FINAL

MARINE CORPS BASE HAWAII INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN UPDATE (~~2017 – 2021~~)

Appendices

Marine Corps Base Hawaii
~~August 2017~~

FINAL

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Appendices

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Marine Corps Base Hawaii

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~~August 2017~~

APPENDICES[1]

[1] Appendix items that appear in *italics* are found only on the Reference CD, not in hard copy.

APPENDIX A
LAWS, REGULATIONS, AND GUIDELINES

This appendix includes information on laws, regulations, and guidelines applicable to natural resources management and INRMP implementation.

A1. INRMP Fact Sheet

A2. MCBH Planning Approaches and Guidelines

A3. *Laws, Regulations, and Other Directives (summary text) (Reference CD only)*

A4. *Sikes Act (Reference CD only)*

A5. *Natural Resource Conservation Metrics (Reference CD only)*

A6. *Tripartite Memorandum of Understanding between DoD, USFWS, and AFWA (Reference CD only)*

A7. *Migratory Bird Treaty Act (Reference CD only)*

A8. *Marine Mammal Protection Act vs State Authority (Reference CD only)*

A9. *State of Hawai'i Related Plans (Reference CD only)*

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A1. INRMP FACT SHEET

Fact sheet on Integrated Natural Resources Management Plans provided by the DoD Natural Resources Conservation Program (July 2015).

http://www.dodnaturalresources.net/Integrated-Natural-Resources-Management-Plans-July-2015.pdf

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Integrated Natural Resources Management Plans

Congress established the Sikes Act (16 U.S.C. 670a-670o) in 1960 to ensure that the U.S. Department of Defense (DoD) conserves and protects the natural resources the
protected fro
some of our
tracts of valu
amended the
implement In
Management

Replace this document with the attached Nov 2020 updated version. Also include the attached additional information re INRMPs

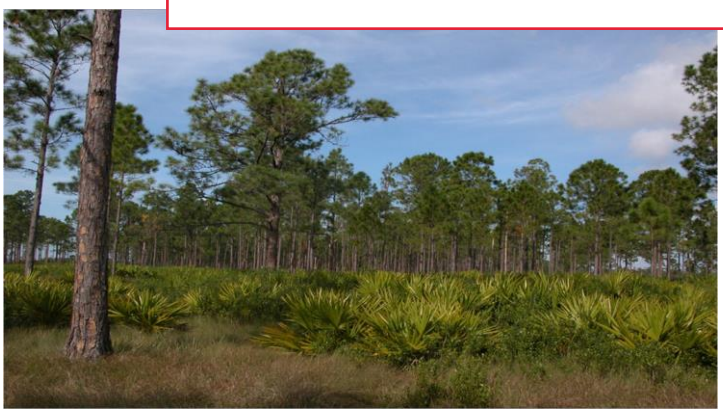
INRMPs provide a comprehensive approach to natural resources management on installations.

xist among the different
asic INRMP includes:

he installation, its history, and its

s and associated timeframes;
lemented and estimated costs;

- A discussion of how the military mission and training requirements are supported while protecting the environment;
- Natural resources' biological needs and legal requirements;
- The role of the installation's natural resources in the context of the surrounding ecosystem; and
- Input from the U.S. Fish & Wildlife Service (USFWS), state fish and wildlife agency, and the general public.



Saw palmetto with longleaf pine background at Avon Park Air Force Range, FL

How INRMPs Guide Natural Resources Management on Military Lands

INRMPs are planning documents that outline how each military installation with significant natural resources will manage those resources. They integrate military mission requirements, environmental and master planning documents, cultural resources, and outdoor recreation to ensure both military operations and natural resources conservation are included and consistent with stewardship and legal requirements.

INRMPs require installations to look holistically at natural resources on a landscape or ecosystem basis. They are living documents that provide direction for daily natural resources management activities, and they provide a foundation for sustaining military readiness.

What an INRMP Includes

INRMPs are based on the principles of ecosystem management. They describe how to manage natural resources, allow for multipurpose uses of those resources, and define public access—all while ensuring no net loss in the capability of an installation to support its military testing and training mission.

The Sikes Act further requires, to the extent appropriate and applicable, that INRMPs include provisions for:

- Sustainable management of fish, plants, and wildlife;
- Enforcement of applicable natural resources laws and regulations;
- Consistency among the various activities conducted under the plan;
- Habitat enhancement, modifications; and/or restoration where necessary to support fish, plants, and/or wildlife;
- Public access to military installations for outdoor recreation and the sustainable use of natural resources by the public to the extent that the use is not inconsistent with the needs of fish, plant, and wildlife resources, and when and where safety and security allow; and
- Compatibility with, and support of, the installation's military mission.

Bells Vireo Nest, San Pedro River, AZ

Examples of projects that are implemented through an INRMP include natural resources assessments, monitoring programs, forestry and rangeland management, noxious and invasive weed control, native habitat restoration, threatened and endangered species management, wildlife education, and recreational hunting and fishing programs. Each of the Military Services has specific policies for developing and implementing INRMPs.

Riverine craft on a training raid, New River Intracoastal Waterway, Camp Lejeune, NC – US Marine Corps Photo

Preparing the INRMP

Trained natural resources professionals prepare the INRMP. Installation managers should actively involve individuals and organizations with a vested interest in managing the installation's natural resources early in the planning process. Stakeholders may include any or all of the following:

- military operations/ training activities managers
- environmental managers
- master planning staff
- federal and state agencies
- agricultural lessees
- recreational groups
- environmental and conservation groups
- cultural resources managers
- installation pest management professionals
- neighboring land owners

Military training on the prairie, Fort Riley, KS

Tracking INRMP Implementation

Each Military Service tracks INRMP progress for its installations, and reports findings to the Office of the Secretary of Defense for each of seven focus areas:

- INRMP Implementation
- Listed Species and Critical Habitat
- Sikes Act Cooperation
- Recreational Use and Access
- Natural Resources Management
- Natural Resources Program Support of the Installation Mission
- Team Adequacy between DoD, the USFWS, and the state fish and wildlife agency

The Sikes Act requires the Secretary of Defense to report annually to Congress the status of each INRMP, and the amounts expended by each military installation to implement its INRMP. The Secretary of the Interior also reports the amounts expended by the USFWS and state fish and game agencies on INRMP-related activities each year.

INRMP Updates

All installations must keep their INRMPs current. INRMPs undergo an annual internal review, and are updated or revised as necessary. Installations invite the USFWS and the appropriate state agency to participate in the annual review process. In addition to DoD's annual review policy, the Sikes Act requires that USFWS and state formally review INRMPs for operation and effect at least every five years.

The INRMP planning process integrates all traditional elements of natural resources management. The process also considers military mission requirements, installation master planning, environmental planning, and outdoor recreation. To address installation requirements and regional issues, INRMPs involve appropriate stakeholders, thereby providing for more efficient and effective management of natural resources on a landscape-scale basis, all while ensuring that military readiness is sustained.

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https://www.denix.osd.mil/nr/

July 2015

A2. MCBH PLANNING APPROACHES AND GUIDELINES

This text describes the foundations of the planning process used for natural resource management at MCBH.

A2.1 PLANNING PROCESS USED

Integrated natural resources management planning for Department of Defense (DoD) facilities has as its foundation "ecosystem management principles" as described in DoD Instruction 4715.03, Natural Resources Conservation Program of March 18, 2011[1] and Marine Corps Order (MCO) P5090.2A Ch 1-3 of August 26, 2013. The planning process used also draws on administrative management principles described in the Code of Environmental Management Principles (CEMP) for Federal Agencies (61 FR 54062) developed by the U.S. Environmental Protection Agency (USEPA) (1997), as directed by Part 4 of Executive Order 13148, Greening of the Government Through Leadership in Environmental Management.[2] It is important to review the evolution of this approach culminating in the requirement for this Integrated Natural Resource Management Plan (INRMP).

A2.2 CODE OF ENVIRONMENTAL MANAGEMENT PRINCIPLES (CEMP)

Even before the Sikes Act Improvement Act – which congressionally mandates INRMPs – there was a related CEMP requirement promulgated by USEPA that contained "precursor" elements. By Executive Order (EO) 12856 (1993), USEPA became the lead Federal agency to develop and enforce compliance with principles and performance objectives that provide a common basis for Federal agencies to move toward responsible environmental management. Among other things, EO 12856 required USEPA to establish an "environmental challenge" program, in cooperation with Federal agencies, including DoD. It required Federal agencies to agree to a code of environmental principles emphasizing pollution prevention, sustainable development, and state-of-the-art environmental management programs. To address this challenge, the CEMP was developed, which contains several component parts. One of those components, "Enabling Systems," included "Measures of Merit" to support overall organizational objectives. In the Conservation area, Headquarters Marine Corps (HQMC) adopted a Measure of Merit that INRMPs would be the primary vehicle through which the Marines would promulgate ecosystem management principles. EO 12856 was revoked with the publication of EO 13148, Greening the Government through Leadership in Environmental Management (2000).

A2.3 ECOSYSTEM APPROACH TO INTEGRATED NATURAL RESOURCE MANAGEMENT

In 1995 the DoD was one of fourteen Federal land management agencies to sign an Interagency Memorandum of Understanding (MOU) to Foster the Ecosystem Approach.[3] The goal of Ecosystem Management as stated in the MOU is:

[1] Initially published as DoD Instruction 4715.3 of May 3, 1996.

[2] Executive Order 13148 was rescinded and replaced by Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, signed January 24, 2007, and Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, signed October 5, 2009. Executive Order 13423 and Executive Order 13514 were subsequently rescinded and replaced by Executive Order 13693, Planning for Federal Sustainability in the Next Decade, signed March 19, 2015. The Memorandum for Executive Departments and Agencies: Incorporating Ecosystem Services into Federal Decision Making, published October 7, 2015, is another recent document that supports this approach.

[3] Memorandum of Understanding to Foster the Ecosystem Approach signed on December 15, 1995 by the President's Council of Environmental Quality and 14 Federal land management agencies. Distributed within DoD in

> …to restore and sustain the health, productivity, and biological diversity of ecosystems and their overall quality of life through a natural resource management approach that is fully integrated with social and economic goals.

The MOU further defined an ecosystem approach as:

> …a method for sustaining or restoring ecological systems and their functions and values. It is goal driven, and it is based on a collaboratively developed vision of desired future conditions that integrates ecological, economic, and social factors. It is applied within a geographic framework defined primarily by ecological boundaries.

Ecosystem Management emphasizes humans as part of the ecosystem, basing resource management decisions not only on "best science" but on associated cultural values, improved communication with the general public, and forming partnerships with government, non-governmental agencies, and other stakeholders.

DoD Instruction 4715.3 of May 3, 1996 defined the 'Goal of Ecosystem Management' and included ten "Ecosystem Management Principles and Guidelines" to be followed by all U.S.-based military installations with significant natural resources.[4]

A. GOAL OF ECOSYSTEM MANAGEMENT

To ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, that approach shall maintain and improve the sustainability and biological diversity of terrestrial and aquatic and marine ecosystems while supporting sustainable economies, human use, and the environment required for realistic military training operations.

B. PRINCIPLES AND GUIDELINES

1. **Maintain and Improve the Sustainability and Native Biodiversity of Ecosystems**. Ecosystem management involves conducting installation programs and activities in a manner that identifies, maintains, and restores the "composition, structure, and function of natural communities that comprise ecosystems," to ensure their sustainability and conservation of biodiversity at landscape and other relevant ecological scales to the maximum extent that mission needs allow.

2. **Administer with Consideration of Ecological Units and Timeframes**. Ecosystem management requires consideration of the effects of installation programs and actions at spatial and temporal ecological scales that are relevant to natural processes. A larger geographic view and more appropriate ecological time frames assist in the analysis of cumulative effects on ecosystems that may not be apparent with smaller and shorter scales. Regional ecosystem management efforts are generally more appropriate than either national or installation-specific efforts. Consideration of sustainability under long-term environmental threats, such as climate change, is also important.

3. **Support Sustainable Human Activities**. People and their social, economic, and national security needs are an integral part of ecological systems, and management of ecosystems depends on sensitivity to those issues. Consistent with mission requirements, actions should

an attachment to Memorandum of the Undersecretary of Defense, Environmental Security (ES)/EQ-CO, Letter of January 23, 1996, prepared by Office of the Undersecretary of Defense, ES. Pentagon, Washington, D.C.

[4] DoD Instruction 4715.3 has been updated to DoD Instruction 4715.03, Natural Resources Conservation Program, published March 18, 2011. Updates include new and updated policy for integrated management of natural resources and implementation of Natural Resources Conservation metrics.

support multiple use (e.g., outdoor recreation, hunting, fishing, forest timber products, and agricultural outleasing) and sustainable development by meeting the needs of the present without compromising the ability of future generations to meet their own needs.

4. **Develop a Vision of Ecosystem Health**. All interested parties (Federal, State, tribal, and local governments, nongovernmental organizations, private organizations, and the public) should collaborate in developing a shared vision of what constitutes desirable future ecosystem conditions for the region of concern. Existing social and economic conditions should be factored into the vision, as well as methods by which all parties may contribute to the achievement of desirable ecosystem goals.

5. **Develop Priorities and Reconcile Conflicts**. Successful approaches should include mechanisms for establishing priorities among the objectives and for conflict resolution during both the selection of the ecosystem management objectives and the methods for meeting those objectives. Identifying "local installation objectives" and "urban development trends" are especially important to determine compatibility with ecosystem objectives. Regional workshops should be convened periodically to ensure that efforts are focused and coordinated.

6. **Develop Coordinated Approaches to Work Toward Ecosystem Health**. Ecosystems rarely coincide with ownership and political boundaries so cooperation across ownerships is an important component of ecosystem management. To develop the collaborative approach necessary for successful ecosystem management, installations should:

    a. Involve the military operational community early in the planning process. Work with military trainers and others to find ways to accomplish the military mission in a manner consistent with ecosystem management.

    b. Develop a detailed ecosystem management implementation strategy for installation lands and other programs based on the vision developed in subsection B.4., above, and those principles and guidelines;

    c. Meet regularly with regional stakeholders (e.g., State, tribal, and local governments; nongovernmental entities; private landowners; and the public) to discuss issues and to work towards common goals.

    d. Incorporate ecosystem management goals into strategic, financial, and program planning and design budgets to meet the goals and objectives of the ecosystem management implementation strategy.

    e. Seek to prevent undesirable duplication of effort, minimize inconsistencies, and create efficiencies in programs affecting ecosystems.

7. **Rely on the Best Science and Data Available**. Ecosystem management is based on scientific understanding of ecosystem composition, structure, and function. It requires more and better research and data collection, as well as better coordination and use of existing data and technologies. Information should be accessible, consistent, and commensurable. Standards should be established for the collection, taxonomy, distribution, exchange, update, and format of ecological, socioeconomic, cartographic, and managerial data.

8. **Use Benchmarks to Monitor and Evaluate Outcomes**. Accountability measurements are vital to effective ecosystem management. Implementation strategies should include specific and measurable objectives and criteria with which to evaluate activities in the ecosystem. Efficiencies gained through cooperation and streamlining should be included in those objectives.

9. **Use Adaptive Management**. Ecosystems are recognized as open, changing, and complex systems. Management practices should be flexible to accommodate the evolution of scientific

understanding of ecosystems. Based on periodic reviews of implementation, adjustments to the standards and guidelines applicable to management activities affecting the ecosystem should be made.

10. **Implement Through Installation Plans and Programs**. An ecosystem's desirable range of future conditions should be achieved through linkages with other stakeholders. "Specific DoD activities" should be identified, as appropriate, in installation INRMPs and ICRMPs and in other planning and budgeting documents.

Marine Corps compliance with an ecosystem approach to integrated natural resource management was further reinforced in MCO P5090.2A, Environmental Compliance and Protection Manual. As summarized in Paragraph 11105.13 of MCO P5090.2A, Ecosystem Management is:

> A goal-driven approach to managing natural and cultural resources that supports present and future mission requirements; preserves ecosystem integrity; is at a scale compatible with natural processes; is cognizant of natural processes' time scales; recognizes social and economic viability within functioning ecosystems; is adaptable to complex, changing requirements; and is realized through effective partnerships among private, local, state, tribal, and Federal interests. Ecosystem management is a process that considers the environment as a complex system functioning as a whole, not as a collection of parts, and recognizes that people and their social and economic needs are a part of the whole.

For emphasis, Ecosystem Management differs from conventional natural resources management in at least three important ways.

1. It stresses collaborative learning and a participatory approach that involves Base resource managers, the internal and external stakeholder communities, and other subject-specific expertise, as appropriate. To be fully collaborative includes recognizing differences in held values pertaining to natural resources and their uses (e.g., Marines may look at a coral reef as an environmental impediment to assault of a beach during amphibious landing maneuvers while a fisherman may look at the same reef as a source of subsistence; a scuba diver as a source of recreation; and a marine biologist as a source of valued biological diversity).

2. It involves multiple disciplines, addressing multiple resources, and is systems oriented. It treats all resources (e.g., soil, wetlands, watersheds, fish and wildlife) as inter-related components of a single system.

3. It views human systems – the economy, community, society, and culture – as part of the ecosystem, rather than seeing human systems as an external factor impacting the environment.

A2.4 INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN (INRMP)

As defined in MCO P5090.2A, Paragraph 11105.25[5], an INRMP is:

> A planning document using ecosystem management principles directing the management of conservation of installation natural resources.

Preparing and implementing such a plan addresses the overarching Marine Corps Natural Resources Management Goals as stated in Paragraph 11200.3 of MCO P5090.2A:

a. Preserve access to air, land, and sea spaces to meet military readiness requirements;
b. Comply with applicable natural resources protection requirements (e.g., laws, E.O.s, and regulations);
c. Provide public access to installation lands, where practicable, provided such access does not conflict with military readiness and does not harm sensitive installation natural resources;
d. Participate in regional ecosystem management partnerships provided such participation does not conflict with military readiness or provisions of a SOFA [Status of U.S. Armed Forces in Japan Agreement] and does not harm installation natural resources; and
e. Participate in wetland mitigation banks and threatened and endangered species conservation banks.[6]

A2.5 WATERSHED APPROACH

Federal regulations and DoD and Marine Corps directives mandate that MCBH take an "ecosystem perspective" while engaging in land and natural resource management actions. This means looking "beyond base borders" to entire ecosystems of which MCBH is a part and working with all stakeholders concerned about shared natural resources in that region. In Hawai'i, a "watershed" is one of the functional units of ecosystem-level concern most useful for land use and resource managers. A watershed is "an area where rain and other water drains to a common location such as a river, lake, or wetland. This collection of water may occur naturally (as with rain running down a hillside) or with the influence of drainage infrastructure such as ditches and storm sewers" (USEPA 1997). Watershed assessment, planning, and actions have become an essential component of integrated natural resources management. The "watershed approach" to resource planning and management is recognized as highly advantageous as a means to accelerate Federal progress towards achieving Clean Water Act compliance. A watershed approach includes a set of methodologies to assess and restore the condition of a watershed. As described in the Unified Federal Policy (UFP) for a Watershed Approach to Federal Land and Resource Management, Notice of Final Policy, (October 18, 2000, 65 FR 62566), it is "a framework to guide watershed management that: (1) uses watershed assessments to determine existing and reference conditions; (2) incorporates assessment results into resource management planning; and (3) fosters collaboration with all landowners in the watershed."

[5] Previously MCO 5090.2A (Paragraph 11105.24) defined an INRMP as an integrated ecosystem management plan showing the interrelationships of individual components of natural resources management (fish and wildlife, forestry, land management, and public access) to mission requirements and other land use activities affecting an installation's natural resources.

[6] While MCBH understands and supports the use of mitigation and conservation banking, these practices have not historically been used in Hawai'i.

The watershed approach is inherently integrative, has clearly defined procedural components, allows for identification of distinct land and water resource management units, and is complementary with ecosystem management principles. It is viewed as an effective and efficient means of addressing multiple compliance requirements bearing on environmental and natural resources components of watersheds: water quality, inland water bodies (streams, lakes, reservoirs, estuaries, and wetlands), riparian habitat, water resources, and others (COA 7.3).

A foundation of the watershed approach is a watershed assessment, which in its most comprehensive sense is a continuous process of information gathering, analysis, stakeholder interaction, action, and response evaluation. As defined in the UFP for a Watershed Approach to Federal Land and Resource Management, a watershed assessment is “an analysis and interpretation of the physical and landscape characteristics of a watershed using scientific principles to describe watershed conditions as they affect water quality and aquatic resources.” Watershed condition is “the state of the watershed based on physical and biogeochemical characteristics and processes (e.g., hydrologic, geomorphic, landscape, topographic, vegetative cover, and aquatic habitat, water flow characteristics and processes (e.g., chemical, physical, and biological) as it affects water quality and water resources.” The UFP states that Federal agencies “will develop a science-based approach to watershed assessment for Federal lands. Watershed assessment information will become part of the basis for identifying management opportunities and priorities and for developing alternatives to protect or restore watersheds” in so far as existing “missions, funding, and fiscal and budgetary authorities permit” (see II. Agency Objectives section of UFP).

A2.6 COOPERATIVE CONSERVATION

EO 13352 Facilitation of Cooperative Conservation (2004) launched a significant national initiative in this regard (Appendix A3). In 2008 the Government Accountability Office (GAO) conducted a study to determine if collaborative resource management is an effective enough means of resolving natural resource conflicts and problems to warrant the use of time and resources it requires (GAO 2008). The GAO determined that the key challenges Federal agencies face have similarities and recommended that agencies develop long term plans that support collaborative efforts.

One response to the GAO recommendations was the development of a MOU, signed January 2009, between the U.S. Departments of Agriculture, Commerce, Defense and the Interior; the USEPA; and the Council on Environmental Quality. The MOU established the Partnership for Cooperative Conservation and provides a framework for Federal agencies to facilitate cooperative conservation initiatives among agencies and across public and private sectors to sustain and conserve natural resources. The MOU calls for the agencies involved to identify issues, develop solutions, and share best practices in collaborative natural resources and environmental management across organizational and jurisdictional boundaries.

A2.7 IMPLEMENTATION LEVEL OF EFFORT

The 2001 INRMP/EA defined three alternative sets of management actions and levels of effort that can be undertaken to implement INRMP management actions: Operational Stewardship (continuing current level of action effort), Compliance-focused Stewardship (reduced level and type of effort), or Optimal Stewardship (increased level and type of effort).

> **Compliance-focused Stewardship**: a programmatic set of management actions comprising an alternative under which MCBH will reduce the scale, type, and intensity of its established resource management program actions in the COA, although integration of military mission priorities with an ecosystem management approach will continue as a central element of compliance (see Sections 5 and 7, 2001 INRMP/EA).
>
> **Operational Stewardship**: a programmatic set of management actions comprising an alternative under which MCBH will continue its existing level of effort in the COA (see Sections 5 and 7, 2001 INRMP/EA).
>
> **Optimum Stewardship**: a programmatic set of management actions comprising an alternative under which MCBH will increase the type, intensity and scale of its established natural resource management program actions in the COA, providing they continue to integrate with military mission priorities (see Sections 5 and 7, 2001 INRMP/EA).

Considering these alternative sets during the INRMP development and update process helped to define the minimum/maximum range of management efforts possible within the INRMP implementation framework, while still adhering to relevant laws, regulations, and directives. To satisfy National Environmental Policy Act (NEPA) requirements when the original INRMP/EA was developed, potential environmental impacts were analyzed and discussed for the three alternative sets of management actions considered (Sections 5 and 8, and Appendix C of the 2001 INRMP/EA). Each alternative comprised a set of programmatic actions that varied in intensity and duration over the time frame of the INRMP.

Since 2001, MCBH has demonstrated a sustained commitment to the Operational Stewardship level of management effort in implementing the integrated natural resources management program. Since this updated INRMP continues this existing level of program implementation, no revision to the NEPA analysis is required or contained in this document.

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A3. LAWS, REGULATIONS, AND OTHER DIRECTIVES

This appendix contains a summary table of laws and regulations applicable to natural resources management at MCBH, along with brief descriptions of some of the principal Federal and State laws, Executive Orders, and other directives that influence MCBH's INRMP. The primary source for their descriptions and relevance to natural resource management is the Federal Register (FR), MCO 5090.2A, or the directive itself. Full text of codified laws can be found through the Legal Information Institute at http://topics.law.cornell.edu/wex. Full text of Executive Orders can be found by searching http://www.archives.gov/federal-register/executive-orders/.

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
LAWS – FEDERAL		
Act To Prevent Pollution From Ships, PL 96-478, as amended (33 U.S.C. §§ 1901-1912)	X	
Alternative Motor Fuel Act of 1988, PL 100-494, as amended		X
Antiquities Act of 1906, PL 59-209 (16 U.S.C. §§ 431-433)	X	
Archaeological and Historic Preservation Act (Moss-Bennett Act) of 1974, PL 86-532 (16 U.S.C. §§ 469-469c)		X
Archaeological Resources Protection Act of 1979, PL 96-95 (16 U.S.C. §§ 470aa-470mm)		X
Base Closure and Realignment Act (BRAC) of 1990, as amended PL 101-510		X
Brown Tree Snake Control and Eradication Act of 2004 (Public Law 108-834)	X	
Clean Air Act of 1955, 69 Stat. 322, as amended (42 U.S.C. §§ 7401-7671q)		X
Clean Air Act of 1970, as amended (42 U.S.C. §§ 7401 *et seq*.)		X
Clean Water Act of 1977, as amended PL 95-217 (33 U.S.C. §§ 1251 *et seq*.)	X	
Coastal Zone Management Act of 1972, PL 92-583 (16 U.S.C. §§ 1451-1465)	X	
Community Environmental Response Facilitation Act of 1992, PL 102-426		X
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA; Superfund), as amended (42 U.S.C. §§ 9601 *et seq*.)		X
Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. §§ 11001 *et seq*.)		X
Emergency Wetlands Resources Act of 1986, PL 99-645, as amended (16 U.S.C. §§ 3901- 3932)		X
Endangered Species Act of 1973, PL 93-205, as amended (16 U.S.C. §§ 1531-1534)	X	
Energy Policy Act of 1992, PL 102-486 as amended (42 U.S.C. ch. 134 §§ 13201 *et seq*.)		X
Energy Policy and Conservation Act of 1975, as amended (42 U.S.C. §§ 6201 *et seq*.)		X
Erosion Protection Act, PL 86-645 as amended (33 U.S.C. §§ 426-426-3)	X	
Estuary Protection Act of 1968, PL 90-454 (16 U.S.C. §§ 1221- 1226)	X	
Estuaries and Clean Waters Act of 2000, PL 106-457 (33 U.S.C. §§ 2901)	X	

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
Federal Facility Compliance Act of 1992, PL 102-386 (42 U.S.C. 6901 note, 6908)		X
Federal Insecticide, Fungicide and Rodenticide Act of 1947, PL 92-516, as amended (7 U.S.C. §§ 136-136y)		X
Federal Land Policy and Management Act of 1976, PL 94-579, as amended (43 U.S.C. §§ 1701-1785)		X
Federal Property and Administrative Services Act of 1949 (10 U.S.C. §§ 484 *et seq*.)		X
Federal Tort Claims Act of 1946, as amended (28 U.S.C. §§ 2671 *et seq*.)		X
Federal Water Pollution Control Act of 1972, PL 92-500, as amended by Clean Water Act of 1977	X	
Fish and Wildlife Conservation Act of 1980, PL 96-366 as amended (16 U.S.C. §§ 2901-2912)	X	
Fish and Wildlife Coordination Act of 1934, PL 85-624, as amended (16 U.S.C. §§ 661-666c)	X	
Food, Agricultural, Conservation and Trade Act of 1990 (Pesticide Recordkeeping), PL 101-624, as amended (7 U.S.C. § 138i-1)		X
Freedom of Information Act of 1966, as amended (5 U.S.C. §§ 552 *et seq*.)		X
Hazardous and Solid Waste Amendments of 1984, PL 98-616		X
Hazardous Materials Transportation Act of 1975 (49 U.S.C. §§ 5101 *et seq*.)		X
Hazardous Materials Transportation Uniform Safety Act of 1990, PL 101-615		X
Historic Sites, Buildings and Antiquities Act of 1935, as amended by PL 74-292, PL 100-17 (16 U.S.C. §§ 461- 467)		X
Lacey Act of 1900, 31 Stat. 187, as amended (16 U.S.C. §§ 667e, 701)	X	
Low-Level Radioactive Waste Policy Act of 1980, as amended (42 U.S.C. §§ 2021 *et seq*.)		X
Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 U.S.C. §§ 1801 *et seq*.)	X	
Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (P.L. 109-479)	X	
Marine Mammal Protection Act of 1972, PL 92-522, as amended (16 U.S.C. §§ 1361-1421h)	X	
Marine Protection, Research and Sanctuaries Act of 1972, as amended (33 U.S.C. §§ 1401 *et seq*. and 16 U.S.C. §§ 1431 *et seq*.)	X	
Migratory Bird Treaty Act of 1918, 40 Stat. 755, as amended (16 U.S.C. §§ 703-712)	X	
Military Construction Authorization Act, Passed Annually		X
Military Construction Codification Act of 1982, PL 97-214		X
Military Reservation and Facilities: Hunting, Fishing and Trapping Act of 1958, PL 85-337 (10 U.S.C. §§ 2671)	X	
Multiple-Use Sustained Yield Act of 1960, PL 86-517 (16 U.S.C. §§ 528-531)		X
National Defense Authorization Act (NDAA) for Fiscal Year 2003	X	
National Defense Authorization Act (NDAA) for Fiscal Year 2004	X	
National Defense Authorization Act (NDAA) for Fiscal Year 2009	X	

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
National Defense Authorization Act (NDAA) for Fiscal Year 2010	X	
National Energy Conservation Policy Act of 1968, PL 95-619		X
National Environmental Policy Act of 1969, PL 91-190 (42 U.S.C. §§ 4321-4370d)	X	
National Historic Preservation Act of 1966, PL 89-665, as amended (16 U.S.C. §§ 470- 470x-6)		X
National Invasive Species Act Of 1996 (16 U.S.C. §§ 4701-4751)	X	
Native American Graves Protection and Repatriation Act of 1990, PL 101-601 (25 U.S.C. §§ 3001-3013)		X
Noise Control Act of 1972 (42 U.S.C. §§ 4901 *et seq*.)		X
Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended, PL 101-646 (16 U.S.C. 4701)	X	
North American Wetlands Conservation Act, PL 101-233 (16 U.S.C. §§ 4401-4414)	X	
Noxious Plant Control Act of 1968, PL 90-583 (43 U.S.C. §§ 1241 *et seq*.)	X	
Noxious Weed Control and Eradication Act of 2004, PL 108-412 (U.S.C. §§ 7781-7786)	X	
Occupational Safety and Health Act of 1970, PL 91-596, (29 U.S.C. §§ 651 *et seq*.)		X
Oceans Act of 2000, PL 106-256, (33 U.S.C. §§857-19)		X
Oil Pollution Act of 1990, PL 101-380 (33 U.S.C. §§ 2701 *et seq*.)		X
Outdoor Recreation – Federal/State Program Act (16 U.S.C. §§ 460 (L) *et seq*.)	X	
Outleasing for Grazing and Agriculture on Military Lands (10 U.S.C. § 2667)		X
Paleontological Resources Preservation Act P.L. 111-011, Title VI, Subtitle D (16 U.S.C. §§ 470aaa)	X	
Plant Protection Act, PL 106-224, as amended (7 U.S.C. §§ 7701-7772)	X	
Pollution Prevention Act of 1990 (42 U.S.C. §§ 13101 *et seq*.)		X
Resource Conservation and Recovery Act of 1976, PL 94-580, as amended (42 U.S.C. §§ 6901 *et seq*.)	X	
Rivers and Harbors Appropriations Act of 1899, 30 Stat. 1151, as amended (33 U.S.C. §§ 401-403)		X
Safe Drinking Water Act of 1974, PL 93-523, as amended (42 U.S.C. §§ 300f-300j-26)		X
Sikes Act (Conservation Programs on Military Reservations of 1960), PL 86-797, as amended (16 U.S.C. §§ 670-670f)	X	
Sikes Act Improvement Act of 1997	X	
Soil Conservation Act of 1938 (16 U.S.C. §§ 5901 *et seq*.)	X	
Soil and Water Resources Conservation Act of 1977, PL 95-192, as amended (16 U.S.C. §§ 2001-2009)	X	
Solid Waste Disposal Act of 1965, PL 89-272, as amended (42 U.S.C. §§ 3251 *et seq*.)		X
Superfund Amendments and Reauthorization Act (SARA) of 1986, PL 99-499		X

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
Sustainable Fisheries Act, PL 104-297 (16 U.S.C. §§ 1801)	X	
Toxic Substances Control Act of 1976 (15 U.S.C. §§ 2601 *et seq*.)		X
Used Oil Recycling Act of 1980, PL 96-463, as amended		X
Water Resources Planning Act, PL 89-80, as amended (42 U.S.C. §§ 1962-1962d-20)		X
Water Quality Act of 1965, PL 89-234		X
Water Quality Improvement Act of 1970, PL 91-224		X
Watershed Protection and Flood Prevention Act, PL 92-419, as amended (16 U.S.C. §§ 1001-1011, 33 U.S.C. 701)	X	
RULES – STATE OF HAWAI'I		
Administrative Rules of the Department of Agriculture (HAR Title 4)		X
Administrative Rules of the Department of Health (HAR Title 11)		X
Administrative Rules of the Department of Land and Natural Resources (HAR Title 13)[1]	X	
Coastal Zone Management Program (HRS Section 205A)	X	
Conservation and Resources Prohibitions (HRS Title 12 Section 171-58.5)	X	
Hawai'i State Planning Act (HRS Section 226)		X
Noxious Weed Control (HRS Chapter 152)		X
Plant and Non-Domestic Animal Quarantine (HRS Chapter 150A)		X
EXECUTIVE ORDERS / MEMORANDUMS OF UNDERSTANDING[2]		
Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970 (35 FR 4247), as amended by Executive Orders 11541 and 11991	X	
Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971 (36 FR 8921)		X
Executive Order 11644, Use of Off-Road Vehicles on Public Lands, February 8, 1972 (37 FR 2877), as amended by Executive Orders 11989 and 12608		X
Executive Order 11987, Exotic Organisms, May 24, 1977 (42 FR 26949)		X
Executive Order 11988, Floodplain Management, May 24, 1977 (42 FR 26951), as amended by Executive Order 12148 and 13690	X	
Executive Order 11990, Protection of Wetlands, May 24, 1977 (42 FR 26961), as amended by Executive Order 12608	X	
Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978 (43 FR 47707), as amended by Executive Order 12580		X

[1] Due to the recreational hunting program at MCTAB, State hunting rules (HAR Title 13, Chapter 123: Rules Regulating Game Mammal Hunting) have a direct influence on MCBH's INRMP. State rules protecting marine resources also have a direct influence on MCBH's INRMP (HAR Title 13, Chapter 95. Rules Regulating the Taking and Selling of Certain Marine Resources. HAR Title 13, Chapter 86.1. Sea Cucumbers).

[2] Many Executive Orders have been amended to allow the transfer of certain functions to the Secretary of Homeland Security. Amendments related solely to the transfer of functions to Homeland Security have not been included.

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, January 4, 1979 (44 FR 1957)		X
Executive Order 12580, Super Fund Implementation, January 23, 1987 (52 FR 2923)		X
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, February 11, 1994 (59 FR 7629), as amended by Executive Order 12948	X	
Executive Order 12906, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure, April 11, 1994 (59 FR 17671), as amended by Executive Order 13286	X	
Executive Order 12962, Recreational Fisheries, June 7, 1995 (60 FR 30769) as amended by Executive Order 13474	X	
Executive Order 13007, Indian Sacred Sites, May 24, 1996 (61 FR 26771)		X
Executive Order 13045, Protection of Children From Environmental Health Risks and Safety Risks, April 21, 1997 (62 FR 19885), as amended by Executive Orders 13229 and 13296	X	
Executive Order 13089, Coral Reef Protection, June 11, 1998 (63 FR 32701)	X	
Executive Order 13112, Invasive Species, February 3, 1999 (64 FR 6183), as amended by Executive Order 13286, as amended by Executive Order 13751	X	
Executive Order 13158, Marine Protected Areas, May 26, 2000 (65 FR 34909)		X
Executive Order 13186, Responsibilities of Federal Agencies To Protect Migratory Birds, January 10, 2001 (66 FR 3853)	X	
Executive Order 13308, Further Amendment to Executive Order 12580, as Amended, Superfund Implementation, June 24, 2003 (68 FR 37691)		X
Executive Order 13352, Facilitation of Cooperative Conservation, August 26, 2004 (69 FR 52989)	X	
Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, October 5, 2009 (74 FR 52117)	X	
Executive Order 13547, Stewardship of the Ocean, Our Coasts, and the Great Lakes, July 19, 2010 (75 FR 43023)	X	
Executive Order 13693, Planning for Federal Sustainability in the Next Decade, March 19, 2015 (80 FR 15871)	X	
Executive Order 13751, Safeguarding the Nation From the Impacts of Invasive Species, December 5, 2016 (81 FR 88609)	X	
Executive Order 13783, Promoting Energy Independence and Promoting Economic Growth, April 5, 2017 (81 FR 51866)	X	
Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds (60 FR 40837 of August 10, 1995)	X	
Memorandum for Chief of Naval Operations Commandant of the Marine Corps: Policy Guidance for Endangered Species Actions (November 25, 2002)	X	

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
Memorandum for Executive Departments and Agencies: Incorporating Ecosystem Services into Federal Decision Making (October 7, 2015)	X	
Memorandum on Environmentally Beneficial Landscaping: Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds (April 26, 1994)	X	
Memorandum of Understanding between the U.S. Department of Defense and the U.S. Fish and Wildlife Service and the Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations (July 29, 2013)	X	
Memorandum of Understanding (MOU) to Foster the Ecosystem Approach (December 15, 1995)	X	
Memorandum of Understanding (MOU) to Promote the Conservation of Migratory Birds (September 5, 2014)	X	
GUIDANCE, NOTICES, POLICIES, AND REGULATIONS		
Code of Environmental Management Principles for Federal Agencies (61 FR 54062)	X	
Code of Federal Regulations, Title 40: Protection of Environment	X	
Curation of Federally Owned and Administered Archaeological Collections (36 CFR § 79)		X
Determination of Eligibility for Inclusion in the National Register of Historic Places (36 CFR. § 63)		X
Department of the Navy Low-Impact Development Policy for Storm Water Management, November 16, 2007	X	
Environmental Protection and Enhancement: Subpart H Historic Preservation (32 CFR § 650)		X
Federal Wildland Fire Management Policy (1995)	X	
Final Notice of Issuance and Modification of Nationwide Permits, March 9, 2000 (65 FR 12818)	X	
Fish and Wildlife Service List of Endangered and Threatened Wildlife and Plants (50 CFR 17.11 and 17.12)	X	
Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes (October 31, 2011) as supplemented (October 22, 2014)	X	
Guidance for Addressing Migratory Bird Management in Integrated Natural Resources Management Plans	X	
Guidelines for Coordination on Integrated Natural Resource Management Plans (June 15, 2015)	X	
Guidelines for Streamlined Integrated Natural Resource Management Plan (INRMP) Review (July 20, 2015)	X	
Historic Preservation Certificates (36 CFR § 67)		X
Hunting and Fishing Permits (32 CFR §§ 552.19)	X	
Integrated Management of Stray Animals on Military Installations (Armed Forces Pest Management Board Technical Guide No. 37) (May 25, 2012)	X	
National Historic Landmarks Program (36 CFR § 65)		X
National Register of Historic Places (36 CFR § 60)		X

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
Native American Graves Protection and Repatriation Act Regulations (43 CFR § 1O)		X
Preservation of American Antiquities (Antiquities Act regulations) (43 CFR § 3)		X
Protection of Archaeological Resources: Department of Defense Uniform Regulations (32 CFR § 229)		X
Protection of Historic and Cultural Properties (3 CFR § 800)		X
Regulations for Implementing NEPA (Council on Environmental Quality. 40 CFR § 1500)	X	
The Secretary of Interior's Standards for Historic Preservation Projects (36 CFR § 68)		X
Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management, Notice of Final Policy, October 18, 2000 (65 FR 62566)	X	
Waiver of Federal Agency Responsibility under Section 110 of the National Historic Preservation Act (36 CFR § 78)		X
MILITARY DIRECTIVES[3]		
Archaeological and Historic Resources Management, DoD Directive 4710.1 (June 21, 1984)		X
Climate Change Adaptation and Resilience, DoD Directive 4715.21 (January 14, 2016)		X
Environmental and Explosives Safety Management on Operational Ranges within the United States, DoD Directive 4715.11 (May 10, 2004)		X
Environmental Security, DoD Directive 4715.1 (February 24, 1996, reissued March 19, 2005)	X	
Natural Resources Management Program, DoD Directive 4700.4 (January 24, 1989)	X	
DoD Pest Management Program, DoD Instruction 4150.07 (May 29, 2008)	X	
Environmental Compliance, DoD Instruction 4715.6 (April 24, 1996)	X	
Environmental Planning and Analysis, DoD Instruction 4715.9 (May 3, 1996)	X	
Environmental Restoration Program, DoD Instruction 4715.7 (April 22, 1996, reissued May 21, 2013)	X	
Fire and Emergency Services (F&ES) Program, DoD Instruction 6055.06 (December 21, 2006)	X	
Integrated Natural Resources Management Plan (INRMP) Implementation Manual, DoD Instruction 4715.03 (November 25, 2013)[4]	X	
Natural Resources Conservation Program, DoD Instruction 4715.03 (March 18, 2011)[5]	X	
Pest Management Program, DoD Instruction 4150.07 (May 29, 2008)	X	

[3] Base orders are subject to periodic review and update. Versions listed in the INRMP may have been subsequently updated. The reader should always consult the latest version.
[4] Cancels and incorporates three Guidance Memorandums related to the implementation of the Sikes Act Improvement Act (October 10, 2002; November 1, 2004; May 17, 2005).
[5] Reissues and renames DoD Instruction 4715.3, Environmental Conservation Program (May 3, 1996).

Natural Resource Laws, Regulations, and Other Directives and their Expected Influence on Natural Resource Management at Marine Corps Base Hawaii

	Influence	
	Direct	**Indirect**
Conservation Law Enforcement Program, Marine Corps Order 5090.4A, (February 13, 2007)	X	
Environmental Compliance and Protection Manual, Marine Corps Order P5090.2A (August 26, 2013)	X	
Policy letter preventing feral cat and dog populations on Navy property (CNO Memorandum, 10 January 2002)	X	
Use of Ecological Risk Assessments (Department of the Navy Environmental Policy Memorandum 97-04 (CMC Ltr 5090 LFL/KK-140 of March 23, 1997))	X	
Headquarters Marine Corps Policy on Base-Wide Master Plant List (CMC Ltr 5090 LFL/1 of 10 April 2006)	X	
Base Order P1500.9B: Standing Operating Procedures for Marine Corps Base Hawaii Ranges and Training Areas (Short Title: SOP for Ranges and Training Areas) (November 7, 2013)	X	
Base Order P1710.1: Base Recreational Activities (June 12. 2012)	X	
Base Order 1711: Hunting Regulations for Marine Corps Base Hawaii (August 12, 2014)	X	
Base Order P3170.1: SOP for Waterfront Operations	X	
Base Order 3302.1: All Hazards Force Protection Plan (May 4, 2015)	X	
Base Order P5233.2: Base Pet and Wildlife Regulations (March 15, 2012)	X	
Base Order 5355.1: Prohibition on the Possession and/or Use of *Salvia Divinorum* (February 27, 2006)	X	
Base Order 5420.1: Environmental Impact Review Procedures (January 27, 1997)	X	
Base Order 11014.20A: Grounds Maintenance and Police: Standards and Responsibilities (March 26, 2004)[6]	X	

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[6] Currently under revision.

LAWS

BROWN TREE SNAKE CONTROL AND ERADICATION ACT OF 2004 (PUBLIC LAW 108-384)

This law provides for the control and eradication of the brown tree snake on the island of Guam and the prevention of the introduction of the brown tree snake to other areas of the United States. It specifically authorizes funding to be provided for brown tree snake control, interdiction, research and eradication including the expansion of interagency and intergovernmental rapid response teams in Hawai‘i. It includes the establishment of quarantine protocols to control the introduction and spread of the brown tree snake and the establishment and sustained funding for an Animal Plant and Health Inspection Service, Wildlife Services, Operations Program State Office located in Hawai‘i dedicated to vertebrate pest management in Hawai‘i and U.S. Pacific territories and possessions.

CLEAN AIR ACT OF 1970, AS AMENDED (42 U.S.C. 7401 *ET SEQ.*)

This Act, the major Federal legislation concerning the control of the Nation’s air quality, requires the setting of National Ambient Air Quality Standards and the development of Federal and State programs to achieve these standards through the control of air pollution sources. The Act also provides for the USEPA’s delegation of authority to states to conduct air pollution control programs. The 1990 amendments (Public Law 101-549) stress pollution control and prevention. (*MCO P5090.2A*).

CLEAN WATER ACT (CWA) 1977, AS AMENDED (PL 95-217, TITLE 33 U.S.C. 1251 *ET SEQ.*)

This Act is a compilation of decades of Federal water pollution control legislation. The Act amended the Federal Water Pollution Control Act (FWPCA) and requires Federal agency consistency with State nonpoint source pollution abatement plans. The CWA is the major Federal legislation concerning improvement of the Nation’s water resources. The Act was amended in 1987 to strengthen enforcement mechanisms and to regulate storm water runoff. The Act provides for the development of municipal and industrial wastewater treatment standards and a permitting system to control wastewater discharges to surface waters. The CWA contains specific provisions for the regulation of dredge soil disposal within navigable waters and for the placement of material into wetlands. Permits are required under sections 401, 402, and 404 for proposed actions which involve wastewater discharges and/or dredging/placement of fill in wetlands or navigable waters. These permits are required prior to the initiation of proposed actions. (*MCO P5090.2A*).

COASTAL ZONE MANAGEMENT ACT (CZMA) OF 1972 (16 U.S.C. 1451 *ET SEQ.*)

This Act requires that, to the maximum extent practicable, Federal action affecting any land/water use, or coastal zone natural resource, be implemented consistent with the enforceable policies of an approved State management program. The Act authorizes states to administer approved coastal nonpoint pollution programs. Advance concurrence from the State Coastal Commission is required prior to taking an action affecting the use of land, water, or natural resources of the coastal zone. Excluded from the coastal zone are lands solely subject to or held in trust by the Federal Government, its officers, or its agents. (*MCO P5090.2A*).

ENDANGERED SPECIES ACT (ESA) OF 1973, AS AMENDED (19 U.S.C. 1531 *ET SEQ.*)

Implemented by 50 CFR 402 and 50 CFR 17, this Act requires all Federal agencies to carry out programs to conserve Federally-listed endangered and threatened plants and wildlife. Development and implementation of these programs must be carried out with the consultation and assistance of the Departments of the Interior and Commerce. A biological assessment may be required to determine

whether formal consultation with the USFWS/NOAA Fisheries is necessary and/or may serve as a basis for a USFWS/NOAA Fisheries biological opinion. (*MCO P5090.2A*).

ESTUARIES AND CLEAN WATERS ACT OF 2000 (PL 106-457, 33 U.S.C. 2901)

This Act encourages the restoration of estuary habitat through more efficient project financing and enhanced coordination of Federal and non-Federal restoration programs, and for other purposes. Title 1 of this Act, the ''Estuary Restoration Act of 2000'' states that the purposes of this title are: (1) to promote the restoration of estuary habitat; (2) to develop a national estuary habitat restoration strategy for creating and maintaining effective estuary habitat restoration partnerships among public agencies at all levels of government and to establish new partnerships between the public and private sectors; (3) to provide Federal assistance for estuary habitat restoration projects and to promote efficient financing of such projects; and (4) to develop and enhance monitoring and research capabilities through the use of the environmental technology innovation program associated with the National Estuarine Research Reserve System established by section 315 of the Coastal Zone Management Act of 1972 (16 U.S.C. 1461) to ensure that estuary habitat restoration efforts are based on sound scientific understanding and innovative technologies. (*Federal Register*)

FISH AND WILDLIFE CONSERVATION ACT OF 1980 (16 U.S.C. 2901 *ET SEQ*.)

This Act promotes State programs for the purpose of conserving, restoring, or otherwise benefiting nongame fish and wildlife, its habitats, or its uses. (*MCO P5090.2A*).

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976 (16 U.S.C. 1801 *ET SEQ*.)

This Act halts overfishing by foreign fleets and aids the development of the domestic fishing industry. The Act gives the United States sole management authority over living resources within its jurisdictional waters. Essential Fish Habitat (EFH) coordination and consultation requirements were established by the 1996 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act and the Department of Commerce's EFH consultation regulations (50 CFR 600.905-930).[7] That status includes a mandate that Federal agencies must consult with the Secretary of Commerce on all activities, proposed activities, authorized, funded, or undertaken by the agency that may adversely affect EFH. (*MCO P5090.2A*)

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT REAUTHORIZATION ACT OF 2006 (P.L. 109-479)

This Act amends the Magnuson-Stevens Fishery Conservation and Management Act. It is was passed to: help strengthen enforcement of U.S. fishing laws; end overfishing through management measures; improve the use of data in fisheries management; and enhance international cooperation on addressing illegal, unreported and unregulated fishing and by-catch of protected living marine resources. To help end overfishing, the Act directs Regional Fishery Management Councils to establish annual quotas in Federally-managed fisheries and increase in the number of limited-access privilege programs that assign specific shares of the annual harvest quota to eligible fishermen, fishing communities and regional fishery associations. The Act creates several programs to improve the quality of information for fishery managers

[7] EFH's for several fish species complexes (e.g., adult and juvenile bottomfish, eggs and larvae) and crustacean species assemblages (e.g., juvenile, adult, and larvae of spiny lobsters) are found in waters around pertinent MCBH coastlines (pers. comm., NMFS rep. A. Everson, 2001; Western Pacific Regional Fishery Management Council 1998). Any Federal action that might have an adverse effect on quality and/or quantity of EFH's is subject to consultation requirements with NOAA Fisheries under Sections 305(b)(2) and 305(b)(4)(B) of that Act. EFH conservation recommendations provided by consulted Federal or State agencies pursuant to Section 305(b)(4)(B) of the Act must be considered.

including establishing regional registries for recreational fishermen and facilitating community based efforts to restore local fish habitats by promoting partnerships between Federal agencies and State and local organizations.

MARINE MAMMAL PROTECTION ACT (MMPA) OF 1972, AS AMENDED (16 U.S.C. 1361 *ET SEQ*.)

Implemented by 50 CFR 18, 215, and 228, this Act mandates a moratorium on the killing, capturing, harming, and importing of marine mammals and marine mammal products. This Act also prohibits the taking of any marine mammal by any person, vessel, or conveyance subject to the jurisdiction of the United States on the high seas or the taking of any marine mammal by a person, vessel, or conveyance in waters or lands under the jurisdiction of the United States. Taking means to harass, hunt, capture, collect, or kill any marine mammal, and includes without limitation any of the following: collection of dead animals or their parts, restraint or detention of a marine mammal, tagging a marine mammal, the negligent or intentional operation of an aircraft or vessel, or doing of any other negligent or intentional act which results in the disturbing or molesting of a marine mammal. (*MCO P5090.2A*).

MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT OF 1972, AS AMENDED (33 U.S.C. 1401 *ET SEQ*. AND 16 U.S.C. 1431 *ET SEQ*.)

This Act establishes regulations relating to dumping specific materials into open waters and establishes a program for the designation and regulation of national marine sanctuaries. (*MCO P5090.2A*).

MARINE RESOURCES PROTECTION (HAWAII STATE LAWS) (HAR TITLE 13, CHAPTER 86.1; HAR TITLE 13, CHAPTER 95; AND HRS TITLE 12, SECTION 171-58.5)

HAR Title 13 Chapter 86.1 restricts the collection of sea cucumbers from State waters. HAR Title 13 Chapter 95 prohibits taking, breaking, or damaging any stony coral or live rock. HRS Title 12 Section 171-58.5 prohibits the mining or taking of sand, dead coral or coral rubble, rocks, soil, or other marine deposits seaward from the shoreline.

MIGRATORY BIRD TREATY ACT, AS AMENDED (16 U.S.C. 703 *ET SEQ*.)

This Act protects migratory birds (listed in 50 CFR 10.13) and their nests and eggs and establishes a permitting process for the taking of migratory birds. (*MCO P5090.2A*).

MILITARY RESERVATION AND FACILITIES: HUNTING, FISHING, AND TRAPPING ACT OF 1958 (PL 85-337, 10 U.S.C. 2671)

This Act requires that all hunting, fishing, and trapping activities on military installations be conducted in accordance with the State fish and game laws in which the installation is located. Appropriate State licenses must be obtained for these activities on the installation. (*MCO P5090.2A*).

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEARS 2004, 2009, AND 2010

The National Defense Authorization Act (NDAA) for Fiscal Year 2004 made important changes in the ESA regarding INRMPs. Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of Interior or the Secretary of Commerce, as appropriate, is precluded from designating critical habitat on any areas owned, controlled, or designated for use by the DoD where an INRMP has been developed that, as determined by the Department of the Interior or the Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation.

The NDAA for Fiscal Year 2009 expanded the cooperative agreement authority for management of natural resources to include off-installation mitigation.

The NDAA for Fiscal Year 2010 authorized the DoD to participate in conservation banking programs, and authorized the Secretary of a military department to enter into interagency agreements for land management on DoD installations. It also directs the Secretary of Defense to establish a comprehensive program related to brown tree snakes that includes measures to ensure that military activities, including the transport of civilian and military personnel and equipment to and from Guam, do not contribute to the spread of brown tree snakes.

The NDAA is used as a mechanism for implementing the Sikes Act Improvement Act of 1997. It needs to be reviewed each time it comes out for possible changes in management requirements.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (PL 91-190, 42 U.S.C. 4321 *ET SEQ*.)

This Act requires consideration of environmental concerns during project planning and execution. The Act requires Federal agencies to prepare an Environmental Assessment or Environmental Impact Statement for Federal actions that have the potential to significantly affect the quality of the human environment, including both natural and cultural resources. The Act is implemented by regulations issued by the Council on Environmental Quality (40 CFR 1500). The Act establishes Federal agency procedures for preserving important natural aspects of the national heritage and enhancing the quality of renewable resources. (*MCO P5090.2A*).

NATIONAL INVASIVE SPECIES ACT OF 1996 (PL 104-332, 16 U.S.C. §§ 4701-4751)

The National Invasive Species Act (NISA) reauthorizes and amends the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 to prevent and control the unintentional introduction of aquatic nuisance species into waters of the United States through ballast water management and other control methods. Section 4713 of the NISA also established the Armed Forces Ballast Water Management Program, which requires DoD to implement a ballast water management program for DoD vessels in order to minimize the risk of introduction of non- indigenous species from ballast water releases.

OUTDOOR RECREATION – FEDERAL/STATE PROGRAM ACT (16 U.S.C. 460(L) *ET SEQ*.)

This Act requires consultations with the United States National Park Service (NPS) regarding management for outdoor recreation. (*MCO P5090.2A*).

PLANT PROTECTION ACT (7 U.S.C. 7701-7772)

This act became law as part of the Agricultural Risk Protection Act. The Plant Protection Act (PPA) gives the Secretary of Agriculture, and through delegated authority, USDA's Animal and Plant Health Inspection Service (APHIS), the ability to prohibit or restrict the importation, exportation, and the interstate movement of plants, plant products, certain biological control organisms, noxious weeds, and plant pests. The PPA consolidates all or part of 10 existing USDA plant health laws into one comprehensive law, including the authority to regulate plants, plant products, certain biological control organisms, noxious weeds, and plant pests. The Plant Quarantine Act, the Federal Pest Act, and the Federal Noxious Weed Act are among the 10 statutes the new Act replaces. The PPA was amended to include the Noxious Weed Control and Eradication Act of 2004 which requires the Secretary of Agriculture to establish a program to provide assistance to eligible weed management entities to control or eradicate noxious weeds on public and private land.

RULES REGULATING GAME MAMMAL HUNTING (HAR TITLE 13, CHAPTER 123)

These rules detail the locations and the restrictions and conditions for hunting game mammals in the State of Hawai‘i. Restrictions and conditions include, but are not limited to, topics such as: types of game mammals, hunting methods, bag limits, open hunting days, and any special conditions and restrictions

applicable to an individual hunting unit. Each island is addressed separately and restrictions and conditions vary among islands as well as among individual hunting units. Per the Engle Act of 1958 (Military Reservation and Facilities: Hunting, Fishing and Trapping Act of 1958), all hunting on MCTAB must be in accordance with State game laws.

SIKES ACT OF 1960: CONSERVATION PROGRAMS ON MILITARY RESERVATIONS ACT, AS AMENDED (PL 86-7987, 16 U.S.C. 670(A) *ET SE*Q.)

This Act requires that each military installation manage natural resources for multipurpose uses and public access appropriate for those uses, consistent with the military department's mission. The Act also requires that each military department provide professional services necessary for fish and wildlife resource management on each installation (per a tripartite cooperative plan agreed to by the military department, USFWS, and State wildlife agency). Additionally, the Act requires that each military department provide professional training in fish and wildlife management for resource management personnel and give priority to contracting work with Federal and State agencies responsible for conserving or managing fish and wildlife. (*MCO P5090.2A*).

SIKES ACT IMPROVEMENT ACT AMENDMENTS OF 1997

The Sikes Act Improvement Act (SAIA) Amendments were passed on November 18, 1997. SAIA mandates that the Secretary of each military department shall prepare and implement an integrated natural resources management plan for each military installation in the United States under the jurisdiction of the Secretary, unless the Secretary determines that the absence of significant natural resources on a particular installation makes preparation of such a plan inappropriate. The Secretary of a military department shall prepare each integrated natural resources management plan for which the Secretary is responsible in cooperation with the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service, and the head of each appropriate State fish and wildlife agency for the State in which the military installation concerned is located. This program shall be required to provide for the conservation and rehabilitation of natural resources on military installations; the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and non-consumptive uses; and subject to safety requirements and military security, public access to military installations to facilitate the use. (*Naval Facilities Engineering Service Center*).

SOIL CONSERVATION ACT (PL 84-566, 16 U.S.C. 5901 *ET SEQ*.)

This Act provides for the application of soil conservation practices on Federal lands. (*MCO P5090.2A*).

EXECUTIVE ORDERS AND MEMORANDUMS OF UNDERSTANDING

EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT (42 FR 26951), AS AMENDED BY EXECUTIVE ORDERS 12148 AND 13690

May 24, 1977. Directs all Federal agencies to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Each agency shall provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Each agency has a responsibility to evaluate the potential effects of any actions it may take in a floodplain; to ensure that its planning programs and budget request reflect consideration of flood hazards and floodplain management. Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans. (*Federal Register*).

EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS (42 FR 26961), AS AMENDED BY EXECUTIVE ORDER 12608

May 24, 1977. Directs Federal agencies to address the need to avoid, to the extent possible, the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. Each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. (*Federal Register*).

EXECUTIVE ORDER 13089, CORAL REEF PROTECTION (63 FR 32701)

June 11, 1998. Mandates that all Federal agencies whose actions may affect U.S. coral reef ecosystems shall: (a) identify their actions that may affect U.S. coral reef ecosystems; (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems. (*Federal Register*).

EXECUTIVE ORDER 13112, INVASIVE SPECIES (64 FR 6183), AS AMENDED BY EXECUTIVE ORDER 13286

February 3, 1999. Seeks to prevent the introduction of invasive species into habitats and ecosystems, provide for their control and to minimize the economic, ecological and human health impacts that invasive species cause. Defines "Invasive species" as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Mandates that each Federal agency whose actions may affect the status of invasive species shall: (1) identify such actions; (2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere. (*Federal Register*).

EXECUTIVE ORDER 13186, RESPONSIBILITIES OF FEDERAL AGENCIES TO PROTECT MIGRATORY BIRDS (66 FR 3853)

January 10, 2001. Directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. This act has implemented international, bilateral conventions for the conservation of migratory birds and their habitats with respect to the United States. Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within two years, a Memorandum of Understanding (MOU) with the USFWS that shall promote the conservation of migratory bird populations. DoD and USFWS have cooperatively developed and signed an MOU that outlines a collaborative approach to promote the conservation of migratory bird populations (July 2006). (*Federal Register*).

EXECUTIVE ORDER 13352, FACILITATION OF COOPERATIVE CONSERVATION (69 FR 52989)

August 26, 2004. Purpose of the order is to "ensure that the Department of Interior, Agriculture, Commerce, and Defense and the [USEPA] implement laws relating to the environment and natural resources in a manner that promotes cooperative conservation, with an emphasis on appropriate inclusion of local participation in Federal decision making, in accordance with their respective agency missions, policies, and regulations." Cooperative conservation is defined as "actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both, and that involve collaborative activity among Federal, State, local, and tribal governments, private for profit and non-profit institutions, other nongovernmental entities, and individuals." (*Federal Register*).

EXECUTIVE ORDER 13514, FEDERAL LEADERSHIP IN ENVIRONMENTAL, ENERGY AND ECONOMIC PERFORMANCE (74 FR 52117)

October 5, 2009. Expands upon the energy reduction and environmental performance requirements for Federal agencies as described in Executive Order 13423. Executive Order 13514 outlines specific targets and management strategies to improve sustainability. (*Federal Register*).

EXECUTIVE ORDER 13547, STEWARDSHIP OF THE OCEAN, OUR COASTS AND THE GREAT LAKES (75 FR 43023)

July 19, 2010. Establishes a national policy meant to ensure the protection maintenance, and restoration of the health and biological diversity of ocean, coastal and Great Lakes ecosystems and resources. Establishes a National Ocean Council that is to implement the policy set forth in the Executive Order and subsequent guidance. (*Federal Register*).

EXECUTIVE ORDER 13693, PLANNING FOR FEDERAL SUSTAINABILITY IN THE NEXT DECADE (80 FR 15869)

March 19, 2015. Directs Federal agencies to increase efficiency and improve environmental performance with a goal of maintaining Federal leadership in sustainability, greenhouse gas emission reductions and support preparations for the impacts of climate change. This goal is to be accomplished through a combination of more efficient operations as outlined in the Executive Order. Directs that the implementation of formal Environmental Management Systems (EMS) should be continued where those systems have proven effective and that the deployment of new EMSs should occur where appropriate. (*Federal Register*).

MEMORANDUM FOR CHIEF OF NAVAL OPERATIONS COMMANDANT OF THE MARINE CORPS

November 25, 2002. This memorandum provides policy guidance for endangered species actions. The memorandum discusses the need to balance final determinations in ESA rule-making with obligations under Title 10 of the U.S. code to maintain ready forces. It calls on the Navy and Marine Corps to ensure participation in ESA listing decisions, critical habitat designation, and recovery planning by providing timely comments on ESA rule-making proposals and potential military mission impacts. By providing timely comments, regulators are better able to determine if a proposed action may not be warranted in certain situations because of on-going military conservation efforts and implementation of installation INRMPs.

MEMORANDUM FOR EXECUTIVE DEPARTMENTS AND AGENCIES: INCORPORATING ECOSYSTEM SERVICES INTO FEDERAL DECISION MAKING

The memorandum, *Incorporating Ecosystem Services into Federal Decision Making* (October 7, 2015), directs Federal agencies to incorporate the values of natural, or "green" infrastructure and ecosystem services in Federal planning and decision-making and to institutionalize polices to that effect, where

appropriate and practicable. It establishes a process for the Federal government to develop guidance on integrating ecosystem service assessments into relevant programs and projects to promote sustainable use of natural resources, ecosystem and community resilience, and the recreational value of the Nation's unique landscapes. Implementation guidance to be developed by the Council on Environmental Quality will suggest best practices for ecosystem services assessments and outline an assessment framework for integrative consideration of ecosystem services into decision processes.

MEMORANDUM OF UNDERSTANDING (DEPARTMENT OF DEFENSE, U.S. FISH AND WILDLIFE SERVICE ASSOCIATION OF FISH AND WILDLIFE AGENCIES)

July 19, 2013. The Department of Defense (DoD), the U.S. Fish and Wildlife Service (USFWS) and the Association of Fish and Wildlife Agencies (AFWA) signed a Memorandum of Understanding (MOU) to help manage natural resources on military installations under provisions of the Sikes Act. The MOU was developed to further the cooperative relationship between the parties in preparing, reviewing, revising, updating and implementing INRMPs for military installations. The MOU describes the roles, responsibilities and operating authorities of the parties to the agreement.

MEMORANDUM OF UNDERSTANDING TO PROMOTE THE CONSERVATION OF MIGRATORY BIRDS (DEPARTMENT OF DEFENSE AND THE U.S. FISH AND WILDLIFE SERVICE)

September 5, 2014. The MOU was created to promote the conservation of migratory bird populations while sustaining the use of military managed lands and airspace for testing, training, and operations. The MOU identifies specific activities where cooperation between the parties will contribute substantially to the conservation of migratory birds and their habitats.

GUIDANCE, NOTICES, POLICIES, AND REGULATIONS

GUIDELINES FOR COORDINATION ON INTEGRATED NATURAL RESOURCE MANAGEMENT PLANS

June 15, 2015. Provides updated guidelines to serve as a reference for USFWS personnel when implementing INRMPs to conserve, protect and manage fish and wildlife resources. Details INRMP coordination between the USFWS and the DoD; the USFWS program responsibilities; INRMP content and requirements.

GUIDELINES FOR STREAMLINED INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN (INRMP) REVIEW

July 20, 2015. The guidelines clarify the process for reviewing and concurring on updates to existing INRMPs, as described in the Sikes Tripartite MOU signed in July 2013 by DoD, USFWS, and the AFWA. The MOU and these guidelines clarify a new process to facilitate faster review and approval of INRMPs requiring updates, reduce the number of noncompliant INRMPs, and improve coordination and collaboration among installation personnel and USFWS regional reviewers.

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) IMPLEMENTATION MANUAL, DEPARTMENT OF DEFENSE MANUAL 4715.03

November 25, 2013. Provides procedures to prepare, review, update and implement INRMPs in compliance with the Sikes Act. Incorporates and cancels previous guidance.

NATURAL RESOURCES CONSERVATION PROGRAM, DEPARTMENT OF DEFENSE INSTRUCTION 4715.03

March 18, 2011. Establishes policy and assigns responsibilities for compliance with applicable Federal, State, and local statutory and regulatory requirements, EOs, memorandums, and DoD policies for the integrated management of natural resources including lands, airs, waters, and coastal and nearshore areas managed or controlled by DoD. Updates and develops new policy for the integrated management of natural resources on property and lands managed or controlled by DoD. Implements new Natural Resources Conservation metrics. Provides procedures for DoD components and installations for developing, implementing, and evaluating effective natural resources management programs.

GUIDANCE FOR FEDERAL AGENCIES ON SUSTAINABLE PRACTICES FOR DESIGNATED LANDSCAPES

October 31, 2011, supplemented October 22, 2014. The guidance was developed to help meet the goals outlined in EO 13514 *Federal Leadership in Environmental, Energy, and Economic Performance*. It describes strategies to achieve sustainable Federal landscape practices. Guidelines are intended to support improved environmental performance of a site beyond the building footprint and are to be used by Federal agencies for landscape practices when implementing landscape improvements, constructing new facilities or rehabilitating existing facilities.

DEPARTMENT OF THE NAVY LOW-IMPACT DEVELOPMENT POLICY FOR STORM WATER MANAGEMENT

November 16, 2007. Department of the Navy Low-Impact Development Policy for Storm Water Management directs the Navy and Marine Corps to plan, program and budget to meet the requirements of the policy beginning in FY 2011. This policy has a goal of maintaining “no net increase” in the amount of storm water, sediment and nutrient loading from major renovation and construction projects at Navy and Marine Corps facilities and installations nationwide. This goal will be accomplished through the use of low-impact development techniques in construction and renovation projects to capture storm water and contaminants that would otherwise flow into nearby watersheds. This policy further emphasizes the importance of a watershed-based, ecosystem-based manner of managing natural resources that is already established in published DoD and Marine Corps INRMP guidance. (*Department of the Navy*).

ENVIRONMENTAL MANAGEMENT SYSTEM

The Marine Corps uses an Environmental Management System (EMS) as a systematic approach to integrating environmental considerations into mission decisions and operations, while continuing to improve environmental compliance. The Marine Corps EMS is a framework of five interrelated components, consistent with other military services and Federal agencies, and with International Organization for Standardization (ISO) 14001, an international standard. The components emphasize continual improvement through effective policy, planning, implementation, checking and preventive/corrective action, and management review.

Following Marine Corps guidance, the Environmental Compliance and Protection Department, Logistics Branch maintains MCBH’s *Environmental Management System (EMS) Manual* (MCBH 2013a). This manual is MCBH’s top-level environmental planning and compliance document, and is applicable to all operations at all its installations (with exception of the Navy Branch Medical and Dental Clinics). Other environmental planning documents, including this INRMP, have been organized within the framework of the EMS manual, and are part of the overall EMS. The EMS Manual describes the core elements of the EMS and their interrelationships by summarizing the basic components of the EMS and providing direction to the relevant documentation (such as plans, SOPs, and instructions). An example of overlap

between the EMS and the INRMP is the EMS Aspect of Natural Resource Land and Watershed Disturbance (e.g., soil disturbance). The INRMP/EA with its own internal organizational structure to list management actions under objectives, and objectives under goals across COA is consistent with the EMS emphasis on ensuring that the manner of carrying out environmental management is systematic, transparent, regularly reviewed and updated, and includes mechanisms for adaptive management and continuous improvement. There is a strong overlap between the approach to implementing EMS and the ecosystem management approach already implemented in the INRMP.

INTEGRATED MANAGEMENT OF STRAY ANIMALS ON MILITARY INSTALLATIONS (ARMED FORCES PEST MANAGEMENT BOARD TECHNICAL GUIDE NO. 37)

May 25, 2012. The technical guide was developed to: provide commanders with an example of a stray animal control policy; identify responsibilities and resources required to implement this policy; provide guidelines for the capture, management and disposition of stray animals; protect working animals, pets and wildlife from injury and death caused by stray animals; and suggest integrated management options and identify coordination requirements to humanely control stray animals on military installations.

UNIFIED FEDERAL POLICY FOR A WATERSHED APPROACH TO FEDERAL LAND AND RESOURCE MANAGEMENT (65 FR 62566)

October 18, 2000. Federal agencies manage large amounts of public lands throughout the country. To protect water quality and aquatic ecosystems on these public lands, Federal agencies have developed the following policy to reduce water pollution from Federal activities and foster a unified, watershed-based approach to Federal land and resource management. This policy is intended to accelerate Federal progress towards achieving the goals of the Clean Water Act (Federal Water Pollution Control Act of 1972, 33 U.S.C. 1251 et seq.). This policy applies only to Federal lands and resources and does not affect water rights laws, procedures, or regulations. This policy does not supersede or otherwise affect existing State or Tribal authority under the Clean Water Act. The Federal agencies also acknowledge that, in international waters, the watershed approach is subject to the international treaties and agreements affecting those waters. (*Federal Register*).

A4. SIKES ACT

Congress established the Sikes Act (16 U.S.C. 670a- 670o) in 1960 to ensure that the DoD conserves and protects the natural resources they use. Since military lands often are protected from human access and impact, they contain some of our nation's most significant remaining large tracts of valuable natural resources. In 1997, Congress amended the Sikes Act to require DoD to develop and implement INRMPs to outline how each military installation with significant natural resources will manage those resources (Sikes Act Improvement Act (SAIA) of 1997).

The SAIA requires all military installations with significant natural resources to prepare and implement integrated natural resource management plans (INRMPs). These plans must support the mission of the installation and comply with a suite of Federal laws governing natural resources management and protection, to include: (a) conservation and rehabilitation of natural resources; (b) sustainable multipurpose uses of resources to include hunting, fishing, trapping, and non-consumptive uses as appropriate; and (c) public access for such uses of natural resources, subject to safety and military security considerations. These plans must truly integrate with the military mission by showing how the installation will comply with natural resource laws in such manner as to ensure 'no net loss in the capability of the installation's lands to support the military mission of the installation'. Cited from SAIA, Section 2904, Preparation of Integrated Natural Resources Management Plans.

The latest information on the Sikes Act, including guidance, updates, and metrics, can be found at: http://www.denix.osd.mil/nr/LegislationandPolicy/LawsandStatutes/SikesAct.cfm. Copies of the *Sikes Act of 1960* and the *Sikes Act Improvement Act of 1997* are included on the INRMP Reference CD.

Other resources on the Sikes Act can be found at:

http://www.dodnaturalresources.net/files/50Years_SikesAct_FINAL_lo-res_.pdf

http://www.fws.gov/fisheries/sikes_act/sikes_act_history.html

http://www.fws.gov/fisheries/sikes_act/documents/DoD Sikes Act Guidance--8 October.pdf

http://www.dodworkshops.org/files/Training/Sikes101-Modules.html

http://www.dodworkshops.org/files/Training/SikesImp-Modules.html

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16 USC CHAPTER 5C, SUBCHAPTER I: CONSERVATION PROGRAMS ON MILITARY INSTALLATIONS

From Title 16—CONSERVATION
CHAPTER 5C—CONSERVATION PROGRAMS ON GOVERNMENT LANDS

SUBCHAPTER I—CONSERVATION PROGRAMS ON MILITARY INSTALLATIONS

§670. Definitions

In this subchapter:

(1) Military installation

The term "military installation"—

(A) means any land or interest in land owned by the United States and administered by the Secretary of Defense or the Secretary of a military department, except land under the jurisdiction of the Assistant Secretary of the Army having responsibility for civil works;

(B) includes all public lands withdrawn from all forms of appropriation under public land laws and reserved for use by the Secretary of Defense or the Secretary of a military department; and

(C) does not include any land described in subparagraph (A) or (B) that is subject to an approved recommendation for closure under the Defense Base Closure and Realignment Act of 1990 (part A of title XXIX of Public Law 101–510; 10 U.S.C. 2687 note).

(2) State

The term "State" means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, the Commonwealth of the Northern Mariana Islands, American Samoa, and the Virgin Islands.

(3) State-owned National Guard installation

The term "State-owned National Guard installation" means land owned and operated by a State when such land is used for training the National Guard pursuant to chapter 5 of title 32, with funds provided by the Secretary of Defense or the Secretary of a military department, even though such land is not under the jurisdiction of the Department of Defense.

(4) State fish and wildlife agency

The term "State fish and wildlife agency" means the one or more agencies of State government that are responsible under State law for managing fish or wildlife resources.

(5) United States

The term "United States" means the States, the District of Columbia, and the territories and possessions of the United States.

(6) Indian tribe

The term "Indian tribe" means any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601 et seq.), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(Pub. L. 86–797, title I, §100, as added Pub. L. 105–85, div. B, title XXIX, §2911, Nov. 18, 1997, 111 Stat. 2021; amended Pub. L. 112–81, div. A, title III, §312(a)(1), Dec. 31, 2011, 125 Stat. 1351; Pub. L. 112–239, div. A, title III, §312(b), Jan. 2, 2013, 126 Stat. 1691.)

REFERENCES IN TEXT

The Alaska Native Claims Settlement Act, referred to in par. (6), is Pub. L. 92–203, Dec. 18, 1971, 85 Stat. 688, which is classified generally to chapter 33 (§1601 et seq.) of Title 43, Public

Lands. For complete classification of this Act to the Code, see Short Title note set out under section 1601 of Title 43 and Tables.

AMENDMENTS

2013—Par. (6). Pub. L. 112–239 added par. (6).

2011—Pars. (2) to (5). Pub. L. 112–81 added pars. (2) and (3) and redesignated former pars. (2) and (3) as (4) and (5), respectively.

SHORT TITLE OF 1997 AMENDMENT

Pub. L. 105–85, div. B, title XXIX, §2901, Nov. 18, 1997, 111 Stat. 2016, provided that: "This title [enacting this section and sections 670e–1 and 670e–2 of this title, amending sections 670a, 670b, 670c, 670c–1, 670f, and 670o of this title, repealing section 670a–1 of this title, and enacting provisions set out as notes under this section and section 670a of this title] may be cited as the 'Sikes Act Improvement Act of 1997'."

SHORT TITLE OF 1978 AMENDMENT

Pub. L. 95–420, §1, Oct. 5, 1978, 92 Stat. 921, provided: "That this Act [amending sections 670f and 670o of this title] may be cited as the 'Sikes Act Amendments of 1978'."

SHORT TITLE

Pub. L. 86–797, §1, as added by Pub. L. 105–85, div. B, title XXIX, §2903, Nov. 18, 1997, 111 Stat. 2016, provided that: "This Act [enacting this chapter] may be cited as the 'Sikes Act'."

§670a. Cooperative plan for conservation and rehabilitation

(a) Authority of Secretary of Defense

(1) Program

(A) In general

The Secretary of Defense shall carry out a program to provide for the conservation and rehabilitation of natural resources on military installations.

(B) Integrated natural resources management plan

(i) To facilitate the program, the Secretary of each military department shall prepare and implement an integrated natural resources management plan for each military installation in the United States under the jurisdiction of the Secretary, unless the Secretary determines that the absence of significant natural resources on a particular installation makes preparation of such a plan inappropriate.

(ii) The Secretary of a military department may, subject to the availability of appropriations, develop and implement an integrated natural resources management plan for a State-owned National Guard installation. Such a plan shall be developed and implemented in coordination with the chief executive officer of the State in which the State-owned National Guard installation is located. Such a plan is deemed, for purposes of any other provision of law, to be for lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use.

(2) Cooperative preparation

The Secretary of a military department shall prepare each integrated natural resources management plan for which the Secretary is responsible in cooperation with the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service, and the head of each appropriate State fish and wildlife agency for the State in which the military installation or State-owned National Guard installation concerned is located. Consistent with paragraph (4), the resulting plan for the military installation or State-owned National Guard installation shall reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources.

(3) Purposes of program

(A) Consistent with the use of military installations and State-owned National Guard installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out the program required by this subsection to provide for—

(i) the conservation and rehabilitation of natural resources on such installations;

(ii) the sustainable multipurpose use of the resources on such installations, which shall include hunting, fishing, trapping, and nonconsumptive uses; and

(iii) subject to safety requirements and military security, public access to military installations to facilitate the use.

(B) In the case of a State-owned National Guard installation, such program shall be carried out in coordination with the chief executive officer of the State in which the installation is located.

(4) Effect on other law

Nothing in this subchapter—

(A)(i) affects any provision of a Federal law governing the conservation or protection of fish and wildlife resources; or

(ii) enlarges or diminishes the responsibility and authority of any State for the protection and management of fish and resident wildlife; or

(B) except as specifically provided in the other provisions of this section and in section 670b of this title, authorizes the Secretary of a military department to require a Federal license or permit to hunt, fish, or trap on a military installation.

(b) Required elements of plans

Consistent with the use of military installations and State-owned National Guard installations to ensure the preparedness of the Armed Forces, each integrated natural resources management plan prepared under subsection (a)—

(1) shall, to the extent appropriate and applicable, provide for—

(A) fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation;

(B) fish and wildlife habitat enhancement or modifications;

(C) wetland protection, enhancement, and restoration, where necessary for support of fish, wildlife, or plants;

(D) integration of, and consistency among, the various activities conducted under the plan;

(E) establishment of specific natural resource management goals and objectives and time frames for proposed action;

(F) sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;

(G) public access to the installation that is necessary or appropriate for the use described in subparagraph (F), subject to requirements necessary to ensure safety and military security;

(H) enforcement of applicable natural resource laws (including regulations);

(I) no net loss in the capability of installation lands to support the military mission of the installation; and

(J) such other activities as the Secretary of the military department determines appropriate;

(2) must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every 5 years; and

(3) may, in the case of a military installation, stipulate the issuance of special State hunting and fishing permits to individuals and require payment of nominal fees therefor, which fees shall be utilized for the protection, conservation, and management of fish and wildlife, including habitat improvement and related activities in accordance with the integrated natural resources management plan; except that—

(A) the Commanding Officer of the installation or persons designated by that Officer are authorized to enforce such special hunting and fishing permits and to collect, spend, administer, and account for fees for the permits, acting as agent or agents for the State if the integrated natural resources management plan so provides, and

(B) the fees collected under this paragraph may not be expended with respect to other than the military installation on which collected, unless the military installation is subsequently closed, in which case the fees may be transferred to another military installation to be used for the same purposes.

(c) Prohibitions on sale and lease of lands unless effects compatible with plan

After an integrated natural resources management plan is agreed to under subsection (a)—

(1) no sale of land, or forest products from land, that is within a military installation covered by that plan may be made under section 2665(a) or (b) of title 10; and

(2) no leasing of land that is within the installation may be made under section 2667 of such title 10;

unless the effects of that sale or leasing are compatible with the purposes of the plan.

(d) Implementation and enforcement of integrated natural resources management plans

With regard to the implementation and enforcement of integrated natural resources management plans agreed to under subsection (a)—

(1) neither Office of Management and Budget Circular A–76 nor any successor circular thereto applies to the procurement of services that are necessary for that implementation and enforcement; and

(2) priority shall be given to the entering into of contracts for the procurement of such implementation and enforcement services with Federal and State agencies having responsibility for the conservation or management of fish or wildlife.

(e) Applicability of other laws

Integrated natural resources management plans agreed to under the authority of this section and section 670b of this title shall not be deemed to be, nor treated as, cooperative agreements to which chapter 63 of title 31 applies.

(f) Reviews and reports

(1) Secretary of Defense

Not later than March 1 of each year, the Secretary of Defense shall review the extent to which integrated natural resources management plans were prepared or were in effect and implemented in accordance with this subchapter in the preceding year, and submit a report on the findings of the review to the committees. Each report shall include—

(A) the number of integrated natural resources management plans in effect in the year covered by the report, including the date on which each plan was issued in final form or most recently revised;

(B) the amounts expended on conservation activities conducted pursuant to the plans in the year covered by the report; and

(C) an assessment of the extent to which the plans comply with this subchapter.

(2) Secretary of the Interior

Not later than March 1 of each year and in consultation with the heads of State fish and wildlife agencies, the Secretary of the Interior shall submit a report to the committees on the amounts expended by the Department of the Interior and the State fish and wildlife agencies in the year covered by the report on conservation activities conducted pursuant to integrated natural resources management plans.

(3) "Committees" defined

In this subsection, the term "committees" means—

(A) the Committee on Resources and the Committee on Armed Services of the House of Representatives; and

(B) the Committee on Armed Services and the Committee on Environment and Public Works of the Senate.

(g) Pilot program for invasive species management for military installations in Guam

(1) Inclusion of invasive species management

During fiscal years 2009 through 2014, the Secretary of Defense shall, to the extent practicable and conducive to military readiness, incorporate in integrated natural resources management plans for military installations in Guam the management, control, and eradication of invasive species—

(A) that are not native to the ecosystem of the military installation; and

(B) the introduction of which cause or may cause harm to military readiness, the environment, or human health and safety.

(2) Consultation

The Secretary of Defense shall carry out this subsection in consultation with the Secretary of the Interior.

(Pub. L. 86–797, title I, §101, formerly §1, Sept. 15, 1960, 74 Stat. 1052; renumbered title I, §101, and amended Pub. L. 93–452, §§1(1), 3(1), (2), Oct. 18, 1974, 88 Stat. 1369, 1375; Pub. L. 97–396, §1, Dec. 31, 1982, 96 Stat. 2005; Pub. L. 99–561, §3(a)(1), Oct. 27, 1986, 100 Stat. 3150; Pub. L. 105–85, div. B, title XXIX, §§2904(a)–(b)(4), (c), 2906, 2907, 2913(2)–(4), Nov. 18, 1997, 111 Stat. 2017, 2018, 2020,

2022; Pub. L. 106–65, div. A, title X, §1067(19), Oct. 5, 1999, 113 Stat. 775; Pub. L. 108–136, div. A, title III, §311(c)(1), Nov. 24, 2003, 117 Stat. 1429; Pub. L. 111–84, div. A, title III, §314, Oct. 28, 2009, 123 Stat. 2248; Pub. L. 112–81, div. A, title III, §312(a)(2), (b)(1), Dec. 31, 2011, 125 Stat. 1352, 1353.)

AMENDMENTS

2011—Pub. L. 112–81, §312(b)(1)(A), (B), inserted section catchline.

Subsec. (a)(1)(B). Pub. L. 112–81, §312(a)(2)(A), designated existing provisions as cl. (i) and added cl. (ii).

Subsec. (a)(2). Pub. L. 112–81, §312(a)(2)(B), inserted "or State-owned National Guard installation" after "military installation" in two places.

Subsec. (a)(3)(A). Pub. L. 112–81, §312(a)(2)(C)(i)–(v), designated introductory provisions as subpar. (A), redesignated former subpars. (A), (B), and (C) as cls. (i), (ii), and (iii), respectively, inserted "and State-owned National Guard installations" after "Consistent with the use of military installations", substituted "such installations" for "military installations" in cl. (i), and inserted "on such installations" after "resources" in cl. (ii).

Subsec. (a)(3)(B). Pub. L. 112–81, §312(a)(2)(C)(vi), added subpar. (B).

Subsec. (b). Pub. L. 112–81, §312(a)(2)(D), inserted "and State-owned National Guard installations" after "military installations" in introductory provisions.

Subsec. (b)(1)(G), (I). Pub. L. 112–81, §312(a)(2)(E), substituted "installation" for "military installation".

Subsec. (b)(3). Pub. L. 112–81, §312(a)(2)(F), inserted ", in the case of a military installation," after "(3) may".

Subsec. (c). Pub. L. 112–81, §312(b)(1)(C), inserted heading.

Subsec. (d). Pub. L. 112–81, §312(b)(1)(D), inserted heading.

Subsec. (e). Pub. L. 112–81, §312(b)(1)(E)(ii), which directed insertion of a comma after "Code", could not be executed because the word "Code" did not appear.

Pub. L. 112–81, §312(b)(1)(E)(i), inserted heading.

2009—Subsec. (g)(1). Pub. L. 111–84 substituted "fiscal years 2009 through 2014" for "fiscal years 2004 through 2008" in introductory provisions.

2003—Subsec. (g). Pub. L. 108–136 added subsec. (g).

1999—Subsec. (f)(3)(A). Pub. L. 106–65 substituted "Committee on Armed Services" for "Committee on National Security".

1997—Subsec. (a). Pub. L. 105–85, §2904(a), added subsec. (a) and struck out former subsec. (a) which read as follows: "The Secretary of Defense is authorized to carry out a program of planning for, and the development, maintenance, and coordination of, wildlife, fish, and game conservation and rehabilitation in each military reservation in accordance with a cooperative plan mutually agreed upon by the Secretary of Defense, the Secretary of the Interior, and the appropriate State agency designated by the State in which the reservation is located."

Subsec. (b). Pub. L. 105–85, §2904(c)(1), inserted heading and substituted, in introductory provisions, "Consistent with the use of military installations to ensure the preparedness of the Armed Forces, each integrated natural resources management plan prepared under subsection (a)—" for "Each cooperative plan entered into under subsection (a)—".

Subsec. (b)(1). Pub. L. 105–85, §2904(c)(1), added par. (1) and struck out former par. (1) which read as follows: "shall provide for—

"(A) fish and wildlife habitat improvements or modifications,

"(B) range rehabilitation where necessary for support of wildlife,

"(C) control of off-road vehicle traffic, and

"(D) specific habitat improvement projects and related activities and adequate protection for species of fish, wildlife, and plants considered threatened or endangered;".

Subsec. (b)(2). Pub. L. 105–85, §2904(c)(2), inserted "and" at end.

Subsec. (b)(3). Pub. L. 105–85, §2904(c)(3), (4), redesignated par. (4) as (3) and struck out former par. (3) which read as follows: "shall, if a multiuse natural resources management plan is applicable to the military reservation, be treated as the exclusive component of that management plan with respect to wildlife, fish, and game conservation and rehabilitation; and".

Subsec. (b)(3)(A). Pub. L. 105–85, §2913(2)(A), substituted "the installation" for "the reservation".

Pub. L. 105–85, §2904(c)(5), substituted "collect, spend, administer, and account for fees for the permits," for "collect the fees therefor,".

Subsec. (b)(3)(B). Pub. L. 105–85, §2912(2)(B), substituted "the military installation on" for "the military reservation on".

Pub. L. 105–85, §2906, inserted before period at end ", unless the military installation is subsequently closed, in which case the fees may be transferred to another military installation to be used for the same purposes".

Subsec. (b)(4). Pub. L. 105–85, §2904(c)(4), redesignated par. (4) as (3).

Pub. L. 105–85, §2904(b)(1), substituted "integrated natural resources management plan" for "cooperative plan" in introductory provisions and in subpar. (A).

Subsec. (c). Pub. L. 105–85, §2904(b)(2), substituted "an integrated natural resources management plan" for "a cooperative plan" in introductory provisions.

Subsec. (c)(1). Pub. L. 105–85, §2913(3)(A), substituted "a military installation" for "a military reservation".

Subsec. (c)(2). Pub. L. 105–85, §2913(3)(B), substituted "the installation" for "the reservation".

Subsec. (d). Pub. L. 105–85, §2904(b)(3), substituted "integrated natural resources management plans" for "cooperative plans" in introductory provisions.

Subsec. (e). Pub. L. 105–85, §2913(4), substituted "chapter 63 of title 31" for "the Federal Grant and Cooperative Agreement Act of 1977 (41 U.S.C. 501 et seq.)".

Pub. L. 105–85, §2904(b)(4), substituted "Integrated natural resources management plans" for "Cooperative plans".

Subsec. (f). Pub. L. 105–85, §2907, added subsec. (f).

1986—Pub. L. 99–561 amended section generally. Prior to amendment, section read as follows: "The Secretary of Defense is hereby authorized to carry out a program of planning, development, maintenance and coordination of wildlife, fish and game conservation and rehabilitation in military reservations in accordance with a cooperative plan mutually agreed upon by the Secretary of Defense, the Secretary of Interior and the appropriate State agency designated by the State in which the reservation is located. Such cooperative plan shall provide for (1) fish and wildlife habitat improvements or modifications, (2) range rehabilitation where necessary for support of wildlife, (3) control of off-road vehicle traffic, and (4) specific habitat improvement projects and related activities and adequate protection for species of fish, wildlife, and plants considered threatened or endangered. Such cooperative plan may stipulate the issuance of special State hunting and fishing permits to individuals and require this payment of a nominal fee therefor, which fees shall be utilized for the protection, conservation and management of fish and wildlife, including habitat improvement and related activities in accordance with the cooperative plan: *Provided*, That the Commanding Officer of the reservation or persons designated by him are authorized to enforce such special hunting and fishing permits and to collect the fees therefor, acting as agent or agents for the State if the cooperative plan so provides. Cooperative plans agreed to under the authority of this section and section 670b of this title shall not be deemed to be, nor treated as, cooperative agreements to which chapter 63 of title 31 applies."

1982—Pub. L. 97–396, §1(1), added cl. (4).

Pub. L. 97–396, §1(2), inserted provision that cooperative plans agreed to under the authority of this section and section 670b of this title shall not be deemed to be, nor treated as, cooperative agreements to which chapter 63 of title 31 applies.

1974—Pub. L. 93–452, §§1(1), 3(2), inserted provisions requiring the cooperative plan to provide for fish and wildlife habitat improvements, range rehabilitation, and off-road vehicle traffic control.

Change of Name

Committee on Resources of House of Representatives changed to Committee on Natural Resources of House of Representatives by House Resolution No. 6, One Hundred Tenth Congress, Jan. 5, 2007.

Effective Date of 2003 Amendment

Pub. L. 108–136, div. A, title III, §311(c)(2), Nov. 24, 2003, 117 Stat. 1429, provided that: "Section 101(g) of the Sikes Act, as added by paragraph (1), [subsec. (g) of this section] shall apply—

"(A) to any integrated natural resources management plan prepared for a military installation in Guam under section 101(a)(1) of such Act on or after the date of the enactment of this Act [Nov. 24, 2003]; and

"(B) effective March 1, 2004, to any integrated natural resources management plan prepared for a military installation in Guam under such section before the date of the enactment of this Act."

Review for Preparation of Integrated Natural Resources Management Plans

Pub. L. 105–85, div. B, title XXIX, §2905, Nov. 18, 1997, 111 Stat. 2019, provided that:

"(a) Definitions.—In this section, the terms 'military installation' and 'United States' have the meanings provided in section 100 of the Sikes Act [16 U.S.C. 670] (as added by section 2911).

"(b) Review of Military Installations.—

"(1) Review.—Not later than 270 days after the date of enactment of this Act [Nov. 18, 1997], the Secretary of each military department shall—

"(A) review each military installation in the United States that is under the jurisdiction of that Secretary to determine the military installations for which the preparation of an integrated natural resources management plan under section 101 of the Sikes Act [16 U.S.C. 670a] (as amended by this title) is appropriate; and

"(B) submit to the Secretary of Defense a report on the determinations.

"(2) Report to congress.—Not later than one year after the date of enactment of this Act, the Secretary of Defense shall submit to Congress a report on the reviews conducted under paragraph (1). The report shall include—

"(A) a list of the military installations reviewed under paragraph (1) for which the Secretary of the appropriate military department determines that the preparation of an integrated natural resources management plan is not appropriate; and

"(B) for each of the military installations listed under subparagraph (A), an explanation of each reason such a plan is not appropriate.

"(c) Deadline for Integrated Natural Resources Management Plans.—Not later than three years after the date of the submission of the report required under subsection (b)(2), the Secretary of each military department shall, for each military installation with respect to which the Secretary has not determined under subsection (b)(2)(A) that preparation of an integrated natural resources management plan is not appropriate—

"(1) prepare and begin implementing such a plan in accordance with section 101(a) of the Sikes Act [16 U.S.C. 670a(a)] (as amended by this title); or

"(2) in the case of a military installation for which there is in effect a cooperative plan under section 101(a) of the Sikes Act on the day before the date of enactment of this Act [Nov. 18, 1997], complete negotiations with the Secretary of the Interior and the heads of the appropriate State agencies regarding changes to the plan that are necessary for the plan to constitute an integrated natural resources management plan that complies with that section, as amended by this title.

