endangered species.	CEV	Project: LXHY498517	Medium
HM 1.1.1 Focus on invasive and nonnative plant species eradication projects in areas of the installation	CEV	Project LXHYOS700517-LXHYOS700523	Medium
HM 3.1.1 Develop specific management actions for nonnative and invasive species identified in the control plan	CEV	Project LXHYOS700517-LXHYOS700523	Medium
WP 1.1.1 Identify, inventory, and map areas at high risk for erosion in order of priority (i.e road banks, unvegetated areas)	CEV	Project: LXHY911004 (Phase I)	Medium
GM 3.1.1 Maintain firebreak clearances and control vegetation around all structures and utilities	CEV	Project LXHYOS700517-LXHYOS700523	High
OR 2.1.1 Erect interpretive signs that include information on birds that commonly	CEV	In house	Low
GIS 1 Create GIS Database	CEV	In house	Medium

11.0 REFERENCES

11.1 Standard References *(Applicable to all AF installations)*

- AFI 32-7064, *Integrated Natural Resources Management*
- Sikes Act
- eDASH Natural Resources Program Page
- Natural Resources Playbook – a Internal AF reference available at https://cs1.eis.af.mil/sites/ceportal/CEPlaybooks/NRM2/Pages/

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12.0 ACRONYMS

12.1 Standard Acronyms (Applicable to all AF installations)

- eDASH Acronym Library
- Natural Resources Playbook – Acronym Section
- U.S. EPA Terms & Acronyms

12.2 Installation Acronyms

- **°F** - degrees Fahrenheit
- **AFSCF** - Air Force Satellite Control Facility
- **AFSCN** - Air Force Satellite Control Network
- **AFSPC** - Air Force Space Command
- **AMSL** - above mean sea level
- **AOC** - Area of Concern
- **CC** - Commander
- **dBA** - A-weighted Decibels
- **DEQPPM** - Defense Environmental Quality Program Policy Memorandum
- **Det 3, 21 SOPS** - Detachment 3, 21st Space Operations Squadron
- **DLNR**-Department of Land & Natural Resources
- **DOFAW** - Division of Forestry and Wildlife
- **DOH** - Department of Health
- **EE** - Ecological Economics
- **EPC/ESOHC** - Environmental Protection Committee/Environmental, Safety, Occupational Health Council
- **IPMP**- Integrated Pest Management Plan
- **ICRMP**- Integrated Cultural Resources Management Plan
- **KPSTS** - Kaena Point Satellite Tracking Station
- **MAJCOM** - Major Command

- **NAR** - Natural Area Reserve
- **NFRAP** - No Further Response Action Planned
- **NRHP** - National Register of Historic Places
- **PA** - Public Affairs Office
- **P.L.** - Public Law
- **POL** - Petroleum, Oil, and Lubricants
- **SAF/MI** - Assistant Secretary of the Air Force
- **SAFO** - Secretary of the Air Force Order
- **SGP** - Space Group
- **STG** - Satellite Tracking Group
- **SWMP** - Storm Water Management Plan
- **USDA-WS** - U.S. Department of Agriculture- Wildlife Services
- **USFWS**- U.S Fish & Wildlife Service
- **WLFMP-** Wildland Fire Management Plan

13.0 DEFINITIONS

13.1 Standard Definitions (Applicable to all AF installations)

- Natural Resources Playbook – Definitions Section

13.2 Installation Definitions

- **Biological Diversity** – The variety of life forms, the ecological roles they perform, and the genetic variability they contain within any defined time and space.
- **Cooperative Agreement** – A written agreement between an Air Force Installation and one or more outside agencies (Federal, state, or local) that coordinates planning strategies. It is a vehicle for obtaining assistance in developing natural resources programs.
- **Critical Habitat** – Any air, land, or water area (excluding existing synthetic structures or settlements that are not necessary to the survival and recovery of a listed species) and constituents thereof that the U.S. Fish and Wildlife Service has designated as essential to the survival and recovery of an endangered or threatened species or a distinct segment of its population.
- **Cropland** – Land primarily suitable for producing farm crops, including grain, hay, and truck crops.
- **Ecosystem Diversity** – The number, relative proportions, and interactions among communities within an ecosystem; landscape diversity can then be the composition of and interactions among ecosystems across a defined landscape.
- **Ecosystem Management** – An approach to natural resources management that focuses on the interrelationships of ecological processes linking soils, plants, animals, minerals, climate, water, and topography. Managers view such processes as a living system that affects and responds to human activity beyond traditional commodity and amenity uses. They also acknowledge the importance of ecosystem services such as water conservation, oxygen recharge, and nutrient recycling.
- **Endangered Species** – Any plant or animal listed or proposed for listing as threatened or endangered by the Federal Government or state governments.
- **Exotic Species** – Any plant or animal not native to a region, state, or country. (This definition excludes certain game species that have become established, such as pheasants.)

- **Featured Species** – A fish or wildlife species whose habitat requires fish or wildlife management (including coordination, multiple-use planning, direct habitat improvements, and cooperative programs) on a unit of land or water. Also refers to a tree species that the forest management plan cites as having value for wood fiber production. The plan usually specifies one or more featured tree species along with one or more associated species to meet multiple-use management objectives.
- **Fish** – Fresh, and saltwater finfish.
- **Floodplains** – Lowland or flat areas adjoining inland and coastal waters, including flood-prone areas on offshore islands, that have a 1 percent or greater chance of flooding in any given year.
- **Game** – Any species of fish or wildlife for which state or Federal laws and regulations prescribe seasons and bag or creel limits.
- **Habitat** – An area that provides the environmental elements of air, water, food, cover, and space necessary for a given species to survive and reproduce.
- **Highly Erodible Soils** – Soils that, because of their physical properties or slope, the U.S. Department of Agriculture, Soil Conservation Service, identifies as being highly susceptible to wind or water erosion.
- **Improved Grounds** – Grounds on which personnel annually plan and perform intensive maintenance activities. These are developed areas of an installation that have lawns and landscape plantings that require intensive maintenance. They usually include the cantonment, parade ground, drill fields, athletic areas, golf courses (excluding roughs), cemeteries, and housing areas.
- **Land Diversity** – The composition of and interactions among ecosystems across a defined landscape.
- **Land Management Unit** – The smallest land management division that planners use in developing specific strategies to accomplish natural resources management goals. Land management units might correspond to grazing units on agricultural outleased land, stands or compartments on commercial forest lands, various types of improved grounds (for example, athletic fields, parks, yards in family housing, or landscaped areas around administrative buildings), or identifiable semi-improved grounds (for example, airfield areas, utility rights-of-way, or roadside areas).
- **Land-Use Regulation** – A document that prescribes the specific technical actions or land use and restrictions with which lessees, permittees, or contractors must comply. It derives from the grazing or cropland management plan and forms a part of all outleases, land use permits, and other contracts.
- **Multiple-Use** – The integrated, coordinated, and compatible use of various natural resources to derive the best benefit while perpetuating and protecting those resources.
- **Multiple-Use and Sustained Yield Management** – The care and use of natural resources so as to best serve the present and future needs of the United States and its people without impairing the productivity of the land and water.
- **Natural Resources Management Professional** – A person with a degree in the natural sciences who manages natural resources on a regular basis and receives periodic training to maintain proficiency in that job.
- **NO FUNDS Service Contract** – An agreement by which a party performs a land management service for a consideration other than funds. Such a contract exists, for example, when a party hired to establish, control, or remove vegetative cover or growth agrees to take payment for the service in the form of the growth that results.
- **Outdoor Interpretation** – Observing and explaining the history, development, and significance of our natural heritage and natural resources.