"(d) Public Comment.—The Secretary of each military department shall provide an opportunity for the submission of public comments on—

"(1) integrated natural resources management plans proposed under subsection (c)(1); and

"(2) changes to cooperative plans proposed under subsection (c)(2)."

Applicability of 1986 Amendments to Existing Contracts

Pub. L. 99–561, §3(a)(2), Oct. 27, 1986, 100 Stat. 3151, provided that: "Subsection (d)(1) of such section 101 (as added by paragraph (1) [16 U.S.C. 670a(d)(1)]) shall not affect any contract entered into before the date of the enactment of this Act [October 27, 1986] for the provision of services to implement or enforce a cooperative plan under this Act [enacting section 670a–1 of this title and amending this section and sections 670f and 670o of this title and section 2665 of Title

10, Armed Forces] on any military installation; but shall apply to the renewal, after such date of enactment, of any such contract."

§670a–1. Repealed. Pub. L. 105–85, div. B, title XXIX, §2912, Nov. 18, 1997, 111 Stat. 2022

Section, Pub. L. 99–561, §2, Oct. 27, 1986, 100 Stat. 3149, related to natural resources and fish and wildlife management on military reservations and required report on military expenditures for fish and wildlife management.

§670b. Migratory game birds; hunting permits

(a) Integrated natural resources management plan

The Secretary of Defense in cooperation with the Secretary of the Interior and the appropriate State agency is authorized to carry out a program for the conservation, restoration and management of migratory game birds on military installations, including the issuance of special hunting permits and the collection of fees therefor, in accordance with an integrated natural resources management plan mutually agreed upon by the Secretary of Defense, the Secretary of the Interior and the appropriate State agency.

(b) Applicability of other laws

Possession of a special permit for hunting migratory game birds issued pursuant to this subchapter shall not relieve the permittee of the requirements of the Migratory Bird Hunting Stamp Act as amended [16 U.S.C. 718 et seq.] nor of the requirements pertaining to State law set forth in Public Law 85–337.

(Pub. L. 86–797, title I, §102, formerly §2, Sept. 15, 1960, 74 Stat. 1053; renumbered title I, §102, and amended Pub. L. 93–452, §3(1), (3), Oct. 18, 1974, 88 Stat. 1375; Pub. L. 105–85, div. B, title XXIX, §§2904(b)(5), 2913(5), Nov. 18, 1997, 111 Stat. 2018, 2022; Pub. L. 112–81, div. A, title III, §312(b)(2), Dec. 31, 2011, 125 Stat. 1353.)

References in Text

The Migratory Bird Hunting Stamp Act, referred to in subsec. (b), subsequently renamed the Migratory Bird Hunting and Conservation Stamp Act, is act Mar. 16, 1934, ch. 71, 48 Stat. 452, as amended, which is classified generally to subchapter IV (§718 et seq.) of chapter 7 of this title. For complete classification of this Act to the Code, see Short Title note set out under section 718 of this title and Tables.

Public Law 85–337, referred to in subsec. (b), is Pub. L. 85–337, Feb. 28, 1958, 72 Stat. 28, which is classified to section 2671 of Title 10, Armed Forces, section 472 of former Title 40, Public Buildings, Property, and Works [now 40 U.S.C. 102], and sections 155 to 158 of Title 43, Public Lands. For complete classification of this Act to the Code, see Tables.

Amendments

2011—Pub. L. 112–81 inserted section catchline and subsec. (a) designation and heading, and substituted "agency.", subsec. (b) designation and heading, and "Possession" for "agency: Provided, That possession".

1997—Pub. L. 105–85 substituted "military installations" for "military reservations" and "an integrated natural resources management plan" for "a cooperative plan".

1974—Pub. L. 93–452, §3(3), substituted "title" for "Act" which for purposes of codification was translated as "subchapter".

§670c. Program for public outdoor recreation

(a) Program authorized

The Secretary of Defense is also authorized to carry out a program for the development, enhancement, operation, and maintenance of public outdoor recreation resources at military installations in accordance with an integrated natural resources management plan mutually agreed upon by the Secretary of Defense and the Secretary of the Interior, in consultation with the appropriate State agency designated by the State in which the installations are located.

(b) Access for disabled veterans, military dependents with disabilities, and other persons with disabilities

(1) In developing facilities and conducting programs for public outdoor recreation at military installations, consistent with the primary military mission of the installations, the Secretary of Defense shall ensure, to the extent reasonably practicable, that outdoor recreation opportunities (including fishing, hunting, trapping, wildlife viewing, boating, and camping) made available to the public also provide access for persons described in paragraph (2) when topographic, vegetative, and water resources allow access for such persons without substantial modification to the natural environment.

(2) Persons referred to in paragraph (1) are the following:

(A) Disabled veterans.

(B) Military dependents with disabilities.

(C) Other persons with disabilities, when access to a military installation for such persons and other civilians is not otherwise restricted.

(3) The Secretary of Defense shall carry out this subsection in consultation with the Secretary of Veterans Affairs, national service, military, and veterans organizations, and sporting organizations in the private sector that participate in outdoor recreation projects for persons described in paragraph (2).

(c) Acceptance of donations

In connection with the facilities and programs for public outdoor recreation at military installations, in particular the requirement under subsection (b) to provide access for persons described in paragraph (2) of such subsection, the Secretary of Defense may accept—

(1) the voluntary services of individuals and organizations; and

(2) donations of property, whether real or personal.

(d) Treatment of volunteers

A volunteer under subsection (c) shall not be considered to be a Federal employee and shall not be subject to the provisions of law relating to Federal employment, including those relating to hours of work, rates of compensation, leave, unemployment compensation, and Federal employee benefits, except that —

(1) for the purposes of the tort claims provisions of chapter 171 of title 28, the volunteer shall be considered to be a Federal employee; and

(2) for the purposes of subchapter I of chapter 81 of title 5, relating to compensation to Federal employees for work injuries, the volunteer shall be considered to be an employee, as defined in section 8101(1)(B) of title 5, and the provisions of such subchapter shall apply.

(Pub. L. 86–797, title I, §103, formerly §3, Sept. 15, 1960, 74 Stat. 1053; Pub. L. 90–465, §1, Aug. 8, 1968, 82 Stat. 661; renumbered title I, §103, Pub. L. 93–452, §3(1), Oct. 18, 1974, 88 Stat. 1375; Pub. L. 105–85, div. B, title XXIX, §§2904(b)(6), 2913(6), Nov. 18, 1997, 111 Stat. 2018, 2022; Pub. L. 105–261, div. B, title XXVIII, §2813, Oct. 17, 1998, 112 Stat. 2206.)

AMENDMENTS

1998—Pub. L. 105–261 inserted section catchline, designated existing provisions as subsec. (a) and inserted heading, and added subsecs. (b) to (d).

1997—Pub. L. 105–85 substituted "military installations" for "military reservations", "an integrated natural resources management plan" for "a cooperative plan", and "the installations" for "such reservations".

1968—Pub. L. 90–465 authorized the carrying out of a public outdoor recreation resources program under a cooperative plan between Secretary of Defense, Secretary of the Interior, and State agencies, and struck out provisions for expenditure of funds collected and purposes therefor, now incorporated in section 670f(a) of this title.

§670c–1. Cooperative and interagency agreements for land management on installations

(a) Authority of Secretary of military department

The Secretary of a military department may enter into cooperative agreements with States, local governments, Indian tribes, nongovernmental organizations, and individuals, and into interagency agreements with the heads of other Federal departments and agencies, to provide for the following:

(1) The maintenance and improvement of natural resources on, or to benefit natural and historic research on, military installations and State-owned National Guard installations.

(2) The maintenance and improvement of natural resources located off of a military installation or State-owned National Guard installation if the purpose of the cooperative agreement or interagency agreement is to relieve or eliminate current or anticipated challenges that could restrict, impede, or otherwise interfere with, whether directly or indirectly, current or anticipated military activities.

(b) Multiyear agreements

(1) Funds appropriated to the Department of Defense for a fiscal year may be obligated to cover the cost of goods and services provided under a cooperative agreement or interagency agreement entered into under subsection (a) or through an agency agreement under section 1535 of title 31 during any 18-month period beginning in that fiscal year, without regard to whether the agreement crosses fiscal years.

(2) In the case of a cooperative agreement under subsection (a)(2), such funds—

(A) may be paid in a lump sum and include an amount intended to cover the future costs of the natural resource maintenance and improvement activities provided for under the agreement; and

(B) may be placed by the recipient in an interest-bearing or other investment account, and any interest or income shall be applied for the same purposes as the principal.

(3) If any funds are placed by a recipient in an interest-bearing or other investment account under paragraph (2)(B), the Secretary of Defense shall report biennially to the congressional defense committees on the disposition of such funds.

(c) Availability of funds; agreement under other laws

(1) Cooperative agreements and interagency agreements entered into under this section shall be subject to the availability of funds.

(2) Notwithstanding chapter 63 of title 31, a cooperative agreement under this section may be used to acquire property or services for the direct benefit or use of the United States Government.

(Pub. L. 86–797, title I, §103a, as added Pub. L. 101–189, div. B, title XXVIII, §2845(a), Nov. 29, 1989, 103 Stat. 1664; amended Pub. L. 105–85, div. B, title XXIX, §2908, Nov. 18, 1997, 111 Stat. 2021; Pub. L. 110–417, [div. A], title III, §313, Oct. 14, 2008, 122 Stat. 4409; Pub. L. 111–84, div. A, title III, §313, Oct. 28, 2009, 123 Stat. 2248; Pub. L. 112–81, div. A, title III, §312(a)(3), (b)(3), Dec. 31, 2011, 125 Stat. 1352, 1353; Pub. L. 112–239, div. A, title III, §312(a), Jan. 2, 2013, 126 Stat. 1691; Pub. L. 113–291, div. A, title III, §312, Dec. 19, 2014, 128 Stat. 3336.)

CODIFICATION

Pub. L. 113–291, §312, which directed amendment of section "103A" of the Sikes Act, was executed to this section, which is section 103a of that Act, to reflect the probable intent of Congress. See 2014 Amendment notes below.

AMENDMENTS

2014—Subsec. (b). Pub. L. 113–291, §312(a), designated existing provisions as par. (1) and added pars. (2) and (3). See Codification note above.

Subsec. (c). Pub. L. 113–291, §312(b), amended subsec. (c) generally. See Codification note above. Prior to amendment, text read as follows: "Cooperative agreements and interagency agreements entered into under this section shall be subject to the availability of funds and shall not be considered, nor be treated as, cooperative agreements to which chapter 63 of title 31 applies."

2013—Subsec. (a). Pub. L. 112–239, which directed amendment of section 103A of Pub. L. 86–797 by inserting "Indian tribes," after "local governments," in introductory provisions of subsec. (a), was executed to this section, which is section 103a of Pub. L. 86–797, to reflect the probable intent of Congress.

2011—Pub. L. 112–81, §312(b)(3)(A), (B), inserted section catchline.

Subsec. (a). Pub. L. 112–81, §312(b)(3)(C), inserted heading.

Subsec. (a)(1). Pub. L. 112–81, §312(a)(3)(A), substituted "military installations and State-owned National Guard installations" for "Department of Defense installations".

Subsec. (a)(2). Pub. L. 112–81, §312(a)(3)(B), substituted "military installation or State-owned National Guard installation" for "Department of Defense installation".

Subsec. (c). Pub. L. 112–81, §312(b)(3)(D), inserted heading.

2009—Pub. L. 111–84 inserted, in section catchline, "and interagency" after "Cooperative", in subsec. (a), ", and into interagency agreements with the heads of other Federal departments and agencies," after "and individuals" in introductory provisions and "or interagency agreement" after "cooperative agreement" in par. (2), in subsec. (b), "or interagency agreement" after "cooperative agreement", and, in subsec. (c), "and interagency agreements" after "Cooperative agreements".

2008—Subsec. (a). Pub. L. 110–417 substituted "to provide for the following:

"(1) The"

for "to provide for the" and added par. (2).

1997—Subsec. (a). Pub. L. 105–85, §2908(1), substituted "Secretary of a military department" for "Secretary of Defense".

Subsec. (b). Pub. L. 105–85, §2908(2), added heading and text of subsec. (b) and struck out former subsec. (b) which read as follows: "A cooperative agreement shall provide for the Secretary of Defense and the other party or parties to the agreement—

"(1) to contribute funds on a matching basis to defray the cost of programs, projects, and activities under the agreement; or

"(2) to furnish services on a matching basis to carry out such programs, projects, and activities,

or to do both."

§670d. Liability for funds; accounting to Comptroller General

The Department of Defense is held free from any liability to pay into the Treasury of the United States upon the operation of the program or programs authorized by this subchapter any funds which may have been or may hereafter be collected, received or expended pursuant to, and for the purposes of, this subchapter, and which collections, receipts and expenditures have been properly accounted for to the Comptroller General of the United States.

(Pub. L. 86–797, title I, §104, formerly §4, Sept. 15, 1960, 74 Stat. 1053; renumbered title I, §104, and amended Pub. L. 93–452, §3(1), (4), Oct. 18, 1974, 88 Stat. 1375; Pub. L. 112–81, div. A, title III, §312(b)(4), Dec. 31, 2011, 125 Stat. 1353.)

Amendments

2011—Pub. L. 112–81 inserted section catchline.

1974—Pub. L. 93–452, §3(4), substituted "title" for "Act" wherever appearing, which for purposes of codification was translated as "subchapter".

§670e. Applicability to other laws; national forest lands

Nothing herein contained shall be construed to modify, amend or repeal any provision of Public Law 85–337, nor as applying to national forest lands administered pursuant to the provisions of section 9 of the Act of June 7, 1924 (43 Stat. 655), nor section 315m of title 43.

(Pub. L. 86–797, title I, §105, formerly §5, Sept. 15, 1960, 74 Stat. 1053; renumbered title I, §105, Pub. L. 93–452, §3(1), Oct. 18, 1974, 88 Stat. 1375; amended Pub. L. 112–81, div. A, title III, §312(b)(5), Dec. 31, 2011, 125 Stat. 1353.)

References in Text

Public Law 85–337, referred to in text, is Pub. L. 85–337, Feb. 28, 1958, 72 Stat. 28, which is classified to section 2671 of Title 10, Armed Forces; section 472 of former Title 40, Public Buildings, Property, and Works [now 40 U.S.C. 102]; and sections 155 to 158 of Title 43, Public Lands. For complete classification of this Act to the Code, see Tables.

Section 9 of the Act of June 7, 1924 [ch. 348, 43 Stat. 655], referred to in text, was classified to the code as follows: The first and fifth sentences were classified to section 471(b) of this title, which was repealed by section 704(a) of Pub. L. 94–579; the second and third sentences were classified to section 505 of this title; and the fourth sentence was classified to section 499 of this title.

AMENDMENTS

2011—Pub. L. 112–81 inserted section catchline.

§670e–1. Federal enforcement of other laws

All Federal laws relating to the management of natural resources on Federal land may be enforced by the Secretary of Defense with respect to violations of the laws that occur on military installations within the United States.

(Pub. L. 86–797, title I, §106, as added Pub. L. 105–85, div. B, title XXIX, §2909(2), Nov. 18, 1997, 111 Stat. 2021.)

PRIOR PROVISIONS

A prior section 106 of Pub. L. 86–797 was renumbered section 108, and is classified to section 670f of this title.

§670e–2. Natural resources management services

To the extent practicable using available resources, the Secretary of each military department shall ensure that sufficient numbers of professionally trained natural resources management personnel and natural resources law enforcement personnel are available and assigned responsibility to perform tasks necessary to carry out this subchapter, including the preparation and implementation of integrated natural resources management plans.

(Pub. L. 86–797, title I, §107, as added Pub. L. 105–85, div. B, title XXIX, §2910, Nov. 18, 1997, 111 Stat. 2021.)

§670f. Appropriations and expenditures

(a) Expenditures of collected funds under integrated natural resources management plans

The Secretary of Defense shall expend such funds as may be collected in accordance with the integrated natural resources management plans agreed to under sections 670a and 670b of this title and cooperative agreements agreed to under section 670c–1 of this title and for no other purpose. All funds that are so collected shall remain available until expended.

(b) Authorization of appropriations to Secretary of Defense

Of the amounts authorized to be appropriated to the Department of Defense, there are authorized to be appropriated to the Secretary of Defense not to exceed $1,500,000 for each of the fiscal years 2014 through 2019, to carry out this subchapter, including the enhancement of fish and wildlife habitat and the development of public recreation and other facilities, and to carry out such functions and responsibilities as the Secretary may have under cooperative agreements entered into under section 670c–1 of this title. The Secretary of Defense shall, to the greatest extent practicable, enter into agreements to utilize the services, personnel, equipment, and facilities, with or without reimbursement, of the Secretary of the Interior in carrying out the provisions of this section.

(c) Authorization of appropriations to Secretary of the Interior

Of the amounts authorized to be appropriated to the Department of the Interior, there are authorized to be appropriated to the Secretary of the Interior not to exceed $3,000,000 for each of the fiscal years 2014 through 2019, to carry out such functions and responsibilities as the Secretary may have under integrated natural resources management plans to which such Secretary is a party under this section, including those for the enhancement of fish and wildlife habitat and the development of public recreation and other facilities.

(d) Use of other conservation or rehabilitation authorities

The Secretary of Defense and the Secretary of the Interior may each use any authority available to him under other laws relating to fish, wildlife, or plant conservation or rehabilitation for purposes of carrying out the provisions of this subchapter.

(Pub. L. 86–797, title I, §108, formerly §6, as added Pub. L. 90–465, §2, Aug. 8, 1968, 82 Stat. 661; renumbered title I, §106, and amended Pub. L. 93–452, §§1(2), 3(1), (4), (5), Oct. 18, 1974, 88 Stat. 1369, 1375; Pub. L. 95–420, §2, Oct. 5, 1978, 92 Stat. 921; Pub. L. 97–396, §2, Dec. 31, 1982, 96 Stat. 2005; Pub. L. 99–561, §§1(a), 3(b), Oct. 27, 1986, 100 Stat. 3149, 3151; Pub. L. 100–653, title II, §202(a), Nov. 14, 1988, 102 Stat. 3827; Pub. L. 101–189, div. B, title XXVIII, §2845(b), Nov. 29, 1989, 103 Stat. 1664; renumbered §108, and amended Pub. L. 105–85, div. B, title XXIX, §§2904(b)(7), (8), 2909(1), 2914(a), Nov. 18, 1997, 111 Stat. 2018, 2021, 2022; Pub. L. 108–136, div. A, title III, §311(a), Nov. 24, 2003, 117 Stat. 1428; Pub. L. 111–84, div. A, title III, §312, Oct. 28, 2009, 123 Stat. 2247; Pub. L. 112–81, div. A, title III, §312(b)(6), Dec. 31, 2011, 125 Stat. 1353; Pub. L. 113–66, div. A, title III, §313, title X, §1091(c)(1), Dec. 26, 2013, 127 Stat. 729, 876.)

AMENDMENTS

2013—Subsecs. (b), (c). Pub. L. 113–66, §313, substituted "fiscal years 2014 through 2019" for "fiscal years 2009 through 2014".

Subsec. (d). Pub. L. 113–66, §1091(c)(1), made technical amendment to directory language of Pub. L. 112–81, §312(b)(6)(F). See 2011 Amendment note below.

2011—Pub. L. 112–81, §312(b)(6), as amended by Pub. L. 113–66, §1091(c)(1), inserted section catchline and headings for subsecs. (a) to (d).

2009—Subsec. (b). Pub. L. 111–84, §312(a), (b)(1), substituted "Of the amounts authorized to be appropriated to the Department of Defense, there are authorized" for "There are authorized" and "fiscal years 2009 through 2014" for "fiscal years 2004 through 2008".

Subsec. (c). Pub. L. 111–84, §312(a), (b)(2), substituted "Of the amounts authorized to be appropriated to the Department of the Interior, there are authorized" for "There are authorized" and "fiscal years 2009 through 2014" for "fiscal years 2004 through 2008".

2003—Subsecs. (b), (c). Pub. L. 108–136 substituted "fiscal years 2004 through 2008" for "fiscal years 1998 through 2003".

1997—Subsec. (a). Pub. L. 105–85, §2904(b)(7), substituted "integrated natural resources management plans" for "cooperative plans".

Subsec. (b). Pub. L. 105–85, §2914(a), substituted "1998 through 2003," for "1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, and 1993,".

Subsec. (c). Pub. L. 105–85, §2914(a), substituted "1998 through 2003," for "1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, and 1993,".

Pub. L. 105–85, §2904(b)(8), substituted "integrated natural resources management plans" for "cooperative plans".

1989—Subsec. (a). Pub. L. 101–189, §2845(b)(1), inserted "and cooperative agreements agreed to under section 670c–1 of this title" after "sections 670a and 670b of this title".

Subsec. (b). Pub. L. 101–189, §2845(b)(2), inserted ", and to carry out such functions and responsibilities as the Secretary may have under cooperative agreements entered into under section 670c–1 of this title" before period at end of first sentence.

1988—Subsecs. (b), (c). Pub. L. 100–653 substituted "1988, 1989, 1990, 1991, 1992, and 1993" for "and 1988".

1986—Subsec. (a). Pub. L. 99–561, §3(b), inserted provision that all funds collected remain available until expended.

Subsecs. (b), (c). Pub. L. 99–561, §1(a), substituted "1985, 1986, 1987, and 1988" for "and 1985".

1982—Subsecs. (b), (c). Pub. L. 97–396, §2(1), substituted "1983, 1984, and 1985," for "ending September 30, 1979, September 30, 1980, and September 30, 1981," wherever appearing.

Subsec. (d). Pub. L. 97–396, §2(2), added subsec. (d).

1978—Subsec. (b). Pub. L. 95–420 substituted provisions authorizing the appropriation of not to exceed $1,500,000 for each of the fiscal years ending Sept. 30, 1979, 1980 and 1981 for provisions authorizing the appropriation of not to exceed $500,000 per fiscal year for fiscal years beginning July 1, 1969, 1970, and 1971 and not to exceed $1,500,000 for fiscal year beginning July 1, 1972 and for each of the next five fiscal years thereafter and struck out provisions relating to the authorization of appropriations to the Secretary of the Interior not to exceed $2,000,000 for the fiscal year beginning July 1, 1973 and for each of the next four fiscal years thereafter to enable the Secretary to carry out the functions and responsibilities under cooperative plans, sums appropriated under this subchapter to be available until expended.

Subsec. (c). Pub. L. 95–420 added subsec. (c).

1974—Subsec. (a). Pub. L. 93–452, §3(5), substituted "sections 101 and 102" for "sections 1 and 2" which for purposes of codification was translated as "sections 670a and 670b", therefore requiring no change in text because of redesignation of former sections 1 and 2 of Pub. L. 86–797 by section 3(1) of Pub. L. 93–452.

Subsec. (b). Pub. L. 93–452, §§1(2), 3(4), inserted provisions authorizing appropriations of not to exceed $1,500,000 for the fiscal year beginning July 1, 1972, and for each of the next five fiscal years thereafter, and authorizing appropriations to the Secretary of the Interior not to exceed $2,000,000 for the fiscal year beginning July 1, 1973, and for each of the next four fiscal years thereafter, and substituted "title" for "Act" wherever appearing, which for purposes of codification was translated as "subchapter".

Effective Date of 2013 Amendment

Pub. L. 113–66, div. A, title X, §1091(c), Dec. 26, 2013, 127 Stat. 876, provided in part that the amendment by section 1091(c)(1) is effective as of Dec. 31, 2011, and as if included in Pub. L. 112–81 as enacted.

16 USC CHAPTER 5C, SUBCHAPTER II: CONSERVATION PROGRAMS ON PUBLIC LANDS

From Title 16—CONSERVATION
CHAPTER 5C—CONSERVATION PROGRAMS ON GOVERNMENT LANDS

SUBCHAPTER II—CONSERVATION PROGRAMS ON PUBLIC LANDS

§670g. Wildlife, fish, and game conservation and rehabilitation programs

(a) Programs required

The Secretary of the Interior and the Secretary of Agriculture shall each, in cooperation with the State agencies and in accordance with comprehensive plans developed pursuant to section 670h of this title, plan, develop, maintain, and coordinate programs for the conservation and rehabilitation of wildlife, fish, and game. Such conservation and rehabilitation programs shall include, but not be limited to, specific habitat improvement projects and related activities and adequate protection for species of fish, wildlife, and plants considered threatened or endangered.

(b) Implementation of programs

The Secretary of the Interior shall implement the conservation and rehabilitation programs required under subsection (a) of this section on public land under his jurisdiction. The Secretary of the Interior shall adopt, modify, and implement the conservation and rehabilitation programs required under such subsection (a) on public land under the jurisdiction of the Chairman, but only with the prior written approval of the Atomic Energy Commission, and on public land under the jurisdiction of the Administrator, but only with the prior written approval of the Administrator. The Secretary of Agriculture shall implement such conservation and rehabilitation programs on public land under his jurisdiction.

(Pub. L. 86–797, title II, §201, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1369; amended Pub. L. 97–396, §3, Dec. 31, 1982, 96 Stat. 2005; Pub. L. 112–81, div. A, title III, §312(b)(7), Dec. 31, 2011, 125 Stat. 1354.)

AMENDMENTS

2011—Pub. L. 112–81 inserted section catchline and headings for subsecs. (a) and (b).
1982—Subsec. (a). Pub. L. 97–396 inserted "of fish, wildlife, and plants" after "species".

TRANSFER OF FUNCTIONS

Atomic Energy Commission abolished and functions transferred by sections 5814 and 5841 of Title 42, The Public Health and Welfare. See, also, Transfer of Functions notes set out under those sections.

DESERT TORTOISE PLAN

Pub. L. 100–275, §12, Mar. 31, 1988, 102 Stat. 60, directed Secretary of the Interior to review status of populations of desert tortoises on lands in Nevada and other States managed by Secretary, other than lands conveyed or leased pursuant to Pub. L. 100–275, assess nature and extent of threats to continued health or stability of such populations on such lands, and prepare a comprehensive plan to address such threats, with Secretary to consult with State officials, other Federal agencies responsible for management of lands where desert tortoise populations are located, the Desert Tortoise Council, and other persons or groups identified by Secretary as having expertise relevant to requirements of this section; such review and assessment to be completed and results to be made available to the public and transmitted to certain committees of Congress no later than two years after Mar. 31, 1988, and such plan to be developed and transmitted to such committees no later than three years after Mar. 31, 1988; with a failure by Secretary to transmit such report within such three-year period not to relieve the Secretary from requirement to prepare such plan.

§670h. Comprehensive plans for conservation and rehabilitation programs

(a) Development of plans

(1) The Secretary of the Interior shall develop, in consultation with the State agencies, a comprehensive plan for conservation and rehabilitation programs to be implemented on public land under his jurisdiction and the Secretary of Agriculture shall do the same in connection with public land under his jurisdiction.

(2) The Secretary of the Interior shall develop, with the prior written approval of the Atomic Energy Commission, a comprehensive plan for conservation and rehabilitation programs to be implemented on public land under the jurisdiction of the Chairman and develop, with the prior written approval of the Administrator, a comprehensive plan for such programs to be implemented on public land under the jurisdiction of the Administrator. Each such plan shall be developed after the Secretary of the Interior makes, with the prior written approval of the Chairman or the Administrator, as the case may be, and in consultation with the State agencies, necessary studies and surveys of the land concerned to determine where conservation and rehabilitation programs are most needed.

(b) Consistency with overall land use and management plans; hunting, trapping, and fishing

Each comprehensive plan developed pursuant to this section shall be consistent with any overall land use and management plans for the lands involved. In any case in which hunting, trapping, or fishing (or any combination thereof) of resident fish and wildlife is to be permitted on public land under a comprehensive plan, such hunting, trapping, and fishing shall be conducted in accordance with applicable laws and regulations of the State in which such land is located.

(c) Cooperative agreements by State agencies for implementation of programs

(1) Each State agency may enter into a cooperative agreement with—

(A) the Secretary of the Interior with respect to those conservation and rehabilitation programs to be implemented under this subchapter within the State on public land which is under his jurisdiction;

(B) the Secretary of Agriculture with respect to those conservation and rehabilitation programs to be implemented under this subchapter within the State on public land which is under his jurisdiction; and

(C) the Secretary of the Interior and the Chairman or the Administrator, as the case may be, with respect to those conservation and rehabilitation programs to be implemented under this subchapter within the State on public land under the jurisdiction of the Chairman or the Administrator; except that before entering into any cooperative agreement which affects public land under the jurisdiction of the Chairman, the Secretary of the Interior shall obtain the prior written approval of the Atomic Energy Commission and before entering into any cooperative agreement which affects public lands under the jurisdiction of the Administrator, the Secretary of the Interior shall obtain the prior written approval of the Administrator.

Conservation and rehabilitation programs developed and implemented pursuant to this subchapter shall be deemed as supplemental to wildlife, fish, and game-related programs conducted by the Secretary of the Interior and the Secretary of Agriculture pursuant to other provisions of law. Nothing in this subchapter shall be construed as limiting the authority of the Secretary of the Interior or the Secretary of Agriculture, as the case may be, to manage the national forests or other public lands for wildlife and fish and other purposes in accordance with the Multiple-Use Sustained-Yield Act of 1960 (74 Stat. 215; 16 U.S.C. 528–531) or other applicable authority.

(2) Any conservation and rehabilitation program included within a cooperative agreement entered into under this subsection may be modified in a manner mutually agreeable to the State agency and the Secretary concerned (and the Chairman or the Administrator, as the case may be, if public land under his jurisdiction is involved). Before modifying any cooperative agreement which affects public land under the jurisdiction of the Chairman, the Secretary of the Interior shall obtain the prior written approval of the Atomic Energy Commission and before modifying any cooperative agreement which affects public land under the jurisdiction of the Administrator, the Secretary of the Interior shall obtain the prior written approval of the Administrator.

(3) Each cooperative agreement entered into under this subsection shall—

(A) specify those areas of public land within the State on which conservation and rehabilitation programs will be implemented;

(B) provide for fish and wildlife habitat improvements or modifications, or both;

(C) provide for range rehabilitation where necessary for support of wildlife;

(D) provide adequate protection for fish and wildlife officially classified as threatened or endangered pursuant to section 1533 of this title or considered to be threatened, rare, or endangered by the State agency;

(E) require the control of off-road vehicle traffic;

(F) if the issuance of public land area management stamps is agreed to pursuant to section 670i(a) of this title—

(i) contain such terms and conditions as are required under section 670i(b) of this title;

(ii) require the maintenance of accurate records and the filing of annual reports by the State agency to the Secretary of the Interior or the Secretary of Agriculture, or both, as the case may be, setting forth the amount and disposition of the fees collected for such stamps; and

(iii) authorize the Secretary concerned and the Comptroller General of the United States, or their authorized representatives, to have access to such records for purposes of audit and examination; and

(G) contain such other terms and conditions as the Secretary concerned and the State agency deem necessary and appropriate to carry out the purposes of this subchapter.

A cooperative agreement may also provide for arrangements under which the Secretary concerned may authorize officers and employees of the State agency to enforce, or to assist in the enforcement of, section 670j(a) of this title.

(4) Except where limited under a comprehensive plan or pursuant to cooperative agreement, hunting, fishing, and trapping shall be permitted with respect to resident fish and wildlife in accordance with applicable laws and regulations of the State in which such land is located on public land which is the subject of a conservation and rehabilitation program implemented under this subchapter.

(5) The Secretary of the Interior and the Secretary of Agriculture, as the case may be, shall prescribe such regulations as are deemed necessary to control, in a manner consistent with the applicable comprehensive plan and cooperative agreement, the public use of public land which is the subject of any conservation and rehabilitation program implemented by him under this subchapter.

(d) State agency agreements not cooperative agreements under other provisions

Agreements entered into by State agencies under the authority of this section shall not be deemed to be, or treated as, cooperative agreements to which chapter 63 of title 31 applies.

(Pub. L. 86–797, title II, §202, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1369; amended Pub. L. 97–396, §4, Dec. 31, 1982, 96 Stat. 2005; Pub. L. 112–81, div. A, title III, §312(b)(8), Dec. 31, 2011, 125 Stat. 1354.)

REFERENCES IN TEXT

The Multiple-Use Sustained-Yield Act of 1960, referred to in subsec. (c)(1), is Pub. L. 86–517, June 12, 1960, 74 Stat. 215, which is classified generally to sections 528 to 531 of this title. For complete classification of this Act to the Code, see Short Title note set out under section 528 of this title and Tables.

CODIFICATION

In subsec. (d), "chapter 63 of title 31" substituted for "the Federal Grant and Cooperative Agreement Act of 1977 (41 U.S.C. 501 et seq.)" on authority of Pub. L. 97–258, §4(b), Sept. 13, 1982, 96 Stat. 1067, the first section of which enacted Title 31, Money and Finance.

AMENDMENTS

2011—Pub. L. 112–81 inserted section catchline and headings for subsecs. (a) to (d).

1982—Subsec. (d). Pub. L. 97–396 added subsec. (d).

TRANSFER OF FUNCTIONS

Atomic Energy Commission abolished and functions transferred by sections 5814 and 5841 of Title 42, The Public Health and Welfare. See, also, Transfer of Functions notes set out under those sections.

§670i. Public land management area stamps for hunting, trapping, and fishing on public lands subject to programs

(a) Agreements to require stamps

Any State agency may agree with the Secretary of the Interior and the Secretary of Agriculture (or with the Secretary of the Interior or the Secretary of Agriculture, as the case may be, if within the State concerned all conservation and rehabilitation programs under this subchapter will be implemented by him) that no individual will be permitted to hunt, trap, or fish on any public land within the State which is subject to a conservation and rehabilitation program implemented under this subchapter unless at the time such individual is engaged in such activity he has on his person a valid public land management area stamp issued pursuant to this section.

(b) Conditions for agreements

Any agreement made pursuant to subsection (a) of this section to require the issuance of public land management area stamps shall be subject to the following conditions:

(1) Such stamps shall be issued, sold, and the fees therefor collected, by the State agency or by the authorized agents of such agency.

(2) Notice of the requirement to possess such stamps shall be displayed prominently in all places where State hunting, trapping, or fishing licenses are sold. To the maximum extent practicable, the sale of such stamps shall be combined with the sale of such State hunting, trapping, and fishing licenses.

(3) Except for expenses incurred in the printing, issuing, or selling of such stamps, the fees collected for such stamps by the State agency shall be utilized in carrying out conservation and rehabilitation programs implemented under this subchapter in the State concerned. Such fees may be used by the State agency to acquire lands or interests therein from willing sellers or donors to provide public access to program lands that have no existing public access for enhancement of outdoor recreation and wildlife conservation: *Provided*, That the Secretary of Agriculture and the Secretary of the Interior maintain such access, or ensure that maintenance is provided for such access, through or to lands within their respective jurisdiction.

(4) The purchase of any such stamp shall entitle the purchaser thereof to hunt, trap, and fish on any public land within such State which is the subject of a conservation or rehabilitation program implemented under this subchapter except to the extent that the public use of such land is limited pursuant to a comprehensive plan or cooperative agreement; but the purchase of any such stamp shall not be construed as (A) eliminating the requirement for the purchase of a migratory bird hunting stamp as set forth in section 718a of this title, or (B) relieving the purchaser from compliance with any applicable State game and fish laws and regulations.

(5) The amount of the fee to be charged for such stamps, the age at which the individual is required to acquire such a stamp, and the expiration date for such stamps shall be mutually agreed upon by the State agency and the Secretary or Secretaries concerned; except that each such stamp shall be void not later than one year after the date of issuance.

(6) Each such stamp must be validated by the purchaser thereof by signing his name across the face of the stamp.

(7) Any individual to whom a stamp is sold pursuant to this section shall upon request exhibit such stamp for inspection to any officer or employee of the Department of the Interior or the Department of Agriculture, or to any other person who is authorized to enforce section 670j(a) of this title.

(Pub. L. 86–797, title II, §203, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1371; amended Pub. L. 100–653, title II, §201, Nov. 14, 1988, 102 Stat. 3826; Pub. L. 112–81, div. A, title III, §312(b)(9), Dec. 31, 2011, 125 Stat. 1354.)

AMENDMENTS

2011—Pub. L. 112–81 inserted section catchline and headings for subsecs. (a) and (b) and realigned margins of subsec. (b)(3).

1988—Subsec. (b)(3). Pub. L. 100–653 amended par. (3) generally. Prior to amendment, par. (3) read as follows: "Except for expenses incurred in the printing, issuing, or selling of such stamps, the fees collected for such stamps by the State agency shall be utilized in carrying out conservation and rehabilitation programs implemented under this subchapter in the State concerned and for no other purpose. If such programs are implemented by both the Secretary of the Interior and the Secretary of Agriculture in the State, the Secretaries shall mutually agree, on

such basis as they deem reasonable, on the proportion of such fees that shall be applied by the State agency to their respective programs."

§670j. Enforcement provisions

(a) Violations and penalties

(1) Any person who hunts, traps, or fishes on any public land which is subject to a conservation and rehabilitation program implemented under this subchapter without having on his person a valid public land management area stamp, if the possession of such a stamp is required, shall be fined not more than $1,000, or imprisoned for not more than six months, or both.

(2) Any person who knowingly violates or fails to comply with any regulations prescribed under section 670h(c)(5) of this title shall be fined not more than $500, or imprisoned not more than six months, or both.

(b) Enforcement powers and proceedings

(1) For the purpose of enforcing subsection (a) of this section, the Secretary of the Interior and the Secretary of Agriculture may designate any employee of their respective departments, and any State officer or employee authorized under a cooperative agreement to enforce such subsection (a), to (i) carry firearms; (ii) execute and serve any warrant or other process issued by a court or officer of competent jurisdiction; (iii) make arrests without warrant or process for a misdemeanor he has reasonable grounds to believe is being committed in his presence or view; (iv) search without warrant or process any person, place, or conveyance as provided by law; and (v) seize without warrant or process any evidentiary item as provided by law.

(2) Upon the sworn information by a competent person, any United States magistrate judge or court of competent jurisdiction may issue process for the arrest of any person charged with committing any offense under subsection (a) of this section.

(3) Any person charged with committing any offense under subsection (a) of this section may be tried and sentenced by any United States magistrate judge designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions as provided for in section 3401 of title 18.

(c) Seizure and forfeiture

All guns, traps, nets, and other equipment, vessels, vehicles, and other means of transportation used by any person when engaged in committing an offense under subsection (a) of this section shall be subject to forfeiture to the United States and may be seized and held pending the prosecution of any person arrested for committing such offense. Upon conviction for such offense, such forfeiture may be adjudicated as a penalty in addition to any other provided for committing such offense.

(d) Applicability of customs laws

All provisions of law relating to the seizure, forfeiture, and condemnation of a vessel for violation of the customs laws, the disposition of such vessel or the proceeds from the sale thereof, and the remission or mitigation of such forfeitures, shall apply to the seizures and forfeitures incurred, or alleged to have been incurred, under the provisions of this section, insofar as such provisions of law are applicable and not inconsistent with the provisions of this section; except that all powers, rights, and duties conferred or imposed by the customs laws upon any officer or employee of the Department of the Treasury shall, for the purposes of this section, be exercised or performed by the Secretary of the Interior or the Secretary of Agriculture, as the case may be, or by such persons as he may designate.

(Pub. L. 86–797, title II, §204, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1372; amended Pub. L. 112–81, div. A, title III, §312(b)(10), (c), Dec. 31, 2011, 125 Stat. 1354, 1355.)

AMENDMENTS

2011—Pub. L. 112–81, §312(b)(10), inserted section catchline and headings for subsecs. (a) to (d).

Subsec. (b)(2), (3). Pub. L. 112–81, §312(c), substituted "magistrate judge" for "magistrate".

§670k. Definitions

As used in this subchapter—

(1) The term "Administrator" means the Administrator of the National Aeronautics and Space Administration.

(2) The term "Chairman" means the Chairman of the Atomic Energy Commission.

(3) The term "off-road vehicle" means any motorized vehicle designed for, or capable of, cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain; but such term does not include—

(A) any registered motorboat at the option of each State;

(B) any military, fire, emergency, or law enforcement vehicle when used for emergency purposes; and

(C) any vehicle the use of which is expressly authorized by the Secretary of the Interior or the Secretary of Agriculture under a permit, lease, license, or contract.

(4) The term "public land" means all lands, under the respective jurisdiction of the Secretary of the Interior, the Secretary of Agriculture, the Chairman, and the Administrator, except land which is, or hereafter may be, within or designated as—

(A) a military reservation;

(B) a unit of the National Park System;

(C) an area within the national wildlife refuge system;

(D) an Indian reservation; or

(E) an area within an Indian reservation or land held in trust by the United States for an Indian or Indian tribe.

(5) The term "State agency" means the agency or agencies of a State responsible for the administration of the fish and game laws of the State.

(6) The term "conservation and rehabilitation programs" means to utilize those methods and procedures which are necessary to protect, conserve, and enhance wildlife, fish, and game resources to the maximum extent practicable on public lands subject to this subchapter consistent with any overall land use and management plans for the lands involved. Such methods and procedures shall include, but shall not be limited to, all activities associated with scientific resources management such as protection, research, census, law enforcement, habitat management, propagation, live trapping and transplantation, and regulated taking in conformance with the provisions of this subchapter. Nothing in this term shall be construed as diminishing the authority or jurisdiction of the States with respect to the management of resident species of fish, wildlife, or game, except as otherwise provided by law.

(Pub. L. 86–797, title II, §205, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1373; amended Pub. L. 112–81, div. A, title III, §312(b)(11), Dec. 31, 2011, 125 Stat. 1355.)

AMENDMENTS

2011—Pub. L. 112–81 inserted section catchline.

TRANSFER OF FUNCTIONS

Atomic Energy Commission abolished and functions transferred by sections 5814 and 5841 of Title 42, The Public Health and Welfare. See, also, Transfer of Functions notes set out under those sections.

§670*l*. Stamp requirements not applicable to Forest Service and Bureau of Land Management lands; authorized fees

Notwithstanding any other provision in this subchapter, section 670i of this title shall not apply to land which is, or hereafter may be, within or designated as Forest Service land or as Bureau of Land Management land of any State in which all Federal lands therein comprise 60 percent or more of the total area of such State; except that in any such State, any appropriate State agency may agree with the Secretary of Agriculture or the Secretary of the Interior, or both, as the case may be, to collect a fee as specified in such agreement at the point of sale of regular licenses to hunt, trap, or fish in such State, the proceeds of which shall be utilized in carrying out conservation and rehabilitation programs implemented under this subchapter in the State concerned and for no other purpose.

(Pub. L. 86–797, title II, §206, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1374; amended Pub. L. 112–81, div. A, title III, §312(b)(12), Dec. 31, 2011, 125 Stat. 1355.)

AMENDMENTS

2011—Pub. L. 112–81 inserted section catchline.

§670m. Indian rights; State or Federal jurisdiction regulating Indian rights

Nothing in this subchapter shall enlarge or diminish or in any way affect (1) the rights of Indians or Indian tribes to the use of water or natural resources or their rights to fish, trap, or hunt wildlife as secured by statute, agreement, treaty, Executive order, or court decree; or (2) existing State or Federal jurisdiction to regulate those rights either on or off reservations.

(Pub. L. 86–797, title II, §207, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1374; amended Pub. L. 112–81, div. A, title III, §312(b)(13), Dec. 31, 2011, 125 Stat. 1355.)

AMENDMENTS

2011—Pub. L. 112–81 inserted section catchline.

§670n. Repealed. Pub. L. 112–81, div. A, title III, §312(d), Dec. 31, 2011, 125 Stat. 1355

Section, Pub. L. 86–797, title II, §208, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1374, related to the jurisdiction, authority, duties, or activities of the Joint Federal-State Land Use Planning Commission.

§670*o*. Authorization of appropriations

(a) Functions and responsibilities of Secretary of the Interior

There are authorized to be appropriated $4,000,000 for each of fiscal years 1998 through 2003, to enable the Secretary of the Interior to carry out his functions and responsibilities under this subchapter, including data collection, research, planning, and conservation and rehabilitation programs on public lands. Such funds shall be in addition to those authorized for wildlife, range, soil, and water management pursuant to section 1748 of title 43, or other provisions of law.

(b) Functions and responsibilities of Secretary of Agriculture

There are authorized to be appropriated $5,000,000 for each of fiscal years 1998 through 2003, to enable the Secretary of Agriculture to carry out his functions and responsibilities under this subchapter. Such funds shall be in addition to those provided under other provisions of law. In requesting funds under this subsection the Secretary shall take into account fish and wildlife program needs, including those for projects, identified in the State comprehensive plans as contained in the program developed pursuant to the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (16 U.S.C. 1601–1610).

(c) Use of other conservation or rehabilitation authorities

The Secretary of the Interior and the Secretary of Agriculture may each use any authority available to him under other laws relating to fish, wildlife, or plant conservation or rehabilitation for purposes of carrying out the provisions of this subchapter.

(d) Contract authority

The Secretary of the Interior and the Secretary of Agriculture may each make purchases and contracts for property and services from, or provide assistance to, the State agencies concerned, if such property, services or assistance is required to implement those projects and programs carried out on, or of benefit to, Federal lands and identified in the comprehensive plans or cooperative agreements developed under section 670h of this title, without regard to division C (except sections 3302, 3307(e), 3501(b), 3509, 3901, 3905, 3906, 4710, and 4711) of subtitle I of title 41. Contract authority provided in this section is effective only to such extent or in such amounts as are provided in appropriation Acts.

(Pub. L. 86–797, title II, §208, formerly §209, as added Pub. L. 93–452, §2, Oct. 18, 1974, 88 Stat. 1374; amended Pub. L. 95–420, §3, Oct. 5, 1978, 92 Stat. 921; Pub. L. 97–396, §5, Dec. 31, 1982, 96 Stat. 2005; Pub. L. 99–561, §1(b), Oct. 27, 1986, 100 Stat. 3149; Pub. L. 100–653, title II, §202(b), Nov. 14, 1988, 102 Stat. 3827; Pub. L. 105–85, div. B, title XXIX, §2914(b), Nov. 18, 1997, 111 Stat. 2023;

renumbered §208 and amended Pub. L. 112–81, div. A, title III, §312(b)(14), (d), Dec. 31, 2011, 125 Stat. 1355.)

References in Text

The Forest and Rangeland Renewable Resources Planning Act of 1974, referred to in subsec. (b), is Pub. L. 93–378, Aug. 17, 1974, 88 Stat. 476, which is classified generally to subchapter I (§1600 et seq.) of chapter 36 of this title. For complete classification of this Act to the Code, see Short Title note set out under section 1600 of this title and Tables.

Codification

In subsec. (d), "division C (except sections 3302, 3307(e), 3501(b), 3509, 3901, 3905, 3906, 4710, and 4711) of subtitle I of title 41" substituted for "title III (other than section 304) of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 251–260)" on authority of Pub. L. 111–350, §6(c), Jan. 4, 2011, 124 Stat. 3854, which Act enacted Title 41, Public Contracts.

Prior Provisions

A prior section 208 of Pub. L. 86–797 was classified to section 670n of this title prior to repeal by Pub. L. 112–81, div. A, title III, §312(d), Dec. 31, 2011, 125 Stat. 1355.

Amendments

2011—Pub. L. 112–81, §312(b)(14), inserted section catchline and headings for subsecs. (a) to (d).

1997—Subsec. (a). Pub. L. 105–85, §2914(b)(1), substituted "$4,000,000 for each of fiscal years 1998 through 2003," for "the sum of $10,000,000 for each of the fiscal years 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, and 1993,".

Subsec. (b). Pub. L. 105–85, §2914(b)(2), substituted "$5,000,000 for each of fiscal years 1998 through 2003," for "the sum of $12,000,000 for each of the fiscal years 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, and 1993,".

1988—Subsecs. (a), (b). Pub. L. 100–653 substituted "1988, 1989, 1990, 1991, 1992, and 1993" for "and 1988".

1986—Subsecs. (a), (b). Pub. L. 99–561 substituted "1985, 1986, 1987, and 1988" for "and 1985".

1982—Subsecs. (a), (b). Pub. L. 97–396, §5(1), substituted "1983, 1984, and 1985," for "ending September 30, 1979, September 30, 1980, and September 30, 1981," wherever appearing.

Subsecs. (c), (d). Pub. L. 97–396, §5(2), added subsecs. (c) and (d).

1978—Subsec. (a). Pub. L. 95–420 substituted provisions authorizing appropriation of $10,000,000 for each of fiscal years ending Sept. 30, 1979, 1980, and 1981 to enable the Secretary to carry out his functions, including data collection, research, planning, and conservation and rehabilitation programs, such funds to be in addition to those authorized for wildlife, range, soil and water management pursuant to section 1748 of title 43, for provisions authorizing appropriation of $10,000,000 for fiscal year ending June 30, 1974, and for each of next four fiscal years to enable Department of the Interior to carry out its functions.

Subsec. (b). Pub. L. 95–420 substituted provisions authorizing appropriation of $12,000,000 for fiscal years ending Sept. 30, 1979, 1980, and 1981 to enable Secretary of Agriculture to carry out his functions, such funds to be in addition to those otherwise provided, and provisions relating to fish and wildlife program needs including those identified in State plans developed pursuant to Forest and Rangeland Renewable Resources Planning Act of 1974, for provisions authorizing appropriation of $10,000,000 for fiscal year ending June 30, 1974, and for each of next four fiscal years to enable Department of Agriculture to carry out its functions.

one or more military departments or Defense Agencies, the Secretary of Defense shall provide for the installation of fiber-optics based telecommunications technology to link as many of the installations in the area as practicable in a telecommunications network. The Secretary shall use a full and open competitive process, consistent with section 2304 of title 10, United States Code, to provide for the installation of the telecommunications network through one or more new contracts.

(b) FEATURES OF NETWORK.—The telecommunications network shall provide direct access to local and long distance telephone carriers, allow for transmission of both classified and unclassified information, and take advantage of the various capabilities of fiber-optics based telecommunications technology.

(c) TIME FOR REQUEST FOR BIDS OR PROPOSALS.—Not later than March 30, 1998, the Secretary of Defense shall release a final request for bids or proposals to provide the telecommunications network or networks described in subsection (a).

(d) REPORT ON IMPLEMENTATION.—Not later than December 31, 1998, the Secretary of Defense shall submit to the congressional defense committees a report on the implementation of subsection (c), including the metropolitan area or areas selected for the installation of a fiber-optics based telecommunications network, the current telecommunication costs for the Department of Defense in the selected area or areas, the estimated cost of the fiber-optics based network, and potential areas for the future use of fiber-optics based networks.

TITLE XXIX—SIKES ACT IMPROVEMENT

Sikes Act Improvement Act of 1997.
Natural resources.
Fish and wildlife.

16 USC 670 note.

SEC. 2901. SHORT TITLE.

This title may be cited as the "Sikes Act Improvement Act of 1997".

SEC. 2902. DEFINITION OF SIKES ACT FOR PURPOSES OF AMENDMENTS.

In this title, the term "Sikes Act" means the Act entitled "An Act to promote effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military reservations", approved September 15, 1960 (16 U.S.C. 670a et seq.), commonly referred to as the "Sikes Act".

SEC. 2903. CODIFICATION OF SHORT TITLE OF ACT.

The Sikes Act (16 U.S.C. 670a et seq.) is amended by inserting before title I the following new section:

"SECTION 1. SHORT TITLE.

"This Act may be cited as the 'Sikes Act'.".

SEC. 2904. PREPARATION OF INTEGRATED NATURAL RESOURCES MANAGEMENT PLANS.

(a) IN GENERAL.—Section 101 of the Sikes Act (16 U.S.C. 670a(a)) is amended by striking out subsection (a) and inserting in lieu thereof the following new subsection:

"(a) AUTHORITY OF SECRETARY OF DEFENSE.—

"(1) PROGRAM.—

"(A) IN GENERAL.—The Secretary of Defense shall carry out a program to provide for the conservation and rehabilitation of natural resources on military installations.

"(B) INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN.—To facilitate the program, the Secretary of each military department shall prepare and implement an integrated natural resources management plan for each military installation in the United States under the jurisdiction of the Secretary, unless the Secretary determines that the absence of significant natural resources on a particular installation makes preparation of such a plan inappropriate.

"(2) COOPERATIVE PREPARATION.—The Secretary of a military department shall prepare each integrated natural resources management plan for which the Secretary is responsible in cooperation with the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service, and the head of each appropriate State fish and wildlife agency for the State in which the military installation concerned is located. Consistent with paragraph (4), the resulting plan for the military installation shall reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources.

"(3) PURPOSES OF PROGRAM.—Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out the program required by this subsection to provide for—

"(A) the conservation and rehabilitation of natural resources on military installations;

"(B) the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and

"(C) subject to safety requirements and military security, public access to military installations to facilitate the use.

"(4) EFFECT ON OTHER LAW.—Nothing in this title—

"(A)(i) affects any provision of a Federal law governing the conservation or protection of fish and wildlife resources; or

"(ii) enlarges or diminishes the responsibility and authority of any State for the protection and management of fish and resident wildlife; or

"(B) except as specifically provided in the other provisions of this section and in section 102, authorizes the Secretary of a military department to require a Federal license or permit to hunt, fish, or trap on a military installation.".

(b) CONFORMING AMENDMENTS.—Title I of the Sikes Act is amended—

(1) in section 101(b)(4) (16 U.S.C. 670a(b)(4)), by striking out "cooperative plan" each place it appears and inserting in lieu thereof "integrated natural resources management plan";

(2) in section 101(c) (16 U.S.C. 670a(c)), in the matter preceding paragraph (1), by striking out "a cooperative plan" and inserting in lieu thereof "an integrated natural resources management plan";

(3) in section 101(d) (16 U.S.C. 670a(d)), in the matter preceding paragraph (1), by striking out "cooperative plans" and inserting in lieu thereof "integrated natural resources management plans";

(4) in section 101(e) (16 U.S.C. 670a(e)), by striking out "Cooperative plans" and inserting in lieu thereof "Integrated natural resources management plans";

(5) in section 102 (16 U.S.C. 670b), by striking out "a cooperative plan" and inserting in lieu thereof "an integrated natural resources management plan";

(6) in section 103 (16 U.S.C. 670c), by striking out "a cooperative plan" and inserting in lieu thereof "an integrated natural resources management plan";

(7) in section 106(a) (16 U.S.C. 670f(a)), by striking out "cooperative plans" and inserting in lieu thereof "integrated natural resources management plans"; and

(8) in section 106(c) (16 U.S.C. 670f(c)), by striking out "cooperative plans" and inserting in lieu thereof "integrated natural resources management plans".

(c) REQUIRED ELEMENTS OF PLANS.—Section 101(b) of the Sikes Act (16 U.S.C. 670a(b)) is amended—

(1) by striking out "(b) Each cooperative" and all that follows through the end of paragraph (1) and inserting in lieu thereof the following:

"(b) REQUIRED ELEMENTS OF PLANS.—Consistent with the use of military installations to ensure the preparedness of the Armed Forces, each integrated natural resources management plan prepared under subsection (a)—

"(1) shall, to the extent appropriate and applicable, provide for—

"(A) fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation;

"(B) fish and wildlife habitat enhancement or modifications;

"(C) wetland protection, enhancement, and restoration, where necessary for support of fish, wildlife, or plants;

"(D) integration of, and consistency among, the various activities conducted under the plan;

"(E) establishment of specific natural resource management goals and objectives and time frames for proposed action;

"(F) sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;

"(G) public access to the military installation that is necessary or appropriate for the use described in subparagraph (F), subject to requirements necessary to ensure safety and military security;

"(H) enforcement of applicable natural resource laws (including regulations);

"(I) no net loss in the capability of military installation lands to support the military mission of the installation; and

"(J) such other activities as the Secretary of the military department determines appropriate;";

(2) in paragraph (2), by adding "and" at the end;

(3) by striking out paragraph (3);

(4) by redesignating paragraph (4) as paragraph (3); and

(5) in paragraph (3)(A) (as so redesignated), by striking out "collect the fees therefor," and inserting in lieu thereof "collect, spend, administer, and account for fees for the permits,".

SEC. 2905. REVIEW FOR PREPARATION OF INTEGRATED NATURAL RESOURCES MANAGEMENT PLANS.

16 USC 670a note.

(a) DEFINITIONS.—In this section, the terms "military installation" and "United States" have the meanings provided in section 100 of the Sikes Act (as added by section 2911).

(b) REVIEW OF MILITARY INSTALLATIONS.—

(1) REVIEW.—Not later than 270 days after the date of enactment of this Act, the Secretary of each military department shall—

(A) review each military installation in the United States that is under the jurisdiction of that Secretary to determine the military installations for which the preparation of an integrated natural resources management plan under section 101 of the Sikes Act (as amended by this title) is appropriate; and

(B) submit to the Secretary of Defense a report on the determinations.

Reports.

(2) REPORT TO CONGRESS.—Not later than one year after the date of enactment of this Act, the Secretary of Defense shall submit to Congress a report on the reviews conducted under paragraph (1). The report shall include—

(A) a list of the military installations reviewed under paragraph (1) for which the Secretary of the appropriate military department determines that the preparation of an integrated natural resources management plan is not appropriate; and

(B) for each of the military installations listed under subparagraph (A), an explanation of each reason such a plan is not appropriate.

(c) DEADLINE FOR INTEGRATED NATURAL RESOURCES MANAGEMENT PLANS.—Not later than three years after the date of the submission of the report required under subsection (b)(2), the Secretary of each military department shall, for each military installation with respect to which the Secretary has not determined under subsection (b)(2)(A) that preparation of an integrated natural resources management plan is not appropriate—

(1) prepare and begin implementing such a plan in accordance with section 101(a) of the Sikes Act (as amended by this title); or

(2) in the case of a military installation for which there is in effect a cooperative plan under section 101(a) of the Sikes Act on the day before the date of enactment of this Act, complete negotiations with the Secretary of the Interior and the heads of the appropriate State agencies regarding changes to the plan that are necessary for the plan to constitute an integrated natural resources management plan that complies with that section, as amended by this title.

(d) PUBLIC COMMENT.—The Secretary of each military department shall provide an opportunity for the submission of public comments on—

(1) integrated natural resources management plans proposed under subsection (c)(1); and

(2) changes to cooperative plans proposed under subsection (c)(2).

SEC. 2906. TRANSFER OF WILDLIFE CONSERVATION FEES FROM CLOSED MILITARY INSTALLATIONS.

Section 101(b)(3)(B) of the Sikes Act (16 U.S.C. 670a(b)) (as redesignated by section 2904(c)(4)) is amended by inserting before the period at the end the following: ", unless the military installation is subsequently closed, in which case the fees may be transferred to another military installation to be used for the same purposes".

SEC. 2907. ANNUAL REVIEWS AND REPORTS.

Section 101 of the Sikes Act (16 U.S.C. 670a) is amended by adding at the end the following new subsection:

"(f) REVIEWS AND REPORTS.—

"(1) SECRETARY OF DEFENSE.—Not later than March 1 of each year, the Secretary of Defense shall review the extent to which integrated natural resources management plans were prepared or were in effect and implemented in accordance with this title in the preceding year, and submit a report on the findings of the review to the committees. Each report shall include—

"(A) the number of integrated natural resources management plans in effect in the year covered by the report, including the date on which each plan was issued in final form or most recently revised;

"(B) the amounts expended on conservation activities conducted pursuant to the plans in the year covered by the report; and

"(C) an assessment of the extent to which the plans comply with this title.

"(2) SECRETARY OF THE INTERIOR.—Not later than March 1 of each year and in consultation with the heads of State fish and wildlife agencies, the Secretary of the Interior shall submit a report to the committees on the amounts expended by the Department of the Interior and the State fish and wildlife agencies in the year covered by the report on conservation activities conducted pursuant to integrated natural resources management plans.

"(3) DEFINITION OF COMMITTEES.—In this subsection, the term 'committees' means—

"(A) the Committee on Resources and the Committee on National Security of the House of Representatives; and

"(B) the Committee on Armed Services and the Committee on Environment and Public Works of the Senate.".

SEC. 2908 COOPERATIVE AGREEMENTS.

Section 103a of the Sikes Act (16 U.S.C. 670c–1) is amended—

(1) in subsection (a), by striking out "Secretary of Defense" and inserting in lieu thereof "Secretary of a military department";

(2) by striking out subsection (b) and inserting in lieu thereof the following new subsection:

"(b) MULTIYEAR AGREEMENTS.—Funds appropriated to the Department of Defense for a fiscal year may be obligated to cover the cost of goods and services provided under a cooperative agreement entered into under subsection (a) or through an agency agreement under section 1535 of title 31, United States Code, during any 18-month period beginning in that fiscal year, without regard to whether the agreement crosses fiscal years.".

SEC. 2909. FEDERAL ENFORCEMENT.

Title I of the Sikes Act is amended—

(1) by redesignating section 106 (16 U.S.C. 670f) as section 108; and

(2) by inserting after section 105 (16 U.S.C. 670e) the following new section:

"SEC. 106. FEDERAL ENFORCEMENT OF OTHER LAWS. 16 USC 670e–1.

"All Federal laws relating to the management of natural resources on Federal land may be enforced by the Secretary of Defense with respect to violations of the laws that occur on military installations within the United States.".

SEC. 2910. NATURAL RESOURCES MANAGEMENT SERVICES.

Title I of the Sikes Act is amended by inserting after section 106 (as added by section 2909) the following new section:

"SEC. 107. NATURAL RESOURCES MANAGEMENT SERVICES. 16 USC 670e–2.

"To the extent practicable using available resources, the Secretary of each military department shall ensure that sufficient numbers of professionally trained natural resources management personnel and natural resources law enforcement personnel are available and assigned responsibility to perform tasks necessary to carry out this title, including the preparation and implementation of integrated natural resources management plans.".

SEC. 2911. DEFINITIONS.

Title I of the Sikes Act is amended by inserting before section 101 (16 U.S.C. 670a) the following new section:

"SEC. 100. DEFINITIONS. 16 USC 670.

"In this title:

"(1) MILITARY INSTALLATION.—The term 'military installation'—

"(A) means any land or interest in land owned by the United States and administered by the Secretary of Defense or the Secretary of a military department, except

land under the jurisdiction of the Assistant Secretary of the Army having responsibility for civil works;

"(B) includes all public lands withdrawn from all forms of appropriation under public land laws and reserved for use by the Secretary of Defense or the Secretary of a military department; and

"(C) does not include any land described in subparagraph (A) or (B) that is subject to an approved recommendation for closure under the Defense Base Closure and Realignment Act of 1990 (part A of title XXIX of Public Law 101–510; 10 U.S.C. 2687 note).

"(2) STATE FISH AND WILDLIFE AGENCY.—The term 'State fish and wildlife agency' means the one or more agencies of State government that are responsible under State law for managing fish or wildlife resources.

"(3) UNITED STATES.—The term 'United States' means the States, the District of Columbia, and the territories and possessions of the United States.".

SEC. 2912. REPEAL OF SUPERSEDED PROVISION.

Section 2 of the Act of October 27, 1986 (Public Law 99–561; 16 U.S.C. 670a–1), is repealed.

SEC. 2913. TECHNICAL AMENDMENTS.

Title I of the Sikes Act, as amended by this title, is amended—

(1) in the heading for the title, by striking out "MILITARY RESERVATIONS" and inserting in lieu thereof "MILITARY INSTALLATIONS";

(2) in section 101(b)(3) (16 U.S.C. 670a(b)(3)), as redesignated by section 2904(c)(4)—

(A) in subparagraph (A), by striking out "the reservation" and inserting in lieu thereof "the installation"; and

(B) in subparagraph (B), by striking out "the military reservation" and inserting in lieu thereof "the military installation";

(3) in section 101(c) (16 U.S.C. 670a(c))—

(A) in paragraph (1), by striking out "a military reservation" and inserting in lieu thereof "a military installation"; and

(B) in paragraph (2), by striking out "the reservation" and inserting in lieu thereof "the installation";

(4) in section 101(e) (16 U.S.C. 670a(e)), by striking "the Federal Grant and Cooperative Agreement Act of 1977 (41 U.S.C. 501 et seq.)" and inserting "chapter 63 of title 31, United States Code";

(5) in section 102 (16 U.S.C. 670b), by striking out "military reservations" and inserting in lieu thereof "military installations"; and

(6) in section 103 (16 U.S.C. 670c)—

(A) by striking out "military reservations" and inserting in lieu thereof "military installations"; and

(B) by striking out "such reservations" and inserting in lieu thereof "the installations".

SEC. 2914. AUTHORIZATIONS OF APPROPRIATIONS.

(a) CONSERVATION PROGRAMS ON MILITARY INSTALLATIONS.—Subsections (b) and (c) of section 108 of the Sikes Act (as redesignated by section 2909(1)) are each amended by striking out "1983"

and all that follows through "1993," and inserting in lieu thereof "1998 through 2003,".

(b) CONSERVATION PROGRAMS ON PUBLIC LANDS.—Section 209 of the Sikes Act (16 U.S.C. 670o) is amended—

(1) in subsection (a), by striking out "the sum of $10,000,000" and all that follows through "to enable the Secretary of the Interior" and inserting in lieu thereof "$4,000,000 for each of fiscal years 1998 through 2003, to enable the Secretary of the Interior"; and

(2) in subsection (b), by striking out "the sum of $12,000,000" and all that follows through "to enable the Secretary of Agriculture" and inserting in lieu thereof "$5,000,000 for each of fiscal years 1998 through 2003, to enable the Secretary of Agriculture".

DIVISION C—DEPARTMENT OF ENERGY NATIONAL SECURITY AUTHORIZATIONS AND OTHER AUTHORIZATIONS

TITLE XXXI—DEPARTMENT OF ENERGY NATIONAL SECURITY PROGRAMS

Subtitle A—National Security Programs Authorizations

Subtitle B—Recurring General Provisions

Subtitle C—Program Authorizations, Restrictions, and Limitations

Subtitle D—Other Matters

A5. NATURAL RESOURCE CONSERVATION METRICS

MCBH has been following a systematic process of evaluating implementation progress since the INRMP was first published (Appendix E2).[1] In 2006, the U.S. Navy and Marine Corps adopted a standardized, web-based Natural Resource Conservation Metrics method for assessing an installation's natural resource management and INRMP implementation progress to be used during annual reviews at all Navy/Marine Corps installations with INRMPs. The metrics are used to standardize collection and reporting across Navy/Marine Corps installations. Since 2007 MCBH has utilized the natural resources metrics as mandated; standard criteria have changed slightly over time.

Evaluating progress using the standardized criteria established for the focus areas covered by the natural resources metrics helps measure success of natural resources management within and across installations. Initially these evaluations were done in coordination with annual regulator reviews.[2] The metrics are evaluated by Natural Resources staff in response to data calls and as part of annual INRMP reviews. The resulting information is provided to HQMC for use in facilitating and documenting the progress of the annual INRMP review required by the Sikes Act, for reporting to the Secretary of Defense on INRMP implementation, and determining the overall health of the Navy/Marine Corps' Natural Resources program.

The metrics evaluation is composed of seven Focus Areas developed to better understand the overall health of DoD's natural resources program, as implemented by the Military Services. Each Focus Area is specifically defined, and each has detailed mandatory definitions for the White/Green/Yellow/Red ratings.[3]

Focus Area 1: INRMP Implementation[4]

Evaluates the execution of actions taken to meet goals/objectives outlined in the INRMP.

- **GREEN:** The installation implemented at least 75% of planned actions[5] for that fiscal year and, as a result, can meet or exceed overall INRMP goals and objectives.
- **YELLOW:** The installation implemented at least 50% of planned actions for that fiscal year and, as a result, can partially accomplish overall INRMP goals and objectives.
- **RED:** The installation implemented less than 50% of planned actions for that fiscal year and, as a result, cannot accomplish overall INRMP goals and objectives.

Focus Area 2: Listed Species and Critical Habitat

Evaluates the extent to which Federally-listed species have been identified and the INRMP provides conservation benefits to these species and their habitats.

- **WHITE**: Surveys were conducted and there are no known Federally-listed species present and/or critical habitat designated on the installation.
- **GREEN:** Surveys have identified Federally-listed species and/or previously designated critical habitat and the INRMP includes specific management plans, goals, and objectives. There has been no critical habitat designated on the installation during the current reporting period.

[1] Criteria followed for evaluating annual progress in previous years of INRMP implementation are defined and discussed in earlier versions of the INRMP.

[2] Evaluation of the first six of the Focus Areas was conducted collaboratively among the MCBH Natural Resources staff and Sikes Act partner agencies (USFWS, NOAA Fisheries, and Hawai'i DLNR), while evaluation of the seventh Focus Area was conducted collaboratively between MCBH Natural Resources staff and military operators on Base.

[3] A white rating only applies to Listed Species and Critical Habitat and Recreational Use and Access.

[4] See Associated Definitions for a description of "implementation."

[5] See Associated Definitions for a description of "planned actions."

- **YELLOW:** Surveys have identified Federally-listed species and/or previously designated critical habitat, but there are no specific management plans, goals, or objectives in the INRMP. Critical habitat was not designated on the installation during the current reporting period.
- **RED:** Surveys to identify Federally-listed species and/or previously designated critical habitat have not been conducted, or there are no specific management plans, goals, and objectives in the INRMP. Critical habitat was designated on the installation during the current reporting period.

Focus Area 3: Sikes Act Cooperation (formerly Partnership Effectiveness)

Determine to what degree USFWS, State fish and wildlife agency and, when appropriate, National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, partnerships are cooperative and result in effective INRMP development, review for operation and effect, and mutual agreement.

- **GREEN:** The installation engaged the USFWS, State fish and wildlife agency and, when appropriate, NOAA Fisheries Service and these efforts are well documented.[6] These partners are familiar with and have reviewed the installation's INRMP, and communications among parties is regular.
- **YELLOW:** The installation engaged the USFWS, State fish and wildlife agency and, when appropriate, NOAA Fisheries Service and these efforts are well documented. However, these partners were non-responsive to installation communications and/or are not familiar with the INRMP.
- **RED:** The installation did not engage the USFWS, State fish and wildlife agency or NOAA Fisheries Service; therefore these partners did not review INRMPs or INRMP updates, nor did they participate in other regular communications.

Focus Area 4: Recreational Use and Access

Evaluate the availability and adequacy of public recreational use opportunities, such as fishing and hunting, and access for handicapped and disabled persons, given security and safety requirements for the installation.

- **WHITE:** Recreational activities are not available either because they do not exist or because they are fully restricted for mission, security, safety, or environmental constraints.
- **GREEN:** Where mission, security, safety, and environmental constraints allow, the INRMP identifies outdoor recreational activities, indicates access areas and allowable public use areas on the installation, the access and the facilities are in good condition, and to the extent practicable, the installation has access areas for handicapped and disabled persons.
- **YELLOW:** Where mission, security, safety, and environmental constraints allow, the INRMP identifies opportunities for outdoor recreational activities, access areas, allowable public use areas on the installation, but the condition of the access and the facilities needs to be improved.
- **RED:** Where mission, security, safety, and environmental constraints allow, the INRMP does not identify outdoor recreational opportunities or access areas for handicapped and disabled persons where resources exist and security/safety requirements allow.

Focus Area 5: Team Adequacy

Assess the adequacy of the natural resources team (professionally-trained natural resources management and/or installation support personnel) in accomplishing INRMP goals and objectives at each installation.

- **GREEN:** There are a sufficient number of professionally-trained natural resources management personnel assigned or available to the installation to implement INRMP goals and objectives.

[6] See Associated Definitions at end of section for a description of "documented."

These professionals received adequate supplemental training to ensure the proper and efficient management of natural resources.

- **YELLOW:** There are an insufficient number of professionally-trained natural resources management personnel assigned or available to the installation to implement INRMP goals and objectives and/or these professionals have not received adequate supplemental training to ensure the proper and efficient management of natural resources.
- **RED:** There are no professionally-trained natural resources management personnel assigned or available to implement INRMP goals and objectives.

Focus Area 6: Natural Resources Management (formerly Ecosystem Integrity)

Evaluate the effectiveness of management activities for conserving and rehabilitating installation natural resources as defined in the INRMP.

- **GREEN:** Natural resources management actions have had a positive effect on desired outcomes. Natural resources conditions are either at, or are nearing, desired conditions to meet the goals and objectives as identified in the INRMP.
- **YELLOW:** Natural resources management actions have had a limited effect on desired outcomes. Natural resources conditions are stable or are at risk of declining. Improvements are needed to better meet the goals and objectives as identified in the INRMP.
- **RED:** Natural resources management actions have not been effective in achieving desired outcomes. Natural resources conditions may be declining. Natural resources are not managed to meet INRMP goals and objectives.

Focus Area 7: Natural Resources Program Support of the Installation Mission

Evaluate the level to which existing natural resources requirements support the installation's ability to sustain the current operational mission ensuring no net loss of mission capability.

- **GREEN:** The installation is fully mission-capable because the Natural Resources Program fully supports current and potential future mission sustainment. Regular coordination between natural resources personnel and other installation departments has been highly effective and successful, and the INRMP minimizes possible mission constraints imposed by natural resources regulatory requirements.
- **YELLOW:** The installation is partially mission-capable because the Natural Resources Program does not fully support current and potential future mission sustainment, and/or natural resources personnel have not effectively coordinated with other installation departments, and/or there are natural resources regulatory requirements that the INRMP does not minimize.
- **RED:** The installation is not mission-capable because the Natural Resources Program does not address mission sustainment, and/or natural resources personnel has not coordinated with other installation departments, and/or the INRMP does not address mission constraints imposed by natural resources regulatory requirements.

Associated Definitions

a. *Implementation* – As defined in the INRMP Implementation Manual, DoDM 4715.03, anticipates the execution of planned projects and activities, including required actions, in accordance with specific timeframes identified in the INRMP. An INRMP is considered to be implemented if the DoD Component:
    - Actively requests, receives, and uses funds for natural resources management projects, activities and other requirements in support of goals and objectives identified in the INRMP.
    - Ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP.

- Invites annual feedback from the appropriate USFWS and State fish and wildlife agency offices on the effectiveness of its INRMP.
- Documents specific INRMP action accomplishments undertaken each year.
- Evaluates effectiveness of past and current management activities, and adapts appropriately to implement future actions.

b. *Planned Actions* – As defined in DoDI 4715.03 as "current compliance," required actions include projects and activities needed because an installation is currently out of compliance (has received an enforcement action from a duly authorized Federal or State agency, or local authority); has a signed compliance agreement or has received a consent order; has not met requirements based on applicable Federal or State laws, regulations, standards, Presidential EOs, or DoD policies; and/or are immediate and essential to maintain operational integrity or sustain readiness of the military mission. These funding requirements also include projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable laws, regulations, standards, DoD policies, or Presidential EOs, but deadlines have not passed or requirements are not in force), but shall be if projects or activities are not implemented in the current program year. Those activities include:

- Environmental analyses for natural resource conservation projects, and monitoring and studies required to assess and mitigate potential impacts of the military mission on conservation resources.
- Planning documentation, master plans, and INRMPs.
- Planning level surveys of natural resources.
- Biological assessments, surveys, monitoring, reporting of assessment results, or habitat protection for listed, at-risk, and candidate species so that proposed or continuing actions can be modified in consultation with the USFWS or the NOAA Fisheries Service.
- Mitigation to meet existing regulatory permit conditions or written agreements.
- Nonpoint source pollution or watershed management studies or actions needed to meet compliance dates cited in approved State coastal nonpoint source pollution control plans, as required to meet consistency.
- Wetlands delineation critical for the prevention of adverse impacts to wetlands, so that continuing actions can be modified to ensure mission continuity.
- Efforts to achieve compliance with requirements that have deadlines that have already passed, as cited in DoD executed agreements, such as support for the Chesapeake Bay Agreement Action Plan.

c. *Documented* – As defined in DoDM 4715.03, partnership effectiveness is considered well documented if the installation keeps a record of when it invites partners to participate in scoping, design, and preparation of the INRMP; invites partners to consider solutions to difficult resource management problems; and notifies appropriate offices of intent to provide drafts for review and coordination in the appropriate time frames. Coordination attempts shall begin with a written request, followed by letters, emails, and phone calls, if appropriate.

d. *Natural Resources* – as defined in DoDI 4715.03, are all elements of nature and their environments of soil, sediments, air, and water. Those consist of two general types, as follows:

- Biological resources – Living resources such as plants and animals.
- Earth resources – Nonliving resources such as minerals and soil components.

A6. TRIPARTITE MEMORANDUM OF UNDERSTANDING BETWEEN DOD, USFWS, AND AFWA

Memorandum of Understanding between the U.S. Department of Defense, and the U.S. Fish and Wildlife Service, and the Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations (July 19, 2013). Reiterates the cooperative relationship between DoD, USFWS, and State fish and wildlife agencies in INRMP development, review, and implementation with mutually agreed upon fish and wildlife conservation objectives. Describes the roles, responsibilities and operating authorities of the parties to the agreement and provides for the development of a streamlined process for reviewing and concurring on updates to existing INRMPs.

http://www.denix.osd.mil/announcements/unassigned/sikes-tripartite-mou/ (A copy of the MOU is included on the Reference CD.)

Guidelines issued two years after the MOU detail how to efficiently execute coordination between the agencies:

Guidelines for Coordination on Integrated Natural Resources Management (June 15, 2015) are for USFWS personnel to reference when implementing the requirements of the Sikes Act. The guidelines, which update and replace the 2001 memorandum Guidance for Coordination of DoD Sikes Act INRMPs, detail INRMP content and requirements, coordination between USFWS and DoD; and USFWS program responsibilities.

https://www.fws.gov/fisheries/sikes_act/documents/FWS_INRMP_Guidelines.pdf (available online)

Guidelines for Streamlined Review of Integrated Natural Resource Management Plan Updates (July 20, 2015) clarifies the process for reviewing and concurring on updates to existing INRMPs. The guidelines were created to facilitate faster review and approval of INRMP updates, reduce the number of noncompliant INRMPs, and improve coordination and collaboration among installation personnel and USFWS regional reviewers.

http://www.dodnaturalresources.net/Streamlined_Sikes_guidance_and_memo_-_signed_7-20-15.pdf (available online)

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MEMORANDUM OF UNDERSTANDING BETWEEN THE U.S. DEPARTMENT OF DEFENSE AND THE U.S. FISH AND WILDLIFE SERVICE AND THE ASSOCIATION OF FISH AND WILDLIFE AGENCIES FOR A COOPERATIVE INTEGRATED NATURAL RESOURCE MANAGEMENT PROGRAM ON MILITARY INSTALLATIONS

A. PURPOSE

The purpose of this Memorandum of Understanding (MOU) is to further a cooperative relationship between the U.S. Department of Defense (DoD), U.S. Department of the Interior – Fish and Wildlife Service (FWS), and state fish and wildlife agencies (states) acting through the Association of Fish and Wildlife Agencies (AFWA) (hereafter referred to as the Parties) in preparing, reviewing, revising, updating and implementing Integrated Natural Resource Management Plans (INRMPs) for military installations.

B. BACKGROUND

In recognition that military lands have significant natural resources, Congress enacted the Sikes Act in 1960 to address wildlife conservation and public access on military installations. The 1997 amendments to the Sikes Act require the DoD to develop and implement an INRMP for each military installation with significant natural resources. A 2012 amendment to the Sikes Act now authorizes the preparation of INRMPs for state-owned National Guard installations used for training pursuant to chapter 5 of title 32 of the United States Code. DoD must prepare all INRMPs in cooperation with the FWS and states. Each INRMP must reflect the mutual agreement of the Parties concerning conservation, protection, and management of fish, wildlife, plants and their habitats on military lands.

INRMPs provide for the management of natural resources, including fish and wildlife and their habitats. To the maximum extent practicable, they incorporate ecosystem management principles, and describe procedures and projects that manage and maintain the landscapes necessary to sustain military-controlled lands for mission purposes. INRMPs also allow for multipurpose uses of resources, including public access appropriate for those uses, provided such access does not conflict with military land use, security requirements, safety, or ecosystem needs, including the needs of fish and wildlife resources. Effective communications and coordination among the Parties, initiated early in the planning process at national, regional, and the military installation levels, is essential to developing, reviewing, and implementing comprehensive INRMPs. When such partnering involves the participation and coordination of all Parties regarding existing FWS and state natural resources management plans or initiatives, such as threatened and endangered species recovery plans or State Wildlife Action Plans, the mutual agreement of all Parties is achieved more easily. INRMPs provide for the conservation

and rehabilitation of natural resources on military lands in ways that help ensure the readiness of the Armed Forces. Thus, a clear understanding of land use objectives for military lands should enable the Parties to have a common understanding of DoD's land management requirements.

This MOU addresses the responsibilities of the Parties to facilitate optimum management of natural resources on military installations. It replaces a DoD-FWS-AFWA MOU for *Cooperative Integrated Natural Resources Management Program on Military Installations* dated January 31, 2006, which expired January 31, 2011.

C. AUTHORITIES

This MOU is established under the authority of the Sikes Act, as amended, 16 U.S.C. 670a-670f, which requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the FWS and states. The DoD's primary mission is national defense. DoD manages approximately 28 million acres of land and waters under the Sikes Act to support sustained military activities while conserving and protecting biological resources.

The FWS manages approximately 150 million acres of the National Wildlife Refuge System, and administers numerous fish and wildlife conservation and management statutes and authorities, including the: Fish and Wildlife Coordination Act, Migratory Bird Treaty Act of 1918, Endangered Species Act, Marine Mammal Protection Act, Bald and Golden Eagle Protection Act, Anadromous Fish Conservation Act, Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, Federal Noxious Weed Act, Alien Species Prevention Enforcement Act of 1992, North American Wetland Conservation Act, and Coastal Barrier Resources Act.

The states in general possess broad trustee and police powers over fish and wildlife within their borders, including – absent a clear expression of Congressional intent to the contrary – fish and wildlife on federal lands within their borders. Where Congress has given federal agencies certain conservation responsibilities, such as for migratory birds or species listed as threatened or endangered under the Endangered Species Act, the states, in most cases, have cooperative management responsibilities.

The Sikes Act (16 U.S.C. 670c-1) allows the Secretary of a military department to enter into cooperative agreements with the states, local governments, Indian tribes, nongovernmental organizations, and individuals to provide for the maintenance and improvement of natural resources, or to benefit natural and historic research, both on and off DoD installations.

The Sikes Act (16 U.S.C. 670a(d)(2) also encourages the Secretary of Defense, to the greatest extent practicable, to enter into agreements to use the services, personnel, equipment, and facilities, with or without reimbursement, of the Secretary of the Interior or states in carrying out the provisions of this section.

The Economy Act (31 U.S.C. 1535 and 1536) allows a federal agency to enter into an agreement with another federal agency for services, when those services can be rendered in a more

convenient or cost effective manner by another federal agency.

D. RESPONSIBILITIES

The Parties to this agreement hereby enter into a cooperative program of INRMP development, review, and implementation with mutually agreed-upon fish and wildlife conservation objectives to satisfy Sikes Act goals.

1. **The DoD, the FWS and AFWA (Parties) mutually agree:**

   a. To meet at least annually at the headquarters' level to discuss implementation of this MOU. The DoD and FWS will alternate responsibilities for coordinating this annual meeting and any other meetings related to this MOU. Proposed amendments to the MOU should be presented in writing to the parties at least 15 days prior to the annual meeting. The terms of this MOU and any proposed amendments may be reviewed at the annual meeting. The meeting may also review mutual Sikes Act research and technology needs, accomplishments, and other emerging issues.

   b. To participate in a Sikes Act Tripartite Core Group consisting of representatives from the Parties. This Core Group will meet at least quarterly, coordinated by the DoD, to discuss and develop projects and guidance to help prepare and implement INRMPs and to discuss Sikes Act issues of national importance.

   c. To engage in sound management practices for natural resource protection and management pursuant to this MOU with full consideration for military readiness; native fish and wildlife; threatened, endangered and at-risk species; and the environment.

   d. To promote the sustainable multipurpose use of natural resources on military installations – including hunting, fishing, trapping, and non-consumptive uses such as wildlife viewing, boating, and camping – in ways that are consistent with DoD's primary military mission and to the extent reasonably practicable.

   e. To develop and implement supplemental Sikes Act MOUs or other agreements, as needed, at the regional and/or state level.

   f. To recognize the most current DoD and FWS Sikes Act Guidance as the guidance for communication and cooperation of the Parties represented by this MOU.

   g. To post current DoD, FWS, and state Sikes Act guidance documents within 14 days of completion on the following sites:

      i. For DoD: https://www.denix.osd.mil/nr

      ii. For FWS: http://www.fws.gov/habitatconservation/sikes_act.html

      iii. For the states: http://www.fishwildlife.org

h. To cooperatively prepare and conduct full reviews of all new INRMPs in a timely manner.

i. To require the DoD Components and appropriate FWS and state offices to conduct a review for operation and effect of each INRMP no less often than every five years, as required by the Sikes Act, and to document these reviews. As a means of facilitating and streamlining this statutory requirement, use the annual progress review of each INRMP as conducted by each DoD Component per DoD policy.

j. To encourage collaboration in annual progress reviews between representatives from each military installation with an INRMP and appropriate representatives from the other Parties.

    i. The Parties shall discuss the performance of each military installation in meeting relevant DoD Natural Resources Focus Area metrics, and potential improvements to INRMP implementation, such as new projects or management practices.

    ii. Meetings may be in person or by another mutually acceptable means.

    iii. The Parties shall discuss methods and projects that the FWS and states can implement that support INRMP goals and objectives.

k. To streamline and expedite the review of INRMP updates or revisions, and to effectively address review for critical habitat exclusions based on the INRMP conservation benefit, when feasible:

    i. DoD and the FWS will develop and implement a streamlined review process within six months of signature of this MOU that will allow for expedited review and approval (new signatures) of updated sections of each INRMP.

    ii. DoD will provide a means of easily identifying all changes to each updated or revised INRMP when forwarding it for review.

    iii. FWS will focus review on those parts of updated INRMPs that reflect changes from the previously reviewed version.

    iv. FWS and the appropriate states will review all INRMPs with major revisions (e.g., changes required by mission realignments, the listing of new species or other significant action that has the potential to affect military operations or readiness).

    v. DoD, FWS, and the states (acting through AFWA) will continue to seek opportunities to make INRMP review processes more efficient while sustaining and enhancing INRMP conservation effectiveness.

    vi. The DoD Components may submit to the USFWS, a priority INRMP list

to address those installations seeking critical habitat exclusions to facilitate coordination with USFWS Endangered Species office.

vii. To ensure consistency, the Parties accept the following definitions:

a) Compliant INRMP: An INRMP that has been both approved in writing, and reviewed, within the past five years, as to operation and effect, by authorized officials of DoD, DOI, and each appropriate state fish and wildlife agency.

b) Review for operation and effect: A comprehensive, joint review by the parties to the INRMP, conducted no less often than every five years, to determine whether the plan needs an update or revision to continue to address adequately Sikes Act purposes and requirements.

c) INRMP update: Any change to an INRMP that, if implemented, is not expected to result in consequences materially different from those in the existing INRMP and analyzed in an existing NEPA document. Such changes will not result in a significant environmental impact, and installations are not required to invite the public to review or to comment on the decision to continue implementing the updated INRMP.

d) INRMP revision: Any change to an INRMP that, if implemented, may result in a significant environmental impact, including those not anticipated by the parties to the INRMP when the plan was last approved and/or reviewed as to operation and effect. All such revisions require approval by all parties to the INRMP, and will require a new or supplemental NEPA analysis.

l. That none of the Parties to the MOU is relinquishing any authority, responsibility, or duty established by law, regulation, policy, or directive.

m. To designate the officials listed below, or their delegates to participate in the activities pursuant to this MOU.

i. DoD: Deputy Director, Natural Resources Conservation Compliance, ODUSD (I&E) ESOH

ii. FWS: National Sikes Act Coordinator, Fish and Aquatic Conservation

iii. AFWA: Director, Government Affairs

2. DoD agrees to:

a. Communicate the establishment of this MOU to all DoD Components.

b. Take the lead in developing policies and guidance related to INRMP development, updates, revisions, and implementation, and to ensure the involvement, as appropriate, in these processes of the FWS and state fish and wildlife agencies.

c. Ensure distribution of the DoD and FWS Sikes Act Guidance to all appropriate DoD Components.

d. Encourage DoD Components to invite appropriate FWS and state fish and wildlife agency offices to participate in annual INRMP reviews. All such invitations should be extended at least 15 business days in advance of the scheduled review to facilitate meaningful participation by all three Parties. Meetings may be in person or by other mutually agreed upon means.

e. Encourage DoD Components to take full advantage of FWS and state fish and wildlife agency natural resources expertise through the use of Economy Act transfers and cooperative agreements. Encourage DoD Components and FWS to explore the use of the Fish and Wildlife Coordination Act for technical assistance, fish stocking, and other conservation projects. Priority should be given to projects that:

    i. Sustain the military mission.

    ii. Effectively apply ecosystem management principles.

    iii. Consider the strategic planning priorities of the FWS and the state fish and wildlife agency.

f. Encourage DoD Components to give priority to INRMP requirements that:

    i. Sustain military mission activities while ensuring conservation of natural resources.

    ii. Provide adequate staffing with the appropriate expertise for updating, revising, and implementing each INRMP within the scope of DoD Component responsibilities, mission, and funding constraints.

g. Encourage DoD Components to discuss with the FWS and state fish and wildlife agencies all issues of mutual interest related to the protection, conservation, and management of fish and wildlife resources on DoD installations.

h. Subject to mission, safety, security, and ecosystem requirements, provide public access to military installations to facilitate the sustainable multipurpose use of its natural resources.

i. Identify natural resource research needs, and develop research proposals with input from the Parties.

j. Identify opportunities to work with the DoD Components to facilitate:

    i. Cooperative regional and local natural resource conservation partnerships and initiatives with FWS and state fish and wildlife agency offices.

    ii. Natural resources conservation technology transfer and training initiatives

between the DoD Components, federal land management agencies, and state fish and wildlife agencies.

k. Provide law enforcement support to protect fish, wildlife, and plant resources on military installations consistent with jurisdiction and authority.

3. FWS agrees to:

a. Communicate the establishment of this MOU to each FWS Regional Office and appropriate field offices in close proximity to military installations.

b. Distribute the DoD and FWS Sikes Act Guidelines to each FWS Regional Office and appropriate field office in close proximity to military installations.

c. Designate regional and field office FWS liaisons to develop partnerships and help DoD implement joint management of ecosystem-based natural resource management programs, and provide a list of those liaisons to the DoD as needed.

d. Provide technical assistance with the appropriate expertise to the DoD in managing its resources within the scope of FWS responsibilities and funding constraints.

e. Encourage field offices to coordinate current and proposed FWS natural resource initiatives and research efforts with those that may relate to DoD installations, and to provide applicable installations with new and relevant information pertaining to distribution and/or research regarding listed and candidate species and species at-risk.

f. Inform DoD Components and affected installations regarding upcoming and reasonably foreseeable proposed listing and critical habitat designations that may potentially affect military installations in a timely manner before publication of such proposals in the Federal Register.

g. Encourage regional and field offices to expedite pending INRMP reviews that may affect foreseeable proposed listing of threatened and endangered species and critical habitat designations.

h. Provide law enforcement support as appropriate to protect fish, wildlife, and plant resources on military installations within the jurisdiction of the FWS.

i. Identify FWS refuges and other potential federal management areas in close proximity to military installations, and, where appropriate, participate in the joint management of ecosystem-based natural resource management projects that support INRMP and other planning goals, objectives, and implementation.

4. AFWA agrees to:

a. Communicate the establishment of this MOU to each state fish and wildlife agency director and appropriate personnel.

b. Distribute the DoD and FWS Sikes Act Guidelines to each state fish and wildlife agency director and appropriate staff.

c. Facilitate and coordinate with the states to encourage them to:

i. Participate in developing, reviewing, updating, revising, approving and, as appropriate implementing INRMPs in a timely way upon request by military installation personnel.

ii. Designate state liaisons to help develop partnerships and to help DoD installation staff implement natural resource conservation and management programs.

iii. Identify state wildlife management areas in close proximity to military installations and, where appropriate, participate in the joint management of ecosystem-based natural resources projects that support INRMP goals, objectives, and implementation.

iv. Provide technical assistance to DoD installation staff in adaptively managing natural resources within the scope of state responsibilities, funding constraints, and expertise.

v. Identify state personnel needs to develop, review, update/revise, approve, and implement INRMPs, and facilitate the identification of funding opportunities to address the fulfillment of state priorities.

vi. Coordinate current and proposed state natural resources research efforts with those that may relate to DoD installations.

vii. Coordinate with DoD installations to develop new, and implement existing, conservation plans and strategies, including, but not limited to State Wildlife Action Plans; the National Fish, Wildlife and Plants Climate Adaptation Strategy; goals or initiatives of the North American Bird Conservation Initiative (NABCI) and/or Partners in Amphibian and Reptile Conservation (PARC); and the National Fish Habitat Action Plan.

E. STATEMENT OF NO FINANCIAL OBLIGATION

This MOU does not impose any financial obligation on the part of any signatory.

F. ESTABLISHMENT OF COOPERATIVE AGREEMENTS

The Parties are encouraged to enter into cooperative or interagency agreements to coordinate and implement natural resource management on military installations. If fiscal resources are required, the Parties must develop a separately funded cooperative or interagency agreement.

Such cooperative or interagency agreements may also be entered into under the authority of the Sikes Act (16 U.S.C. 670c-l). Interagency agreements may be entered into under the authority of the Economy Act (31 U.S.C. 1535 and 1536). The Parties should also explore opportunities to utilize the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-666c) to facilitate agreements for FWS technical assistance, fish stocking, and other conservation activities. Each funded cooperative or interagency agreement shall include a work plan and a financial plan that identify goals, objectives, and a budget and payment schedule. A cooperative or interagency agreement to accomplish a study or research also will include a study design and methodology in the work plan. It is understood and agreed that any funds allocated via these cooperative or interagency agreements shall be expended in accordance with its terms and in the manner prescribed by the fiscal regulations and/or administrative policies of the party making the funds available.