- **Outdoor Recreation Resources** – Land and water areas and associated natural resources that provide, or have the potential to provide, opportunities for outdoor recreation for current and future generations.
- **Parcours** – Physical fitness trails created for jogging and calisthenics. They are usually in wooded areas and are about 1.5 to 2 miles in length. Numerous exercise stations along the route direct the participants through various exercises.
- **Procurement Contract** – An agreement by which the government agrees to pay a contractor to establish, control, or remove vegetative cover or growth for land management purposes. This contract may not extend beyond the period for which funding for the service is available.
- **Recreation Carrying Capacity** – The level of recreational use that an area can sustain without damage to the environment.
- **Rotation A**ge – The planned number of years between the regeneration of a forest stand and its final cutting at a specified stage of maturity.
- **SALES Service Contract** – An agreement by which the contractor pays the Government for crops, crop residue, or grazing privilege incidental to control or removal of vegetative growth for land management purposes. Sales contracts cover a period of 1 to 5 years.
- **Semi-Improved Grounds** – Grounds where personnel perform periodic maintenance primarily for operational and aesthetic reasons (such as erosion and dust control, bird control, and visual clear zones). These usually include grounds adjacent to runways, taxiways, and aprons; runway clear zones; lateral safety zones (AFR 86-14); rifle and pistol ranges; picnic areas; ammunition storage areas; antenna facilities; and golf course roughs.
- **Special Natural Area** – Areas on bases that contain natural resources that warrant special protection efforts. Special Natural Areas can include botanical areas, ecological reserves, geological areas, riparian zones, scenic areas, and zoological reserves. A Special Natural Area designation in an INRMP is a temporary status that is applicable for the period covered by the INRMP, and can be rescinded by order of the Base or Wing Commander. Such areas will be reassessed if the military mission requirements of the base change, during any base realignment or closure action involving the property, or if the property becomes excess and requires disposal.
- **Species Diversity** – The number and proportion of species composing a natural community.
- **Stewardship** – The management of installation resources with the goal of maintaining or increasing the resource's value indefinitely into the future.
- **Threatened Species** – Those federally or state-listed species of flora and fauna that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range and that have been designated for special protection and management pursuant to the Endangered Species Act or state statues.
- **Unimproved Grounds** – Grounds not classified as improved or semi-improved and usually not mowed more than once a year. These include weapons ranges; forest lands; cropland and grazing lands; lakes, ponds, and wetlands; and areas in airfields beyond the safety zones.
- **Urban Forests** – Planted or remnant native tree species existing within urbanized areas such as parks, tree-lined residential streets, scattered tracts of undisturbed woodlands, and cantonment areas.
- **Urban Wildlife** – Wildlife that habitually live or periodically survive in an urban environment on improved or semi-improved grounds.
- **Watchable Wildlife Areas** – Areas identified under the Watchable Wildlife Program as suitable for passive recreational uses such as bird watching, nature study, and other nonconsumptive uses of wildlife resources.

- **Wildlife-Carrying Capacity** – The maximum density of wildlife that a particular area or habitat can carry on a sustained basis without deterioration of the habitat.

14.0 APPENDICES

Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP

Federal Public Laws and Executive Orders	
National Defense Authorization Act of 1989, Public Law (P.L.) 101-189; Volunteer Partnership Cost-Share Program	Amends two Acts and establishes volunteer and partnership programs for natural and cultural resources management on DoD lands.
Defense Appropriations Act of 1991, P.L. 101-511; Legacy Resource Management Program	Establishes the "Legacy Resource Management Program" for natural and cultural resources. Program emphasis is on inventory and stewardship responsibilities of biological, geophysical, cultural, and historic resources on DoD lands, including restoration of degraded or altered habitats.
EO 11514, Protection and Enhancement of Environmental Quality	Federal agencies shall initiate measures needed to direct their policies, plans, and programs to meet national environmental goals. They shall monitor, evaluate, and control agency activities to protect and enhance the quality of the environment.
EO 11593, Protection and Enhancement of the Cultural Environment	All Federal agencies are required to locate, identify, and record all cultural resources. Cultural resources include sites of archaeological, historical, or architectural significance.
EO 11987, Exotic Organisms	Agencies shall restrict the introduction of exotic species into the natural ecosystems on lands and waters which they administer.
EO 11988, Floodplain Management	Provides direction regarding actions of Federal agencies in floodplains, and requires permits from state, territory and Federal review agencies for any construction within a 100-year floodplain and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for acquiring, managing and disposing of Federal lands and facilities.
EO 11989, Off-Road vehicles on Public Lands	Installations permitting off-road vehicles to designate and mark specific areas/trails to minimize damage and conflicts, publish information including maps, and monitor the effects of their use. Installations may close areas if adverse effects on natural, cultural, or historic resources are observed.
EO 11990, Protection of Wetlands	Requires Federal agencies to avoid undertaking or providing assistance for new construction in wetlands unless there is no practicable alternative, and all practicable measures to minimize harm to wetlands have been implemented and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.
EO 12088, Federal Compliance With Pollution Control Standards	This EO delegates responsibility to the head of each executive agency for ensuring all necessary actions are taken for the prevention, control, and abatement of environmental pollution. This order gives the U.S. Environmental Protection Agency (US EPA) authority to conduct