G. AMENDMENTS

This MOU may be amended at any time by mutual written agreement of the Parties.

H. TERMINATION

Any party to this MOU may remove itself upon sixty (60) days written notice to the other parties.

I. EFFECTIVE DATE AND DURATION

This MOU will be in effect upon date of final signature, and will continue for ten years from date of final signature. The parties will meet six (6) months prior to the expiration of this MOU to discuss potential modifications and renewal terms.

7-29-13
Date

John Conger
Acting Deputy Under Secretary of Defense
(Installations and Environment)
U.S. Department of Defense

6.24.13
Date

Dan Ashe
Director
Fish and Wildlife Service
U.S. Department of Interior

7-15/2013
Date

Ron Regan
Executive Director
Association of Fish and Wildlife Agencies

A7. MIGRATORY BIRD TREATY ACT

The following documents relate to Department of Defense (DoD) compliance with the Migratory Bird Treaty Act (MBTA). Copies are included on the INRMP Reference CD.

Memorandum for Deputy Assistant Secretary of the Army Regarding Guidance for Addressing Migratory Bird Management in Integrated Natural Resources Management Plans (August 18, 2017)

The memorandum provides guidance on addressing migratory bird management in INRMPs. It consolidates and clarifies existing bird and bird habitat management requirements that must be addressed in the installation INRMP, outlines best management practices, and provides links to available resources that can be used to facilitate compliance with legal requirements. The specific legal requirements addressed in the guidance implement the Migratory Bird Treaty Act, Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," and the Migratory Bird Rule. There is specific emphasis on clarifying application of the Migratory Bird Rule and the readiness authorization, which had been widely but incorrectly perceived as an exemption. The guidance does not create any new requirements.

Memorandum of Understanding between the U.S. Department of Defense and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds (September 5, 2014)

The MOU identifies specific activities where cooperation between USFWS and DoD will contribute to migratory bird conservation efforts. It details actions that should be taken by DoD to advance migratory bird conservation; avoid or minimize take; and ensure DoD operations are consistent with the MBTA. It states that the DoD and USFWS will collaborate, when possible, with State and Federal agencies and many non-Federal partners to coordinate migratory bird conservation efforts. The DoD shall follow all migratory bird permitting requirements for non-military readiness activities that are subject to 50 CFR Part 21 (February 28, 2007). No permit is required to take birds in accordance with 50 CFR Parts 21.43-21.47 (depredation orders).[1] INRMPs must address the conservation of birds and their habitat to promote and support migratory birds in compliance with the MBTA and should incorporate all migratory bird conservation strategies addressed in Regional or State Bird Conservation Plans. DoD will engage in planning with USFWS prior to any activity that is likely to affect populations of migratory birds. Military lands and non-military readiness activities will be managed in a manner that supports migratory bird conservation giving consideration to: habitat protection, restoration, and enhancement; fire and fuel management; invasive species; communication towers, utilities and energy development; recreation and public use; and habitat management projects. Implementation of conservation measure should follow BASH guidelines and be completed in consideration of the military mission and risks to aircraft and aircrew.

Migratory Bird Permits; Take of Migratory Birds by the Armed Forces (February 28, 2007)

The rule authorizes take of migratory birds, with limitations, that result from DoD military readiness activities. If the DoD determines that a proposed or an ongoing military readiness activity may result in a significant adverse effect on the sustainability of a population of a migratory bird species of concern, then they must confer and cooperate with the USFWS to develop appropriate and reasonable-conservation measures to minimize or mitigate identified significant adverse effects. The Secretary of the Interior, or his designee, will retain the power to withdraw or suspend the authorization for particular activities in appropriate circumstances.

[1] None of the birds listed in this Depredation Order (blackbirds, cowbirds, grackles, crows and magpies) occur in Hawai'i.

Birds of Conservation Concern 2008 (excerpt)

The 1988 amendment to the Fish and Wildlife Conservation Act mandates the USFWS to 'identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973.' *Birds of Conservation Concern 2008* is the most recent effort to carry out this mandate (BCC 2008). The overall goal of this report is to accurately identify the migratory and non-migratory bird species (beyond those already designated as Federally threatened or endangered) that represent our highest conservation priorities and draw attention to species in need of conservation action. The geographic scope of this endeavor is the United States in its entirety, including island 'territories' in the Pacific and Caribbean. BCC 2008 encompasses three distinct geographic scales–North American Bird Conservation Initiative Bird Conservation Regions, USFWS Regions, and National–and is primarily derived from assessment scores from three major bird conservation plans: Partners in Flight, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan" (USFWS 2008b). The full text of the Birds of Conservation Concern, including methodology and lists for all areas and regions may be viewed at:

http://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf.

The list for Hawaii is excerpted below.

USFWS Birds of Conservation Concern – Hawaii (2008)[2]

Laysan Albatross (*Phoebastria immutabilis*) *

Black-footed Albatross (*Phoebastria nigripes*)

Christmas Shearwater (*Puffinus nativitatis*)

Band-rumped Storm-Petrel (*Oceanodroma castro*) (a)

Tristram's Storm-Petrel (*Hydrobates tristrami*)

Bristle-thighed Curlew (*Numenius tahitiensis*) (nb)*

Short-eared Owl (*Asio flammeus sandwichensis*)*

'**Elepaio** (*Chasiempis sandwichensis*) (d)**

'Oma'o (*Myadestes obscurus*)

Hawai'i 'Amakihi (*Chlorodrepanis virens*) (d)

O'ahu 'Amakihi (*Chlorodrepanis flava*) (d)**

Kaua'i 'Amakihi (*Chlorodrepanis stejnegeri*) (d)

'Anianiau (*Magumma parva*) (d)

'Akikiki (*Oreomystic bairdi*) (a,d)

Maui 'Alauahio (*Paroreomyza montana*) (d)

'Akeke'e (*Loxops caeruleirostris*) (d)

'I'iwi (*Vestiaria coccinea*) (d)

'Apapane (*Himatione sanguinea*) (d)

Notes:

* Found on MCBH Kaneohe Bay.

** Found in close proximity to MCBH properties Camp Smith and Waikane Valley Impact Area.

[2] (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in the Bird Conservation Region.

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
3400 DEFENSE PENTAGON
WASHINGTON, DC 20301-3400

ENERGY,
INSTALLATIONS,
AND ENVIRONMENT

AUG 18 2017

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE ARMY
(ENVIRONMENT, SAFETY AND OCCUPATIONAL HEALTH)
DEPUTY ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT)
DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE
(ENVIRONMENT, SAFETY AND INFRASTRUCTURE)
DIRECTOR, DEFENSE LOGISTICS AGENCY (DSS-E)

SUBJECT: Guidance for Addressing Migratory Bird Management in Integrated Natural Resources Management Plans

This memorandum provides guidance on Addressing Migratory Bird Management in Integrated Natural Resources Management Plans (attached). The Guidance consolidates and clarifies existing bird and bird habitat management requirements that installation natural resources managers must address in their installation Integrated Natural Resource Management Plans (INRMPs). The Guidance also outlines best management practices and provides links to available resources that can be used to facilitate compliance with legal requirements.

The specific legal requirements addressed in this guidance implement the Migratory Bird Treaty Act, Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," and the Migratory Bird Rule. There is specific emphasis on clarifying application of the Migratory Bird Rule and the readiness authorization – which has been widely but incorrectly perceived as an exemption.

My point of contact is Ms. Alison Dalsimer, 571-372-6893, allyn.a.dalsimer.civ@mail.mil.

M Sullivan

Maureen Sullivan
Deputy Assistant Secretary of Defense
(Environment, Safety and Occupational Health)

Attachment:
As stated

Introduction

The Department of Defense's (DoD's) ability to sustain and enhance military readiness and other installation activities depends on proactive, ecosystem-based management strategies that help installations promote healthy landscapes, maintain realistic training environments, and ensure regulatory compliance.

Purpose

The purpose of this guidance is to consolidate current legal and policy requirements, specifically the Migratory Bird Treaty Act, Migratory Bird Readiness Rule, Executive Order (EO) 13186, and other legislation listed in Appendix 1 (*Relevant Legislation*); and to help identify potential migratory bird conservation best practices for use in Integrated Natural Resources Management Plans (INRMPs).

Background

INRMPs and the National Environmental Policy Act (NEPA) process constitute the principal tools for effectively integrating mission needs with ecosystem-based natural resource management. INRMPs and NEPA environmental analyses also serve to ensure compliance with applicable natural resources related laws, EOs, and regulations. For DoD construction, operations, and training activities, the INRMP and NEPA processes provide valuable baseline information to help planners avoid or minimize adverse effects on sensitive species and habitats. These processes also provide useful information for conducting effective regulatory consultations and ensure potential natural resource impacts, viable alternative courses-of-action, and reasonable mitigation options (if determined to be required) are identified and considered early in the development, design, and siting approval processes for a proposed action.

DoD installations must ensure that INRMPs and NEPA analyses adequately address migratory bird management and the potential impacts of proposed military activities - readiness and non-readiness related alike - on migratory birds. Section 315 of the 2003 National Defense Authorization Act and the Military Readiness Rule (50 CFR Part 21) authorizes, with certain limitations, the incidental take of migratory birds during military readiness activities. Nonetheless, the Armed Forces must give appropriate consideration to protecting migratory birds when planning and executing military readiness activities; however, implementing protections must not diminish the effectiveness of those activities. Moreover, this requirement pertains to all military readiness activities,[1] not just those that may result in a significant adverse effect on a population of a migratory bird species (see *Preamble to Final Rule on the Take of Migratory Birds by the Armed Forces*, 72 Fed. Reg. 8931-8950 (February 28, 2007)).[2]

[1] "Military Readiness Activity" includes all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. It does not include (a) routine operation of installation operating support functions, such as administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; morale, welfare, and recreation activities; shops; and mess halls, (b) operation of industrial activities, or (c) construction or demolition of facilities listed above. See Pub. L. 107-314, §315(f) and 50 CFR § 21.3.

[2] See Appendix 2, *Definitions,* for explanation of "significant adverse effect" and "population."

DoD installations manage and monitor the effects that both military readiness (e.g., Migratory Bird Readiness Rule) and non-readiness (e.g., DoD-U.S. Fish and Wildlife Service (USFWS) Memoranda of Understanding **(**MOUs), EO 13186) activities have on migratory bird species and populations. Through the implementation of INRMPs, proper management of migratory bird species and habitats, including the timely implementation of appropriate conservation practices, helps installations avoid or minimize impacts to migratory birds. This guidance does not create any new requirements.

Guidance: How to Incorporate Migratory Bird Conservation into INRMPs

The Armed Forces have a long history of working with the USFWS and state fish and wildlife agencies to develop and implement conservation measures to conserve birds and their habitats. Many of the conservation measures detailed below represent state-of-the-art techniques and practices to inventory, protect, and monitor migratory bird populations. In accordance with the Sikes Act, conservation measures are detailed in DoD INRMPs specific for each installation, and coordinated with the USFWS and state fish and wildlife agencies. The most important factor in minimizing and mitigating effects on takes of migratory birds is an understanding of when and where such takes are likely to occur. This means developing knowledge of migratory bird habits and life histories, including their migratory paths and stopover sites, and their feeding, breeding, and nesting habits. This basic inventory data provides the basis for migratory bird conservation in the INRMP. The annual Sikes Act INRMP reviews conducted by the Armed Forces installation biologist and their USFWS and state partners is an opportunity to review the current status of migratory bird species and determine if changes to conservation measures are required.

The following steps are recommended to help guide installation planning as it relates to the conservation of migratory birds and their habitats:

Step 1: Determine the Bird Species of Concern on Your Installation

- In collaboration with the USFWS and state fish and wildlife agencies, identify in the installation INRMP the bird species of concern that may require specific management emphasis to ensure both species conservation and military mission sustainability. The DoD Partners in Flight database of Migratory Bird Species of Concern (http://www.dodpif.org/resources/bcrmap.php) provides useful information about species that are likely to occur on an installation, and that may require special consideration in the installation's INRMP. This database has been developed for most DoD Installations, and includes information from the following sources:

    - USFWS Birds of Conservation Concern, found at: https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf
    - Priority Migratory Bird Species documented in the:
        - North American Waterbird Conservation Plan
        - U.S. Shorebird Conservation Plan
        - Partners in Flight Bird Conservation Plans
        - North American Waterfowl Management Plan
        - List of Threatened and Endangered Bird Species in 50 CFR 17.11 (http://www.fws.gov/endangered/wildlife.html) and
        - Game Birds Below Desired Condition (https://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2008.Par.38405.File.dat/IM2008-050_att3.pdf)

- The Species of Concern list can be further refined to an installation-specific Mission Sensitive Priority Bird Species list. See the DoD PIF Mission Sensitive Priority Bird Species fact sheet at http://www.dodpif.org/downloads/factsheet11_priority-species.pdf

or contact your regional DoD PIF Representative if you need help determining what Mission Sensitive Priority Bird Species are on your installation.

Step 2: Describe Interrelatedness between the Mission Sensitive Species and Installation Mission Activities

- Utilize basic life history data on the installation-specific Mission Sensitive Priority Bird Species to help articulate and describe interrelatedness and potential conflicts between these birds and installation mission requirements. It is important to describe just what the bird conservation/installation conflicts are, their significance, and how implementing the INRMP will de-conflict these issues.

Step 3: Develop Specific Goals, Objectives, and Conservation Measures to Manage the Installation-Specific Mission Sensitive Priority Bird Species

- Identify and incorporate into your INRMP the applicable bird conservation goals, habitat protection objectives, and conservation measures identified in the various bird conservation plans for your state and physiographic region. It is important that the installation's natural resource program be a part of the larger bird conservation initiatives surrounding the installation. Some suggested bird conservation plans and initiatives that can be linked to the INRMP include the:

    - North American Bird Conservation Initiative: http://www.nabci-us.org
    - Partners in Flight: http://www.partnersinflight.org/
    - North American Waterfowl Management Plan: https://www.fws.gov/birds/management/bird-management-plans/north-american-waterfowl-management-plan.php
    - North American Waterbird Conservation Plan: https://www.fws.gov/birds/management/bird-management-plans/waterbird-conservation-for-the-americas.php
    - U.S. Shorebird Conservation Plan: http://ndwr.state.nv.us/hearings/past/spring/browseable%5Cexhibits%5CUSFWS/FWS-2050.pdf
    - State Wildlife Action Plans

- The INRMP should identify the conservation measures that support the INRMP Goals and Objectives for bird species of concern, describing how they improve existing habitat, create new habitat, enhance degraded habitat, improve conditions for birds, and/or support other stakeholder efforts within your physiographic region. These measures may include protecting wetlands; maintaining and enhancing forest buffers; eliminating feral animals (including feral cats) that may be a threat to migratory birds or their habitat; reducing or eliminating harmful grazing practices; and implementing appropriate invasive species controls to prevent establishment or reduce presence of species that negatively impact migratory bird survival. All conservation measures should be detailed in the installation INRMP. Examples for the installation natural resource manager (NRM) to consider in the INRMP may include:

- Forest management
  - Convert to uneven-age and/or other progressive forest management that enhances available habitat values.
  - Maintain and enhance bottomland hardwood forests.
  - Create snag trees or protect existing snags during forestry programs.

- Habitat enhancement/restoration
  - Maintain and restore priority habitats.
  - Incorporate habitat enhancement into project review and project design.
  - Create habitat as mitigation programs.
  - Promote nest box and platform programs.
  - Encourage nesting in tower structures, where appropriate.

- Invasive, non-native species
  - Implement feral cat eradication programs.
  - Implement invasive species control programs.
  - Removal of exotic species.

- Wetlands
  - Protect and restore wetlands.
  - Promote positive water use modifications to improve hydrology and avian habitat in arid areas.

- Agricultural Outleases
  - Initiate establishment of native warm-season grasses or other field and grassland conditions beneficial to birds found in the area.
  - Modify agricultural leases to promote nesting and fledgling protection by setting appropriate dates for mowing, haying, or harvesting.
  - For leases near an airfield, do not grow crops that will attract species which create a bird strike risk.

- Communication towers, power lines, wind energy, and buildings
  - Identify and remove inactive/abandoned communication towers.
  - Remove unused power lines and poles, especially in open habitat areas such as deserts and grasslands where such structures provide artificial raptor perches.
  - Minimize new tower and wind turbine construction impacts through critical assessment of structure requirement, location site evaluation and structure design assessment for minimal avian impacts.
  - To promote appropriate nesting, maintain towers that do not present collision issues or provide raptor perches in inappropriate habitats (e.g., desert, grasslands, prairie).

- Explain how these measures were developed to support both readiness and non-readiness activities, and how these measures help to avoid and minimize impacts on priority species and their habitats. Again, it is important that installation's natural resource program be a part of the larger bird conservation initiatives surrounding the installation to achieve

meaningful bird conservation results. Installations should develop and maintain conservation partnerships to manage migratory birds in support of military mission requirements, comply with applicable laws and sound stewardship, and maintain consistency with the broad national bird management objectives, such as the national Partners in Flight initiative.

Step 4: Determine Survey and Monitoring Requirements

- Identify in the INRMP any surveys and monitoring required to support INRMP Goals and Objectives for the conservation of bird species of concern.
- Become familiar with the *Coordinated Bird Monitoring Plan (CBMP): Technical Recommendations for Military Lands*, which describes monitoring techniques to meet the Bird Rule and NEPA requirements. It is important to use the best scientific data available to assess the impacts of proposed actions and to determine the most effective mitigation strategies.
- Consider participating in large-scale surveys such as the North American Breeding Bird Survey and the Monitoring Avian Productivity and Survivorship initiatives, which ensure that data from DoD lands is incorporated into national efforts.
- Enter survey and monitoring data into eBIRD or the Coordinated Bird Monitoring Database (CBMD), and store data in the CBMD and Avian Knowledge Network (AKN).
- Collaborate with USFWS and other groups involved with bird monitoring to:

    - Assess the status and trends of the installation-specific Mission Sensitive Priority Species.
    - Use national standards and protocols described in the CBMP.
    - Deposit monitoring and inventory data in national repositories.
    - Promote participation in national inventory and monitoring programs.

Step 5: Ensure Collaboration with the Installation's Bird Air Strike Hazard (BASH) Program

- Responsibility for executing the BASH Program generally falls to the installation's Air Operations function. NRMs should be an integral part of the installation's BASH team, supporting the Air Operations function. The NRM must ensure that bird control techniques, disposal of animal remains, and habitat modifications around the airfield are properly described in the INRMP and incorporated into the BASH Plan.

Step 6: Summarize Outreach and Public Access Programs

- Summarize the installation's migratory bird outreach and public access programs. Outreach activities should be coordinated with the installation's Public Affairs Office.
- Outreach programs may include, but are not limited to, International Migratory Bird Day, Endangered Species Day, Earth Day, National Public Lands Day, Breeding Bird Survey, and Christmas Bird Count.

Step 7: Review and Maintain the Bird Conservation Goals in the INRMP

- Maintain regular communications with the USFWS, state fish and wildlife agencies, and other partners to stay current with bird conservation efforts within your physiographic region.
- Use the information gathered during the INRMP annual review as part of the discussion about the effectiveness of your bird conservation efforts.
- Utilize the findings and recommendations from the INRMP annual reviews to determine effects on birds, especially bird species of concern, and modify the bird conservation measures in your INRMP.
- Use the information from your partnership interactions and other sources to keep your INRMP migratory bird information current.

Resource: DoD Partners in Flight (PIF)

As part of its Natural Resources Program, DoD has established an ad hoc network of subject matter experts to provide technical information that supports migratory bird management and monitoring on DoD lands. The National Technical Representative[3] leads the DoD PIF Steering Committee, provides technical support and expertise regarding migratory bird issues, coordinates inputs from this group, and is charged by the DoD Natural Resources Program to:

- Collect/compile relevant technical information;
- Distribute DoD approved information to all interested and appropriate stakeholders;
- Monitor trends; and
- Serve as a resource center for relevant technical information and materials.

DoD PIF offers a wide variety of resources to help natural resources managers better comply with relevant laws and policies, and incorporate migratory bird information into installation INRMPs. DoD PIF representatives also provide assistance to installation NRMs for monitoring and inventory, research and management, and education programs involving birds and their habitats. For more information on DoD PIF, please visit the DoD PIF website.

[3] The *2014 Strategic Plan for Bird Conservation and Management on Department of Defense Lands* defines the National Technical Representative and their role.

Appendix 1: Relevant Legislation

Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712)
The MBTA (16 USC §§ 703 et seq.) of 1918 is a federal statute that implements four treaties with the U.S. and Canada, Mexico, Japan, and Russia on the conservation and protection of migratory birds. The MBTA states that it is illegal to pursue, hunt, take, capture, kill, or sell "migratory" birds or sell any of their parts (e.g., feathers, eggs, nests), alive or dead, as defined in 16 U.S.C. §§ 703-712. Further, the regulatory definition of "migratory bird" as applied in this context and detailed in 50 CFR §§10.13, is broad, and includes most native birds found in the United States – including species that do not migrate. The regulation prohibits the taking, selling, transporting, and importing of migratory bird species and includes any part, egg, or nest of such bird (50 CFR §§10.12 and 10.13). The MBTA is a strict liability statute, meaning that any take, intentional or not, is prohibited without regulatory authorization. This protection extends to nearly all species of waterfowl, shorebirds, raptors, seabirds, and songbirds.[4]

DoD Migratory Bird Readiness Rule (50 CFR Part 21)
Section 315 of the 2003 National Defense Authorization Act and the Military Readiness Rule (50 CRF Part 21) implementing Section 315 authorize, with certain limitations, the incidental take of migratory birds during military readiness activities. Some confusion has arisen over whether the Armed Forces must give appropriate consideration to the protection of migratory birds only for military readiness activities that may result in a significant adverse effect on a population of migratory birds, or for all military readiness activities.

Under the Migratory Bird Readiness Rule, installations must identify and consider ways to minimize or mitigate the take of migratory birds during *all* military readiness activities. Nevertheless, it is important to understand that for military readiness activities that are *not* expected to have a significant adverse effect on a population of migratory birds, an installation need only identify and *consider* ways to minimize or mitigate the take of migratory birds (typically, in its INRMP or in project-specific NEPA documents). Installations are not obligated to *implement* any measures that would diminish the effectiveness of the military readiness activities under consideration. On the other hand, for military readiness activities that may have a significant adverse effect *at the population level*, an installation must confer with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate any significant adverse effects.

2001 Executive Order (EO) 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, and DoD-USFWS Memoranda of Understanding (MOUs)
On July 31, 2006, DoD and the USFWS entered into a MOU to *Promote the Conservation of Migratory Birds*, in accordance with EO 13186.[5] The MOU does not address or authorize migratory bird take. Instead, it identifies activities where cooperation between DoD and the USFWS will contribute substantially to the conservation of migratory birds and their habitats.[6]

The 2014 MOU between DoD and the USFWS describes specific actions that DoD should take to advance migratory bird conservation, reasonably avoid or minimize the take of migratory

[4] http://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php
[5] http://www.dodpif.org/downloads/EO13186.pdf
[6] http://www.dodpif.org/plans/migratory/mbtadod.php; http://www.dodpif.org/downloads/EO13186.pdf

birds, and ensure DoD activities (excluding military readiness) comply with the MBTA in ways that are "consistent with imperatives of safety and security." In addition, Armed Forces must ensure that its operations are consistent with the MBTA and, in ways that help sustain the use of military managed lands and airspace for testing, training, and operations, should avoid or minimize the take of migratory birds and advance migratory bird conservation through its natural resources management activities.

Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c)
The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald and golden eagles, including their parts, nests, or eggs. It provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, egg thereof.[7]

Endangered Species Act (ESA) (7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.)
The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range (i.e., at the brink of extinction). "Threatened" means a species is likely to become endangered within the foreseeable future (i.e., likely to reach the brink of extinction in the near future). Federal agencies must consult with the USFWS and/or the National Marine Fisheries Service on ongoing or proposed actions they authorize, fund, or carry out that 'may affect' listed species or designated critical habitat.[8]

National Environmental Policy Act (NEPA) (42 U.S.C. §4321 et seq.)
Enacted in 1969, NEPA established a national policy to adequately consider environmental impacts of major federal projects on the human environment (natural and physical). It directs federal agencies to thoroughly assess the environmental consequences of "major federal actions significantly affecting the environment" and requires federal agencies to give equal consideration to environmental factors in their planning and decision-making processes. Prior to DoD funding or implementing a project that may have environmental impacts, DoD decision makers must be informed of the environmental consequences from a proposed action that may significantly affect the human environment, make that information available to the public, and consider those consequences in their decision making process.

Sikes Act: (16 U.S.C. 670a-670f, as amended)
Originally enacted in 1960, the Sikes Act Improvement Act (1997) requires that DoD develop and implement INRMPs for all military installations, unless the Secretary of the Military Department determines that the absence of significant natural resources makes preparation of an INRMP inappropriate. INRMPs, prepared in cooperation with the USFWS and state fish and wildlife agencies, integrate natural resource management activities with other installation activities, including military operations and training. INRMP implementation should benefit the capability of DoD lands to support military testing, training, and operations.[9]

[7] https://www.fws.gov/midwest/midwestbird/eaglepermits/bagepa.html
[8] http://www.fws.gov/endangered/laws-policies/; http://www.fws.gov/endangered/esa-library/pdf/t-vs-e.pdf
[9] http://legcounsel.house.gov/Comps/Sikes%20Act.pdf

Appendix 2: Definitions

Significant Adverse Effect

What is a significant adverse effect on a population?
An effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level.

How is that determined?
The Migratory Bird Readiness Rule specifies that the Armed Forces' implementation of the NEPA process will be the primary mechanism to determine whether any ongoing or proposed military readiness activity is likely to result in a significant adverse effect on a population of a migratory bird species. NEPA documents provide the opportunity for both the USFWS and the public to review and comment on proposed military readiness activities relative to migratory birds. Due to the significant variability in military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis. Additional mechanisms for making significance determinations include the INRMP preparation and review processes and, when applicable, consultation under the ESA.

Who is Responsible for assessing "Significant Adverse Effects?"
This responsibility initially lies with the Armed Forces. When requested, the USFWS will provide technical assistance to the Armed Forces in identifying specific populations of migratory bird species that may be affected by a military readiness activity.

Population

50 CFR 21.3 defines *population* as "a group of distinct, coexisting, conspecific individuals, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status."

What constitutes a population for the purposes of determining potential effects of military readiness activities will be scientifically based. A population could be defined as one that occurs spatially across a geographically broad area, such as the Western Atlantic red knot population that migrates along the Atlantic seaboard, to a more geographically limited species, such as breeding population of Bicknell's thrush whose breeding range is limited to mountain tops in the northeastern U.S. and southeastern Canada.

The Migratory Bird Readiness Rule states that when conservation measures are implemented and require monitoring, the Armed Forces must retain records of any monitoring data and report it to the USFWS during the annual INRMP review, along with migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.[10] The conservation measures developed in cooperation with the USFWS should also be documented during the NEPA process for the military activity at issue.

[10] http://www.dodpif.org/plans/migratory/mbtadod.php

MEMORANDUM OF UNDERSTANDING BETWEEN THE

U.S. DEPARTMENT OF DEFENSE AND THE U.S. FISH AND WILDLIFE SERVICE

TO PROMOTE THE CONSERVATION OF MIGRATORY BIRDS

This Memorandum of Understanding (MOU) is entered into between the U.S. Department of Defense (DoD) and the U.S. Fish and Wildlife Service (FWS) (hereinafter "the Parties").

A. Purpose and Scope

This MOU is entered into pursuant to Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (66 FR 3853 [January 17, 2001]). The purpose of this MOU is to promote the conservation of migratory bird populations while sustaining the use of military managed lands and airspace for testing, training, and operations.

This MOU does not address incidental take resulting from military readiness activities or active DoD airfield operations. Military readiness activities are covered by 50 CFR 21.15 (Authorization of take incidental to military readiness activities). Bird-related management activities with a potential to affect airfield operations or safety will be managed according to DoDI 4165.57 and the airfield's Bird/Wildlife Aircraft Strike Hazards (BASH) Program.

Installation commanders responsible for military airfields will not implement wildlife conservation prescriptions set forth in this MOU if they conclude that such actions will negatively impact military mission or combat capability, or if such action will increase the possibility of aircraft-wildlife strikes. Should installation commanders choose to implement wildlife conservation measures, they must follow BASH guidelines, and consider military mission impacts and elevated risk to aircraft and aircrew.

This MOU specifically pertains to the following categories of DoD activities:

1) Natural resource management activities, including, but not limited to, habitat management, erosion control, forestry activities, hunting, fishing, agricultural outleasing, conservation law enforcement, invasive-weed management, and prescribed burning;[1]

2) Installation support activities, including, but not limited to, administration, retail sales, food service, health care, water and sewage treatment, supply and storage, education, housing, equipment maintenance, base transportation, laundry and dry cleaning, recreation, and religious activities;

3) Operation of industrial activities;

[1] Vegetation management within the airfield environment shall be governed by the installation Integrated Natural Resource Management Plans (INRMP) and associated Bird/Wildlife Aircraft Strike Hazard (BASH) Plan.

4) Construction, maintenance, renovation, or demolition of facilities that support the activities described in items 1 through 3; and

5) Prevention or abatement of pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

This MOU identifies specific activities where cooperation between the Parties will contribute substantially to the conservation of migratory birds and their habitats. This MOU does not alter or waive any responsibilities of DoD or FWS, as applicable, under the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (Eagle Act), and the Endangered Species Act (ESA); nor does it authorize the take of migratory birds.

B. Authorities

The Parties' responsibilities under the MOU are authorized by provisions of the following laws and authorities:

- Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 410hh-3233)
- Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668d)
- Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544)
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds, 2001 (66 FR 3853 [January 17, 2001])
- Fish and Wildlife Act of 1956, as amended (16 U.S.C. 791a *et seq.*)
- Fish and Wildlife Conservation Act of 1980, as amended (16 U.S.C. 2901-2911)
- Fish and Wildlife Coordination Act of 1980, as amended (16 U.S.C. 661-667)
- Migratory Bird Conservation Act of 1929, as amended (16 U.S.C. 715 *et seq.*)
- Migratory Bird Treaty Act, of 1918, as amended (16 U.S.C. 703-711)
- National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347)
- Sikes Act Improvement Act of 1997 (16 U.S.C. 670a-670o)
- Agreements to limit encroachments and other constraints on military training, testing, and operations (10 U.S.C. 2684a)

C. Background

Department of Defense

The DoD mission is to provide for the Nation's defense. DoD's Natural Resources Program works to ensure continued access to land, air, and water resources for realistic military training and testing, while ensuring that the natural and cultural resources entrusted to DoD's care are sustained in a healthy condition.

The DoD is an active participant in international bird conservation partnerships including Partners in Flight (PIF) and the North American Bird Conservation Initiative (NABCI). Through PIF and NABCI, DoD works in partnership with numerous federal and state agencies and nongovernmental organizations to conserve migratory and resident birds and to enhance their survival. Military lands frequently provide some of the best remaining habitat for migratory and resident bird species, and DoD plans to continue supporting bird conservation activities.

Integrated Natural Resources Management Plans (INRMPs) offer a coordinated approach for incorporating habitat conservation efforts into installation management. INRMPs provide significant baseline information that can be used when preparing National Environmental Policy Act (NEPA) documents for all DoD management activities. This linkage helps to ensure that appropriate conservation and mitigation measures are identified in NEPA documents and committed to, when appropriate, in final decision documents.

The DoD develops INRMPs cooperatively with the FWS and appropriate state fish and wildlife agencies. DoD's strategy focuses on inventorying and long-term monitoring to determine changes in migratory bird populations on DoD installations. Effective on-the-ground management may then be applied to those areas identified as having the highest conservation value. DoD's goal is to support military training and testing by providing for no net loss of an installation's military readiness capability and capacity. DoD implements cooperative projects and programs on military lands to benefit the health and well-being of birds and their habitats, when consistent with the military mission, military readiness, and the safety of DoD personnel.

The DoD has a cooperative network of natural resources personnel and others from military installations across the United States that provides technical assistance, including how to incorporate landbird, shorebird, and waterbird habitat management efforts into INRMPs. These bird conservation experts work collaboratively to conserve migratory and resident birds and their habitats on DoD lands.

The DoD implements bird inventories and monitoring programs in numerous ways, including Next Generation Radar (NEXRAD) for studying bird movements in the atmosphere, and maintains an integrated pest management (IPM) program designed to reduce the use of pesticides, herbicides, fungicides, etc. In addition, the management of natural resources on DoD properties benefits migratory birds through efforts such as invasive-species control, habitat enhancement/restoration, water-quality improvement, and wetland conservation.

Fish and Wildlife Service

As a federal agency within the U.S. Department of the Interior, the FWS mission is to work with others to conserve, protect, manage, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The FWS Migratory Bird Program serves as a focal point in the United States for policy development and strategic planning, program implementation, and evaluation of actions designed to conserve migratory birds and their habitats.

The FWS is legally mandated to implement the conservation provisions of the MBTA, which includes responsibilities for managing migratory bird populations, domestic and international coordination, and the development and enforcement of regulations that govern authorized take of migratory birds. The Migratory Bird Conservation Act established the Migratory Bird Conservation Commission to approve land acquisition with Migratory Bird Conservation Funds. The Fish and Wildlife Coordination Act (FWCA) requires consultation under certain circumstances and added provisions to recognize the important contribution of wildlife resources to the Nation. The FWCA requires consideration and coordination of wildlife conservation, including habitat protection, through acquisition, enhancement, and/or management and avoidance and minimization of avian stressors related to federal activities.

The following FWS programs have responsibilities with regards to bird conservation activities:

1) The Division of Migratory Bird Management and the Migratory Bird Programs in FWS Regional Offices serve as focal points for policy development and strategic planning. These offices develop and implement monitoring and management initiatives that help maintain healthy populations of migratory birds and their habitats, and provide continued opportunities for citizens to enjoy bird-related recreation.

2) The Division of Bird Habitat Conservation is instrumental in supporting habitat conservation partnerships through the administration of bird conservation grant programs and development of Joint Ventures that serve as major vehicles for implementing the various bird conservation plans across the country.

3) Ecological Services Field Offices across the country serve as the primary contacts for technical assistance and environmental reviews involving migratory bird issues. The Field Offices coordinate with the Regional Migratory Bird Offices, as necessary, regarding permits and overall migratory bird conservation coordination.

4) The Office of Law Enforcement is the principal FWS program that enforces the legal provisions of the MBTA, Eagle Act, ESA, and other laws pertaining to migratory birds.

5) The National Wildlife Refuge (NWR) System manages NWRs and Waterfowl Production Areas across the country, many of which were established to protect and conserve migratory birds. NWRs not only protect important bird habitat, but also focus on monitoring migratory bird populations, restoring and maintaining native habitats, and educating the public on recreational and economic benefits of migratory birds.

6) The Science Applications program works with other FWS programs and partners to ensure that the necessary science, tools, and capacity are available for planning and implementing the most efficient and effective conservation actions to protect fish and wildlife, including migratory birds. The office facilitates regional self-directed science management partnerships called Landscape Conservation Cooperatives to develop and apply shared science capacity to conservation.

D. Statement of Mutual Interest and Benefit

The Parties have a common interest in the conservation and management of America's natural resources. The Parties agree that migratory birds are important components of biological diversity, and that the conservation of migratory birds will help sustain ecological systems and help meet the public demand for conservation education and outdoor recreation, such as wildlife viewing and hunting opportunities. The Parties also agree that it is important to focus on reducing stressors on bird populations, restore and enhance habitat where actions can benefit specific ecosystems and migratory birds dependent upon them, and recognize that actions taken to benefit some migratory bird populations may adversely affect other migratory bird populations. The Parties also agree that while it is the FWS' aim to ensure biologically diverse, thriving habitat for migratory birds away from airfields, it is DoD's aim to ensure flight safety by making airfield environments as unattractive as possible to migratory birds while supporting FWS' efforts away from airfields.

E. Responsibilities of Both Parties

The Parties agree that this MOU shall be implemented to the extent permitted by law and in harmony with evolving requirements of agency missions, subject to the availability of appropriations and budgetary limits. Both Parties shall:

1) Support the conservation intent of Executive Order 13186, and the migratory bird conventions by:

    a) Integrating bird conservation principles, measures, and practices into agency planning and actions; and

    b) Avoiding or minimizing, to the extent practicable, the exposure of birds and their resources to avian stressors that result in take.

2) Emphasize an interdisciplinary, collaborative approach to migratory bird conservation in cooperation with other governments, state and federal agencies, and non-federal partners within the geographic framework of the NABCI Bird Conservation Regions.

3) Work to protect, restore, and enhance migratory bird habitats, as practicable, on DoD-managed lands, in ways that do not conflict with or impede military training and testing, by:

    a) Designing and executing actions to minimize, to the extent practicable and consistent with the military mission, avian stressors on migratory bird populations, including impacts to breeding, migration, or wintering habitats; and by developing and implementing, as appropriate, conservation measures that could reduce the take of migratory birds or enhance the quality of the habitats they use;

    b) Working to identify, conserve, and manage significant bird conservation sites that occur on DoD-managed lands;

    c) Preventing or abating pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable; and

    d) Preventing the introduction and establishment of, and controlling and reducing the spread of existing, non-native invasive species that may be harmful to native flora and fauna, including migratory bird populations, as required by Executive Order 13112 on Invasive Species.

4) Work with willing landowners to prevent or minimize the loss or degradation of migratory bird habitats on lands adjacent or near military installation boundaries. This cooperative conservation may include:

    a) Participating in efforts to identify, protect, and conserve important migratory bird habitats or other significant bird conservation sites and ecological conditions that occur in landscapes or watersheds that may be of conservation value to migratory

birds found on DoD lands, and that also buffer one or more installations from adverse impacts to DoD mission or resource-management activities;

b) Providing information on migratory bird resources found on DoD lands for partners to include and integrate into their outreach and education materials and activities; and

c) Using available authorities to enter into agreements with federal, state, tribal, or other governmental entities, or nongovernmental organizations to conserve and enhance habitats in a manner compatible with military operations.

5) Promote collaborative projects such as:

a) Developing or using existing inventory and monitoring programs, at appropriate scales, with national or regional standardized protocols, to assess the status and trends of bird populations and habitats, including migrating, breeding, and wintering birds;

b) Designing management studies and research/monitoring projects using national or regional standardized protocols and programs to identify the habitat conditions needed by applicable species of concern, to understand interrelationships of co-existing species, and to evaluate the effects of management activities on habitats and populations of migratory birds;

c) Sharing inventory, monitoring, research, and study data for breeding, migrating, and wintering bird populations and habitats in a timely fashion with national data repositories such as the Avian Knowledge Network, National Point Count Database, and Monitoring Avian Productivity and Survivorship (MAPS);

d) Working in conjunction with each other and federal and state agencies to develop reasonable and effective conservation measures for actions that reduce the exposure of birds and their habitats to avian stressors;

e) Participating in or promoting the implementation of existing regional or national inventory and monitoring programs such as Breeding Bird Survey (BBS), Christmas Bird Counts, bird atlas projects, or game-bird surveys (e.g., mid-winter waterfowl surveys) on DoD lands where practicable and feasible;

f) Using existing partnerships and exploring opportunities for expanding and creating new partnerships to facilitate combined funding for inventory, monitoring, management studies, and research; and

g) Improving habitat on lands adjacent to DoD-managed lands through programs such as the DoD Readiness and Environmental Protection Integration and Land and Water Conservation Fund programs.

6) Work cooperatively to identify and utilize existing conservation measures to avoid or minimize the effects of avian stressors, and develop new conservation measures as

needed.

7) Per Executive Order 13186 (Sec. 3(12)), provide training opportunities to appropriate personnel on responsibilities under the MBTA, the Eagle Act, and other regulations protecting birds, current processes for coordination on bird conservation issues, strategies for properly assessing how actions effect bird populations, and recommended approaches on how to avoid or minimize the exposure of birds and their habitats to avian stressors.

8) Participate annually in the interagency Council for the Conservation of Migratory Birds. The duties of the Council include the following:

   a) Sharing resource information to help conserve and manage migratory birds;

   b) Fostering partnerships to further the goals of Executive Order 13186;

   c) Reporting annually on Executive Order accomplishments and recommendations; and

   d) Selecting an annual recipient of a Presidential Migratory Bird Federal Stewardship Award.

9) Promote migratory bird conservation nationally and internationally through activities such as National Public Lands Day and International Migratory Bird Day.

F. Department of Defense Responsibilities

1) Follow all migratory bird permitting requirements for intentional take under 50 CFR 21.22 (banding or marking), 21.23 (scientific collecting), 21.26 (special Canada Goose permit), 21.27 (special purposes), or 21.41 (depredation). Though no permit is required to take birds in accordance with 50 CFR 21.43 - 21.47 (depredation orders), follow all regulatory requirements set forth in those sections when applicable.

2) Consistent with military mission requirements, encourage incorporation of comprehensive migratory bird management objectives into relevant DoD planning documents, including INRMPs, Integrated Pest Management Plans (IPMPs), Installation Master Plans, NEPA analyses, and other relevant documents. Comprehensive planning efforts for migratory birds include PIF Bird Conservation Plans, the North American Waterfowl Management Plan, U.S. Shorebird Conservation Plan, North American Waterbird Conservation Plan, and associated regional plans where available.

3) Consistent with current and emerging mission requirements, manage military lands and non-military readiness activities in a manner that supports migratory bird conservation, habitat protection, restoration, and enhancement.

4) Inventory and monitor bird populations on DoD lands to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts

5) In accordance with DoD *INRMP Implementation Manual* (DoDM 4715.03, 2013),work

cooperatively with FWS and state and fish and wildlife agencies to promote timely development, effective review, and revisions of INRMPs, including any potential revisions to promote the conservation of migratory birds.

6) Incorporate conservation measures addressed in regional or state bird conservation plans in the INRMP development process.

7) Consistent with safety and security requirements, allow the FWS and other partners reasonable access to military lands for conducting sampling or survey programs, including but not limited to MAPS, BBS, International Shorebird Survey, game-bird surveys, and breeding bird atlases.

8) Consistent with safety and security requirements and bird conservation responsibilities, support the economic and recreational benefits of bird-related activities by allowing public access to military lands for recreational uses, such as bird watching and other non-consumptive activities.

9) Develop policies and procedures for facilities design that will promote the conservation of migratory bird populations and habitat, including:

    a) Mitigating the negative impacts of reflective glass in building design by considering building location and orientation with respect to migratory bird areas, and use of other mitigation techniques, such as reducing the amount of reflective glass on buildings;

    b) Maximizing the use of native landscaping to promote migratory bird habitat, except in areas subject to BASH hazards.

    c) Turning off interior building lighting at night, especially lighting in offices with exterior windows that face outward to exterior building surfaces that may be visible to migratory or resident birds.

10) Prior to implementing any activity that has, or is likely to have, a measurable negative effect on migratory bird populations:

    a) Identify the migratory bird species likely to occur in the area of the proposed action, and determine if any species of concern could be affected by the activity;

    b) Assess and document, through the project planning process (e.g., NEPA), the potential effects of the proposed action on species of concern. Use best available demographic, population, or habitat-association data in the assessment of effects upon species of concern; and

    c) Engage in early planning and scoping with the FWS to proactively address migratory bird conservation, and to initiate appropriate actions to avoid or minimize the exposure of birds and their habitats to avian stressors that may result in the take of migratory birds.

11) Continue to promote the conservation of migratory birds on military lands, to the extent

permitted by law, subject to the availability of appropriations, within Administration budgetary limits, and where in harmony with DoD missions.

a) Fire and fuels-management practices. Fire plays an important role in shaping plant and animal communities, and is a valuable tool in restoring habitats altered by decades of fire suppression. Fire management may include fire suppression, fire prevention, fuels treatment, and prescribed burning. Prescribed burning is one of the most effective tools in managing grassland and longleaf pine/wiregrass ecosystems. Fire-management planning efforts will consider the effects of fire management strategies on the conservation of migratory bird populations, and should be combined with monitoring to properly assess fire management on relevant habitats and species.

b) Management practices for invasive and aquatic nuisance species. Invasive and aquatic nuisance species are a threat to native plants and wildlife throughout the United States, including on military lands. Efforts to prevent, control, and contain these species must take into account both the impacts from invasive species and the effects of the control efforts on migratory bird populations. Invasive species that can threaten migratory birds and their habitats include, but are not limited to, exotic grasses, trees and weeds, terrestrial and aquatic insects and organisms, non-native birds, and stray and feral cats.

c) Communications towers, utilities, and energy development. Increased communications demands, changes in technology, and the development of alternative energy sources have resulted in additional exposure of migratory birds and their resources to avian stressors. DoD will review best practices outlined in FWS Guidance, and consult with FWS as needed when considering the development of these technologies on military lands. Construction of new utility and energy systems and associated infrastructure should avoid or minimize the exposure of birds and their resources to avian stressors. Consideration also may be given to retrofitting existing utilities to reduce impacts. Available guidance includes (but is not limited to):

   i. Avian Power Line Interaction Committee - *Suggested Practices for Avian Protection on Power Lines* (2006)
   ii. Avian Power Line Interaction Committee - *Reducing Avian Collisions with Power Lines* (2012)
   iii. U.S. Fish and Wildlife Service *Land-based Wind Energy Guidelines* (2012)
   iv. U.S. Fish and Wildlife Service *Guidance on the Siting, Construction, Operation, and Decommissioning of Communication Towers* (2000) and FWS comments to the FCC on towers and lighting (2007)

12) To the extent reasonable and practicable, use a best-practices approach for routine maintenance, retrofitting, and management actions to the extent they do not diminish military readiness, including:

a) Turning out lights in buildings, especially multiple-story buildings, at night,

except where needed for safety or security reasons;

b) Reducing or eliminating activities that can attract invasive species, including feeding or managing outdoor or feral cats;

c) Minimizing or eliminating the use of pesticides (e.g., insecticides, herbicides, rodenticides);

d) Covering open pipes in which birds may be able to enter but not escape (e.g., in-ground pipes, outhouses, roofs);

e) Minimizing exposure to hazardous chemicals, including covering or removing open pits containing oil or other chemicals; and

f) Minimizing vegetation removal and manipulation during the breeding season, as practicable and when not in conflict with airfield BASH management.

G. Responsibilities of the Fish and Wildlife Service

1) Work with DoD by providing recommendations to minimize the effects of avian stressors on migratory birds from DoD actions.

2) Through the Division of Migratory Bird Management, maintain a Web page of permits that provides links to all offices responsible for issuing migratory bird take permits and permit applications.

3) Provide essential background information to DoD, when requested, to ensure sound management decisions. This may include information on migratory bird distributions, status, key habitats, conservation guidelines, and risk factors within each BCR. FWS will regularly update its *Birds of Conservation Concern* publication so it can be reliably referenced.

4) Work to identify special migratory bird habitats (e.g., nesting, stopover, migration corridors), and the ecological conditions important in those habitats.

5) Using the Points of Contact list (Appendix A), the FWS will continue to provide general guidance and information regarding migratory birds and their habitats to DoD, upon request. This guidance includes technical assistance for avoiding or minimizing project-related impacts on migratory birds.

6) The Migratory Bird Program will develop and provide FWS guidance to the Ecological Services Field Offices to ensure consistency in the interpretation and implementation of the MBTA as it applies to all federal actions.

7) In accordance with FWS Guidelines for Coordination with DoD and Implementation of the 1997 Sikes Act, promote timely and effective review of INRMPs, including any potential recommendations and revisions related to the conservation of migratory birds.

8) Review and comment on NEPA and other planning documents forwarded by military

installations.

9) Notify installations of any proposed or current actions that may result in a significant take of migratory birds.

H. Dispute Resolution

Preventing potential conflicts or resolving disagreements between the Parties will be attempted first at staff levels and elevated through the respective organizational levels if necessary. If staff level resolution is not possible, the conflict will be addressed through Alternative Dispute Resolution processes.

I. Mutual Agreement

1) This MOU will not change or alter requirements associated with the MBTA, Eagle Act, ESA, NEPA, Sikes Act, or other statutes or legal authority. This MOU is intended to provide internal guidance to federal agency staff.

2) The discretionary responsibilities established by this MOU may be incorporated into planned DoD actions; however, DoD may not be able to implement these discretionary responsibilities until DoD has successfully included them in formal planning, programming, and budgeting processes. This MOU is intended to be implemented when new actions are initiated as well as when INRMPs, IPMPs, and BASH plans are initiated or revised, and if the MOU's discretionary responsibilities are successfully included in formal planning, programming, and budgeting processes.

3) This MOU in no way restricts either Party from participating in similar activities with other public or private agencies, governments, organizations, or individuals.

4) This MOU is neither a fiscal nor a funds-obligation document. Any endeavor involving reimbursement, contribution of funds, or transfer of anything of value between the Parties will be handled in accordance with applicable laws, regulations, and procedures, including those for government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the Parties, and shall be independently authorized by appropriate statutory authority.

5) The Parties shall schedule periodic meetings to review progress and identify opportunities for advancing the principles of this MOU.

6) This MOU is intended to improve the internal management of the executive branch, and does not create any right or benefit, substantive or procedural, separately enforceable as law or equity by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

7) Modifications to the MOU's scope shall be made by the Parties' mutual consent, through issuance of a written modification, signed and dated by the Parties, prior to any changes.

8) Either Party may terminate this MOU, in whole or in part, at any time before the

expiration date by providing the other Party with a written statement to that effect.

F. Definitions

Action – a program, activity, project, official policy, rule, regulation, or formal plan directly carried out by one of the Parties.

Airfield Environment – UFC 3-260-01 defines what an airfield is and all of its component parts, and defines clearance criteria. DoDI 4165.57 AICUZ describes the acceptable land uses for component parts of the airfield. The Airfield's BASH Program is responsible for maintaining hazard-free airfields.

Avian Knowledge Network – an international organization of government and non-government institutions focused on understanding the patterns and dynamics of bird populations across the Western Hemisphere (www.avianknowledge.net).

Avian Stressor – any alteration of or addition to the environment that affects birds or their resources.

Bird/Wildlife Aircraft Strike Hazard (BASH) – an actual or potential collision between wildlife (i.e., a bird, mammal, or reptile) and an aircraft (e.g., plane or helicopter).

Breeding Bird Survey (BBS) – a standardized international survey that provides information on population trends of breeding birds, through volunteer observations located along randomly selected roadside routes in the United States, Canada and Mexico (www.mbr-pwrc.usgs.gov/bbs/bbs.html).

Bird Conservation Region (BCR) – a geographic unit used to facilitate bird conservation actions under the North American Bird Conservation Initiative (www.nabci-us.org/bcrs.htm).

Birds of Conservation Concern – a list that is published and periodically updated by the FWS Division of Migratory Bird Management intended to identify the migratory and non-migratory bird species that-- in addition to species already listed under the ESA, proposed or candidate-- represent the FWS's highest conservation priorities, including ESA candidate species. The most current version of the list, Birds of Conservation Concern 2008, is available at www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html.

Cantonment Area – the principal built-up area of a DoD installation, typically containing housing, barracks, military organizational areas, and community support infrastructure.

Comprehensive Planning Efforts for Migratory Birds – includes Partners in Flight, North American Waterfowl Management Plan, U.S. Shorebird Conservation Plan, Western Hemisphere Shorebird Reserve Network, North American Waterbird Conservation Plan, and other partnership planning efforts integrated through the North American Bird Conservation Initiative.

Conservation Measure – any action undertaken to address project-related stressors/impacts that ultimately improve the conservation status of one or more migratory bird species. Conservation measures split into two categories: Ecological/Habitat measures (driven by EO 13186) and Avian

Mortality measures (driven by MBTA). Conservation measures work to avoid or minimize an impact, reduce the impact over time, or rectify or compensate for the impact. Conservation Measures are also referred to as Mitigation, Best Practices, and Best Management Practices.

Conservation Planning – strategic and tactical planning of agency activities for the long-term conservation of migratory birds and their habitats.

Council for the Conservation of Migratory Birds – an interagency council established by the Secretary of the Interior to oversee the implementation of Executive Order 13186.

Ecological Condition – the composition, structure, and processes of ecosystems over time and space. This includes the diversity of plant and animal communities, the productive capacity of ecological systems and species diversity, ecosystem diversity, disturbance processes, soil productivity, water quality and quantity, and air quality. Often referred to in terms of ecosystem health, which is the degree to which ecological factors and their interactions are reasonably complete and functioning for continued resilience, productivity, and renewal of the ecosystem.

Effect (adverse or beneficial) – the biological consequences of an impact or the implementation of a conservation measure. Effects can be adverse (habitat avoidance) or beneficial (improved habitat quality). The effect is determined by the exposure of the bird or resource to the stressor/impact and the response to the impact. Effects may be direct, indirect, or cumulative, and refer to effects from actions or categories of actions on migratory birds, their populations, habitats, ecological conditions, and significant bird conservation sites.

Impact – the combined result of an action/project, all of its associated activities and components, and the stressors (see below) produced by those actions.

Integrated Natural Resources Management Plan (INRMP) – an integrated plan based, to the maximum extent practicable, on ecosystem management that shows the interrelationships of individual components of natural resources management (e.g., fish and wildlife, forestry, land management, outdoor recreation) to military mission requirements and other land use activities affecting an installation's natural resources. INRMPs are required for all DoD installations with significant natural resources, pursuant to the Sikes Act.

International Shorebird Survey – a monitoring program started in 1974 to survey shorebirds (sandpipers, plovers, etc.) across the Western Hemisphere (www.pwrc.usgs.gov/iss/iss.html).

International Migratory Bird Day (IMBD) – IMBD celebrates, brings attention to, and educates people about the migration of nearly 350 species of migratory birds that nest and breed throughout the Western Hemisphere. IMBD is celebrated in Canada, the United States, Mexico, Central and South America, and the Caribbean (http://birdday.org/birdday).

Management Action – an activity by a government agency that could cause a positive or negative impact to migratory bird populations or habitats. Conservation measures to mitigate potential activity-related stressors may be required.

Migratory Bird – an individual of any species protected by the Migratory Bird Treaty Act (MBTA) as listed in 50 CFR § 10.13.

Military Readiness Activity – all Armed Forces training and operations that relate to combat, including but not limited to the adequate and realistic testing of military equipment, vehicles, flight operations, weapons, and sensors for proper operation and suitability for use in combat.

Monitoring Avian Productivity and Survivorship (MAPS) – a program that uses the banding of birds during the breeding season to track the changes and patterns in the number of young produced, and the survivorship of adults and young (www.birdpop.org/maps.htm).

National Environmental Policy Act (NEPA) – a federal statute that requires federal agencies to prepare a detailed analysis of the environmental impacts of a proposed action and alternatives, and to include public involvement in the decision making process for major federal actions significantly affecting the quality of the human environment 42 U.S.C. 4321, et seq.

North American Bird Conservation Initiative (NABCI) – a partnership to align the avian conservation community to implement bird conservation through regionally-based, biologically driven, landscape-oriented partnerships across the North American continent. NABCI includes federal agencies of Canada, Mexico and the United States, as well as most landbird, shorebird, waterbird, and waterfowl conservation initiatives (www.nabci-us.org).

North American Waterbird Conservation Plan – a partnership of federal and state government agencies, non-governmental organizations, and private interests focusing on the conservation of waterbirds, primarily including marshbirds and inland, coastal, and pelagic colonial waterbirds (www.waterbirdconservation.org/plans.html). The partnership's vision is that the distribution, diversity, and abundance of breeding, migratory, and nonbreeding waterbirds are sustained throughout the lands and waters of North America, Central America, and the Caribbean.

North American Waterfowl Management Plan – a partnership of federal and state agencies, non-governmental organizations, and private interests focusing on the restoration of waterfowl populations through habitat restoration, protection, and enhancement (http://birdhabitat.fws.gov/NAWMP/nawmphp.htm).

Partners in Flight (PIF) – a cooperative partnership of more than 300 partners including federal and state government agencies, non-governmental organizations, conservation groups, foundations, universities, and industry focusing on the conservation of landbirds. DoD was an original signatory to the 1991 PIF Federal Agencies' MOA (www.partnersinflight.org).

Ranges & Training Areas (RTAs) – as defined within each installation's INRMP.

Species of Concern – refers to several categories of birds including: 1) species listed in the periodic report, *Birds of Conservation Concern*, published by the FWS Division of Migratory Bird Management (www.fws.gov/migratorybirds); 2) priority migratory bird species documented in the comprehensive bird conservation plans (North American Waterbird Conservation Plan, United States Shorebird Conservation Plan, Partners in Flight Bird Conservation Plans); 3) species or populations of waterfowl identified as high, or moderately high, continental priority in

the North American Waterfowl Management Plan; 4) listed threatened and endangered bird species in 50 CFR § 17.11; and 5) MBTA-listed gamebirds of management concern, as listed in the *Birds of Management Concern* list (www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BMC.html).

Take – to pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to pursue, hunt, wound, kill, trap, capture or collect (50 CFR § 10.12). The Executive Order 13186 further defines "take" to include intentional take, meaning take that take is the purpose of the activity in question, and unintentional (incidental) take, meaning take that results from, but is not the purpose of, the activity in question. Both intentional and unintentional take constitute take as defined by the MBTA. The regulations implementing the Eagle Act define take to mean pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb bald and golden eagles (50 CFR § 22.3).

U.S. Shorebird Conservation Plan – a partnership of federal and state government agencies, non-governmental organizations, and private interests focusing on restoring and protecting stable and self-sustaining populations of all shorebird species (www.shorebirdplan.org).

K. Agreement Contacts and Execution

The principal contacts for this instrument are as follows:

Brad Bortner, Chief Division of Migratory Bird Management US Fish and Wildlife Service	L. Peter Boice, Deputy Director Natural Resources Program Office of the Secretary of Defense

This MOU is executed as of the last date signed below and expires no later than five (5) years thereafter, at which time it is subject to review and renewal, or expiration.

The Parties hereto have executed this agreement as of the date shown below:

Dan Ashe Director US Fish and Wildlife Service	John Conger Acting, Deputy Under Secretary of Defense (Installations & Environment) US Department of Defense
Signature 9.5.2014 Date	Signature 7/10/2014 Date

Appendix A: FWS Points of Contact list

Contact Information for Headquarters and Regional U.S. Fish and Wildlife Service Migratory Bird and Ecological Services Offices. For a complete listing of field offices see http://www.fws.gov/offices/.

FWS Region	States Covered	Migratory Bird Office	Migratory Bird Permits	Endangered Species
Headquarters		703-358-1714	703-358-1825	703-358-2171
Region 1	Hawaii, Idaho, Oregon, Washington	503-231-6164	503-872-2715	503-231-6151
Region 2	Arizona, New Mexico, Oklahoma Texas	505-248-6875	505-248-7882	505-248-6920
Region 3	Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio Wisconsin	612-713-5473	612-713-5436	612-713-5350
Region 4	Alabama, Arkansas Florida, Georgia Kentucky, Louisiana Mississippi, North Carolina, South Carolina, Tennessee	404-679-7070	404-679-7070	404-679-7140
Region 5	Connecticut, Delaware, Maine Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania Rhode Island, Vermont, Virginia West Virginia	413-253-8643	413-253-8643	413-253-8304
Region 6	Colorado, Kansas Montana, Nebraska North Dakota, South Dakota, Utah Wyoming	303-236-4409	303-236-8171	303-236-4252
Region 7	Alaska	800-368-8890	907-786-3693	907-786-3856
Region 8	California, Nevada	916-414-6464	916-414-6464	916-414-6464

subject to OMB approval under the Paperwork Reduction Act (PRA), 44 U.S.C. 3501 *et seq.*, or impose any enforceable duty or contain any unfunded mandate as described under Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) (Public Law 104–4). Nor does it require any special considerations under Executive Order 12898, entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629, February 16, 1994); or OMB review or any Agency action under Executive Order 13045, entitled *Protection of Children from Environmental Health Risks and Safety Risks* (62 FR 19885, April 23, 1997). This action does not involve any technical standards that would require Agency consideration of voluntary consensus standards pursuant to section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272 note). Since tolerances and exemptions that are established on the basis of a petition under section 408(d) of FFDCA, such as the tolerance in this final rule, do not require the issuance of a proposed rule, the requirements of the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 *et seq.*) do not apply. In addition, the Agency has determined that this action will not have a substantial direct effect on States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132, entitled *Federalism*(64 FR 43255, August 10, 1999). Executive Order 13132 requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.'' This final rule directly regulates growers, food processors, food handlers, and food retailers, not States. This action does not alter the relationships or distribution of power and responsibilities established by Congress in the preemption provisions of section 408(n)(4) of FFDCA. For these same reasons, the Agency has determined that this rule does not have any ''tribal implications'' as described in Executive Order 13175, entitled *Consultation and Coordination with Indian Tribal Governments* (65 FR 67249, November 6, 2000). Executive Order 13175, requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.'' ''Policies that have tribal implications'' is defined in the Executive order to include regulations that have ''substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and the Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.'' This rule will not have substantial direct effects on tribal governments, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this rule.

VII. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of this final rule in the **Federal Register**. This final rule is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 180

Environmental protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pests, Reporting and recordkeeping requirements.

Dated: February 16, 2007.

James Jones,

Director, Office of Pesticide Programs.

■ Therefore, 40 CFR chapter I is amended as follows:

PART 180—[AMENDED]

■ 1. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 321(q), 346a and 371.

■ 2. Section 180.625 is added to read as follows:

§180.625 Orthosulfamuron; tolerances for residues.

(a) *General.* Tolerances are established for residues of orthosulfamuron 1-(4,6-dimethoxypyrimidin-2-yl)-3-[2-(dimethylcarbamoyl)- phenylsulfamoyl] urea) *per se* in or on the following commodities:

Commodity	Parts per million
Rice, grain	0.05
Rice, straw	0.05

(b) *Section 18 emergency exemptions.* [Reserved]

(c) *Tolerances with regional registrations.* [Reserved]

(d) *Indirect and inadvertant residues.* [Reserved]

[FR Doc. 07–898 Filed 2–23–07; 2:13 pm]

BILLING CODE 6560–50–S

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 21

RIN 1018–AI92

Migratory Bird Permits; Take of Migratory Birds by the Armed Forces

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, or possessing of migratory birds unless permitted by regulations promulgated by the Secretary of the Interior. While some courts have held that the MBTA does not apply to Federal agencies, in July 2000, the United States Court of Appeals for the District of Columbia Circuit ruled that the prohibitions of the MBTA do apply to Federal agencies, and that a Federal agency's taking and killing of migratory birds without a permit violated the MBTA. On March 13, 2002, the United States District Court for the District of Columbia ruled that military training exercises of the Department of the Navy that incidentally take migratory birds without a permit violate the MBTA.

On December 2, 2002, the President signed the 2003 National Defense Authorization Act (Authorization Act). Section 315 of the Authorization Act provides that, not later than one year after its enactment, the Secretary of the Interior (Secretary) shall exercise his/her authority under Section 704(a) of the MBTA to prescribe regulations to exempt the Armed Forces for the

incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense or the Secretary of the military department concerned. The Authorization Act further requires the Secretary to promulgate such regulations with the concurrence of the Secretary of Defense. The Secretary has delegated this task to the U.S. Fish and Wildlife Service (Service).

In passing the Authorization Act, Congress itself determined that allowing incidental take of migratory birds as a result of military readiness activities is consistent with the MBTA and the treaties. With this language, Congress clearly expressed its intention that the Armed Forces give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities, but not at the expense of diminishing the effectiveness of such activities. This rule has been developed by the Service in coordination and cooperation with the Department of Defense and the Secretary of Defense concurs with the requirements herein.

Current regulations authorize permits for take of migratory birds for activities such as scientific research, education, and depredation control (50 CFR parts 13, 21 and 22). However, these regulations do not expressly address the issuance of permits for incidental take. As directed by Section 315 of the Authorization Act, this rule authorizes such take, with limitations, that result from military readiness activities of the Armed Forces. If any of the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of a migratory bird species, then they must confer and cooperate with the Service to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects. The Secretary of the Interior, or his/her designee, will retain the power to withdraw or suspend the authorization for particular activities in appropriate circumstances.

DATES: This rule is effective March 30, 2007.

ADDRESSES: The final rule and other related documents can be downloaded at *http://migratorybirds.fws.gov*. The complete file for this rule is available for inspection, by appointment, during normal business hours at the Division of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Arlington, Virginia 22203, telephone 703–358–1714.

FOR FURTHER INFORMATION CONTACT: Robert Blohm, Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, telephone 703–358–1714.

SUPPLEMENTARY INFORMATION:

Background

Migratory birds are of great ecological and economic value and are an important international resource. They are a key ecological component of the environment, and they also provide immense enjoyment to millions of Americans who study, watch, feed, or hunt them. Recognizing their importance, the United States has been an active participant in the internationally coordinated management and conservation of migratory birds. The Migratory Bird Treaty Act (16 U.S.C. 703–712) (MBTA) is the primary legislation in the United States established to conserve migratory birds. The U.S. Fish and Wildlife Service (Service), is the Federal agency within the United States responsible for administering and enforcing the statute.

The MBTA, originally passed in 1918, implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The original treaty upon which the MBTA was based was the Convention for the Protection of Migratory Birds, signed with Great Britain in 1916 on behalf of Canada for the protection ''of the many species of birds that traverse certain parts of the United States and Canada in their annual migration.'' The MBTA was subsequently amended after treaties were signed with Mexico (1936, amended 1972, 1997), Japan (1972), and Russia (1976), and the amendment of the treaty with Canada (1995).

While the terms of the treaties vary in their particulars, each treaty and subsequent amendments impose substantive obligations on the United States for the conservation of migratory birds and their habitats. For example, the Canada treaty, as amended, includes the following conservation principles:

- To manage migratory birds internationally;
- To ensure a variety of sustainable uses;
- To sustain healthy migratory bird populations for harvesting needs;
- To provide for, maintain, and protect habitat necessary for the conservation of migratory birds; and
- To restore depleted populations of migratory birds.

The Canada and Mexico treaties protect selected families of birds, while the Japan and Russia treaties protect selected species of birds. All four treaties provide for closed seasons for hunting game birds. The list of the species protected by the MBTA appears in title 50, section 10.13, of the Code of Federal Regulations (50 CFR 10.13).

Under the MBTA, it is unlawful ''by any means or in any manner, to pursue, hunt, take, capture, [or] kill'' any migratory birds except as permitted by regulation (16 U.S.C. 703). The Secretary is authorized and directed, from time to time, having due regard to the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds to adopt suitable regulations permitting and governing the take of migratory birds when determined to be compatible with the terms of the treaties (16 U.S.C. 704). Furthermore, the regulations at 50 CFR 21.11 prohibit the take of migratory birds except under a valid permit or as permitted in the implementing regulations. The Service has defined ''take'' in regulation to mean to ''pursue, hunt, shoot, wound, kill, trap, capture, or collect'' or to attempt these activities (50 CFR 10.12).

On July 18, 2000, the United States Court of Appeals for the District of Columbia ruled in *Humane Society* v. *Glickman,* 217 F.3d 882 (D.C. Cir. 2000), that Federal agencies are subject to the take prohibitions of the MBTA. The United States had previously taken the position, and two other courts of appeals held or suggested, that the MBTA does not by its terms apply to Federal agencies. See *Sierra Club* v. *Martin,* 110 F.3d 1551, 1555 (11th Cir. 1997); *Newton County Wildlife Ass'n* v. *U.S. Forest Service,* 113 F.3d 110, 115 (8th Cir. 1997). Subsequently, on December 20, 2000, we issued Director's Order 131 to clarify the Service's position that, pursuant to *Glickman,* Federal agencies are subject to the permit requirements of the Service's existing regulations.

Because the MBTA is a criminal statute and does not provide for citizen-suit enforcement, a private party who violates the MBTA is subject to investigation by the Service and/or prosecution by the Department of Justice. However, the Administrative Procedure Act (5 U.S.C. 551 et seq.) (APA) allows private parties to file suit to prevent a Federal agency from taking ''final agency action'' that is ''arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law'' (5 U.S.C. 706(2)(A)). If the prohibitions of the MBTA apply to Federal agencies, private parties could seek to enjoin Federal actions that take migratory birds, unless such take is authorized pursuant to regulations developed in

accordance with 16 U.S.C. 704, even when such Federal actions are necessary to fulfill Government responsibilities and even when the action poses no threat to the species at issue.

In *Center for Biological Diversity* v. *Pirie,* a private party obtained an injunction prohibiting live-fire military training exercises of the Department of the Navy that had the effect of killing some migratory birds on the island of Farallon de Medinilla (FDM) in the Pacific Ocean. On March 13, 2002, the United States District Court for the District of Columbia ruled that the Navy activities at FDM resulting in a take of migratory birds without a permit from the Service violated the MBTA and the APA (191 F. Supp. 2d. 161 and 201 F. Supp. 2d 113). On May 1, 2002, after hearing argument on the issue of remedy, the Court entered a preliminary injunction ordering the Navy to apply for a permit from the Service to cover the activities, and preliminarily enjoined the training activities for 30 days. The United States Court of Appeals for the District of Columbia Circuit stayed the District Court's preliminary injunction pending appeal. The preliminary injunction, and associated stay, expired on May 31, 2002. A permanent injunction was issued by the District Court on June 3, 2002. The Circuit Court also stayed this injunction pending appeal on June 5, 2002. On December 2, 2002, the President signed the Authorization Act creating an interim period during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities. During the interim period, Congress also directed the Secretary of the Interior to develop regulations that exempt the Armed Forces from incidental take during authorized military readiness activities. The Department of Defense must concur with the regulations before they take effect. The Circuit Court subsequently dismissed the *Pirie* case as moot. In light of the *Glickman* and *Pirie* decisions, the authorization that this rule provides is essential to preserving the Service's role in determining what military readiness activities, if any, create an unacceptable risk to migratory bird resources and therefore must be modified or curtailed.

The Armed Forces are responsible for protecting the United States from external threats. To provide for national security, they engage in military readiness activities. ''Military readiness activity'' is defined in the Authorization Act to include all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. It includes activities carried out by contractors, when such contractors are performing a military readiness activity in association with the Armed Forces, including training troops on the operation of a new weapons system or testing the interoperability of new equipment with existing weapons systems. Military readiness does not include (a) the routine operation of installation operating support functions, such as: administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; morale, welfare, and recreation activities; shops; and mess halls, (b) the operation of industrial activities, or (c) the construction or demolition of facilities listed above.

Section 315 of the 2003 National Defense Authorization Act (Pub. L. 107–314, 116 Stat. 2458, Dec. 2, 2002, *reprinted in* 16 U.S.C. 703 note) (hereinafter ''Authorization Act'') requires the Secretary of Defense, in consultation with the Secretary, to identify ways to minimize, mitigate, and monitor take of migratory birds during military readiness activities and requires the Secretary to prescribe, with the concurrence of the Secretary of Defense, a regulation that exempts military readiness activities from the MBTA's prohibitions against take of migratory birds. With the passage of the Authorization Act, Congress determined that such regulations are consistent with the MBTA and the underlying treaties by requiring the Secretary to promulgate such regulations. Furthermore, Congress clearly expressed its intention that the Armed Forces give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities, but not at the expense of diminishing the effectiveness of such activities. Any diminishment in effectiveness could impair the ability of the Armed Forces to fulfill their national security mission. Diminishment could occur when military training or testing is modified in ways that do not allow the full range of training methods to be explored.

This rule authorizes the Armed Forces to take migratory birds incidental to military readiness activities, subject to certain limitations and subject to withdrawal of the authorization to ensure consistency with the provisions of the migratory bird treaties. The authorization provided by this rule is necessary to ensure that the work of the Armed Forces in meeting their statutory responsibilities can go forward. This rule is also appropriate and necessary to ensure compliance with the treaties and to protect a vital resource in accordance with the Secretary's obligations under Section 704 of the MBTA as well as under Section 315 of the Authorization Act. This rule will continue to ensure conservation of migratory birds as the authorization it provides is dependent upon the Armed Forces conferring and cooperating with the Service to develop and implement conservation measures to minimize or mitigate significant adverse effects to migratory birds. This rule has been developed by the Service in coordination and cooperation with the Department of Defense, and the Secretary of Defense concurs with the requirements herein.

Executive Order 13186

Migratory bird conservation relative to activities of the Department of Defense and the Coast Guard other than military readiness activities are addressed separately in Memoranda of Understanding (MOUs) developed in accordance with Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, signed January 10, 2001. The MOU with the Department of Defense was published in the **Federal Register** August 30, 2006 (Volume 71, Number 168). Upon completion of the MOUs with additional Federal agencies, and in keeping with the intent of the Executive Order for Federal agencies to promote the conservation of migratory bird populations, the Service may issue incidental take authorization to address specific actions identified in the MOUs.

Responses to Public Comment

On June 2, 2004, we published in the **Federal Register** (69 FR 31074) a proposed rule to authorize the take of migratory birds, with limitations, that result from Department of Defense military readiness activities. We solicited public comment on the proposed rule for 60 days ending on August 2, 2004.

By this date, we received 573 comments in response to the proposed rule; 24 were from identified organizations or agencies. The following text discusses the substantive comments received and provides our response to those comments. Additionally, it provides an explanation of significant changes from the proposed rule. We do not specifically address the comments that simply opposed the rule unless they included recommendations for revisions. Comments are organized by topic.

To more closely track the language in the Authorization Act and to clarify that the rule applies to the incidental taking

of a migratory bird by a member of the Armed Forces during a military readiness activity, we have replaced the ''Department of Defense'' with ''Armed Forces,'' where applicable.

Violation of the Migratory Bird Treaty Act and the Four Migratory Bird Treaties

Comment: The statement that the rule allows take only in ''narrow instances'' of military readiness activities goes against the spirit and letter of the MBTA, which forbids the take of migratory birds and thus abrogates the MBTA.

Service Response: The MBTA regulates, rather than absolutely forbids, take of migratory birds. The Secretary is authorized and directed, from time to time, having due regard to the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds to adopt suitable regulations permitting and governing the take of migratory birds when determined to be compatible with the terms of the treaties (16 U.S.C. 704). In the Authorization Act, Congress directed the Secretary to utilize his/her authority to permit incidental take for military readiness activities. Furthermore, Congress itself by passing the Authorization Act determined that allowing incidental take of migratory birds as a result of military readiness activities is consistent with the MBTA and the treaties. Thus, this rule does not abrogate the MBTA.

Comment: Citing broad take authorization language in the current text of the treaty with Canada, concern was expressed regarding the analysis in the proposed rule that the treaty with Canada has a narrower focus than the treaties with Japan and Russia.

Service Response: We agree with the commenter that the Canada treaty, as amended by the 1995 Protocol, now includes broad exception language similar to that in the Japan and Russia treaties. We have expanded upon and added additional clarification in the section ''Is the rule consistent with the MBTA?'' discussing compatibility of this rule with the MBTA and the four treaties.

Authorization of Take Under § 21.15(a)

Comment: The Department of Defense should avoid take of migratory birds by avoiding areas inhabited by migratory birds including restricting construction and active use of airfields in the vicinity of wildlife refuges, prohibiting military operations over wildlife refuges or sensitive migratory bird habitat areas, and avoiding areas where migratory birds nest, breed, rest, and feed.

Service Response: Military lands often support a diversity of habitats and their associated species, including migratory birds; thus it would be difficult for the Armed Forces to completely avoid areas inhabited by birds or other wildlife species. When determining the location for a new installation, such as an airfield, the applicable Armed Force must prepare environmental documentation in accordance with the National Environmental Policy Act (42 U.S.C. 4321 et seq.) (NEPA) that gives due consideration to the impacts of the proposal on the environment, including migratory birds. With respect to wildlife refuges, Congress in the 2000 amendments to the National Wildlife Refuge System Administration Act noted specifically that the provisions of the Act relating to determinations of the compatibility of a use would not apply to overflights above a refuge (Pub. L. 106–580; December 29, 2000). Nevertheless, as noted in this rule, the Armed Forces have made significant investments in acquiring data on the distribution of bird populations and identification of migration routes, as well as the use of military lands for breeding, stopover sites, and over-wintering areas, to protect and conserve these areas. The Armed Forces actively utilize radar ornithology to plan new construction and testing and training operations in areas and times of least constraints. The Armed Forces also have a strong interest in avoiding bird/aircraft conflicts and use this type of information to assist range planners in selecting training times when bird activity is low.

In accordance with the Sikes Act (included in Pub. L. 105–85), the Department of Defense must provide for the conservation and rehabilitation of natural resources on military installations. Thus, potential conflicts with natural resources, including migratory birds, should be addressed in Integrated Resource Management Plans (INRMP), where applicable. Although the Sikes Act does not apply to the Coast Guard, they are also starting to encourage applicable bases to develop INRMPs.

Comment: Provision should be included that the Department of Defense cannot ignore scientific evidence and proceed on a course of action where take is inevitable.

Service Response: None of the four treaties strictly prohibit the taking of migratory birds without exception. Furthermore, the Service acknowledges that regardless of the entity implementing an activity, some birds may be killed even if all reasonable conservation measures are implemented. With the passage of the Authorization Act, Congress directed the Secretary to authorize incidental take by the Armed Forces. Thus, they will be allowed to take migratory birds as a result of military readiness activities, consistent with this rule. This rule, however, will continue to ensure conservation of migratory birds as it requires the Armed Forces to confer and cooperate with the Service to develop and implement conservation measures to minimize or mitigate adverse effects to migratory birds when scientific evidence indicates an action may result in a significant adverse effect on a population of a migratory bird species.

As stated in the Principles and Standards section of this rule, the Armed Forces will use the best scientific data available to assess through the NEPA process, or other environmental requirements, the expected impact of proposed or ongoing military readiness activities on migratory bird species likely to occur in the action areas.

Comment: The Department of Defense should not have the sole authority/responsibility to determine whether the survival of the species is threatened, and only then initiate consultation with the Service.

Service Response: We assume that, despite the commenter's use of the term ''consultation'', this is a reference to the requirement under § 21.15(a)(1) to ''confer and cooperate,'' and not to the requirement of ''consultation'' under section 7 of the Endangered Species Act (ESA), 16 U.S.C. 1536. Section 21.15(a)(1) does condition the requirement to ''confer and cooperate'' on a determination by the Armed Forces that a military readiness activity may result in a significant adverse effect on a population of a migratory birds species. However, we expect that the Armed Forces will notify the Service of any activity that even arguably triggers this requirement. In addition, putting aside the requirements of this regulation, the Armed Forces would, as a matter of course share such information in a number of circumstances.

First, NEPA, and its regulations at 40 CFR 1500–1508, require that Federal agencies prepare environmental impact statements for ''major Federal actions significantly affecting the quality of the human environment.'' These statements must include a detailed analysis of the impacts of an agency's proposed action and any reasonable alternatives to that proposal. NEPA also requires the responsible Federal official to ''consult

with and obtain comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved.''

Second, the Sikes Act (16 U.S.C. 670a-670o), as amended in 1997, requires the development of INRMPs by the Department of Defense that reflect the mutual agreement of the Department of Defense, the Service, and the appropriate State wildlife agency. The Sikes Act has provided the Service, as well as the public, with an opportunity to review natural resources management on military lands, including any major conflicts with migratory birds or their habitat. NEPA documentation is also completed on new or revised INRMPs. Department of Defense policy requires installations to review INRMPs annually in cooperation with the Service and State resource agencies. Annual reviews facilitate adaptive management by providing an opportunity for the parties to review the goals and objectives of the plans and to evaluate any new scientific information that indicates the potential for adverse impacts on population of a migratory bird species from ongoing (or new) military readiness activities.

Third, if the military readiness activity may affect a species listed under the ESA, the Armed Forces would communicate with the Service to determine whether formal consultation is necessary under section 7 of the ESA.

If, as a result these formal processes or by any other mechanism the Service obtains information which raise concerns about the impacts of military readiness on migratory bird populations, the Service can request additional information from the Armed Services. Under section 21.15(b)(2)(iii), failure to provide such information can form the basis for withdrawal of the authorization to take migratory birds. In any case, based on this information, the Service can, under appropriate circumstances, suspend or withdraw the authorization even if the Armed Forces do not themselves determine that a military readiness activity may result in a significant adverse effect on a population of a migratory bird species.

Comment: The threshold for requiring the Department of Defense to confer with the Service when a ''significant adverse effect on the sustainability of a population of migratory bird species of concern'' is too high. This could allow significant damage to resources that could be avoided with criteria that are more stringent.

Service Response: We agree. We have modified the threshold to ''significant adverse effect on a population of migratory bird species.'' The definitions of ''population'' and ''significant adverse effect'' have also been modified accordingly in this rule.

Comment: The provision that the rule must be promulgated with the concurrence of the Secretary of Defense requires the regulator to get permission of the regulated agency.

Service Response: The 2003 Defense Authorization Act required that the regulation be developed with the concurrence of the Secretary of Defense. However, as indicated in § 21.15(b), we have the authority to withdraw authorization if it is determined that a proposed military readiness activity may be in violation of any of the migratory bird treaties or otherwise is not being implemented in accordance with this regulation.

Comment: Encourage more emphasis on upfront planning and evaluation of minimum-impact alternatives to foster more opportunities to avoid or mitigate impacts.

Service Response: As stated in this rule, the Department of Defense currently incorporates a variety of conservation measures into their INRMP documents to address migratory bird conservation. Additional measures will be developed in the future with all the Armed Forces in coordination with the Service and implemented where necessary to avoid, minimize, or mitigate significant adverse effects on migratory bird populations. This rule also indicates the Armed Forces shall engage in early planning and scoping and involve agencies with special expertise in the matters related to the potential impacts of a proposed action.

Comment: The proposed rule grants the Department of Defense greater authority to take and kill migratory birds than authorized in the Defense Authorization Act, which is the only statutory authority for the proposed rule and requires that the Department of Defense minimize and mitigate impacts to migratory birds.

Service Response: We do not agree that the rule provides greater authority to take birds than authorized in the Defense Authorization Act. What this rule does is provide clarity regarding the processes the Armed Forces are required to initiate to minimize and mitigate adverse impacts of authorized military readiness activities on migratory birds while ensuring compliance with the migratory bird treaties and meeting the Secretary's obligations under Section 704 of the MBTA.

Comment: The rule should require mitigation options be formally assessed and evaluated prior to undertaking the activity and that mitigation be commensurate with the extent of the impact.

Service Response: We agree that mitigation can be very complex both from the perspective of replicating all the ecosystem components that a species needs to successfully survive and reproduce regardless of whether mitigation is ex-situ or in-situ.

The Service's Mitigation Policy (Fish and Wildlife Service Manual, 501 FW 2) is designed to assist the Service in the development of consistent and effective recommendations to protect and conserve valuable fish and wildlife resources to help ensure that mitigation be commensurate with the extent of the impact.

In addition, as indicated in this rule, the Armed Forces will confer and cooperate with the Service to develop and implement conservation measures when an ongoing or proposed activity may have a significant adverse effect on a population of migratory bird species. The public, and the Service, also have the opportunity to review and comment on proposed military readiness activities in accordance with NEPA.

Comment: Section 21.15(a) of the proposed regulation must be revised to provide a system of oversight by the Service both in determining whether Department of Defense military readiness activities would likely adversely impact a migratory bird population and in setting a timeline for the implementation of conservation measures.

Service Response: As previously indicated, the Service and the public have the opportunity to review and comment on proposed military readiness activities in accordance with NEPA or other environmental review. Thus, we will be provided an opportunity to evaluate whether a proposed activity may have an adverse effect on migratory bird populations.

Comment: Pursuant to authority granted by 10 U.S.C. 101 and 14 U.S.C. 1, the U.S. Coast Guard is a branch of the armed forces of the USA at all times. Under this authority, the Coast Guard engages in military readiness activities. Furthermore, under the definition of ''Secretary of Defense,'' the Department of Homeland Security is included with respect to military readiness activities of the U.S. Coast Guard. The rule should be revised accordingly to reflect this.

Service Response: Section 315 of the Authorization Act provides for the Secretary ''to prescribe regulations to exempt the Armed Forces for the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense or the Secretary of the military department concerned.'' We agree that

''Armed Forces'' includes the Coast Guard.

Comment: In order for potential impacts of the implementation of this rule to be effectively analyzed, the rule should not be categorically excluded. A full NEPA analysis should be conducted for the rule.

Service Response: Because of the broad spectrum of activities, activity locations, habitat types, and migratory birds potentially present that may be affected by this rule, it is not foreseeable or reasonable to anticipate all the potential impacts in a meaningful manner of military readiness activities conducted by the Armed Forces on the affected environment; thus it is premature to examine potential impacts of the rule in accordance with NEPA. We have determined that any environmental analysis of the rule would be too broad, speculative, and conjectural.

Part 516 Departmental Manual 2.3 A (National Environmental Policy Act Part 1508.4) allows an agency (Bureau) in the Department of Interior to determine if an action is categorically excluded from NEPA. We have made the determination that the rule is categorically excluded in accordance with 516 Departmental Manual 2, Appendix 1.10. This determination does not diminish the responsibility of the Armed Forces to comply with NEPA. Whenever the Armed Forces propose to undertake new military readiness activities or to adopt a new, or materially revised, INRMP where migratory bird species may be affected, the Armed Forces invite the Service to comment as an agency with ''jurisdiction by law or special expertise'' upon their NEPA analysis. In addition, if the potential for significant effects on migratory birds makes it appropriate, the Armed Forces may invite the Service to participate as a cooperating agency in the preparation of their NEPA analysis. Moreover, authorization under this rule requires that if a proposed military readiness activity may result in a significant adverse impact on a population of migratory bird species, the Armed Forces must confer and cooperate with the Service to develop and implement appropriate measures to minimize or mitigate these effects. The environmental consequences of the proposed military readiness activity, as well as the potential of any such measures to reduce the adverse impacts of the proposed activity, would be covered in NEPA documentation prepared for the proposed action.

Comment: Section 21.15(a) of the proposed regulation is unclear as to who is to determine that ongoing or proposed activities are likely to result in significant adverse effects.

Service Response: We have revised § 21.15(a) to clarify that this responsibility initially lies with the action proponent, i.e., the Armed Forces. Just as the Armed Forces make the initial determination that consultation is required under similar statutes, such as the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA) or the National Historic Preservation Act (16 U.S.C. 470), the action proponent will consider the likely effects of its proposed action and whether such effects require that it confer with the Service to develop and implement appropriate conservation measures to minimize or mitigate potential significant adverse effects. Where significant adverse impacts are likely, existing requirements under NEPA for federal agencies to prepare environmental documentation will ensure that both the public and the Service have an opportunity to review a proposed action and the Armed Force's determination with respect to migratory birds.

The Service and State wildlife agencies (and the general public if plan revisions are proposed) also have an opportunity to review the Department of Defense's management of installation natural resources, including the impacts of land use on such resources, during the quintennial review of INRMPs for Department of Defense lands. Consultation under the Endangered Species Act offers yet another opportunity for the Service to provide input on the potential effects of a proposed military readiness activity on federally listed migratory birds.

Comment: The document uses both the terms ''may'' affect migratory birds and ''likely'' to affect migratory birds. ''May'' should be used to be consistent with the NEPA threshold for impacts on the environment.

Service Response: The Service has intentionally established different standards for when the Armed Forces are required to confer with the Service and for when we may propose withdrawal of authorization. We have established a broad standard for triggering when the Armed Forces must notify the Service of potential adverse effects on migratory birds. We agree that requiring the Armed Forces to confer with the Service when applicable activities ''may'' result in a significant adverse effect is consistent with the analysis threshold utilized in NEPA. The Secretary determined that the more restrictive threshold of suspending or withdrawing authorization was warranted when a military readiness activity likely would not be compatible with one or more of the treaties or is likely to result in a significant adverse effect on a migratory bird population.

Withdrawal of Take Authorization § 21.15(b)

Comment: The Department of Defense is given too much decision power in the rule. Concern was expressed that the final decision regarding whether a military readiness activity is authorized or not is made by political appointees rather than unbiased career employees.

Service Response: Our political system is based upon a structure whereby policy decisions are made by political appointees rather than career employees. To address what may be perceived as too much power by the Armed Forces, it is the Secretary of the Interior who has, and retains, the final determination regarding whether an activity is authorized under the MBTA, not the Secretary of Defense.

Comment: The rule should require sufficient monitoring to detect significant impacts and provide for diligent oversight by the Department of the Interior to head off problems well before jeopardy is near and withdrawal of authorization is suspended or proposed to be withdrawn.

Service Response: We concur that monitoring can play a key role in providing valuable data needed to evaluate potential impacts of activities, inform conservation decisions, and evaluate effectiveness of conservation measures. For monitoring to be relevant, it should focus on specific objectives, desired outcomes, key hypotheses, and conservation measures. As stated in § 21.15(b)(2)(ii) of the rule, in instances where it is appropriate, the Armed Forces are required to ''conduct mutually agreed upon monitoring to determine the effects of military readiness activity on migratory bird species and/or the efficacy of the conservation measures implemented by the Armed Forces.'' This rule also states that the Armed Forces will consult with the Service to identify techniques and protocols to monitor impacts of military readiness activities. We have also added additional text clarifying the monitoring requirements of the Armed Forces.

Comment: The procedure for withdrawal of the authority is so cumbersome and subject to so many exclusions as to make the withdrawal procedure non-functional.

Service Response: We have clarified the procedures for when the Secretary may propose withdrawing authorization in § 21.15(b)(2), (4) and (5).

Comment: The statutory language of the Defense Authorization Act says

nothing about requiring input from the State Department prior to suspending authorization. Thus, the rule needlessly goes beyond its statutory authority.

Service response: In accordance with the MBTA (16 U.S.C. 704), the Secretary of the Interior has the authority to ''determine when, and to what extent, if at all, and by what means, it is compatible with the terms of the conventions to allow hunting, taking, capture, killing * * * and to adopt suitable regulations permitting and governing the same.'' The Defense Authorization Act does not limit that authority. Requiring the input of the State Department is within the standards of § 704.

Comment: The provision that the Secretary must seek the view of the Department of Defense prior to suspending authorization due to a violation with any of the treaties it affects permits the Department of Defense to itself determine its compliance with the migratory bird treaties. The statutory language of the Defense Authorization Act did not address this in any way.

Service Response: Section 21.15(b)(1) of this regulation provides that the Secretary retains the discretion to make the ultimate determination that incidental take of migratory birds during a specific military readiness activity would be incompatible with the treaties. Although the Defense Authorization Act required the Secretary to promulgate a regulation, it did not mandate the specific text or all of the conditions in this regulation. This regulation is consistent with the Defense Authorization Act as well as with 16 U.S.C. 704. Moreover, seeking the views of the Armed Forces is appropriate given the possible impacts that suspension of the take authorization could have on national security. Similarly, consulting with the State Department on issues of treaty interpretation is appropriate because of the State Department's expertise and authority in this area as well as its responsibility for maintaining the relationship of the United States with its treaty partners.

Comment: The Secretary should not have unilateral power to suspend or withdraw take authorization as the Defense Authorization Act states the Secretary must exercise authority with the concurrence of the Secretary of Defense.

Service Response: In accordance with § 315(d)(1) and (2) of the Authorization Act, the regulation ''to exempt the Armed Forces for the incidental take of migratory birds during military readiness activities'' shall be developed by the Secretary of the Interior with the concurrence of the Secretary of Defense. However, the Defense Authorization Act does not restrict or limit our authority in 16 U.S.C. 704 and 712 relative to administering and enforcing the MBTA and complying with the four migratory bird treaties.

Definitions § 21.3

Comment: Incidental take is not defined in the rule or the Defense Authorization Act. Concern was expressed that the Department of Defense being authorized to take migratory birds incidental to military readiness activities without ''incidental'' being defined will result in the Department of Defense reading this as the ability to actively kill migratory birds and destroy their habitat in anticipation of the potential for such problems.

Service Response: Current regulations authorize permits for take of migratory birds for activities such as scientific research, education, and depredation control (50 CFR parts 13, 21 and 22). However, these regulations do not expressly address the issuance of permits for incidental take. ''Incidental take of migratory birds'' is not defined under the MBTA or in any subsequent regulation, and the Service does not anticipate having a regulatory definition for ''incidental take'' in the short term. Neither the MBTA, the Defense Authorization Act, nor this rule authorize the take of migratory birds simply in anticipation of the potential for future problems, i.e., removing the potential source of problems before any conflicts may arise with military readiness activities.

Comment: Blanket exemption for any and all military readiness activities should not be authorized. In particular, those activities that involve acquisition of new land and construction of facilities in sensitive migratory bird habitat areas should not be authorized. Authorization to take birds should only include those types of activities that are too time or mission-sensitive for thorough evaluation, and where incidental take is unavoidable.

Service Response: As defined in the 2003 Defense Authorization Act, military readiness activities include all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Military readiness does not include (a) routine operation of installation operating support functions, such as: administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; morale, welfare, and recreation activities; shops; and mess halls, (b) operation of industrial activities, or (c) construction or demolition of facilities listed above.

Acquisition of lands by the Armed Forces is not covered by this authorization as the acquisition itself does not take birds even when the land is being acquired for implementing future military readiness activities. In accordance with NEPA, environmental analysis of any major Federal agency action, which may include land acquisition and future proposed activities on these lands, must be addressed prior to the action occurring. Likewise, construction of facilities in sensitive migratory bird habitat would be addressed through NEPA.

Comment: The rule covers all military branches of service and includes contractors and agents. These should be clearly delineated in order to minimize the number of exempt entities.

Service Response: The rule applies to contractors only when such contractors are performing a military readiness activity in association with the Armed Forces—i.e., the contractors are performing a federal function. For example, a contractor training troops on the operation of a new weapons system or testing its interoperability with existing weapons systems would be covered. The regulation does not cover routine contractor testing performed at an industrial activity that is privately owned and operated.

Comment: The Defense Authorization Act does not limit applicability of minimization and mitigation measures to just ''species of concern'' but applies to all ''affected species of migratory birds.'' In addition, concern was expressed that this level of threshold could result in avoidable impacts to species that are not included in the ''species of concern lists'' but are nevertheless valuable public resources.

Service Response: We agree that the Defense Authorization Act is not specifically limited to species of concern, nor did we envision that the rule prevents the Armed Forces from addressing adverse impacts on all affected species of migratory birds through the NEPA process, including those that are locally endemic or otherwise have limited distribution within a State. The rule has been modified by requiring the Armed Forces to confer with the Service when they determine an action may result in a significant adverse effect on the

population of any migratory bird species.

Comment: Use of population status at the Bird Conservation Region (BCR) level as a criterion for action could reduce consideration of locally important bird resources, concentrations of birds and special habitats, and populations that do not coincide closely with BCRs.

Service Response: We have revised the definition of population so that it is not based upon species distribution or occurrence within a Bird Conservation Region and thus eliminates the concerns expressed above. As used in the rule, a population is defined as ''a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.''

What constitutes a population for the purposes of determining potential effects of military readiness activities will be scientifically based. A population could be defined as one that occurs spatially across a geographically broad area, such as the Western Atlantic red knot population that migrates along the Atlantic seaboard, to a more geographically limited species, such as breeding population of Bicknell's thrush whose breeding range is limited to mountain tops in the northeastern U.S. and southeastern Canada. When requested, the Service will provide technical assistance to the Armed Forces in identifying specific populations of migratory bird species that may be affected by a military readiness activity.

Comment: The definition of conservation measure does not adequately recognize international treaty obligations and the right of the Secretary of the Interior to withdraw take authorization should the treaties be violated. In the definitions, after the words ''while allowing for completion of the action in a timely manner,'' insert ''if such action would be consistent with the international treaties underlying the MBTA.''

Service Response: If conservation measures implemented by the Armed Forces in accordance with the rule are not sufficient to render the action compliant with the treaties, the Secretary will suspend the authorization. Failure to implement conservation measures is not the sole criterion for proposing withdrawal.

Comment: ''Conservation measures'' is defined to include monitoring when it has the potential to produce data relevant to substantiating impacts, validating effectiveness of mitigation, or providing other pertinent information. However, in the absence of a monitoring requirement, this provision is unworkable.

Service Response: Monitoring is required in § 21.15(b)(ii) of the rule. This section indicates that the Department of Defense's failure ''to conduct mutually agreed upon monitoring to determine the effects of military readiness activity on migratory bird species and/or the efficacy of the conservation measures implemented by the Department of Defense'' is potential cause for the Secretary to propose withdrawing authorization. However, as indicated in the response below, reference to monitoring has been removed from the definition of conservation measures.

Comment: Monitoring should not be considered a conservation measure, rather it should be conducted separately and apart from any necessary and reasonable mitigation actions.

Service Response: Although monitoring can play a key role in the continued growth of bird conservation by providing the information needed to inform conservation decisions and evaluate their effectiveness, we have removed it from the definition of conservation measures.

Comment: The threshold of ''significant adverse effect on the sustainability of a population'' is too high.

Service Response: The threshold for when the Armed Forces will be required to confer with the Service and implement appropriate conservation measures has been modified to when a ''significant adverse effect on a population of migratory bird species'' may result from an ongoing or proposed military readiness activity. The definition of significant adverse effect has also been accordingly revised in the rule.

Comment: The rule has a different standard than what was indicated by Congress in the Defense Authorization Act. The Act indicates measures are to be identified that minimize and mitigate ''any adverse impacts'' not just ''significant adverse effects.'' The Service is inserting thresholds of both likelihood and significance that are not any way implied by the statute.

Service Response: As indicated in Section 315(b) of the Authorization Act, the identification of measures to minimize and mitigate *any adverse impacts* of authorized military readiness activities pertains to the period of interim authority. The standard for authorization of take is established by the Secretary's authority under § 704 of the MBTA, whereby in exercising this authority he/she may prescribe regulations that exempt the Armed Forces for the incidental taking of migratory birds during military readiness activities. As indicated in the rule, the Secretary established thresholds for granting authority to incidentally take migratory birds. For those military readiness activities that would not have a significant adverse effect on migratory bird species populations take is authorized without conferring with the Service, subject to the withdrawal provision of § 21.15(b)(1). If a proposed or ongoing activity may result in a significant adverse effect, the Armed Forces must confer and cooperate with the Service. Take authorization would be suspended or withdrawn only when a military readiness activity likely would not be compatible with one or more of the treaties or is likely to result in a significant adverse effect on a migratory bird population.

Comment: Conservation measures that are project designs or mitigation activities should be changed from those that are ''reasonable and feasible'' to ''reasonable and necessary.'' This will result in a conservation measure that is appropriate to its purpose and essential to conservation.

Service Response: This revision has been made to the definition of conservation measures.

Comment: ''Conservation measures'' fails to place any restrictions or requirements on the amount of time that the Department of Defense would be given to apply the mitigation actions. The phrase ''over time'' implicitly grants the Department of Defense the ability to ignore the need for immediate action to counter adverse impacts.

Service Response: ''Over time'' was deleted from the definition.

Supplementary Information Section

Many comments were received on the Supplementary section of the proposed rule which did not pertain to any recommended revisions to § 21.15. These were taken into consideration in the final rule.

Comment: Ambiguous terms such as ''should,'' ''encourage,'' ''anticipates,'' etc., relative to Department of Defense activities contributing towards the conservation of migratory birds should be replaced with stronger terms such as ''require.''

Service Response: The **SUPPLEMENTARY INFORMATION** text has no

regulatory force and thus use of stronger terms has no regulatory weight. However, this comment was given due consideration and several revisions were made to strengthen the measures the Armed Forces are currently undertaking to address migratory bird conservation. These terms are not applicable in the actual rule, and therefore, no revisions were made relative to the authorization in this regard.

Comment: Integrated Natural Resources Management Plans (INRMPs) as informal mechanisms may not provide prompt and diligent efforts to minimize permitted take of birds. State wildlife agencies encourage more rigorous and thorough planning requirements and offer their considerable expertise and assistance.

Service Response: The Sikes Act Improvement Act of 1997 (included in Pub. L. 105–85) requires the development and implementation of INRMPs for relevant Department of Defense installations and mandates that plans be prepared in cooperation with the Service and State fish and wildlife agencies. The purpose of INRMPs is to plan natural resource management activities within the capabilities of the biological setting to support military training requirements. Although the Sikes Act does not apply to the Coast Guard, the Coast Guard is also starting to encourage their bases to address natural resource activities through INRMPs. The Service has been and continues to be committed to expanding partnerships with the Department of Defense. Updated Department of Defense guidance stresses that installations shall work in cooperation with the Service and States while developing or revising INRMPs. Each installation will invite annual feedback from the Service and States concerning how effectively the INRMP is being implemented. Installations have also established and maintain regular communications with the Service and State fish and wildlife agencies to address issues concerning natural resources management including migratory birds.

The Sikes Act also offers opportunities beyond the INRMP process for States and the Service to offer their expertise and assistance on military lands and with respect to migratory birds. For example, under the Sikes Act, the Department of Defense can enter into cooperative agreements with the Service, States, and nonprofit organizations to benefit birds and other species. Programs such as the Chesapeake Bay Program, Coastal America, and Partners In Flight also offer opportunities to partner with States and to share information and advice.

Comment: If the Service must rely on INRMPs for monitoring and mitigation of bird take, we recommend a requirement to complete, revise, and update plans to address bird monitoring and assessment of military readiness impacts and that migratory bird conservation activities receive adequate funding.

Service Response: The Sikes Act and Department of Defense guidance provide mechanisms to address emerging needs related to bird monitoring and assessment of military readiness impacts. The Sikes Act requires INRMPs to be reviewed, and revised as necessary, as to operation and effect by the parties (i.e., the Service and State resource agencies) on a regular basis, but not less often than every 5 years. In October 2004, the Department of Defense issued supplemental guidance for implementation of the Sikes Act relating to INRMP reviews. Department of Defense policy requires installations to review INRMPs annually in cooperation with the Service and State resource agencies. Annual reviews facilitate adaptive management by providing an opportunity for the parties to review the goals and objectives of the plans and to establish a realistic schedule for undertaking proposed actions. During annual reviews of the INRMPs, the Department of Defense will also discuss with the Service conservation measures implemented and the effectiveness of these measures in avoiding, minimizing, or mitigating take of migratory birds.

This rule relies on the Armed Forces utilizing the NEPA process to determine whether any ongoing or proposed military readiness activity is likely to result in a significant adverse effect on a population of a migratory bird species. The rule requires the Armed Forces to develop and implement appropriate conservation measures if a proposed action may have a significant adverse effect on a population of migratory bird species. To ensure that such conservation measures adequately address impacts to migratory birds, the rule also requires the Armed Forces to monitor the effects of such military readiness activities on migratory bird species taken during the military readiness activities at issue, and to retain records of these measures and monitoring data for 5 years from the date the Armed Forces commence their action.

Comment: We do not believe that impacts addressed by this rule can be adequately monitored or remedied without commitment of more resources to gather new bird data, conduct additional efforts to monitor impacts, or spend more money.

Service Response: Although the rule requires the Armed Forces to conduct mutually agreed upon monitoring to determine the effects of a military readiness activity on migratory bird species and the efficacy of the conservation measures implemented by the Armed Forces, we cannot require the Armed Forces to provide additional funding or resources towards monitoring. However, we do agree that monitoring is an important component of activities the Armed Forces undertake to address migratory bird conservation. We have expanded the monitoring discussion under ''Rule Authorization'' below.

Comment: Concern was expressed that the proposed broad exemption will be perceived as precluding the need for full NEPA consideration for covered activities.

Service Response: As stated in this rule, the Armed Forces will continue to be responsible for being in compliance with NEPA, and all other applicable regulations, and ensuring that whenever they propose to undertake new military readiness activities or to adopt a new, or materially revised, INRMP and migratory bird species may be affected, the Armed Forces invite the Service to comment as an agency with ''jurisdiction by law or special expertise'' upon their NEPA analysis. In addition, if the potential for significant effects on migratory birds makes it appropriate, the Armed Forces may invite the Service to participate as a cooperating agency in the preparation of their NEPA analysis. Moreover, authorization under this rule requires that if a proposed military readiness activity may result in a significant adverse impact on a population of migratory bird species, the Armed Forces must confer and cooperate with the Service to develop and implement appropriate measures to minimize or mitigate these effects. The environmental consequences of the proposed military readiness activity, as well as the potential of any such measures to reduce the adverse effects of the proposed activity, would be covered in NEPA documentation prepared for the proposed action.

Comment: The Department of Defense should be required to demonstrate that all ''practicable'' means of avoiding the ''take'' of migratory birds have been considered prior to the implementation of a new readiness program or construction of a new installation.

Service Response: The Armed Forces will be addressing ''take'' in a variety of ways. As stated above, through the NEPA process, the environmental consequences of their proposed military readiness activities will be evaluated, as well as any measures to reduce take of migratory birds. In addition, the INRMPs currently incorporate conservation measures to address migratory bird conservation. The Service will continue to work with the Armed Forces to develop additional measures in the future.

Comment: Nowhere does the rule mention how and when the Department of Defense will assess current, ongoing activities for which NEPA compliance is complete. The rule should be amended to require, within a specified time period of 90–120 days, a report by the Department of Defense to the Secretary on the impacts of their current military readiness activities on migratory birds.

Service Response: As a preliminary matter, it is important to note that where NEPA compliance has been completed, that compliance should have included consideration of the impacts on migratory birds. Since the enactment of NEPA, the Service has been notified of, and provided the opportunity to comment on, proposed military readiness activities that have the potential for significant impacts on the environment, including significant impacts on migratory birds. Nevertheless, it is possible that ongoing military readiness activities might in the future be determined to meet the threshold for the requirement under § 21.15(a)(1) to ''confer and cooperate.'' There are at least three mechanisms in place that require the Armed Forces to address environment impacts of ongoing activities for which NEPA is complete; supplementary statements under NEPA, INRMP reviews, and the monitoring requirements in the rule.

In accordance with NEPA Part 1502.9, an agency shall prepare a supplement to either a draft or a final environmental impact statement whenever: (1) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (2) the agency learns of significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. This rule relies on the Armed Forces to use the NEPA process to determine whether an ongoing military readiness activity may result in a significant adverse effect on a population of a migratory bird species.

The Sikes Act (16 U.S.C. 670a–670o), enacted in 1960, has required cooperation among the Department of Defense, the Service, and State wildlife agencies. The 1997 amendments to the Sikes Act require the development of INRMPs that reflect the mutual agreement of the Department of Defense, the Service, and the appropriate State wildlife agency. The Sikes Act provides the Service, as well as the public, an opportunity to review natural resources management on military lands, including any potential effects on migratory birds or their habitat. NEPA documentation is prepared to support new or revised INRMPs. Department of Defense policy requires installations to review INRMPs annually in cooperation with the Service and State resource agencies. Annual reviews facilitate adaptive management by providing an opportunity for the parties to review the goals and objectives of the plans and to evaluate any new scientific information that indicates the potential for adverse impacts on migratory birds from new or ongoing military readiness activities. In addition, during annual INRMP reviews, the Department of Defense, the Service and the State resources agency evaluate the conservation measures implemented and the effectiveness of these measures in avoiding, minimizing, or mitigating take of migratory birds.

This rule requires the Armed Forces to develop and implement appropriate conservation measures if a proposed action may have a significant adverse effect on a population of migratory bird species. When conservation measures implemented in accordance with § 21.15(a)(1) require monitoring, the Armed Forces must retain records of these measures and monitoring data for 5 years from the date the Armed Forces commence their action.

Comment: We disagree with the interpretation of the statute that Congress ''signaled that the Department of Defense should give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities, but not at the expense of diminishing the effectiveness of such activities.'' This suggests a diminishment of protection for migratory birds. It was Congress's intent that the Department of Defense should not be forced to halt these activities but rather should modify them to minimize impacts, or, if such activities cannot be practicably altered to minimize impacts, that mitigation measures must be in place to ensure conservation of migratory birds.

Service Response: This rule will not diminish the protection of migratory birds. Rather, by requiring the Armed Forces to confer with the Service to develop and implement conservation measures when a military readiness activity may significantly affect a population of a migratory bird species, a greater benefit to birds will result than the current status operandi. Increased coordination and technical assistance between the Service and the Armed Forces will reduce the number of migratory birds that are incidentally taken as a result of military readiness activities.

Measures Taken by the Armed Forces To Minimize and Mitigate Takes of Migratory Birds

As the basis for this rule, under the authority of the MBTA and in accordance with Section 315 of the Authorization Act, the Armed Forces will consult with the Service to identify measures to minimize and mitigate adverse impacts of authorized military readiness activities on migratory birds and to identify techniques and protocols to monitor impacts of such activities. The inventory, avoidance, habitat enhancement, partnerships, and monitoring efforts described below illustrate the efforts currently undertaken by the Armed Forces to minimize or mitigate adverse impacts to migratory birds from testing and training activities to maintain a ready defense. Additional conservation measures, designed to minimize and mitigate adverse impacts of authorized military readiness activities on affected migratory bird species, with emphasis on species of concern, will be developed in joint coordination with the Service when evaluation of specific military readiness activities indicates the need for additional measures.

We have a long history of working with natural resources managers at Armed Forces installations through our Field Offices to develop and implement these conservation initiatives. Many of the conservation measures detailed below represent state-of-the-art techniques and practices to inventory, protect, and monitor migratory bird populations. In accordance with provisions of the Sikes Act, as amended, these conservation measures are detailed in Department of Defense INRMPs for specific installations and endorsed by the Service and State fish and wildlife agencies. Additional conservation measures may be incorporated into future revisions of the INRMPs if determined necessary during their quintennial review.

Bird Conservation Planning. The Department of Defense prepares INRMPs for most Department of Defense installations. Under the Sikes Act, the Department of Defense must provide for the conservation and rehabilitation of natural resources on military

installations. To facilitate the program, the Secretary of Defense prepares and implements an INRMP for each military installation in the United States on which significant natural resources are found. The resulting plans must reflect the mutual agreement of the military installation, the Service, and the appropriate State fish and wildlife agency on conservation, protection, and management of fish and wildlife resources. The importance of a cooperative relationship among these parties is also stressed in Department of Defense and Service guidances concerning INRMP development and review. In accordance with the Department of Defense guidance, each installation will invite annual feedback from the Service and States concerning how effectively the INRMP is being implemented. Installations also maintain regular communications with the Service and State fish and wildlife agencies to address issues concerning natural resources management including migratory birds. Although the Sikes Act does not apply to the Coast Guard, they are also starting to encourage applicable bases to develop INRMPs.

INRMPs incorporate conservation measures addressed in Regional or State Bird Conservation Plans to ensure that the Department of Defense does its part in landscape-level management efforts. INRMPs are a significant source of baseline conservation information and conservation initiatives used to develop NEPA documents for military readiness activities. This linkage helps to ensure that appropriate conservation measures are incorporated into mitigation actions, where needed, that will protect migratory birds and their habitats.

To-date, over 370 INRMPs have been approved. Through cooperative planning in the development, review and revision of INRMPs, the Department of Defense, the Service and the States can effectively avoid or minimize adverse impacts on migratory bird populations. Through this process, the Service and the Department of Defense will continue to work together to design and develop monitoring surveys that effectively evaluate population trends and cumulative impacts on installations.

The Fish and Wildlife Conservation Act of 1980, as amended in 1988, directs the Secretary of the Interior to ''identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation action, are likely to become candidates for listing under the Endangered Species Act of 1973.'' This list is prepared and updated at 5-year intervals by the Service's Division of Migratory Bird Management. The current list of the ''Birds of Conservation Concern'' is available at *http://migratorybirds.fws.gov/reports/bcc2002.pdf*.

''Birds of Conservation Concern 2002'' includes species that are of concern because of (a) documented or apparent population declines, (b) small or restricted populations, or (c) dependence on restricted or vulnerable habitats. It includes three distinct geographic scales: Bird Conservation Regions, Service Regions, and National. The Service Regions include the seven Service Regions plus the Hawaiian Islands and Puerto Rico/U.S. Virgin Islands.

Bird Conservation Regions (BCRs), adopted by the North American Bird Conservation Initiative (NABCI), are the most basic geographical unit by which migratory birds are designated as birds of conservation concern. The BCR list includes certain species endemic to Hawaii, the Pacific Island territories, and the U.S. Caribbean Islands that are not protected by the MBTA, and thus are not subject to this rule. These species are clearly identified in the list. The complete BCR list contains 276 species. NABCI is a coalition of U.S., Canadian, and Mexican governmental agencies and private organizations working together to establish an inclusive framework to facilitate regionally based, biologically driven, landscape-oriented bird conservation partnerships. A map of the NABCI BCRs can be viewed at *http://www.nabci-us.org*.

The comprehensive bird conservation plans, such as the North American Waterfowl Management Plan, the U.S. Shorebird Conservation Plan, Partners in Flight (PIF) Bird Conservation Plans, and the North American Waterbird Conservation Plan, are the result of coordinated partnership-based national and international initiatives dedicated to migratory bird conservation. Each of these initiatives has produced landscape-oriented conservation plans that lay out population goals and habitat objectives for birds. Additional information on these plans and their respective migratory bird conservation goals can be found at:

North American Waterfowl Management Plan (*http://birdhabitat.fws.gov/NAWMP/nawmphp.htm*).

North American Waterbird Conservation Plan (*http://www.waterbirdconservation.org*).

U.S. Shorebird Conservation Plan (*http://shorebirdplan.fws.gov/*).

Partners in Flight (*http://www.partnersinflight.org*).

Conservation Partnerships. The Department of Defense has entered into a number of conservation partnerships with nonmilitary partners to improve habitats and protect avian species. In 1991, the Department of Defense, through each of the military services, joined the PIF initiative. The Department of Defense developed a PIF Strategic Plan in 1994, and revised it in 2002. The Department of Defense PIF program is recognized as a model conservation partnership program. Through the PIF initiative, the Department of Defense works in partnership with over 300 Federal and State agencies and nongovernmental organizations (NGOs) for the conservation of neotropical migratory and resident birds and enhancement of migratory bird survival. For example, bases have worked with NGOs to develop management plans that address such issues as grazing and the conversion of wastewater treatment ponds to wetlands and suitable habitat. Universities use Department of Defense lands for migratory bird research and, on occasion, re-establish nesting pairs to take advantage of an installation's hospitable habitat. The Department of Defense PIF program tracks this research and provides links between complementary research on different installations and service branches.

The Authorization Act included a provision that allows the Department of Defense to provide property at closed bases to conservation organizations for use as habitat and another provision that, in order to lessen problems of encroachment, allows the Department of Defense to purchase conservation easements on suitable property in partnership with other groups. Where utilized, these provisions will offer further conservation benefits to migratory birds.

Bird Inventories. The most important factor in minimizing and mitigating takes of migratory birds is an understanding of when and where such takes are likely to occur. This means developing knowledge of migratory bird habits and life histories, including their migratory paths and stopovers as well as their feeding, breeding, and nesting habits.

The Department of Defense implements bird inventories and monitoring programs in numerous ways. Some Department of Defense installations have developed partnerships with the Institute for Bird Populations to Establish Monitoring Avian Productivity and Survivorship (MAPS) stations. The major objective of

the MAPS program is to contribute to an integrated avian population monitoring system for North American land birds by providing annual regional indices and estimates for four populations and demographic parameters for select target species in seven different regions of North America. The MAPS methodology provides annual regional indices of adult population size and post-fledgling productivity from data on the numbers and proportions of young and adult birds captured; annual regional estimates of adult population size, adult survivorship, and recruitment into the adult population from capture-recapture data on adult birds; and additional annual estimates of adult population size from point-count data collected in the vicinity of MAPS stations. Without these critical data, it is difficult or impossible to account for observed population changes. The Department of Defense is helping to establish a network of MAPS stations in all seven biogeographical regions and build the program necessary to monitor neotropical migratory bird population changes nationwide. Approximately 20% of the continental MAPS network involves military lands.

Since the early 1940s, radar has been used to monitor bird migration. The newest weather surveillance radar, WSR–88D or NEXRAD (for Next Generation Radar), is ideal for studies of bird movements in the atmosphere. This sophisticated radar system can be used to map geographical areas of high bird activity (e.g., stopover, roosting and feeding, and colonial breeding areas). It also provides information on the quantity, general direction, and altitudinal distribution of birds aloft. Currently, the United States Air Force is using NEXRAD, via the U.S. Avian Hazard Advisory System (AHAS), to provide bird hazard advisories to all pilots, military and civilian, in an attempt to warn air traffic of significant bird activity. The information is publicly available for the contiguous United States on line at *http://www.usahas.com* and will soon be available for the State of Alaska.

NEXRAD information is critically important for the protection of habitats used by migratory birds during stopover periods. This information is vital to Department of Defense land managers who protect stopover areas on military land. The data is also particularly important to land managers of military air stations where bird/aircraft collisions threaten lives and cost millions of dollars in damages every year. The Department of Defense established a partnership with the Department of Biological Sciences at Clemson University to collect, analyze, and use the biological information from the NEXRAD network to identify important stopover habitat in relation to Department of Defense installations. Initial efforts were concentrated in the Southeast to complement existing radar data from the Gulf Coast. This partnership has enabled the collection and transfer of radar data from all NEXRAD sites, via modem, to one remote station at Clemson University, where the data can be archived and analyzed.

The Department of Defense uses bird inventory and survey information in connection with the preparation of INRMPs. The Department of Defense also uses bird inventory and survey information when undertaking environmental analyses required under the NEPA. An environmental assessment or an environmental impact statement is used to determine the potential effects of any new, planned activity on natural resources, including migratory birds.

The Department of Defense PIF program is currently developing a database of migratory bird species of concern that are likely to occur on each installation utilizing the Service's published list of Birds of Conservation Concern (*http://migratorybirds.fws.gov/reports/bcc2002.pdf*); priority migratory bird species documented in the comprehensive bird conservation plans (North American Waterbird Conservation Plan (*http://www.waterbirdconservation.org*), United States Shorebird Conservation Plan (*http://shorebirdplan.fws.gov*), Partners in Flight Bird Conservation Plans (*http://www.partnersinflight.org/*); species or populations of waterfowl identified as high, or moderately high, continental priority in the North American Waterfowl Management Plan; listed threatened and endangered bird species in 50 CFR 17.11; and Migratory Bird Treaty Act-listed game birds below desired population sizes (*http://migratorybirds.fws.gov/reports/reports.html*).

Avoidance. Avoidance is the most effective means of minimizing takes of migratory birds. Where practicable, the Department of Defense avoids potentially harmful use of nesting sites during breeding and nesting seasons and of resting sites on migratory pathways during migration seasons. Avoidance sometimes involves using one area of a range rather than another. On some sites in which bombing, strafing, or other activities involving the use of live military munitions could affect birds in the area, the Department of Defense may conduct an initial, benign sweep of the site to ensure that any migratory birds in the area are dispersed before live ordnance is used. Another tool used by the Department of Defense to deconflict flight training activities is the U.S. Air Force Bird Avoidance Model (BAM). This model places breeding bird and Christmas count data into a Geographic Information Systems model to assist range planners in selecting training times when bird activity is low. The BAM is available online at the *http://www.usahas.com* Web site.

Pesticide Reduction. Reducing or eliminating pesticide use also benefits migratory birds. The Armed Forces maintain an integrated pest management (IPM) program that is designed to reduce the use of pesticides to the minimum necessary. The Department of Defense policy requires all operations, activities, and installations worldwide to establish and maintain safe, effective, and environmentally sound IPM programs. IPM is defined as a planned program, incorporating continuous monitoring, education, record-keeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, material, or the environment. IPM uses targeted, sustainable (i.e., effective, economical, and environmentally sound) methods, including education, habitat modification, biological control, genetic control, cultural control, mechanical control, physical control, regulatory control, and the judicious use of least-hazardous pesticides. Department of Defense policy mandates incorporation of sustainable IPM philosophy, strategies, and techniques in all aspects of Department of Defense pest management planning, training, and operations, including installation pest-management plans and other written guidance to reduce pesticide risk and prevent pollution.

Habitat Conservation and Enhancement. Habitat conservation and enhancement generally involve improvements to existing habitat, the creation of new habitat for migratory birds, and enhancing degraded habitats. Improvements to existing habitat include wetland protection, maintenance and enhancement of forest buffers, elimination of feral animals (in particularly feral cats) that may be a threat to migratory birds, and elimination of invasive species that crowd out other species necessary to migratory bird survival. Examples of the latter include control and elimination of brown tree snake, Japanese honeysuckle, kudzu, and brown-headed cowbirds.

Efforts to eliminate invasive species are being undertaken in association with natural resources management under Sikes Act INRMPs. For example, at one site, grazing was reduced from more than 60,000 to about 23,000 acres, and has become a management tool to enhance the competitive advantage of native plants, especially perennial grasses. Special projects are under way on Department of Defense property to control exotic plants and to remove unused structures that occupy potentially valuable habitat or unnaturally increase predator populations. At some locations, native forest habitat is being reestablished.

The preparation of INRMPs continues to offer opportunities to consider such land management measures as converting to uneven-age and/or other progressive forest management that enhances available habitat values, establishing native warm-season grasslands, maintaining and enhancing bottomland hardwood forests, and promoting positive water-use modifications to improve hydrology and avian habitat in arid areas. Department of Defense installations are active in promoting the use of nest boxes and, where appropriate, the use of communications towers for nesting. In addition, the Department of Defense PIF program has prepared fact sheets addressing such issues as communications towers and power lines, West Nile virus, wind energy development, the Important Bird Areas program, and bird/aircraft strike hazards (BASH).

Other. At a few sites where the potential for migratory bird take is more severe, the Department of Defense has implemented extensive mitigation measures. In such instances, the responsible military service has taken practicable measures to minimize the impacts of its operations on protected migratory birds. Such measures include limiting the type and quantity of ordnance; limiting target areas and activities to places and times that protect key nesting areas for migratory birds; implementing fire-suppression programs or measures where wildfire can potentially damage nesting habitat; conducting environmental monitoring; and implementing mitigation measures, such as predator removal, on the site or nearby.

Monitoring the Impacts of Military Readiness Activities on Migratory Birds

The Authorization Act requires the Armed Forces to identify measures to monitor the impacts of military readiness activities on migratory birds. For military lands where migratory bird data may be lacking, monitoring may include the collection of baseline demographic, population, or habitat-association data. Where feasible, the Armed Forces will conduct agreed-upon monitoring to determine the level of take from military readiness activities.

Monitoring provides important data regarding the impacts of military readiness on migratory birds. It also contributes valuable information where data on species of migratory birds may be limited. In addition, monitoring data assists the Armed Forces in guiding their decisions regarding migratory bird conservation, particularly in developing or amending INRMPs.

The Department of Defense monitors bird populations that may be affected by military readiness activities in numerous ways. In addition to the MAPS program discussed above, Department of Defense facilities participate in the Breeding Biology Research and Monitoring Database (BBIRD) program to study nesting success and habitat requirements for breeding birds. Many installations also engage in Christmas bird counts, migration counts (Point, Circle, Area, or Flyover Counts), standardized and/or customized breeding and wintering point counts, grassland-bird flush counts, NEXRAD (discussed above) and BIRDRAD studies, point count surveys, hawk watches, overflight surveys, and/or rookery surveys. At sites where bird takes are a concern, such as Farallon de Medinilla in the Northern Marianas, the Department of Defense engages in more extensive monitoring, including overflight and rookery surveys several times a year, so that it can monitor trends in bird populations.

The Department of Defense is not alone in monitoring the status of birds on its installations. Much of its monitoring is done through formal partnerships with conservation organizations. In addition, Watchable Wildlife programs provide opportunities for the public to provide feedback on the numbers and types of birds they have observed from viewing sites on Department of Defense installations.

The Armed Forces can use clear evidence of bird takes, such as the sight of numerous dead or injured birds, as a signal that it should modify its activities, as practicable, to reduce the number of takes. With respect to the problem of bird/aircraft collisions, the Department of Defense undertakes intensive, bird-by-bird monitoring. The U.S. Air Force Safety Center's Bird/Wildlife Aircraft Strike Hazard team at Kirtland Air Force Base, NM, and the Navy Safety Center at Norfolk, VA, track aircraft/wildlife (bird and mammal) collisions because of the danger such collisions represent to pilots, crews, and aircraft. By focusing on local, regional, and seasonal populations and movements of birds, pilots and airport personnel have been better able to avoid collisions, in many cases by modifying those conditions at airfields that are attractive to birds.

What Are the Provisions of the Rule?

National Environmental Policy Act (NEPA) Considerations

NEPA, and the Council on Environmental Quality's (CEQ) NEPA implementing regulations at 40 CFR 1500–1508, require that Federal agencies prepare environmental impact statements for ''major Federal actions significantly affecting the quality of the human environment.'' These statements must include a detailed analysis of the impacts of an agency's proposed action and any reasonable alternatives to that proposal. NEPA requires the responsible Federal official to ''consult with and obtain comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved'' (42 U.S.C. 4332(2)(C)). NEPA also provides for public involvement in the decision-making process. The CEQ's regulations implementing NEPA emphasize the integration of the NEPA process with the requirements of other environmental laws. The CEQ regulations at 40 CFR 1500.2 state: ''Federal agencies shall to the fullest extent possible * * * integrate the requirements of NEPA with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively.'' Regulations at 40 CFR 1502.25 state: ''To the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by * * * other environmental review laws and executive orders.''

In keeping with this emphasis, the rule relies on the Armed Forces utilizing the NEPA process to determine whether any ongoing or proposed military readiness activity is ''likely to result in a significant adverse effect on the population of a migratory bird species.'' More particularly, the Armed Forces prepare NEPA analyses whenever they propose to undertake a new military readiness activity that may significantly affect the quality of the human environment; propose to make a substantial change to an ongoing military readiness activity that is

relevant to environmental concerns; learn of significant new circumstances or information relevant to the environmental concerns bearing on an ongoing military readiness activity; or prepare or revise an INRMP covering an area used for military readiness activities. During the preparation of environmental impact statements analyzing the effects of proposed military readiness activities on migratory bird species, the Armed Forces consult with the Service as an agency with ''jurisdiction by law and special expertise.'' If the Armed Forces identify a significant adverse effect on migratory birds during the preparation of a NEPA analysis, this rule requires the Armed Forces to confer and cooperate with the Service to develop and implement appropriate conservation measures to minimize or mitigate any such significant adverse effects. The Armed Forces will continue to be responsible for ensuring that military readiness activities are implemented in accordance with all applicable statutes including NEPA and ESA.

Endangered Species Act Consideration

Section 7(a)(1) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA), provides that, ''[t]he Secretary [of the Interior] shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act.'' Furthermore, section 7(a)(2) requires all Federal agencies to insure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat. We completed an Intra-Service Consultation on the proposed rule and we have determined that this rule to authorize take under the MBTA will have no effect on listed species. The rule does not authorize take under the ESA. If a military readiness activity may affect a listed species, the Armed Forces retains responsibility for consulting with the Service under section 7(a)(2) of the ESA. Similarly, if a military readiness activity is likely to jeopardize the continued existence of a species proposed for listing, the Armed Forces retain responsibility for conferring with the Service in accordance with section 7(a)(4) of the ESA.

Rule Authorization

This rule authorizes the Armed Forces to take migratory birds as an incidental result of military readiness activities. The Armed Forces must continue to apply for and receive an MBTA permit for scientific collecting, control of birds causing damage to military property, or any other activity that is addressed by our existing permit regulations (50 CFR part 13, 21, 22). These activities may not be conducted under the authority of this rule. If any activity of the Armed Forces falls within the scope of our existing regulations, we will consider, when processing the application, the specific take requested as well as any other take authorized by this rule that may occur.

Authorization of take under this rule applies to take of migratory birds incidental to military readiness activities, including (a) all training and operations of the Armed Forces that relate to combat, and (b) the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Authorization of take does not apply to (a) routine operation of installation operating support functions, such as: administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; morale, welfare, and recreation activities; shops; and mess halls, (b) operation of industrial activities, or (c) construction or demolition of facilities listed above.

The authorization provided by this rule is subject to the military service conducting an otherwise lawful military readiness activity in compliance with the provisions of the rule. To ensure the Service maintains the ability to manage and conserve the resource, the Secretary retains the authority to withdraw or suspend authorization of take with respect to any specific military readiness activity under certain circumstances.

With respect to a military readiness activity of the Armed Forces likely to take migratory birds, the rule authorizes take provided the Armed Forces are in compliance with the following requirement:

> If the Armed Forces determine that ongoing or proposed activities may result in a significant adverse effect on the population of a migratory bird species, the Armed Forces must confer and cooperate with the Service to develop and implement appropriate conservation measures to minimize or mitigate such significant adverse effects.

The Armed Forces will continue to be responsible for addressing their activities other than military readiness through a MOU developed in accordance with Executive Order 13186, ''Responsibilities of Federal Agencies to Protect Migratory Birds,'' January 10, 2001.

When Is Take Not Authorized?

If a proposed or an ongoing action may have a significant adverse effect on a population of a migratory bird species, as that term is defined in Section 21.3, the Armed Forces must confer with the Service so that we may recommend conservation measures. In certain circumstances, the Secretary must suspend the take authorization with respect to a particular military readiness activity; in other circumstances, the Secretary has the discretion to initiate a process that may result in withdrawal. We will make every effort to work with the Armed Forces in advance of a potential determination to withdraw take authorization in order to resolve migratory bird take concerns and avoid withdrawal. With respect to discretionary withdrawal, the rule provides an elevation process if the Secretary of Defense or other national defense official appointed by the President and confirmed by the Senate determines that protection of national security requires continuation of the activity.

The Secretary will immediately suspend authorization for take if continued authorization likely would not be compatible with any one of the migratory bird treaties. Withdrawal of authorization may be proposed if the Secretary determines that failure to do so is likely to result in a significant adverse effect on a population of a migratory bird species and one or more of the following circumstances apply:

> (A) The Armed Forces have not implemented conservation measures that (i) are directly related to protecting the migratory bird species affected by the proposed military readiness activity; (ii) would significantly reduce take of migratory birds species affected by the military readiness activity, (iii) are economically feasible, and (iv) do not limit the effectiveness of military readiness activities.
>
> (B) The Armed Forces fail to conduct mutually agreed upon monitoring to determine the effects of a military readiness activity on migratory bird species and/or the efficacy of the conservation measures implemented by the Armed Forces.
>
> (C) The Armed Forces have not provided reasonably available information that the Secretary has determined is necessary to evaluate whether withdrawal of take authorization for the specific military readiness activity is appropriate.

The determination as to whether an immediate suspension of authorization is warranted (i.e., whether the action likely would not be compatible with a migratory bird treaty), or withdrawal of an authorization is proposed will be made independent of each other. Regardless of whether the circumstances of paragraphs (A) through (C) above

exist, there will be an immediate suspension if the Secretary determines, after seeking the views of the Secretary of Defense and after consulting with the Secretary of State, that incidental take of migratory birds during a specific military readiness activity likely would not be compatible with one or more of the migratory bird treaties.

Proposed withdrawal of authorization will be provided in writing to the Secretary of Defense including the basis for the determination. The notice will also specify any conservation measures or other measures that would, if the Armed Forces agree to implement them, allow the Secretary to cancel the proposed withdrawal of authorization. Any take incidental to a military readiness activity subject to a proposed withdrawal of authorization will continue to be authorized by this regulation until the Secretary of the Interior, or his/her delegatee, makes a final determination on the withdrawal.

The Secretary may, at his/her discretion, cancel a suspension or withdrawal of authorization at any time. A suspension may be cancelled in the event new information is provided that the proposed activity would be compatible with the migratory bird treaties. A proposed withdrawal may be cancelled if the Armed Forces modify the proposed activity to alleviate significant adverse effects on a population of a migratory bird species or the circumstances in paragraphs (A) through (C) above no longer exist. Cancellation of suspension or withdrawal of authorization becomes effective upon delivery of written notice from the Secretary to the Department of Defense.

Request for Reconsideration

In order to ensure that the action of the Secretary in not authorizing take does not result in significant harm to the Nation, any proposal to withdraw authorization under 50 CFR 21.15(b)(2) will be reconsidered by the Secretary or his/her delegatee who must be an official nominated by the President and confirmed by the Senate, if, within 45 days of the notification with respect to a military readiness activity, the Secretary of Defense, or other national defense official, who also must be an official nominated by the President and confirmed by the Senate, determines that protection of the national security requires continuation of the action.

Scope of Authorization

The take authorization provided by the rule applies to military readiness activities of the Armed Forces, including those implemented through contractors of the Armed Forces and their agents.

Principles and Standards

As discussed above, the only condition applicable to the authorization under this rule is that the Armed Forces confer and cooperate with the Service if the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of a migratory bird species. To avoid this threshold from being reached, as well as to provide for migratory bird conservation, it is in the best interest of the Armed Forces to address potential migratory bird impacts from military readiness activities by adopting the following principles and standards.

To proactively address migratory bird conservation, the Armed Forces should engage in early planning and scoping and involve agencies with special expertise in the matters relating to the potential impacts of a proposed action. When a proposed action by the Armed Forces related to military readiness may result in the incidental take of birds, the Armed Forces should contact the Service so we can assist the Armed Forces in addressing potential adverse impacts on birds and mitigating those impacts. As stated in this rule, the Armed Forces must confer with the Service when these actions may have a significant adverse effect on a population of a migratory bird species.

The Armed Forces will, in close coordination with the Service, develop a list of conservation measures designed to minimize and mitigate potential adverse impacts of authorized military readiness activities on affected migratory bird species. A cooperative approach initiated early in the project planning process will have the greatest potential for successfully reducing or eliminating adverse impacts. Our recommendations will emphasize avoidance, minimization, and rectifying adverse impacts. The Armed Forces should consider obvious avoidance measures at the outset of project planning, such as siting projects to avoid important nesting areas or to avoid collisions of birds with structures, or timing projects to avoid peak breeding activity. In addition, models such as the AHAS and BAM should be used to avoid bird activity when planning flight training and range use. The Armed Forces will consider these conservation measures for incorporation in new NEPA analyses, INRMPs, INRMP revisions, and base comprehensive or master plans, whenever adverse impacts to migratory birds may result from proposed military readiness activities.

''Conservation measures'' are project designs or mitigation activities that are technically and economically reasonable, and minimize the take of migratory birds and adverse impacts while allowing for completion of an action in a timely manner. When appropriate, the Armed Forces should adopt existing industry guidelines supported by the Service and developed to avoid or minimize take of migratory birds. We recognize that implementation of conservation measures will be subject to the availability of appropriations.

The Armed Forces should promote the inclusion of comprehensive migratory bird management objectives from bird conservation plans into the planning documents of the Armed Forces. The bird conservation plans, available either from the Service's Regional Offices or via the Internet, include: North American Waterfowl Management Plan, PIF, and the U.S. Shorebird Conservation Plan. The North American Waterbird Conservation Plan, the newest planning effort, addresses conservation of seabirds, wading birds, terns, gulls, and some marsh birds, and their habitats. The Armed Forces should also work collaboratively with partners to identify, protect, restore, and manage Important Bird Areas, Western Hemisphere Shorebird Reserve Network sites, and other significant bird sites that occur on Department of Defense lands. The Department of Defense should continue to work through the PIF program to incorporate bird habitat management efforts into INRMPs.

In accordance with the Authorization Act and the 2002 revised Sikes Act guidelines, the annual review of INRMPs by the Department of Defense, in cooperation with the Service and State fish and wildlife agencies, will include monitoring results of any migratory bird conservation measures.

The Armed Forces will use the best available databases to determine which migratory bird species are likely to occur in the area of proposed military readiness activities. This includes species likely to occur in the project area during all phases of the project.

The Armed Forces will use the best scientific data available to assess, through the NEPA process or other environmental requirements, the expected impact of proposed or ongoing military readiness activities on migratory bird species likely to occur in action areas. Special consideration will be given to priority habitats, such as important nesting areas, migration stop-over areas, and wintering habitats.

The Armed Forces will adopt, to the maximum extent practicable, conservation measures designed to minimize and mitigate any adverse impacts of authorized military readiness activities on affected migratory bird species. The term ''to the maximum extent practicable'' means without limiting the subject readiness activities in ways that compromise the effectiveness of those activities, and to the extent economically feasible.

At the Department of Defense's request, the Service will provide technical assistance in identifying the migratory bird species and determining those likely to be taken as a result of the proposed action, assessing impacts of the action on migratory bird species, and identifying appropriate conservation measures to mitigate adverse impacts.

Is this rule consistent with the MBTA?

Yes. This issue has two components. First is the question of whether the MBTA prohibits promulgation of regulations authorizing incidental take of migratory birds pursuant to military readiness activities. Second is the question of whether the details of this rule, individually and collectively, conflict with the MBTA in some way.

The starting point for answering both questions is the fact that Sections 704 and 712(2) of 16 U.S.C. provide us with broad authority to promulgate regulations allowing for the take of migratory birds when compatible with the terms of the migratory bird treaties. We find the take that is authorized in this rule is compatible with the terms of the treaties and consistent with the purposes of the treaties.

Regarding the first question, whether any such regulations are permissible under the MBTA, Congress itself by passing the Authorization Act determined that such regulations are consistent with the MBTA and the underlying treaties by requiring us to promulgate such regulations. Even in the absence of the Authorization Act, regulations authorizing take incidental to military readiness activities are compatible with the terms of the treaties, and therefore authorized by the MBTA.

The MBTA implements four treaties: a 1916 treaty with Great Britain on behalf of Canada that was substantially amended by a 1995 protocol; a 1936 treaty with Mexico, amended by a 1997 protocol; a 1972 treaty with Japan; and a 1978 treaty with the former Soviet Union. These international agreements recognize that migratory birds are important for a variety of purposes. They provide a food resource, insectivorous birds are useful to agriculture, they provide recreational benefits and are useful for scientific and educational purposes, and they are important for aesthetic, social, and spiritual purposes. Collectively, the treaties require the Unites States to provide mechanisms for protecting the birds and their habitats, and include special emphasis on protecting those birds that are in danger of extinction.

The Japan and Russia treaties each call for implementing legislation that broadly prohibits the take of migratory birds. At the same time, those treaties allow the implementing legislation to include exceptions to the take prohibitions. The treaties recognize a variety of purposes for which take may be authorized, including scientific, educational, and propagative purposes; the protection of persons or property; and hunting during open seasons. The treaties also contemplate authorizing takings ''for specific purposes not inconsistent with the objectives [or principles]'' of the treaties. The Canada treaty, since adoption of the 1995 Protocol, now includes similar language: ''the taking of migratory birds may be allowed * * * for * * * specific purposes consistent with the conservation principles of this Convention.''

In contrast, the take prohibitions required by the 1936 Mexico treaty have a narrower focus than the later treaties. The Mexico treaty is more clearly directed at stopping the indiscriminate killing of migratory birds by hunting and for commercial purposes through the establishment of closed seasons. In addition, even the language of the Mexico treaty that addresses the need for domestic regulation prohibiting certain activities with respect to migratory birds is subject to the objective ''to satisfy the need set forth in * * * Article[I].'' Article I provides: ''In order that the species may not be exterminated, the high contracting parties declare that it is right and proper to protect birds denominated as migratory, whatever may be their origin, which in their movements live temporarily in the United States of America and the United Mexican States, by means of adequate methods which will permit, in so far as the respective high contracting parties may see fit, the utilization of said birds rationally for purposes of sport, food, commerce and industry.'' Therefore, to the extent that the Mexico treaty is interpreted to have application to take beyond hunting and the like, that treaty must also be interpreted to allow the parties to authorize take that is consistent with the needs set forth in Article I.

The broad language of the exceptions in the Japan, Russia, and Canada treaties clearly indicate that the intent of the parties was not to prohibit all take of migratory birds. Just as clearly, the take of large absolute numbers of birds (e.g. millions of birds taken in sport hunting) is allowable under the treaties, so long as that take is ultimately limited in a way that is consistent with the conservation principles and objectives of the treaties. Thus, allowing for take incidental to military readiness activities is, as a general matter, consistent with the conservation principles and objectives of all three of these treaties.

The Mexico treaty does not require the parties to prohibit incidental take, and therefore allowing take incidental to military readiness activities cannot conflict with the terms of that treaty. And even if that treaty was read to apply more broadly, it is clear that the parties intended it only to require the rational regulation of take, not an absolute prohibition. Allowing take incidental to military readiness activities is consistent with the needs set forth in Article I. More broadly, we conclude that any incidental take allowed under the broad exceptions of the other three treaties is consistent with the Mexico treaty.

Turning to the second question, whether this particular rule governing take incidental to military readiness activities is consistent with the treaties (and therefore the MBTA), the take that is authorized here is for a special purpose consistent with the principles and objectives of the treaties. The authorization allows take of birds only in limited instances—take that results from military readiness activities. Furthermore, the rule expressly requires the Armed Forces to develop conservation measures to minimize or mitigate impacts where such impacts may have a significant adverse effect on a population of a migratory bird species. Moreover, the Secretary must suspend the take authorization if he/she concludes that a specific military readiness activity likely would not be compatible with the migratory bird treaties and may withdraw the authorization if he/she is unable to obtain from Armed Forces the information needed to assure compliance. Thus, the authorization in this rule in effect incorporates a safeguard that provides for compliance with the requirements of the treaties.

It is not entirely clear what level of effect on a migratory bird population would be required to constitute a violation of any of the treaties. It is clear, however, that the relatively minor

(at a population level) amount of take caused by military readiness activities is exceedingly unlikely to constitute a possible violation, even in the absence of any safeguards. When combined with the procedural safeguards set forth in this rule, there is no reasonable chance that a violation of the treaties will occur under this rule. In these circumstances, the take that would be authorized by this rule is thus compatible with the terms of the treaties and consistent with the purposes of those treaties.

The rule's process of broad, automatic authorization subject to withdrawal is particularly appropriate to military readiness activities. First, as noted above, we expect that military readiness activities will rarely, if ever, have the broad impact that would lead to a significant adverse effect on a population of migratory bird species, even absent the conservation measures that the Armed Forces undertake voluntarily or pursuant to another statute, such as the ESA. Second, the Armed Forces, like other federal agencies, have a special role in ensuring that the United States complies with its obligations under the four migratory bird treaties, as evidenced by the Migratory Bird Executive Order 13186 (January 10, 2001). Like other Federal agencies, the Armed Forces strive not only to lessen detrimental effects of their actions on migratory birds but to actively promote the conservation of the resource and integrate conservation principles and practices into agency programs. Numerous internal programs and collaborative ventures among Federal agencies and non-Federal partners have contributed significantly to avian conservation. These efforts are grounded in the tenets of stewardship inherent in our treaty obligations. Third, given the importance of military readiness to national security, it is especially important not to create a complex process that, while perhaps useful in other contexts, might impede the timely carrying-out of military readiness activities.

Why does the rule apply only to the Armed Forces?

This rule was developed in accordance with the Authorization Act, which created an interim period, during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities, and required the development of regulations authorizing the incidental take of migratory birds associated with military readiness activities. This rule carries out the mandates of the Authorization Act. This rule authorizes take resulting from otherwise lawful military readiness activities subject to certain limitations and subject to withdrawal of the authorization to ensure consistency with the provisions of the treaties.

Required Determinations

Regulatory Planning and Review (E.O. 12866). In accordance with the criteria in Executive Order 12866, this rule is a significant regulatory action. OMB makes the final determination of significance under Executive Order 12866.

a. Analysis indicates this rule will not have an annual economic effect of $100 million or adversely affect an economic sector, productivity, jobs, the environment, or other units of government. This rule is intended to benefit the Department of Defense, and all of its branches of the Armed Forces, by providing a mechanism to comply with the MBTA and the treaties. A full cost-benefit and economic analysis is not required.

This rule will not affect small businesses or other segments of the private sector. It applies only to the Armed Forces. Thus, any expenditure under this rule will accrue only to the national defense agencies. Our current regulations allow us to permit take of migratory birds only for limited types of activities. This rule authorizes take resulting from the military readiness activities of the Armed Forces, provided the Armed Forces comply with certain requirements to minimize or mitigate significant adverse effects on a population of a migratory bird species.

Analysis of the annual economic effect of this rule indicates that it will have de minimis effects for the following reasons. Without the rule, the Armed Forces could be subject to injunction by third parties via the APA for lack of authorization under the MBTA for incidental takes of migratory birds that might result from military readiness activities. This rule will enable the Armed Forces to alleviate costs associated with responding to litigation as well as costs associated with delays in military training. Furthermore, the rule is structured such that the Armed Forces are not required to apply for individual permits to authorize take for every individual military readiness activity. The take authorization is conveyed by this rule. This avoids potential costs associated with staff necessary to prepare and review applications for individual permits to authorize military readiness activities that may result in incidental take of migratory birds, and the costs that would be attendant to delay.

The principal annual economic cost to the Armed Forces will likely be related to costs associated with developing and implementing conservation measures to minimize or mitigate impacts from military readiness activities that may have a significant adverse effect on a population of a migratory bird species. However, we anticipate that this threshold of potential effects on a population has a low probability of occurring. The Armed Forces are already obligated to comply with a host of other environmental laws, such as NEPA, which requires them to assess impacts of their military readiness activities on migratory birds, endangered and threatened species, and other wildlife. Most of the requirements of this rule will be subsumed by these existing requirements.

With this rule, the Armed Forces will have a regulatory mechanism to enable the Armed Forces to effectively implement otherwise lawful military readiness activities. Without the rule, the Armed Forces might not be able to complete certain military readiness activities that could result in the take of migratory birds pending issuance of an MBTA take permit or resolution of any lawsuits.

b. This rule will not create serious inconsistencies or otherwise interfere with the actions of the Armed Forces, including those other than military readiness. The Armed Forces must already comply with numerous environmental laws intended to minimize impacts to wildlife.

c. This rule will not materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients. This rule does not have anything to do with such programs.

d. This rule raises novel legal or policy issues. This rule raises a novel policy issue in that it implements a new area of our program to carry out the MBTA. Under 50 CFR 21.27, the Service has the authority to issue special purpose permits for take that is otherwise outside the scope of the standard form permits of section 21. Special purpose permits may be issued for actions whereby take of migratory birds could result as an unintended consequence. However, the Service has previously issued such permits only in very limited circumstances.

Regulatory Flexibility Act. For the reasons discussed under Regulatory Planning and Review above, I certify that this rule will not have a significant economic effect on a substantial number of small entities as defined under the Regulatory Flexibility Act (5 U.S.C. 601 et seq.). A final Regulatory Flexibility Analysis is not required. Accordingly, a

Small Entity Compliance Guide is not required.

Small Business Regulatory Enforcement Fairness Act. This rule is not a major rule under 5 U.S.C. 804(2), the Small Business Regulatory Enforcement Fairness Act. This rule:

a. Will not have an annual effect on the economy of $100 million or more.

b. Will not cause a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions.

c. Will not have significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises.

Unfunded Mandates Reform Act. In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501, et seq.):

a. This rule will not ''significantly or uniquely'' affect small governments. A Small Government Agency Plan is not required. We have determined and certified pursuant to the Unfunded Mandates Reform Act, 2 U.S.C. 1502 et seq., that this rulemaking will not impose a cost of $100 million or more in any given year on local or State government or private entities.

b. This rule will not produce a Federal mandate of $100 million or greater in any year, i.e., it is not a ''significant regulatory action'' under the Unfunded Mandates Reform Act.

Takings. In accordance with Executive Order 12630, the rule does not have significant takings implications. A takings implication assessment is not required. The only effect of this rule is to authorize incidental takes of migratory birds by the Armed Forces as a result of military readiness activities. This rule will not result in the physical occupancy of property, the physical invasion of property, or the regulatory taking of any property.

Federalism. In accordance with Executive Order 13132, and based on the discussions in Regulatory Planning and Review above, this rule will not have significant Federalism effects. A Federalism assessment is not required. Due to the migratory nature of certain species of birds, and given the Federal Government's responsibility to implement the migratory bird treaties, Congress assigned the Federal Government responsibility over these species when it enacted the MBTA. This rule will not have a substantial direct effect on fiscal capacity, change the roles or responsibilities of Federal or State governments, or intrude on State policy or administration.

Civil Justice Reform. In accordance with Executive Order 12988, the Office of the Solicitor has determined that this rule will not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. The intent of the rule is to relieve the Armed Forces and the judicial system from potential litigation resulting from potential take of migratory birds during military readiness activities. The Department of the Interior has certified to the Office of Management and Budget that this rule meets the applicable standards provided in Sections 3(a) and 3(b)(2) of Executive Order 12988.

Paperwork Reduction Act. This rule will not require any new information collections under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Under the Paperwork Reduction Act, we do not need to seek Office of Management and Budget (OMB) approval to collect information from current Federal employees, military personnel, military reservists, and members of the National Guard in their professional capacities. Because this rule will newly enable us to collect information only from employees of the Armed Forces in their professional capacity, we do not need to seek OMB approval under the Paperwork Reduction Act. In other cases, Federal agencies may not conduct or sponsor, and members of the public are not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act. We have determined that this rule is categorically excluded under the Department of the Interior's NEPA procedures in Part 516 of the Departmental Manual, Chapter 2, Appendix 1, Categorical Exclusion 1.10. Categorical Exclusion 1.10 applies to: ''policies, directives, regulations, and guidelines of an administrative, financial, legal, technical or procedural nature and whose environmental effects are too broad, speculative, or conjectural to lend themselves to meaningful analysis and will later be subject to the NEPA process, either collectively or case-by-case.''

Military readiness activities of the Armed Forces occur across a broad geographic area covering a wide diversity of habitat types and potentially affecting a high diversity of migratory birds. Potential impacts on migratory birds will also vary spatially and temporally across the landscape. In addition, the specific type of military readiness activity will vary significantly among the Armed Forces, and the biological and geographical spectrum across which these activities may occur is potentially unique. Because of the broad spectrum of activities, their locations, habitat types, and migratory birds potentially present that may be affected by this rule, the potential impacts of military readiness activities conducted by the Armed Forces on the affected environment are too broad, speculative and conjectural to lend themselves to meaningful analysis. Thus, it is premature to examine potential impacts of the rule.

However, this determination does not diminish the responsibility of the Armed Forces to comply with NEPA and individual military readiness activities at issue will be subject to the NEPA process by the Armed Forces to evaluate any environmental impacts. Whenever the Armed Forces propose to undertake new military readiness activities or to adopt a new, or materially revised, Integrated Natural Resources Management Plan, and migratory bird species may be affected, the Armed Forces will consult with and obtain comments from the Service, an agency with ''jurisdiction by law or special expertise,'' upon their NEPA analysis. The NEPA analysis will include cumulative effects where applicable. In addition, if the potential for significant effects on migratory birds makes it appropriate, the Armed Forces may invite the Service to participate as a cooperating agency in the preparation of their NEPA analysis. Moreover, authorization under this rule requires that if a proposed military readiness activity may result in a significant adverse impact on a population of migratory bird species, the Armed Forces must confer and cooperate with the Service to develop and implement appropriate measures to minimize or mitigate these effects. The environmental consequences of the proposed military readiness activity, as well as the potential of any such measures to reduce the adverse effects of the proposed activity, would be covered in NEPA documentation prepared for the proposed action.

We have also determined that this authorization would not result in ''extraordinary circumstances'' whereby actions cannot be categorically excluded pursuant to 516 DM 2.3A(2). This rule only authorizes the incidental take of migratory birds (with limitations) as a result of military readiness activities. We are not authorizing the Armed Forces to implement military readiness activities that may have significant adverse impacts on natural resources, have highly controversial environment effects, or result in significant cumulative impacts. If an individual

military readiness action by the Armed Forces or the cumulative impacts of multiple activities may result in such an impact, then the Armed Forces will be responsible for completing an environmental analysis in accordance with NEPA. We are also not authorizing the take of a federally listed or proposed species. The Armed Forces must still comply with the Endangered Species Act.

Furthermore, we expect that military readiness activities will rarely, if ever, have the broad impact that would lead to a significant adverse effect on a population of a migratory bird species, even absent the conservation measures that the Armed Forces undertakes voluntarily or pursuant to another statute. The Armed Forces also have an important role in ensuring that the United States complies with the four migratory bird treaties, the Endangered Species Act, and other applicable regulations for individual ongoing or proposed military readiness activities.

A copy of the Service's Categorical Exclusion determination is available upon request at the address indicated in the **ADDRESSES** section of this rule.

Government-to-Government Relationship with Tribes. In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951), E.O. 13175, and 512 DM 2, we have evaluated possible effects on federally recognized Indian tribes and have determined that there are no effects. This rule applies only to military readiness activities carried out by the Armed Forces that take migratory birds. It will not interfere with the Tribes' ability to manage themselves or their funds.

Energy Effects. On May 18, 2001, the President issued Executive Order 13211 on regulations that significantly affect energy supply, distribution, or use. This Executive Order requires agencies to prepare Statements of Energy Effects when undertaking certain actions. As this rule is not expected to significantly affect energy supply, distribution, or use, this action is not a significant energy action, and no Statement of Energy Effects is required.

List of Subjects in 50 CFR Part 21

Exports, Hunting, Imports, Reporting and recordkeeping requirements, Transportation, Wildlife.

■ For the reasons described in the preamble, we amend title 50, chapter I, subchapter B of the Code of Federal Regulations as follows:

PART 21—[AMENDED]

■ 1. The authority citation continues to read as follows:

Authority: Migratory Bird Treaty Act, 40 Stat. 755 (16 U.S.C. 703); Public Law 95–616, 92 Stat. 3112 (16 U.S.C. 712(2)); Public Law 106–108, 113 Stat. 1491, Note following 16 U.S.C. 703.

■ 2. Amend § 21.3 by adding the following definitions, in alphabetical order:

§ 21.3 Definitions.

* * * * *

Armed Forces means the Army, Navy, Air Force, Marine Corps, Coast Guard, and the National Guard of any State.

* * * * *

Conservation measures, as used in § 21.15, means project design or mitigation activities that are reasonable from a scientific, technological, and economic standpoint, and are necessary to avoid, minimize, or mitigate the take of migratory birds or other adverse impacts. Conservation measures should be implemented in a reasonable period of time.

* * * * *

Military readiness activity, as defined in Pub. L. 107–314, § 315(f), 116 Stat. 2458 (Dec. 2, 2002) [Pub. L. § 319 (c)(1)], includes all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. It does not include (a) routine operation of installation operating support functions, such as: administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; morale, welfare, and recreation activities; shops; and mess halls, (b) operation of industrial activities, or (c) construction or demolition of facilities listed above.

Population, as used in § 21.15, means a group of distinct, coexisting, conspecific individuals, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.

* * * * *

Secretary of Defense means the Secretary of Defense or any other national defense official who has been nominated by the President and confirmed by the Senate.

* * * * *

Significant adverse effect on a population, as used in § 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is ''biologically viable'' when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem is not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, determinations of significant measurable decline will be made on a case-by-case basis.

■ 3. Amend part 21, subpart B, by adding a new § 21.15 as follows:

§ 21.15 Authorization of take incidental to military readiness activities.

(a) *Take authorization and monitoring.*

(1) Except to the extent authorization is withdrawn or suspended pursuant to paragraph (b) of this section, the Armed Forces may take migratory birds incidental to military readiness activities provided that, for those ongoing or proposed activities that the Armed Forces determine may result in a significant adverse effect on a population of a migratory bird species, the Armed Forces must confer and cooperate with the Service to develop and implement appropriate conservation measures to minimize or mitigate such significant adverse effects.

(2) When conservation measures implemented under paragraph (a)(1) of this section require monitoring, the Armed Forces must retain records of any monitoring data for five years from the date the Armed Forces commence their action. During Integrated Natural Resource Management Plan reviews, the Armed Forces will also report to the Service migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

(b) *Suspension or Withdrawal of take authorization.*

(1) If the Secretary determines, after seeking the views of the Secretary of Defense and consulting with the Secretary of State, that incidental take of migratory birds during a specific military readiness activity likely would not be compatible with one or more of

the migratory bird treaties, the Secretary will suspend authorization of the take associated with that activity.

(2) The Secretary may propose to withdraw, and may withdraw in accordance with the procedures provided in paragraph (b)(4) of this section the authorization for any take incidental to a specific military readiness activity if the Secretary determines that a proposed military readiness activity is likely to result in a significant adverse effect on the population of a migratory bird species and one or more of the following circumstances exists:

(i) The Armed Forces have not implemented conservation measures that:

(A) Are directly related to protecting the migratory bird species affected by the proposed military readiness activity;

(B) Would significantly reduce take of the migratory bird species affected by the military readiness activity;

(C) Are economically feasible; and

(D) Do not limit the effectiveness of the military readiness activity;

(ii) The Armed Forces fail to conduct mutually agreed upon monitoring to determine the effects of a military readiness activity on migratory bird species and/or the efficacy of the conservation measures implemented by the Armed Forces; or

(iii) The Armed Forces have not provided reasonably available information that the Secretary has determined is necessary to evaluate whether withdrawal of take authorization for the specific military readiness activity is appropriate.

(3) When the Secretary proposes to withdraw authorization with respect to a specific military readiness activity, the Secretary will first provide written notice to the Secretary of Defense. Any such notice will include the basis for the Secretary's determination that withdrawal is warranted in accordance with the criteria contained in paragraph (b)(2) of this section, and will identify any conservation measures or other measures that would, if implemented by the Armed Forces, permit the Secretary to cancel the proposed withdrawal of authorization.

(4) Within 15 days of receipt of the notice specified in paragraph (b)(3) of this section, the Secretary of Defense may notify the Secretary in writing of the Armed Forces' objections, if any, to the proposed withdrawal, specifying the reasons therefore. The Secretary will give due consideration to any objections raised by the Armed Forces. If the Secretary continues to believe that withdrawal is appropriate, he or she will provide written notice to the Secretary of Defense of the rationale for withdrawal and response to any objections to the withdrawal. If objections to the withdrawal remain, the withdrawal will not become effective until the Secretary of Defense has had the opportunity to meet with the Secretary within 30 days of the original notice from the Secretary proposing withdrawal. A final determination regarding whether authorization will be withdrawn will occur within 45 days of the original notice.

(5) Any authorized take incidental to a military readiness activity subject to a proposed withdrawal of authorization will continue to be authorized by this regulation until the Secretary makes a final determination on the withdrawal.

(6) The Secretary may, at his or her discretion, cancel a suspension or withdrawal of authorization at any time. A suspension may be cancelled in the event new information is provided that the proposed activity would be compatible with the migratory bird treaties. A proposed withdrawal may be cancelled if the Armed Forces modify the proposed activity to alleviate significant adverse effects on the population of a migratory bird species or the circumstances in paragraphs (b)(2)(i) through (iii) of this section no longer exist. Cancellation of suspension or withdrawal of authorization becomes effective upon delivery of written notice from the Secretary to the Department of Defense.

(7) The responsibilities of the Secretary under paragraph (b) of this section may be fulfilled by his/her delegatee who must be an official nominated by the President and confirmed by the Senate.

Dated: July 25, 2006.

Matt Hogan,

Acting Assistant Secretary for Fish and Wildlife and Parks.

Dated: April 10, 2006.

Philip W. Grone,

Deputy Under Secretary of Defense (Installations and Environment).

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BIRDS OF CONSERVATION CONCERN 2008

U.S. Fish and Wildlife Service
Division of Migratory Bird Management
Arlington, Virginia

December 2008

BIRDS OF CONSERVATION CONCERN 2008

Prepared by

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Division of Migratory Bird Management
Arlington, Virginia

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LIST OF ACRONYMS

AI	Area Importance (an assessment factor)
ABC	American Bird Conservancy
BBS	Breeding Bird Survey
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BD	Breeding Distribution
CCS	Continental Combined Score
DPS	Distinct Population Segment
ESA	Endangered Species Act
FWCA	Fish and Wildlife Conservation Act
MBTA	Migratory Bird Treaty Act
NABCI	North American Bird Conservation Initiative
NAWCP	North American Waterbird Conservation Plan
ND	Non-breeding Distribution
NWR	National Wildlife Refuge
PIF	Partners in Flight
PS	Population Size
PT	Population Trend
RD	Relative Density
TB	Threats in the Breeding Season
TN	Threats in the Non-breeding season
USFWS	U.S. Fish and Wildlife Service
USSCP	United States Shorebird Conservation Plan

EXECUTIVE SUMMARY

The 1988 amendment to the Fish and Wildlife Conservation Act mandates the U.S. Fish and Wildlife Service (USFWS) to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973." *Birds of Conservation Concern 2008* (*BCC 2008*) is the most recent effort to carry out this mandate. The overall goal of this report is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent our highest conservation priorities. The geographic scope of this endeavor is the United States in its entirety, including island "territories" in the Pacific and Caribbean. *BCC 2008* encompasses three distinct geographic scales—North American Bird Conservation Initiative (NABCI) Bird Conservation Regions (BCRs), USFWS Regions, and National—and is primarily derived from assessment scores from three major bird conservation plans: the Partners in Flight North American Landbird Conservation Plan, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan.

Bird species considered for inclusion on lists in this report include nongame birds, gamebirds without hunting seasons, subsistence-hunted nongame birds in Alaska; and Endangered Species Act candidate, proposed endangered or threatened, and recently delisted species. Assessment scores from all three bird conservation plans are based on several factors, including population trends, threats, distribution, abundance, and relative density. These assessment scores serve as the foundation on which we built the *BCC 2008* lists. Although the different bird conservation plans use somewhat different methods for determining the highest priority species, the scores from each represent true conservation priorities for each of the three species groups (landbirds, shorebirds, and waterbirds). We therefore view the conservation priorities within each plan as approximately equivalent. After creating BCR lists, we developed specific criteria for including species on USFWS Region and National lists. The various BCR lists contain 10 to 53 species, USFWS Region lists contain 27 to 78 species, and the National list contains 147 species. On average, priority species make up about 10 to 15 percent of the native bird species in any given geographic unit.

While all of the bird species included in *BCC 2008* are priorities for conservation action, this list makes no finding with regard to whether they warrant consideration for ESA listing. Our goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions. We recommend that these lists be consulted in accordance with Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds." This report should also be used to develop research, monitoring, and management initiatives. *BCC 2008* is intended to stimulate coordinated and collaborative proactive conservation actions among Federal, State, Tribal, and private partners. We hope that, by focusing attention on these highest-priority species, this report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby contributing to healthy avian populations and communities.

ACKNOWLEDGMENTS

This document was the result of close collaboration between staff in all regions of the U.S. Fish and Wildlife Service's Migratory Bird Program. The primary collaborators were Mila Plavsic, Jeff Shenot, and Marie Strassburger (Region 9); the initiative coordinators, Brad Andres (U.S. Shorebird Conservation Plan; USSCP), Jennifer Wheeler (North American Waterbird Conservation Plan; NAWCP) and Terry Rich (Partners in Flight; PIF); and the Regional Coordinators: Tara Zimmerman, Mike Green, Nanette Seto, Sue Thomas, and Maura Naughton (Region 1), Bill Howe and Dave Krueper (Region 2), Steve Lewis, Tom Will, and Bob Russell (Region 3), Dean Demarest, Chuck Hunter, Jaime Collazo, and Stefani Melvin (Region 4), Randy Dettmers (Region 5), Stephanie Jones, Suzanne Fellows, and Kevin Kritz (Region 6), Kent Wohl, Steve Matsuoka, and Richard Lanctot (Region 7). All were involved in developing selection criteria, compiling and finalizing BCR and USFWS Region lists, and reviewing and commenting on several drafts of this report.

The basis of this list is the work that many people have done to reach true avian priorities, and we have based this document on their work. We are particularly grateful for all of the work the initiatives (USSCP, NAWCP, and PIF) have done completing prioritization scores and methods. We thank Arvind Panjabi (Rocky Mountain Bird Observatory) for making available the PIF database and for responding to our many questions.

This edition of the *BCC 2008* is dedicated to John L. Trapp, who retired from USFWS in 2007 after 33 years of outstanding contributions to bird conservation. John had an extensive ornithological knowledge and passion for birds, and he oversaw almost all of the previous editions of the Birds of Conservation Concern.

INTRODUCTION

The purpose of this document is to identify migratory and non-migratory birds of the United States and its territories that are of conservation concern so as to stimulate coordinated and proactive conservation actions among Federal, State, Tribal, and private partners. The conservation concerns may be the result of population declines, naturally or human-caused small ranges or population sizes, threats to habitat, or other factors. The primary statutory authority for *Birds of Conservation Concern 2008* (*BCC 2008*) is the Fish and Wildlife Conservation Act of 1980 (FWCA), as amended; other authorities include the Endangered Species Act (ESA) of 1973, the Fish and Wildlife Act of 1956, and 16 U.S.C. § 701. The 1988 amendment (Public Law 100-653, Title VIII) to the FWCA requires the Secretary of the Interior, through the United States Fish and Wildlife Service (USFWS), to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." *BCC 2008* is the most recent effort by the USFWS to carry out this proactive conservation mandate and update *Birds of Conservation Concern 2002* (USFWS 2002). The overall goal of this report is to accurately identify those species (beyond those already federally listed as threatened or endangered) in greatest need of conservation action at three different geographic scales.

A primary goal of the USFWS is to conserve avian diversity in North America (USFWS 1990, 2004). This goal includes reducing or removing threats that may necessitate that a species be considered for listing under the ESA. The Birds of Conservation Concern are largely a subset of a larger list known as the Birds of Management Concern (BMC). The BMC is a subset of all species protected by the Migratory Bird Treaty Act (MBTA, see 50 CFR 10.13), and includes those which pose special management challenges due to a variety of factors (e.g., too few, too many, conflicts with human interests, or societal demands) (USFWS 2004). The BMC includes both game birds below their desired condition and nongame birds. As indicated in its strategic plan (USFWS 2004), the Migratory Bird Program places priority emphasis on these birds in its activities.

The philosophy underlying this report is that proactive bird conservation is necessary at a time when human impacts are at an all-time high. We strongly believe that a well-designed program that addresses resource-management issues up front will prevent or remove the need to consider listing species as threatened or endangered, and will promote and conserve long-term avian diversity in the United States. In addition, proactive conservation clearly is more cost-effective than the extensive recovery efforts required once a species is federally listed under the ESA. Our intent is for *BCC 2008* to stimulate coordinated efforts to develop and implement comprehensive and integrated approaches for the study, management, and protection of "non-ESA listed" bird species deemed to be in the most need of additional conservation actions. It should also be noted that, while the inclusion of native species not listed under the MBTA is beyond the scope of the FWCA, the USFWS has an incentive to encourage proactive management of these species by State agencies and other partners to prevent the need for listing them as endangered or threatened.

Bird species assemblages, guilds, or communities have recently been promoted as indicators of ecological integrity in a variety of habitats (Bradford et al. 1998, O'Connell et al. 2000, Canterbury et al. 2000, Venier and Pearce 2007), and at-risk bird species are good measures of ecosystem threats (Beissinger et al. 1996). Setting priorities in conservation is crucial because resources are limited. Many systems for setting wildlife-conservation priorities have been proposed. Some have focused heavily on identifying and quantifying threats to endangered or rare species (Master 1991, Wilcove et al. 1998). Others have focused on highlighting species that deserve attention due to threats to their populations, widespread or long-term declines, or low potential for population recovery (Millsap et al. 1990). The Canadian Wildlife Service developed a priority ranking system that focuses on conservation concerns and agency responsibilities to assist in setting conservation priorities for landbird species (Dunn 1997, Dunn et al. 1999). The mandate of the 1988 FWCA amendment requires a more proactive approach.

BCC 2008 uses current conservation assessment scores from three bird conservation plans: Partners in Flight North American Landbird Conservation Plan (PIF; Rich et al. 2004), the United States Shorebird Conservation Plan (USSCP; Brown et al. 2001, USSCP 2004), and the North American Waterbird Conservation Plan (NAWCP, Kushlan et al. 2002). Waterfowl game species covered by the North American Waterfowl Management Plan (Canadian Wildlife Service, U.S. Fish and Wildlife Service, Secretario de Medio Ambiente y Recursos Naturales, 2004) are specifically excluded from the BCC list in accordance with the FWCA of 1980. Species in need of additional conservation attention are identified at three distinct geographic scales: North American Bird Conservation Initiative (NABCI) Bird Conservation Regions (BCRs; U.S. NABCI Committee 2000a, 2000b, 2000c), USFWS Regions, and National.

Assessment scores are based on several parameters including population trend, threats, distribution, abundance, and the importance of an area to a species. Partners in Flight, a coalition of Federal and State government agencies, non-governmental organizations, and private interests, developed species assessment scores out of concern for the sharp declines in many North American landbirds (Rich et al. 2004). The PIF approach (Carter et al. 2000, Rich et al. 2004) has been peer-reviewed by an independent body of avian biologists (Beissinger et al. 2000). Similar coalitions have prepared and reviewed conservation assessment scores for shorebirds at the National scale (Brown et al. 2000, USSCP 2004), and in step-down regional shorebird conservation plans (see http://www.fws.gov/shorebirdplan) and for waterbirds at the continental scale (Kushlan et al. 2002) and in step-down regional waterbird conservation plans (see http://www.waterbirdconservation.org). Additionally, we found it necessary to develop conservation assessment scores for species not yet evaluated by any of the bird conservation plans, such as Pacific Island birds. Taken together, these assessment scores can be used to develop a comprehensive set of integrated bird conservation priorities; this represents a unique conservation effort unmatched in any other major group of organisms in North America.

BACKGROUND

Why Did We Create Lists at Different Geographic Scales?

Listing birds of conservation concern at three geographic scales maximizes the utility of the lists for a variety of partner agencies and organizations. The different geographic scales, from smallest to largest, are as follows:

Bird Conservation Regions (BCRs). We have adopted BCRs as the smallest of our geographic scales. BCRs have been endorsed by the North American Bird Conservation Initiative (NABCI, U.S. NABCI Committee 2000a, 2000b, 2000c) as the basic units within which all-bird conservation efforts will be planned and evaluated (Fig. 1). The NABCI is an endeavor to increase the effectiveness of bird conservation at the continental level and currently includes the United States, Canada, and Mexico. Its goal is to deliver "the full spectrum of bird conservation through regionally based, biologically driven, landscape-oriented partnerships" (U.S. NABCI Committee 2000a). A published map of BCRs and accompanying written descriptions of each are available (U.S. NABCI Committee 2000b, 2000c). The BCR lists will be most useful to Federal land-managing agencies and their partners in their efforts to abide by the bird conservation principles embodied in the MBTA and Executive Order 13186, "Responsibilities of Federal agencies to protect migratory birds" (Clinton 2001). The NABCI has recognized 35 BCRs that cover the contiguous 48 States, Alaska, and Hawaii, numbered 1 to 5, 9 to 37, and 67 (Hawaii) (U.S. NABCI Committee 2000a, 2000b, 2000c, http://www.nabci-us.org/bcrs.html). For purposes of this report, we created two additional BCRs to encompass island "territories" of the United States,[1] "Other U.S. Pacific Islands" (i.e., excluding Hawaii) and "U.S. Caribbean Islands." In the *BCC 2002* report, these two BCRs were referred to as BCR 68 for the Pacific Ocean and BCR 69 for the Caribbean, but those designations were changed for *BCC 2008* because NAWCP uses those numbers to refer to marine areas ("pelagic" BCRs). Although *BCC*

[1] Island "territories" and other affiliations of the United States considered in this document include (a) *American Samoa*—an unincorporated and unorganized territory; (b) *Baker Island*—an unincorporated territory administered by the USFWS as a National Wildlife Refuge (NWR); (c) *Commonwealth of the Northern Marianas Islands*—aligned through a covenant of "political union"; (d) *Guam*—an unincorporated organized territory; (e) *Howland Island*—an unincorporated territory administered by the USFWS as a NWR; (f) *Jarvis Island*—an unincorporated territory administered by the USFWS as a NWR; (g) *Johnston Atoll*—an unincorporated and unorganized territory under joint operational control of the Department of Defense and USFWS (and administered as a NWR); (h) *Kingman Reef*—an unincorporated territory administered by the USFWS as a NWR; (i) *Midway Atoll*—an unincorporated territory administered by the USFWS as a NWR; (j) *Navassa Island*—administered by the USFWS as a NWR; *(k) Palmyra Atoll*—an incorporated territory that is partially privately owned and partially administered by USFWS as an NWR; (l) *Commonwealth of Puerto Rico*—a commonwealth; (m) *U.S. Virgin Islands*—an unincorporated organized territory; and (n) *Wake Island*—an unincorporated territory administered by the Department of the Interior (Central Intelligence Agency 2001).

2008 does not adopt the pelagic BCR system, it recognizes that some BCC species occur in the U.S. primarily or only at sea. These species are listed under the adjacent terrestrial BCR. Thus, there are 37 BCR lists of priority species.

USFWS Regions. BCC lists are presented in this document for 8 USFWS Regions.[2] The USFWS Region lists will be useful to USFWS administrators and biologists, other Federal and State agencies within a Region, and their partners and cooperators.

National. The National list encompasses the United States in its entirety, including island "territories" in the Caribbean and the Pacific. The National list should be viewed as a barometer of the status of U.S. bird populations, providing an "early warning" of birds that may decline to levels requiring ESA protection unless additional conservation measures are taken. The National list will be most useful as an outreach tool for educating the public about the precarious status of bird species in the U.S. It will also be useful for National bird conservation planning. The National list should not be used to foster bird conservation at smaller geographic scales; that is the purpose of the BCR and USFWS Region lists.

Although there are other lists of this nature, such as the National Audubon Society/American Bird Conservancy 2007 WatchList (Butcher et al. 2007), *BCC 2008* is the only list that meets USFWS mandates for the conservation of migratory nongame birds. Conservation organizations create lists of concern that reflect their unique missions, and it is important to keep this in mind when comparing lists. With regard to birds, the USFWS focuses on its trust responsibilities as defined by the Code of Federal Regulations, which excludes, for example, gallinaceous birds (resident game birds) unless they are listed as threatened or endangered under the Endangered Species Act (ESA). Similarly, the *Birds of Conservation Concern*, as mandated by Congressional legislation, excludes birds regulated as hunted species and birds listed under the ESA. Nongovernmental organizations like American Bird Conservancy (ABC) or National Audubon are not limited by these legal distinctions, and as a result they can provide lists that are more inclusive. The USFWS *Birds of Conservation Concern*, the ABC/Audubon Watch List, and a number of other lists share a common base: they are all reliant on the conservation assessments of the major bird partner initiatives and the surveys upon which those initiative assessments are grounded. National Audubon, American Bird Conservancy, and the USFWS are all partners, among others, in participating in the assessments of those initiatives.

[2] The Pacific Region (Region 1) includes Idaho, Oregon, Washington, Hawaii, and the Pacific Islands. The Southwest Region (Region 2) includes Arizona, New Mexico, Oklahoma, and Texas. The Great Lakes-Big Rivers Region (Region 3) includes Illinois, Indiana, Iowa, Michigan, Missouri, Minnesota, Ohio, and Wisconsin. The Southeast Region (Region 4) includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico/Virgin Islands, South Carolina, and Tennessee. The Northeast Region (Region 5) includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia. The Mountain-Prairie Region (Region 6) includes Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, and Wyoming.
The Alaska Region (Region 7) consists of the state of Alaska. The California and Nevada Region (Region 8) consists of the states of California and Nevada.

What Bird Species Did We Consider?

The various species groups considered for inclusion in *BCC 2008* are described in Table 1 and include nongame birds; gamebirds without hunting seasons; subsistence-hunted nongame birds in Alaska; and Endangered Species Act candidate, proposed endangered or threatened, and recently delisted species. The major groups of species not considered in this assessment are (1) migratory gamebirds for which hunting regulations are established (i.e., cooperatively managed by Federal-State flyway councils); (2) species that are peripheral to the U.S. (i.e., population fragments within U.S. jurisdiction are too small to be managed capably); (3) species, subspecies, and populations of federally-endangered or -threatened birds (i.e., those subject to the provisions of the ESA); (4) resident gamebirds (i.e., managed by State wildlife agencies), unless listed as a federal ESA candidate; and (5) non-native species.

Because the assessments of the three bird conservation initiatives that we use here are all species-based, assessment scores were available only for full species. However, where appropriate, subspecies and populations are included in this assessment based on geographic range, federal candidate status, or available local data. Such subspecies and populations are noted on lists at all three geographic scales.

In the spirit of all-bird conservation, we include native species not specifically covered by the MBTA when they are deemed to be conservation priorities, as long as they are not part of one the groups excluded from consideration (see above). To avoid confusion, we clearly differentiate between those species that are and are not protected by the MBTA. A list of species protected by the MBTA is found in Title 50, Part 10, of the *Code of Federal Regulations*.

What Sources of Information Did We Use?

The methods used to assess and prioritize species differ between PIF, the USSCP, and the NAWCP. These differences relate to geographic scope, factor thresholds, and treatment of uncertainty. Although the methods for determining the highest-priority species are somewhat different among the different initiatives, scoring reflects state-of-the-art conservation assessments for each of the three species groups (landbirds, shorebirds, and waterbirds); we therefore view the conservation priorities within the three conservation plans as approximately equivalent.

PIF Assessment Scores. We used assessment scores from the PIF Species Assessment Database (version 2005, with unpublished 2007 updates) housed at the Rocky Mountain Bird Observatory, which we believe were the best available data at the time this report was prepared. In this database a panel of bird species experts has assigned each landbird species in North America scores ranging from 1 (lowest priority or degree of concern) to 5 (highest priority or degree of concern) for each of six factors, assessing aspects of future vulnerability at the range-wide scale: Population Size (PS), Breeding Distribution (BD), Non-breeding Distribution (ND), Threats in the Breeding Season (TB), Threats in the Non-breeding season (TN), and Population Trend (PT) (Panjabi et al. 2005). These factors are then used to calculate a Continental Combined Score

(CCS): PS + max(BD, ND) + max(TB, TN) + PT. The threats scores and the distribution scores are highly correlated so PIF used this score rather than a simple total. Thus, CCS ranges from 4 for a widespread and increasing species which is expected to face even more favorable conditions in the future, to 20 for a species of the very highest future conservation concern. The CCS was used to develop the landbird portion of the National BCC list.

Partners in Flight also assesses species at the BCR level. That assessment includes two additional criteria, Relative Density (RD) and Percent of Population, which reflect the importance of a particular BCR to each species. The global scores for TB, TN, and PT are also adjusted using BCR-specific data. These BCR scores informed the selection of landbirds for the *BCC 2008* BCR lists.

All of these factors are defined and discussed in detail in Panjabi et al. (2005). Both PIF breeding and wintering (non-breeding) scores, where available, were used in assessing species for inclusion in the *BCC 2008* report. In consultation with experts, the USFWS prepared scores for landbirds of Hawaii and Pacific island "territories" using the PIF process.

USSCP Assessment Scores. For shorebird species, we started with the updated assessment scores from the USSCP (USSCP 2004), which were built on original plan assessments (Brown et al. 2000, Brown et al. 2001). We incorporated new information on shorebird population trends and sizes published by Morrison et al. (2006) and Bart et al. (2007). Information on population sizes were ranked according to the PIF criteria. We also included updates in breeding and nonbreeding threats provided by regional shorebird working groups. The USSCP assessment process uses most of the same factor scores (with slightly different criteria) as PIF, but priorities were derived using a categorical (rather than a summation) approach (Brown et al. 2001). A prioritization protocol for shorebirds (in Brown et al. 2001) describes prioritization categories and their relationship to factor scores.

NAWCP Assessment Scores. Like USSCP, the NAWCP assessment process also uses most of the same factor scores (with slightly different criteria) as PIF and derives priorities using a categorical approach (Kushlan et al. 2002). For all three scales used in the BCC, we referred to the continental-scale assessment results documented in the NAWCP plan (Kushlan et al. 2002) and subsequent analyses (i.e., for non-colonial waterbirds, documented at http://www.waterbirdconservation.org), which we considered to be the best available data for waterbirds and seabirds. For *BCC 2008* BCR lists, we also referred to assessments in regional waterbird conservation plans or documents that most closely resemble regional waterbird conservation plans, where available (see www.waterbirdconservation.org.) These regional-scale status assessments are, in general, based on the continental-scale assessment, though regional planning groups made adjustments based on BCR-scale needs and values.

What Selection Criteria Did We Use For *Birds of Conservation Concern 2008* Lists?

The following are the criteria used to select species for consideration and inclusion on BCR, USFWS Region, and National lists. At each scale, USFWS expertise and discretion refined the

pool of species under consideration from the three bird conservation initiatives—as well as those selected for priority lists—to comply with the FWCA amendment of 1988. The same criteria were used for all subspecies and populations considered separately for inclusion.

There may be additions to the lists over the next several years. Newly designated Federal candidate species, species proposed for listing, and species removed from the list of endangered and threatened species will automatically be considered to be on the appropriate BCC list(s), effective the day of their designation or delisting as published in the *Federal Register*.

General criteria (rule-sets) for placing species on any BCC list

1. Begin with list from appropriate bird conservation initiative.

2. Follow criteria below for appropriate bird groups (see Panjabi et al. 2005 for explanation of terms).

3. Add non-breeding species if the species occurs at significant Relative Density scores and/or has moderate or high threat levels (based on expert opinion or data) in non-breeding season, if not already included due to breeding population (indicate with "nb").

4. Consider subspecies and populations where appropriate and where information on their status is available (e.g., Dickinson 2003).

5. Remove sport-hunted species (including their non-hunted populations) and federally-listed threatened or endangered populations (retaining non-listed populations with notation).

6. Add any recently ESA de-listed, candidate, or proposed species not already included.

7. In very limited circumstances, add or remove species (and document rationale) when Service expertise, supplemental information, or local data indicates a much greater or lesser degree of concern than that reflected by bird conservation initiative scoring.

Criteria for placing species on BCR lists

***LANDBIRD* criteria for *BCR* lists (see Panjabi 2005 for explanation of terms)**:

1. Include species meeting the PIF criteria for Species of Regional Importance – Continental Concern (U.S. and Canada), EXCEPT

   a) if Regional Combined Score <15 and Action Code = "Planning and Responsibility"

   b) in BCRs shared with Canada and Mexico, those with Relative Density ≥1 in the *U.S.* portion of the BCR (consult state population data).

c) for species shared with Latin America and the Caribbean (LAC), remove species with core ranges outside the U.S. and its territories if <1% of population or range-wide distribution is in the U.S. and threats in LAC are low. However, if conservation action for a species is warranted in the U.S. due to high threats in LAC, then it could be included in the appropriate U.S. BCR lists.

2. Include species meeting the PIF criteria for Species of Regional Importance – Regional Concern IF:

   a) Regional Combined Score ≥15 and Action Code = "Critical Recovery" or "Immediate Management"

   b) Regional Combined Score ≥ 17 and Action Code = "Management Attention"

3. Rank species in Hawaii and Pacific island territories using latest PIF criteria and above criteria as appropriate.

***SHOREBIRD* criteria for *BCR* lists:**

1. Include all species, subspecies, and populations meeting criteria for National BCC List if >1% of taxon occurs anytime during annual cycle in the BCR (i.e., Relative Density ≥1 in the BCR). The criteria for National BCC List are:

   a) population is undergoing a strong decline (Population Trend = 5), regardless of population size; OR
   b) population is declining or stable (Population Trend = 4 or 3) and populations are small, distributions are limited and threats are high (Population Size + Breeding Distribution + Non-breeding Distribution + Threats to Breeding + Threats to Non-breeding ≥ 18).

***WATERBIRD* criteria for *BCR* lists:**

1. Initially identify species of greatest concern from each BCR using the regional waterbird conservation plans or similar documentation (e.g., Joint Venture implementation plans). Depending on BCR-scale approaches, include species regionally assessed as High or Highest/Highly Imperiled, as Tier I (if the PIF approach was used), or priority species for BCR-scale partnership.

2. Remove species from BCR lists if U.S. populations are considered unmanageable (e.g., Relative Density <1).

3. Identify and retain only those species of greatest conservation concern, as some regional-plan species lists were designed to maximize support for a wide range of conservation activities by partners or identify species around which partnerships could operate.

Criteria for placing species on USFWS Regional lists

1. Include species from the BCC BCR lists if the species has the equivalent of a RD >1 or a manageable population in 50% or more of the BCRs in which it occurs within a USFWS region.

Criteria for placing species on BCC National list

***LANDBIRD* criteria for *National* list:**

1. Include all PIF "Continental Watchlist" (which includes the U.S. and Canada) species and U.S. island territories' species that meet PIF Continental Watchlist criteria EXCEPT,

   a) species without manageable populations in the U.S. or its territories; however, if conservation action is warranted in the U.S. due to high threats elsewhere, then such species could be included;

   b) species that are not listed on any BCC BCR list.

***SHOREBIRD* criteria for *National* list:**

1. Include species (or subspecies/population designations where supported by USSCP Conservation Assessment [2000] or more recent work) that meet any ONE of the following criteria:

   a) population is undergoing a strong decline (Population Trend = 5), regardless of population size; OR
   b) population is declining or unknown (Population Trend = 4 or 3) and populations are small, distributions are limited and threats are high (Population Size + Breeding Distribution + Non-breeding Distribution + Threats to Breeding + Threats to Non-breeding ≥ 18).

Scores have been revised and reflect the best science to date and are under review (Andres unpubl.).

WATERBIRD criteria for *National* list:

1. Include species ranked "Highly Imperiled" in the NAWCP continental-scale assessment unless not occurring on any BCR list.

2. Consider all species ranked "High" in the NAWCP continental-scale assessment (unless not

occurring on any BCR list) and include those with global population size (PS) factor score of 5, 4, 3 or 2. Populations at PS = 2 are included if they are at the lower end of the range in this category (i.e., 69,200) and experiencing steep declines.

THE *BIRDS OF CONSERVATION CONCERN 2008* LISTS

To maximize the usefulness of this report to multiple partners, the *BCC 2008* lists are presented in 46 separate tables, comprising 37 BCR lists (Tables 2 to 38), 8 USFWS Region lists (Tables 39 to 47) and 1 National list (Table 48). Summaries of the status of each species at each of the three distinct geographic scales are provided in Appendix B, and a list of scientific names of all species mentioned is found in Appendix C. The BCR lists range from 10 to 53 species, USFWS Region lists range from 27 to 78 species, and the National list consists of 147 species. The number of priority species represents roughly 10 to 15 percent of all bird species of any given geographic unit.

BCR Lists

The number of species on individual BCR lists (Tables 2 to 38) ranges from 10 to 53, averaging about 27. Lists are generally larger for BCRs in the southern United States, reflecting greater species diversity at lower latitudes and the importance of these regions for wintering migrants. Island birds are at increased risk of becoming endangered. Thus, the "Other U.S. Pacific Islands" BCR and "U.S. Caribbean Islands" BCR have relatively high proportions of their native species represented as birds of conservation concern. Roughly ten percent of the bird species native to Hawaii (BCR 67) are identified as birds of conservation concern, but that region also has a disproportionately large number of bird species listed as either endangered or threatened under the ESA; combining birds of conservation concern with endangered or threatened species, about 25 percent of the native Hawaiian avifauna is at risk.

USFWS Region Lists

The number of species on individual USFWS Region lists (Tables 39 to 47) ranges from 27 to 78, averaging about 50. Following the trend seen in BCRs, USFWS Region lists of priority species are larger in the southern United States, although this is partially attributed by the disparities in area covered by each of the Regions. The birds on the USFWS Region lists generally represent about 10 percent of the species native to the respective Regions.

National List

The National list (Table 48) is comprised of 147 species, and includes disproportionately larger numbers of species from the orders Procellariformes (albatrosses, petrels, shearwaters, and storm-petrels), Charadriiformes (shorebirds, gulls, terns, and auks), and Piciformes (woodpeckers). Within the Charadriiformes, the families Charadriidae (plovers), Haematopodidae (oystercatchers), Scolopacidae (sandpipers), and Alcidae (murres, murrelets,

and auklets) are represented on the list by greater numbers of species than expected. Among the Passeriformes—a large and diverse order of perching birds—the families Parulidae (wood-warblers) and Emberizidae (sparrows) and the subfamily Drepanidinae (Hawaiian honeycreepers) dominate the list in terms of both actual and relative numbers.