Federal Public Laws and Executive Orders	
	reviews and inspections to monitor Federal facility compliance with pollution control standards.
EO 12898, Environmental Justice	This EO requires certain federal agencies, including the DoD, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.
EO 13112, Exotic and Invasive Species	To prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	The U.S. Fish and Wildlife Service (USFWS) has the responsibility to administer, oversee, and enforce the conservation provisions of the Migratory Bird Treaty Act, which includes responsibility for population management (e.g., monitoring), habitat protection (e.g., acquisition, enhancement, and modification), international coordination, and regulations development and enforcement.
United States Code	
Animal Damage Control Act (7 U.S.C. § 426-426b, 47 Stat. 1468)	Provides authority to the Secretary of Agriculture for investigation and control of mammalian predators, rodents, and birds. DoD installations may enter into cooperative agreements to conduct animal control projects.
Bald and Golden Eagle Protection Act of 1940, as amended; 16 U.S.C. 668-668c	This law provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
Clean Air Act, (42 U.S.C. § 7401– 7671q, July 14, 1955, as amended)	This Act, as amended, is known as the Clean Air Act of 1970. The amendments made in 1970 established the core of the clean air program. The primary objective is to establish Federal standards for air pollutants. It is designed to improve air quality in areas of the country which do not meet Federal standards and to prevent significant deterioration in areas where air quality exceeds those standards.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (Superfund) (26 U.S.C. § 4611–4682, P.L. 96-510, 94 Stat. 2797), as amended	Authorizes and administers a program to assess damage, respond to releases of hazardous substances, fund cleanup, establish clean-up standards, assign liability, and other efforts to address environmental contaminants. Installation Restoration Program guides cleanups at DoD installations.
Endangered Species Act (ESA) of 1973, as amended; P.L. 93-205, 16 U.S.C. § 1531 et seq.	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Under this law, no Federal action is allowed to jeopardize the continued existence of an endangered or threatened species. The ESA requires consultation with the USFWS and the NOAA Fisheries (National Marine Fisheries Service) and the preparation of a biological evaluation or a biological

Federal Public Laws and Executive Orders	
	assessment may be required when such species are present in an area affected by government activities.
Federal Aid in Wildlife Restoration Act of 1937 (16 U.S.C. § 669–669i; 50 Stat. 917) (Pittman-Robertson Act)	Provides Federal aid to states and territories for management and restoration of wildlife. Fund derives from sports tax on arms and ammunition. Projects include acquisition of wildlife habitat, wildlife research surveys, development of access facilities, and hunter education.
Federal Environmental Pesticide Act of 1972	Requires installations to ensure pesticides are used only in accordance with their label registrations and restricted-use pesticides are applied only by certified applicators.
Federal Land Use Policy and Management Act, 43 U.S.C. § 1701–1782	Requires management of public lands to protect the quality of scientific, scenic, historical, ecological, environmental, and archaeological resources and values; as well as to preserve and protect certain lands in their natural condition for fish and wildlife habitat. This Act also requires consideration of commodity production such as timbering.
Federal Noxious Weed Act of 1974, 7 U.S.C. § 2801–2814	The Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.
Federal Water Pollution Control Act (Clean Water Act [CWA]), 33 U.S.C. §1251–1387	The CWA is a comprehensive statute aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Primary authority for the implementation and enforcement rests with the US EPA.
Fish and Wildlife Conservation Act (16 U.S.C. § 2901–2911; 94 Stat. 1322, PL 96-366)	Installations encouraged to use their authority to conserve and promote conservation of nongame fish and wildlife in their habitats.
Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.)	Directs installations to consult with the USFWS, or state or territorial agencies to ascertain means to protect fish and wildlife resources related to actions resulting in the control or structural modification of any natural stream or body of water. Includes provisions for mitigation and reporting.
Lacey Act of 1900 (16 U.S.C. § 701, 702, 32 Stat. 187, 32 Stat. 285)	Prohibits the importation of wild animals or birds or parts thereof, taken, possessed, or exported in violation of the laws of the country or territory of origin. Provides enforcement and penalties for violation of wildlife related Acts or regulations.
Leases: Non-excess Property of Military Departments, 10 U.S.C. § 2667, as amended	Authorizes DoD to lease to commercial enterprises Federal land not currently needed for public use. Covers agricultural outleasing program.
Migratory Bird Treaty Act 16 U.S.C. § 703–712	The Act implements various treaties for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful without a valid permit.
National Environmental Policy Act of 1969 (NEPA), as amended; P.L. 91-190, 42 U.S.C. § 4321 et seq.	Requires Federal agencies to utilize a systematic approach when assessing environmental impacts of government activities. Establishes the use of environmental impact statements. NEPA proposes an interdisciplinary approach in a decision-making process designed to identify unacceptable or unnecessary impacts on the environment. The Council of Environmental Quality (CEQ) created Regulations for Implementing the National Environmental Policy Act [40 Code of

Federal Public Laws and Executive Orders	
	Federal Regulations (CFR) Parts 1500– 1508], which provide regulations applicable to and binding on all Federal agencies for implementing the procedural provisions of NEPA, as amended.
National Historic Preservation Act, 16 U.S.C. § 470 et seq.	Requires Federal agencies to take account of the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). Provides for the nomination, identification (through listing on the NRHP), and protection of historical and cultural properties of significance.
National Trails Systems Act (16 U.S.C. § 1241–1249)	Provides for the establishment of recreation and scenic trails.
National Wildlife Refuge Acts	Provides for establishment of National Wildlife Refuges through purchase, land transfer, donation, cooperative agreements, and other means.
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd–668ee)	Provides guidelines and instructions for the administration of Wildlife Refuges and other conservation areas.
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001–13; 104 Stat. 3042), as amended	Established requirements for the treatment of Native American human remains and sacred or cultural objects found on Federal lands. Includes requirements on inventory, and notification.
Rivers and Harbors Act of 1899 (33 U.S.C. § 401 et seq.)	Makes it unlawful for the USAF to conduct any work or activity in navigable waters of the United States without a Federal Permit. Installations should coordinate with the U.S. Army Corps of Engineers (USACE) to obtain permits for the discharge of refuse affecting navigable waters under National Pollutant Discharge Elimination System (NPDES) and should coordinate with the USFWS to review effects on fish and wildlife of work and activities to be undertaken as permitted by the USACE.
Sale of certain interests in land, 10 U.S.C. § 2665	Authorizes sale of forest products and reimbursement of the costs of management of forest resources.
Soil and Water Conservation Act (16 U.S.C. § 2001, P.L. 95-193)	Installations shall coordinate with the Secretary of Agriculture to appraise, on a continual basis, soil/water-related resources. Installations will develop and update a program for furthering the conservation, protection, and enhancement of these resources consistent with other Federal and local programs.
Sikes Act (16 U.S.C. § 670a–670l, 74 Stat. 1052), as amended	Provides for the cooperation of DoD, the Departments of the Interior (USFWS), and the State Fish and Game Department in planning, developing, and maintaining fish and wildlife resources on a military installation. Requires development of an Integrated Natural Resources Management Plan and public access to natural resources, and allows collection of nominal hunting and fishing fees. NOTE: AFI 32-7064 sec 3.9. Staffing. As defined in DoDI 4715.03, use professionally trained natural resources management personnel with a degree in the natural sciences to develop and implement the installation INRMP. (T-0). 3.9.1. Outsourcing Natural Resources