DISCUSSION

BCC 2008 is the latest update in a continuing effort to assess and prioritize bird species for conservation purposes (USFWS 1982, 1987, 1995, 2002; and U.S. Department of the Interior 1990). It is difficult to make meaningful comparisons among the lists because of differences in the way each succeeding report was prepared. In chronological order, these previous lists contained 28, 30, 77, 124, and 131 species of conservation concern at a National scale in 1982, 1987, 1990, 1995, and 2002 respectively; by comparison, *BCC 2008* includes 147 species at the National scale.

Do these figures reflect an actual decline in the conservation status of the Nation's birdlife, or do they merely reflect improvements in our ability to accurately identify and characterize species in real need of conservation attention? The truth probably lies somewhere in between. The preparation of prioritized species lists should be viewed as an evolving process, improving as our knowledge base increases, with each list reflecting the best available information at the time of its publication. The three bird conservation initiatives update their own assessments and scoring as new data or analyses become available. The data from these initiatives—which form the basis of *BCC 2008*—incorporate a great deal of input from many bird experts and have wide acceptance among members of avian conservation and scientific communities. We are confident that the methods used in *BCC 2008* are the best available for identifying avian conservation priorities as directed by the FWCA amendment of 1988.

Of the 131 species on the *BCC 2002* National list, 103 were retained on the current 2008 list and 28 were deleted due to a lack of convincing evidence that continued elevated concern is warranted. Forty-four species were added to the National list, resulting in a net gain of sixteen species for a current total of 147 species.

Of the 211 species on the Audubon WatchList (Butcher et al. 2007) that are not also a) endangered or threatened or b) hunted, 106 are on the *BCC 2008* National list and an additional 8 are on USFWS Region or BCR lists.

The selection criteria that we used identified 10 to 15 percent of all species at each geographic scale to be in need of additional conservation attention. Nongame migratory birds protected by the MBTA, the primary focus of this effort, make up an overwhelming proportion of the species on the *BCC 2008* lists. However, the proportional representation of non-MBTA species increases progressively at larger scales, reflecting the vulnerability of the island-endemic species that form the bulk of this group. The proportional representation of ESA candidate species also increases progressively at larger scales. ESA-delisted and ESA-proposed species make up a progressively smaller proportion of the species at larger scales.

BCC 2008 can be used as a barometer of the condition of our country's avifauna. Although there are general patterns that can be inferred from this report, there is no single reason why any species was placed on any one of these lists; some are relatively common but are undergoing sharp declines in population numbers, others are rare but may actually be increasing in numbers in certain locations, and others may be both rare and declining. However, habitat loss due to alteration or destruction continues to be the major reason for the declines of many species (Askins et al. 1990, USFWS 1995, Samson et al. 1998, Askins 2000). Birds included in the *BCC 2008* lists are deemed priorities for conservation actions, and the lists will be consulted for actions taken on Federal lands in accordance with Executive Order 13186, "Responsibilities of Federal agencies to protect migratory birds" (Clinton 2001). BCC species will also receive priority attention in the USFWS when allocating research, monitoring, and management funding. Our hope is that *BCC 2008* will stimulate coordinated, collaborative proactive conservation actions among Federal, State, and private partners.

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APPENDIX A

Table 1 Eligibility of Various Species Groups for *BCC 2008* Consideration.

Applicable Federal Authority	Eligible	Not Eligible
Migratory Bird Treaty Act	"Nongame" and "other" species (as variously defined by bilateral migratory bird conventions with Canada, Mexico, Japan, and Russia)	Species peripheral to the U.S. (e.g., population fragments too small to be managed capably)
	"Gamebirds" (as defined by 50 CFR 20.11) for which hunting seasons have not recently been established (e.g., most shorebirds)	"Gamebirds" (as defined by 50 CFR 20.11) for which sport hunting seasons are established
	All subsistence-hunted species in Alaska (except "gamebirds" with established sport hunting seasons)	
Endangered Species Act	Candidates, including "resident gamebirds" (see below), or proposed Endangered or Threatened	Species, subspecies, and populations designated as Endangered or Threatened (as listed at 50 CFR 17.11)
	Non-listed subspecies and populations of otherwise Endangered or Threatened species (e.g., *occidentalis* ssp. of Spotted Owl)	
	Recently delisted MBTA species (e.g., Peregrine Falcon)	
	Other MBTA species delisted in the future	
None	Endemic Hawaiian honeycreepers of the subfamily Drepanididae (e.g., Hawai`i `Amakihi)	"Resident gamebirds" (generally hunted and managed by State wildlife agencies), unless listed as ESA Candidate (see above)
	Other island endemics (e.g., Fiji Shrikebill)	Non-native species

Table 36 BCR 67 (Hawaii) *BCC 2008* list.[38]

Laysan Albatross
Black-footed Albatross
Christmas Shearwater
Band-rumped Storm-Petrel (a)
Tristram's Storm-Petrel
Bristle-thighed Curlew (nb)
Short-eared Owl
`Elepaio (d)
`Oma`o
Hawai`i `Amakihi (d)
Oahu `Amakihi (d)
Kaua`i `Amakihi (d)
`Anianiau (d)
`Akikiki (a,d)
Maui `Alauahio (d)
`Akeke`e (d)
`I`iwi (d)
`Apapane (d)

38 (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR

Table 37 Other U.S. Pacific Islands *BCC 2008* list.[39]

Laysan Albatross
Black-footed Albatross
Herald Petrel
Tahiti Petrel (d)
Phoenix Petrel (d)
Christmas Shearwater
Audubon's Shearwater
Polynesian Storm-Petrel (d)
Spotless Crake (American Samoa pop.) (a,d)
Purple Swamphen
Bristle-thighed Curlew (nb)
Friendly Ground-Dove (American Samoa DPS) (a,d)
Micronesian Myzomela (d)
Rufous Fantail (*mariae* ssp.) (d)
Rufous Fantail (*saipanensis* ssp.) (d)
Fiji Shrikebill (d)
Tinian Monarch (d)
Bridled White-eye (*saypani* ssp.) (c,d)
Golden White-eye (d)
Micronesian Starling (*guami* ssp.) (d)
Polynesian Starling (d)

39 (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR

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A8. MARINE MAMMAL PROTECTION ACT VS STATE AUTHORITY

The following document provides NOAA's perspective on the relationship of the Marine Mammal Protection Act to certain provisions of Hawai'i State law that prohibit take of Federally-listed species, and the related enforceability under the Coastal Zone Management Act.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

OFFICE OF THE GENERAL COUNSEL

June 20, 2008

The Honorable Frank R. Jimenez
General Counsel of the Navy
1000 Navy Pentagon
Washington, DC 20450-1000

Dear Mr. Jimenez,

In a letter dated June 19, 2008, you asked for the views of the National Oceanic and Atmospheric Administration (NOAA) on the issue of whether Section 109(a) of the Marine Mammal Protection Act (MMPA), 16 U.S.C. § 1379(a), preempts certain provisions of Hawaii state law, Haw. Rev. Stat §§ 195D-1 – 195D-32 and Haw. Admin. Reg. §§ 13-124-1 – 13-124-10, which prohibit take of federally-listed species, as those laws relate to marine mammals. In addition, you asked for NOAA's views regarding the implications of preemption on the enforceability of those laws under the Coastal Zone Management Act (CZMA).

Our view is that enforcement of the Hawaii state laws and regulations identified above is, in this context, preempted by Section 109(a) of the MMPA, insofar as those laws and regulations relate to the taking of marine mammals. To the extent any state requirement is preempted by the MMPA, it is not enforceable under the CZMA.

Section 109(a) of the MMPA provides that "[n]o state may enforce . . . any State law or regulation . . . relating to the taking of any species . . . of marine mammal" within the State unless the Secretary of Commerce has transferred management authority for that species to the State. MMPA § 109(a), 16 U.S.C. § 1379(a); cf. 16 U.S.C. § 1362(13) (defining "take"). *See generally* 50 C.F.R. Part. 403 (governing transfer of MMPA authority). The plain language of this provision is unambiguous and preempts all state statutes and regulations related to the taking of marine mammals. As noted by the District Court for Hawaii in a case interpreting Section 109(a), the Supreme Court has held that the use of the phrase "relating to" underscores Congress' broad pre-emptive purpose. *U.F.O. Chuting of Hawaii, Inc. v. Young*, 327 F. Supp.2d 1220, 1223 (D. Haw. 2004) (*citing Morales v. Trans World Airlines, Inc.*, 504 U.S. 374, 382 (1992)). Thus, as a general matter, unless the Secretary of Commerce has transferred MMPA management authority for marine mammal species to a particular state, any state law that prohibits take of marine mammals constitutes a state law "relating to" the taking of marine mammals and, to that extent, is preempted.

In addition, Section 6(c) of the ESA, 16 U.S.C. § 1535(c), generally authorizes states to enter into cooperative agreements with the Secretary of Commerce (through NOAA) or the Department of the Interior under which funding is made available to a state to assist in state efforts to conserve endangered and threatened species. A specific type of Section 6 agreement, however, requires findings by the Secretary that the state has established programs for conservation of all protected species, and recognizes the state's authority to establish and enforce protections for such species. See ESA § 6(g)(2)(A), 16 U.S.C. § 1535(g)(2)(A); *see also* ESA § 6(c)(1)(A)-(E), 16 U.S.C. § 1535(c)(1)(A)-(E), *and* compare text preceding § 6(c)(2), 16 U.S.C. § 1535(c)(2). An uncodified provision of the 1981 amendments to the MMPA states: "Nothing in the amendments made by subsection (a) [amending § 109(a)] shall be construed as affecting in any manner, or to any extent, any cooperative agreement entered into by a State under [ESA] section 6(c)." P.L. 97-58, § 4(b). Thus, in the case of certain ESA Section 6 agreements that explicitly recognize the state's authority to establish and enforce protections for listed marine mammals, the uncodified provision may be read to provide a limited exception that would allow enforcement of state laws relating to such species to ensure that the purposes of the Section 6 agreement are fulfilled. Such an exception would not apply in this case for the reasons discussed below.

In this case, the Secretary of Commerce has not transferred MMPA management authority over any marine mammal species to the State of Hawaii. Moreover, although NOAA entered into a cooperative agreement with the Hawaii Department of Land and Natural Resources on August 29, 2006, this agreement does not explicitly recognize the state's authority to establish and enforce protections for listed marine mammals; instead the agreement grants only limited authority, primarily providing a vehicle for making federal funding available to Hawaii to conserve listed species. *See* Cooperative Agreement Between the United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, and the Hawaii Department of Land and Natural Resources for the Conservation of Threatened and Endangered Species, at 4. Therefore, enforcement of a Hawaii state law that prohibits take of federally-listed species is preempted under the MMPA, to the extent it relates to the taking of marine mammals. Section 109(a) of the MMPA does not preempt enforcement of Hawaii state law to the extent it does not relate to the taking of marine mammals.

To the extent Hawaii's state requirements are preempted by the MMPA, they are not enforceable under the CZMA. The CZMA requires that Federal agency actions be consistent, to the maximum extent practicable, with the enforceable policies of a state's Federally-approved coastal management program. 16 U.S.C. § 1456(c)(1)(A). Enforceable policies are state policies that are legally binding through laws and regulations by which a state exerts control over natural resources within its coastal zone. 16 U.S.C. § 1453(6a); 15 C.F.R. § 930.11(h). Enforceable polices, however, do not include state statutes and regulations that are preempted by Federal law, as they are not "legally binding." Moreover, NOAA's approval of a State CZM program does not negate the preemptive effect of Federal law. NOAA has consistently interpreted enforceable policies as those state policies not preempted by Federal law. *See* NOAA Office of Ocean and

Coastal Resource Management, CZMA Federal Consistency Overview, at 6 (Aug. 10, 2007), available at, http://coastalmanagement.noaa.gov/consistency/resources.html; NOAA Office of Ocean and Coastal Resource Management, Program Change Guidance, Section II(D), at 8 (July 1996), available at, http://coastalmanagement.noaa.gov/consistency/FC_policy_guidance.html.

Sincerely,

Jane C. Luxton
General Counsel

3

A9. STATE OF HAWAIʻI RELATED PLANS

The following State plans are included on the reference cd:

- Hawaiʻi Ocean Resources and Management Plan (2013)
- Hawaiʻi's Nonpoint Source Management Plan 2015-2020 (2014)
- Hawaiʻi's State Wildlife Action Plan (2015)
- State of Hawaiʻi Aquatic Invasive Species Management Plan (2003)
- Hawaiʻi Interagency Biosecurity Plan (2016)

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APPENDIX B
FIGURES

This appendix contains maps and figures in support of the INRMP. The MCBH GIS data repositories were the primary government provided information to support development of these figures. Additional information was obtained from public data repositories (e.g., Federal, State) and contractor-developed datasets.

Regional

1. MCBH Properties, Island of O‘ahu

MCBH Kaneohe Bay

2. MCBH Kaneohe Bay Site Map
3. MCBH Kaneohe Bay Range Training Complex
4. MCBH Kaneohe Bay Soils
5. MCBH Kaneohe Bay, Bird Surveys
    a. Nu‘upia Ponds Vicinity: Shearwater Nesting Burrows with Chicks
    b. Nu‘upia Ponds Vicinity: Hawaiian Stilt Nesting and Foraging Locations
    c. Hale Koa and Sag Harbor: Hawaiian Stilt Nesting and Foraging Locations
6. MCBH Kaneohe Bay – Wetlands
    a. MCBH Kaneohe Bay Wetlands – Overview
    b. MCBH Kaneohe Bay Wetlands – Nu‘upia Ponds Vicinity
    c. MCBH Kaneohe Bay Wetlands – Salvage Yard
    d. MCBH Kaneohe Bay Wetlands – Percolation Ditch
    e. MCBH Kaneohe Bay Wetlands – Motor Pool
    f. MCBH Kaneohe Bay Wetlands – Hale Koa & Sag Harbor
    g. MCBH Kaneohe Bay Wetlands – Klipper Golf Course Ponds
7. MCBH Kaneohe Bay Off Limit Areas
    a. Former Trap and Skeet Range (UXO0003)
    b. Former Moving Target Range (UXO0002)
8. MCBH Kaneohe Bay Flood Hazard Areas
9. MCBH Kaneohe Bay Marine Resources Survey
10. MCBH Kaneohe Bay Monk Seal Haul-Out Locations
11. MCBH Kaneohe Bay, Projected Sea Level Rise
12. MCBH Kaneohe Bay, Vegetation Species of Conservation Concern
    a. Nu‘upia Ponds Area
    b. Pyramid Rock Area
13. MCBH Kaneohe Bay – Ulupa‘u Crater
    a. Ulupa‘u Crater: Erosion Sensitivity
    b. Ulupa‘u Crater: Recent Fire Occurrence
    c. Ulupa‘u Crater: Water Cannons
14. MCBH Kaneohe Bay – Fishing and Water Sports

Marine Corps Training Area Bellows

15. MCTAB Site Map
16. MCTAB Soils
17. MCTAB Wetlands
18. MCTAB Flood Hazard Areas
19. MCTAB Floodway Restoration
20. MCTAB Marine Resources Survey Area
21. MCTAB Vegetation
22. MCTAB Invasive Species Vegetation
    a. Koa Haole Cover
    b. Guinea Grass Cover
    c. Christmasberry Cover
    d. Kiawe Cover
    e. California Grass Cover
    f. High Fire Danger
    g. Fountain Grass Locations (2001-2005)
    h. Fountain Grass Locations (2006-2016)
    i. Broomsedge
23. MCTAB Recreational Areas

Waikane Valley Impact Area

24. Waikane Valley Impact Area and Vicinity
25. Waikane Valley Impact Area Soils
26. Waikane Valley Impact Area Unexploded Ordnance Removal Activities

Camp Smith

27. Camp Smith and Vicinity
28. Camp Smith Soils
29. Camp Smith Vegetation
30. Camp Smith Invasive Species

Pu‘uloa Range Training Facility

31. Pu‘uloa RTF and Vicinity
32. Pu‘uloa RTF Soils
33. Pu‘uloa RTF Flood Hazard Areas
34. Pu‘uloa RTF Shoreline Erosion Project Area

Pearl City Annex

35. Pearl City Annex, Manana Housing Area, and Vicinity
36. Pearl City Annex Wetlands

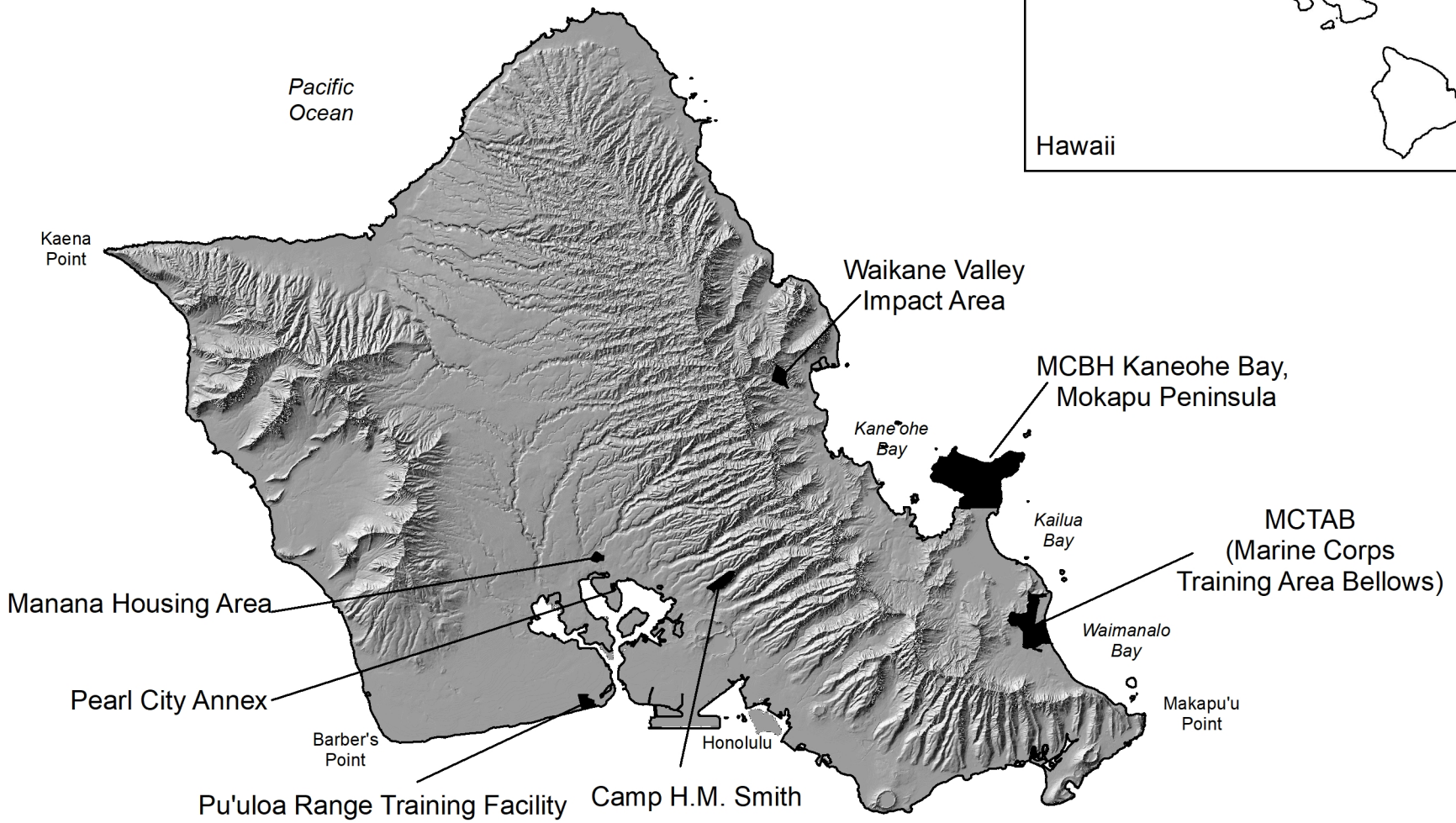


Figure 1
MCBH Properties, Island of Oahu

Source: MCBH GIS Data Repository; State of Hawaii Data Repository

N

0 1.5 3 6 9 Miles

Final MCBH INRMP Update (2017-2021)
August 2017

Figure 2
MCBH Kaneohe Bay Site Map

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

500 yd Security Buffer Zone

Wildlife Management Area

Source: MCBH GIS Data Repository
Aerial Photo from ESRI

N

0 0.15 0.3 0.6 0.9 Miles

FIGURE 3: MCBH KANEOHE BAY RANGE TRAINING COMPLEX

This map depicts training ranges in Ulupa‘u Crater.

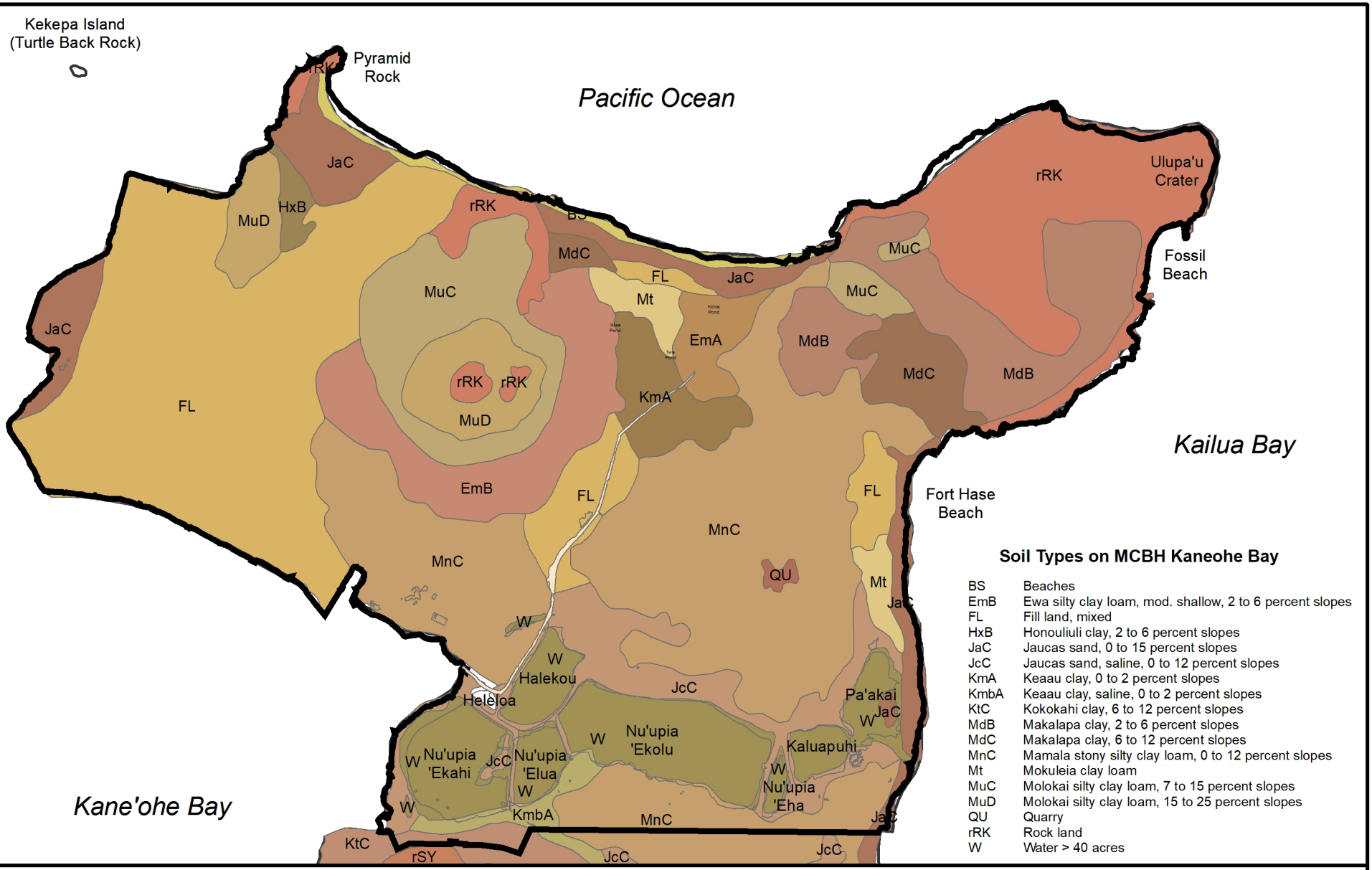


Figure 4
MCBH Kaneohe Bay Soils

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository (Soil types from
NRCS (SCS) Soil Survey of O`ahu (Foote et al. 1972))

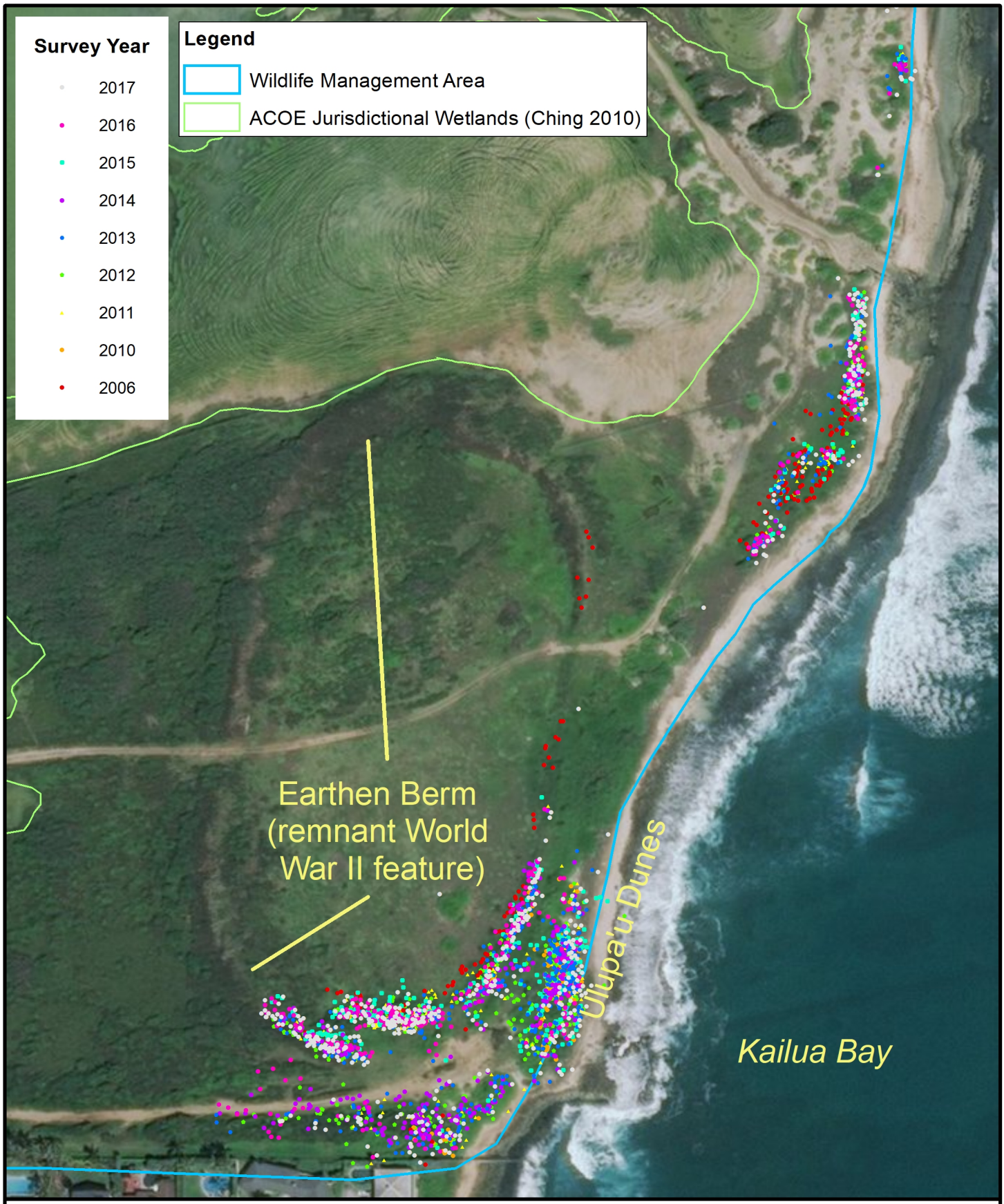


Figure 5a. MCBH Kaneohe Bay Bird Surveys
Nu'upia Ponds Vicinity
Shearwater Nesting Burrows with Chicks

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
Aerial photo from ESRI.
Nesting data retained in Natural Resources Dept files.

N

0 0.01 0.02 0.04 Miles

Figure 5b. MCBH Kaneohe Bay Bird Surveys
Nu'upia Ponds Vicinity
Hawaiian Stilt Nesting and Foraging Locations

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

Wildlife Management Area

ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository;
Aerial photo from ESRI
Stilt nesting and foraging from Volinski 2007 and Natural Resources Staff observations

N

0 0.05 0.1 0.2 Miles

Figure 5c. MCBH Kaneohe Bay Bird Surveys
Hale Koa and Sag Harbor
Hawaiian Stilt Nesting and Foraging Locations
Final MCBH INRMP Update (2017-2021)
August 2017

Legend

ACOE Jurisdictional Wetlands (Ching 2010)

nesting/foraging

Source: MCBH GIS Data Repository;
Aerial photo from ESRI
Stilt nesting and foraging from Volinski 2007
and Natural Resources Staff observations

N

0 0.015 0.03 0.06 Miles

Figure 6a
MCBH Kaneohe Bay Wetlands - Overview

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- Wildlife Management Area
- ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository
Aerial photo from ESRI

N

0 0.125 0.25 0.5 0.75 Miles

Figure 6b. MCBH Kaneohe Bay Wetlands
Nu'upia Ponds Vicinity

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- Wildlife Management Area
- ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

N

0 0.05 0.1 0.2 0.3 Miles

Figure 6c. MCBH Kaneohe Bay Wetlands Salvage Yard

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

PCB Contamination (No-go for AAVs - MudOps)

ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository; Aerial photo from ESRI

N

0 0.02 0.04 0.08 Miles

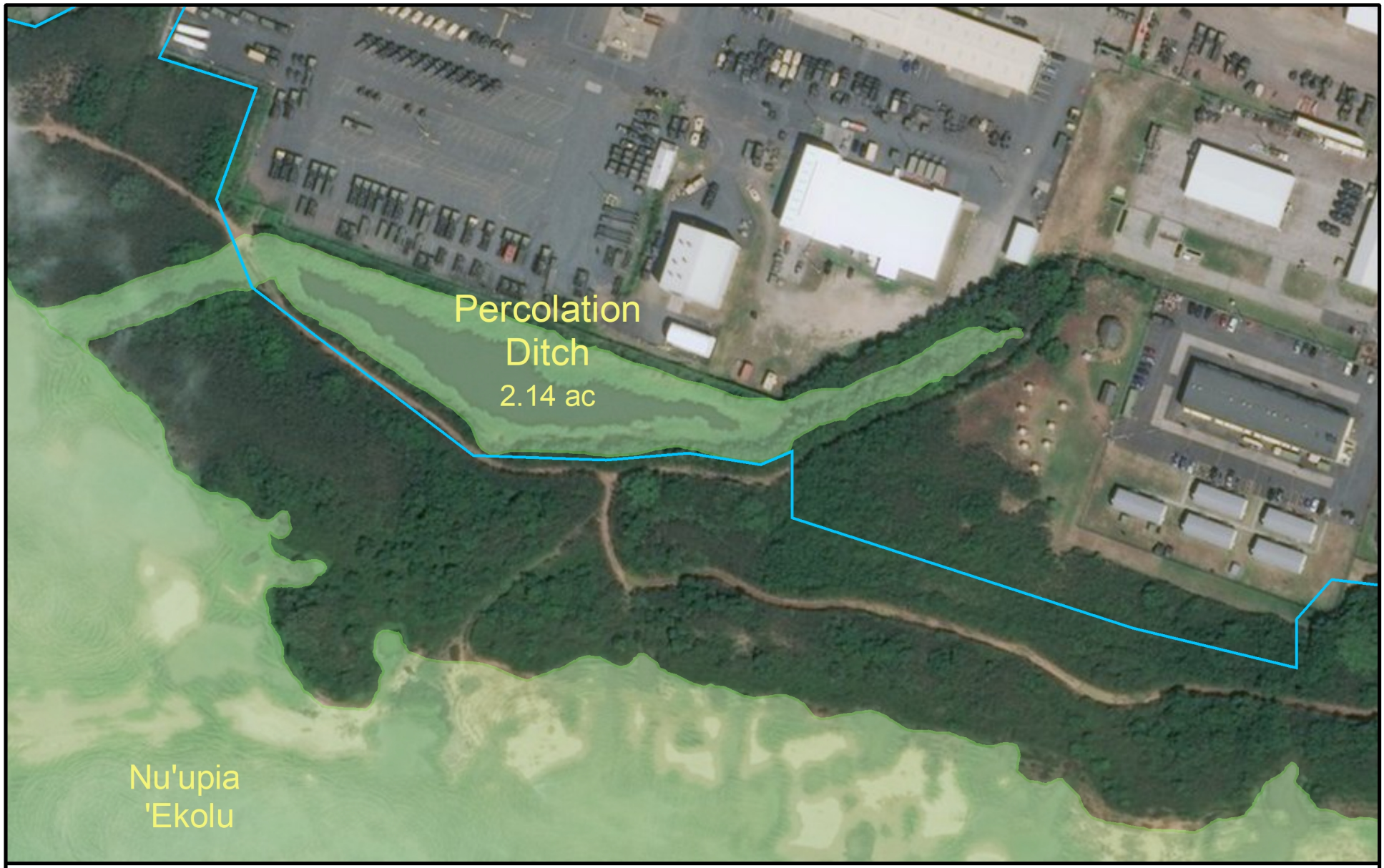


Figure 6d. MCBH Kaneohe Bay Wetlands Percolation Ditch

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

Wildlife Management Area

ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository; Aerial photo from ESRI

N

0 0.01 0.02 0.04 Miles

Figure 6e. MCBH Kaneohe Bay Wetlands Motor Pool

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository; Aerial photo from ESRI

N

0 0.01 0.02 0.04 Miles

Figure 6f. MCBH Kaneohe Bay Wetlands
Hale Koa & Sag Harbor

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

N

Miles
0 0.02 0.04 0.08

Figure 6g. MCBH Kaneohe Bay Wetlands
Klipper Golf Course Ponds

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

ACOE Jurisdictional Wetlands (Ching 2010)

Note: Klipper Golf Course Ponds are located on the Kaneohe Klipper Golf Course

Source: MCBH GIS Data Repository; Aerial photo from ESRI

N

0 0.01 0.02 0.04 Miles

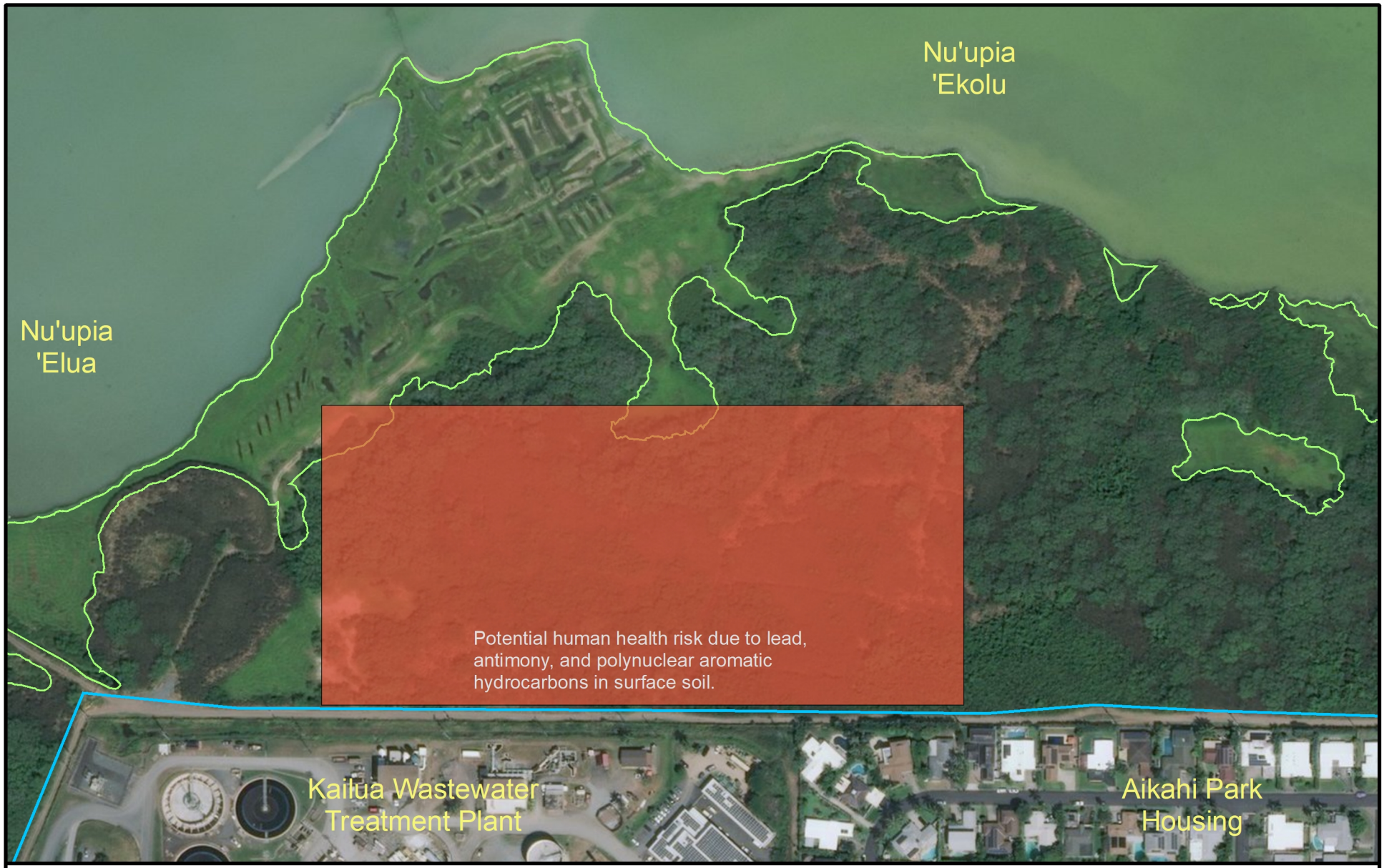


Figure 7a. MCBH Kaneohe Bay Off Limit Areas
Former Trap and Skeet Range (UXO0003)

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- Wildlife Management Area
- ACOE Jurisdictional Wetlands (Ching 2010)
- Portion of MRS UXO 0003 Site (approx bnds)

Source: MCBH GIS Data Repository;
Aerial photo from ESRI.

N

0 0.015 0.03 0.06 Miles

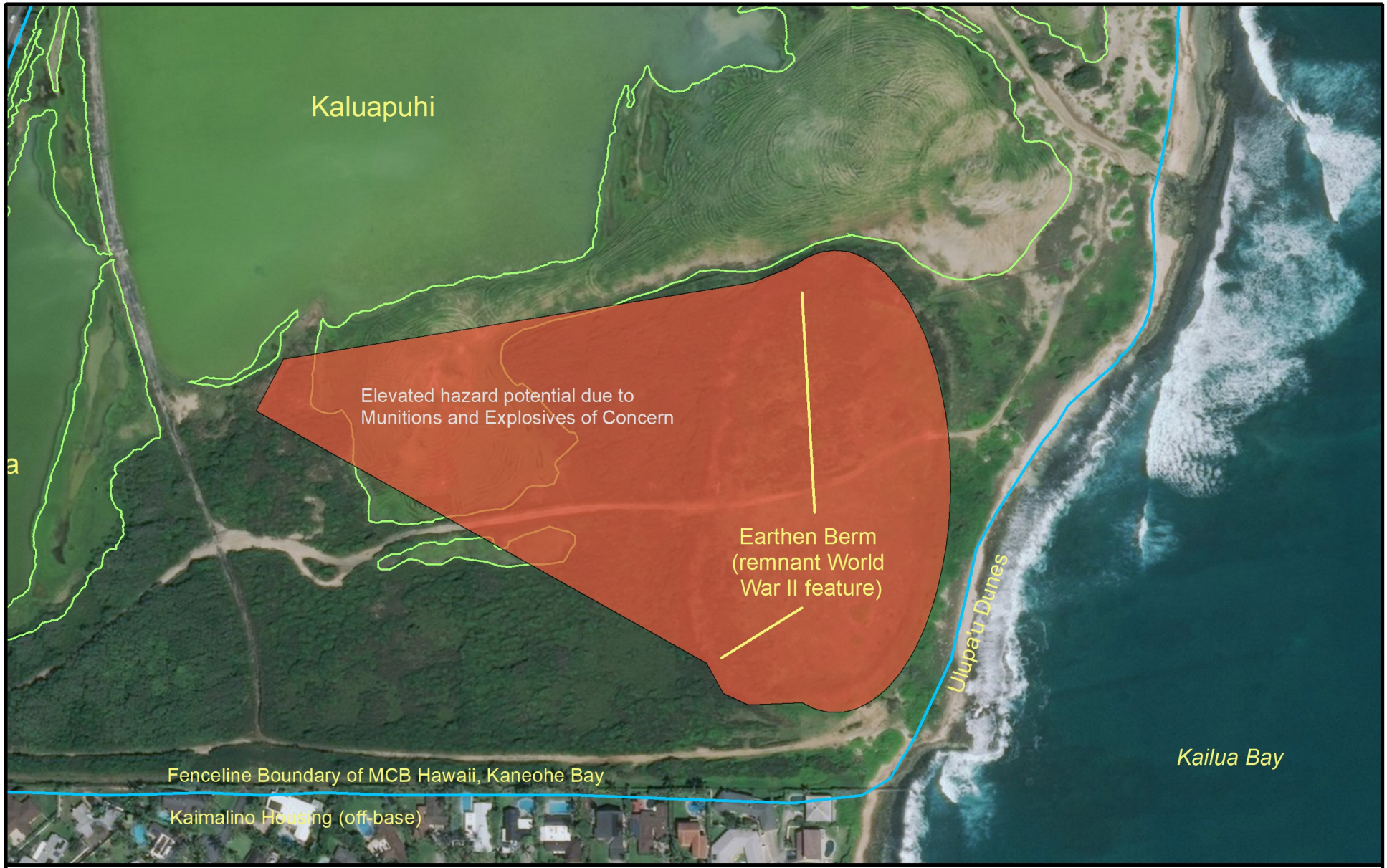


Figure 7b. MCBH Kaneohe Bay Off Limit Areas
Former Moving Target Range (UXO0002)

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- MRS UXO 0002 Site (approx bnds)
- Wildlife Management Area
- ACOE Jurisdictional Wetlands (Ching 2010)

Source: MCBH GIS Data Repository;
Aerial photo from ESRI.

N

0 0.015 0.03 0.06 Miles

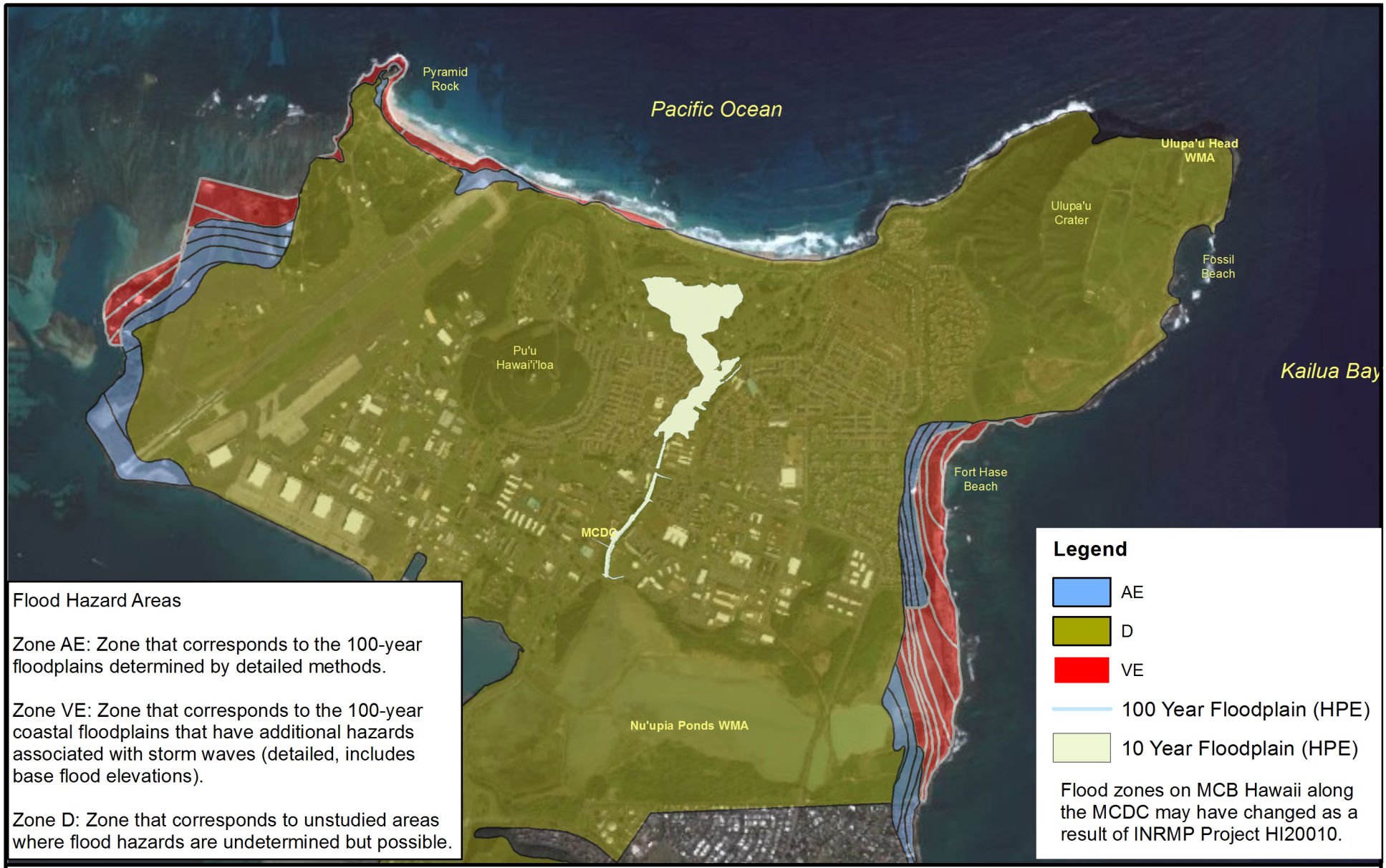


Figure 8
MCBH Kaneohe Bay Flood Zones

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
Aerial photo from ESRI
Flood Hazard Areas from C/C Honolulu (2011)
and Mokapu Central Drainage Channel Study, MCBH (HPE 2003)

FIGURE 9: MCBH KANEOHE BAY MARINE RESOURCES SURVEYS

The following figure and associated descriptive information about the observations (e.g., habitat, species) in survey areas are highlights of the results of the USFWS-led marine resources surveys in the MCBH Kaneohe Bay 500-yard security buffer zone (USFWS 2008, 2013). The map of the survey areas was used for both qualitative and quantitative surveys. Management recommendations to promote conservation of marine resources can be found in the final reports (USFWS 2008, 2013). See further discussion in COA 7.4.

HABITAT DESCRIPTIONS (USFWS 2008)

Station 1 Habitat: Carbonate and basalt pavement with sediment filled sand channels and depressions was the primary habitat with a change in rugosity to a basalt dominated boulder field.

Station 2 Habitat: This site was a moderate relief carbonate pavement over basalt with occasional sand channels and overhangs. *Porites compressa* and *Montipora capitata* were observed and macroalgae assemblage was diverse with 34 taxa recorded during the survey.

Station 3 Habitat: This station had high-relief spur-and-groove morphology with overhangs and archways large enough for a diver to swim through. The spurs were mostly composed of carbonate while the grooves were sediment-covered basalt. Coral, crustose coralline algae and filamentous turf algae with grazing scars were the common benthic organisms.

Station 4 Habitat: Located at the base of a windward cliff, this site is dominated by a mix of boulders covered with small encrusting coral colonies (*Porites* and *Montipora*) and a variety of zoanthids (*Palythoa* and *Zoanthus*). A diverse assemblage of urchins, mollusks, and sponges were recorded.

Station 5 Habitat: Complex coral community features caves, overhangs, and crevices provide suitable habitat for a diverse assemblage of reef fish, mollusks, and algae. Significant bioerosion is attributed to large numbers of the boring urchin, *Echinometra matthaei*.

Station 6 Habitat: Sand-scoured carbonate pavement and basalt with sand filled channels and depressions; ledges; scattered coral heads of *Pocillopora damicornis* and collapsed lava tubes dominate substrate types of this station. Ghost nets and ordnance (various sizes) were observed

Station 7 Habitat: The primary substrate type was low relief carbonate pavement over basalt with occasional sand channels and overhangs. Macroalgae formed three distinct canopies: 1) the tallest macrophytes were meadow-forming adult forms of the brown alga *Dictyopteris australis*; 2) a mixture of the green alga *Microdictyon setchellianum* and juvenile *D. australis* as a turf and sediment-covered filamentous turf algae in between the *D. australis* adults; 3) crustose coralline algae underneath the *M. setchellianum*. The green turtle *Chelonia mydas* was observed at the surface. Since the alga *Microdictyon setchellianum* is consumed by green turtles in Hawaii, this area may provide a grazing habitat for turtles.

Station 8 Habitat: High energy, low relief coral community featuring *Pocillopora*, *Porites*, and *Montipora* coral species. Strong waves have eroded the carbonate reef forming arches, crevices, ridges and grooves that provide habitat for a wide variety of reef fish and mollusk species. Algae diversity was low. Observed a young Hawaiian monk seal (*Neomonachus schauinslandi*), with acoustical tracking tag, foraging for food at the spur and groove structure.

Station 9 Habitat: This dredged area had an intact reef flat, a steep graded slope with coral and macroalgae cover and a broad soft sediment plain that leveled off. Coral cover abruptly ended along the dredged slope. *Halophila decipiens* formed an extensive meadow in the shallow soft sediments. The green turtle *Chelonia mydas* was seen resting in the area. As both seagrass species are frequently consumed by green turtles in Hawaii this area could be considered a potential grazing habitat for the green turtle. The endemic seagrass *Halophila hawaiiana* formed dense patches, on soft sediment.

Station 10 Habitat: Low energy environment largely soft sediment bottom, with isolated *Porites* coral pinnacles appearing in abundance throughout the station. The pinnacles support a diverse assemblage of macroinvertebrates. However, the pinnacles have been invaded by alien algae (*Acanthophora* and *Gracilaria*) and the keyhole sponge (*Mycale*).

Station 11 Habitat: Two invasive macroalgae species occurred as unattached accumulations (tumbleweed-like morphology) within the soft bottom, dredged habitat (marina). The red alga *Gracilaria salicornia* formed the base of the macroalgal accumulations and it supported an epiphyte, the red alga *Acanthophora spicifera*.

DETAILED OBSERVATIONS (USFWS AND USGS 2013)

Survey Areas 1-3 Eastern Facing Communities

Survey Areas 1-3 are eastern facing communities that are exposed to tradewinds, large waves, and swell. The increased wave activity could account for the encrusting morphology of corals and the turf morphology of algae that occur in these habitats. Both taxa often dominate the benthic substrate. Native and diverse algal meadows and few encrusting colonies of common Hawaiian corals (*Montipora* spp., *P. lobata*) dominate the habitat in Survey Area 1. A very small patch of branching corals occur on large basalt boulders located in the deeper reef. Flat carbonate pavement colonized by turf algae and encrusting corals are found along the shallow transects in Survey Area 2. However, the habitat transitioned from a co-dominated community in the nearshore to a coral dominated community in deeper water.

Survey Areas 4-8 Northern Facing Communities

Survey Areas 4-8 have northern exposures to tradewinds and this area experiences large oceanic waves and swell. The benthic colonizers throughout these stations are native algae and corals. The species identities and proportions of these taxa change among stations with the varying substrate types. Survey Area 4 consists of large platform boulders that have broken away from the seaward cliffs. *Palythoa caesia* was a common colonizer of these rocks and occurs in dense patches. Coral diversity is high in Survey Area 4 and an octocoral, zoanthids, and scleractinian representatives were encountered. Crustose and turf algae were also common. Reef fish aggregate within the smooth boulder substrate which was colonized by crustose and turf algae. Survey Area 5 consists of a spur and groove reef. Cropped reef algae with short statures and colonies of corals with encrusting or mound morphology tend to dominate the benthos. However, encrusting corals (*P. lobata*, *Montipora* spp.) tended to occupy a larger percentage of the hard substrate towards western boundary. As a result of the intense wave action in Survey Area 8, the substrate in the outer reef is highly sculpted creating few channels and numerous overhangs and ledges. Turf algae and *P. meandrina* are the dominant benthic colonizers on the hard substrate spurs. Green sea turtles frequent this reef, resting in the ledges and overhangs. The reef flat located nearshore in Survey Area 8 is protected from large waves and swell. Large coral colonies with microatoll morphologies can be found here along with a boring urchin (*E. mathaei*) zone covered in turf algae. The brown alga *Turbinaria ornata*, the green alga *H. discoidea*, and the invasive *A. spicifera* often inhabit this survey area. Juvenile and adult reef fishes and non-coral macroinvertebrates were common in all stations 4-8.

Survey Areas 9-11 Western Facing Communities

Survey Areas 9-11 are located on the western side of the peninsula where it is protected from wave action. These areas have been highly modified by dredging activities and as a result the soft sediment occurs throughout much of these stations. The sediment is devoid of epi-benthic cover but numerous burrows from infauna are present. Rays are known to frequent the bay and feed on alpheid shrimps but none were seen. Seagrasses (*H. decipiens*, *H. hawaiiana*) grow in much of the soft sediment located in Survey Area 9. The two species of seagrass were observed at station 9 but these species occupy different areas and do not co-mingle. These grass stands tend to be dense with long axes (5-cm). In contrast in areas 9-10 *Halophila decipiens* is sparsely distributed in shallow waters.

Corals occupy areas that were not previously dredged. *Montipora capitata* and *P. compressa* are common members of the patch and shallow reefs found in Survey Areas 9-11. Two colonies of diseased corals were found in Survey Area 10. *M. armata*, a red colored sponge has invaded the coral reefs, occupying the space between coral fingers. *Gracilaria salicornia* and *A. spicifera* are also invaders in the shallow regions of the reef flats, patch reefs, and fringing reefs. In some areas these algae form dense mats that blanket the substrate. This is of concern as these species are thought to out-compete many native corals and algae. Numerous green sea turtles were observed to feed and frequent in coral and seagrass habitats in Survey Area 9. Debris was also concentrated in the boat channel and near the beaches in this survey area.

U.S. Fish & Wildlife Service
Pacific Islands Office
Honolulu, Hawaii
MCBH - Kaneohe Bay: Inventory Study Areas
1
2
3
4
5
6
7
8
9
10
11
Study Areas
1-11
N
W
E
S
0 250 500 Meters
0 0.25 0.5 Miles
Produced in the Division of Ecological Service Honolulu, HI
Map Date: April 07
UTM Zone 4, NAD83
1:31,000

1

Figure 10 MCBH Kaneohe Bay
Monk Seal Haul-Out Locations

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

500 yd Security Buffer Zone

Wildlife Management Area

Source: MCBH GIS Data Repository
Aerial Photo from ESRI

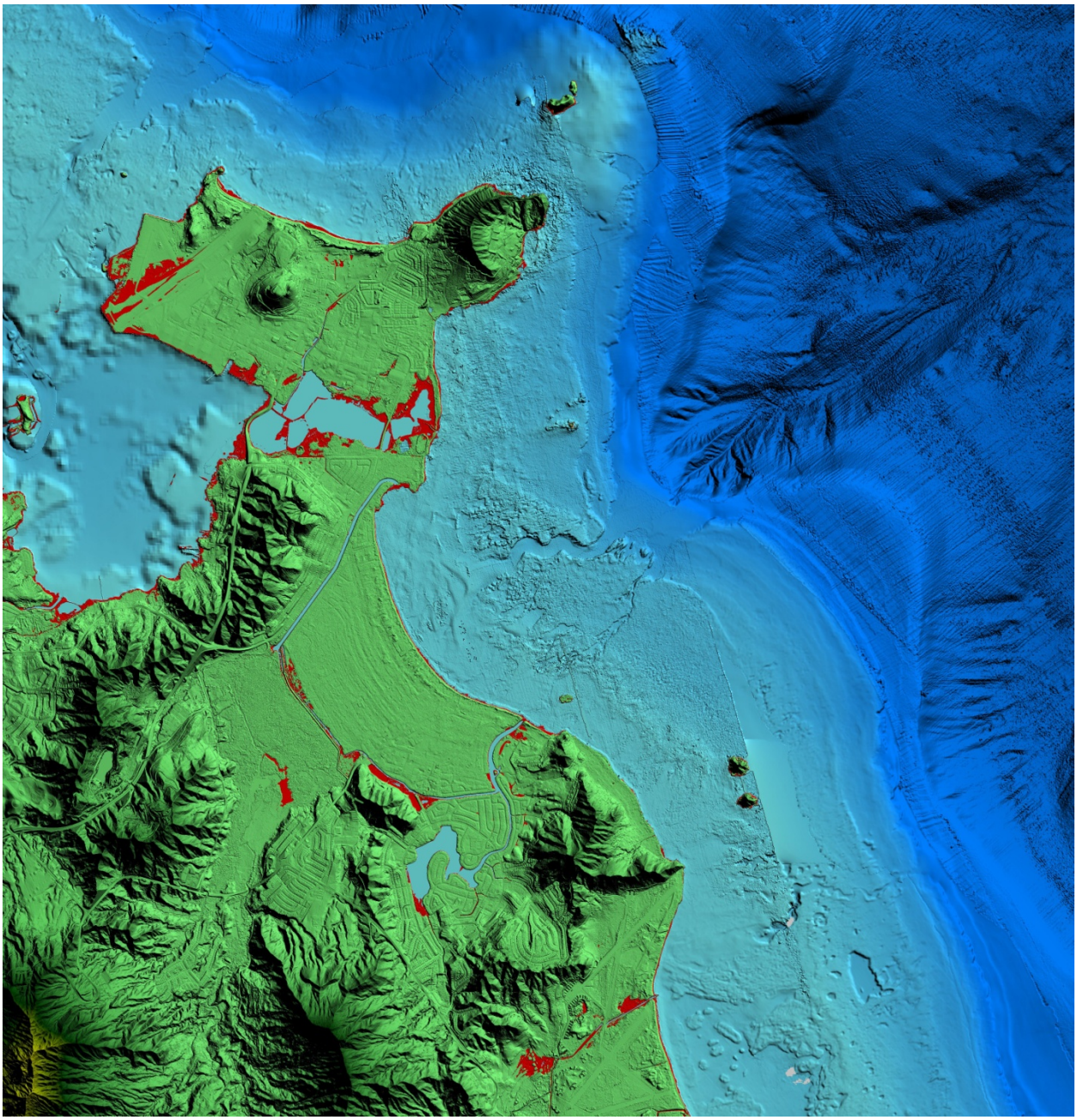
N

0 0.1 0.2 0.4 0.6 Miles

FIGURE 11: MCBH KANEOHE BAY PROJECTED SEA LEVEL RISE

This map depicts the general area of Mōkapu Peninsula and Kailua Bay. The red tone areas indicate lands vulnerable to sea level rise impacts, at high tide, when mean sea level rises 3 ft (91 cm) above present. According to Dr. Charles Fletcher (University of Hawai'i), the latest research suggests we are facing ~1 ft (32 cm) of sea level rise by 2050 and a range of 2.5-6.2 ft (0.75-1.9 m) by the end of the century. See further discussion in COA 7.4.

Source: Dr. C. Fletcher, map used with permission



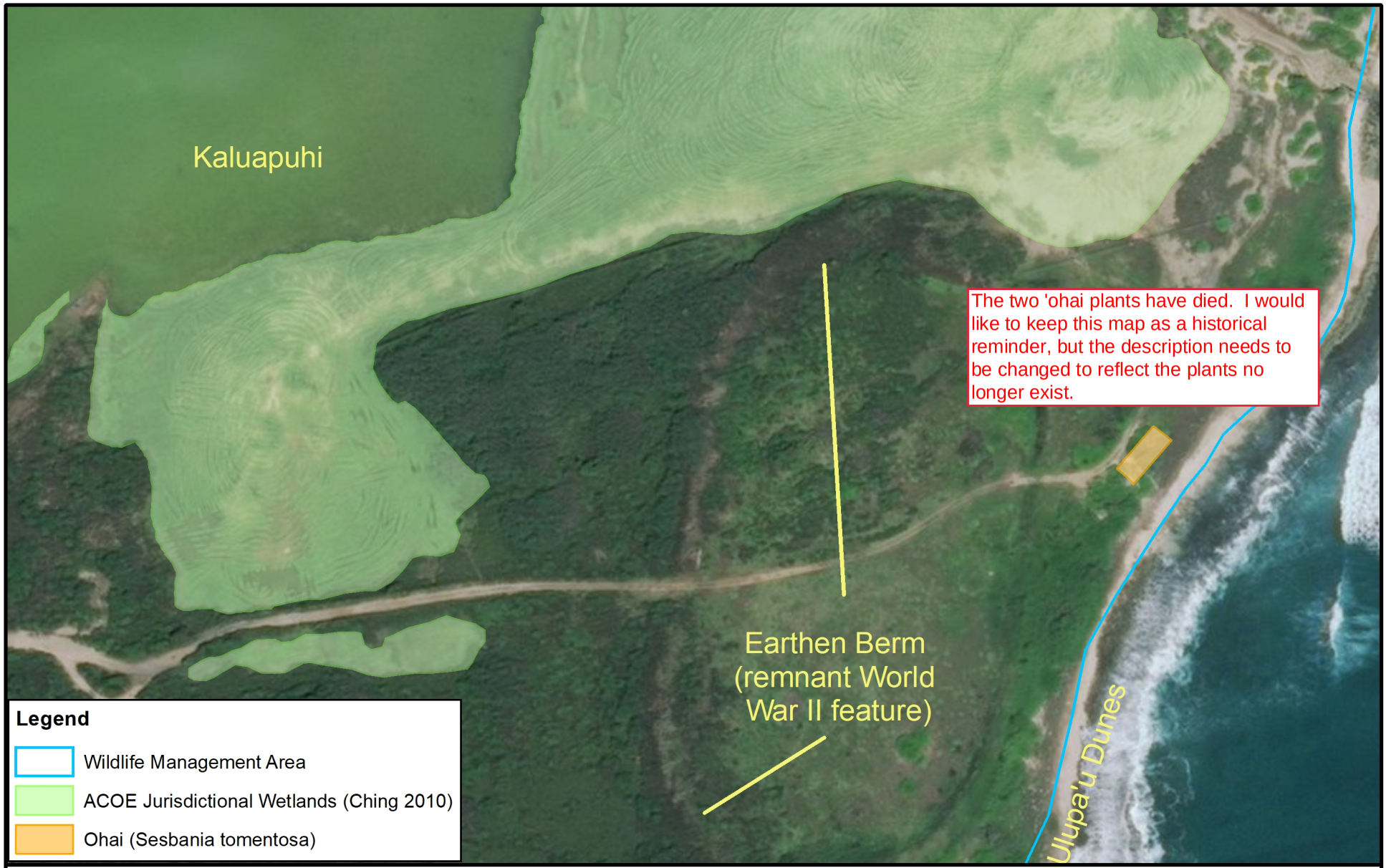


Figure 12a MCBH Kaneohe Bay
Vegetation Species of Conservation Concern
Nu'upia Ponds Vicinity

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
Aerial photo from ESRI.

Figure 12b MCBH Kaneohe Bay
Vegetation Species of Conservation Concern
Pyramid Rock Vicinity
Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- Maiapilo (Capparis sandwichiana)
- Nama (Nama sandwicensis)

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

N

0 0.03 0.06 0.12 Miles

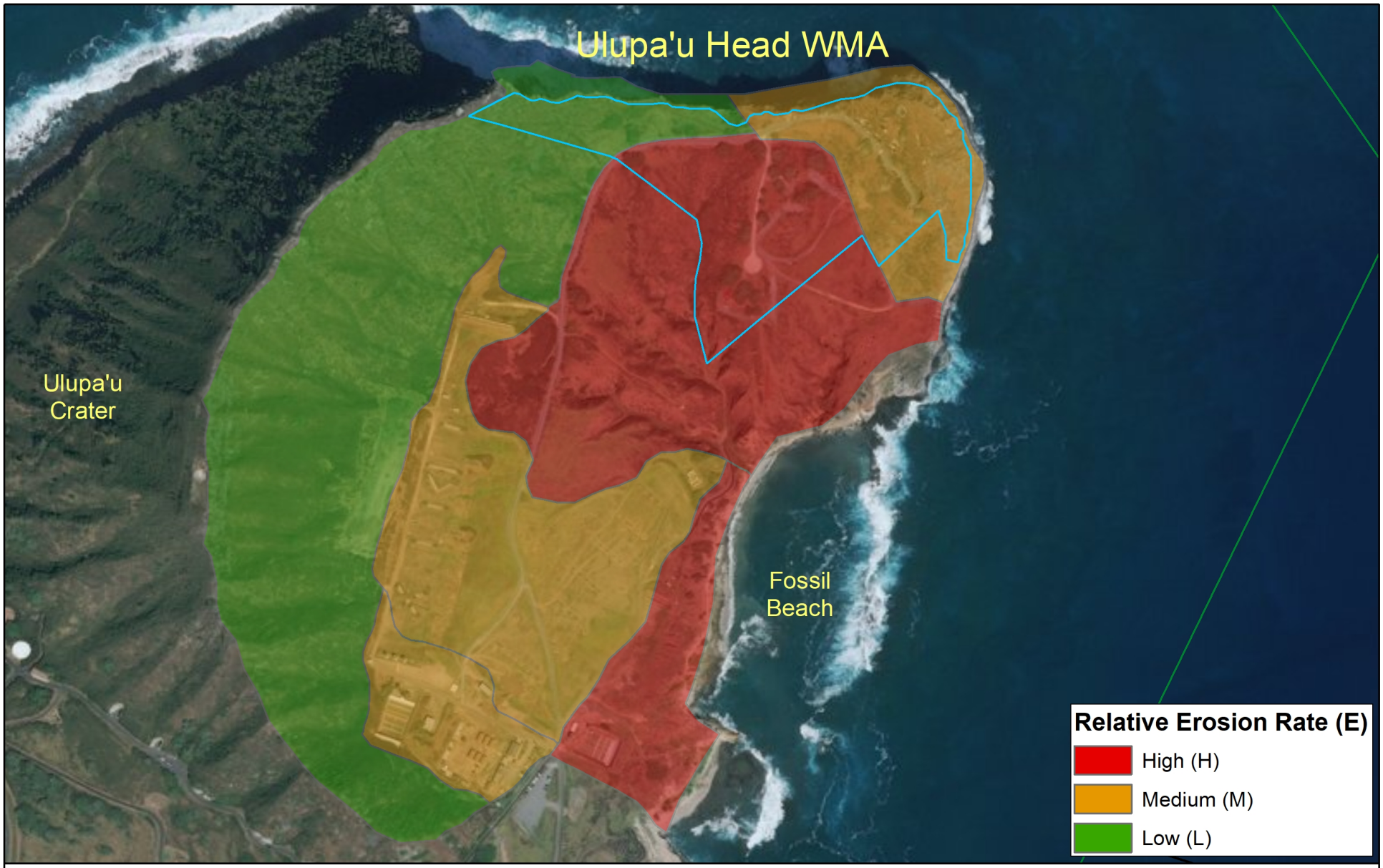


Figure 13a
Ulupa'u Crater: Erosion Sensitivity

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

500 yd Security Buffer Zone

Wildlife Management Area

Source: MCBH GIS Data Repository
Aerial Photo from ESRI

N

0 0.05 0.1 0.2 Miles

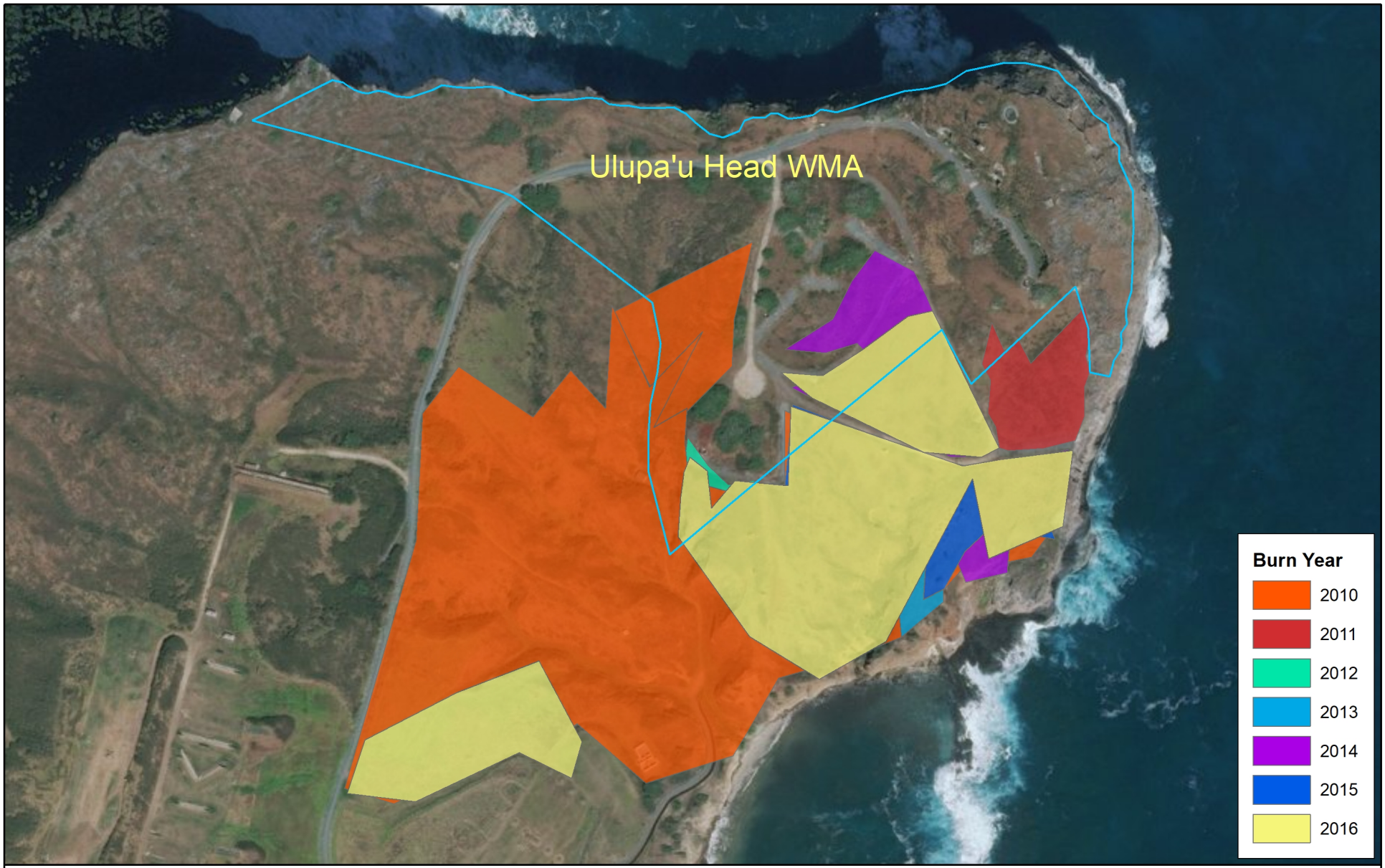


Figure 13b
Ulupa'u Crater: Wildland Fires

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository
Aerial Photo from ESRI

N

0 0.025 0.05 0.1 Miles

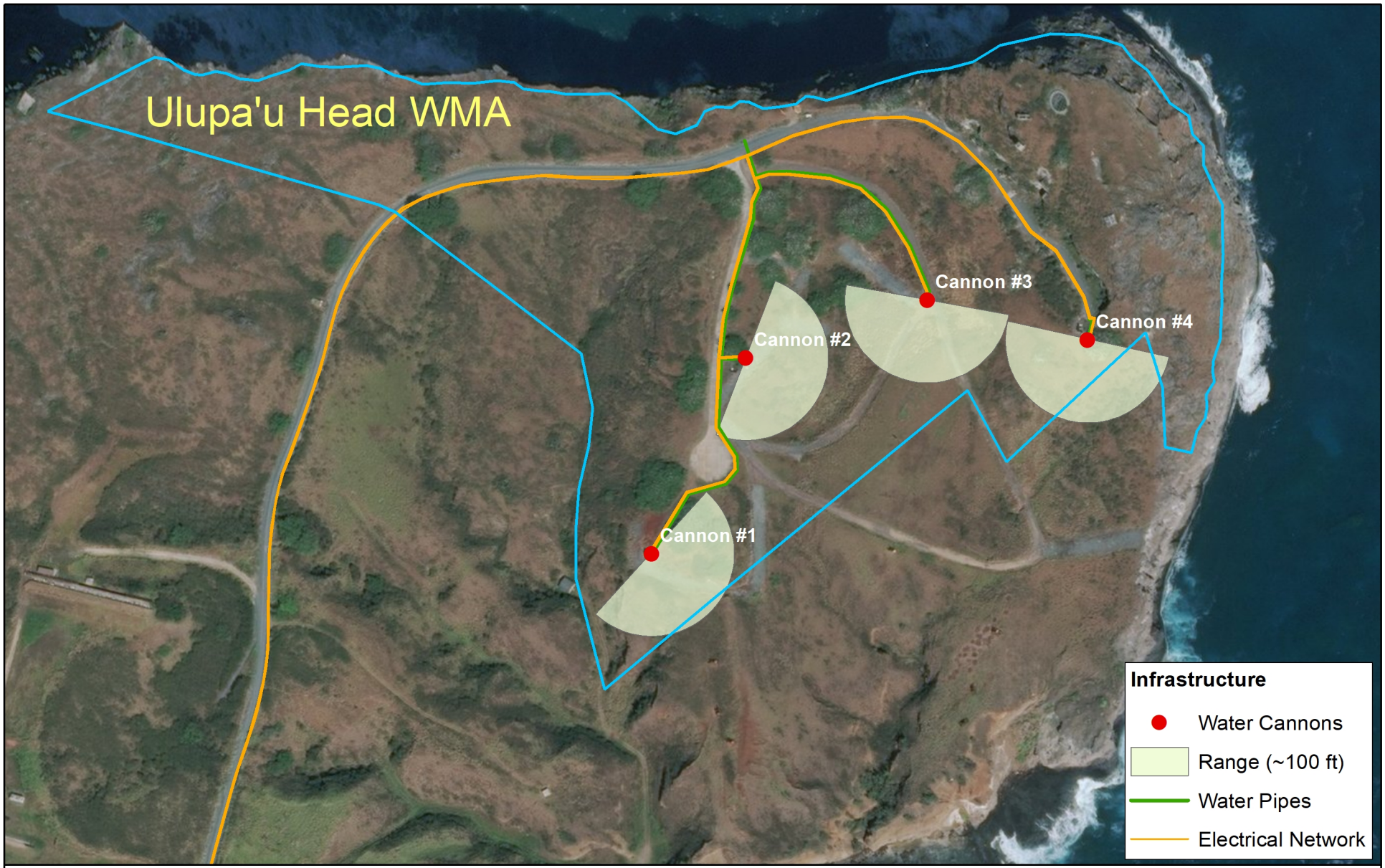


Figure 13c
Ulupa'u Crater: Water Cannons

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

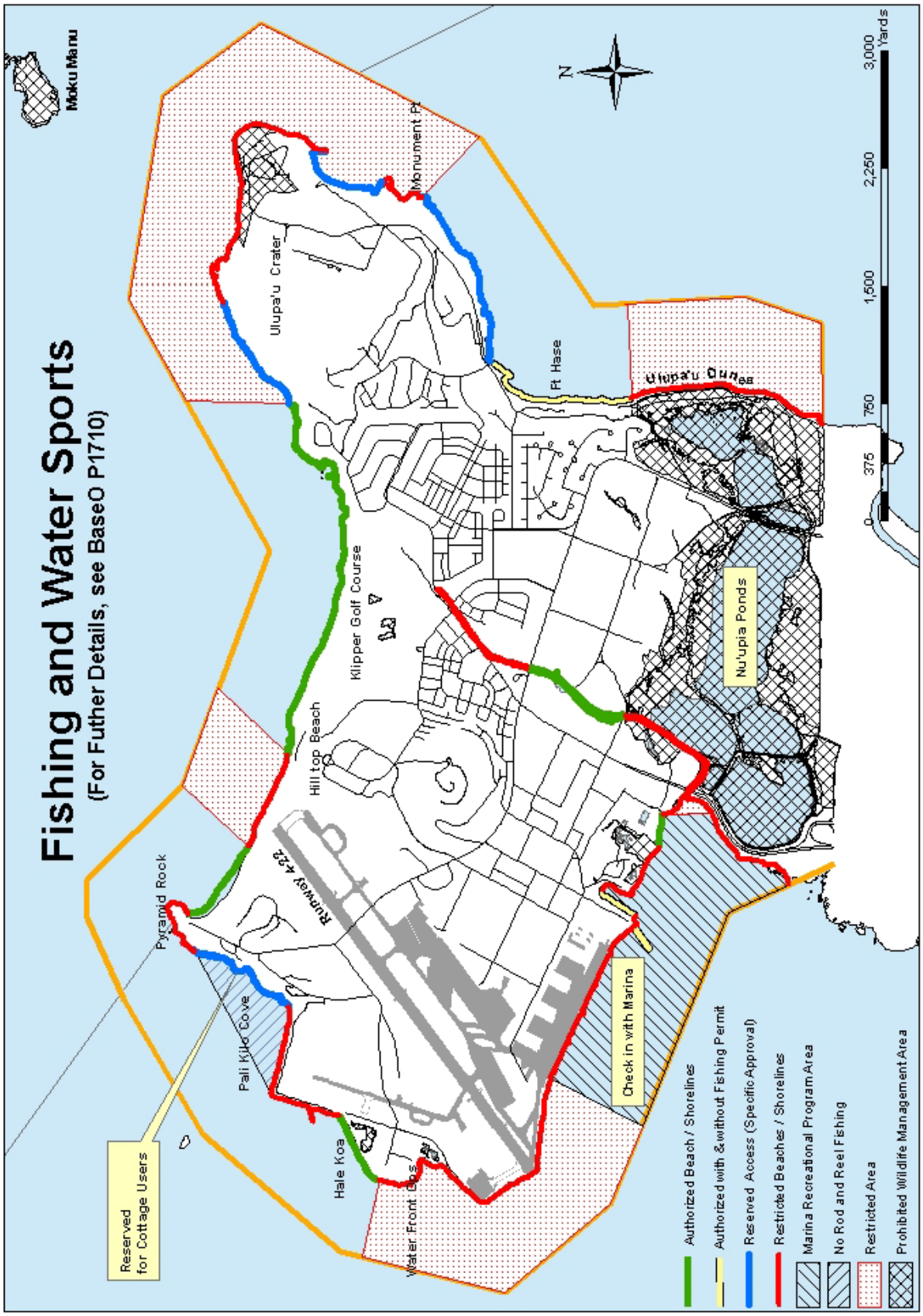
Wildlife Management Area

Source: MCBH GIS Data Repository
Aerial Photo from ESRI

N

0 75 150 300 Feet

FIGURE 14: MCBH KANEOHE BAY FISHING AND WATER SPORTS



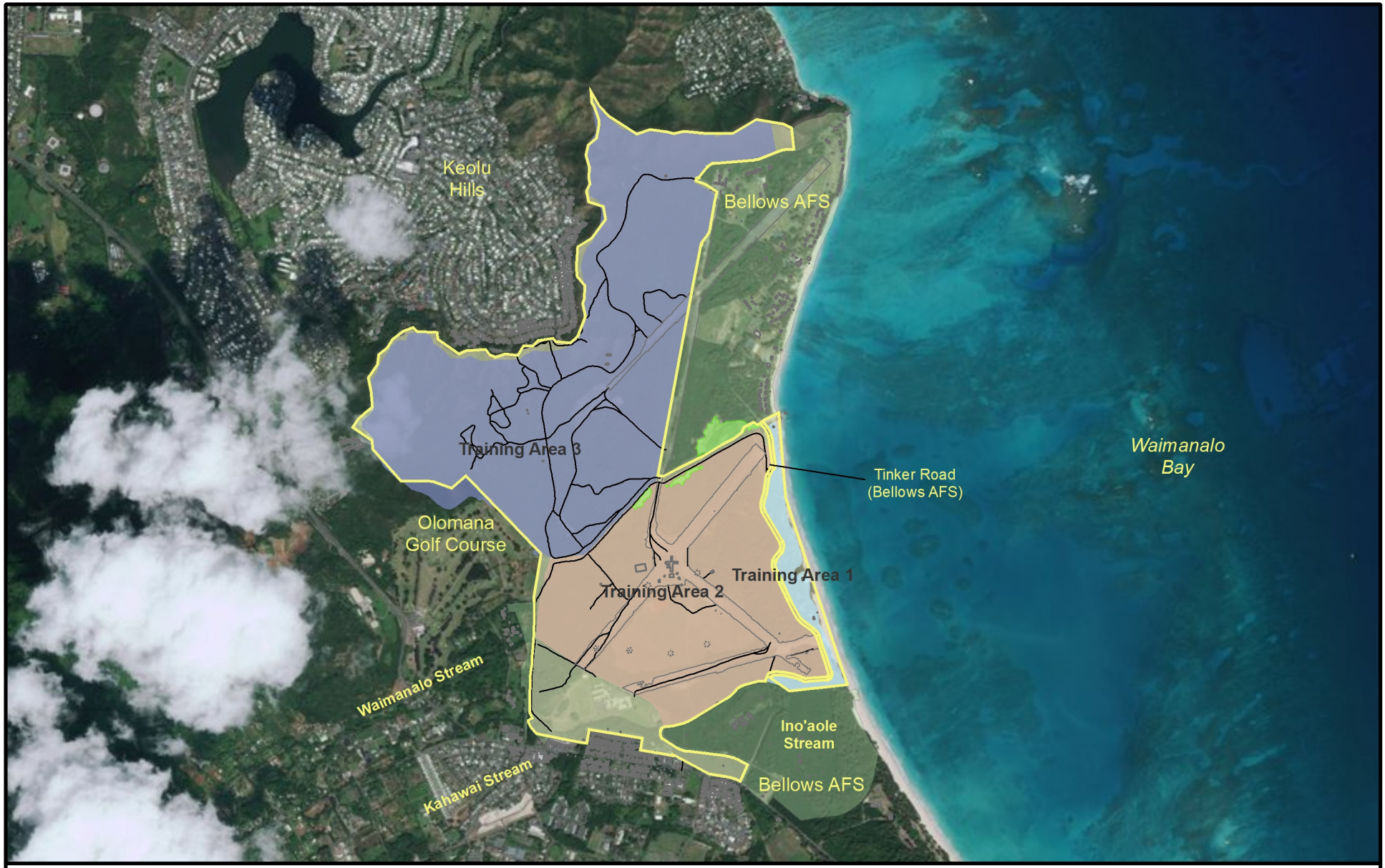


Figure 15
MCTAB Site Map

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- Installation Area
- Wetlands

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository

N

0 0.2 0.4 0.8 Miles

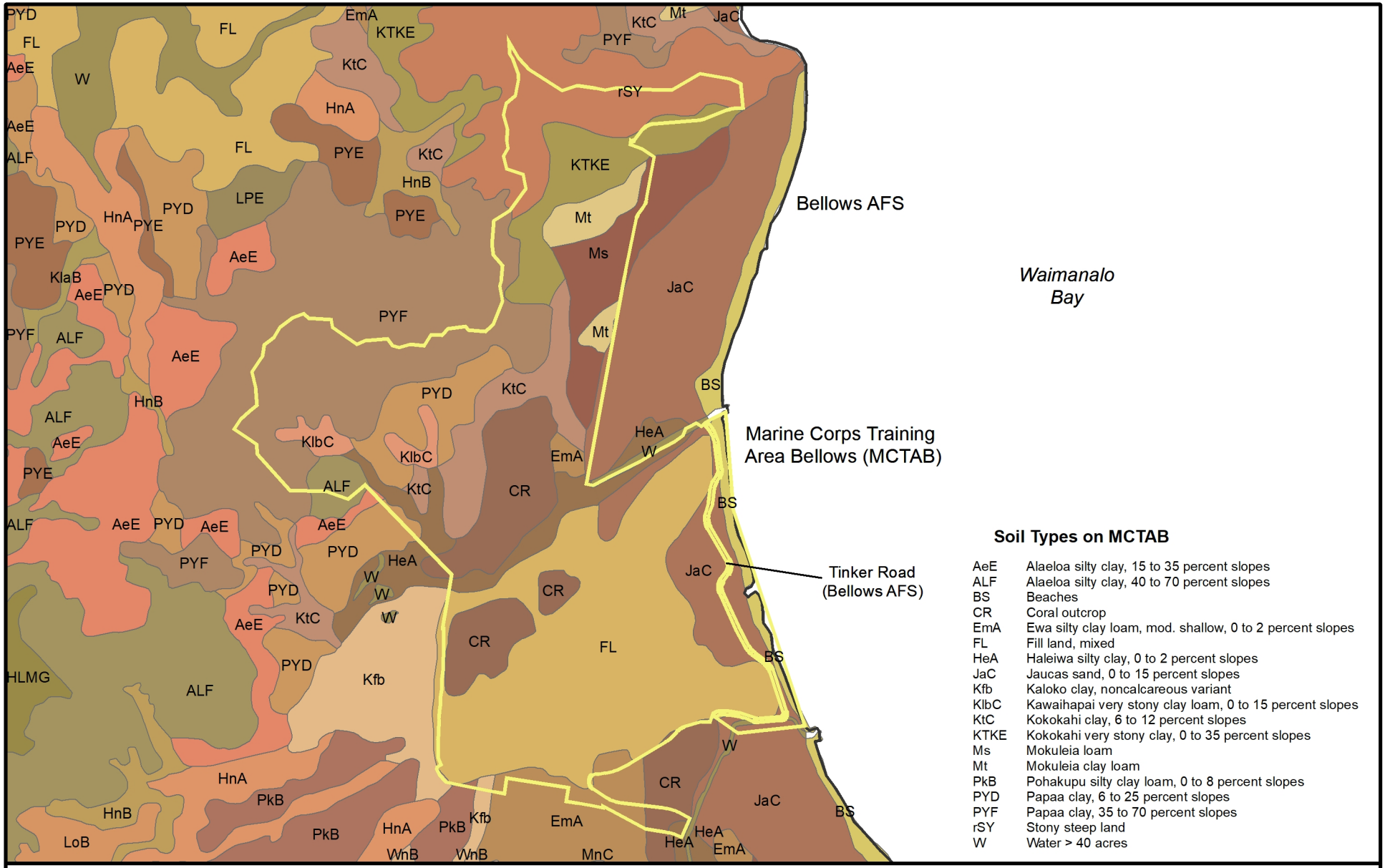


Figure 16
MCTAB Soils

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository (Soil types from NRCS (SCS) Soil Survey of O`ahu (Foote et al. 1972))

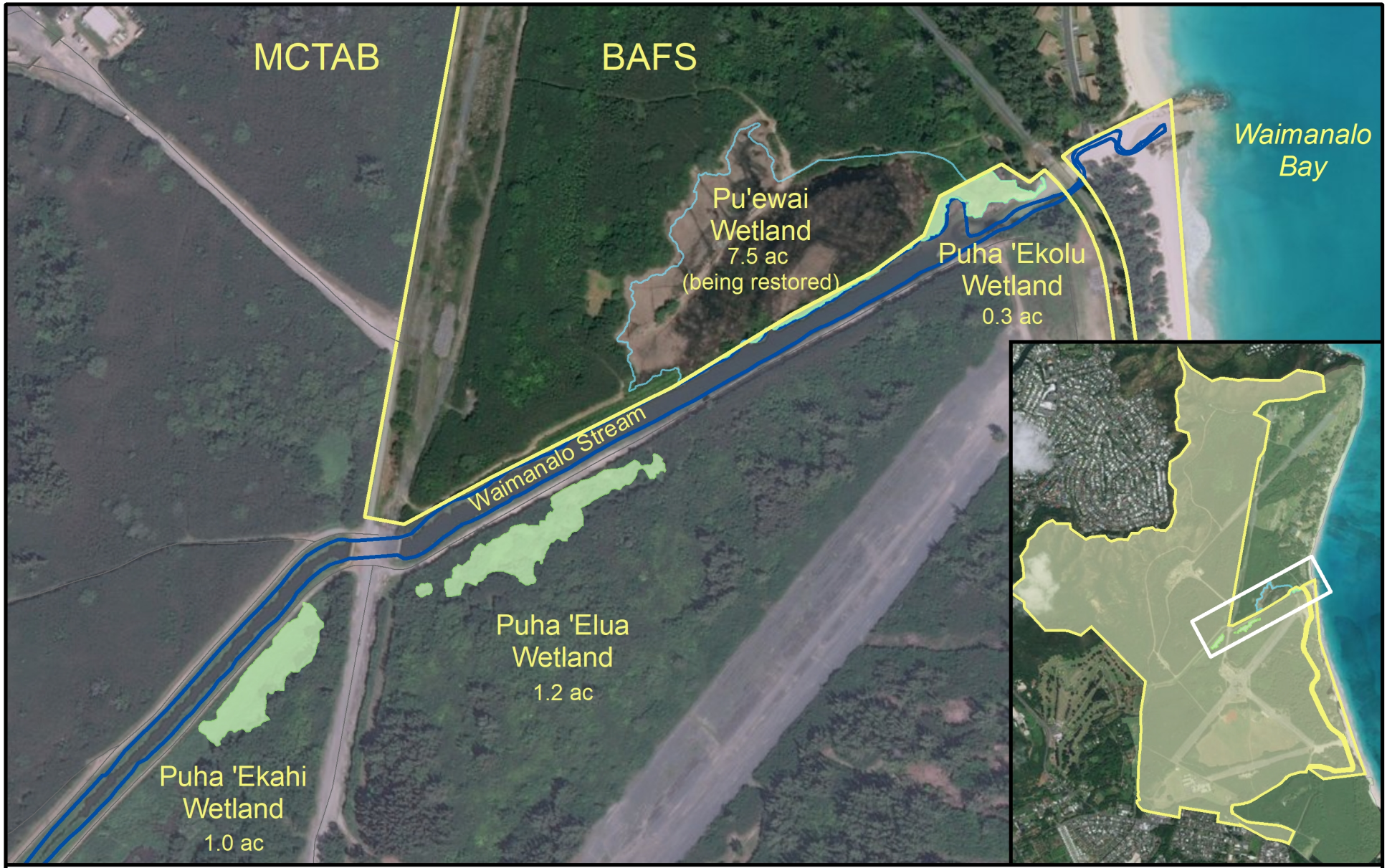


Figure 17
MCTAB Wetlands

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

= ACOE Jurisdictional Wetlands MCTAB (Ching 2002, 2010)

= ACOE Jurisdictional Wetlands BAFS (Ching 2002)

Source: MCBH GIS Data Repository; Aerial photo from ESRI

N

0 0.03 0.06 0.12 Miles

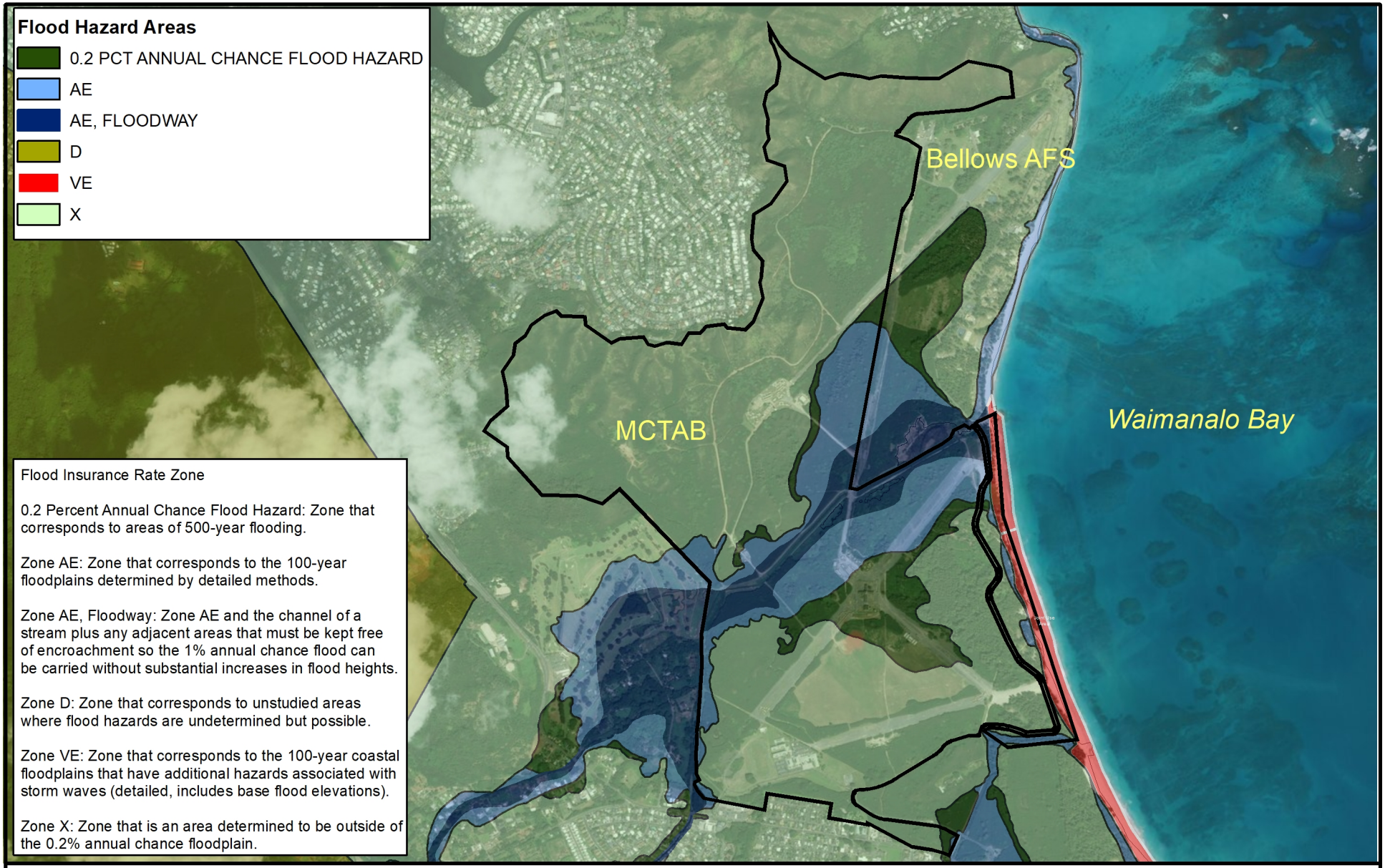


Figure 18
MCTAB Flood Hazard Areas

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository (2011 data)

N

0 0.1 0.2 0.4 0.6 Miles

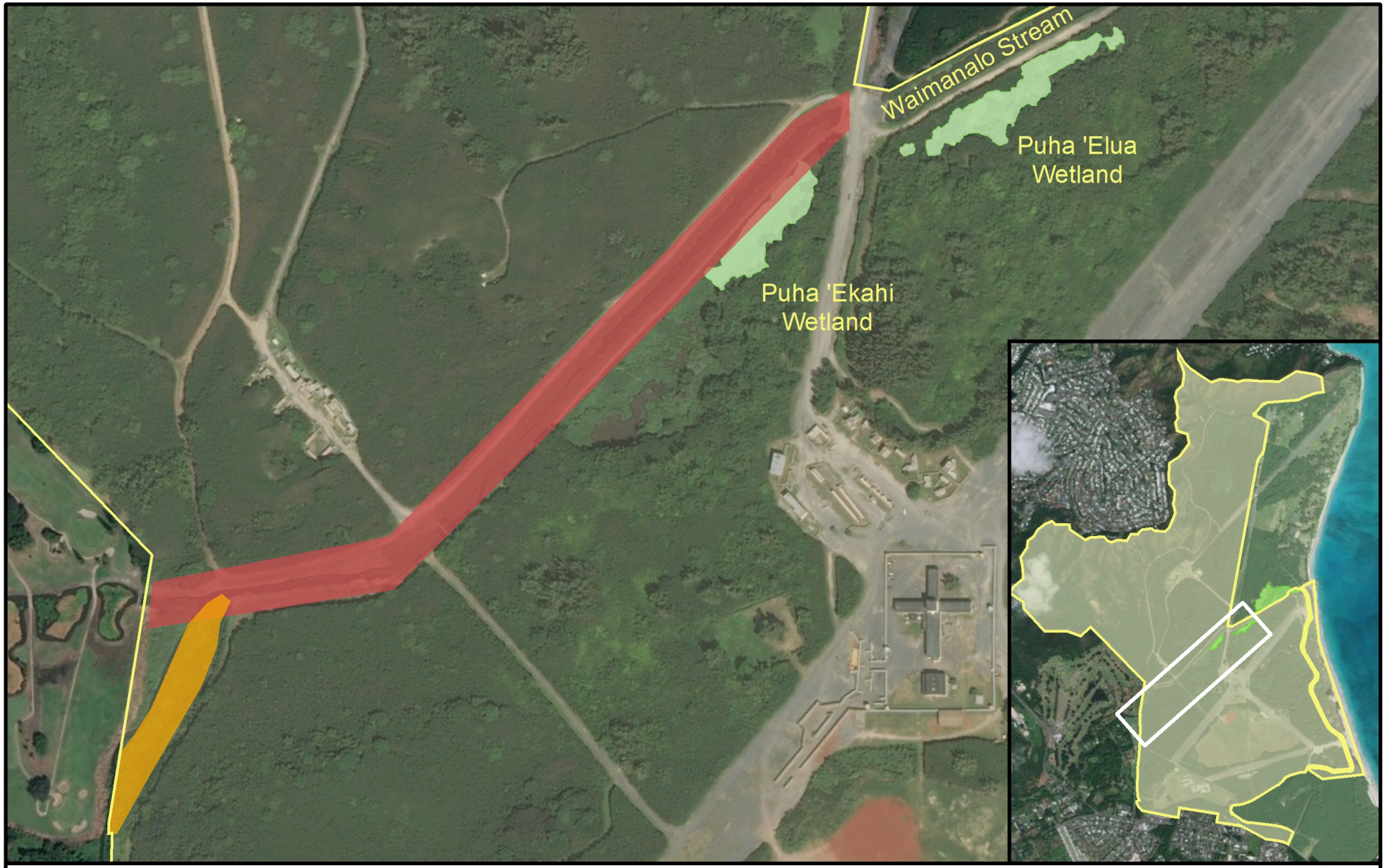


Figure 19
MCTAB Floodway Restoration

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- Floodway Restoration
- Maintenance Dredging

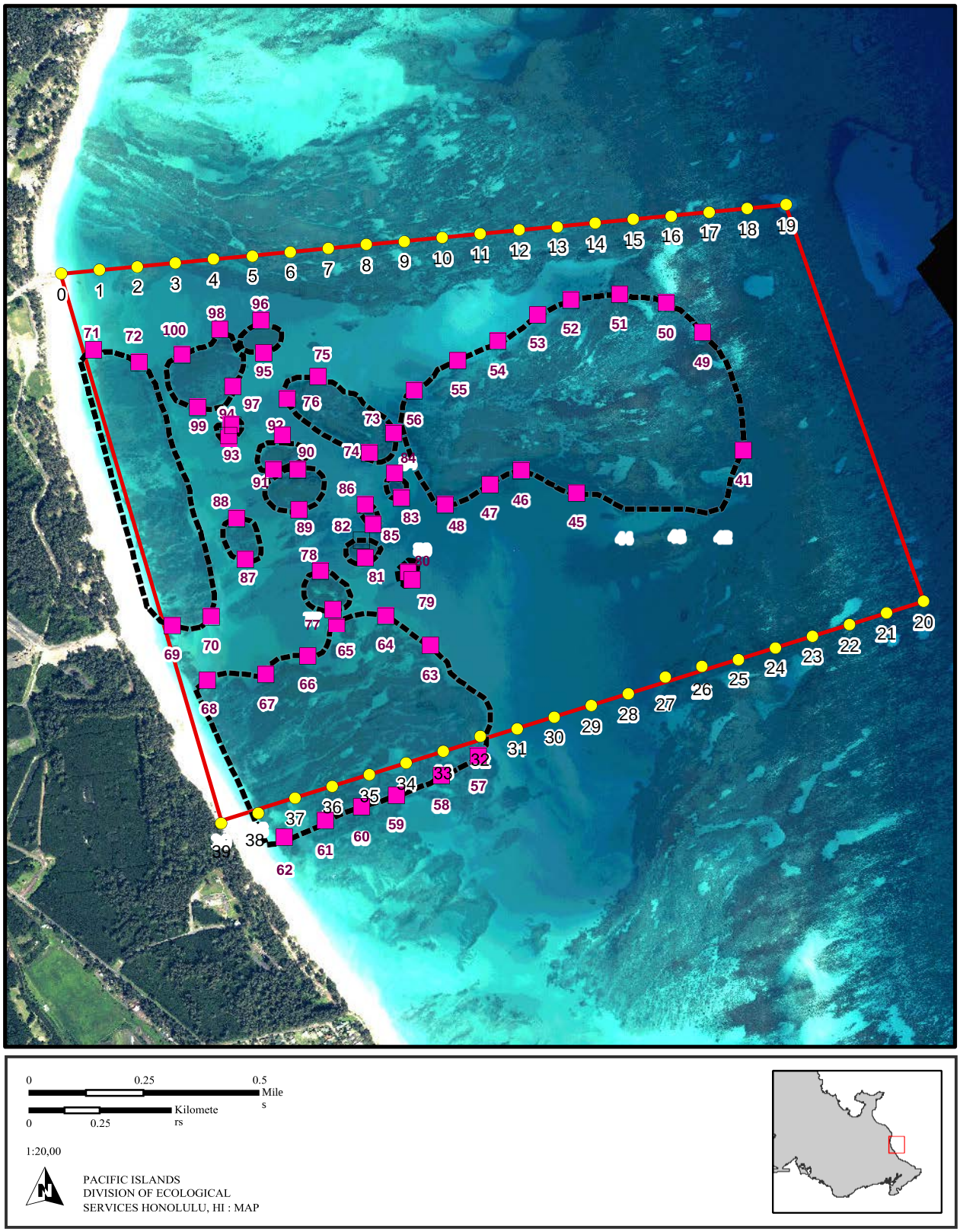
Source: MCBH GIS Data Repository; Aerial photo from ESRI

N

0 0.0325 0.065 0.13 Miles

FIGURE 20: MCTAB MARINE RESOURCES SURVEY AREA

This map depicts the survey area for the *MCTAB Marine Resources Survey* (USFWS in prep). See further discussion in COA 7.4.