Federal Public Laws and Executive Orders	
	Management. As stipulated in the Sikes Act, 16 U.S.C. § 670 et. seq., the Office of Management and Budget Circular No. A-76, Performance of Commercial Activities, August 4, 1983 (Revised May 29, 2003) does not apply to the development, implementation and enforcement of INRMPs. Activities that require the exercise of discretion in making decisions regarding the management and disposition of government owned natural resources are inherently governmental. When it is not practicable to utilize DoD personnel to perform inherently governmental natural resources management duties, obtain these services from federal agencies having responsibilities for the conservation and management of natural resources.
DoD Policy, Directives, and Instructions	
DoD Instruction 4150.07 DoD Pest Management Program dated 29 May 2008	Implements policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program.
DoD Instruction 4715.1, Environmental Security	Establishes policy for protecting, preserving, and (when required) restoring and enhancing the quality of the environment. This instruction also ensures environmental factors are integrated into DoD decision-making processes that could impact the environment, and are given appropriate consideration along with other relevant factors.
DoD Instruction (DODI) 4715.03, Natural Resources Conservation Program	Implements policy, assigns responsibility, and prescribes procedures under DoDI 4715.1 for the integrated management of natural and cultural resources on property under DoD control.
OSD Policy Memorandum – 17 May 2005 – Implementation of Sikes Act Improvement Amendments: Supplemental Guidance Concerning Leased Lands	Provides supplemental guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission. INRMPs must address the resource management on all lands for which the subject installation has real property accountability, including leased lands. Installation commanders may require tenants to accept responsibility for performing appropriate natural resource management actions as a condition of their occupancy or use, but this does not preclude the requirement to address the natural resource management needs of these lands in the installation INRMP.
OSD Policy Memorandum – 1 November 2004 – Implementation of Sikes Act Improvement Act Amendments: Supplemental Guidance Concerning INRMP Reviews	Emphasizes implementing and improving the overall INRMP coordination process. Provides policy on scope of INRMP review, and public comment on INRMP review.
OSD Policy Memorandum – 10 October 2002 – Implementation of Sikes Act Improvement Act: Updated Guidance	Provides guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD and replaces the 21 September 1998 guidance Implementation of the Sikes Act Improvement Amendments. Emphasizes implementing and improving the overall INRMP coordination process and focuses on coordinating with stakeholders, reporting requirements and metrics, budgeting for

Federal Public Laws and Executive Orders	
	INRMP projects, using the INRMP as a substitute for critical habitat designation, supporting military training and testing needs, and facilitating the INRMP review process.
USAF Instructions and Directives	
32 CFR Part 989, as amended, and AFI 32-7061, Environmental Impact Analysis Process	Provides guidance and responsibilities in the EIAP for implementing INRMPs. Implementation of an INRMP constitutes a major federal action and therefore is subject to evaluation through an Environmental Assessment or an Environmental Impact Statement.
AFI 32-7062, Air Force Comprehensive Planning	Provides guidance and responsibilities related to the USAF comprehensive planning process on all USAF-controlled lands.
AFI 32-7064, Integrated Natural Resources Management	Implements AFPD 32-70, Environmental Quality; DODI 4715.03, Natural Resources Conservation Program; and DODI 7310.5, Accounting for Sale of Forest Products. It explains how to manage natural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFI 32-7065, Cultural Resources Management	This instruction implements AFPD 32-70 and DoDI 4710.1, Archaeological and Historic Resources Management. It explains how to manage cultural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFPD 32-70, Environmental Quality	Outlines the USAF mission to achieve and maintain environmental quality on all USAF lands by cleaning up environmental damage resulting from past activities, meeting all environmental standards applicable to present operations, planning its future activities to minimize environmental impacts, managing responsibly the irreplaceable natural and cultural resources it holds in public trust and eliminating pollution from its activities wherever possible. AFPD 32-70 also establishes policies to carry out these objectives.
Policy Memo for Implementation of Sikes Act Improvement Amendments, HQ USAF Environmental Office (USAF/ILEV) on January 29, 1999	Outlines the USAF interpretation and explanation of the Sikes Act and Improvement Act of 1997.

Appendix B. KPSTS INRMP Documentation and Correspondence

Appendix C. KPSTS Natural Resources Revised Database

KPSTS Natural Resources Revised Database

DOCUMENT NAME	DATE	LOCATION
Plans		
Erosion and Sedimentation Control Manual	Unknown	Unknown
Hazardous Waste Management Plan	August 2014	Det 3, 21 SOPS CE, CEO, CEV, etc
Installation Comprehensive Plan	In Progress	Det 3, 21 SOPS CE
Installation Master Plan - Utility Drawings	Unknown	Det 3, 21 SOPS CE
Integrated Cultural Resources Management Plan	January 2014	Det 3, 21 SOPS CEV
Integrated Pest Management Plan	Feb 2013	Revision in progress, Det 3, 21 SOPS CEV
Invasive Plant Species Control Plan	May 2005-2012	Det 3, 21 SOPS CEV
Jurisdictional Wetlands Evaluation and Assessment Report	NA	NA
Outdoor Recreation Plan	NA	NA
Resource Inventory Report	April 1996	Det 3, 21 SOPS CEV
Storm Water Pollution Prevention Plan (Management Plan)	September 2013	Det 3, 21 SOPS CEV
AFIs / Federal Regulations		
AFI 32-1053; Pest Management Program	1 April 1999	
AFI 32-7060; Interagency and Intergovernmental Coordination for Environmental Planning	25 March 1994	
AFI 32-7061; Environmental Impact Analysis Process	24 January 1995	
AFI 32-7064; Integrated Natural Resources Management	22 July 1994	
AFI 32-7065; Cultural Resources Management	13 June 1994	
AFM 32-7081; Forest Management Manual	1 May 1998	
AFI 32-7084; ACUZ Program Manager's Guide	1 March 1999	
Clean Water Act (CWA); P.L. 95-217, as amended	1977	
Conservation Programs on Military Reservations; Sikes Act Improvement Amendments (P.L. 105-85)	1997	
DODI 4700.4; Natural Resources Management Program	24 January 1989	
Endangered Species Act; 16 U.S.C. 1531 *et seq.*	1973	

DOCUMENT NAME	DATE	LOCATION
Executive Order 11514; Protection and Enhancement of Environmental Quality	24 May 1977	
Executive Order 11988; Floodplains Management	24 May 1977	
Executive Order 11990; Wetlands Management	24 May 1977	
AFIs / Federal Regulations (continued)		
Federal Fish and Wildlife Permit for Migratory Bird Depredation	1995	
Federal Insecticide, Fungicide, and Rodenticide Act as amended; 7 U.S.C. 136 *et seq.*	1982	
Federal Land Policy and Management Act; 43 U.S.C. 1701	1976	
Federal Noxious Weed Act; 7 U.S.C. 2809 *et seq.*	1974	
Fish and Wildlife Conservation Act; P.L. 96-366, 16 USC 2901	1979	
Fish and Wildlife Coordination Act; 16 U.S.C. 661 *et seq.*	-	
Migratory Bird Conservation Act; PL 89-699, 16 U.S.C. 715	1965	
National Environmental Policy Act 42 U.S.C. 4341	1970	
Forest Management; Title 10 U.S.C. 2665	-	
Secretary of the Air Force Order 780.1 Wetlands	-	
Secretary of the Air Force Order 790.1 Floodplains	-	
Soil and Water Conservation Act; P.L. 95-193, 16 U.S.C. 2001	1977	

Appendix D. Species Recorded at KPSTS (1996 Resource Inventory Report Data)

Appendix E. Invasive Plant Species Control Plan

The Invasive Species Control Plan and associated activity reports are located in the KPSTS environmental files.

Appendix F. Watershed Protection/ Storm Water Management Plan

The Storm Water Management Plan is located in the KPSTS environmental files

Appendix G: Summary of INRMP Actions for FY 2014 through FY 2019

Summary of INRMP Actions for FY 2017 through FY 2022

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
	1. INRMP Review, Update, and Implementation							
INRMP-1	**Develop, Review, and Revise INRMP (1)**					200		
	In consultation with USFWS, DOFAW, and KPSTS's ESOH Council, develop an INRMP that accommodates operational requirements while conserving regional ecosystem function and biodiversity.							
	Ensure that the goals and objectives of the approved INRMP are consistent with those of the KPSTS General Plan and other operational plans.							
	Facilitate integration of the approved INRMP into the installation's General Plan, and other operational plans.							
	Develop generic Scope of Work (SOW) and Individual Independent Government Cost Estimate (IGCE) for the rewrite of this INRMP and associated component plans.							
	Negotiate, award, and oversee the performance of the rewrite of this INRMP and associated component plans.							
INRMP-2	**Establish Budget for INRMP Implementation (1)**					40		
	On an annual basis, prepare the budget to implement the next fiscal year's actions.							
	Investigate the use of alternative funding sources (e.g., cooperative agreements)							
	Insert new items here							
	Insert new items here							
	2. Ecosystem Management							
EM-1	**Evaluation of Ecosystem Stressors (0)**					40		

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
	Develop a tool that evaluates the stressors on ecosystem health.							
	Apply matrix in management decisions to reduce or eliminate ecosystem stressors.							
EM-2	**Communication of Ecosystem Management Philosophy to Personnel and Visiting Units (0)**					68		
	Include ecosystem management justification in direction provided by the environmental office on all land management projects.							
	Develop educational materials that describe ecosystem management, natural resources, and operational policies for use in training permanent and visiting units.							
	Distribute educational materials on ecosystem management to personnel and visitors with potential to make decisions about activities that impact natural resources							
	Insert new items here							
	Insert new items here							
	3. Fish and Wildlife Management							
FW-1	**Establish a Flora and Fauna Monitoring Program (0)**					200		
	Conduct surveys to assess, at a minimum, avian, mammalian, and insect species and populations. This survey should include a. Detailed survey protocols and established timelines for their completion to ensure that KPSTS personnel maintain the most current data available concerning the resources they are managing. b. A comparison of previous survey data to assess temporal trends in population and habitat conditions. c. Information from the USFWS, DOFAW, and other local experts.							
	Incorporate biological survey data into the INRMP as they are collected.							
FW-2	**Predator and Nonnative Species Control (0)**					184		

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
	Continue to coordinate with the USFWS, the USDA WS program, and the DOFAW for on-going control on the installation.							
	Determine effective trapping methodologies and hunting strategies.							
	Survey for predator and nonnative species activity.							
	Ensure perimeter fence is re-enforced.							
FW-3	**Periodic Review of the State of Hawaii's Comprehensive Wildlife Conservation Strategy (0)**					16		
	Periodically review the Comprehensive Wildlife Conservation Strategy. It is available online at: http://dlnr.hawaii.gov/wildlife/cwcs/							
	Coordinate with DOFAW to insure management actions on the installation support the goals of the Comprehensive Wildlife Conservation Strategy.							
	Insert new items here							
	Insert new items here							
	4. Threatened and Endangered Species Management							
TE-1	**Update Biological Inventory (0)**					200		
	Conduct an updated survey of potential occurring federally listed threatened and endangered species. Given the extent of the 1996 survey, this effort need not be extensive and should focus only on a reconnaissance of the potential habitats on the installation where newly listed species of concern might likely occur.							
	Incorporate findings into relevant planning documents and the INRMP as part of the annual review.							
	Insert new items here							
	Insert new items here							

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
	5. Habitat Management							
IPM-1	**Protection and Revegetation of Native Plant Species (2)**					130		
	Focus invasive and nonnative plant species eradication projects in these areas of the installation.							
	Plant native species such as alah'e *(Canthiurn odoratum)* and 'a'ali'i *(Dodonaea viscose)*.							
IPM-2	**Revegetation of Barren Areas with Native Piligrass *(Heteropogon contortus)*, Lovegrass (*Eragrostis variabilis)*, Javanese flatsedge (*Cyperus javanicus)*, and other native species (2)**					130		
	Plant barren areas with piligrass *(Heteropogon contortus*), lovegrass (*Eragrostis variabilis)*, Javanese flatsedge (*Cyperus javanicus)*, and other native species.							
IPM-3	**Continue Nonnative and Invasive Species Eradication per the Invasive Plant Species Control Plan (1)**					300		
	Develop specific management actions for nonnative and invasive species identified in the control plan.							
	Continue to monitor the spiny cactus treatment area for new growth and treat as necessary.							
	Do not purchase or use nonnative and invasive species in landscaping, or for land restoration or erosion-control projects							
	For landscaping, use plants that are native to the local region as much as possible or those that are not known to be invasive.							
	Notify adjacent land managers of nonnative and invasive plant occurrences and offer to assist in nonnative and invasive plant removal projects.							
	Insert new items here							
	Insert new items here							
	6. Wetland and Floodplain Management							