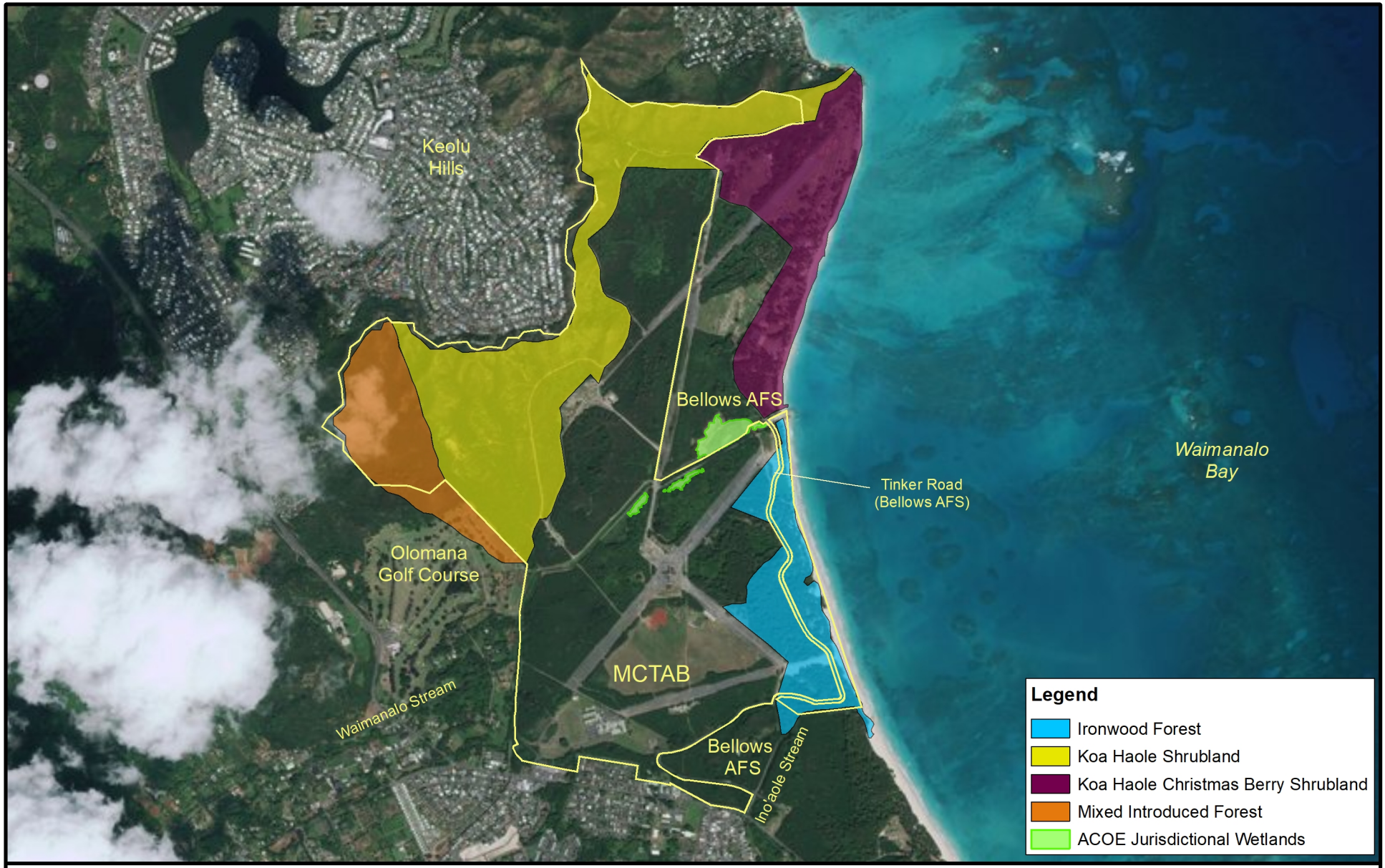


Figure 21
MCTAB Vegetation

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository;
Botanical Survey Bellows Air Force Station (Char 1995)
Aerial photo from ESRI
Note: Vegetation boundaries approximate

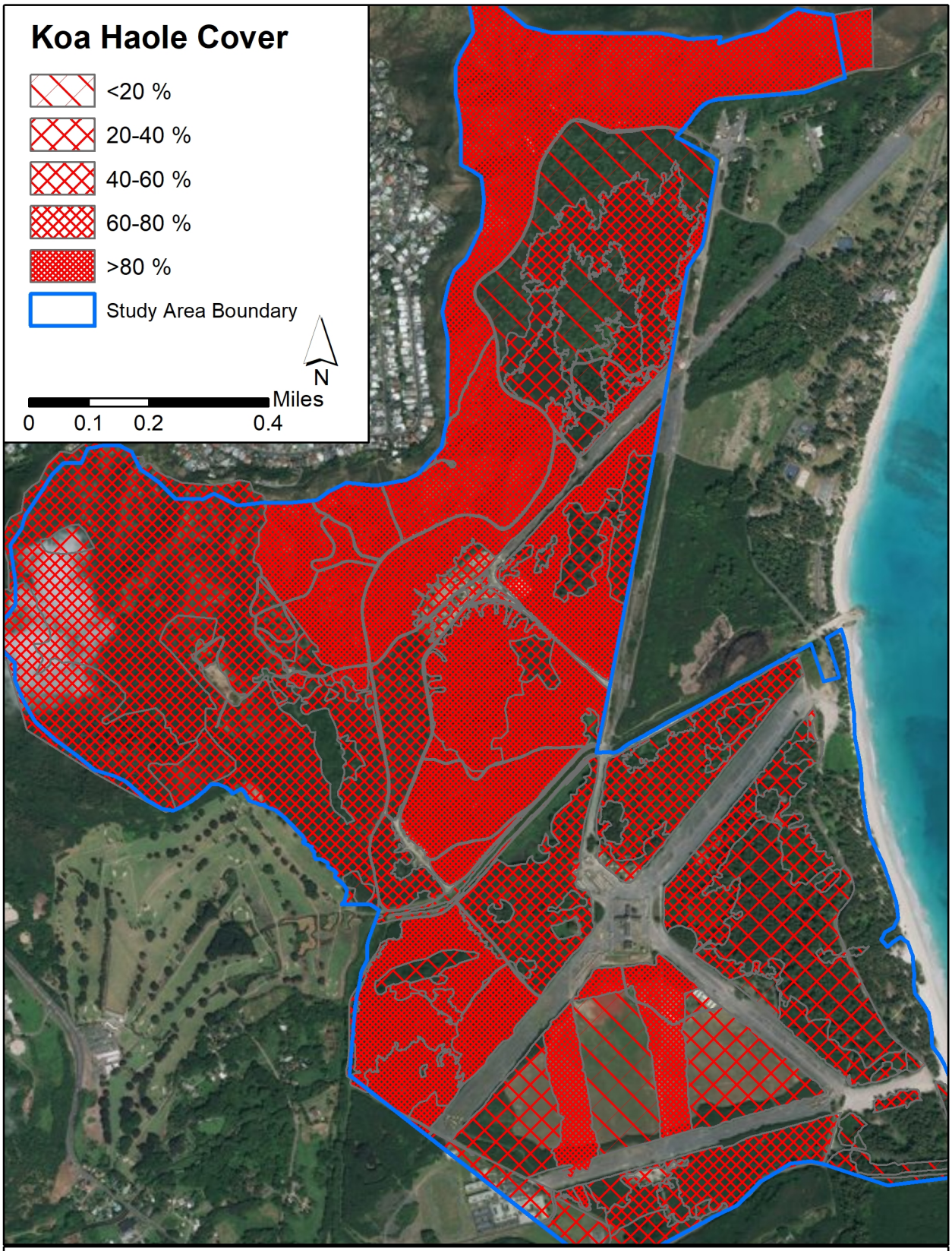


Figure 22a
MCTAB Invasive Vegetation: Koa Haole Cover

Final MCBH INRMP Update (2017-2021)
August 2017

Source: Figure 2, GIS Mapping and Control of Invasive Species/Erosion/ Brushfire Control on MCBH Training Lands (GII 2004)

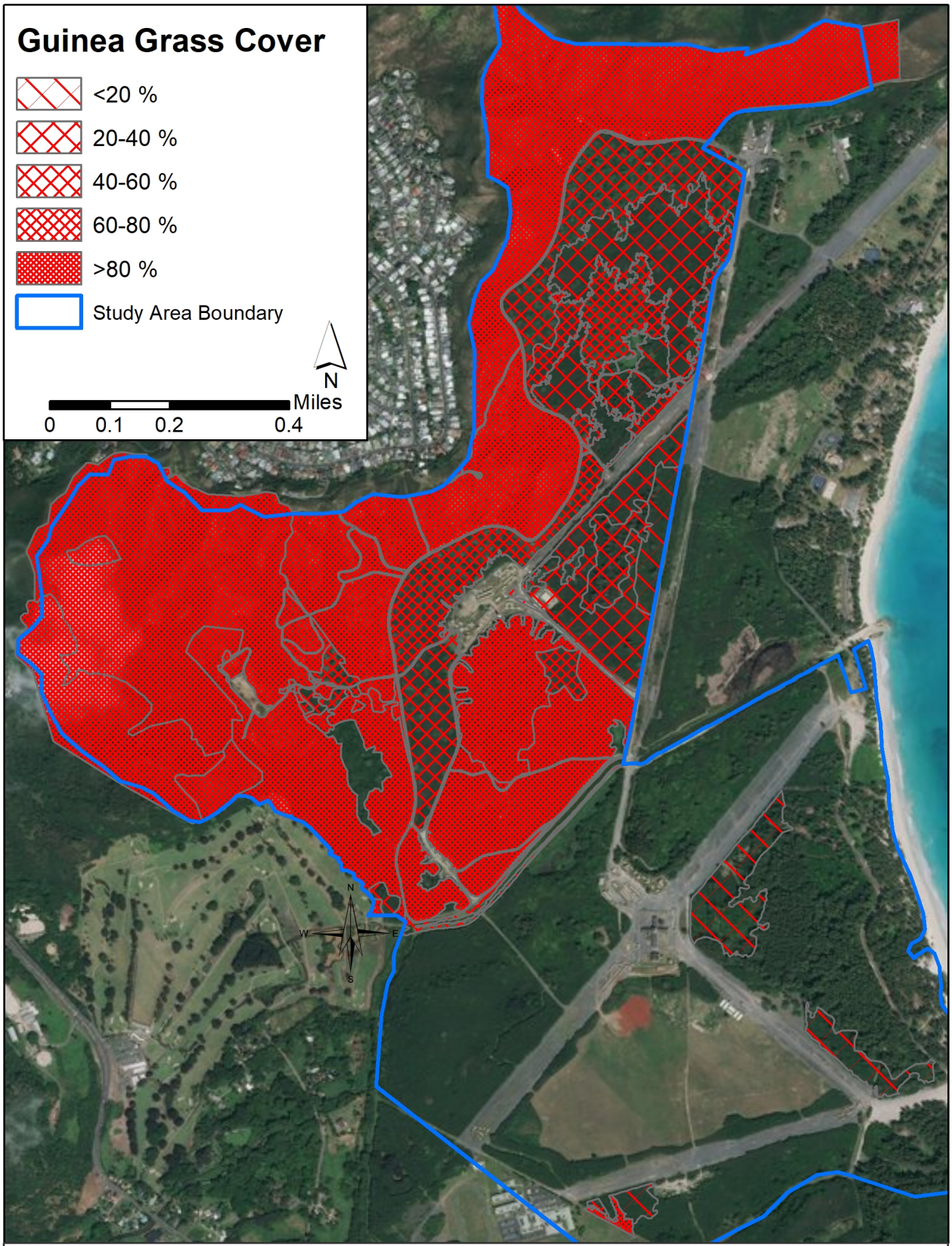


Figure 22b
MCTAB Invasive Vegetation: Guinea Grass Cover

Final MCBH INRMP Update (2017-2021)
August 2017

Source: Figure 3, GIS Mapping and Control of Invasive Species/Erosion/ Brushfire Control on MCBH Training Lands (GII 2004)

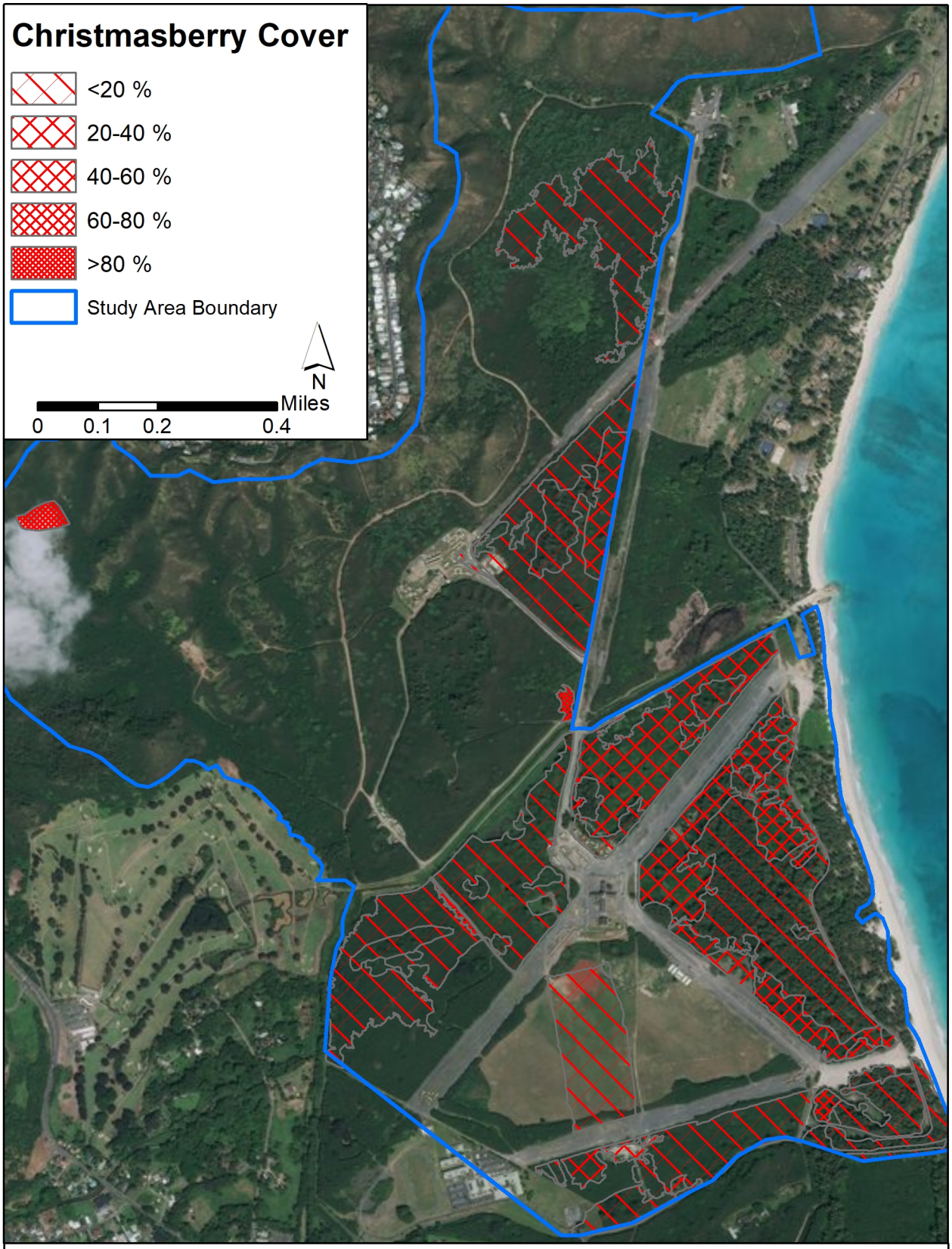


Figure 22c
MCTAB Invasive Vegetation: Christmasberry Cover

Final MCBH INRMP Update (2017-2021)
August 2017

Source: Figure 4, GIS Mapping and Control of Invasive Species/Erosion/ Brushfire Control on MCBH Training Lands (GII 2004)

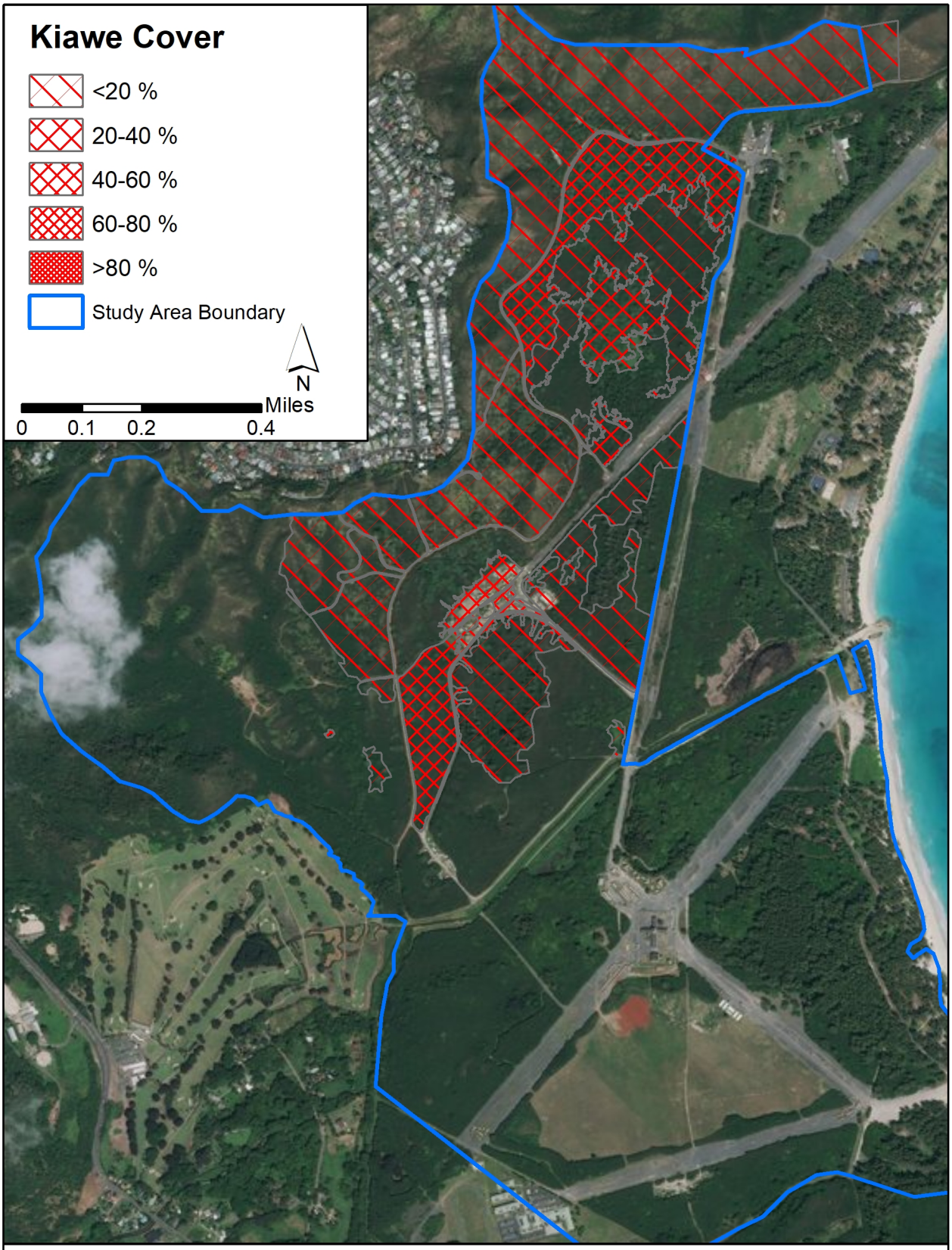


Figure 22d
MCTAB Invasive Vegetation: Kiawe Cover

Final MCBH INRMP Update (2017-2021)
August 2017

Source: Figure 5, GIS Mapping and Control of Invasive Species/Erosion/ Brushfire Control on MCBH Training Lands (GII 2004)

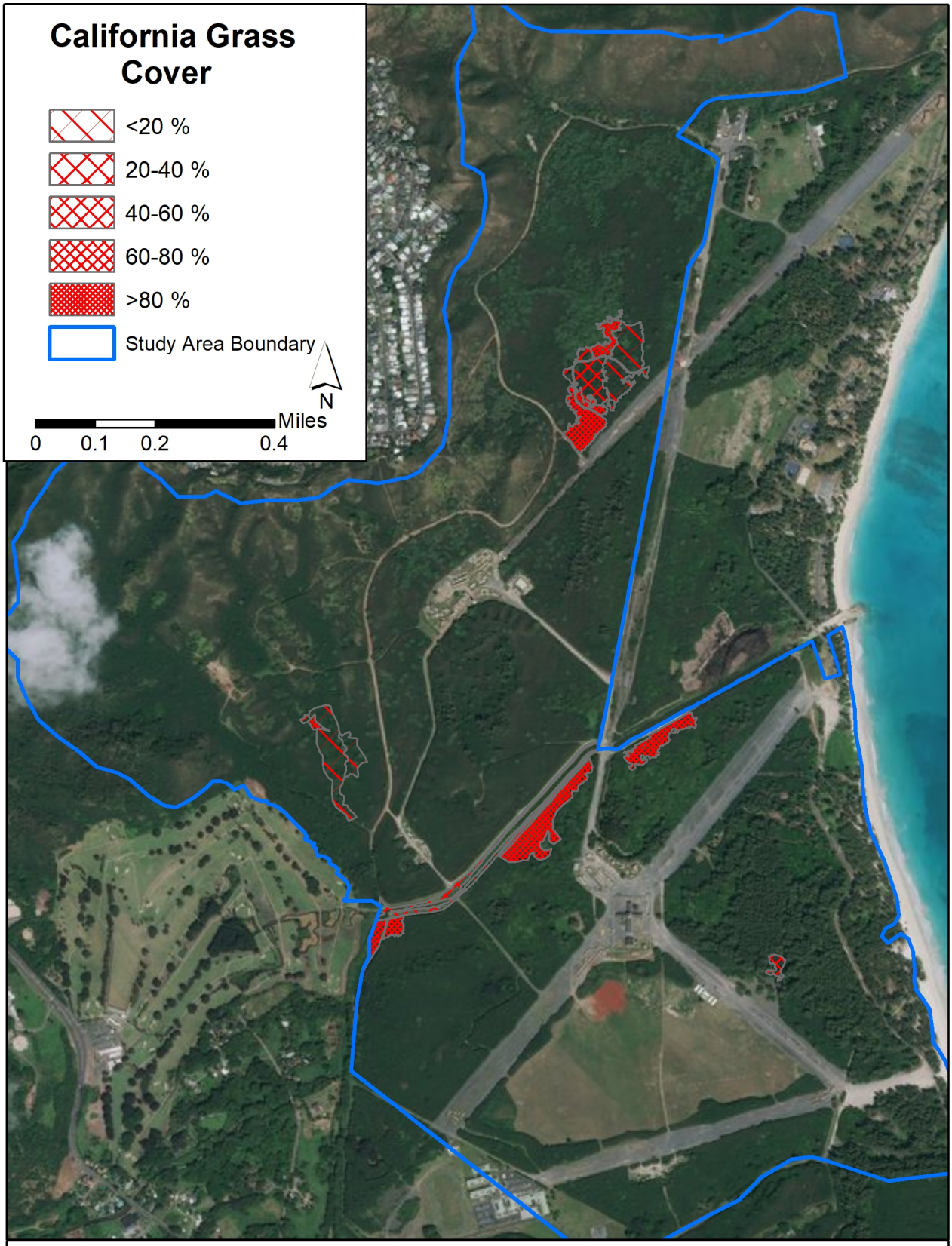


Figure 22e
MCTAB Invasive Vegetation: California Grass Cover

Final MCBH INRMP Update (2017-2021)
August 2017

Source: Figure 6, GIS Mapping and Control of Invasive Species/Erosion/ Brushfire Control on MCBH Training Lands (GII 2004)

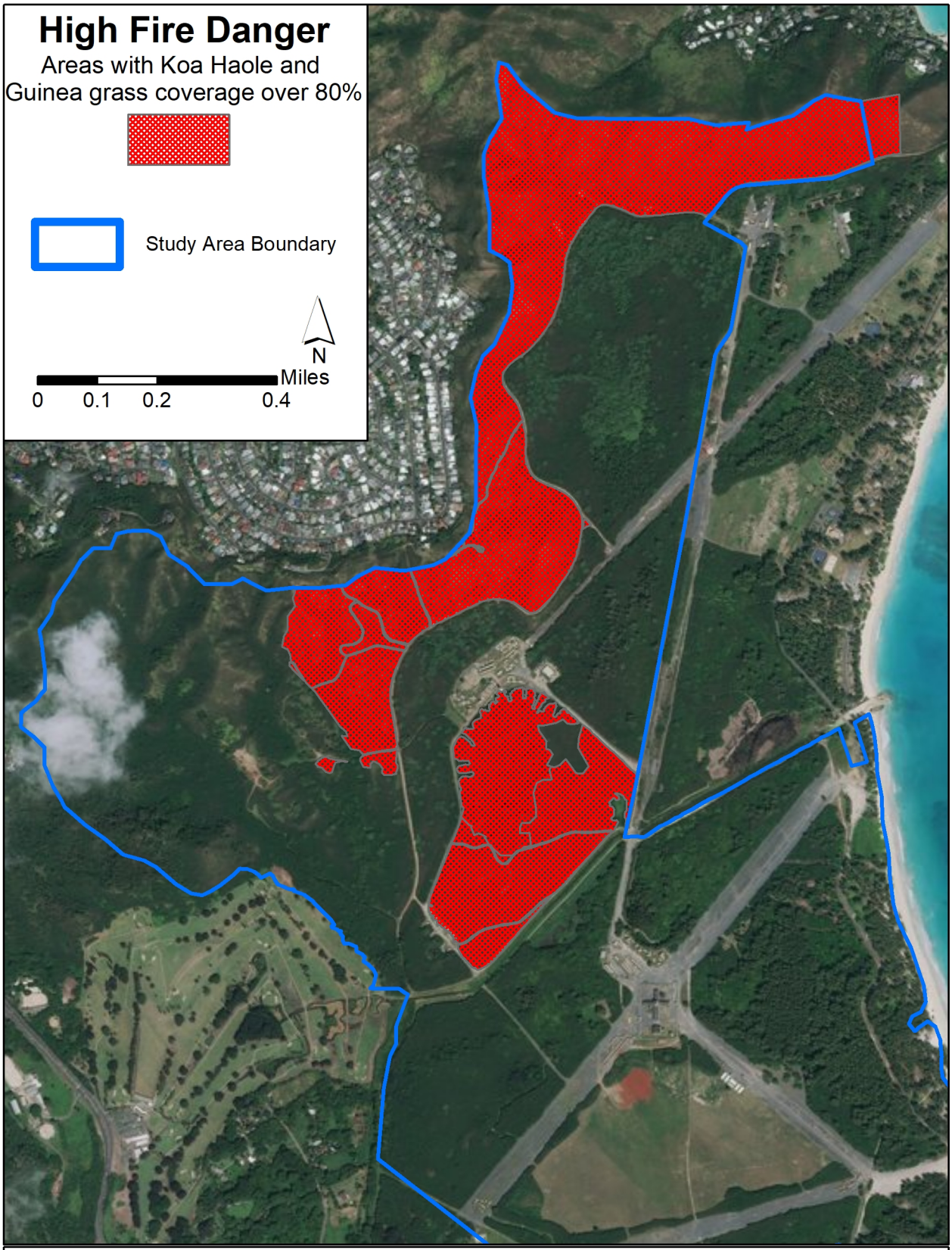


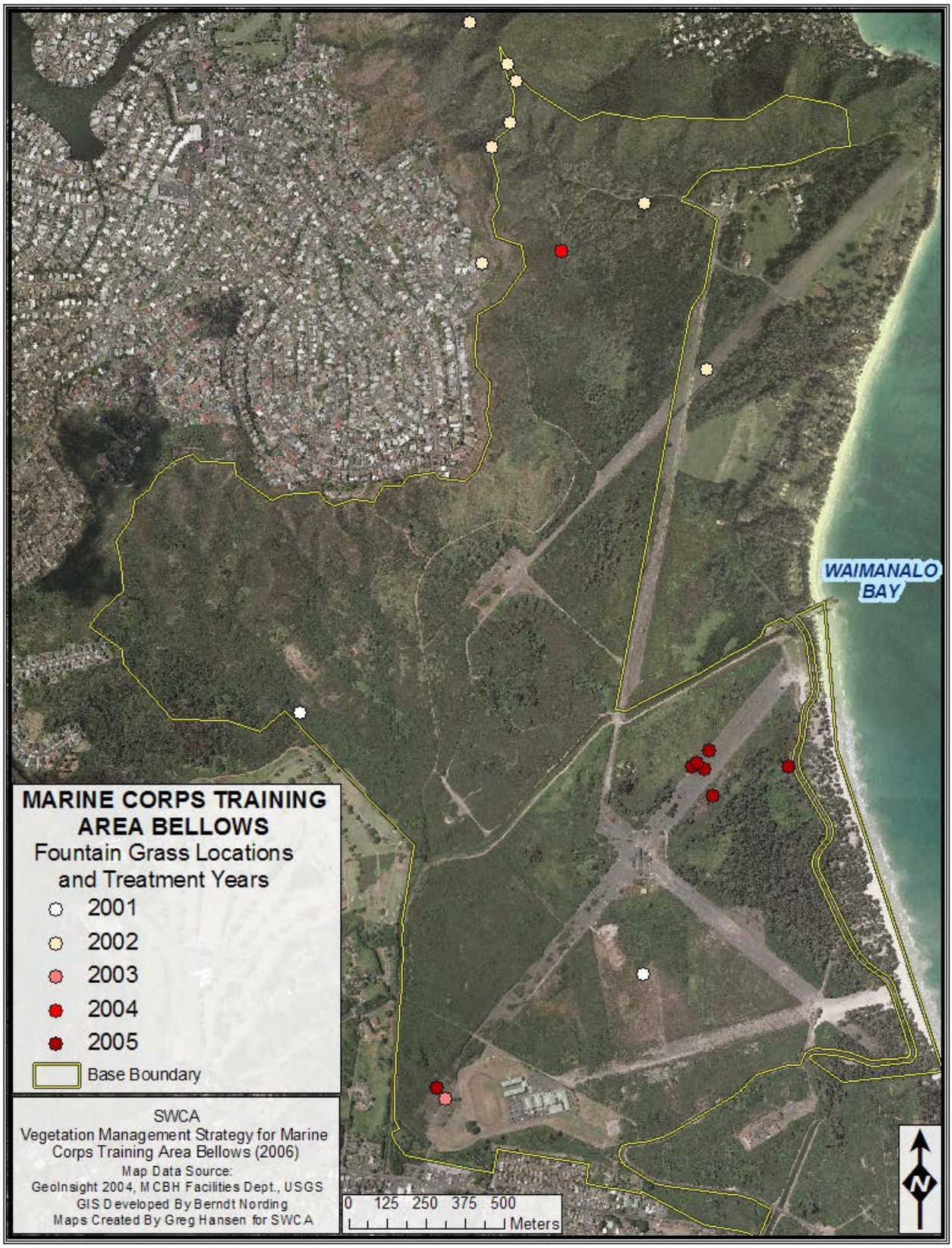
Figure 22f
MCTAB Invasive Vegetation: High Fire Danger

Final MCBH INRMP Update (2017-2021)
August 2017

Source: Figure 7, GIS Mapping and Control of Invasive Species/Erosion/ Brushfire Control on MCBH Training Lands (GII 2004)

FIGURE 22G: MCTAB FOUNTAIN GRASS LOCATIONS (2001-2005)

(Figure 9 from SWCA 2007)



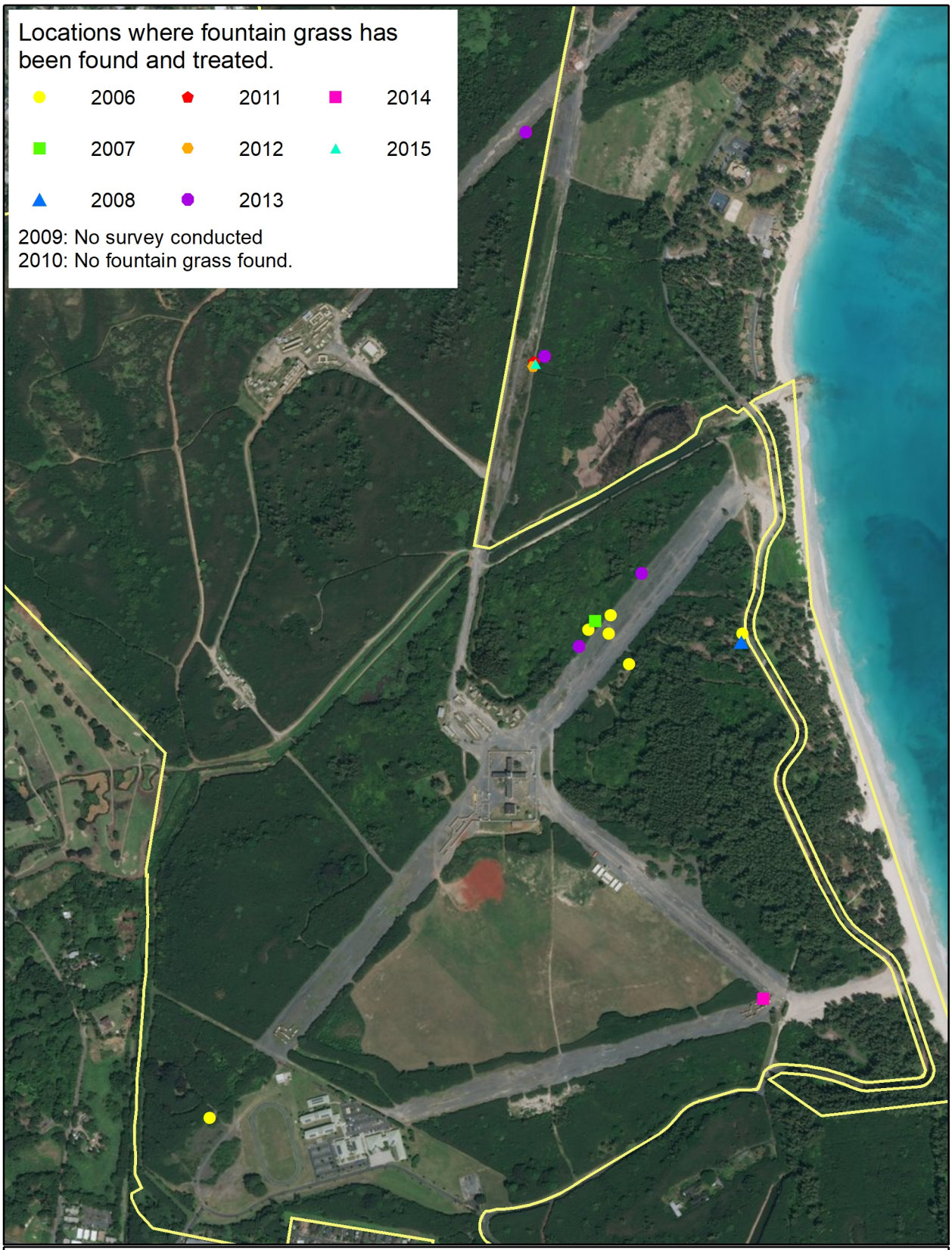


Figure 22h
MCTAB Fountain Grass Locations (2006-2015)

Source: MCBH GIS Data Responsitory

Final MCBH INRMP Update (2017-2021)
August 2017

0 0.075 0.15 0.3 Miles

N

Figure 22i
MCTAB Broomsedge Location

Source: MCBH GIS Data Responsitory

Final MCBH INRMP Update (2017-2021)
August 2017

0 0.05 0.1 0.2 Miles

N

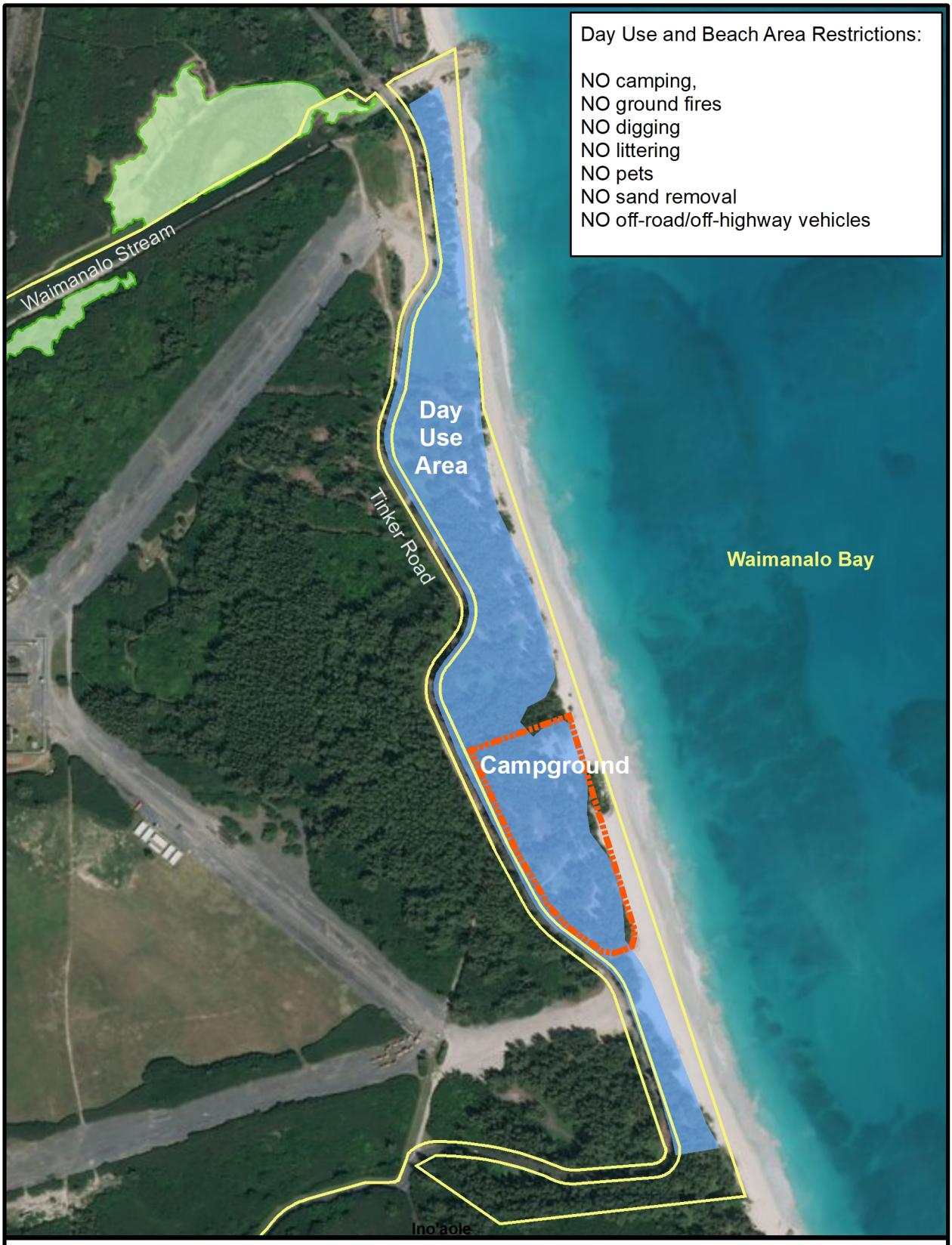


Figure 23
MCTAB Recreational Areas

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

N

0 0.04 0.08 0.16
Miles

Final MCBH INRMP Update (2017-2021)
August 2017

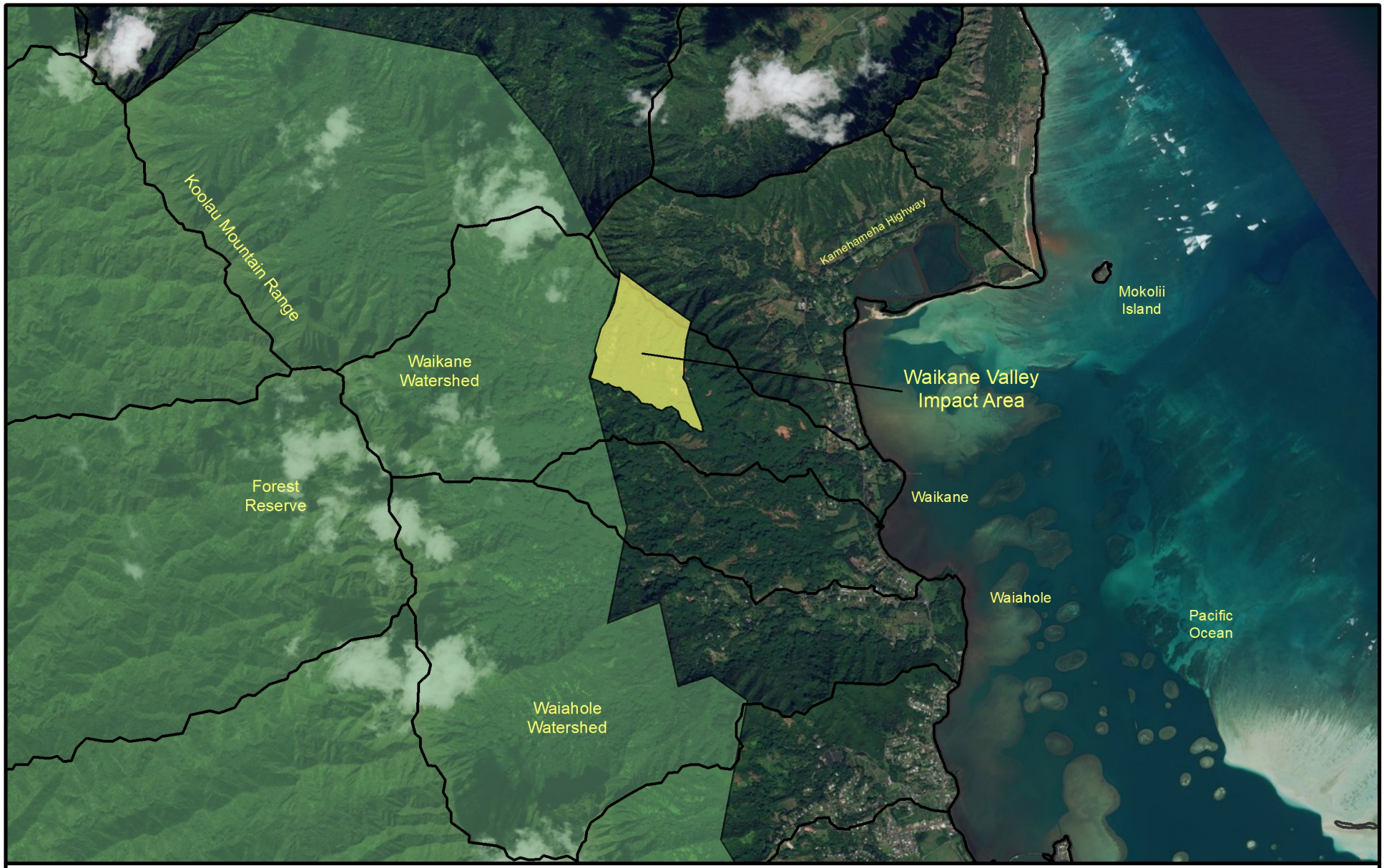


Figure 24
Waikane Valley Impact Area and Vicinity

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

- Watersheds
- O'ahu 'Elepaio Critical Habitat
- Installation Boundary

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository
Aerial photo from ESRI

N

0 0.3 0.6 1.2 Miles

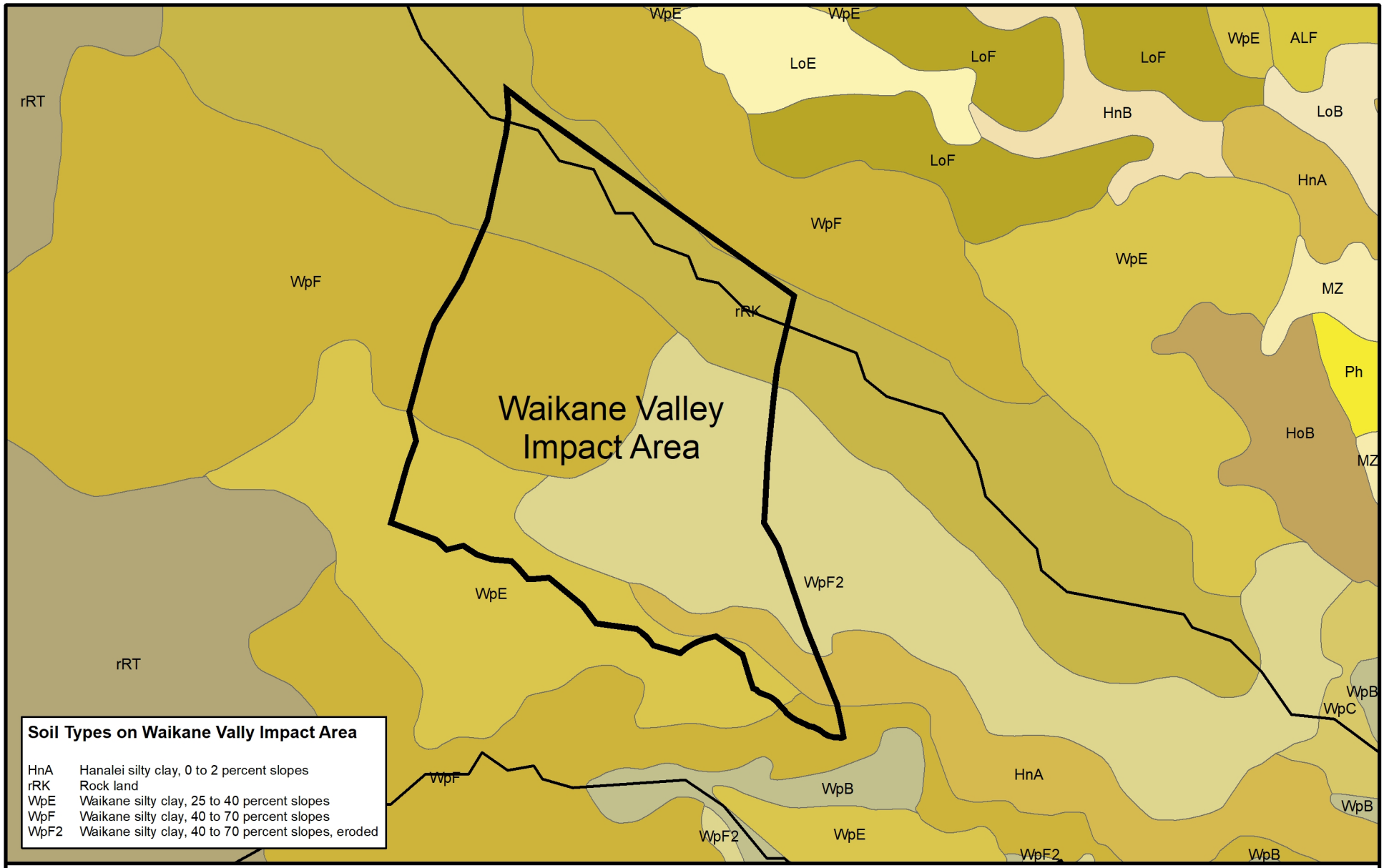


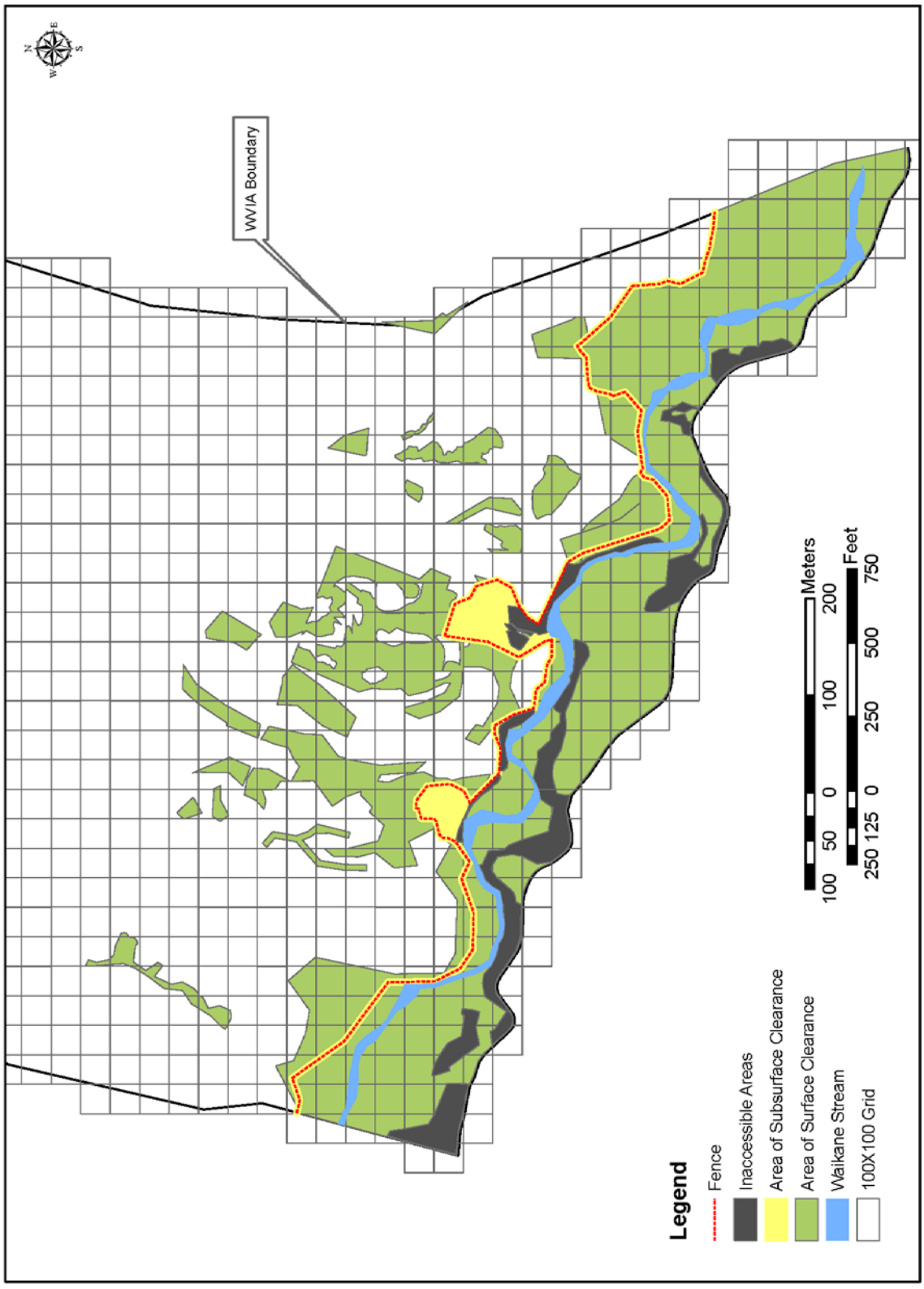
Figure 25
Waikane Valley Impact Area Soils

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository (Soil types from NRCS (SCS) Soil Survey of O`ahu (Foote et al. 1972))

FIGURE 26: WAIKANE VALLEY IMPACT AREA UNEXPLODED ORDNANCE REMOVAL ACTIVITIES

This map depicts areas of unexploded ordnance removal activity in Waikane Valley Impact Area (DoN 2015). See further discussion in COA 7.3.



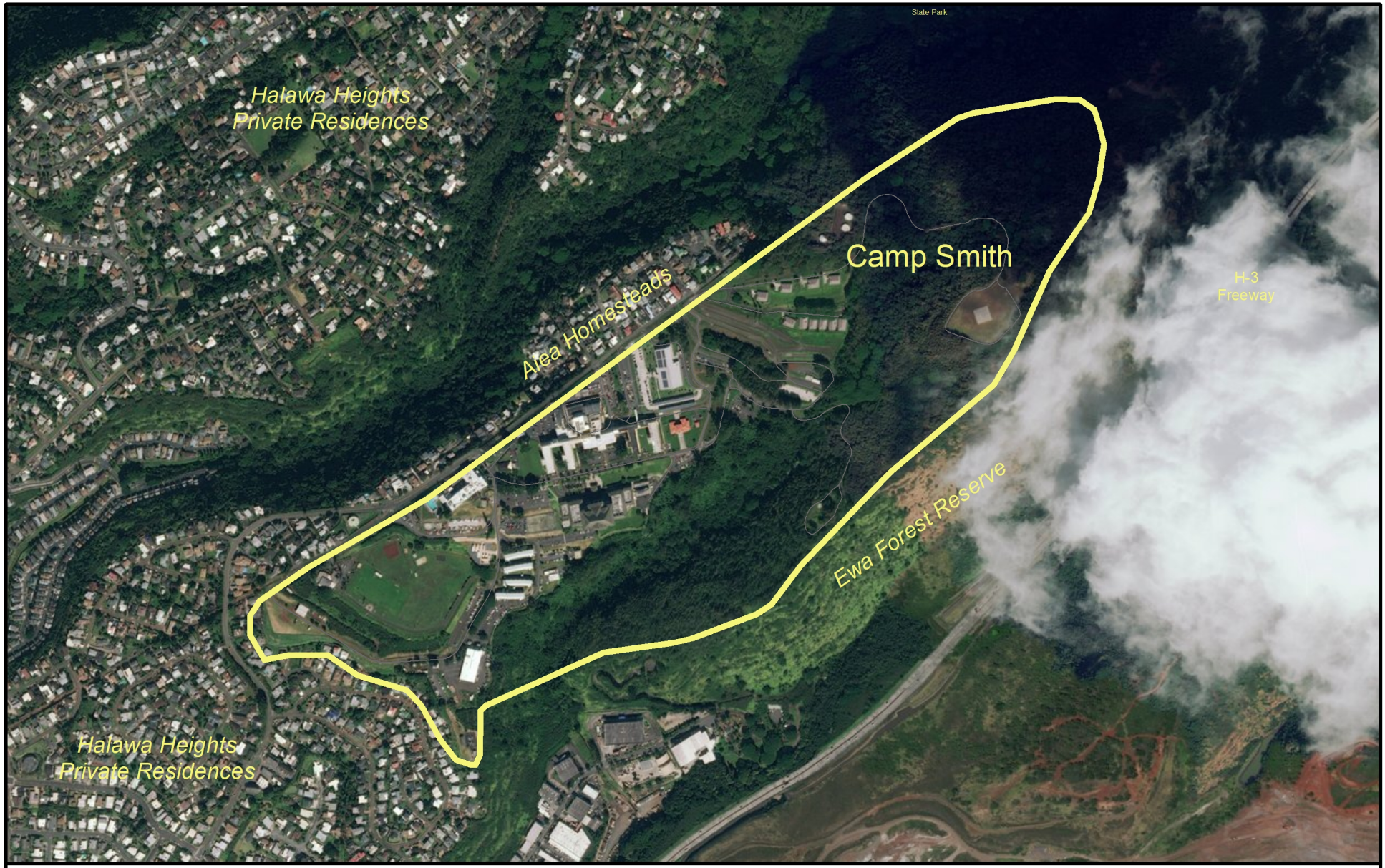


Figure 27
Camp Smith and Vicinity

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

N

0 0.05 0.1 0.2 Miles

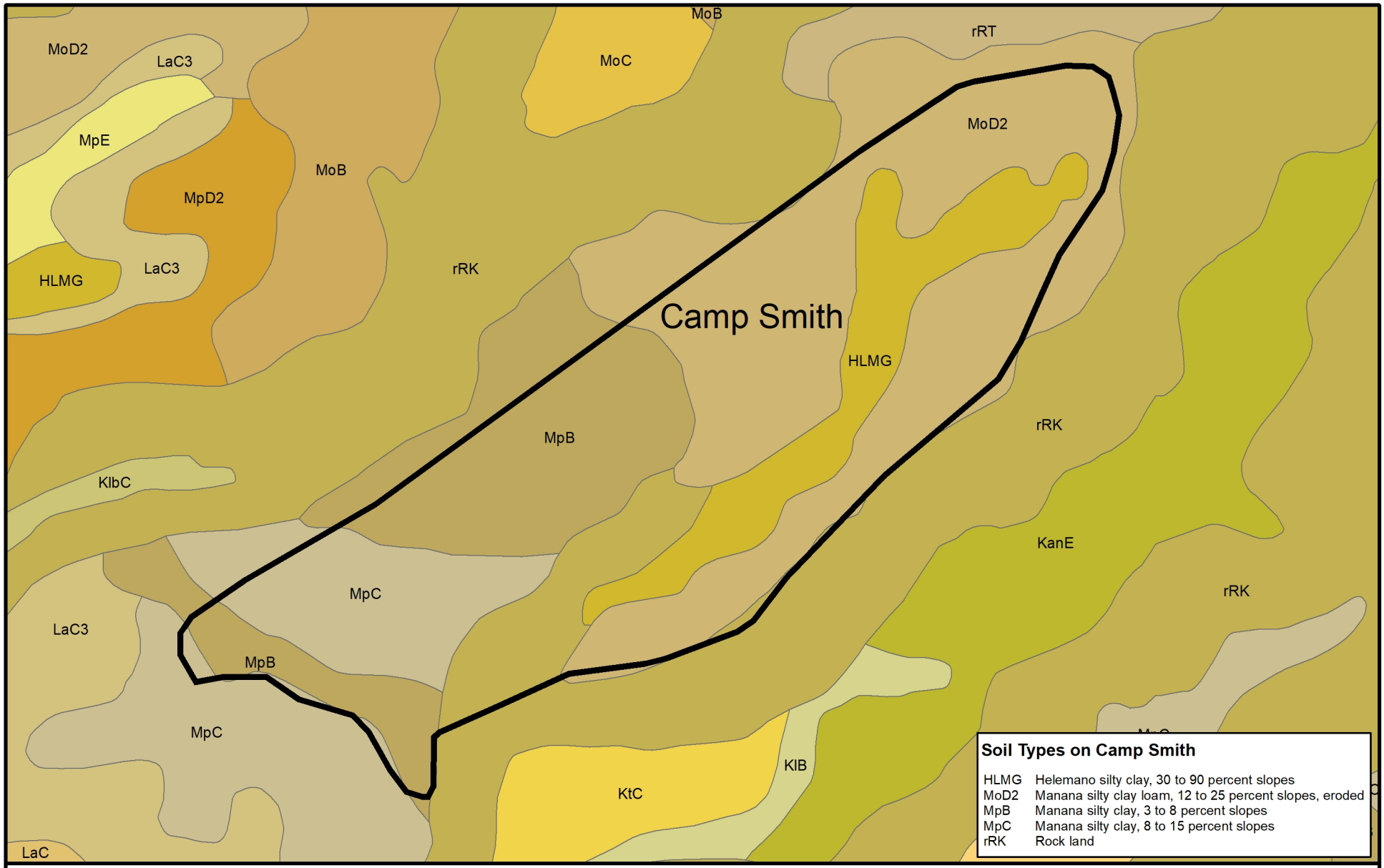


Figure 28
Camp Smith Soils

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository (Soil types from
NRCS (SCS) Soil Survey of O`ahu (Foote et al. 1972))

Figure 29
Camp Smith Vegetation

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

Forested Area (boundaries apprx)

Source: MCBH GIS Data Repository;
Aerial photo from ESRI;
Vegetation from MCBH Master Plan
(Wilson Okamoto & Associates, Inc. 1999)

N

0 0.05 0.1 0.2 Miles

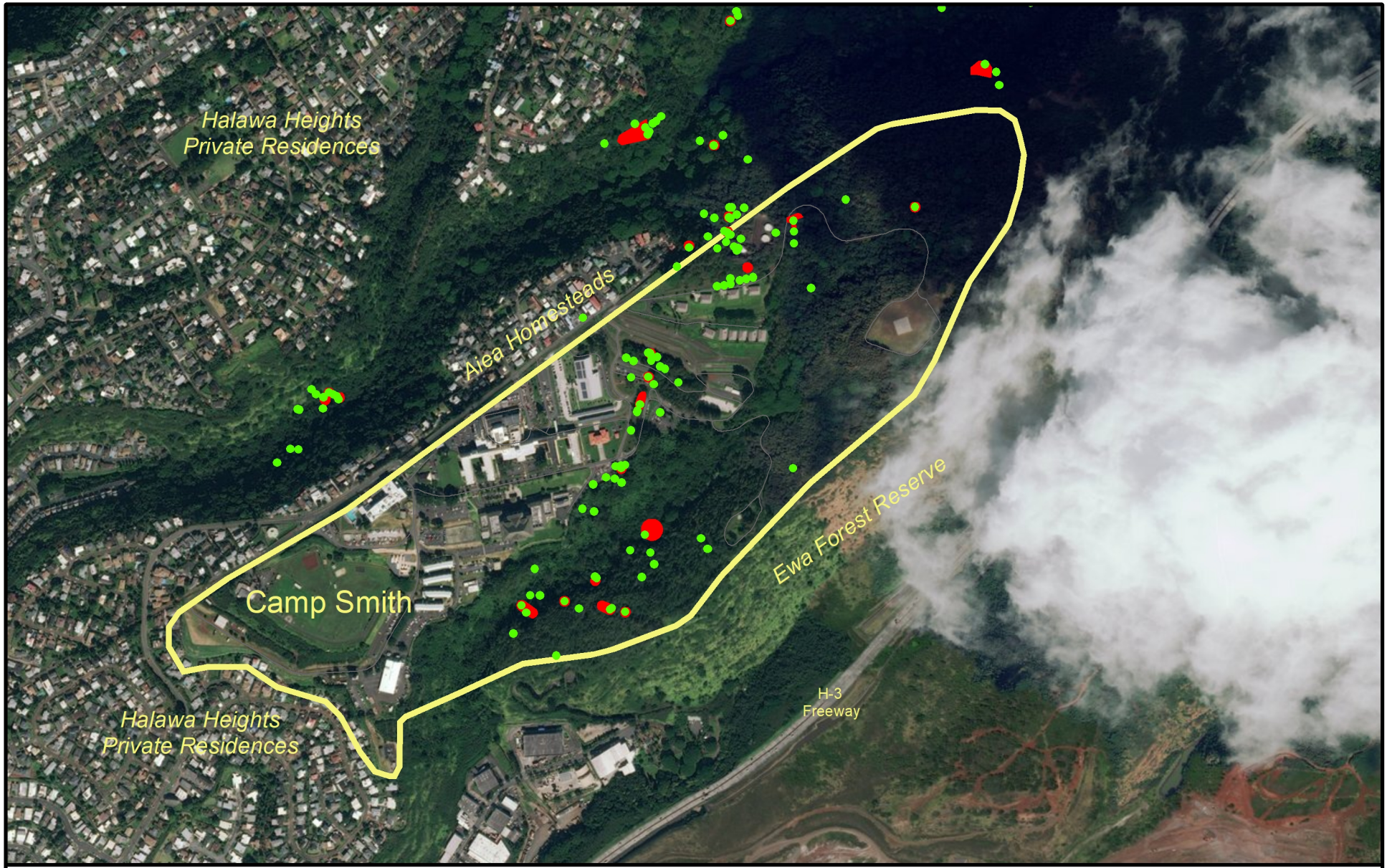


Figure 30
Camp Smith Invasive Species

Final MCBH INRMP Update (2017-2021)
August 2017

Legend

Devil Weed Hotspots

Devil Weed Treatment Points

Source: MCBH GIS Data Repository;
OISC (June 2016)
Aerial photo from ESRI

N

0 0.05 0.1 0.2 Miles

Figure 31
Pu'uloa RTF and Vicinity

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

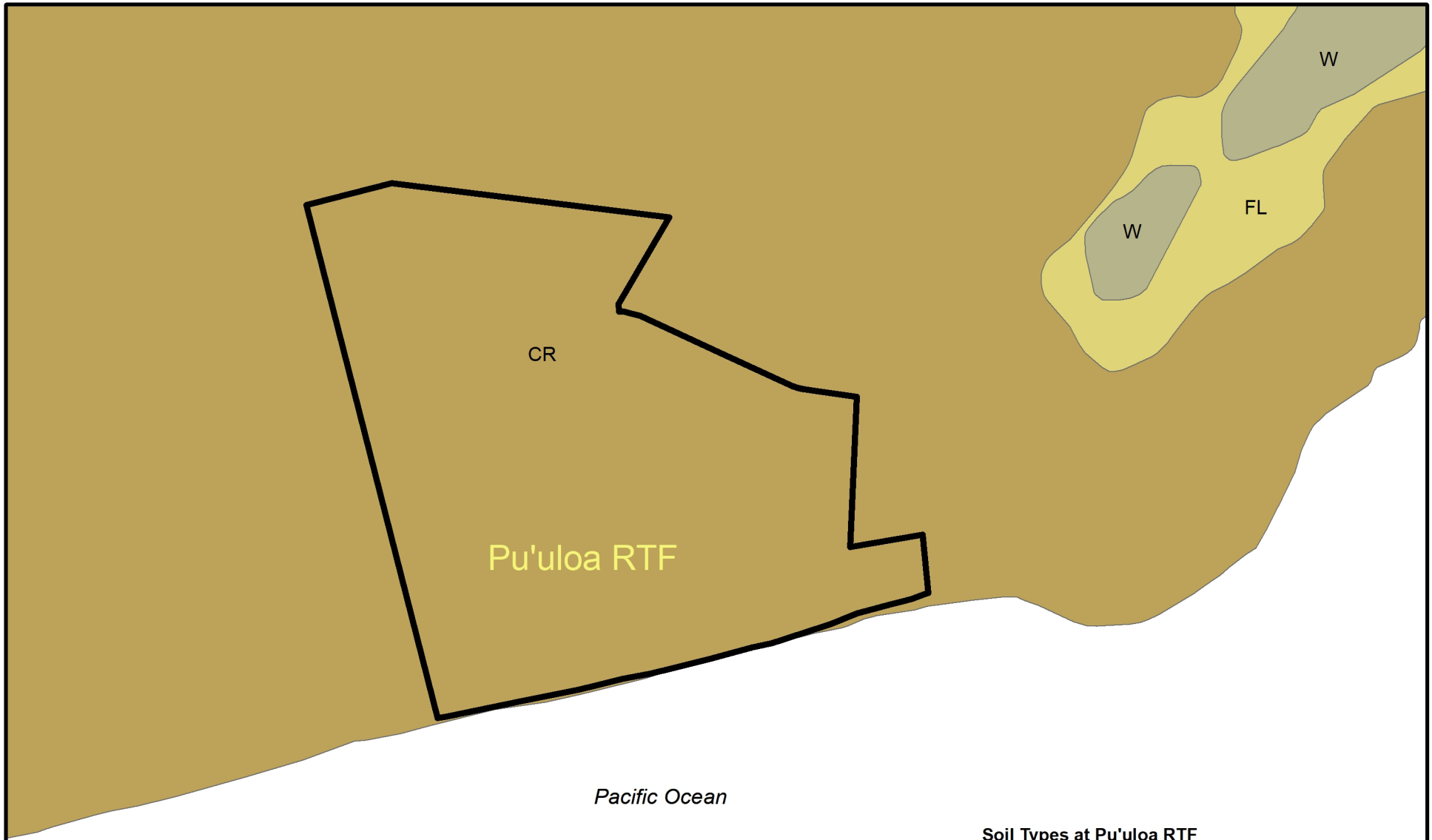


Figure 32
Pu'uloa RTF Soils

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository (Soil types from
NRCS (SCS) Soil Survey of O`ahu (Foote et al. 1972))

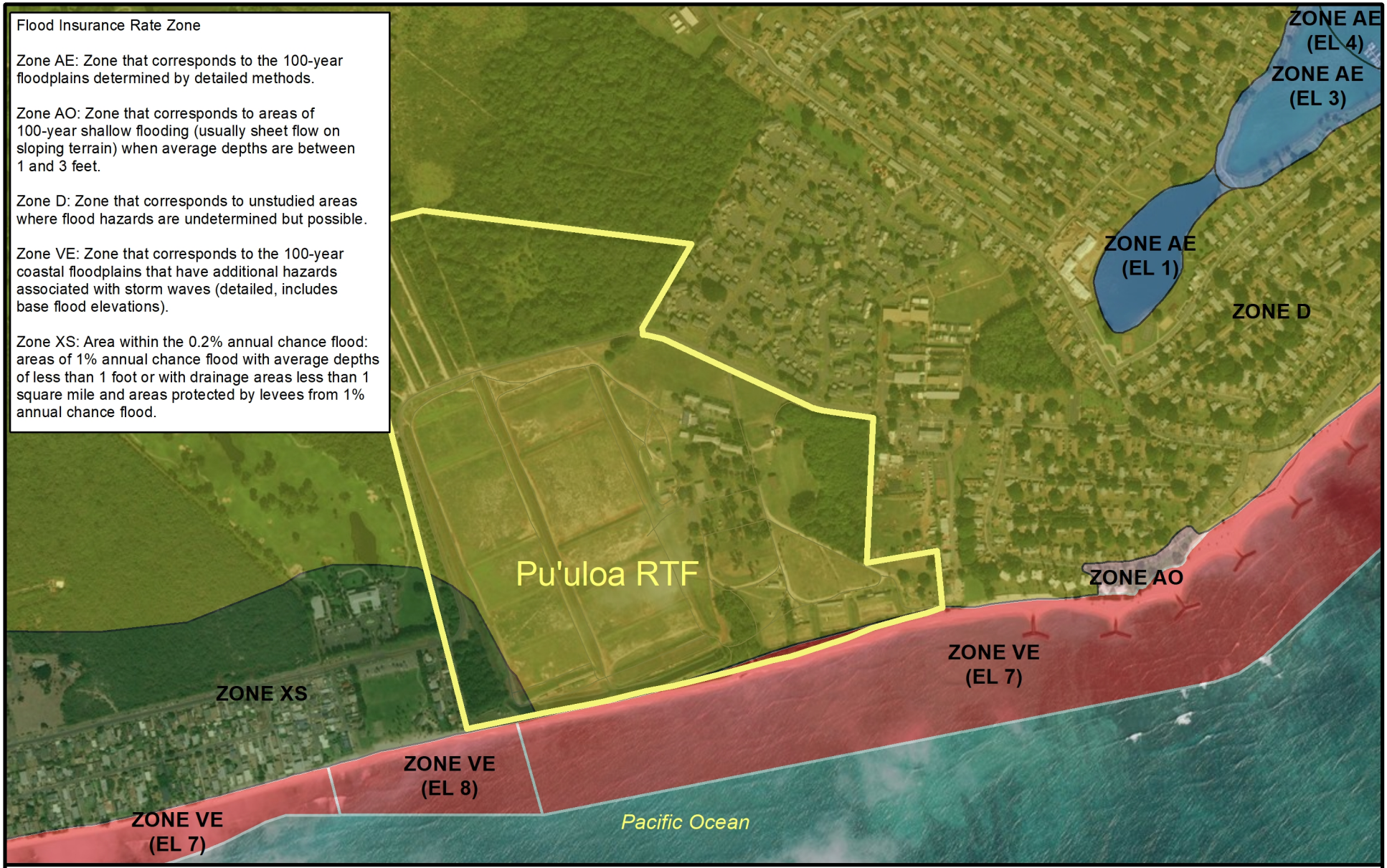


Figure 33
Pu'uloa RTF Flood Hazard Areas

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
State of Hawaii Data Repository (2011 data);
Aerial photo from ESRI

FIGURE 34: PU‘ULOA RTF SHORELINE EROSION PROJECT AREA

This map depicts the project area from the *Pu‘uloa Shoreline Erosion Study* (SSFM International, Inc., Sea Engineering, Inc., and Brownlie & Lee 2015). See further discussion in COA 7.4.

Scale: 1 inch = 60 feet

LEGEND

Project Area

Range Identification

Figure 35
Pearl City Annex, Manana Housing Area, and Vicinity

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

Figure 36
Pearl City Annex Wetlands

Final MCBH INRMP Update (2017-2021)
August 2017

Source: MCBH GIS Data Repository;
Aerial photo from ESRI

N

0 0.015 0.03 0.06 Miles

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APPENDIX C
FLORA AND FAUNA OF MCBH

This appendix includes information on the flora and fauna of MCBH.

C1. *Species Inventory (Reference CD only)*

C2. Protected Species Highlights

C3. Species of Control Concern Management

C4. ESA and MBTA Bird Species Protection Measures

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C1. SPECIES INVENTORY

This species inventory contains species lists for MCBH properties represented in this INRMP. Lists are included for: mammals and reptiles (Table C1-1), birds (Table C1-2), fish (Table C1-3), marine invertebrates (Table C1-4), terrestrial invertebrates (Table C1-5), plants (Table C1-6), and algae (Table C1-7).[1] Species that are protected or regulated under Federal or State laws are of particular concern to MCBH natural resource management, including those protected under the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA) and the Migratory Bird Treaty Act (MBTA), as well as aggressive, invasive plant species. Specific management actions are identified in Section 7.

The species lists represent a cumulative update of those in the 2001 INRMP/EA, the 2006 INRMP, and the 2011 INRMP.[2] The species inventory can never be considered complete due to the lack of resources to fund comprehensive surveys of each property and the dynamic nature of the environment. Hence the inventory principally reflects the project-driven nature of the information gathering process (e.g., flora and fauna surveys that are conducted as part of specific projects usually undergoing environmental review, rather than on the entire MCBH property). However, the coastal and marine surveys conducted around the Mōkapu Peninsula and in the waters seaward of MCTAB were thorough, detailed surveys. The species included are those noted in various plans, studies, projects, and reports undertaken on MCBH properties, including species of protection and control concern (i.e., pest or invasive species). These species lists will continue to be periodically reviewed and updated. While the plant species list does contain some cultivated plants, a complete inventory of horticultural/ornamental plants on all MCBH properties has not been attempted.[3]

Since taxonomic definitions and regulatory status of species can change, the process of updating these lists includes cross-checking the regulatory status of species that occur at MCBH with the latest Federal and State threatened and endangered species lists as well as those for birds protected under the MBTA.[4] A column in the species lists identifies species with regulatory status.

The lists included in this INRMP reflect the most current and available scientific information (e.g., presence on a particular property, scientific names, regulatory status).[5] The *Integrated Taxonomic Information System* (ITIS) (http://www.itis.gov/) is primarily used as the final authority for all scientific names, with the exception of plants, in which case the *Manual of the Flowering Plants of Hawaii Revised Edition with Supplement* (Wagner et al 2003 & 2012) is used. ITIS is a cooperative project of North American agencies to provide authoritative taxonomic information on plants, animals, fungi and microbes. ITIS was created, in part, to provide up-to-date standardized nomenclature for Federal agencies to reference. Other current sources may be used to confirm updates.

[1] This species inventory is intended to cover plants that occur "naturally" (both natives and invasives) in the MCBH environment and cultivated plants installed as part of a designated wetland/wildlife habitat enhancement project. For a complete species list for any section of Base property (in either the natural or built environment), this species inventory should be paired with a field survey of the specific site of interest.

[2] The organization of bird species, which remained the same in the 2001 INRMP/EA, the 2006 INRMP, and the 2011 INRMP, has been changed.

[3] Cultivated plants can be identified by using the source code and/or referencing previous INRMPs. Cultivated plants that have died off may or may not have been replaced with the same species or at all.

[4] Some species listed may also be protected under international treaties (e.g., Convention on International Trade in Endangered Species (CITES)) and the laws of other countries.

[5] Edits have been made to some species names to reflect the most current and available scientific information. Previous scientific names may be found in the source reports.

The following information is included for each species (where applicable): scientific name, common name, Hawaiian name, regulatory status (e.g., endangered/threatened at the Federal or State level), origin (e.g., endemic, indigenous, introduced), MCBH properties on which the species has been documented, whether or not the species is considered invasive, and a source code that identifies the primary source(s) of data for the observation. See Glossary (Appendix I) for definitions of the terms used in the "Origin" columns. A species is listed as invasive on MCBH properties if it meets the criteria for invasive as defined in Executive Order 13112 as being "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health."

Definition of Source Codes for Species Lists:[6]

1. Fish and Wildlife Management Plan for Marine Corps Air Station, Kane'ohe Bay, Volumes 1 & 2 (USFWS 1984)
2. Biological Surveys in the Nu'upia Ponds Wildlife Management Area in Association with the November 1984 Opening of the Pa'akai/Kailua Bay Channel (AECOS Inc. 1985)
3. Natural Resources Management Plan, Camp H.M. Smith, USMC, Oahu, Hawaii (U.S. Department of the Navy 1990)
4. Final Environmental Assessment for Fencing/Warning Signs and Demolition Work for FY87 MCON Project P-106, Land Acquisition, Waikane, Oahu, Hawaii (BCA 1991)
5. A Natural Resources Survey of the Nearshore Waters of Mokapu Peninsula, Kaneohe Marine Corps Air Station (Henderson 1992)
6. Fish and Wildlife Management Plan (Rauzon 1992a, 1992b)
7. Environmental Assessment for New Family Housing Construction at Camp H.M. Smith, Oahu, Hawaii (U.S. Department of the Army 1994)
8. Final Environmental Impact Statement, Land Use and Development Plan, Bellows Air Force Station, Waimanalo, HI (BCH 1995)
9. Fish Communities of the Nu'upia Fishponds, Nu'upia Wildlife Management Area, Mokapu, O'ahu, Hawai'i (Brock 1994 in R.M. Towill 1995)
10. Endangered Hawaiian Stilt Survey and Assessment for Improved Management Options, Marine Corps Base Hawaii (Rauzon and Tanino 1995)
11. Final Integrated Natural Resources Management Plan for Hickam AFB Oahu, Bellows AFS Oahu, Hickam POL Pipeline Oahu, Kaala AFS Oahu, Kaena Point STS Oahu, Kokee AFS Kauai, Palehua Solar Observatory Oahu (15th Air Base Wing Installations) (Air Force Center for Environmental Excellence 1997)
12. Environmental Study of Nu'upia Ponds Wildlife Management Area, Marine Corps Base Hawaii, Kaneohe Bay (Cox and Jokiel 1997)
13. Klipper Golf Course Improvements Marine Corps Base Hawaii, Kaneohe Bay. Environmental Assessment. (Helber Hastert & Fee, Planners 1997)
14. Botanical Survey of Selected Areas of MCBH, Kane'ohe, O'ahu, Hawai'i (Herbst 1998)
15. Biological Assessment and Habitat Characterization of Waimanalo Stream: Establishing Environmental Goals and a TMDL for Watershed Management (Smith 1998)
16. Strategic Integrated Resources Management Planning for Selected Properties of Marine Corps Base Hawaii: Camp H.M. Smith, Puuloa Training Facility, and a Portion of Waikane Valley (Tuggle and Wilcox 1998)

[6] A source code links the reader to the reference(s) that document the presence of each species found on a particular property and what year the information was gathered and/or reported. The reader can identify the newest information by referring to the source code.

17. Mokapu: Manual for Watershed Health and Water Quality (Wilcox et al. 1998)
18. Draft Environmental Assessment: Marine Corps Amphibious Training in Hawaii (BCH 1999)
19. MCBH Master Plan 1999 (Wilson Okamoto and Associates, Inc. 1999)
20. MCBH Pest Management Plan, Volume 1, Kaneohe Bay (NAVFAC Pacific 2000)
21. Wetlands of MCBH, Island of Oahu, Hawaii (Ching 2002)
22. Nonindigenous Marine Species in Kane‘ohe Bay, O‘ahu, Hawai‘i. (Coles et al. 2002)
23. MCBH Invasive Species Management Study (Garrison et al. 2002)
24. Biological Resources Report for a Proposed Marine Corps Jungle Warfare Training Area in Waikane Valley on Windward O‘ahu (Guinther et al. 2003)
25. GIS Mapping and Control of Invasive Species/ Erosion/Brushfire Control on MCBH Training Lands (GII 2004)
26. Cave Faunal Survey and Environmental Assessment for the Reburial of the Mokapu Collection Aboard Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii, Final Report (Howarth and Preston 2005)
27. Feasibility Study for Mangrove Removal Along the South Kane‘ohe Bay Shoreline, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii (AECOS Inc. 2006)
28. The Endangered Hawaiian Stilt Biological Monitoring Survey on the Mokapu Peninsula, Marine Corps Base Hawaii – Kaneohe Bay (2006-2007) (Volinski 2007)
29. Assessment of the Marine Environment in the Vicinity of the Proposed Wave Attenuator Cove Recreational Marine, Marine Corps Base Hawaii, Kaneohe, Oahu, Hawaii. (Belt Collins Hawaii Ltd., and Marine Research Consultants Inc. 2008)
30. Assessment of Marine Environment in Vicinity of Waterfront Facility Operations: MILCON Project P-618 MCBH at Kaneohe Bay (Marine Research Consultants, Inc. 2008)
31. MCBH Ant Survey Report/Consult Sheet (NAVFAC Pacific 2008)
32. Inventory of Coastal and Marine Resources Marine Corps Base Hawaii at MCBH - Kaneohe Bay, Mokapu Peninsula, Oahu Island, Hawaii (USFWS 2008a)
33. Turtle Splits From the Crowd to Nest on Oahu Beach (Scott 2009)
34. Natural Resources Surveys in Advance of an Explosives Ordnance Disposal Operation in the Waikane Valley Impact Area, MCBH (AECOS Inc. 2010)
35. Wetlands of MCBH, Island of Oahu, Hawaii (Ching 2010)
36. Flora & Fauna Resources Assessment for the Marine Corp Training Area Bellows (MCTAB) Outdoor Recreation Feasibility Study Bellows, Oahu, Hawaii. (LeGrande and VanderWerf 2010)
37. Waterbird Monitoring Report at the Percolation Ditch Wetland and Golf Course Wetlands, Marine Corps Base Hawai’i, Kaneohe Bay, 7/23/2010 to 12/8/2010 (Lohr 2010)
38. Preliminary Assessment Concerning both the Shoreline Fishing Perceptions and the Quantitative Shoreline Fishing Effort, Harvest, and Catch at Marine Corps Base Hawaii; Kaneohe, Hawaii. (Carnevale and Allen 2011)
39. Final Benthic Community and Habitat Maps of Marine Resources at Marine Corps Base Hawaii, Kaneohe, Oahu Island, Hawaii. (USFWS and USGS 2013)
40. MCBH Landscape Manual (MCBH Environmental Department 2014)
41. MCBH Environmental Department Natural Resources Program (in house files or communications)
42. O‘ahu Invasive Species Committee (in house files or communications)

Table C1-1: Species Inventory - Mammals and Reptiles

Scientific Name	Common Name	Hawaiian Name	Regulatory Status					Origin	Property					Invasive	Source
			Threatened (US)	Endangered (US)	State Protected*	Marine Mammal Protection Act			MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Mammals															
Marine															
Globicephala macrorhynchus	Short-finned pilot whale					X			X						41
Megaptera novaeangliae	Humpback whale	Kahola				X	Endangered (State)	Global	X	X					18
Neomonachus schauinslandi	Hawaiian monk seal	'Ilio-holo-i-ka-uaua		X	X	X	Endangered (US)	Endemic	X	X					8,18,32
Physeter macrocephalus (P. catodon)	Sperm whale			X	X	X	Endangered (US)	Global	X						23
Stenella longirostris	Hawaiian spinner dolphin					X	Oahu		X	X					18
Terrestrial															
Canis lupus familiaris	Feral dog							Introduced	X	X	X	X	X		3,6,8,24,34
Felis catus	Feral cat							Introduced	X	X	X	X	X	X	3,8,11,16,24,34
Herpestes javanicus	Small Indian mongoose							Introduced	X	X	X	X	X	X	3,8,17,24,34
Mus musculus	House mouse							Introduced	X	X		X	X		3,8,20
Oryctolagus cuniculus	Feral/domestic rabbit							Introduced				X			16
Rattus exulans	Polynesian rat							Introduced				X	X		3
Rattus norvegicus	Norwegian rat							Introduced	X			X	X		3,20
Rattus rattus	Roof rat							Introduced	X			X	X		3,20
Sus scrofa	Feral pig							Introduced		X	X	X	X	X	8,11,16,24,34
Reptiles															
Marine															
Chelonia mydas	Green sea turtle	Honu	X		X		Threatened (US)	Indigenous	X	X			X		3,8,11,18,29, 41
Eretmochelys imbricata	Hawksbill sea turtle	`Ea		X	X		Endangered (US)	Indigenous	X	X					8,11,18
Lepidochelys olivacea	Olive Ridley sea turtle		X		X		Threatened (US)	Circumtropical	X						33
Terrestrial															
Anolis carolinensis	Green anole lizard							Introduced				X	X		3
Anolis sagrei	Brown anole							Introduced	X						41
Hemidactylus frenatus	House gecko							Introduced				X	X		3
Hemidactylus garnotii	Indo-pacific gecko							Polynesian Introduction				X	X		3
Hemiphyllodactylus typus	Tree gecko							Indigenous?				X	X		3
Lampropholis delicata	Metallic skink							Introduced				X	X		3
Lepidodactylus lugubris	Mourning gecko							Indigenous?				X	X		3
Rana spp.	Frog							Introduced		X					11
Ramphotyphlops braminus	Blind snake							Introduced				X	X		3
Rhinella marina	Cane toad, Giant toad	Poloka						Introduced	X	X		X	X		3,11,17
Trachemys scripta elegans	Red-eared slider							Introduced	X						37

* Marine mammals and sea turtles listed federally as threatened or endangered species are protected under Hawaii Revised Statues, Chapter 159D and Hawaii Administrative Rules, 13-124.