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
WT -1	**Remain in compliance with USACE, USEPA, and State of Hawaii's wetland regulations (1)**					24		
	Comply with the CWA, NEPA and other applicable EOs and regulations when planning and completing construction activities.							
	Insert new items here							
	Insert new items here							
	7. Watershed Protection Management							
WM-1	**Erosion Prevention Program (1)**					80		
	Identify, inventory, and map areas at high risk for erosion in order of priority (i.e., road banks, unvegetated areas). Gathered data should then be entered into the AutoCAD / Geographical Information Sysytem (GIS) database and monitored to identify any new erosion problems.							
	Consult with the Natural Resources Conservation Service (NRCS) on conservation practices and assistance with prioritizing problem areas.							
	Revegetate exposed areas after construction or maintenance activities.							
	Monitor revegetation efforts annually.							
WM-2	**Implement the Control Measures Presented in the Storm Water Management Plan (0)**					80		
	Implement the six control measures presented in the Storm Water Management Plan.							
	Insert new items here							
	Insert new items here							
	8. Grounds Maintenance							
GM-1	**Landscape and Revegetation Plan (0)**					80		

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
	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, timber harvest, and other disturbances.							
	Seed areas that are currently bare with native grass mix. Only native species, derived from local seed sources (if available) should be used for these purposes.							
	Monitor revegetation efforts for effectiveness and modify as needed.							
GM-2	**Integrated Pest Management Plan (0)**					80		
	Continue to implement the Integrated Pest Management Plan.							
	Implement actions to prevent the destruction of the structures by pests at KPSTS.							
	Implement management measures to control pests posing a potential threat to human health							
	Update the plan every 5 years to ensure that the plan reflects changes in pest populations and current management issues.							
GM-3	**Wildland Fire Management (0)**					160		
	Maintain firebreak clearances and control vegetation around all structures and utilities.							
	Develop and implement a Wildland Fire Management Plan and train personnel accordingly.							
	Support firefighting efforts conducted by Federal, state, and city/county organizations.							
	Insert new items here							
	Insert new items here							
	9. Outdoor Recreation and Public Access							
OR-1	**Public Access, General Safety, and Security (1)**					40		
	Evaluate the public access protocol.							

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
	A DOFAW training manual for hunting regulations should be incorporated into the security protocol.							
OR-2	**Establish a Watchable Wildlife Site (3)**					140		
	Erect interpretive signs that include information on birds that commonly occur in the area, an explanation and diagrams of wind dynamics near coastal bluffs, and information on whale migration patterns and whale species that can be seen from the bluff, and native plant species that occur on the nearby rock outcroppings.							
	Install a safety rail and a picnic table.							
	Insert new items here							
	Insert new items here							
	10. Surrounding Lands							
SL-1	**Coordination with Surrounding Landowners (3)**					80		
	Educate neighboring landowners about the presence of invasive and nonnative plant species on the installation, the potential for them to spread to and from adjacent lands, and the legal requirements to control those species.							
	Ensure grazing animals on the adjacent property do not enter the installation.							
	Insert new items here							
	Insert new items here							
	11. GIS							
GIS-1	**Create GIS Database for KPSTS (0)**					160		
	Acquire a GIS and train Environmental Office Staff in ArcView methods to ensure the accuracy and relevance of data collection, and manipulation.							
	Develop and implement written standards and procedures for GIS administration, including managing metadata.							

Action Number	Natural Resource Area Actions and Categories	Project Execution Lead	Recurring	1-Time Event	As Needed	Estimated Labor Hours	Date & Action	Notes
	Define questions to be answered by GIS, comparisons that should be made, and what formats for GIS output are necessary for KPSTS staff.							
	Educate decisionmakers about the capabilities and limitations of the GIS.							
	Acquire necessary GIS layers.							
	Maintain and operate GIS database to provide current, site-specific information.							
	Develop an annual report that clearly states the condition and trends within KPSTS.							
	Insert new items here							
	Insert new items here							

Appendix H. INRMP Update Report Template

INRMP Update Report

Report Number____ **Type of Update: ☐ Supplement Existing Report or Action**

INRMP Section_____, Page_____ **☐ Remove Existing Project or Action**

Prepared by_____ **☐ Create New Project or Action**

1. Project or action.
2. Goal/ objective for the project or action.
3. Related projects. List relevant INRMP sections and pages. Indicate if these projects are contingent on completion of project or action listed in 1 above.
4. Anticipated start/ end dates. Indicate whether one-time (e.g., survey) or routine (e.g., monitoring).
5. Coordination requirements. Include estimated timeline/ schedule.
Installation Offices/ Programs:
Local Authorities:
State Agencies:
Federal Agencies:
6. Compliance requirements. List appropriate regulations, documentation, permits.
Service/ Installation:
State:
Federal:
7. Briefly describe reason for update.

Appendix I. Environmental Assessment Portions

Environmental Assessment

This section of the document assesses known, potential, and reasonably foreseeable environmental consequences related to implementing the INRMP and managing natural resources at KPSTS. See **Table 1-3** in **Section 1.7.2** for a roadmap indicating NEPA analysis and the corresponding INRMP sections.

Section 6.1 addresses implementation of the No Action Alternative that reflects the continuation of existing baseline conditions as described in **Sections 3 and 4**. **Section 6.2** presents potential effects in the context of the scope of the Proposed Action and in consideration of the affected environment. This assessment presents resource areas adapted from the resources described in **Sections 3 and 4** , as well as resource areas requiring assessment pursuant to 32 CFR 989 *Environmental Impact Analysis Process,* such as socioeconomics and environmental justice. It also considers implementation of the selected management measures in their entirety (as presented in **Sections 4** and **6**, and **Appendix J**). Cumulative effects are discussed in **Section 6.3**. Implementation of the INRMP (i.e., the Proposed Action) is KPSTS's preferred alternative. A summary of the potential environmental consequences associated with the No Action Alternative and the Proposed Action is also presented in **Section 6.3**. A summary of the FONSI is presented in **Section 6.4**.

An Alternative Action was considered during the screening process, but was not carried forward for further analysis because it was not ecologically sound or compatible with the requirements of the military mission. **Section 4** provides a description of the goals and objectives used to develop management measures for each resource area's issues and concerns and the rationale for why certain management measures were selected. Therefore, the analytical framework supporting each resource area is not repeated in this section.

As discussed in **Section 1.4**, the KPSTS INRMP is a "living" document that focuses on a 5-year planning period based on past and present actions. Short-term management practices included in the plan have been developed without compromising long-range goals and objectives. Because the plan will be modified over time, additional environmental analyses could be required as new management measures are developed for the long term (i.e., beyond 5 years).

No Action Alternative

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

Potential consequences associated with the No Action Alternative are discussed in this section for each resource area. **Section 6.3** summarizes the analysis of potential consequences for the No Action Alternative and compares them to the Proposed Action. As shown, no significant adverse effects would be expected. Under the No Action Alternative, the environmental conditions at KPSTS would not benefit from the management measures associated with implementing the proposed INRMP.

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

Affected Environment – Minor adverse effects on the general environmental conditions of KPSTS would be expected under the No Action Alternative. Without the implementation of component

plans and attachments as described in this INRMP to manage the natural resources at KPSTS, certain resources would be vulnerable to degradation.

Climate – No effects on climate would be expected.

Air Quality – Negligible adverse effects would be expected. The primary concern regarding air quality and potential environmental effects pertains to increases in pollutant emissions; exceedance of NAAQS and other Federal, state, and local limits; and impacts on existing air permits. No emissions-producing equipment other than diesel-powered generators, which are regulated by a Hawaii DOH permit, is utilized at KPSTS. KPSTS monitors the permit conditions and has maintained compliance, submitted its required periodic reports, and has been inspected by the Hawaii DOH with no violations found (USAF 2008d).

Noise – No effects would be expected. The primary concern regarding noise and potential environmental effects pertains to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance (e.g., noise complaints). Potential effects are precluded by the fact that current natural resources management actions do not involve activities that would affect noise conditions. Existing noise levels would not change. Therefore, there would be no effects regarding noise levels or sound quality as a result of implementation of the No Action Alternative.

Topography, Geology, and Soils – Minor adverse effects would be expected. KPSTS has activities and plans in place to reduce soil erosion; however, without additional actions needed for effective control of soil erosion and enhancement of sediment retention, impacts on the topography, geology, and soils associated with erosion and sedimentation on KPSTS would be expected to continue and possibly increase with future construction and land use changes driven by safety issues and mission changes.

Water Resources – No effects would be expected. There are no water resources on KPSTS.

Wetlands – No effects would be expected. There are no wetlands on KPSTS.

Floodplains – No effects would be expected. There are no floodplains on KPSTS.

Riparian Habitat – No effects would be expected. There is no riparian habitat on KPSTS.

Terrestrial Ecosystems – Minor adverse effects would be expected. Under the No Action Alternative, there would be no formal plan of action to conserve terrestrial habitat conditions and diversity on a regional basis in light of land conversions necessitated by mission safety requirements.

Fauna – Minor adverse effects would be expected. The No Action Alternative does not specify mechanisms to ensure regional biodiversity through specific actions aimed at maintaining habitat on the installation.

Endangered, Threatened, and Rare Species – No effects would be anticipated as no such species are known to reside on KPSTS.

Land Use – Minor adverse effects would be expected. The No Action Alternative does not accommodate land use conversions necessitated by changes in missions.

Facilities – Minor adverse effects would be expected. The No Action Alternative does not provide natural resources conservation efforts aimed specifically at construction of new facilities, leaving the land surface around those facilities and, therefore, the facilities themselves, at risk.

Hazardous and Toxic Materials – No effects would be expected. Hazardous and toxic materials would continue to be handled in accordance with Federal laws and AFIs, including the Resource Conservation and Recovery Act (RCRA); the FIFRA; the Toxic Substances Control Act (TSCA); and AFI 32 4002, Hazardous Material Emergency Planning and Response Program. Therefore, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the No Action Alternative.

Socioeconomic Resources – No effects would be expected. Under the No Action Alternative, typical changes in population, housing, and economic conditions would continue. Potential effects are precluded by the fact that the No Action Alternative does not involve activities that change existing socioeconomic resources.

Environmental Justice – No effects would be expected. The primary concern regarding environmental justice and potential environmental effects pertains to disproportionately high and adverse consequences to minority, low-income communities, or children. The No Action Alternative in itself does not create any advantage or disadvantage for any group or individual, and is not expected to create disproportionately high or adverse human health or environmental effects on minority or low-income populations or communities surrounding the installation. The installation would address, however, any project-specific issues regarding disproportionate adverse health or environmental effects on minority, low-income groups, or children should they arise, and would use best environmental management practices to ensure compliance with applicable regulatory requirements. Therefore, there would be no effects as a result of implementation of the No Action Alternative.

Cultural Resources –No adverse effects would be expected. The No Action Alternative in itself does not lead to any actions that have the potential to significantly affect cultural resources, tribal resources, tribal rights, or Native Hawaiian lands, which is the threshold consideration of 27 Oct 99 Annotated DOD American Indian and Alaska Native Policy for analysis of effects on Native Americans.

In summary, the analysis of existing (i.e., baseline) conditions identifies no significant adverse environmental concerns, for the conservation, management, or restoration of natural resources. However, the No Action Alternative would conflict with KPSTS's underlying need to meet mission requirements and comply with environmental regulations and policies. Therefore, implementation of the No Action Alternative is not the preferred alternative.

Proposed Action (Preferred Alternative)

Potential consequences associated with the Proposed Action are discussed in this section for each resource area described in **Section 6**. **Section 6.3** summarizes the analysis of potential consequences for the Proposed Action and compares them to the No Action Alternative (i.e., baseline or existing conditions). Potential environmental consequences associated with implementation of the revised INRMP would result in either no effects or beneficial effects for each resource area, with the exception of air quality where minor adverse effects might be expected. Compared to the No Action Alternative, environmental conditions at KPSTS would be conserved or improved as a result of implementing the proposed INRMP revision. Therefore, implementing the revised INRMP (i.e., the Proposed Action) is the preferred alternative.

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

Affected Environment – Beneficial impacts on the general environmental conditions of KPSTS would be expected from implementation of the Proposed Action.

Climate – No effects on climate would be expected.

Air Quality – Negligible adverse effects would be expected. The primary concern regarding air quality and potential environmental effects pertains to increases in pollutant emissions, exceedance of NAAQS, and impacts on existing air permits. No emissions-producing equipment other than diesel-powered generators, which are regulated by a Hawaii DOH permit, is utilized at KPSTS. KPSTS monitors the permit conditions and has maintained compliance, submitted its required periodic reports, and has been inspected by the Hawaii DOH with no violations found.