Table C1-2: Species Inventory - Birds

Scientific Name	Common Name	Hawaiian Name	Regulatory Status						Origin	Property						Invasive	Source Code
			Threatened (US)	Endangered (US)	Birds of Conservation Concern (US)	Threatened (HI)	Endangered (HI)	Migratory Bird Treaty Act (MBTA)		MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF	Pearl City Annex		Sources listed on pg C1-2
Birds																	
Landbirds																	
Acridotheres tristis	Common myna								Introduced	X	X	X	X	X		X	1,3,6,8,18,24,36
Alauda arvensis	Skylark							X	Introduced	X	X						1,6,8,11
Amandava amandava	Red avadavat								Introduced		X						8,10
Ara macao	Scarlet macaw								Introduced	X							41
Asio flammeus sandwichensis	Hawaiian Short-eared owl	*Pueo*					Oahu	X	Endemic	X	X	X	X	X			1,3,6,8,16,28
Callipepla californica	California quail								Introduced	X							1,6
Cardinalis cardinalis	Northern cardinal				X			X	Introduced	X	X	X	X	X		X	1,3,8,11,16,18,24,36
Chlorodrepanis flava	O'ahu 'amakihi	*O'ahu 'Amakihi*						X	Endemic				X				3,19
Columba livia	Rock dove/pigeon								Introduced	X	X		X	X		X*	1,3,6,8,11
Copsychus malabaricus	White-rumped shama								Introduced	X	X	X	X				1,3,6,8,11,18,24,36
Crithagra mozambica	Yellow-fronted canary								Introduced		X						8,11,36
Estrilda astrild	Common waxbill								Introduced	X	X	X				X	8,11,18,24,36
Euodice malabarica	Warbling silverbill, Indian silverbill								Introduced		X						10,11
Euplectes franciscanus	Orange bishop								Introduced	X							6
Euplectes orix	Red bishop								Introduced	X							10
Francolinus erckelii	Erckel's francolin								Introduced	X						X	18
Gallus gallus	Red junglefowl								Introduced			X					24
Garrulax canorus	Hwamei								Introduced		X	X					8,24
Geopelia striata	Barred dove, zebra dove								Introduced	X	X	X	X	X		X*	1,3,8,11,16,18,24,36
Haemorhous mexicanus	House finch							X	Introduced	X	X	X	X	X		X*	1,3,6,8,18,24,36
Horornis diphone	Japanese bush warbler								Introduced	X	X	X	X				3,8,11,24
Leiothrix lutea	Red-billed leiothrix								Introduced	X	X	X					1,6,8,24
Lonchura atricapilla	Black-headed munia								Introduced		X						11
Lonchura oryzivora	Java sparrow								Introduced	X	X		X	X		X*	6,8,11
Lonchura punctulata	Scaly-breasted munia								Introduced	X	X	X	X	X			1,3,6,8,16,18
Mimus polyglottos	Northern mockingbird							X	Introduced	X	X		X	X			1,3,6,8,11,18
Pandion haliaetus	Osprey							X	Indigenous	X							1,6
Paroaria coronata	Red-crested cardinal								Introduced	X	X		X	X			1,3,8,11,18,36
Passer domesticus	House sparrow								Introduced	X	X		X	X			1,3,6,8,11,36
Phasianus colchicus	Ring-necked pheasant								Introduced	X	X	X					1,6,8,11,24
Psittacula krameri	Rose-ringed parakeet								Introduced	X							10
Pycnonotus cafer	Red-vented bulbul								Introduced	X	X	X	X	X		X	1,3,6,8,11,18,24,36

Table C1-2: Species Inventory - Birds

Scientific Name	Common Name	Hawaiian Name	Regulatory Status						Origin	Property						Invasive	Source Code
			Threatened (US)	Endangered (US)	Birds of Conservation Concern (US)	Threatened (HI)	Endangered (HI)	Migratory Bird Treaty Act (MBTA)		MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF	Pearl City Annex		Sources listed on pg C1-2
Birds																	
Pycnonotus jocosus	Red-whiskered bulbul								Introduced			X					24,36
Sicalis flaveola	Saffron finch								Introduced		X						11
Streptopelia chinensis	Spotted dove								Introduced	X	X	X	X	X			1,3,8,11,16,24,36
Tyto alba	Common barn owl							X	Introduced	X	X		X	X			1,3,6,8,11
Zosterops japonicus	Japanese white-eye								Introduced	X	X	X	X	X		X*	1,3,8,11,16,18,24,36
Waterfowl																	
Anas acuta	Northern pintail	*Koloa mapu*						X	Indigenous	X	X						1,8,10
Anas americana	American wigeon							X	Indigenous	X							1,6,10
Anas clypeata	Northern shoveler	*Koloa moha*						X	Indigenous	X	X						1,6,8,10,28
Anas crecca	Green-winged teal							X	Indigenous	X							1,6
Anas platyrhynchos	Mallard							X	Introduced	X						X*	1,6,28
Anas wyvilliana	Hawaiian duck	*Koloa maoli*		X			X	X	Endemic	X	X				X		8,10,11
Anas wyvilliana X Anas platyrhynchos	Hawaiian duck X Mallard hybrid							X		X							28
Aythya affinis	Lesser scaup							X	Indigenous	X							1,6
Aythya marila	Greater scaup							X	Indigenous	X							6,10
Branta bernicla	Brant				X			X	Indigenous	X							6
Branta bernicla nigricans	Black brant							X	Indigenous	X							28
Branta canadensis	Canada goose							X	Indigenous	X							18
Branta sandvicensis	Hawaiian goose	*Nene*		X			X	X	Endemic	X							41
Bubulcus ibis	Cattle egret							X	Introduced	X	X		X	X	X	X*	3,6,8,10,11,36
Bucephala albeola	Bufflehead							X	Indigenous	X							6
Fulica alai	Hawaiian coot	*'Alae ke'oke'o*		X			X	X	Endemic	X	X						8,11,28,35
Gallinula galeata sandvicensis	Hawaiian common moorhen	*'Alae 'ula*		X			X	X	Endemic	X	X						8,11,28
Lophodytes cucullatus	Hooded merganser							X	Indigenous	X							6
Nycticorax nycticorax hoactli	Black-crowned night heron	*'Auku'u*						X	Indigenous	X	X				X		2,8,10,11,27,28,32,35
Seabirds																	
Anous minutus melanogenys	Black noddy	*Noio*						X	Endemic	X							1,6,27,28,32
Anous stolidus pileatus	Brown noddy	*Noio koha*						X	Indigenous	X							1,6,18
Ardenna pacifica	Wedge-tailed shearwater	*'Ua'u kani*			X			X	Indigenous	X	X						8,10,11,25,32
Chlidonias niger	Black tern							X	Indigenous	X							10
Fregata minor palmerstoni	Great frigatebird	*'Iwa*						X	Indigenous	X	X						6,11,28
Gygis alba	White tern	*Manu-o-ku*				X		X	Indigenous	X							1,6
Hydroprogne caspia	Caspian tern							X	Indigenous	X							1,6,28
Larus delawarensis	Ring-billed gull							X	Indigenous	X							6
Leucophaeus atricilla	Laughing gull							X	Indigenous	X							1,6,10

Table C1-2: Species Inventory - Birds

Scientific Name	Common Name	Hawaiian Name	Regulatory Status						Origin	Property							Invasive	Source Code
			Threatened (US)	Endangered (US)	Birds of Conservation Concern (US)	Threatened (HI)	Endangered (HI)	Migratory Bird Treaty Act (MBTA)		MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF	Pearl City Annex			Sources listed on pg C1-2
Birds																		
Leucophaeus pipixcan	Franklin's gull							X	Indigenous	X								1,6,10
Onychoprion fuscatus	Sooty tern	*'Ewa'ewa*						X	Indigenous	X								6,10
Phaethon lepturus	White-tailed tropicbird	*Koa'e kea*						X	Indigenous	X								1,18
Phaethon rubricauda	Red-tailed tropicbird	*Koa'e 'ula*						X	Indigenous	X								1
Phoebastria immutabilis	Laysan albatross	*Moli*						X	Indigenous	X	X							8,18
Sterna antillarum	Least tern							X	Indigenous	X								1,6
Sterna hirundo	Common tern							X	Indigenous	X								28
Sula dactylatra	Masked booby	*'A*						X	Indigenous	X	X							6,11
Sula leucogaster	Brown booby	*'A*						X	Indigenous	X	X							1,6,11
Sula sula rubripes	Red-footed booby	*'A*						X	Indigenous	X	X							1,6,11,25
Thalasseus bergii	Great crested tern							X	Indigenous	X								6
Shorebirds																		
Ardea herodias	Great blue heron							X	Indigenous	X								6
Arenaria interpres	Ruddy turnstone	*'Akekeke*						X	Indigenous	X	X			X	X			1,3,8,6,10,19,25, 27,32,36
Calidris alba	Sanderling	*Hunakai*						X	Indigenous	X	X			X	X			3,8,11,19,32,36
Calidris alpina	Dunlin							X	Indigenous	X								1,6
Charadrius semipalmatus	Semipalmated plover							X	Indigenous	X								1,6
Egretta caerulea	Little blue heron							X	Indigenous	X								6
Egretta thula	Snowy egret							X	Indigenous	X								6
Gallinago gallinago	Common snipe							X	Indigenous	X								1,6
Himantopus mexicanus knudseni	Hawaiian stilt	*Ae'o*		X			X	X	Endemic	X	X				X			2,8,10,11,28,29, 32,35
Limnodromus spp.	Dowitcher							X	Indigenous	X								1,6
Limnodromus scolopaceus	Long-billed dowitcher							X	Indigenous	X								10,28
Numenius phaeopus	Whimbrel							X	Indigenous	X								6
Numenius tahitiensis	Bristle-thighed curlew	*Kioea*						X	Indigenous	X								6,10,28
Phalaropus fulicarius	Red phalarope				X			X	Indigenous	X								10
Plegadis chihi	White-faced ibis				X			X	Indigenous	X								28
Pluvialis fulva	Pacific golden plover	*Kolea*						X	Indigenous	X	X		X	X	X			3,8,10,11,16,25, 32,36
Pluvialis squatarola	Black-bellied plover							X	Indigenous	X								1,6
Tringa flavipes	Lesser yellowlegs							X	Indigenous	X								1,6
Tringa incana	Wandering tattler	*'Ulili*						X	Indigenous	X	X			X	X			3,6,8,9,11,28,32, 36
Tringa melanoleuca	Greater yellowlegs							X	Indigenous	X								1,6
Tringa semipalmata	Willet							X	Indigenous	X								6

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Acanthuridae	*Acanthurus achilles*	Achilles tang	Paku`iku`i		Indigenous	X	X					6,8,11,32
Acanthuridae	*Acanthurus blochii*	Ringtail surgeonfish	Pualu		Indigenous		X					8,11,32
Acanthuridae	*Acanthurus dussumieri*	Eyestripe surgeonfish	Palani		Indigenous	X						6,32,38
Acanthuridae	*Acanthurus auranticavus*	Orange socket surgeon fish				X	X					6,8,11,18
Acanthuridae	*Acanthurus guttatus*	White-spotted surgeon fish, spotted tang	Api		Indigenous	X						6,32
Acanthuridae	*Acanthurus leucopareius*	Whitethroated surgeonfish	Maikoiko		Indigenous	X	Oahu					6,8,32
Acanthuridae	*Acanthurus mata*	Elongated surgeonfish	Pualu			X	X					6,11
Acanthuridae	*Acanthurus nigricans*	Goldrim tang			Indigenous	X						32
Acanthuridae	*Acanthurus nigrofuscus*	Brown surgeon, lavendar tang	Mai`i`i		Indigenous	X	X					6,8,11,32
Acanthuridae	*Acanthurus nigroris*	Blueline surgeon	Maiko		Indigenous	X	X					6,8,11,12,32
Acanthuridae	*Acanthurus olivaceus*	Orangespot surgeonfish	Na`ena`e		Indigenous	X	X					6,11,32
Acanthuridae	*Acanthurus triostegus*	Convict tang	Manini		Indigenous	X	X					6,8,32,38
Acanthuridae	*Acanthurus xanthopterus*	Yellowfin surgeonfish	Pualu		Indigenous	X						6
Acanthuridae	*Ctenochaetus hawaiiensis*	Chevron tang, black surgeon fish	Kole no kaheo		Indigenous	X						6
Acanthuridae	*Ctenochaetus strigosus*	Yellow-eyed, gold-ring surgeonfish	Kole		Indigenous	X	X					6,8,32
Acanthuridae	*Naso brevirostris*	Pale-tail, spotted unicorn fish	Kala lolo		Indigenous	X						6,32
Acanthuridae	*Naso hexacanthus*	Sleek, six-spined surgeon	`Opelu kala		Indigenous	X	X					
Acanthuridae	*Naso lituratus*	Orange-spine surgeon fish	Umaumalei		Indigenous	X	X					6,8,11,32
Acanthuridae	*Naso unicornis*	Bluespine unicornfish	Kala		Indigenous	X						6,32
Acanthuridae	*Zebrasoma flavescens*	Yellow tang	Lau`ipala		Indigenous	X	X					6,8,32
Acanthuridae	*Zebrasoma veliferum*	Sail-fin tang	Maneoneo		Indigenous	X						6,32
Albulidae	*Albula spp.*	Bonefish	`O`io		Indigenous	X						6,38
Antennariidae	*Antennarius commerson*	Commerson's frogfish				X						32
Apogonidae	*Apogon kallopterus*	Iridescent cardinalfish	`Upapalu makanui		Indigenous	X						6,32
Apogonidae	*Apogon spp.*	Cardinal fish	Uupapalu			X						6,32
Apogonidae	*Foa brachygramma*	Bay cardinalfish				X						25
Atherinidae	*Iso hawaiiensis*	Hawaiian surf sardine, small silverside				X						6
Aulostomidae	*Aulostomus chinensis*	Chinese trumpet fish	Nunu		Indigenous	X	X					6,8,11,25
Balistidae	*Balistes polylepis*	Finescale, Brown trigger fish			Indigenous	X						6
Balistidae	*Melicthys niger*	Black durgeon	Humuhumu `ele `ele		Indigenous	X	X					6,11,32
Balistidae	*Melicthys vidua*	Pinktail, Red-tailed trigger fish	Humuhumu hi`ukole		Indigenous	X	X					6,8,9,17,32
Balistidae	*Rhinecanthus aculeatus*	Lagoon, black-bar trigger fish	Humuhumu nukunuku apua`a		Indigenous	X						9,12,17,32
Balistidae	*Rhinecanthus rectangulatus*	Reef triggerfish	Humuhumu nukunuku apua`a		Indigenous		X					11,32
Balistidae	*Sufflamen bursa*	Lei trigger fish	Humuhumu lei		Indigenous	X						6,32
Balistidae	*Sufflamen fraenatus*	Bridled triggerfish	Humuhumu mimi		Indigenous							32

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Balistidae	*Xanthichthys mento*	Red-tail, cross-hatch				X						6
Belonidae	*Ablennes hians*	Flat needle fish	`Aha			X						6
Belonidae	*Belone platyura (Platybelone argalus)*	Keel-tailed needle fish	`Aha				X					11
Belonidae	*Strongylura appendiculata*	Needle fish	`Aha			X	X					6,11
Belonidae	*Strongylura gigantea*	Giant needle fish	`Aha			X						6
Blenniidae	*Blennica gibbifrons*					X						32
Blenniidae	*Cirripectes vanderbilti*	Scarface blenny	Pao`o		Endemic	X						6,32
Blenniidae	*Exallias brevis*	Shortbodied blenny	Pao`o kauila		Indigenous	X						6,32
Blenniidae	*Istiblennius gibbifrons*	Hump-head blenny			Indigenous	X						6
Blenniidae	*Istiblennius zebra*	Koloa maoli	Pao`o lehei		Endemic	X						6
Blenniidae	*Plagiotremus goslinei*	Gosline's fang blenny			Endemic	X	X					6,11,32
Blenniidae	*Plagiotremus ewaensis*	Ewa fangblenny			Endemic	X						32
Blenniidae		Blenny	Pao`o			X						6
Bothidae	*Bothus mancus*	Peacock flounder	Paki`i		Indigenous	X	X					6,11
Bothidae	*Bothus spp.*	Flounder	Paki`i			X						6
Bothidae	*Arnoglossus spp.*	Lefteye flounder				X						6
Caracanthidae	*Caracanthus typicus*	Hawaiian velvetfish			Endemic	X						6,32
Carangidae	*Alectis ciliaris*	Thread-fin jack	Ulua kihi kihi			X						6
Carangidae	*Alectis indicus*	Indian thread-fin Jack	Ulua kihi kihi			X						6
Carangidae	*Carangoides ferdau*	Barred jack	Ulua `omilu		Indigenous	X						6
Carangidae	*Carangoides sp.*	White jack				X						2
Carangidae	*Caranx ignobilis*	White jack, Trevally	Aukea		Indigenous	X						6
Carangidae	*Caranx lugubris*	Black Jack				X						1,6
Carangidae	*Caranx mate*	Yellow-tailed scad	`Omaka			X						1,6,38
Carangidae	*Caranx melampygus*	Blue-fin trevally, Blue jack	`Omilu nukumoni		Indigenous	X						6,32,38
Carangidae	*Caranx sexfasciatus*	Big-eye trevally, six-banded jack	Pake ulua		Indigenous	X	X					6,9,11,17
Carangidae	*Decapterus macarellus*	Mackerel scad			Indigenous	X						32
Carangidae	*Decapterus pinnulatus*	Mackerel scad	Opelu			X	X					6,11,12
Carangidae	*Gnathanodon speciosus*	Golden trevally, yellow jack	Ulua pa`opa`o		Indigenous		X					6,11
Carangidae	*Naucrates ductor*	Pilot fish				X						6
Carangidae	*Scombroides laysan*	Leatherback	Lai		Indigenous	X						6,38
Carangidae	*Selar crumenopthalmus*	Big-eye scad	Akule		Indigenous	X	X					6,11
Carangidae	*Seriola dumerili*	Amber jack	Kahala		Indigenous	X						6
Carangidae		Jack				X						6,38
Carcharhinidae	*Carcharhinus amblyrhynchos*	Grey reef shark	Mano		Indigenous	X						6
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	Mano pa`ele		Indigenous	X						6
Carcharhinidae	*Carcharhinus melanopterus*	Blacktip reef shark	Mano		Indigenous	X						6
Carcharhinidae	*Carcharinus milberti*	Milbert's sandbar shark			Indigenous	X						6
Carcharhinidae	*Galeocerdo cuvieri*	Tiger shark	Mano pa`ele		Indigenous	X						6

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Carcharhinidae	*Pterolamiops longimanus*	Oceanic whitetip shark			Indigenous	X	X					6,8,11
Carcharinidae	*Triaenodon obesus*	White-tipped reef shark	Lalakea		Indigenous	X						6
Chaetodontidae	*Chaetodon auriga*	Threadfin butterflyfish	Kikakapu		Indigenous	X						6,32
Chaetodontidae	*Chaetodon citrinellus*	Speckled, Lemon butterflyfish	Lauhau			X						6,32
Chaetodontidae	*Chaetodon ephippium*	Saddleback butterflyfish	Kikakapu		Indigenous	X						6,32
Chaetodontidae	*Chaetodon fremblii*	Bluestripe butterflyfish	Kikakapu kahuhili		Endemic	X	X					6,8,11,32
Chaetodontidae	*Chaetodon lineolatus*	Lined butterflyfish	Kikakapu kahuhili		Indigenous	X						6,32
Chaetodontidae	*Chaetodon lunula*	Racoon butterflyfish	Kikakapu		Indigenous	X						6,32
Chaetodontidae	*Chaetodon lunulatus*	Oval butterflyfish			Indigenous	X						32
Chaetodontidae	*Chaetodon miliaris*	Milletseed butterflyfish	Lau wiliwili		Endemic	X	X					6,8,32
Chaetodontidae	*Chaetodon multicinctus*	Multi-banded, pebbled butterflyfish	Kikakapu		Endemic	X	X					6,8,32
Chaetodontidae	*Chaetodon ornatissimus*	Ornate butterflyfish	Kikakapu kahuhili		Indigenous	X						6,32
Chaetodontidae	*Chaetodon quadrimaculatus*	Four-spot butterflyfish	Lauhau		Indigenous	X						6,32
Chaetodontidae	*Chaetodon spp.*	Butterflyfish				X	X					8,11,18
Chaetodontidae	*Chaetodon trifasciatus*	Three-band butterflyfish				X						6,11
Chaetodontidae	*Chaetodon unimaculatus*	One-spot butterflyfish	Kikakapu		Indigenous	X						6,32
Chaetodontidae	*Forcipiger spp.*					X						32
Chaetodontidae	*Forcipiger flavissimus*	Long-nose butterflyfish	Lauwiliwili nukunukuku oi`oi		Indigenous	X						6,32
Chaetodontidae	*Forcipiger longirostris*	Long-nose butterflyfish	Lauwiliwilinukunuku'oi'oi		Indigenous	X						32
Chaetodontidae	*Heniochus acuminatus*	Black and white butterfly				X						5
Chaetodontidae	*Holacanthus arcuatus*	Black-band angelfish				X						5
Chanidae	*Chanos chanos*	Milkfish	Awa		Indigenous	X						6,38
Cichlidae	*Oreochromis mossambica*	Mossambique tilapia			Introduced	X						6,10,15,28
Cichlidae	*Sarotheradon mossambicus*	Blackjaw tilapia			Introduced	X	X					6,8,11
Cichlidae	*Tilapia spp.*					X						29,32
Cirrhitidae	*Amblycirrhitus bimacula*	Two-spot hawkfish	Piliko`a		Indigenous	X						6
Cirrhitidae	*Cirrhitops fasciatus*	Redbar, banded hawkfish	Pilikoa		Indigenous	X						6,32
Cirrhitidae	*Cirrhitus pinnulatus*	Stocky, speckled hawkfish	Po`op`a`a		Indigenous	X						6,32
Cirrhitidae	*Paracirrhites arcatus*	Arceye hawkfish	Piliko`a		Indigenous	X						6,32
Cirrhitidae	*Paracirrhites forsteri*	Blackside hawkfish	Hilu piliko`a		Indigenous	X						6,32
Clupeidae	*Sardinella marquesensis*	Marquesan sardine	Makiawa		Introduced	X	X					6,11,12,17
Clupeidae	*Spratelloides delicatus*	Delicate round herring, sprat	Piha			X						6
Cobitidae	*Misgurnus anguillicaudatus*	Dojo loach			Introduced	X						6
Congridae	*Conger cinereus*	Mustache conger eel, white eel	Puhi uha		Indigenous	X						6
Dactylopteridae	*Dactyloptena orientalis*	Helmet flying gurnard	Loloa`u			X						6,38
Dasyatidae	*Dasyatis spp.*	Sting ray	Hihimanu			X						6
Diodontidae	*Diodon holacanthus*	Spiny pufferfish, long-spine	Kokala		Indigenous	X						6
Diodontidae	*Diodon hystrix*	Spot-fin, giant porcupine fish	Kokala		Indigenous	X						6
Eleotridae	*Eleotris sandwicensis*	Sleeper fish	O`opu `akupa		Endemic	X	X*	X				6,15,16

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Elopidae	*Elops hawaiensis*	Hawaiian tarpon, Hawaiian ladyfish	Awa`aua		Indigenous	X						17,38
Engraulidae	*Encrasicholina purpurea*	Hawaiian anchovy	Nehu		Endemic	X	X					11,29,38
Engraulidae	*Stolephorus buccaneer (Encrasicholina punctifer)*	Buccaneer, Round-headed anchovy				X						6
Exocoetidae		Flying fish	Malolo			X						6
Fistularidae	*Fistularia commersonii*	Blue-spotted cornetfish	Nunu peke		Indigenous	X						6,32
Gobiidae	*Gobiidae spp.*					X						32
Gobiidae	*Asterropteryx semipunctatus*	Half spotted goby, starry goby	`O`opu			X	X					6,9,12,17,32
Gobiidae	*Awaous guamensis*	Goby	O`opu nakea		Endemic		X	X				8,11,24
Gobiidae	*Bathygobius coalitus*	Basalt goby	`O`opu		Indigenous	X						6
Gobiidae	*Chonophorus stamineus*	Common goby	`O`opu			X	X					6,11
Gobiidae	*Coryphopterus spp.*	gobies	`O`opu			X						32
Gobiidae	*Eviota epiphanes*	Divine dwarf	`O`opu			X						6
Gobiidae	*Gnatholepis anjerensis*	Eye bar goby				X						6
Gobiidae	*Kelloggella oligolepis*	Scaleless goby				X						6
Gobiidae	*Oxyurichthys lonchotus*	Pointed-tail goby	`O`opu-kai		Indigenous		X					11
Gobiidae	*Psilogobius mainlandi*	Hawaiian shrimp burrow goby			Endemic	X						6,32
Gobiidae	*Stenogobius hawaiiensis*	Goby	O`opu naniha		Indigenous	X	X*	X				6,15,16
Hemiramphidae		Half-beak	Ihe`ihe			X						6
Holocentridae	*Myripristis spp.*	Mempachi, soldierfish	`U`u			X	X					2,11,32
Holocentridae	*Myripristis berndti*	Bigscale soldierfish	`U`u		Indigenous	X						32
Holocentridae	*Myripristis kuntee*	Epaulette soldierfish	`U`u		Indigenous	X						32
Holocentridae	*Neoniphon sammara*	Spot-fin, Blood-spot squirrel fish				X						6,32
Holocentridae	*Sargocentron diadema*	Crown squirrelfish	`Ala`ihi			X						2
Holocentridae	*Sargocentron microstomus*	Small-mouth squirrelfish				X						6
Holocentridae	*Sargocentron punctatissimum*	Peppered Squirrelfish	`Ala`ihi			X						6,32
Holocentridae	*Sargocentron - spiniferum*	Saber Squirrelfish	`Ala`ihi			X						6
Holocentridae	*Sargocentron - xantherythrum*	Yellow-red squirrelfish			Indigenous	X						6,32
Kuhliidae	*Kuhlia sandvicensis*	Hawaiian flagtails	`Aholehole		Endemic	X		X				6,16
Kuhliidae	*Kuhlia taeniura*	Banded flag-tail	`Aholehole			X	X					8
Kyphosidae	*Kyphosus spp.*					X						32
Kyphosidae	*Kyphosus bigibbus*	Brown chub, rudderfish	Nenue			X						6,32,38
Kyphosidae	*Kyphosus cinerascens*	Highfin rudderfish	Nenue		Indigenous	X						32
Kyphosidae	*Kyphosus vaigiensis*	Lowfin chub, rudderfish	Nenue pala		Indigenous	X						32
Labridae	*Anampses chrysocephalus*	Psychedelic, red-tail wrasse	Opule		Endemic	X						6,32
Labridae	*Anampses cuvier*	Spotted wrasse, pearl wrasse	Opulepule lauli		Endemic		X					8,11,32
Labridae	*Bodianus bilunulatus*	Hawaiian hogfish	`A`awa		Indigenous	X						6,9,17,32
Labridae	*Cheilinus rhodochrous (Oxycheilinus unifasciatus)*	Ringtail wrasse	Po`ou			X						18

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Labridae	*Coris ballieui*	Lined coris	Mālamalama		Endemic	X						32
Labridae	*Cheilio inermis*	Cigar wrasse, mongoose wrasse	Kupoupou		Indigenous	X						6,32,38
Labridae	*Coris flavovittata*	Yellowstripe coris	Hihalea hilu		Endemic		X					11,32
Labridae	*Coris gaimard*	Yellowstripe coris	Hinalea akilolo		Indigenous	X						6,32
Labridae	*Coris venusta*	Elegant coris	Hīnālea		Endemic	X						32
Labridae	*Coris spp.*	Wrasse				X						6
Labridae	*Cymolutes lecluse*	Sharp-headed wrasse			Indigenous	X						32
Labridae	*Gomphosus varius*	Bird wrasse	Hinalea `i`iwi		Indigenous	X						6,12,17,32
Labridae	*Halicoeres ornatissimus*	Ornate wrasse	Ohua paawela		Indigenous	X						6,32
Labridae	*Hemipteronotus spp.*		Lae nihi			X	X					6,11
Labridae	*Labroides phthirophagus*	Hawaiian cleaner wrasse	Hinalea		Endemic	X	X					8,11,12,17,32
Labridae	*Macropharyngodon geoffrey*	Black wrasse			Indigenous	X						32
Labridae	*Novaculichthys taeniourus*	Rock mover wrasse	Lae nihi		Indigenous	X						6,32
Labridae	*Oxycheilinus bimaculatus*	Two-spot wrasse			Indigenous	X						32
Labridae	*Oxycheilinus unifasciatus*	Ringtail wrasse	po'ou		Indigenous	X						32
Labridae	*Pseudocheilinus octotaenia*	Eight-lined wrasse	Aleihi lakea		Indigenous	X	X					6,11,32
Labridae	*Stethojulis balteata*	Green or belted wrasse	`Omaka		Endemic	X	X					8,9,12,17,32
Labridae	*Thallasoma ballieui*	Blacktail wrasse	Hinalea luahine		Endemic	X	X					6,8,32
Labridae	*Thallasoma duperrey*	Saddle wrasse	Hinalea lauwili		Endemic	X	X					6,8,9,17,32, 38
Labridae	*Thallasoma fuscum*	Brown, brick wrasse	`Awela			X						6
Labridae	*Thallasoma purpureum*	Surge wrasse			Indigenous	X						32
Labridae	*Thallasoma lunare*	Moon wrasse				X						6
Labridae	*Thallasoma trilobatum*	Christmas wrasse	`Awela		Indigenous	X	X					6,8,32
Labridae	*Xyrichtys pavo*	Peacock razorwrasse	Laenihi			X	X					6,8,11,32
Lethrinidae	*Monotaxis grandoculis*	Bigeye emperor, Grand-eyed porgy	Mu		Indigenous	X						6,32
Lutjanidae	*Aphareus furca*	Small-tooth jobfish, Fork-tailed snapper	Wahanui		Indigenous	X	X					6,8,11
Lutjanidae	*Aprion virescens*	Green jobfish	Uku		Indigenous	X						6,32
Lutjanidae	*Lutjanus fulvus*	Blacktail snapper	Toau		Introduced	X						6,32,38
Lutjanidae	*Lutjanus kasmira*	Blue-line snapper	Ta`ape		Introduced	X						6,32
Malacanthidae	*Malacanthus brevirostrus*	flagtail filefish	maka`a		Indigenous	X						32
Microcanthidae	*Microcanthus strigatus*	Stripey				X	X					6,11,12
Microdesmidae	*Gunnelichthys curiosus*	Curious wormfish			Indigenous	X						32
Mobulidae	*Manta birostris*	Manta ray	Hahalua		Indigenous	X	X					6,11
Monocanthidae	*Aluterus monoceros*	Unicorn filefish, one-spined leatherjacket				X						6,12,17
Monocanthidae	*Aluterus scriptus*	Scrawled filefish	Oili lepa, loulu		Indigenous	X						6
Monocanthidae	*Cantherhines dumerilii*	Barred filefish	`O`ili		Indigenous	X						32

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Monocanthidae	*Cantherhines sandwichiens*	Squaretail filefish	`O`ili lepa		Indigenous	X						32
Monocanthidae	*Osbeckia scripta*	Blue-lined leather fish	Oilipa			X						6
Monocanthidae	*Pervagor spilosoma*	Fantail filefish	`O`ili `uwi`uwi		Indigenous	X						6,32
Muglidae	*Mugil cephalus*	Striped mullet	`Ama`ama		Indigenous	X						6,29,38
Muglidae	*Neomyxus chaptalli*	Mullet	Uouoa			X	X					6,11
Muglidae	*Neomyxus leucisus*	Sharp-nose, False mullet	Uouoa		Indigenous	X						2
Mulllidae	*Mulloidichthys flavolineatus*	Yellowstripe goatfish	Weke`a		Indigenous	X	X					5,6,8,32
Mulllidae	*Mulloidichthys vanicolensis*	Yellowfin goatfish	Weke ula		Indigenous		X					11,32,38
Mulllidae	*Parupeneus bifasciatus*	Doublebar goatfish	Munu			X	X				X	2,12,17,32
Mulllidae	*Parupeneus cyclostomas*	Gold saddle, blue goatfish	Moano kea		Indigenous	X	X					6,8,32
Mulllidae	*Parupeneus multifasciatus*	Manybar goat	Moano		Indigenous	X	X					6,11,32
Mulllidae	*Parupeneus pleurostigma*	Sidespot goatfish	Malu		Indigenous	X						9.12.17.32
Mulllidae	*Parupeneus porphyreus*	White saddle, red goat fish	Kumu		Endemic	X						6,32
Mulllidae	*Upeneus taeniopterus*	Band-tailed goat fish, nightmare weke	Weke pue`o				X					8,38
Muraenidae	*Echnida nebulosa*	Snowflake moray	Puhi kapa		Indigenous	X						6
Muraenidae	*Gymnomuraena zebra*	Zebra moray	Puhi		Indigenous	X						12,17
Muraenidae	*Gymnothorax flavimarginatus*	Yellow margin moray eel	Puhi paka		Indigenous	X						6,32
Muraenidae	*Gymnothorax javanicus*	Giant moray	Puhi		Indigenous	X						32,38
Muraenidae	*Gymnothorax meleagris*	Whitemouth moray, spotted eel	Puhi `oni`o		Indigenous	X	X					6,11,32
Muraenidae	*Gymnothorax petelli*	Yellow-headed moray	Puhi			X	X					6,11,12
Muraenidiae	*Gymnothorax rueppelliae*	Yellow head moray eel	Puhi`ou			X						32
Muraenidae	*Gymnothorax steindachneri*	Steindachner's moray	Puhi		Endemic	X						6
Muraenidae	*Gymnothorax undulatus*	Undulated, common moray	Puhi lau milo		Indigenous	X						6
Muraenidae	*Scuticaria tigrina*	Tiger moray	Puhi		Indigenous	X						6
Muraenidae		Moray eel				X						6
Myliobatidae	*Aetobatis narinari*	Spotted eagle ray	Hihimanu		Indigenous	X						6
Nomeidae	*Nomeus gronovii*	Man-o-war fish				X						6
Ophichthidae	*Ophichthus spp.*	Snake eel	Puhi			X	X					6,11,18
Opiphidae	*Brotula spp.*	Brotula, cusk eel	Pala hoana			X						6
Ostraciidae	*Lactoria fornasini*	Thornback, five-horned cow fish	Makukana		Indigenous	X						6
Ostraciidae	*Ostracion maleagris*	Speckled box fish, spotted trunkfish	Moa		Indigenous	X						6
Poeciliidae	*Gambusia affinis*	Mosquitofish			Introduced	X						6
Poeciliidae	*Mollienisia latipunctata*	Sailfin molly			Introduced	X						6
Poeciliidae	*Poecilia mexicana*	Top minnow, Short-fin Molly, Mexican Molly			Introduced	X	X					6,11,18
Poeciliidae	*Poecilia reticulata*	Guppy, rainbow fish, millions fish			Introduced	X		X				6,24

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Poeciliidae	*Poecilia sphenops*	Liberty molly			Introduced	X						6
Poeciliidae	*Poecilia vittata*	Cuban molly			Introduced		X					11
Poeciliidae	*Xiphophorus helleri*	Green swordtail						X				24
Polynemidae	*Polydactylus sexfilis*	Thread-fin	Moi		Indigenous		X					11,38
Pomacanthidae	*Centropyge potteri*	Potter's angel fish			Endemic	X						6,32
Pomacanthidae	*Desmoholacanthus*	Bandit angel fish			Endemic	X						6
Pomacentridae	*Abudefduf abdominalis*	Hawaiian sergeant, green damsel	Mamamo		Endemic	X	X					6,8,12,18,32, 38
Pomacentridae	*Abudefduf sordidus*	Blackspot sergeant, gray damsel	Kupipi		Indigenous	X	X					6,8,11,38
Pomacentridae	*Abudefduf vaigiensis*	Indo-Pacific sergeant	mamo		Indigenous	X						32
Pomacentridae	*Chromis agilis*	Agile chromis			Indigenous	X						32
Pomacentridae	*Chromis hanui*	Chocolate dip damselfish			Endemic							32
Pomacentridae	*Chromis leucura*	White-tail chromis				X	X					6,11
Pomacentridae	*Chromis ovalis*	Oval chromis			Endemic	X						6,32
Pomacentridae	*Chromis spp.*	Damselfish				X						6
Pomacentridae	*Chromis vanderbilti*	Blackfin chromis, vanderbilt's chromis			Indigenous	X						6,32
Pomacentridae	*Chromis verator*	Threespot chromis			Endemic	X						18,32
Pomacentridae	*Dascyllus albisella*	Hawaiian spotted damsel, domino damselfish, Hawaiian dascyllus	Alo`ilo`i		Endemic	X	X					6,8,11,32
Pomacentridae	*Plectroglyhidodon imparipennis*	Brighteye damsel			Indigenous	X	X					6,8,11,32
Pomacentridae	*Plectroglyhidodon johnstonianus*	Johnston damselfish			Indigenous	X	X					6,8,11,32
Pomacentridae	*Plectoglyhidodon sindonis*	Rock damselfish			Indigenous	X						32
Pomacentridae	*Stegastes fasciolatus*	Pacific gregory			Indigenous	X	X					6,8,32
Priacanthidae	*Heteropriacanthus cruentatus*	Glass-eye, Big-eye	`Aweoweo		Indigenous	X						6
Priacanthidae	*Priacanthus meeki*	Hawaiian bigeye	āweoweo		Indigenous	X						32
Scaridae	*Calotomus carolinus*	Stareye parrotfish	Ponuhunuhu		Indigenous	X						9,12,17,32
Scaridae	*Chlorurus perspicillatus*	Spectacled, large blue parrot fish	Uhu uliuli		Endemic	X						6,32
Scaridae	*Chlorurus sordidus*	Daisy, bullethead parrotfish	Uhu		Indigenous	X						2,6,9
Scaridae	*Scaridae spp.*	Parrotfish				X						6,38
Scaridae	*Scarus dubius*	Regal parrotfish	Lauia		Endemic	X						6,32
Scaridae	*Scarus formosus*	Formosan parrotfish				X						6
Scaridae	*Scarus forsteri (psittacus)*	Forster's parrotfish (palenose)	Uhu			X						6
Scaridae	*Scarus psittacus*	Palenosed parrotfish	Uhu		Indigenous	X						32
Scaridae	*Scarus rubroviolaceus*	Redlip parrotfish	Uhu palukaluka		Indigenous	X						32
Scaridae	*Scarus spp.*	Juvenile Scarus				X						6,8

Table C1-3: Species Inventory - Fish

Family	Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Fish												
Scombridae	*Acanthocybium solandri*	Wahoo	Ono			X						6
Scombridae	*Auxis thazard*	Frigate mackerel	Ke`o ke`o			X						6,12
Scombridae	*Euthynnus affinis*	Bonito	Kawakawa			X						12
Scombridae	*Katsuwonus pelamis*	Skipjack tuna	Aku			X						6
Scombridae	*Sarda orientalis*	Striped bonito										
Scombridae	*Thunnus albacares*	Yellow-fin tuna	Ahi		Indigenous	X						6
Scorpaenidae	*Dendrochirus barberi*	Hawaiian lionfish			Endemic	X						6,32
Scorpaenidae	*Pterois sphex*	Hawaiian turkeyfish	Nohu pinao		Endemic	X						6
Scorpaenidae	*Scorpaenodes parvipinnis*	Low fin scorpion fish				X						6
Scorpaenidae	*Scorpaenopsis cacopsis*	Titan scorpionfish, Jenkin's	Nohu		Endemic	X						6
Scorpaenidae	*Scorpaenopsis diabolus*	Devil scorpionfish	Nohu omakaha		Indigenous	X						6
Scorpaenidae	*Sebastapistes ballieui*	Spotfish scorpionfish			Endemic	X						32
Scorpaenidae	*Sebastapistes corniorta*	Speckled scorpion fish	Nohu		Indigenous	X						6,32
Scorpaenidae	*Taenianotus triacanthus*	Leaf scorpionfish	Nohu		Indigenous		X					11,32
Scorpaenidae		Scorpionfish				X						6,9,17
Serranidae	*Cephalopholis argus*	Peacock grouper	Roi		Introduced	X						6,32
Sphyaenidae	*Sphyraena barracuda*	Great barracuda	Kaku		Indigenous	X						6,32,35
Sphyaenidae	*Sphyraena helleri*	Heller's barracuda	Kawale`a		Indigenous	X						6,38
Sphyrnidae	*Sphyrna - lewini*	Hammerhead	Mano kihikihi		Indigenous	X						6,38
Syngnathidae	*Hippocampus kuda*	Sea horse			Indigenous	X						6
Syngnathidae		Pipe fish				X	X					6,8,11
Synodontidae	*Saurida gracilis*	Slender Lizardfish	`Ulae		Indigenous	X						6,32
Synodontidae	*Synodus variegatus*	Reef, variegated lizardfish	`Ulae									32
Tetradontidae	*Arothron hispidus*	Stripedbelly puffer	`O`opu hue		Indigenous		X					11,32
Tetradontidae	*Arothron meleagris*	White-spotted puffer	`O`opu hue		Indigenous	X	X					6,8,32
Tetradontidae	*Canthigaster amboinensis*	Spider-eye puffer, ambon toby	Puu olai		Indigenous		X					11,32,38
Tetradontidae	*Canthigaster coronata*	Crowned toby	Puu olai		Indigenous	X						6,32
Tetradontidae	*Canthigaster janthinopterus (jactator)*	White-spotted puffer				X	X					6,11,32
Tetradontidae	*Canthigaster rivulata*	maze puffer				X						32
Tripterygiidae	*Enneapterygius atriceps*	Hawaiian three-finned blenny, black-head blenny			Endemic	X						6,9,12,17
Zanclidae	*Zanclus cornutus*	Moorish idol	Kihikihi		Indigenous	X	X					6,8,11,32

X* = Recorded upstream of MCTAB in Smith, G. 1998. Biological Assessment and Habitat Characterization of Waimanalo Stream: Establishing Environmental Goals and a TMDL for Watershed Management. 36pp. Since these species are amphidromous (spend portions of their life cycle at sea) they must pass through MCTAB portions of Waimanalo Stream in order to be found in the upper regions where they were recorded. Thus, while they have not been recorded at MCTAB, they are included in this list.

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Annelida	Polychaetes	*Capitella sp.*				X						2
Annelida	Polychaetes	*Eulalia sanguinea*			Introduced	X						22
Annelida	Polychaetes	*Hydroides elegans*			Introduced	X						22
Annelida	Polychaetes	*Myzobdella sp.?*	Fish leech					X				24
Annelida	Polychaetes	*Polydora sp.*	Polychaetes			X						2
Annelida	Hawaiian Short-eared owl	*Pomatoleios kraussii*			Introduced	Oahu						22
Annelida	Segmented worms	*Errantia spp.*				X						5
Annelida	Segmented worms	*Sabellastarte sanctijosephi*	Feather duster worm		Indo-Pacific	X						2,5,29,30, 32
Annelida	Segmented worms	*Sabellastarte spectabilis*	Feather duster worm		Introduced	X						22,30
Annelida	Segmented worms	*Salmacina dysteri*	Sea frost worm		Introduced	X						22
Annelida	Segmented worms	*Sedentaria spp.*				X						5
Annelida	Segmented worms	*Spirobranchus giganteus*	Christmas tree worm			X						32
Annelida		*Naineris laevigata*	Grube			X						2
Arthropoda	Amphipod	*Corophium insidiosum*			Introduced	X						2
Arthropoda	Amphipod	*Elasmopus rapax*			Introduced	X						22
Arthropoda	Amphipod	*Leucothoe micronesiae*			Introduced	X						22
Arthropoda	Amphipod	*Paraleucothoe flindersi*			Introduced	X						22
Arthropoda	Amphipod	*Stenothoe gallensis*			Introduced	X						22
Arthropoda	Barnacles	*Balanus amphitrite*	Amphitrite's rock barnacle		Introduced	X						2,5
Arthropoda	Barnacles	*Balanus eburneus*	Ivory barnacle		Introduced	X						5
Arthropoda	Barnacles	*Balanus sp.*	Barnacle			X						5
Arthropoda	Barnacles	*Balanus trigonus*	Trigonate barnacle		Indo-Pacific	X						5
Arthropoda	Barnacles	*Chthamalus proteus*	Caribbean barnacle		Introduced	X						22
Arthropoda	Box crabs	*Calappa bicornis*	Horned box crab			X						5
Arthropoda	Box crabs	*Calappa calappa*	Large box crab	Pokipoki	Indo-Pacific	X						5
Arthropoda	Box crabs	*Calappa hepatica*	Common box crab, Hepatic box crab	Pokipoki	Indo-Pacific	X						5
Arthropoda	Coral shrimp	*Stenopus hispidus*	Banded coral shrimp			X						5
Arthropoda	Crabs	*Metopograpsus thukuhar*	Common mangrove graspid		Indigenous	X						2,17
Arthropoda	Crabs	*Pilumnus oahuensis*			Introduced	X						22
Arthropoda	Crabs	*Scylla serrata*	Samoan crab		Samoa (1920s)	X	X					9,11
	Crabs	*Thalamita sp.*	Swimming crab		Indigenous	X						2,5,17
Arthropoda	Crabs	*Thalamita crenata*	Blue pincher crab		Indo-Pacific	X						9
Arthropoda	Crabs	*Thalamita edwardsi*	Edward's swimming crab		Indigenous	X						2,9
Arthropoda	Crabs	*Thalamita integra*			Indigenous	X						2,9
Arthropoda	Crabs	*Xanthid sp.*				X						9
Arthropoda	Crangonidae	*Carangonidae spp.*				X						5
Arthropoda	Crustacea, Isopoda	*Ligia sp.*	Isopod			X						2,17
Arthropoda	Crustacea, Amphipoda	*Talorchestia sp.*	Sand flea			X						17

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Arthropoda	Diploposa	*Spirobolellus spp.*	Millipede			X						26
Arthropoda	Frog crabs	*Ranina ranina*	Kona crab	Papa`i kua loa		X						5
Arthropoda	Ghost crabs	*Ocypode ceratophthalma*	Horned-eyed ghost crab	Ohiki		X						5
Arthropoda	Hermit crabs	*Paguridae spp.*				X						5
Arthropoda	Hippolytidae	*Hippolysmata kukenthali*	Leech?			X						5
Arthropoda	Hippolytidae	*Saron marmoratus*	Marbled shrimp		Indo-Pacific	X						5
Arthropoda	Land barnacles	*Koloa maoli*										5,17
Arthropoda	Leaf-jawed prawns	*Gnathophylum fasciolatum (G. americanum)*	Bumblebee shrimp			X						5
Arthropoda	Leaf-jawed prawns	*Hymenocera picta*	Harlequin shrimp		Indo/Eastern-Pacific	X						5
Arthropoda	Limu spider crabs	*Simocarcinus simplex*	Simple collector crab	Kumulipoa, papa`i lim	Indo-Pacific	X						5
Arthropoda	Malacostrata	*Amphipod spp.*	Amphipods			X						5
Arthropoda	Malacostrata	*Caprellid spp.*	Skeleton shrimp			X						5
Arthropoda	Malacostrata	*Isopod spp.*	Isopods			X						5
Arthropoda	Malacostrata	*Mysid spp.*	Mysids									5
Arthropoda	Malacostraca	*Porcellionides pruinosus*	Pill bug			X						26
Arthropoda	Malacostrata	*Tanaid spp.*				X						5
Arthropoda	Mantis shrimp	*Gonodactylaceus falcatus*	Common mantis shrimp		Introduced							5,22
Arthropoda	Mantis shrimp	*Gonodactylaceus sp.*	Mantis shrimp									32
Arthropoda	Mantis shrimp	*Squillidae spp.*				X						5
Arthropoda	Mole crabs	*Emirita pacifica*	Sand turtle			X						5
Arthropoda	Palaemonidae	*Palaemonidae spp.*				X						5
Arthropoda	Parthenope crabs	*Lambrus longispinus*	Long-spined parthenope			X						5
Arthropoda	Parthenope crabs	*Parthenope horrida*	Horrid parthenope crab			X						5
Arthropoda	Pebble crabs	*Carpilius maculatus*	Seven-eleven crab, Spotted pebble crab	`Alakuma	Indo-Pacific	X						5
Arthropoda	Pebble crabs	*Xanthidae spp.*				X						5
Arthropoda	Porcelain crabs	*Petrolisthes coccineus*	Red porcelain crab	Kumimi maka`o		X						5
Arthropoda	Processidae	*Processa processa*				X						5
Arthropoda	Crabs	*Lophozozymus intonsus*	Bearded crab	kūmimi		X						32
Arthropoda	Crabs	*Trapezia digitalis*	Brown guard crab			X						32
Arthropoda	Crabs	*Trapezia ferruginea*	Rusty guard crab		Indigenous	X						32
Arthropoda	Crabs	*Trapezia flavopunctata*	Yellow-spotted guard crab		Indo-Pacific	X						32
Arthropoda	Crabs	*Trapezia intermedia*	Common guard crab			X						32
Arthropoda	Crabs	*Trapezia tigrina*	Red spotted guard crab			X						32
Arthropoda	Rock crabs	*Grapsid spp.*				X						5
Arthropoda	Rock crabs	*Grapsus grapsus tenuicrustatus*	`A`ama	`A`ama		X						5,29
Arthropoda	Rock crabs	*Percnon planissimum*	Flat rock crab	Papa		X						5

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Arthropoda	Rock crabs	*Percnon sp.*				X						32
Arthropoda	Rock crabs	*Plagusia depressa*	Tuburculate rock crab, Scaly rock crab			X						5
Arthropoda	Shrimps	*Alpheus crassimanus*	Pistol shrimp			X						9
Arthropoda	Shrimps	*Alpheus sp.*	Shrimp			X						32
Arthropoda	Shrimps	*Andamanensis palaemonella*	Shrimp			X						17
Arthropoda	Shrimps	*Atyoida bisulcata*	Mountain shrimp	O`pae kala`ole	Endemic		X	X				11,16
Arthropoda	Shrimps	*Macrobrachium grandimanus*	O'pae oeha'a	O'pae oeha'a	Endemic		X*	X				15,16
Arthropoda	Shrimps	*Macrobrachium lar*	Pacific prawn					X				24
Arthropoda	Shrimps	*Palaemon debilis*	Feeble shrimp	`Opae huna	Indo-Pacific	X						2,9,17
Arthropoda	Shrimps	*Palaemon pacificus*	Tiger shrimp		Indo-Pacific	X						2
Arthropoda	Shrimps	*Stenopus hispidus*	Coral banded shrimp			X						32
Arthropoda	Slipper lobsters	*Parribacus antarcticus*	Sculpted slipper lobster	Ula-papapa		X						5
Arthropoda	Slipper lobsters	*Scyllarides squammosus*	Scaly slipper lobster	Ula-papapa		X						5
Arthropoda	Snapping shrimp	*Alpheus heeia*				X						5
Arthropoda	Snapping shrimp	*Alpheus lobidens polynesica*										5
Arthropoda	Snapping shrimp	*Alpheus mackayi*				X						5
Arthropoda	Snapping shrimp	*Alpheus pacificus*				X						5
Arthropoda	Snapping shrimp	*Alpheus rapax*	Snapping shrimp		Indo-Pacific	X						5
Arthropoda	Snapping shrimp	*Alpheus spp.*				X						5,32
Arthropoda	Snapping shrimp	*Synalpheus spp.*				X						5
Arthropoda	Spider crabs	*Pynogonid spp.*	Spider crab			X						5
Arthropoda	Spiny lobsters	*Panulirus japonicus*	Japanese spiny lobster	Ula		X						5
Arthropoda	Spiny lobsters	*Panulirus marginatus*	Spiny lobster	Ula		X						5
Arthropoda	Swimming crabs	*Charybdis hawaiiensis*	Hawaiian swimming crab			X						5,32
Arthropoda	Swimming crabs	*Podopthalmus vigil*	Long-eyed swimming crab	Mo`ala		X						5
Arthropoda	Swimming crabs	*Portunus sanguinolentus*	Haole crab, White crab	Kuhonu	Indo-Pacific	X						5,9
Arthropoda	Swimming crabs	*Thalamita admete*				X						2,5
Arthropoda	Swimming crabs	*Thalamita crenata*	Crenate swimming crab			X						2,5
Arthropoda	True lobsters	*Enoplometopus occidentalis*	Red reef lobster, Western lobster		Indo-Pacific	X						5
Chordata	Sea squirts/ Tunicates	*Ascidea interrupta*				X						5
Chordata	Sea squirts/ Tunicates	*Ascidea sp.*				X						5,32
Chordata	Sea squirts/ Tunicates	*Ascidea sp.*			Introduced	X						22
Chordata	Sea squirts/ Tunicates	*Ascidea sydneiensis*	Yellow-green sea squirt		Introduced?*	X						5
Chordata	Sea squirts/ Tunicates	*Botryllidae spp.*				X						5
Chordata	Sea squirts/ Tunicates	*Didemnidae spp.*				X						5
Chordata	Sea squirts/ Tunicates	*Didemnum perlucidum*	Didemnid tunicate		Introduced	X						22
Chordata	Sea squirts/ Tunicates	*Diplosoma listerianum*	Didemnid tunicate		Introduced	X						22
Chordata	Sea squirts/ Tunicates	*Didemnum spp.*	Orange colonial tunicate			X						32
Chordata	Sea squirts/ Tunicates	*Didemnum spp.*	White colonial tunicate			X						32

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Chordata	Sea squirts/ Tunicates	*Polycarpa spp.*	Golden sea squirt			X						32
Chordata	Sea squirts/ Tunicates	*Herdmania pallida*	Sea-squirt		Introduced	X						22
Chordata	Sea squirts/ Tunicates	*Microcosmus exasperatus*	Sea-squirt		Introduced	X						22
Chordata	Sea squirts/ Tunicates	*Phallusia nigra*	Ascidian		Introduced	X						22,32
Chordata	Sea squirts/ Tunicates	*Polyandrocarpa sagamiensis*	Tunicate		Introduced	X						22
Chordata	Sea squirts/ Tunicates	*Polyclinum constellatum*	Tunicate		Introduced	X						5,22
Cnidaria	Colonial anemones	*Zoanthus pacificus*		Limu-make-o-hana		X						5
Cnidaria	Colonial corals	*Anthelia edmondsoni*	Blue octocoral		Endemic		X					8,32
Cnidaria	Hydrozoa	*Pennaria tiarella*	Christmas tree hydroid		Introduced	X						5
Cnidaria	Hydrozoa	*Obelia dichotoma*			Introduced	X						22
Cnidaria	Hydrozoa	*Pennaria disticha*			Introduced	X						22
Cnidaria	Jellyfish	*Charybdea spp.*	Box jellyfish	Pololia		X	X					5,11
Cnidaria	Jellyfish	*Phyllorhiza punctata*	White spotted jellyfish		Introduced	X						5
Cnidaria	Jellyfish	*Thysanostoma flagellatum*	Pelagic jellyfish			X						5
Cnidaria	Jellyfishes	*Cassiopea medusa*	Upside-down jelly			X						9
Cnidaria	Sea anemone	*Aiptasia pulchella*	Common brown anenome			X						5
Cnidaria	Siphonophore	*Physalia physalis*	Portuguese man-o-war	Pa`imalau		X	X					5,11
Cnidaria	Soft corals	*Carijoa riisei*	Snowflake coral		Introduced	X						22
Cnidaria	Soft corals	*Isaurus elongatus*				X						5
Cnidaria	Soft corals	*Palythoa spp.*				X						5
Cnidaria	Soft corals	*Sinularia densa*	Dense leather coral		Indigenous	X						39
Cnidaria	Stony corals	*Cycloseris sp.*				X						5
Cnidaria	Stony corals	*Cyphastrea ocellina*	Ocellated coral			X						5,32
Cnidaria	Stony corals	*Fungia scuteria*	Mushroom coral	`Ako`ako`a kohe		X						5
Cnidaria	Stony corals	*Lepastrea sp.*				X						5
Cnidaria	Stony corals	*Leptastrea purpurea*	Crust coral		Indo-Pacific	X	X					8,18,32
Cnidaria	Stony corals	*Leptoseris sp.*				X						5
Cnidaria	Stony corals	*Montipora capitata*	Rice coral		Endemic	X	X					5,8,18,27, 29,30,32,3 9
Cnidaria	Stony corals	*Montipora dilitata*	Hawaiian coral		Endemic	X						5
Cnidaria	Stony corals	*Montipora flabellata*	Blue rice coral		Endemic*	X	X					5,8,32,39
Cnidaria	Stony corals	*Montipora patula*	Spreading coral		Endemic*	X	X					8,18,27,32
Cnidaria	Stony corals	*Monitpora studeri*	Branching rice coral			X						32
Cnidaria	Stony corals	*Palythoa cesia*	Zooanthid coral, rubber coral			X						32
Cnidaria	Stony corals	*Pavona duerdeni*	Duerden's coral		Endemic*	X						5,18,32
Cnidaria	Stony corals	*Pavona varians*	Corrugated coral			X						5,32
Cnidaria	Stony corals	*Pocillopora damicornis*	Lace coral		Indo/East-Pacific	X	X					5,8,18,30, 32
Cnidaria	Stony corals	*Pocillopora eydouxi*	Antler coral		Indo-Pacific	X	X					5,8,32

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Cnidaria	Stony corals	*Pocillopora ligulata*				X						5,32
Cnidaria	Stony corals	*Pocillopora meandrina*	Cauliflower coral		Western Pacific, East Indian Ocean	X	X					5,8,18,32,39
Cnidaria	Stony corals	*Porites brighami*	Brigham's coral			X	X					5,8,32
Cnidaria	Stony corals	*Porites compressa*	Finger coral	Pohaku puna	Endemic*	X	X					5,8,18,27,29,30,32
Cnidaria	Stony corals	*Porites duerdeni*	Thick hawaiian finger coral			X						5
Cnidaria	Stony corals	*Porites evermanni*	Evermann's coral	Pohaku puna	Endemic?*	X						5,32,39
Cnidaria	Stony corals	*Porites lobata*	Lobe coral	Pohaku puna	Indo-Pacific	X	X					8,18,27,32,39
Cnidaria	Stony corals	*Psammocora stellata*				X						5,32
Cnidaria	Stony corals	*Psammocora verrilli*	Hawaiian petaloid coral			X						5
Cnidaria	Zoanthid (Colonial Anemones)	*Palythoa caesia*	Blue-gray zoanthid		Indo-Pacific	X	X					5,8,32
Cnidaria	Zoanthid (Colonial Anemones)	*Zooanthus spp.*	Zoanthids			X						27,32
Echinodermata	Brittle stars	*Ophiuroidea*	Unidentified brittle star			X						32
Echinodermata	Sea cucumbers	*Actinopyga mauritiana*	White-spotted sea cucumber			X						5,32,39
Echinodermata	Sea cucumbers	*Chiridota rigda*				X						5
Echinodermata	Sea cucumbers	*Holothuria atra*	Black sea cucumber	Loli okuhi kuhi		X	X					5,8,18,32,39
Echinodermata	Sea cucumbers	*Holothuria cinerascens*	Ashy sea cucumber	Loli pua		X						5
Echinodermata	Sea cucumbers	*Holothuria edulis*	Edible sea cucumber	Loli	Indo-Pacific	X						5
Echinodermata	Sea cucumbers	*Holothuria fuscorubra*				X						5
Echinodermata	Sea cucumbers	*Holothuria monocaria*				X						5
Echinodermata	Sea cucumbers	*Holothuria pardalis*	Leopard sea cucumber			X						32
Echinodermata	Sea cucumbers	*Holothuria pervicax*	Stubborn sea cucumber	Loli ka`e	Indo-Pacific	X						5,32
Echinodermata	Sea cucumbers	*Holothuria whitmaei*	Teated sea cucumber	Loli	Indo-Pacific	X						8,18,32
Echinodermata	Sea cucumbers	*Opheodesoma spectabilis*	Conspicuous sea cucumber	Weli	Indo-Pacific	X						5,32
Echinodermata	Sea cucumbers	*Stichopus chloronotus*	Sea cucumber			X						5,38
Echinodermata	Sea cucumbers	*Stichopus horrens*	Warty sea cucumber	`Unae		X						5
Echinodermata	Sea urchins	*Colobocentrotus atratus*	Rock urchin	Ha`uke`uke		X						5
Echinodermata	Sea urchins	*Diadema paucispinum*	Long-spined urchin	Wana halula			X					8
Echinodermata	Sea urchins	*Echinometra mathaei*	Rock-boring urchin, White short-spine urchin	`Ina kea		X	X					5,8,30,32
Echinodermata	Sea urchins	*Echinometra oblongata*	Oblong urchin, Black short-spine urchin	`Ina		X						5,32
Echinodermata	Sea urchins	*Echinothrix calamaris*	Banded urchin	Wana		X	X					8,32,39
Echinodermata	Sea urchins	*Echinothrix diadema*	Long-spine urchin	Wana		X						5,18,32,39
Echinodermata	Sea urchins	*Echinometra mathaei*	Rock-boring urchin	`Ina kea		X	X					8,11,18,32,39

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Echinodermata	Sea urchins	*Echinostrephus aciculatus*	Needle-spined urchin			X	X					8,18,32,39
Echinodermata	Sea urchins	*Eucidaris metularia*	Ten-lined urchin			X						32
Echinodermata	Sea urchins	*Heterocentrotus spp.*	Pencil urchin	Ha`uke`uke`ula`ula		X	X					5,8
Echinodermata	Sea urchins	*Heterocentrotus mammillatus*	Pencil urchin	Ha`uke`uke`ula`ula			X					8,32,39
Echinodermata	Sea urchins	*Metalia spatagus*	Sea beaver			X						5
Echinodermata	Sea urchins	*Tripneustes gratilla*	Collector urchin	Hawa `e maoli		X	X					5,8,18,32, 39
Echinodermata	Starfishes	*Acanthaster planci*	Crown of thorns starfish			X						32
Echinodermata	Starfishes	*Culcita novaeguineae*	Cushion sea star			X						32
Echinodermata	Starfishes	*Gnathophiuroida spp.*				X						5
Echinodermata	Starfishes	*Linckia diplax*					X					8
Echinodermata	Starfishes	*Linckia multiflora*	Spotted linckia	Hoku kai			X					8,32
Echinodermata	Starfishes	*Ophiactis savignyi*	Brittle star			X						5
Echinodermata	Starfishes	*Ophiocoma sp.*				X						5
Echiura	Proboscis worms	*Echiura spp.*				X						5
Ectoprocta	Bryzoan	*Amathia distans*	White bushy bryozoan		Introduced	X						22
Ectoprocta	Bryzoan	*Bugula neritina*			Introduced	X						22
Ectoprocta	Bryzoan	*Bugula robusta*			Introduced	X						22
Ectoprocta	Bryzoan	*Schizoporella errata*	Erratic bryozoan		Introduced	X						5,22
Ectoprocta	Bryzoan	*Watersipora edmondsoni*			Introduced	X						22
Mollusca	Atyids	*Atys spp.*				X						5
Mollusca	Atyids	*Haminoea spp.*				X						5
Mollusca	Bivlalves: Ark shells	*Arca ventricosa*	Ark shell			X						32
Mollusca	Bivalves: Ark shells	*Arcidae spp.*				X						5
Mollusca	Bivalves: Glycymeridids	*Glycymeris spp.*				X						5
Mollusca	Bivalves: Mussels	*Lithophaga sp.*	Boring mussel			X						32
Mollusca	Bivalves: Mussels	*Modiolus matris*				X						32
Mollusca	Bivalves: Mussels	*Mytilidae spp.*				X						5
Mollusca	Bivalves: Oysters	*Crassostrea gigas*	Japanese oyster		Japan (1926)	X						5,17
Mollusca	Bivalves: Oysters	*Ostrea hanleyana*				X						5
Mollusca	Bivalves: Oysters	*Ostrea sandvicensis*	Hawaiian oyster		Endemic	X						5,32
Mollusca	Bivalves: Oysters	*Pinctada margaritifera*	Black-lipped pearl oyster		Indo-Pacific	X						32,39
Mollusca	Bivalves: Oysters	*Pinctada radiata*	Pearl Harbor oyster			X						32
Mollusca	Bivalves: Pen shells	*Pinna muricata*	Prickly pen shell			X						5
Mollusca	Bivalves: Pen shells	*Streptopinna saccata*	Baggy pen shell			X						32
Mollusca	Bivalves: Rock oysters	*Chama isostoma*	Jewel oysters		Indo-Pacific	X						5,32
Mollusca	Bivalves: Saddle oysters	*Anomia nobilis*	Saddle oysters			X						5
Mollusca	Bivalves: Scallops	*Pectinidae spp.*	Scallops			X						5
Mollusca	Bivalves: Thorny oysters	*Spondylus spp.*	Thorny oysters			X						5
Mollusca	Bivalves: Toothed pearl shells	*Isognomon spp.*	Toothed pearl shells			X						5,32

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Mollusca	Boring clams	*Gastrochaena spp.*				X						5
Mollusca	Bubble shells	*Bulla vernicosa*	Bubble shell, sea slug			X						5
Mollusca	Buccinids	*Buccinidae spp.*				X						5
Mollusca	Bullinids	*Bullinidae spp.*				X						5
Mollusca	Calytraeids	*Crepidula aculeata*	Slipper limpets		Introduced	X						5,22
Mollusca	Calytraeids	*Crucibulum spinosum*	Spiny cup-and-saucer shell		Introduced, origin unreported	X						5
Mollusca	Cerithids	*Bittium nesioticum*				X						5
Mollusca	Cerithids	*Bittium spp.*				X						5
Mollusca	Cerithids	*Bittium zebrum (synonym of Cerithium zebrum)*	Zebra horn			X						5
Mollusca	Cerithids	*Cerithium spp.*				X						5,32
Mollusca	Cerithids	*Rhinoclavis sinensis*				X						32
Mollusca	Cerithids	*Rhinoclavis sp.*				X						32
Mollusca	Chitons	*Ischnochiton petaloides*	Flat chiton			X						5
Mollusca	Chitons	*Rhyssoplax linsleyi*	Hawaiian chiton			X						5
Mollusca	Clams	*Ctena bella*				X						5
Mollusca	Clams	*Lucinidae spp.*				X						5
Mollusca	Cockles	*Cardiidae spp.*				X						5
Mollusca	Cockles	*Trachycardium orbita*	Rounded cockle	Pupu kupa		X						5
Mollusca	Colubrarids	*Colubraridae spp.*				X						5
Mollusca	Columbellids	*Columbellidae spp.*				X						5
Mollusca	Cones	*Conus abbreviatus*	Abbreviated cone			X						5,32
Mollusca	Cones	*Conus chaldaeus*				X						5
Mollusca	Cones	*Conus distans*				X						32,39
Mollusca	Cones	*Conus ebraeus*	Hebrew cone		Indo-Pacific	X						5,32,39
Mollusca	Cones	*Conus flavidus*	Yellow pacific cone		Indo-Pacific	X						32
Mollusca	Cones	*Conus leopardus*	Leopard cone, Thousand spotted cone			X						5,32
Mollusca	Cones	*Conus lividus*	Spiteful cone		Indo-Pacific	X						32
Mollusca	Cones	*Conus marmoreus*	Cone shell			X						32
Mollusca	Cones	*Conus miles*	Soldier cone		Indo-Pacific	X						32
Mollusca	Cones	*Conus moreleti*				X						32
Mollusca	Cones	*Conus nussatella*	Nussatella cone			X						5
Mollusca	Cones	*Conus pennaceus*	Penniform cone		Indo-Pacific	X						5,32
Mollusca	Cones	*Conus pulicarius*	Flea cone		Indo-Pacific	X						5
Mollusca	Cones	*Conus spp.*				X						5
Mollusca	Cones	*Conus striatus*	Striated cone		Indo-Pacific	X						5
Mollusca	Coralliophilids	*Coralliophidae spp.*				X						5
Mollusca	Costellarids	*Costellarid spp.*				X						5

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
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Marine Invertebrates												
Mollusca	Cowries	*Cypraea caputserpentis*	Snakehead cowrey	leho kupa		X						5,32
Mollusca	Cowries	*Cypraea helvola*	Honey cowrey	leho `ōpule		X						32
Mollusca	Cowries	*Cypraea isabella*	Isabella's cowrey	pūleho, leho kūpe`e li	Indo Pacific	X						32
Mollusca	Cowries	*Cypraea maculifera*	Reticulated cowrey	leho kōlea		X						5
Mollusca	Cowries	*Cypraea mauritiana*	Humpback cowrey	leho ahi, leho pa`a		X						5
Mollusca	Cowries	*Cypraea moneta*	Money cowrey			X						5
Mollusca	Cowries	*Cypraea talpa*	Mole cowrey			X						32
Mollusca	Cowries	*Cypraen tigris*	Tiger cowrey			X						5,25,32,39
Mollusca	Eulimids	*Eulimidae spp.*				X						5
Mollusca	Frog shells	*Bursidae spp.*				X						5
Mollusca	Heart clams	*Carditodae spp.*				X						5
Mollusca	Helmet shells	*Cassididae spp.*				X						5
Mollusca	Hipponicids	*Hipponicidae spp.*				X						5
Mollusca	Hipponicids	*Hipponix pilosus*				X						5
Mollusca	Jellyfishes	*Aurelia aurita*	Moon jelly	Pololia			X					11
Mollusca	Lasaeids	*Lasaeidae spp.*				X						5
Mollusca	Limpets	*Cellana exarata*	Black-foot opihi	`Opihi makaiauli	Endemic	X						5
Mollusca	Limpets	*Cellana sandwicensis*	Yellowfoot `opihi	`Opihi alinalina	Endemic	X						5
Mollusca	Littorines	*Littorina pintado*	Dotted periwinkle	Pipipi kolea		X						5
Mollusca	Littorines	*Littorina scabra*	Snail				X					11
Mollusca	Littorines	*Littorina spp.*				X						5,29
Mollusca	Littorines	*Peasiella tantilla*				X						5
Mollusca	Marginellids	*Marginellidae spp.*				X						5
Mollusca	Miter shells	*Mitra coffea*	Coffee miter			X						5
Mollusca	Miter shells	*Mitra mitra*	Episcopal miter		Indo-Pacific	X						5
Mollusca	Miter shells	*Mitra papalis*	Papal miter		Indo-Pacific	X						5
Mollusca	Miter shells	*Mitra pele*				X						5
Mollusca	Miter shells	*Mitra stictica*	Punctured miter			X						32
Mollusca	Miter shells	*Mitra spp.*				X						5
Mollusca	Muricids	*Muricid spp.*				X						5
Mollusca	Nassarids	*Nassarius spp.*				X						5
Mollusca	Naticids	*Naticidae spp.*				X						5
Mollusca	Nerites	*Nerita picea*	Black nerite	Pipipi		X						5,27,29
Mollusca	Nerites	*Nerita polita*	Polished nerite	Kupe`e		X						5
Mollusca	Nerites	*Nerita spp.*				X						5
Mollusca	Nerites	*Theodoxus neglectus*			Endemic	X						2,5
Mollusca	Nudibranchs	*Chromodoris spp.*				X						5
Mollusca	Nudibranchs	*Hexabranchus aureomarginatus*				X						5
Mollusca	Nudibranchs	*Hexabranchus sanguineus*	Spanish dancer		Indo-Pacific	X						5
Mollusca	Nudibranchs	*Hypselodoris spp.*				X						5

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Mollusca	Nudibranchs	*Melibe pilosa*	Throw-net nudibranch		Indo-Pacific	X						5
Mollusca	Nudibranchs	*Pteraeolidia ianthina*	Blue dragon nudibranch		Indo-Pacific	X						32
Mollusca	Nudibranchs	*Phestilla siboogae*				X						5
Mollusca	Nudibranchs	*Phyllidiella pustulosa*	Pink spotted phyllidia		Indo-Pacific	X						32
Mollusca	Nudibranchs	*Phyllidia varicosa*	Varicose phyllidia		Indo-Pacific	X						5
Mollusca	Nudibranchs	*Risbecia imperialis*	Imperial nudibranch			X						32
Mollusca	Nudibranchs	*Trippa spp.*				X						5
Mollusca	Octopi	*Octopus spp.*				X						32
Mollusca	Octopi	*Octopus cyanea*	Day octopus	He`e mauli		X						5,32,39
Mollusca	Octopi	*Octopus ornatus*	Night octopus	He`e puloa		X						5
Mollusca	Olive shells	*Olividae spp.*				X						5
Mollusca	Periwinkles	*Fasciolaridae spp.*				X						5
Mollusca	Pheasant shells	*Tricolia variabilis*				X						5
Mollusca	Plakobranchids	*Elysia spp.*				X						5
Mollusca	Plakobranchs	*Plakobranchus ocellatus*	Ringed sap-sucking slug		Indo-Pacific	X						5
Mollusca	Pyramidellids	*Pyramidellidae spp.*				X						5
Mollusca	Rissoids	*Rissoidae spp.*				X						5
Mollusca	Sea hares	*Aplysia dactylomela*	White speckled sea hare	Kualakai		X						5
Mollusca	Sea hares	*Aplysia parvula*	Small sea hare	Kualakai		X						5
Mollusca	Sea hares	*Dolabella auricularia*	Eared sea hare	Kualakai		X						5
Mollusca	Sea hares	*Dolabrifera dolobrifera*	Common sea hare	Kualakai		X						5
Mollusca	Sea hares	*Stylocheilus longicauda*	Lined sea hare			X						5
Mollusca	Sea slugs	*Aglajidae spp.*				X						5
Mollusca	Sea slugs	*Chelidonura hirundina*	Blue swallowtail slug			X						5,32
Mollusca	Shipworms	*Teredinidae spp.*				X						5
Mollusca	Shipworms	*Teredo clappi*				X						5
Mollusca	Smooth cockles	*Ervilia sp.*				X						5
Mollusca	Snails	*Vexilla vexillum*	Snail (found feeding on sea urchins)			X						32
Mollusca	Spiny chitons	*Acanthochiton spp.*				X						5
Mollusca	Strombids	*Strombus dentatus*				X						32
Mollusca	Strombids	*Strombus maculatus*	Spotted stromb	Pupu mamaiki		X						5,32
Mollusca	Tellen shells	*Macoma spp.*				X						5
Mollusca	Tellen shells	*Tellina spp.*				X						5
Mollusca	Terebra shells	*Terebra crenulata*				X						5

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Mollusca	Terebra shells	*Terebridae spp.*				X						5
Mollusca	Thaidids	*Drupa morum*	Mulberry drupe	Makaloa		X						5,32
Mollusca	Thaidids	*Drupa ricina*	Spotted drupe	Makaloa		X						5,32
Mollusca	Thaidids	*Drupa rubusidaeus*	Brilliant drupe	makaloa		X						32
Mollusca	Thaidids	*Drupa spp.*				X						5
Mollusca	Thaidids	*Drupella elata*				X						32
Mollusca	Thaidids	*Morula granulata*	Granular drupe	Maka`awa	Indo-Pacific	X						5
Mollusca	Thaidids	*Morula spp.*				X						5
Mollusca	Thaidids	*Morula uva*	Grape morula		Indo-Pacific	X						5,32
Mollusca	Thaidids	*Thais intermedia*				X						5
Mollusca	Top shells	*Euchelus gemmatus*	Spire top shell			X						5
Mollusca	Top shells	*Trochidae spp.*				X						5
Mollusca	Top shells	*Trochus intextus*	Woven top	Ha`upu	Pacific	X						5,32
Mollusca	Trapeziids	*Trapexium oblongatum*				X						5
Mollusca	Triphorids	*Triphorid sp.*				X						5
Mollusca	Triton shells	*Charonia tritonis*	Triton's trumpet	Pu, `ole		X						5,32
Mollusca	Triton shells	*Cymatium nicobaricum*	Goldmouth triton, Nicobar triton		Indo-Pacific	X						32
Mollusca	Triton shells	*Cymatidae spp.*				X						5
Mollusca	Tun shells	*Tonna perdix*	Partridge tun	Pu`oni`oni`o	Indo-Pacific	X						5
Mollusca	Turbin shells	*Leptothyra candida*				X						5
Mollusca	Turbin shells	*Leptothyra verruca*	Wart turbans			X						5
Mollusca	Turbin shells	*Turbo sandvicensis*	Hawaiian turban	`Alilea pupu mahina	Endemic	X						5,32
Mollusca	Turrids	*Turidae spp.*				X						5
Mollusca	Venerid clams	*Lioconcha hieroglyphica*				X						5
Mollusca	Venerid clams	*Venerupis philippinaarum (Tapes japonica)*	Bay edible clam			X						5
Mollusca	Venerid clams	*Veneridae spp.*				X						5
Mollusca	Vermetids	*Dendropoma spp.*				X						5
Mollusca	Vermetids	*Eualetes tulipa*			Introduced	X						22
Mollusca	Vermetids	*Serpulorbis variabilis*	Variable worm snail	Kauna`oa		X						5,32
Mollusca	Vermetids	*Vermetus alii*				X						5,32

Table C1-4: Species Inventory - Marine Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Marine Invertebrates												
Mollusca	Wentletraps	*Epitonium spp.*				X						5
Mollusca	Whelk	*Engina albocincta*				X						32
Mollusca	Whelk	*Littorina scabra*	Mangrove whelk			X						27
Mollusca	Wood boring clams	*Martesia striata*	Wood borin clams			X						5
Platyhelminthes	Flatworms	*Pseudoceros dimidiatus*	Divided flatworm			X						32
Porifera	Sponges	*Axinyssa sp.*	Orange-yellow sponge		Indo-Pacific	X						32
Porifera	Sponges	*Callyspongia sp.*	Violet sponge		Introduced	X						32
Porifera	Sponges	*Chelonaplysilla sp.*				X						32
Porifera	Sponges	*Chondrosia chucalla*	Black pincushion sponge, meandering sponge		Indo-Pacific	X						5,32
Porifera	Sponges	*Unidentified species*	Black pincushion sponge			X						5
Porifera	Sponges	*Clathria (Microconia) sp.*	Vermillion clathra			X						32
Porifera	Sponges	*Dactylospongia sp.*	Yellow sponge			X						32
Porifera	Sponges	*Dysidea* cf. *avara*	Acquisitive sponge		Introduced	X						32
Porifera	Sponges	*Dysidea granulosa*				X						32
Porifera	Sponges	*Dysidea sp.*			Introduced	X						22,32
Porifera	Sponges	*Iotrochota protea*	Staining sponge			X						32
Porifera	Sponges	*Liosina paradoxa*	Paradoxical sponge			X						32
Porifera	Sponges	*Lissodendoryx hawaiiana*	Orange sponge			X						32
Porifera	Sponges	*Luffariella metachromia*	Yellow sponge			X						32
Porifera	Sponges	*Mycale armata*	Orange sponge		Introduced	X						22,32
Porifera	Sponges	*Mycale cecilia*			Introduced	X						22
Porifera	Sponges	*Phorbas sp.*	Red phorbas, Red encrusting sponge			X						32
Porifera	Sponges	*Spongia oceania*				X						32
Porifera	Sponges	*Spirastrella vagabunda*	Coral-boring sponge			X						32
Porifera	Sponges	*Stylinos sp.*	Orange stylinos			X						32
Porifera	Sponges	*Suberites zeteki*	Lobate sponge		Introduced	X						32
Porifera	Sponges	*Unidentified species*	Black finger sponge			X						5
Porifera	Sponges	*Unidentified species*	Purple sponge			X						5
Porifera	Sponges	*Unidentified species*	Yellow sponge			X						5
Porifera	Sponges	*Unidentified species*	Misc. sponges				X					8
Sipuncula	Peanut worms	Sipucula spp.				X						5

X* = Recorded upstream of MCTAB in Smith, G. 1998. (Biological Assessment and Habitat Characterization of Waimanalo Stream). Since these species are amphidromous (spend portions of their life cycle at sea) they must pass through MCTAB portions of Waimanalo Stream in order to be found in the upper regions where they were recorded. Thus, while they have not been recorded at MCTAB, they are included in this list.

Table C1-5: Species Inventory - Terrestrial Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Invertebrates												
Arthropoda	Arachnida, spider	*Argiope appensa*	Hawaiian garden spider			X						42
Arthropoda	Arachnida, spider	*Cheiracanthium mordax*	Pale leaf spider			X						17
Arthropoda	Arachnida, spider	*Oxyopidae spp.*	Lynx spider			X						17
Arthropoda	Arachnida, spider	*Phidippus audax*	Jumping spider			X						17
Arthropoda	Arachnida, spider	*Pholcidae sp.*	Cellar spider			X						26
Arthropoda	Chilopoda, centipede	*Scolopendra subspinipes*	Giant centipede			Oahu						26
Arthropoda	Diploposa	*Spirobolellus spp.*	Millipede			X						26
Arthropoda	Insecta, leafhopper	*Acizzia uncatoides*			Introduced			X				34
Arthropoda	Insecta, dragonfly	*Anax junius*	Green darner			X						17
Arthropoda	Insecta, ant	*Anoplolepis gracilipes*	Yellow crazy ant			X		X				31,34
Arthropoda	Insecta, moth	*Ascalapha odorata*	Black witch		Introduced			X				34
Arthropoda	Insecta, ant	*Camponotus sp.*	Carpenter ant		Introduced			X				34
Arthropoda	Insecta, beetle	*Ceresium unicolor*	Ceresium long-horned beetle					X				34
Arthropoda	Insecta, parasitic wasp	*Chacidoidea sp.*	Chalcid wasp			X						26
Arthropoda	Insects, dragonfly	*Crocothemis servilia*	Scarlet skimmer			X						17
Arthropoda	Insecta, cricket	*Cycloptilodes americanus*	Saussure's scaly cricket			X						26
Arthropoda	Insecta, true bug	*Cydnidae sp.*	Burrower bug			X						26
Arthropoda	Insecta, springtail	*Cyphoderus similis*	Springtail			X						26
Arthropoda	Insecta, fly	*Drosophila suzukii*	Spotted-wing drosophila		Introduced			X				34
Arthropoda	Insecta, earwig	*Euborellia annulipes*	Ringlegged earwig			X						26
Arthropoda	Insecta, moth	*Eudonia sp.*			Endemic			X				34
Arthropoda	Insecta, cockroach	*Euthyrrhapha pacifica*	Pacific cockroach			X						26
Arthropoda	Insecta, true bug	*Hyalopeplus pellucidus*	Transparentwinged plant bug		Endemic			X				34
Arthropoda	Insecta, bee	*Hylaeus anthracinus*	Yellow-faced bee		Endemic	X						41
Arthropoda	Insecta, moth	*Hyposmocoma sp.*			Endemic	X		X				26,34
Arthropoda	Insecta, damselfly	*Ischnura ramburii*	Rambur's forktail			X						17
Arthropoda	Insecta, butterfly	*Lampides boeticus*	Bean butterfly			X						2
Arthropoda	Insecta, grasshopper	*Laupala sp.*	Hawaiian cricket		Endemic			X				34
Arthropoda	Insecta, psocid	*Liposcelis divinatorius*	Book louse			X						26
Arthropoda	Insecta, moth	*Mestolobes sp.*			Endemic			X				34
Arthropoda	Insecta, ephydrid	*Neoscatella sexnotata*	Shorefly			X						10
Arthropoda	Insecta, true bug	*Nesiomiris sp.*			Endemic			X				34
Arthropoda	Insecta, dragonfly	*Orthemis ferruginae*	Roseate skimmer			X						17
Arthropoda	Insecta, grasshopper	*Oxya japonica*	Japanese grasshopper			X						17
Arthropoda	Insecta, dragonfly	*Pantala flavescens*	Globe skimmer			X						17
Arthropoda	Insecta, cockroach	*Periplaneta americana*	American cockroach			X						26
Arthropoda	Insecta, ant	*Pheidole megacephala*	Bigheaded ant		Introduced			X				34
Arthropoda	Insecta, casebearing moth	*Phereoeca allutella*	Household casebearer			X						26
Arthropoda	Insecta, fly	*Phoridae sp.*	Phorid fly, coffin fly, scuttle fly			X						26
Arthropoda	Insecta, ant	*Plagiolepis alluadi*	Little yellow ant			X						31

Table C1-5: Species Inventory - Terrestrial Invertebrates

Phylum	Class/Common Group	Scientific Name	Common Name	Hawaiian Name	Origin	Property					Invasive	Source Code
						MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Invertebrates												
Arthropoda	Insecta, psocid	*Psyllipsocus minutissimus*	Bark louse			X						26
Arthropoda	Insecta, fly	*Pulicivora spp.*	Phorid fly, coffin fly, scuttle fly			X						26
Arthropoda	Insecta, psocid	*Ptycta pupukea*	Bark louse		Endemic			X				34
Arthropoda	Insecta, cockroach	*Pycnoscelus indicus*	Burrowing cockroach			X	X	X	X	X	X	17
Arthropoda	Insecta, beetle	*Koloa maoli*	Bark and Ambrosia beetles									26
Arthropoda	Insecta, moth	*Scotorythra nephelosticta cocytias*			Endemic			X				34
Arthropoda	Insecta, flea	*Siphonaptera sp.*	Flea			X						26
Arthropoda	Insecta, ant	*Solenopsis sp.*	Stinging ant, fire ant			X						26
Arthropoda	Insecta, lacewing	*Sympherobius barberi*	Barber's Brown lacewing		Introduced			X				34
Arthropoda	Insecta, grasshopper	*Tenodera angustipennis*	Narrow-winged mantis		Introduced			X				34
Arthropoda	Insecta, ant	*Tetramorium simillimum*				X						31
Arthropoda	Insecta, springtail	*Tomocerus minor*	Springtail		Introduced			X				34
Arthropoda	Insecta, leafhopper	*Trioza iolani*	Ohia/metrosideros leaf gall		Endemic			X				34
Freshwater Invertebrates												
Annelida	Polychaetes	*Namalycastis abiuma*	Fresh water polychaete		Indigenous							17
Arthropoda	Insecta, beetle	*Enochrus nebulosa*	Water scavenger beetle									2
Arthropoda	Insecta, fly	*Ephydra riparia*	Shorefly			X						2,17
Arthropoda	Insecta, fly	*Hydrophorus pacificus*	Longlegged fly			X						2,10
Arthropoda	Insecta, true bug	*Mesovelia mulsanti*	Water treader			X						17
Arthropoda	Insecta, fly	*Telmatoscopus albipunctatus*	Filter fly			X						2,10
Arthropoda	Arachnida, spider	*Tetragnatha sp.*	Web spinning spider			X						17
Arthropoda	Insecta, true bug	*Trichocorixa blackburni*	Water boatman			X						2
Arthropoda	Insecta, true bug	*Trichocorixa reticulata*	Water boatman			X						2,10
Arthropoda	Insecta, beetle	*Tropisternus salsamentus*	Water scavenger beetle			X						2,17
Mollusca	Snails	*Lymnaidae*	Pond snail			X						17
Mollusca	Snails	*Melanoides sp.*	Thiarid snail		Indigenous		X					11
Mollusca	Snails	*Melanoides tuberculata*	Melanid snail					X				24
Mollusca	Snails	*Thiaridae*	Snail			X						17
Mollusca	Snails	*Unidentified species*	Apple snail		Introduced		X					11

X* = Recorded upstream of MCTAB in Smith, G. 1998. (Biological Assessment and Habitat Characterization of Waimanalo Stream). Since these species are amphidromous (spend portions of their life cycle at sea) they must pass through MCTAB portions of Waimanalo Stream in order to be found in the upper regions where they were recorded. Thus, while they have not been recorded at MCTAB, they are included in this list.