Noise – No effects would be expected. The primary concern regarding noise and potential environmental effects pertains to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance (e.g., noise complaints). However, potential effects are precluded by the fact that the Proposed Action does not involve activities that would impact noise conditions, such as changes in military equipment, increase in the number or location of personnel, construction of new facilities or modification of existing facilities, or increase or change in military operations. Therefore, there would be no effects on noise levels or sound quality as a result of implementing the Proposed Action.

Topography, geology, and soils – Beneficial effects would be expected. By implementing additional activities to reduce soil erosion and enhance sediment retention, impacts on topography, geology, and soils associated with erosion and sedimentation control at KPSTS would be minimized. Monitoring of soil conditions on the installation to identify potential problem areas, the implementation of conservation measures in areas where exposure of soils is necessary, and, when possible, the avoidance of activities likely to result in erosion would minimize potential impacts on the topography, geology, and soil resources at KPSTS.

Water Resources – Beneficial effects would be expected. Efforts associated with erosion and sediment control would reduce the potential for water quality degradation downstream of the installation.

Wetlands – No effects would be expected. There are no wetlands on KPSTS.

Floodplains – No effects would be expected. There are no floodplains on KPSTS.

Riparian Habitat – No effects would be expected. There is no riparian habitat on KPSTS.

Terrestrial Ecosystems – Beneficial effects would be expected. From the perspective of habitat, implementation of the Proposed Action would result in improved terrestrial habitat conditions for wildlife by providing terrestrial habitat protection.

Fauna – Beneficial effects on wildlife species would be expected on a regional basis. Implementation of the Proposed Action would result in conservation of habitat on the installation.

Endangered, Threatened, and Rare Species – No effects would be anticipated as no such species are known to reside on KPSTS.

Land Use – Beneficial impacts would be expected. The Proposed Action provides specific guidance on the conservation of ecosystem function in light of required land use conversions.

Facilities – Beneficial impacts would be expected. The Proposed Action includes development of revegetation plans designed to protect disturbed lands around newly constructed facilities, and therefore the integrity and function of the facilities themselves.

Hazardous and Toxic Materials – No effects would be expected. Hazardous and toxic materials would continue to be handled in accordance with Federal laws and AFIs, including the RCRA, FIFRA, TSCA, and AFI 32-4002. Thus, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the Proposed Action.

Socioeconomic Resources – No effects would be expected. The primary concern regarding potential effects on socioeconomic resources pertains to changes in population, housing, and economic conditions. Potential effects are precluded by the fact that the Proposed Action does not involve any activities that would contribute to changes in socioeconomic resources. Therefore, there would be no effects on socioeconomic resources as a result of implementing the Proposed Action.

Environmental Justice – No effects would be expected. The primary concern regarding environmental justice and potential environmental effects pertains to disproportionately high and adverse consequences to minority or low-income. Implementation of the Proposed Action in itself would not create any advantage or disadvantage for any group or individual. The proposed INRMP is not expected to create disproportionately high or adverse human health or environmental effects on minority or low-income populations or communities surrounding KPSTS. The installation would address, however, any project-specific issues regarding disproportionate adverse health or environmental effects on minority, low-income groups, or, children should they arise, and would use best environmental management practices to ensure compliance with applicable regulatory requirements. Therefore, there would be no effects as a result of implementing the Proposed Action.

Cultural Resources – No effects would be expected. The Proposed Action incorporates the most current data relative to the nature and location of cultural resources on the base, and therefore, its implementation would not lead to any actions that have the potential to significantly affect cultural resources, tribal resources, tribal rights, or Indian lands for which the threshold of consideration is 27 Oct 99 Annotated DOD American Indian and Alaska Native Policy.

These findings are consistent with the goals of the natural resources management program to maintain ecosystem viability and ensure the sustainability of desired military training conditions. The nature of the management measures recommended by the revised INRMP, if implemented, would directly and positively affect the health and condition of natural resources at KPSTS.

Cumulative Effects

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

Implementation of the INRMP would result in a comprehensive natural resources management strategy for KPSTS that represents compliance, restoration, prevention, and conservation; improves the existing management approach for natural resources on the installation; and meets legal and policy requirements consistent with national natural resources management philosophies. Implementation would be expected initially to improve existing environmental conditions at KPSTS, as shown by the potential for beneficial effects in **Table 6-1** and as described in **Section 6.2**. Over time, adoption of the Proposed Action would enable KPSTS to achieve its goal of maintaining ecosystem viability and ensuring sustainability of desired military conditions.

Future development is possible at KPSTS and the Proposed Action was developed to counteract adverse effects that development might have on local and regional natural resources. Although development can be expected to continue outside of KPSTS, cumulative adverse effects on these resources would not be expected when added to the effects of activities associated with the proposed management measures contained in the revised INRMP.

Table 6-1. Summary of Potential Environmental Consequences

Resource Area/Environmental Condition [a]	Environmental Consequence	
	No Action Alternative	Proposed Action
Affected Environment	Minor Adverse	Beneficial
Climate	None	None
Air Quality	Minor Adverse	Minor Adverse
Noise	None	None
Topography	Minor Adverse	Beneficial
Geology	Minor Adverse	Beneficial
Soils	Minor Adverse	Beneficial
Water Resources	None	None
Wetlands	None	None
Floodplains	None	None
Riparian Habitat	None	None
Terrestrial Ecosystems	Minor Adverse	Beneficial
Fauna	Minor Adverse	Beneficial
Endangered, Threatened, and Rare Species	No Effect	No Effect
Land Use	Minor Adverse	Beneficial
Facilities	Minor Adverse	Beneficial
Hazardous and Toxic Materials	None	None
Socioeconomic Resources	None	None
Environmental Justice	None	None
Cultural Resources	None	None

Note: [a] Resource areas presented in this column are adapted from the resources described in **Sections 3** and **4**, as well as those resource areas requiring assessment pursuant to 32 CFR 989, *Environmental Impact Analysis Process.*

FONSI

Implementation of the Proposed Action would result in either no effects, minor adverse effects, or short- and long-term beneficial effects on identified resources and areas of environmental concern. Based on the

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

15.0 ASSOCIATED PLANS

Tab 1 – Wildland Fire Management Plan (WLFMP)

Tab 2 – Invasive Species Management Plan

Tab 3 – Integrated Pest Management Plan (IPMP)

Tab 4 – Integrated Cultural Resources Management Plan (ICRMP)

Tab 5 – Stormwater Management Plan (SWMP)