Table C1-6: Species Inventory - Terrestrial Plants

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Abutilon grandifolium	Hairy abutilon	Ma'o		Introduced	X						14
Abutilon incanum	Hoary abutilon, Flowering maple	Ma'o		Indigenous	X	X					8,14
Acacia confusa	Formosan Koa			Introduced	X	X				X	8
Acacia farnesiana	Klu, kolu	Klu, kolu		Introduced	X	X				X	2,6,8
Acacia koa	Koa	Koa		Endemic			X	X			4,16,24,34
Achyranthes aspera var. aspera	Devil's Horsewhip			Introduced	X	X	Oahu		X		8,14,23
Adenanthera pavonina	Red sandalwood, Coral bean tree			Introduced		X				X	8
Adiantum raddianum	Maiden-hair fern			Introduced			X				24
Agave sisalana	Sisal	Malina		Introduced	X	X				X	8,17
Ageratina riparia	Maui pāmakani	Maui pāmakani		Introduced			X				34
Ageratum conyzoides	Maile hohono			Introduced	X	X					8,14
Albizia lebbeck	Siris tree			Introduced		X				X	8
Aleurites moluccana	Kukui, Atui, Candlenut			Polynesian Introduction		X	X	X			3,4,8,24,34
Alocasia cucullata	Chinese taro			Introduced			X				24
Alocasia macrorrhiza	Variegated ape	'Ape		Polynesian Introduction	X		X				4,21,24,34
Aloe vera	Common aloe			Introduced	X						14,32
Alpina purpurata	Red ginger			Introduced			X				24,34
Alternanthera pungens	Khaki weed			Introduced	X	X				X	8,14,25
Alysicarpus vaginalis	Alysicarpus			Introduced	X	X					8,14
Amaranthus spinosus	Spiny amaranth	Pakai kuku		Introduced	X	X					2,6,8,21
Amaranthus viridus	Slender amaranth	Pakai		Introduced	X	X					8,14
Anagallis arvensis	Scarlet pimpernel			Introduced	X	X					2,6,8,18,32
Andropogon virginicus	Broomsedge		Noxious Weed (HI)	Introduced		X	X			X	8,16,24,34
Angiopteris evecta	Mule's foot fern			Introduced			X				34
Antigonon leptopus	Mexican creeper			Introduced	X						1,2,6
Araucaria heterophylla	Norfolk Island pine			Introduced				X			3
Archontophoenix alexandrae	Alexandria palm			Introduced			X				24
Ardisia crenata	Hilo holly			Introduced			X			X	24,34
Ardisia elliptica	Shoebutton ardisia			Introduced			X			X	24,34
Argemone glauca	Hawaiian poppy	Pua kala		Endemic	X						14
Arundina graminifolia	Bamboo orchid			Introduced			X				4
Asparagus setaceus	Asparagus fern			Introduced		X					8
Asystasia gangetica	Chinese violet			Introduced	X	X		X	X	X*	2,6,8,18,21,23,32
Atriplex semibaccata	Australian saltbush			Introduced	X				X		1,6,18,23,32
Atriplex suberecta	Saltbush			Introduced	X					X	2,17,32

Table C1-6: Species Inventory - Terrestrial Plants

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Axonopus fissifolius	Narrowleaf carpetgrass			Introduced			X				34
Azara spp.	Azara			Introduced		X					8
Bacopa monnieri	Bacopa	'Ae 'ae		Indigenous	X	X					2,6,8,21,40
Batis maritima	Pickleweed	'Akulikuli-kai		Introduced	X	X			X	X	3,6,8,18,21,32,35
Bauhina sp.	Orchid tree			Introduced			X				24
Bidens alba var. radiata	White-flowered bidens			Introduced	X	X	X			X	8,14,18,24,32,34
Bidens cervicata	Kauai beggarticks			Endemic			X				34
Bidens pilosa	Spanish needle, beggar's tick	Ki, ki nehe		Introduced	X	X				X	6,8,14,21,32
Bidens sandvicensis	Ko'oko'olau	Ko'oko'olau		Endemic		X					8
Bischofia javanica		Koloa maoli		Introduced			Introduced				24
Blechnum occidentale	Bechnum fern			Introduced			X				4,16,24,34
Boerhavia coccinea	Red-flowered boerhavia, Hog feed			Introduced	X	X				X	8.14,18,32
Boerhavia repens	Alena			Indigenous	X						2,14,32
Bolboschoenus maritimus	Makai, Kaluha	Makai, Kaluha		Indigenous	X						2,18,21,40
Bothriochloa barbinodis	Fuzzy top			Introduced	X	X					8,18
Bothriochloa pertusa	Pitted beardgrass			Introduced	X	X					8,14
Bouganvillea spectabilis				Introduced	X		Introduced				32
Broussonetia papyrifera	Paper mulberry	Wauke		Polynesian Introduction	X						14
Bryophyllum daigremontianum				Introduced	X						14
Calophyllum inophyllum	Alexandrian laurel	Kamani		Polynesian Introduction	X	X	Introduced				32,21
Calyptocarpus vialis	Hierba del cabello			Introduced	X	X	Introduced				8,14
Canavalia cathartica	Moanaloa			Introduced		X					8
Canavalia sericea	Silky jackbean	Pohue		Introduced	X						14,18,32
Canna indica	Canna			Introduced			X			X	24
Canthium odoratum	Alahe'e	Alahe'e		Indigenous			X				34
Capparis sandwichiana	Caper	Maiapilo	Species of Concern (HI), Vulnerable	Endemic	X						1,14

Table C1-6: Species Inventory - Terrestrial Plants

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Capsicum frutescens	Bird pepper	Nioi		Introduced		X					8
Carcia papaya	Papaya	Mikana, pawpaw		Introduced		X					8
Carex wahuensis wahuensis	Oahu sedge			Endemic			X				34
Cassytha filiformis		Kauna'ao pehu		Indigenous			X				24
Casuarina equisetifolia	Common ironwood	Paina		Introduced	X	X		X	X	X	3,8,16,18,21, 25,32,35
Casuarina glauca	Saltmarsh/Longleaf ironwood			Introduced		X				X	8,32
Casuarina litorea	Ironwood			Introduced	X						6,17
Catharanthus roseus	Madagascar periwinkle			Introduced			X			X	24
Cenchrus ciliaris	Buffelgrass			Introduced	X	X				X	8,14,32
Cenchrus echinatus	Common sandbur	'Ume'alu		Introduced	X	X					2,6,8,25,32
Centaurium erythraea	Bitter herb			Introduced		X					8
Centella asiatica	Asiatic pennywort	Pohe kula		Introduced			X				4,34
Chamaecrista nictitans	Partridge pea	Lauki		Introduced	X	X	X				1,6,8,14,24,34
Chenopodium album	Lamb's quarters			Introduced	X						1,2,6
Chenopodium murale	Nettle-leaved goosefoot	'Aheahea		Introduced	X	X					6,8,14
Chenopodium oahuense	'Aheahea, 'aweoweo	'Aheahea, 'aweoweo		Endemic	X						14,18,32
Chloris barbata	Swollen fingergrass	Mau'ulei		Introduced	X	X			X	X	1,2,3,6,8,18
Chloris divaricata	Australian star grass			Introduced	X						
Chloris spp.	Fingergrass			Introduced	X				X		19,32
Christella dentata	Downy wood fern			Introduced			X				34
Christella parasitica	Oak fern			Introduced			X				16,24,34
Chromolaena odorata	Devil weed; Siam weed		Noxious Weed (HI)	Introduced				X			42
Chrysopogon aciculatus	Golden beardgrass	Pilipili- ' ula	Noxious Weed (US)	Indigenous		X	X				4,8,24
Cibotium chamissoi	Chamisso's manfern	Hapu'u i`i		Endemic			X				24,34
Citharexylum caudatum	Fiddlewood			Introduced		X	X			X	8,24,34
Citrus maxima	Pummelo			Introduced			X				34
Clidemia hirta	Koster's curse		Noxious Weed (HI)	Introduced			X	X		X	21,24,34
Clusia rosea	Autograph tree, copey			Introduced		X	Introduced			X	8
Coccinia grandis	Ivy/scarlet-fruited gourd		Noxious Weed (HI)	Introduced	X	X				X	8,14,32,35
Coccoloba uvifera	Sea grape			Introduced	X						2,6,18,32
Cocculus trilobus	Huehue			Indigenous		X					8
Cocos nucifera	Coconut	Niu, ololani		Polynesian Introduction	X	X	X	X	X		3,8,14,18,24, 32
Coix lachryma-jobi	Job's tears			Introduced			X				4,21,24,34
Commelina benghalensis	Hairy honohono, spiderwort		Noxious Weed (US)	Introduced	X	X	X			X	6,8,35

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Terrestrial Plants											
Commelina diffusa	Dayflower, spiderwort	Honohono		Introduced	X	X	X	X		X	2,4,6,8,21,24,32,35
Conocarpus erectus	Buttonwood, button mangrove			Introduced	X						21,32
Conyza bonariensis	Hairy horseweed	Ilioha		Introduced	X	X					2,6,8
Conyza canadensis	Horseweed	Lani wela		Introduced	X						32
Cordia subcordata	Kou	Kou		Polynesian Introduction, Indigenous?	X						14
Cordyline fruticosa	Ti	Ti, ki		Polynesian Introduction	X		X				4,24,34
Coronopus didymus	Swinecress			Introduced		X					8
Costus woodsonii	Red spiral ginger			Introduced			X				24,34
Crinum asiaticum	Spider/giant lily, poison bulb; Purple crinum			Introduced	X		X				14,24,32
Crotalaria incana	Fuzzy rattlepod	Kukaehoki		Introduced	X	X					2,6,8,32
Crotalaria pallida	Smooth rattlepod, rattle-box	Pikakani		Introduced	X	X	X				1,6,8,24,34
Crotalaria verrucosa	Rattle-box			Introduced	X						1,6,14
Cryptostegia madagascariensis var. glaberrima	Madagascar rubbervine			Introduced	X						14
Cuscuta sandwichiana	Kauna'oa, Dodder	Kauna'oa		Endemic		X			X		6,23
Cynodon dactylon	Bermuda grass	Manienie, mahiki		Introduced	X	X		X			
Cynodon dactylon var. maritimus	Giant Bermuda grass			Introduced	X						2,6
Cyperus involucratus	Umbrella sedge	'Ahu'awa haole		Introduced	X		X				4,21,24,34
Cyperus javanicus	Japanese flatsedge	‘Ahu‘awa		Indigenous	X						21
Cyperus laevigatus	Makaloa	Makaloa		Indigenous	X						40
Cyperus polystachyos	Manyspike flatsedge			Indigenous	X		X				34,35
Cyperus rotundus	Nutgrass, nut sedge	Kili'o'opu		Introduced	X	X				X	2,6,8
Dactylotenium aegyptium	Beach wiregrass			Introduced	X						32
Dendrobium sp.				Introduced			X				24
Desmanthus pernambucanus				Introduced	X						14
Desmanthus virgatus	Virgate/slender mimosa, dwarf koa			Introduced	X	X					2,6,8,18,32
Desmodium incanum	Spanish clover	Ka'imi		Introduced	X	X	X	X			1,2,8,21
Desmodium tortuosum	Florida beggarweed			Introduced	X	X					8,14,32
Desmodium triflorum	Three-flowered beggarweed			Introduced	X	X					1,6,8
Dichanthium aristatum	Wilder grass			Introduced	X						1,2,6
Dichanthium sericeum	Australian bluestem			Introduced		X					8
Dicliptera chinensis	Dicliptera			Introduced			X				24
Dicranopteris linearis		Uluhe		Indigenous			X				24,34
Dieffenbachia maculata	Spotted dumb-cane			Introduced			X				24,34

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					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Digitaria ciliaris	Hairy crabgrass			Introduced	X	X					8,14
Digitaria insularis	Sourgrass			Introduced	X	X					1,2,6,8,14
Digitaria spp.	Crabgrass			Introduced		X					8
Dioscorea bulbifera	Bitter yam	Hoi		Polynesian Introduction			X				24,34
Diospyros sandwicensis	Hawaiian persimmon, Hawaiian ebony	Lama		Endemic			X				34
Echinochloa colona	Jungle rice grass			Introduced	X	X					1,6,8
Echinochloa crus-galli	Barnyard rice			Introduced	X						8
Eclipta alba	False daisy			Introduced	X	X					8,14,18,35
Eleocharis sp.	Spikesedge			Indigenous	X						35
Eleusine indica	Wiregrass, goosegrass	Manienie ali'I		Introduced	X	X				X	2,6,8,18,32
Emilia coccinea	Scarlet tasselflower			Introduced	X						21
Emilia fosbergii	Floras paintbrush	Red pualele		Introduced	X	X	X	X			2,6,8,34,35
Emilia sonchifolia	Emilia	Pualele		Introduced	X		X			X	24,32
Enterolobium cyclocarpum	Elephant ear, Ear pod tree			Introduced				X			3
Epipremnum pinnatum	Pothos			Introduced			X			X	24,34
Eragrostis tenella	Lovegrass			Introduced		X				X	8
Erichtites hieracifolia	Fireweed			Introduced	X						32
Erechtites valerianifolia				Introduced			X			X	24
Erigeron bellioides	Fleabane			Introduced	X						14
Erythrina sandwicensis	Wiliwili	Wiliwili		Endemic	X						21
Eucalyptus robusta	Swamp mahogany			Introduced				X			16,35
Eucalyptus spp.	Eucalyptus, gum tree			Introduced		X		X	X	X	3,8
Euphorbia degeneri	Beach spurge	Koko, `akoko		Endemic	X	X					2,14,17,18,32
Euphorbia heterophylla	Wild poinsettia	Kaliko		Introduced	X						14
Euphorbia hirta	Hairy spurge, garden spurge	Koko kahiki		Introduced	X	X					1,6,8,14,18,32
Euphorbia hypericifolia	Graceful spurge			Introduced	X	X					2,6,8,14,17,32
Eupohorbia prostrata	Prostrate spurge			Introduced	X	X					1,2,6,8,14,18, 32
Eupohorbia thymifolia	Gulf sandmat			Introduced	X						14
Falcataria moluccana	Albizia			Introduced			X				34
Ficus microcarpa	Chinese banyan			Introduced	X	X	X	X		X	8,14,16,24,34
Ficus spp.	Banyan			Introduced	X	X		X	X	X	3,8,32
Fimbristylis cymosa	Button fimbristylis	Mau'u 'aki'aki		Indigenous	X		X				2,18,32,34
Flaveria trinervia	Flaveria			Introduced	X						18,32
Furcraea foetida	Mauritius hemp, Sisal	Malina		Introduced	X						32
Gaillardia pulchella	Blanket flower	Melekule wai kahuli, waikahuli		Introduced		X					8

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					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Gossypium barbadense	Sea island cotton			Introduced		X					8
Grevillea robusta	Silk oak	'Oka kilika		Introduced		X	X				8,24,34
Halophila descipiens	Sea grass				X						
Halophila maritima					X						delete?
Hedychium cornorarium	White ginger			Introduced			X				24,34
Heliconia bihai	Lobster claw			Introduced			X			X	24,34
Heliconia caribaea	Heliconia			Introduced			X			X	24,34
Heliconia psittacorum	Parakeet flower			Introduced			X			X	24,34
Heliocarpus popayanensis		Moho		Introduced			X			X	24,34
Heliotropium amplexicaule	Heliotrope			Introduced	X	X					8,18
Heliotropium anomalum	Hinahina	Hinahina		indigenous	X						14,18
Heliotropium curassavicum	Seaside heliotrope	Nena, kupukai		Indigenous	X	X					1,2,6,25
Heliotropium foertherianum	Beach heliotrope			Introduced	X	X			X		1,3,6,8,14,21,
Heliotropium procumbens var depressum	Heliotrope			Introduced	X	X					8,18
Heteropogon contortus	Pili, piligrass, twisted beardgrass			Indigenous	X	X					6,8
Hibiscus arnottianus	Native white hibiscus	Koki`o ke`oke`o	Endangered (US)	Endemic	X						40
Hibiscus brackenridgei	Native yellow hibiscus (state flower)	Ma`o hau hele	Endangered (US)	Endemic	X						40
Hibiscus calyphyllus	Hau	Hau		Indigenous	X	X	X	X			2,3,6,8,13,16, 21,24,32,34,35
Hippeastrum striatum	Amaryllis, Barbados lily, orange lily			Introduced	X						24
Hylocereus undatus	Night-blooming cereus			Introduced	X	X				X	8,14,32
Hyptis pectinata	Comb hyptis		Noxious Weed (HI)	Introduced	X	X				X	8,14
Impatiens walleriana	Impatiens, busy lizzy			Introduced			X				34
Indigofera spicata	Creeping indigo			Introduced	X	X					8,14
Indigofera suffruticosa	Indigo	'Iniko		Introduced	X	X					2,6,8
Ipomoea alba	Moonflower	Koali pehu		Introduced		X					8
Ipomoea batatas	Sweet potato	Uala		Polynesian Introduction			X				24
Ipomoea cairica	ivy-leaved morning glory	Koali 'ali		Introduced	X	X					8,14
Ipomoea indica	Koali	Koali 'awa, Koali 'awahia		Indigenous	X	X			X		3,8,14,32
Ipomoea obscura	White field bindweed			Introduced	X	X					8,14
Ipomoea ochracea	Yellow-flowered morning-glory			Introduced		X					8
Ipomoea pes-caprae ssp. brasiliensis	Beach morning glory	Pohuehue		Indigenous	X	X					2,6,8,18,21,40, 32
Ipomoea triloba	Little bell			Introduced	X						14
Jacquemontia ovalifolia sandwicense	Pa'u-o-hi'iaka, kakuaohi'iaka	Pa'u-o-hi'iaka, kakuaohi'iaka		Endemic	X	X					1,2,18,21,40

Table C1-6: Species Inventory - Terrestrial Plants

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Jasminum fluminense	Wild jasmine			Introduced		X				X	8
Justicia betonica	White shrimp plant			Introduced		X				X	8,32
Kalanchoe pinnatum	Air plant	'Oliwa ku kahakai		Introduced	X						14
Kalanchoe tubiflora	Chandelier plant			Introduced		X					8
Kyllinga nemoralis	Whitehead spikesedge			Introduced	X						35
Lantana camara	Lantana, lakana			Introduced	X	X	X	X		X	1,3,6,8,18,24, 32,34
Lepidium virginicum	Peppergrass			Introduced		X					8
Lepisorus thunbergianus	Weeping fern	Pākahakaha		Indigenous			X				34
Leptochloa uninervia	Leptochloa, sprangletop			Introduced	X	X					1,6,8
Leucaena leucocephala	Koa haole	Koa haole, ekoa, lilikoa		Introduced	X	X		X	X	X	2,3,6,8,14,18,1 9,21,25,32
Lipochaeta integrifolia	Nehe	Nehe		Endemic	X						14,18,32
Ludwigia octovalis	Primrose willow			Polynesian Introduction	X						21
Lycium sandwicense	'Ohelo kai, 'ae'ae	'Ohelo kai, 'ae'ae		Indigenous	X						14,18
Lycopersicom pimpinellifolium	Currant tomato, wild tomato			Introduced		X					8
Lycopodium cernuum	Club moss	Wawae-`iole		Indigenous			X				4,24,34
Macaranga mappa	Bingabing			Introduced			X			X	24,34
Macroptilium atropurpureum	Siratro, purple bushbean			Introduced		X					8
Macroptilium lathyroides	Cow pea, Wild bean			Introduced	X	X					1,6,8,14
Malachra alceifolia	Malachra, wild okra		Noxious Weed (HI)	Introduced		X				X	8
Malva parviflora	Cheese weed			Introduced		X					8
Malvastrum coromandelianum	False mallow			Introduced	X	X					1,6,8
Mangifera indica	Mango	Manako		Introduced		X	X				4,24,34
Manihot esculenta	Cassava, tapioca			Introduced			X				24
Mariscus javanicus	March cyperus	'Ahu'awa		Indigenous	X						1,2,6,13
Medicago lupulina	Black medic, nonesuch			Introduced		X					8
Medicago polymorpha	Bur clover			Introduced	X	X					2,6,8,18
Medicago sativa	Alfalfa, Lucerne	'Alapapa		Introduced	X			X			3,6,19
Megathysus maximus	Guinea grass			Introduced	X	X	X			X	2,6,8,18,24,25, 32,34,35
Melinis minutiflora	Molasses grass			Introduced		X	X			X	4,6,34
Melinis repens	Natal redtop			Introduced	X						14
Merremia aegyptia	Hairy merremia, hairy morning-glory	Koali kua hulu		Introduced	X	X					2,6,8
Metrosideros polymorpha	'Ohi'a	'Ohi'a		Endemic			X	X			16,24,34
Mimosa pudica var. unijuga	Sensitive plant, sleeping grass	Puahilahila		Introduced	X	X	X	X			2,6,8,24,32,35
Momordica charantia	Wild bittermelon			Introduced	X	X				X	8,32

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Terrestrial Plants											
Monstera deliciosa	Split leaf philodendron			Introduced			X				24
Morinda citrifolia	Indian mulberry	Noni		Polynesian Introduction	X	X	X				8,14,21,24,34
Murraya paniculata	Mock orange, orange jessamine			Introduced		X				X	8
Musa X paradisiaca	Banana	Maia		Introduced		X	X				4,8,24,34
Musa cf. *velutina*	Pink banana			Introduced			X				24,34
Myoporum sandwicensis	Naio papa	Naio papa		Indigenous	X	X					14,40
Nama sandwicense	Nama	Hinahina kahakai	Species of Greatest Conservation Concern (HI)	Endemic	X	X					8,14,32
Neomarica gracilis	Neomarica			Introduced			X				24
Nephrolepis exaltata hawaiiensis		ni‘ani‘au		Endemic			X				34
Nephrolepis multiflora	Hairy sword fern			Introduced		X	X				4,8,16,24,34
Nestegis sandwicensis		Olopua		Endemic			X				34
Nicotiana glauca	Tree tobacco	Makahala, paka		Introduced	X					X	32
Nymphaea spp.	Water lily	Lilia-lana-l-ka-wai		Introduced	X					X	17,21
Ocimum gratissimum	Wild basil			Introduced	X	X				X	8,14
Oplismenus hirtellus	Basket grass	Honohono kukui		Introduced			X				16,24,34
Opuntia cochenillifera	Cochineal cactus			Introduced	X						14,32
Opuntia ficus-indica	Prickly pear	Panini		Introduced	X						14
Opuntia spp.	Prickly pear			Introduced	X	X			X	X	6,8,23
Osteomeles anthyllidifolia		'Ulei, u'ulei		Indigenous		X	X				8,16,24,34
Oxalis corniculata	Yellow wood sorrel	`Ihi-`awa		Polynesian Introduction	X	X	X				1,6,8,24,34
Oxalis debilis	Pink wood-sorrel			Introduced			X			X	24
Paederia scandens		Maile pilau		Introduced			X			X	24,34
Pandanus tectorius	Pandanus, screwpine	Hala		Indigenous	X	X	X				8,16,18,21,24,40,32,34
Panicum maximum var. trichoglume	Green panicgrass			Introduced		X					8
Panicum torridum		Kakonakona		Endemic	X						14
Paraserianthes falcataria	Albizia			Introduced			X				16,21,24,34
Paspalum conjugatum	Hilo grass	Mau'u hilo		Introduced	X	X	X			X	2,4,6,8,21,24,34
Paspalum distichum	Knotgrass			Indigenous		X					21
Paspalum scrobiculatum	Ricegrass	Mau'u laiki	Noxious Weed (US)	Indigenous		X	X				8,24,34

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Terrestrial Plants											
Paspalum urvillei	Vasey grass			Introduced		X					38
Paspallum vaginatum	Seashore paspallum			Introduced	X	X				X	8,17,40,35
Passiflora edulis	Passion fruit	Liliko'i		Introduced		X					8
Passiflora foetida	Love-in-a-mist, scarlet-fruited passion flower	Pohapoha		Introduced	X	X			X	X*	2,6,8,17,21,23,32
Passiflora laurifolia	Yellow granadilia			Introduced			X			X	24,34
Passiflora suberosa	Huehue haole, Corky passionflower			Introduced	X	X				X	8,14
Pellaea viridis	Green cliffbrake			Introduced		X					8
Pennisetum ciliare	Buffel grass			Introduced	X						1,2,6
Pennisetum clandestinum	Kikuyu grass		Noxious Weed (US)	Introduced	X						1,2,6
Pennisetum polystachion	Feathery pennisetum			Introduced	X		X				6,24,34
Pennisetum purpureum	Napier grass, elephant grass			Introduced		X				X	8,21
Pennisetum setaceum	Fountain grass		Noxious Weed (HI)	Introduced	X	X				X	21,23,25
Peperomia remyi	Peperomia	Ala'ala wai nui		Endemic	X						14
Phlebodium aureum		Laua`e-haole		Introduced			X				24,34
Phyla nodiflora	Creeping ip plant, turkey tangle			Introduced		X					8
Phyllanthus debilis	Niruri			Introduced	X	X					8,14
Phymatosorus grossus		Laua`e		Introduced			X				24,34
Phymatosorus scolopendria	Laua'e Fern	Laua'e		Introduced	X						17
Physalis angulata	Ground cherry, Husk tomato			Introduced	X						14
Piper sp.				Introduced			X				24
Pithecellobium dulce	'Opiuma, madras thorn, Manila tamarind	'Opiuma		Introduced		X			X	X	3,8
Pittosporum sp.	Hoʻawa	Hoʻawa		Endemic			X				34
Pityrogramma austroamericana	Gold fern			Introduced			X				34
Plantago major	Broad-leaved plantain	Laukahi		Introduced		X					8
Plectranthus parviflorus	Spurflower			Indigenous	X						1,6,14
Pleomele halapepe		Hala pepe		Endemic			X				34
Pleopeltis thunbergiana		Pakahakaha		Indigenous			X				24
Pluchea carolinensis	Pluchea			Introduced			X			X	24
Pluchea indica	Indian fleabane, Indian pluchea			Introduced	X	X		X	X	X	2,6,8,14,18,21,23,32,35
Pluchea symphytifolia	Sourbush, Hairy fleabane			Introduced	X	X					6,8,18,17,21,32
Pluchea X fosbergii	Hybrid pluchea			Introduced	X	X					8,14,21,32,35
Plumbago zeylanica	Leadwort	'Ilie'e, hilie'e		Indigenous	X	X					8,14
Portulaca oleracea	Pigweed, common purslane	'Akulikuli kula		Introduced	X	X					1,2,6,8,18,32
Portulaca pilosa	Portulaca	'Akulikuli		Introduced	X	X					8,18,32

Table C1-6: Species Inventory - Terrestrial Plants

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Prosopis pallida	Algaroba, mesquite	Kiawe	Noxious Weed (US)	Introduced	X	X			X	X	2,3,6,8,19,21, 25,32
Psilotum nudum		Moa		Indigenous			X				24,34
Psidium cattleianum	Strawberry guava	Waiawi 'ula 'ula		Introduced		X	X	X		X	3,8,16,21,24, 34
Psidium guajava	Common guava	Kuawa		Introduced		X	X	X		X	3,8,16,21,24, 34
Psydrax odoratum		Alahe'e		Indigenous				X			3
Pteris cretica	Cretan brake			Indigenous			X				24,34
Ptychosperma macarthurii	MacArthur Palm			Introduced	X		X				34
Reichardia tingitana				Introduced	X						14,18
Rhizophora mangle	American mangrove, red mangrove			Introduced	X	X				X*	6,8,17,21,25, 32,35
Rhynchelytrum repens (Tricholaena rosea)	Natal redtop			Introduced	X	X				X	2,6,8
Ricinus communis	Castor bean	Koli		Introduced		X				X	8,32
Rivina humilis	Rouge plant, coral berry			Introduced		X					8
Rubus rosifolius	Thimbleberry			Introduced			X			X	24,34
Ruppia maritima	Widgeon grass, sea tassel			Indigenous	X						2,17,34
Sacciolepis indica	Glenwood grass			Introduced			X				4,24,34
Salvinia molesta	Water fern		Noxious Weed (US)	Introduced		X				X	23,25
Samanea saman	Monkeypod	'Ohai		Introduced		X		X	X	X	3,8,19
Sansevieria trifasciata	Bowstring hemp, mother-in-law's tongue			Introduced	X			X			14,21,32
Santalum spp. (possibly intermediate btwn coastal spps ellipticum and inland spps freycinianatum)	Sandalwood	`Iliahi		Endemic		X					25
Scaevola gaudichaudiana	Naupaka-kuahiwi	Naupaka-kuahiwi		Endemic			X				16,24,34
Scaevola taccada	Beach naupaka	Naupaka, naupaka kahakai		Indigenous	X	X					2,8,14,18,21, 40,32,35
Schefflera actinophylla	Octopus tree, umbrella tree			Introduced	X	X	X	X	X	X	3,4,8,17,19,24, 34,35
Schinus terebinthifolius	Christmas berry	Wilelaiki		Introduced	X	X	X	X	X	X	2,3,6,8,16,18,2 5,32,34,35
Schoenoplectus lacustiris	Great bulrush	`Aka`akai		Indigenous	X						17,40,35
Scirpus maritimus					X						10
*Senecio madagascariensis**	Fireweed		Noxious Weed (HI)	Introduced		X					38

*There has only been one recorded sighting of this plant. It was eradicated and has not appeared again.

Table C1-6: Species Inventory - Terrestrial Plants

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Senna pendula				Introduced		X					8
Senna surattensis	Kolomona, kalamona	Kolomona, kalamona		Introduced		X					8
Sesbania tomentosa	`Ohai	`Ohai	Endangered (US)	Endemic	X						41
Sesuvium portulacastrum	Sea purslane	'Akulikuli		Indigenous	X	X	X				1,2,6,18,21,40, 32,35
Setaria gracilis	Yellow foxtail	Mau'u kalepuni		Introduced		X				X	8
Setaria verticillata	Bristly foxtail	Mau'u pilipili		Introduced	X						1,2,6
Sida ciliaris				Introduced		X					38
Sida fallax	`Ilima	`Ilima		Indigenous	X	X					1,2,6,8,13,18, 21,32
Sida rhombifolia	Cuba jute			Introduced	X	X					8,14
Sida spinosa	Prickly sida			Introduced	X						1,6
Solanum americanum	Glossy nightshade	Popolo		Indigenous	X	X					8,13,14
Solanum lycopersicum var. cerasiforme	Cherry tomato			Introduced	X						14,32
Solanum mauritianum		Pua nana honua		Introduced			X				24
Solanum nigrum	Black nightshade	Popolo		Introduced	X						2,6
Solanum seaforthianum	Brazilian nightshade, blue potato vine			Introduced	X	X				X	8,14
Solanum torvum	Prickly solanum, turkeyberry		Noxious (US)(HI)	Introduced		X				X	8
Sonchus oleraceus	Sow thistle	Pualele		Introduced	X	X					2,6,8,18
Sorghum halpense	Johnson grass			Introduced	X						1,2,6
Spathodea campanulata	African Tulip Tree			Introduced		X	X			X	8,24,34
Spathoglottis plicata	Philippine ground orchid			Introduced			X				24,34
Spergularia marina	Saltmarsh sand spurry	Mimi'ilio		Introduced	X						2,6,18
Spermacoce assurgens	Buttonweed			Introduced		X					8
Sphagneticola trilobata				Introduced	X						14
Sphenomeris chinensis	Pala'a fern	Pala'a		Indigenous			X				4,24,34
Sporobolus indicus	West Indian dropseed, Smut grass			Introduced		X				X	8
Sporobolus virginicus	Beach dropseed grass, seashore rushgrass	'Aki'aki		Indigenous	X	X					2,6,8,18,40,32
Stachys arvensis	Staggerweed			Introduced	X	X					8,14
Stachytarpheta cayennensis	Joee, false vervain	Oi		Introduced	X						1,2,6
Stachytarpheta dichotoma	Vervain			Introduced			X				4,24
Stachytarpheta jamaicensis	Jamaica vervain	Owi, oi		Introduced	X	X					1,6,8,32
Stachytarpheta urticifolia	Nettle-leaved vervain	Owi, oi		Introduced		X	X				8,24,34
Stapelia gigantea	Carrion flower, Zulu giant, giant toad plant			Introduced	X	X				X	8,14
Stenotaphrum secundatum	Buffalo grass	Aki'aki haole		Introduced	X						14,32

Table C1-6: Species Inventory - Terrestrial Plants

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Terrestrial Plants											
Styphelia tameiameiae	Pukiawe	Pukiawe		Indigenous			X				16,24,34
Swietenia mahogani	West Indian mahogany			Introduced		X					8
Synedrella nodiflora	Nodeweed			Introduced	X	X					8,14
Syzygium cumini	Java plum	Palama		Introduced		X	X			X	8,16,21,24,34
Syzygium malaccense	Mountain apple	Ohi'a 'ai		Polynesian Introduction			X				24,34
Tabebuia pentaphylla	Pink tecoma			Introduced		X				X	8
Terminalia catappa	Indian almond	Kamani haole		Introduced	X						14,32
Tetragonia tetragonioides	New Zealand spinach			Introduced		X					8,32
Thespesia populnea	Milo	Milo		Indigenous	X	X					2,6,8,18,21,40, 32,35
Thunbergia fragrans	White thunbergia			Introduced			X			X	24,34
Tournefortia argentea	Beach heliotrope			Introduced	X	X			X		1,3,6,8,14,21, 32
Trianthema portulacastrum				Introduced	X						14
Tribulus cistoides	Nohu	Nohu		Indigenous	X						1,6
Tridax procumbens	Coatbuttons		Noxious Weed (US)	Introduced	X	X					1,2,8
Typha latifolia	Common cattail			Introduced	X					X	17,35
Urena lobata	Ramina			Introduced			X			X	24
Urochloa mutica	California grass, paragrass			Introduced	X	X	X			X	2,6,8,16,21,24, 25,32,35
Verbesina encelioides	Golden crown-beard			Introduced	X	X					2,6,8,32
Vernonia cinerea var. parviflora	Little ironweed			Introduced	X	X					2,6,8
Vigna marina	Beach pea	Nanea, mohihihi		Indigenous	X						2,14,18,32
Vitex rotundifolia	Beach vitex	Pohinihina, Kolokolo kahakai		Indigenous	X	X					8,40,32
Vitex trifolia var. subtrisecta	Vitex	Polinalina		Introduced	X	X					8,14
Waltheria indica		`Uha loa, hi`oloa, kanakaloa		Indigenous	X	X					1,6,8
Wedelia trilobata	Wedelia			Introduced	X	X		X		X	8,18,21,32
Wikstroemia oahuensis	'Akia	'Akia		Endemic			X				4,24,34
Wikstroemia uva-ursi	'Akia	'Akia		Endemic	X	X					16,40
Wollastonia integrifolia	Nehe	Nehe		Endemic	X						14,18,32
Xanthium strumarium	Cockleburs			Introduced	X						10
Xanthosoma sagittifolium	Tannia			Introduced			X				24
Youngia japonica	Oriental hawkbeard			Introduced	X		X				14,24
Zingiber zerumbet	Shampoo ginger	Awapuhi		Introduced		X	X				4,24,34
Zoysia matrella	Zoysia grass, Manila grass			Introduced		X					38

Table C1-7: Species Inventory - Algae

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Algae											
Acanthophora pacifica	Red algae				X						32
Acanthophora spicifera	Red algae			Introduced	X	X					2,8,17,18,32
Ahnfeltia concinna	Red algae	Limu aki'aki		Indigenous	X						19
Amansia glomerata	Red algae			Indigenous	X						32
Asparagopsis taxiformis	Red algae	Limu kohu		Indigenous	X	X					8,19,32,39
Asteromenia spp.	Red algae				X		Oahu				32
Avrainvillea amadelpha	Mud weed			Introduced		X					39
Bornetella sphaerica	Green algae				X						32
Botryocladia skottsbergii	Red algae				X						32
Bryopis spp.	Green algae				X						32
Caulerpa racemosa	Green algae			Indigenous	X	X					8,32
Caulerpa serrulata	Green algae				X						32
Caulerpa sertularioides	Green algae			Indigenous	X						32
Caulerpa taxifolia	Green algae			Invasive Indigenous	X						32,39
Caulerpa vericillata	Green algae				X						32
Caulerpa webbiana	Green algae				X						32
Chaetomorpha antennina	Green algae				X						32
Cladophora spp.	Green algae				X						32
Codium arabicum	Green algae			Indigenous	X						32,39
Codium edule	Green algae	Limu wawae 'iole		Indigenous	X						19
Codium reediae	Green algae			Indigenous	X						32
Codium spp.	Green algae					X					8
Coelothrix irregularis	Red algae				X						32
Corallina spp.	Red algae					X					8
Daysa iridescens	Red algae				X						32,39
Dictopteris spp.	Brown algae			Introduced		X					8
Dictyopteris australis	Brown algae			Indigenous	X						8,39
Dictyosphaeria cavernosa	Green bubble algae			Invasive Indigenous	X						18,32
Dictyosphaeria verslugsii	Green bubble algae			Indigenous	X						32
Dictyota spp.	Brown algae				X	X					8,32
Dictyota acutiloba	Brown algae				X						32
Dotyella hawaiiensis	Red algae			Indigenous	X						32,39
Enteromorpha spp.	Green algae					X					8
Euptilocladia magruderi				Indigenous	X						39

Table C1-7: Species Inventory - Algae

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Algae											
Galaxaura spp.	Red algae				X	X					8,32
Galaxaura marginata	Red algae			Indigenous	X						32
Gibsmithia hawaiiensis	Red algae			Indigenous	X						32,39
Gracilaria spp.	Red algae				X						32
Gracilaria bursapastoris	Red algae	Limu ogo (Japanese)			X						19
Gracilaria salicornia	Red algae	Gorilla ogo		Introduced	X						32
Grateloupia filicina	Red algae	Limu huluhuluwaena			X						19
Halichrysis coalescens	Red algae				X						32
Halimeda spp.	Green algae					X					8,18
Halimeda discoidea	Green algae			Indigenous	X						32,39
Halophila deciphens	Hawaiian sea grass	Koloa maoli		Indigenous	X		Indigenous				32
Halophila hawaiiana	Hawaiian sea grass			Endemic	X						18,32
Haloplegma duperreyi	Red algae				X						32
Halymenia formosa	Red algae	Lepe 'ula'ula			X						32
Hydroclathrus clathratus	Brown algae				X						32
Hydrolithon spp.	Red algae					X					8
Hypnea musciformis	Red algae			Introduced	X						39
Hypnea spp.	Red algae			Introduced		X	Indigenous				8
Jania spp.	Red algae				X	X					8.32
Laurencia spp.	Red algae	Limu mane`one`o		Indigenous	X						32,39
Liagora spp.	Red algae			Indigenous			Indigenous				18,32
Lobophora variegata	Brown algae				X		Indigenous				32
Lyngbya majuscula	Blue-green algae					X					8,18
Martensia fragilis	Red algae			Indigenous	X						32,39
Microdictyon spp.	Green algae				X						32
Microdictyon setchellianum	Green algae			Indigenous	X						32,39
Microdictyon umbillicatum	Green algae				X						32
Neogoniolithon spp.	Red algae					X					8
Neomartensia flabelliformis	Red algae				X						32
Neomeris sp.	Green algae				X						32
Neomeris annulata	Green algae					X					8
Padina spp.	Brown algae			Indigenous	X	X					8,18,32

Table C1-7: Species Inventory - Algae

Scientific Name	Common Name	Hawaiian Name	Regulatory Status	Origin	Property					Invasive	Source Code
					MCBH Kaneohe Bay	MCTAB	Waikane Valley Impact Area	Camp Smith	Pu'uloa RTF		Sources listed on pg C1-2
Algae											
Padina melemele	Brown algae			Endemic	X						32
Peyssonnelia spp.	Red algae				X						32
Peysonellia rubra sp.	Red algae			Introduced		X					8
Porolithon spp.	Red algae					X					8
Portieria hornmanni	Red algae				X						32
Predaea spp.	Red algae				X						32
Ralfsia pangoensis	Brown algae				X						27
Rhipidosiphon javensis	Green algae				X						32
Rosenvingea intricata	Brown algae				X						32
Sargassum echinocarpum	Brown algae	Limu kala		Indigenous		X					8,11,18
Siphonocladius tropicus	Green algae				X						32
Spyridia filamentosa	Red algae				X						17,32,39
Stypopodium flabelliforme	Brown algae			Indigenous	X						32,39
Symploca hydnoides	Blue-green algae				X						27
Symploca spp.	Blue-green algae/cyanobacteria				X						32
Titanophora pikeana	Red algae				X						32
Trichogloea requienii	Red algae			Indigenous	X						32,39
Tolypiocladia glomerulata	Red algae				X						32
Turbinaria ornata	Brown algae			Indigenous	X						32
Ulva fasciata	Green algae; Sea lettuce	Limu palahalala		Indigenous	X						17
Ulva spp.	Green algae; Sea lettuce	Limu palahalala				X					8
Valonia spp.	Green algae					X					8
Ventricaria ventricosa	Green bubble algae				X		Indigenous				32
Wrangelia elegantissima	Red algae			Indigenous	X						32,39
Crustose coralline algae	Red algae				X						32
Filamentous turf					X						32
Wiry turf					X						32

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C2. PROTECTED SPECIES HIGHLIGHTS

A number of species are found on land or in waters around MCBH jurisdiction that are protected or regulated under Federal or State laws (e.g., Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), Migratory Bird Treaty Act (MBTA), and Hawai'i Revised Statute Chapter 195D, Conservation of Aquatic Life, Wildlife and Land Plants).[1] Other species that are considered "at risk" (i.e., species of concern or species of greatest conservation need), are afforded protection by the Natural Resources Management Program at MCBH.

Annual review of the INRMP requires that MCBH report on all measures taken for the protection of listed species and critical habitat. Each of the threatened and endangered species in Table C2-1 is included in the annual metrics review process and is assessed separately in six different categories: location mapped on installation GIS, goals and monitoring requirements in place to assess conservation effectiveness, funding of listed species projects, adequate data on habitat conditions, adequate data on population presence and numbers, and extent that INRMP projects and programs benefit the species. Ten of these species have been formally documented as occurring on the installation by multiple agencies and/or individuals. In addition, even though MCBH hosts dozens of MBTA-protected bird species, this appendix details only those that are also protected under the ESA (e.g., Hawaiian stilt, Hawaiian coot, Hawaiian duck, and Hawaiian moorhen), or are specifically managed for due to a high geographic concentration of them found on MCBH properties (e.g., red-footed boobies, wedge-tailed shearwaters). 'Species of Concern' is a term used by Federal agencies to describe species for which there is concern about their status and might be in need of concentrated conservation actions. 'Species of Greatest Conservation Need' is a term used by State of Hawai'i agencies that encompasses all species on the Federal 'Species of Concern' list plus additional species State agencies have concerns about regarding status and threats. Neither status carries any procedural or substantive protections under the ESA. Listed species and critical habitat changes will be addressed in yearly reviews and future INRMP updates.

Conservation and Management sheets have been developed to provide basic background information on protected species and those of conservation concern that occur at MCBH. These species are actively targeted as part of MCBH's current conservation efforts. The sheets include information on common name, Hawaiian name, scientific name, legal status, appearance, native range, habitat (where it grows or resides in Hawai'i), methods of reproduction and dispersal, ecological threats, current locations on Base, general conservation strategies, and MCBH conservation measures. They contain photos of the species to help in identification.

Additional detail on management actions aimed at protection of these species is contained in the COA (Section 7). Many of the INRMP management actions are designed to benefit multiple species, as mandated by the ecosystem-based management approach to INRMP implementation required by Marine Corps Order (MCO P5090.2A, Section 11200). For example, enhancement of wetland habitat can provide benefits for several species of endangered and migratory waterbirds, while improving water quality and reducing flood risk to adjacent human communities.

[1] Under Hawai'i Revised Statute Chapter 195D, any species determined to be a Federally endangered or threatened species pursuant to the ESA is deemed to have, at minimum, the same status for the State. The regulatory status listed for all species in Table C2-1 reflects the most protected status, in this case the Federal standing.

Table C2-1. MCBH Protected Species and Species of Conservation Concern

Scientific Name	Common Name	Hawaiian Name	Regulatory Status[1]	Origin	Pg
Marine Species					
Megaptera novaeangliae	Humpback whale	*Kahola*	State Endangered, MMPA[2]	Global	C2-4
Pseudorca crassidens[3]	False killer whale	----	Endangered	Global	C2-6
Neomonachus schauinslandi	Hawaiian monk seal	*ʻIlio-holo-i-ka-uaua*	Endangered, MMPA	Endemic	C2-9
Chelonia mydas	Green sea turtle	*Honu*	Threatened	Indigenous	C2-13
Eretmochelys imbricata	Hawksbill sea turtle	*ʻEa*	Endangered	Indigenous	C2-13
Lepidochelys olivacea	Olive ridley sea turtle	----	Endangered	Circumtropical	C2-13
Lingula reevii[4]	----	----	Species of Concern	Indigenous	
Montipora dilitata	Irregular rice coral	----	Species of Concern, Protected under HAR Chapter 13-95	Endemic	C2-21
Montipora flabellata	Blue rice coral	----	Protected under HAR Chapter 13-95	Endemic	C2-21
Montipora patula	Sandpaper rice coral	----	Protected under HAR Chapter 13-95	Endemic	C2-21
Waterbirds					
Anas wyvilliana	Hawaiian duck	*Koloa maoli*	Endangered, MBTA	Endemic	C2-23
Fulica alai	Hawaiian coot	*ʻAlae keʻokeʻo*	Endangered, MBTA	Endemic	C2-25
Gallinula galeata sandvicensis	Hawaiian common moorhen	*ʻAlae ʻula*	Endangered, MBTA	Endemic	C2-27
Himantopus mexicanus knudseni	Hawaiian stilt	*Aeʻo*	Endangered, MBTA	Endemic	C2-29
Shorebirds and Seabirds					
Ardenna pacifica	Wedge-tailed shearwater	*ʻUaʻu kani*	Birds of Conservation Concern, MBTA	Indigenous	C2-31
Sula sula rubripes	Red-footed booby	*ʻA*	MBTA	Indigenous	C2-34
Other Terrestrial Species					
Asio flammeus sandwichensis	Hawaiian short-eared owl	*Pueo*	State Endangered, MBTA	Endemic	C2-37
Branta sandvicensis	Hawaiian goose	*Nēnē*	Endangered, MBTA	Endemic	C2-39
Hylaeus anthracinus	Yellow-faced bee	*Nalo meli maoli*	Endangered	Endemic	C2-41
Lasirus cinereus semotus[5]	Hawaiian hoary bat	*ʻOpeʻapeʻa*	Endangered	Endemic	C2-43
Plants					
Capparis sandwichiana	Native caper	*Maiapilo*	Species of Greatest Conservation Need (HI)	Endemic	C2-45
Nama sanwichensis	Nama	*Hinahina kahakai*	Species of Greatest Conservation Need (HI)	Endemic	C2-47
Sesbania tomentosa	Oʻahu riverhemp	*ʻOhai*	Endangered	Endemic	C2-49

Table Notes

[1] All species in the table are included on the Hawaiʻi State list of Species of Greatest Conservation Need. Some species are also protected under international treaties (e.g., Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)).

[2] NOAA Fisheries revised the ESA listing status of the humpback whale, effective October 11, 2016 (Section 5).

[3] MCBH has never detected false killer whales within the MCBH 500-yard Naval Defensive Sea Area, and at this time the area is does not contain habitat preferred by this species. However, designated critical habitat for the main Hawaiian Islands insular population is proposed for all waters surrounding the main

Hawaiian Islands from 45 meters to 3,200 meters in depth, including the area surrounding the MCBH 500-yard Naval Defensive Sea Area. The MCBH INRMP describes conservation measures that MCBH takes to ensure Marine Corps activities do not adversely impact the insular population and any potentially designated critical habitat.

[4] *Lingula reevii* is a brachiopod that occurs in shallow, sandy reef flats in Kāne'ohe Bay. It has been recorded adjacent to but not within MCBH's 500-yard security buffer zone. Further information on this species may be found at http://www.nmfs.noaa.gov/pr/pdfs/species/inarticulatedbrachiopod_detailed.pdf

[5] MCBH has not yet documented the presence of the Hawaiian hoary bat on its properties, but 11 bat vocals have been recorded on the HIARNG RTI, leased MCBH property at MCTAB. MCBH will be conducting surveys to confirm or deny its presence during this INRMP implementation period (COA 7.1).

Whales

COMMON NAME: Humpback Whale
HAWAIIAN NAME: *Kohola*
SCIENTIFIC NAME: *Megaptera novaeangliae*
LEGAL STATUS: Protected under the MMPA, State Endangered Species law, CITES, and the International Whaling Commission moratorium against whaling.

APPEARANCE: Adult humpback whales range from 40 to 50 feet in length and weigh 25 to 40 tons. Heads are broad and rounded and bodies are round, narrowing towards the tail. There is a dorsal fin on their back and ventral grooves that run from the lower jaw back to the belly area. The top of the head and lower jaw have bumpy knobs. They are black on the upper side and mottled black and white on the underside, with flippers that range from all white to all black. Flippers are long (between 1/4 and 1/3 of the length of the body), and the tail is up to 18 feet wide, serrated, and pointed at the tips.

HABITAT: Humpback whales are found in all of the world's oceans. Most spend summer in temperate and polar waters to feed and winter in tropical waters for mating and calving. The Central North Pacific Stock winters in Hawai'i and migrates to the British Columbia/Alaska area in summer.

DIET: Humpback whales are baleen whales and feed on krill, small crustaceans, and fish.

REPRODUCTION: Humpback whales reach sexual maturity between 6 and 10 years of age. Females will bear one calf every 2 to 3 years after a 12 month gestation period. Calves nurse for approximately one year.

POPULATION TRENDS: For the latest information on population trends, consult NOAA Fisheries' Marine Mammal Stock Assessment Reports posted at http://www.nmfs.noaa.gov/pr/sars/

ECOLOGICAL THREATS: Whales may be negatively impacted or killed by hooking or entanglement in fishing gear, ship strikes, habitat impacts (reduced water quality and available forage resources), harassment by boats (such as whale watching vessels), and harvest. Acoustic impacts on whales include immediate effects (such as injury and behavioral modification) from exposure to noise from seismic profilers and sonars used in oceanographic research and military operations, as well as construction activities such as pile driving. They also include exposure to rising ambient noise levels, the effects of which are currently not well understood.

Whales

NOAA FISHERIES CONSERVATION STRATEGIES: Conservation strategies include the creation of whale sanctuaries, preserving the moratorium against whaling, mitigation of ship strikes, and responding to whales in distress. Federal regulations prohibit approaching whales within 100 yards in the water and within 1000 feet when operating an aircraft.

Water vessels should follow NOAA Fisheries' *Guidelines for Whale Protection and Human Safety* while boating in Hawai'i. Guidelines include maintaining the appropriate distance (100 yds), passing around whales from behind, stopping the vessel and taking it out of gear if a whale is within the 100 yd buffer of the vessel, notifying other vessels that may not be aware of a whale in their path, and reporting any collisions with whales to NOAA Fisheries. NOAA Fisheries has a handbook that details the laws and regulations for federally protected marine resources including whales: http://hawaiihumpbackwhale.noaa.gov/documents/pdfs_ocean_users/hawaiioceanusersguide.pdf

Humpback whales are protected under the MMPA. It was determined in 2016 that the Central North Pacific (Hawaiian archipelago and Johnston Atoll) distinct population segment did not warrant listing under the Endangered Species Act. Any action that is likely to cause harm or to harass them requires a Letter of Authorization or an Incidental Harassment Authorization from NOAA Fisheries. http://www.nmfs.noaa.gov/pr/permits/incidental/

MCBH CONSERVATION MEASURES: Conservation measures that benefit whales include:

- **Habitat protection and enhancement**. MCBH opportunistically removes marine debris from the water and routinely from land areas within its jurisdiction. Actions are taken to reduce nonpoint source pollution from the land into the sea such as erosion control measures, which reduce damage to off-shore habitat.
- **Restrictions within the 500 yard marine buffer zone at MCBH Kaneohe Bay**. Includes prohibiting entry of commercial fishing and whale watching vessels.
- **Enforcement**. The 500 yard buffer zone is regularly patrolled for violations to regulations. Marines and civilians are made aware of the regulation to stay 100 yds away from whales in the ocean, which includes not placing a boat or kayak in the path of an approaching whale.
- **Interagency cooperation**. MCBH supports NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary annual island-wide humpback whale count by providing conditional access passes to specific vantage points on Mōkapu Peninsula for NOAA-sponsored volunteers during designated count weekends.
- **Education and outreach**. Development and distribution of informational material including videos, fact sheets, pamphlets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

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For more information: MCBH Integrated Natural Resources Management Plan Update. 2016. Sections 7.0, 7.4, 8, 9, Appendix C & D.

PHOTOS

1. NOAA. http://www.noaanews.noaa.gov/stories2008/20080331_sanctuaryoceancount.html

Main Hawaiian Island Insular False Killer Whale

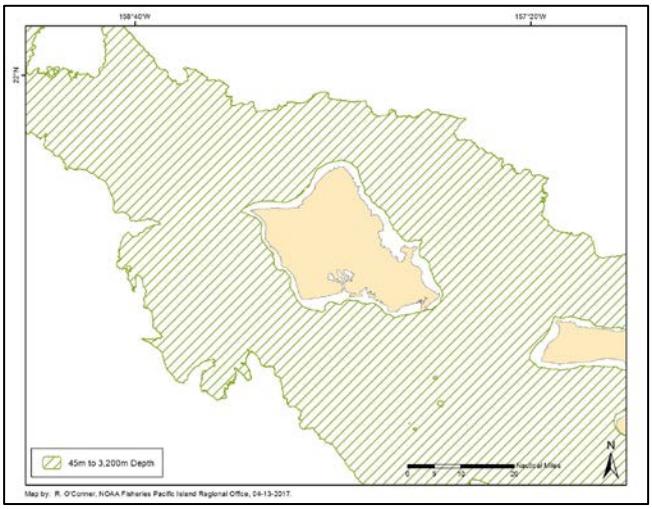
COMMON NAME: Insular False Killer Whale
HAWAIIAN NAME: False Killer Whale
SCIENTIFIC NAME: *Pseudorca crassidens*
LEGAL STATUS: Endangered (Federal and State) Main Hawaiian Islands Insular False Killer Whale Distinct Population Segment. Protected under the MMPA. Endangered (IUCN Red List).

APPEARANCE: False killer whales are large members of the dolphin family. Females reach lengths of 15 feet, while males are almost 20 feet. In adulthood, false killer whales can weigh approximately 1,500 pounds. They have a small conical head without a beak. Their dorsal fin is tall and their flippers (pectoral fins) have a distinctive hump or bulge in the middle of the front edge. False killer whales have dark coloration except for some lighter patches near the throat and middle chest. Their body shape is more slender than other large delphinids.

BEHAVIOR: They form strong social bonds, usually found in groups of 10-20; they are known to "strand" in large groups. They are also found with other cetaceans, most notably bottlenose dolphins.

NATIVE RANGE: False killer whales are found worldwide mainly in tropical and warm-temperate waters. The main Hawaiian Islands (MHI) insular false killer whales are an island-associated population of false killer whales that relies entirely on the productive submerged habitats of the MHI to support all of their life-history stages.

POPULATION TRENDS: Reeves et al. (2009) suggested that the MHI insular stock of false killer whales may have declined during the last two decades, based on sightings data collected near Hawai'i using various methods between 1989 and 2007. The minimum population estimate for the MHI insular stock of false killer whales is the number of distinctive individuals identified during 2011 to 2014 photo-identification studies, or 92 false killer whales (Baird et al. 2015). Aerial sighting rates during these surveys showed a statistically significant decline that could not be attributed to any weather or methodological changes.



Area around O'ahu under consideration for designated critical habitat for the MHI insular false killer whale.

HABITAT: Adapted to an island-associated foraging strategy and overall ecology, insular false killer whales are generally found in deeper waters just offshore, moving primarily throughout and among the shelf and slope habitat on both the windward and leeward sides of all the MHI. These areas offer a wide range of depths for insular false killer whales to travel, forage, and move freely around and between the islands. Waters surrounding the

Main Hawaiian Island Insular False Killer Whale

MHI **from 45 meters to 3,200 meters in depth** have been identified as meeting the parameters defined in the Endangered Species Act for critical habitat and this area is under consideration for the designation of MHI insular false killer whale critical habitat.

DIET: MHI insular false killer whales feed on a variety of large pelagic fish as well as squid (cephalopods). Within waters surrounding the MHI, habitat conditions should support the successful growth, recruitment, and nutritional quality of prey to support the individual growth, reproduction, and development of MHI insular false killer whales.

REPRODUCTION: False killer whales' breeding season lasts several months. Gestation periods range from 14 to 16 months and lactation occurs for one and a half to two years. False killer whales have low reproduction rates with calving intervals of approximately seven years. Maturity occurs at around 12 years of age and maximum longevity is 63 years.

ECOLOGICAL THREATS: Reasons for the decline of the MHI insular false killer whale DPS include:

- Marine debris entanglement or ingestion
- Contaminants and toxins introduced through prey consumption can put individual health or reproduction at risk
- Interactions with long-line fisheries or consuming previously hooked fish
- Incidental take in commercial and recreational non-longline fisheries
- Biomagnification of some pollutants can adversely affect health in these top marine predators, causing immune suppression, decreased reproduction, or other impairments
- Water pollution and changes in water temperatures may also increase pathogens, naturally occurring toxins, or parasites in surrounding waters
- Inherently slow reproductive rates and an aging population
- Low genetic diversity
- Waters with in-water noise below levels that impact false killer whales' ability to detect, interpret, and utilize acoustic cues that support important life history functions
- Exposure to infectious or harmful agents (such as bacteria, viruses, toxins, or parasites) either through their prey or directly through ingestion of contaminated waters

NOAA FISHERIES CONSERVATION STRATEGIES: On November 28, 2012 the National Marine Fisheries Service (NMFS) listed the MHI insular false killer whale Distinct Population Segment (DPS) as endangered. In October 2016, NMFS initiated the preparation of a draft recovery plan for MHI insular false killer whales by holding a recovery planning workshop to identify potential recovery criteria and actions to address the threats to MHI insular false killer whale. Some proposed strategies are to: (1) Obtain more demographic information (abundance, injury trends, survival rates, range, habitat use, and social clusters); (2) Monitor commercial longline fisheries in the MHI; (3) Better characterize interactions between State fisheries and MHI insular false killer whales; (4) Develop State and trigger-dependent management actions; (5) Develop a Strategic Outreach Plan; and (6) Better characterize State fisheries.

Main Hawaiian Island Insular False Killer Whale

MCBH CONSERVATION MEASURES: There have been no official or anecdotal sightings of the insular false killer whale within MCBH's 500 yd Naval Defensive Sea Area, otherwise known as the security buffer zone. The waters surrounding the Mōkapu peninsula outside of the security buffer zone contain habitat normally associated with foraging by the MHI insular false killer whales. Although there are no geographical areas owned or controlled by the Department of Defense at MCBH that overlap with the areas under consideration for MHI insular false whale critical habitat, MCBH does conduct programs and activities that would indirectly benefit the MHI insular false killer whales.

Conservation measures at MCBH that benefit the insular false killer whale include:

- **Monitor for presence of MHI insular false killer whales to help direct management activities.**
- **Monitor recreational water activities.** Ensure recreational fishermen attend to their gear, do not discard fishing line or hooks into the water, take immediate action to free the MHI insular false killer whales minimizing injury, and avoid further interactions should an incident occur.
- **Hazardous waste, toxins and contaminants control.** MCBH has a number of programs in place, i.e., Storm Water Management and Monitoring Program, HAZMAT/HAZMIN programs, recycling, maintain oil water separators, and conducts water quality monitoring to prevent and contain environmental contaminants or hazardous material from entering coastal waters.
- **Removal of marine debris.** MCBH conducts efforts to remove marine debris that washes up on Base beaches.
- **Feral animal control.** MCBH has an active feral and nuisance animal control program, which includes capturing and removing rats and cats that can potentially spread toxoplasmosis into the marine environment.
- **Interagency cooperation.** MCBH collaborates with NOAA Fisheries regarding data sharing on marine mammals including insular false killer whale sightings (none to date). If a sick, injured, stranded, entangled, or dead marine mammal appears in MCBH waters or on beaches it is reported, protected, and if necessary transferred to appropriate authorities at NOAA Fisheries for rehabilitation and/or necropsy
- **Education and outreach.** MCBH works with the Marine Corps Community Services (MCCS) marina to disperse educational material to prevent disposing of plastics, nets, or potential contaminants into the ocean and to prevent boat strikes of the MHI insular false killer whales.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 5, 7.4, and Appendix C.

PHOTOS

1. False killer whale. Marie Hill. 2013
2. Proposed critical habitat for O'ahu. Provided by NOAA. 2017.
3. False killer whale mother and calf (*Pseudorca*) Robin Baird. 2008.

Hawaiian Monk Seal

COMMON NAME: Hawaiian Monk Seal
HAWAIIAN NAME: *'Ilio-holo-i-ka-uaua (The Dog that Runs in Rough Seas)*
SCIENTIFIC NAME: *Neomonachus schauinslandi*
LEGAL STATUS: Endangered (Federal and State). Protected under the MMPA. Endangered (IUCN Red List).

APPEARANCE: Monk seals are named for the folds of skin on their head that look like a monk's hood and because of their mostly solitary nature. Female monk seals are slightly larger than males. Females can be up to 7.5 feet long and 450 lbs while males can be up to 7 feet long and 375 lbs. Adults have silvery-grey colored backs with lighter creamy coloration on their underside. Additional light patches and red and green tinged coloration from attached algae are common. The back of the animals may become darker with age, especially in males. Monk seal life expectancy is 25-30 years.

NATIVE RANGE: Monk seals are endemic to the Hawaiian Islands. The majority of the population lives in the Northwestern Hawaiian Islands Papahanaumokuakea Marine National Monument - the largest contiguous fully protected conservation area in the U.S. Monk seals are also found on the MHI; pupping has been recorded on all islands except Lanai where haul-outs, but not pupping, have been recorded.

POPULATION TRENDS: The Hawaiian monk seal is one of the rarest marine mammals in the world, in part because it was hunted to the brink of extinction in the late 19th century. Over the last 50 years, the Hawaiian monk seal population has declined by more than 60%. The monk seal population is currently declining at 4% annually and is estimated at fewer than 1,200 individuals. Survival rates of monk seal pups have dropped from 80-90% in the 1970s to lower than 15% today. As the older breeding females begin to pass away, there are fewer younger animals maturing, which could lead to a catastrophic collapse of the entire population. While the larger NWHI population is shrinking, the MHI population is growing, and is estimated at approximately 200 animals as of 2015. The population in the MHI is estimated to be growing at a rate of approximately 6.5% per year. Accordingly, in recent years, monk seal sightings on MCBH properties have been increasing. For latest information on population trends, see NOAA Fisheries' Marine Mammal Stock Assessment Reports by Species at http://www.nmfs.noaa.gov/pr/ or http://www.nmfs.noaa.gov/pr/pdfs/sars/po2010sehm-hi.pdf.

HABITAT: Monk seals spend two-thirds of their time at sea in waters surrounding atolls, islands, and areas farther offshore on reefs and submerged banks. Monk seals also use deepwater coral beds as foraging habitat. Monk seals are often seen resting on beaches during the day. Monk seals breed and haul-out on sand, corals, and volcanic rock. Sandy, protected beaches surrounded by shallow waters are preferred when pupping.

DIET: Monk seals are primarily benthic (bottom) foragers, and eat a variety of prey including fish, cephalopods (octopus and squids) and crustaceans (crabs, lobster, shrimp). Their diet varies by location, sex, and age. Adults are generally nocturnal hunters while juveniles forage more during the day on species that hide in the sand or under rocks. Monk seals generally forage offshore in waters

60-300 feet deep but can also venture deeper than 1,000 feet, to feed on eels and other benthic organisms.

REPRODUCTION: Females generally mature at age 5-6. It is unknown when males mature. Monk seals are promiscuous and mate underwater. In areas with male-dominated sex ratios, group mobbing of estrus (in "heat") females is known to occur, sometimes causing serious injury or even death to the female. The gestation period is 10-11 months. Birthing rates vary with a range of 30-70% of adult females birthing in a given year. Birthing occurs year round with most births occurring in late March and early April.

Pups are about 3 feet long and 35 lbs at birth. Newborns are black and then molt near the end of their nursing period. Nursing occurs for about 39 days, during which time the mother fasts and remains on land. During this process the female may lose hundreds of pounds. The process of rearing a pup is very challenging, and most females are not able to reproduce every year. After the pup is weaned, the mother abandons her pup and returns to sea. In rare circumstances, lactating females have been observed fostering others' offspring.

ECOLOGICAL THREATS: Reasons for the decline of the monk seal include:

- Entanglement in marine debris
- Ingestion of fisheries debris or toxic substances
- Human disturbance including intentional kills
- Competition for food and a decrease in food availability for some subpopulations (e.g., French Frigate Shoals)
- Shark predation
- Aggressive male behavior towards females
- Pup mortality
- Inherently slow reproductive rates and an aging population
- Low genetic diversity
- Harmful algal blooms
- Toxoplasmosis from beaches or storm water runoff containing infected cat feces
- Habitat loss due to erosion of haul-out and pupping beaches throughout its range
- Global climate change (if sea level continues to rise many of the remaining beaches will disappear).

HUMAN-SEAL INTERACTION: The increase in monk seals in the MHI requires enhanced attention to threats related to species utilization of populated areas. The most serious human related threats in the MHI, as identified in the *Main Hawaiian Island Monk Seal Management Plan* (NFMS 2016), include infectious diseases, human-seal interactions, habitat threats, and human dimensions (management capacity, communication and community engagement, and public knowledge and attitudes). Some examples of threats related to human-seal interactions in the MHI are: embedded hooks from recreational fishing, seals becoming entangled in gill nets and disturbance and harassment of seals on beaches.

Hawaiian Monk Seal

NOAA FISHERIES CONSERVATION STRATEGIES: NOAA Fisheries' overarching monk seal recovery strategies are to: (1) enhance survival of female seals, especially juveniles, born in the NWHI; (2) ensure natural population growth and reduce human-seal interactions in the MHI; (3) prevent and mitigate disease and build seal health care capacity; and (4) administer a recovery program for maximum effectiveness, integration and partnerships. Designated critical habitat was revised in 2015 for the NWHI and the MHI. For O'ahu, designated critical habitat includes all of the nearshore waters out to 200 meters, except where excluded for national security reasons, or deemed ineligible due to protection measures afforded in Base INRMPs. Terrestrial areas from the shoreline to 5 meters inland were also designated for some areas of O'ahu.

MCBH CONSERVATION MEASURES: The majority of monk seal haul-outs at MCBH occur at Kaneohe Bay along the Mōkapu Peninsula beaches. Monk seals also haul-out on the Pu'uloa RTF shoreline, although infrequently, and haul-outs at MCTAB may occur but have not been documented. Sightings at MCBH have increased in recent years with 90 sightings occurring between 2012 and 2016. NOAA Fisheries determined, as discussed in the final rule, that the conservation measures carried out by MCBH provide a benefit to the monk seal and its habitat therefore its coastal lands were precluded from critical habitat designation.

MCBH engages in a variety of conservation measures to support the continued health and viability of this species. Specific management actions detailed in the MCBH INRMP are assessed annually as part of the INRMP performance evaluation in cooperation with USFWS, NOAA Fisheries, and Hawai'i DLNR, and revised if necessary due to new information. The following management activities have been implemented and procedures established to protect Hawaiian monk seals to the greatest extent. Management activities, aimed at maintaining ecosystem health, benefit the species indirectly, such as implementing measures to minimize erosion and polluted run-off and invasive species removal.

Conservation measures that benefit monk seals include:

- **Monitoring for presence to help direct management activities**. Natural Resources staff record occurrences and consult with NOAA Fisheries as needed.
- **Seal protection zones.** All monk seal sightings should be reported to the military police at (808) 257-2123 or to NOAA Fisheries' Monk Seal Hotline at (808) 220-7802. If a monk seal hauls-out in an area people frequent, trained, designated staff will erect barriers around the animal and monitor the site. Signs indicating these are protected species, that people and pets are required to remain at least 100 feet away and contact information are placed near the barriers.
- **Removal of marine debris.** MCBH conducts efforts to remove derelict fishing gear and other marine debris from MCBH jurisdictional waters.
- **Restrictions to protect marine species.** MCBH has several regulations in place that provide protection for monk seals. MCBH Kaneohe Bay has a 500 yard seaward buffer zone within which MCBH claims control to all access and resources. Regulations restrict fishing, surfing, and other near shore activities. Pets must be leashed at all times and are only allowed on beaches during specific times. Enforcement is supported by two

full-time federally-commissioned Conservation Law Enforcement Officers on the Environmental Department staff and occasionally by the Military Police Department.

- **Pet regulations.** Per BO P5233.2, pets must be under control of their owners at all times (indoors, fenced area, or leash). This protects seals from negative encounters with dogs on the beach. In addition, feeding of wild animals aboard MCBH is unauthorized. Cat colonies and feeding stations are prohibited; this helps protect seals from the risk of toxoplasmosis.
- **Interagency cooperation.** MCBH collaborates with NOAA Fisheries regarding data sharing on monk seal sightings. If a sick, injured, stranded, entangled or dead monk seal appears in MCBH waters or on beaches it is reported, protected, and if necessary transferred to appropriate authorities at NOAA Fisheries for rehabilitation and/or necropsy.
- **Educational outreach.** MCBH posts warning signs at frequent monk seal haul-out sites and around hauled-out seals. Briefings given to military personnel on Base include information on monk seal reporting and avoidance procedures. Information on monk seal reporting procedures is posted on the MCBH website and included in Appendix C3.
- **Protocols to be followed during military maneuvers and large scale recreational events.** Beaches and nearshore waters in the vicinity of the event are surveyed one hour prior to the event and throughout the duration of the event. If monk seals are present prior to the event, it may be delayed, rerouted, or cancelled. If monk seals appear during an event people are asked to move away from the area and regular protection zone protocols are followed.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 6, 7.4, Appendix C & D.

PHOTOS

1. Hawaiian monk seal at MCBH. MCBH. 2010.
2. Hawaiian monk seal on O'ahu. SRGII. 2011.
3. Hawaiian monk seal signage used at MCBH. Dr. Diane Drigot. 2010.

Hawai'i Turtles

COMMON NAME: Green Turtle, Green Sea Turtle
HAWAIIAN NAME: *Honu*
SCIENTIFIC NAME: *Chelonia mydas*
LEGAL STATUS: Threatened (Federal/State). Endangered (IUCN Red List). Protected under CITES.

APPEARANCE: Green sea turtles are the largest hard-shell sea turtle, averaging three feet in length and weighing 300 to 350 pounds. They have a heart-shaped shell that is smooth with shades of black, gray, green, brown and yellow on top and yellow-white on the bottom. All hatchlings have a black dorsal surface and a white ventral surface. Flippers of green sea turtles are single-clawed.

HABITAT: Green sea turtles utilize ocean beaches for nesting and open ocean and coastal areas for feeding. Female green sea turtles migrate between foraging areas and nesting beaches. Basking can occur on both nesting beaches and non-nesting areas.

DIET: Adult green sea turtles are almost exclusively herbivorous and feed primarily on seagrass and algae (*limu*).

REPRODUCTION: Green sea turtles nest primarily in the Northwestern Hawaiian Islands (NWHI), but frequent the main Hawaiian Islands (MHI) for much of the year feeding on *limu*. Females nest every 2 to 4 years after approximately 22 years of age. They return to the same beaches where they hatched. Nesting may occur May 15 – September 30. Females lay an average of 5 nests (or clutches) of 135 eggs each at approximately two week intervals. Eggs incubate for 65-80 days before hatching. Hatchlings emerge almost exclusively at night and move immediately to the water.

THREATS: Threats to all of Hawai'i's sea turtles include: loss of foraging and nesting habitat due to climate change (sea level rise), development, and pollution; recreational beach use (including nest damage by recreational vehicles); predation of eggs and hatchlings by mongoose, free-roaming cats and pigs; coastal development; beach erosion; artificial lighting; boat collisions; entanglement in fishing gear and marine debris; incidental take in sport and commercial fisheries; poaching; military testing and training activities on beaches; and the fibropapilloma virus.

NOAA FISHERIES and USFWS CONSERVATION STRATEGIES: Protect species through use of international agreements, protect primary nesting areas of the green sea turtle in the NWHI, enforce regulations prohibiting take of the species, mediate the adverse effects on nesting and foraging habitats, stop direct harvest of turtles and eggs through education and enforcement actions, reduce incidental harvest by deep water fisheries, and prevent capture in nearshore gillnets and hookings by nearshore fishers.

Hawai'i Turtles

MCBH CONSERVATION MEASURES

Green sea turtles are frequently seen in MCBH Kaneohe Bay's marine buffer zone and are, on rare occasions, seen basking along the Pu'uloa RTF shoreline. The first known nesting by a green sea turtle at MCBH occurred in June 2015 at MCBH Kaneohe Bay. Although the turtle was not sighted, six holes were detected and hatchling tracks and dead hatchlings were observed.

MCBH engages in a variety of conservation measures to support the continued health and viability of green sea turtles. Specific management actions detailed in the MCBH INRMP are assessed annually as part of the INRMP performance evaluation in cooperation with USFWS, NOAA Fisheries, and Hawai'i DLNR, and revised if necessary due to new information. The following management activities have been implemented and procedures established to protect green sea turtles to the greatest extent possible. They also apply to the less common hawksbill and olive ridley sea turtles. Management activities aimed at maintaining ecosystem health benefits these species indirectly, such as implementing measures to minimize erosion and polluted run-off and invasive species removal.

Predator Control. Predator control is conducted year round for the protection of MCBH's endangered waterbirds and MBTA-protected ground nesting seabirds (wedge-tailed shearwaters). Should a turtle nest be discovered outside an area covered by normal predator control efforts, additional control efforts will be instituted to protect the turtle nesting site.

Sea Turtle Monitoring. Natural Resources staff monitor for and record occurrences of sea turtle activity. Ability to monitor more frequently is constrained by personnel availability, vehicle availability, and the fact that there are miles of shoreline to monitor, much of which is currently accessible only by foot. MCBH consults with NOAA Fisheries and USFWS as necessary. Information collected during monitoring includes: survey date, turtle activity (e.g., nests, false crawl, non-nesting excavation, observation of adults), general location of nests, approximate size and age (adult/juvenile), and other noteworthy observations (e.g., tumors, tag).

- MCBH Kaneohe Bay Shorelines: Pyramid Rock, 2,000 ft; North Beach, 5,300 ft; Fort Hase, 6,300 ft with (3,100 ft within Wildlife Management Area)
  - Efforts will be made to enlist support from volunteers, water safety personnel, and NOAA monk seal volunteers to gain more visual coverage of Mōkapu Peninsula beaches.
  - Monitor all beaches at least 1x/week year-round for green sea turtles coming ashore to bask. Opportunistic monitoring will supplement routine monitoring.
  - During nesting season (May 15-Sep 30), monitor Fort Hase Beach (site of 2015 nesting) 2-3x/week.
  - Monitor any discovered nests 2-3x/week. Within 2 weeks of eggs hatching, monitor every other day or daily if personnel availability and time permits.
- MCTAB Shoreline [5,000 ft]
  - Will seek to enlist the support of Bellows Air Force Station (AFS) to help monitor MCTAB's shoreline.
  - Monitor once a week for green sea turtles coming ashore to bask.
  - Monitor 1-2x a week if a nest is discovered, more frequently if conditions allow.
- Pu'uloa RTF Shoreline [2,950 ft]
  - The Range's beach guards monitor Pu'uloa's restricted beach almost daily to prevent unauthorized access.
  - The beach is highly eroded, very narrow, and inland movement is restricted by impact berms.
  - On the rare occasions a green sea turtle comes ashore on the beach at Pu'uloa, it would be reported.

Hawai'i Turtles

Wildlife Friendly Lighting. Natural Resources staff work with facility engineers to minimize lighting issues throughout MCBH. Particularly near shorelines, lights have been removed, numbers of lights limited, or not installed in the first place. When lighting is required, all exterior lights for new construction and renovations are required to use International Dark-Sky compliant fixtures, unless otherwise required by the military mission.

Beach Management/Shoreline Protection. MCBH encourages plant growth, especially native beach strand vegetation on beach areas to reduce erosion and stabilize the firm land. Efforts are conducted to control invasive plant species.

Sea Turtle Protection Zones. Any incidences of basking or nesting sea turtles should be reported to the military police at (808) 257-2123. If a sea turtle comes ashore for basking or nesting on a beach where people frequent, designated personnel will erect barriers around the animal and monitor the site. Signs indicating these are protected species, that people and pets are required to remain at least 100 feet away, and contact information are placed near the barriers. Additional protective measures include:

Sea Turtle Basking:

- Only pre-approved military equipment (AAVs)/training and civilian vehicles used for emergency response, policing, debris removal, or biologic monitoring are allowed on beaches.
- Pets must be leashed at all times and are only allowed on certain beaches during specific times.
- Control invasive plant species.

Sea Turtle Nesting:

- Immediately control and sign the area.
- Limit the presence of people within 100 feet of the nesting site.
- Make beach off-limits to dogs until the hatchlings depart.
- Restrict nighttime beach activities.
- Stop alcohol consumption on beach.
- Minimize artificial lighting on beach.
- Prevent driving of any vehicles on the ocean-ward side of active nests, tire ruts will impede the movement of hatchlings. Rake ruts to ensure that emerging hatchlings have a clear path between the nest and water.
- If nest excavations will be conducted: Coordinate with the local government and USFWS a minimum of 72 hours after the first observed emergence, or according to the terms and conditions on an authorized Sec 10(a)(1)(a), endangered species permit.

Marine Debris Removal. MCBH conducts efforts to remove derelict fishing gear and other marine debris from MCBH jurisdictional waters. Monitor for and remove marine debris, including derelict fishing gear, nets, or other entanglement hazards, from the beach.

Hawai'i Turtles

Access Restrictions. MCBH has several regulations in place that provide protection for sea turtles. MCBH Kaneohe Bay has a 500 yard seaward buffer zone within which MCBH exerts control to all access and resources. Regulations restrict fishing, surfing, and other near shore activities. Enforcement is supported by two full-time federally-commissioned Conservation Law Enforcement Officers on the Environmental Department staff.

Protocols for Military Maneuvers and Large-scale Recreational Events. Beaches and nearshore waters in the vicinity of the event are surveyed at least one hour prior to the event and observed during the event. If sea turtles are present, the event may be postponed, cancelled, or moved at least 150 yards away from the marine animal. In the unlikely event a sea turtle comes ashore during an event people and equipment will be required to move at least 150 yards away from the area and regular protection zone protocols are followed.

Injured/Dead Response. If a sick, injured, stranded, entangled, or dead sea turtle appears in MCBH waters or on beaches it is immediately reported to the Military Police, protected, and reported to NOAA's Sea Turtle Stranding Hotline (808) 725-5730 or (808) 256-4377 (after hours) for rehabilitation and/or necropsy. If the turtle is in the water, bring ashore if safe to do so, and remove entanglement. Refrain from removing barbed hooks.

Educational Outreach. Briefings given to military personnel on Base include information on sea turtle reporting and appropriate procedures to follow in their presence. Informational material on sea turtles is provided to visitors staying at the Temporary Lodging Facility (TLF), beach cottages, cabanas and made available at all public events held on base. Fishermen are encouraged to use barbless circle hooks. Information on sea turtle reporting procedures is posted on the MCBH website or you may contact the Environmental Dept at (808) 257-7000 or (808) 216-7135.

Hawai'i Turtles

COMMON NAME: Hawksbill Turtle
HAWAIIAN NAME: *Honu'ua*
SCIENTIFIC NAME: *Eretmochelys imbricate*
LEGAL STATUS: Endangered (Federal/State). Endangered IUCN Red List. Protected under CITES.

APPEARANCE: Hawksbill turtles are a small to medium sized marine turtle; averaging two and a half feet in length and weighing 100 to 150 pounds (can grow as large as 200 pounds). The top shell is dark to golden brown with streaks of orange, red and black with a serrated back and overlapping thorny scales or plates. The bottom shell is clear yellow. They usually have 2 claws on each of their 4 flippers. Head is elongated and tapers to a point with a beak-like mouth.

HABITAT: Hawksbill turtles frequent rocky areas, coastal reefs, shallow coastal areas and estuaries, and prefer water less than 65 feet deep.

DIET: Hawksbill turtles are often associated with the coral reef community and feed primarily on sponges, other invertebrates, and algae.

REPRODUCTION: Hawksbill turtles nest in the MHI, predominantly on the Island of Hawai'i at the same beaches where they were born. Females nest every 2 to 3 years after they mature at about 30 inches in size (age unknown). Females lay an average of 3 to 5 nests (or clutches) of approximately 130 eggs each every 14 to 16 days. Eggs incubate for 2 months before hatching.

MCBH OCCURENCE: Although no hawksbill turtles have been officially recorded within areas of MCBH jurisdiction, the environmental conditions are favorable for their presence. An October 2016 nesting on Bellows AFS (adjacent to MCTAB) was suspected to be a hawksbill turtle.

CONSERVATION MEASURES: The same conservation measures afforded the green sea turtle will be applied to the hawksbill turtle where appropriate.

COMMON NAME: Olive Ridley Sea Turtle
SCIENTIFIC NAME: *Lepidochelys olivacea*
LEGAL STATUS: Threatened (Federal/State). Protected under CITES.

APPEARANCE: Adult olive ridley sea turtles average 100 pounds, are olive/ grayish green in color and have a heart shaped top shell with 5 to 9 pairs of thorny scales or plates. They have 1 to 2 claws on each of their 4 flippers. Hatchlings are mostly black with a bit of green on the sides

HABITAT: Olive ridley sea turtles primarily spend time in the open ocean but have been known to inhabit coastal areas. They migrate from pelagic foraging to coastal breeding and nesting grounds, back to pelagic foraging. They are globally distributed in the tropical regions of the world.

Hawai'i Turtles

DIET: Adult olive ridley sea turtles are carnivorous and feed on a wide variety of organisms including fish and mollusks.

REPRODUCTION: Nesting occurs throughout tropical waters, but rarely in Hawai'i. Olive ridley sea turtles are known for their habit of mass synchronized nestings where hundreds to thousands of females come ashore at once to lay their eggs. Females nest once or twice a season every year after about 15 years of age. They produce a clutch of approximately 100 eggs and incubation takes 50 to 60 days.

MCBH OCCURENCE: Although olive ridley sea turtles are rarely seen in Hawai'i, on July 16, 2009 one nested on MCBH's Pyramid Rock Beach; the first documented nesting on O'ahu. Although other known nestings occurred in on Maui (1985) and Hilo, Hawai'i (2002), the MCBH nesting was the most successful of all events, with over 50% of the eggs laid hatching in September 2009. Natural Resources staff collaborated with NOAA Fisheries and USFWS biologists to monitor the nest and relocate, protect, and conduct a public releasing of the hatchlings.

CONSERVATION MEASURES: The same conservation measures afforded the green sea turtle will be applied to the olive ridley sea turtle where appropriate.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Sections 4, 6, 7.4, 7.6, 7.7, 8, Appendix C & D.

PHOTOS

1. Andy Bruckner. NOAA. http://www.nmfs.noaa.gov/pr/species/turtles/photos.htm#green
2. Green Sea Turtle Nesting Attempt at Fort Hase Beach, MCBH
3. Nick Caloyianis. http://animals.nationalgeographic.com/animals/reptiles/hawksbill-turtle/
4. Photographer unknown, Nesting Olive Ridley at Pyramid Rock Beach, MCBH.
5. Lance Bookless, MCBH, Olive Ridley Hatchlings at Pyramid Rock Beach, MCBH.

Nesting Beach Surveys
Topic: Crawl Identification

Adapted from Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Guidelines for Marine Turtle Permit Holders
PIFWO Version: June 2016

GLOSSARY OF TERMS

Crawl – Tracks and other sign left on a beach by a sea turtle.

False crawl – A crawl resulting from an abandoned nesting attempt (a non-nesting crawl).

Nest -- A crawl resulting from a nesting attempt in which eggs were deposited.

Egg chamber – The cavity excavated by the rear flippers of a nesting turtle into which the turtle deposits a clutch of eggs.

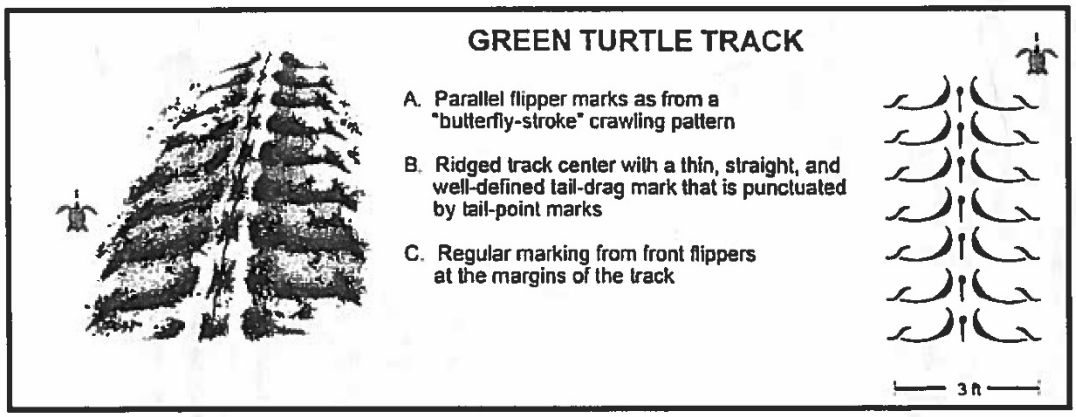
Primary body pit – The excavation made by a turtle on the beach just prior to digging the egg chamber.

Backstop – An approximately 45° incline made in the sand as sand is pushed back with the rear flippers during the excavation of the primary body pit. Such a steeply inclined backstop is not present in the secondary body pit.

Escarpment – The perimeter of the secondary body pit where the front flippers have cut away a small cliff into the surrounding sand.

CRAWL IDENTIFICATION

Green turtle (*Chelonia mydas*).tracks from a sea turtle with simultaneous limb movement, a center drag mark from the tail, and track width approximately 35 inches:



If the crawl is from a green turtle, is it a nest or a false crawl?

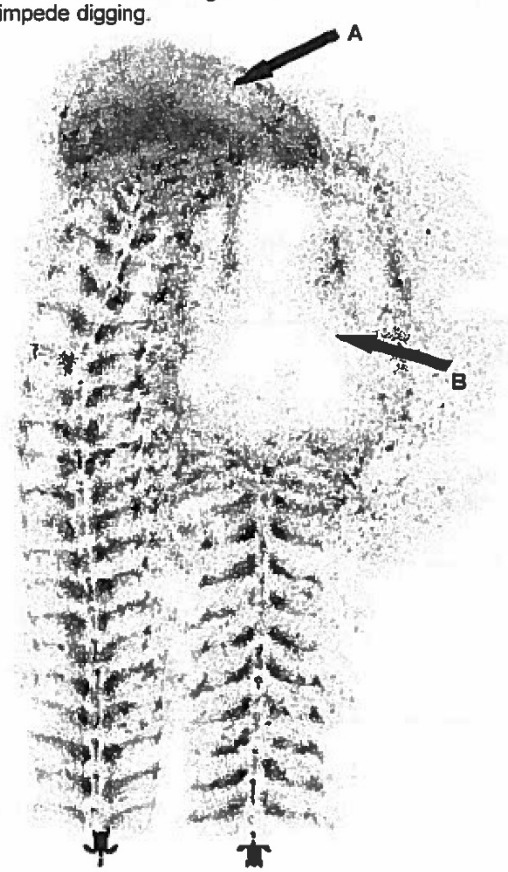
A. Identify emerging and returning tracks by their direction (Figure 1). As a green turtle crawls, it will push sand backward with each flipper stroke.

B. Follow the path taken by the turtle and look for the following attributes.

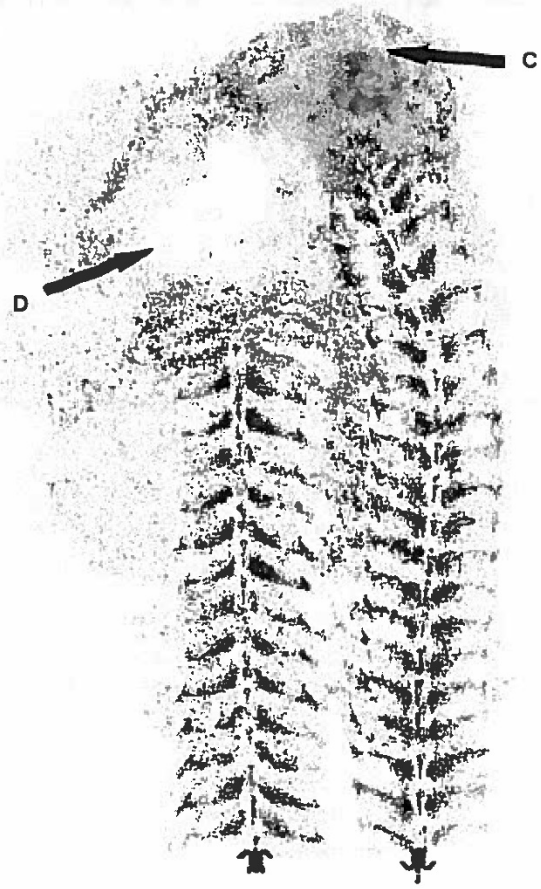
   1. Evidence of front flipper covering (Figure 3). If present, the crawl is a **NEST**.
      a. Sand thrown into a mound that is more than twice as long as the visible body pit or a deep (1-2 foot) secondary body pit with an escarpment (Figure 3).
   2. Evidence of an abandoned nesting attempt. If present, the crawl is a **FALSE CRAWL**.
      a. Very little or no sand disturbed other than tracks.
      b. Less sand thrown over the emerging track and a shallower body pit than in 1a above (Figure 3).

Figure 3. Characteristics of **green turtle crawls** indicating either that the turtle had previously nested (left a nest) or had abandoned its nesting attempt (left a "false crawl").

A **green turtle nest** site on an open beach showing a secondary body pit (**A**) and a mound of thrown sand (**B**) that is greater than twice as long as the visible secondary body pit. Note that smaller nest mounds are expected when obstacles or vegetation impede digging.



A **green turtle false crawl** on an open beach showing an abandoned primary body pit (**C**) and a mound of thrown sand (**D**) that is smaller than twice as long as the visible primary body pit. Note that many green turtle nests may have body pits and nest mounds that look similar to this.



Rice Corals

COMMON NAME: Rice Corals: Irregular rice coral/ Blue rice coral/ Sandpaper rice coral
HAWAIIAN NAME: koa (general name for several species of corals including rice corals)
SCIENTIFIC NAME: *Montipora dilitata/ Montipora flabellata/ Montipora patula*
LEGAL STATUS: Protected under HAR Chapter 13-95

APPEARANCE: *Montipora* species are included in the group stony corals due to their hard skeleton. *Montipora dilitata* colonies are usually purple or pale to dark brown and reach 3 feet in diameter. Morphology can be variable with colonies being a combination of encrustations, plates, knobs, and branches. They are characterized by a very smooth surface lacking papillae and verrucae. Corallite walls are well defined. *Montipora flabellata* are encrusting corals with irregular lobes that are usually blue in color (but may photograph pink), sometimes brown or purple. Corallites are small, papillae cover the colony surface and are sometime fused into ridges. Septa are poorly developed. They are normally a flat, ground covering coral. *Montipora patula* colonies are small encrusting or tiered plate corals chocolate brown in color with light borders. They can grow to over 6 feet across. Plates usually have free edges, corallites are small and irregular in height, and papillae are concentrated around corallites.

Montipora diltata

Montipora flabellate

Montipora patula

NATIVE RANGE: *Montipora* species are endemic to the Hawaiian Islands. *Montipora dilitata:* In the Main Hawaiian Islands it is only known to occur in Kāne'ohe Bay. Previously it was much more abundant in Kāne'ohe Bay. *Montipora flabellata*: Occurs around all of the Hawaiian Islands and is found within MCBH's 500 yd buffer zone. *Montipora patula*: Occurs around all the Hawaiian Islands.

HABITAT: *Montipora dilitata:* Restricted to shallow, sub-tidal environments with calm water. *Montipora flabellata*: Occurs in shallow, high wave-energy environments down to a depth of ten meters. *Montipora patula*: Occurs in reef flats down to a depth of ten meters.

DIET: *Montipora* species, like many coral species, have a mutually beneficial relationship with photosynthetic algae known as zooxanthellae that live within the coral's tissues. The coral provides protection for the algae and the algae provide energy and nutrients for the coral produced through photosynthesis. Stony corals with zooxanthellae can get up to 98% of their nutrition from the sugars produced by the algae. Stony corals may also feed on small plankton or dissolved organic matter that is in the water.

REPRODUCTION: Rice corals are hermaphrodites with each individual having both male and female sexual organs. They spawn through a synchronized release of eggs and sperm that is prompted by a particular combination of day length, tide, and moonlight. Fertilization occurs on the surface and the resulting coral larvae actively select substrate to settle on. *Montipora* species are also known to reproduce asexually by fragmentation. These species reach sexually maturity between three and eight years of age.

Rice Corals

ECOLOGICAL THREATS: Bleaching related to the rise in ocean temperatures as a result of global climate change. Bleaching events lead to mortality. Predation by crown-of-thorns starfish (*Acanthaster planci*). Diseases such as acute Montipora white syndrome, a tissue disease that can lead to mortality, are a threat but have not yet caused serious mortality of corals in Hawai'i. Alien alga species and invasive green alga can cover rice corals inhibiting the ability of zooxanthellae to photosynthesize. Pollution, such as high levels of nutrients, sediments, and fresh water, negatively impacts corals in the nearshore areas. Anchors, fish pots, swimmers, and divers can all cause damage to corals.

CONSERVATION STRATEGIES: It is illegal to take, break, or damage stony coral. Stony corals are extensively monitored by the DLNR Division of Aquatic Resources, NOAA Fisheries, and the Coral Reef Assessment and Monitoring Program partnership, including the University of Hawai'i. Agencies and groups work together to: increase education outreach (especially to tourists), prevent establishment of alien species, remove marine debris, restore habitat where feasible, expand or create Marine Protected Areas, and provide rapid respond to shipwrecks, oil spills, disease outbreaks, hurricanes, and other acute impacts.

MCBH CONSERVATION MEASURES: Rice corals occur in Kāne'ohe Bay within and adjacent to the 500 yard buffer zone. Conservation measures that benefit these species of rice coral include:

- **Habitat protection and enhancement**. Removal of marine debris is conducted on a regular basis. MCBH engages in management actions focused on reducing nonpoint source pollution as well as beach and shoreline erosion. MCBH manages spill risk as a part of its Natural Resource Trustee Responsibilities and complies with NRDA and spill response obligations. Assessment of the extent of the threat of alien species in ongoing.
- **Monitoring for presence to help direct management activities**. MCBH funds benthic community and habitat surveys in its jurisdictional waters and the near shore environment of MCTAB to record the abundance and health of marine resources. These surveys are used to direct management actions to avoid or minimize negative impacts. Monitoring includes photo-documenting marine resources as well as threats and risks. Natural Resources staff acknowledge that effects due to climate change are important to monitor and if possible, mitigate.
- **Education and outreach**. Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers. A focus is placed on avoiding damage to the corals while engaging in recreational activities. Natural Resources staff engage with MCCS about educating boaters and divers at the marina and those that rent their beach cottages. Interpretive exhibits are currently being developed, to include one panel specifically focused on coral reefs.

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3. Jodi N. Harney, Coral Reef Network. http://www.coralreefnetwork.com/marlife/corals/acrop.htm

Hawaiian Duck

COMMON NAME: Hawaiian Duck
HAWAIIAN NAME: *Koloa*
SCIENTIFIC NAME: *Anas wyvilliana*
LEGAL STATUS: Endangered (Federal and State). MBTA protected.

APPEARANCE: Hawaiian ducks, or koloa, are a small dabbling duck. Both sexes resemble a dark female mallard, mottled brown with blue wing bars bordered on both sides by white. Males have darker head and neck feathers, an olive colored bill, bright orange feet and legs, and are 19 to 20 inches long. Females have a more orange or gray colored bill with a dark mark on the upper ridge, feet and legs that are dull orange, and are 16 to 17 inches long. Data indicate that there has been extensive hybridization between koloa and feral mallards on O'ahu. There is often difficulty distinguishing genetically pure koloa (*Anas wyvilliana*) from true mallards (*Anus platyrhynchos*) and koloa-mallard hybrids, although mallards and hybrids tend to be larger. For management purposes the three species often must be grouped together as koloa/ hybrid/ mallard.

NATIVE RANGE: Endemic. Previously koloa inhabited all of the main Hawaiian Islands except Lāna'i and Kaho'olawe. They are now restricted to wild populations on Kaua'i and Ni'ihau and small reestablished populations on O'ahu, Hawai'i and Maui.

HABITAT: Koloa occupy coastal wetlands, freshwater pools, bogs, streams, and marshy areas. They prefer shallow water with nearby dense cover and safe roosting sites (islands).

DIET: Koloa feed on grass seeds and other vegetation, crustaceans, insects, nematodes, and algae.

REPRODUCTION: Information on the nesting biology of koloa is sparse. Nesting occurs year round with the majority of activity occurring between January and May. Koloa build their nests on the ground near water. They generally lay eight to ten eggs that incubate for less than one month.

ECOLOGICAL THREATS: The main threat to koloas is hybridization with feral mallards. Other threats include: habitat loss; altered hydrology (modifications to wetland habitats); alien plant encroachment; avian botulism; and introduced mammalian predators. Duckling predators include mongooses, cats, dogs, black-crowned night herons, and common mynas.

USFWS CONSERVATION STRATEGIES: Although there is not currently an active captive breeding program, koloa bred in captivity have previously been used for reintroductions. Captive breeding programs or future translocation of birds are still considered valid and valuable methods of increasing the population on certain islands. The importation of mallards is restricted by the State and efforts to eliminate koloa/mallard hybrids are being evaluated. Efforts to protect and restore wetlands and control predators benefit this species.

Hawaiian Duck

MCBH CONSERVATION MEASURES: Hawaiian ducks and/or hybrids have been recorded at MCBH Kaneohe Bay, MCTAB and Pearl City Annex. Regularly conducted surveys for waterbirds indicate that the number of Hawaiian duck/ hybrid/ mallards at MCBH has increased notably since 2002. Prior to 2002, surveys typically detected less than 20 ducks per visit. Between 2002 and 2010 the number present at MCBH has steadily grown, with over 100 recorded during regular counts in each year since 2010.

Conservation measures that benefit koloa include:

- **Habitat protection and enhancement.** Although maintaining healthy non-invasive vegetation is important, ducks on MCBH have adapted well to an urbanized environment. They are regularly found foraging in the open grassy areas around base and at the Water Reclamation Facility. Presence documented at Klipper Golf Course Ponds and the Percolation Ditch wetland has increased since the implementation of habitat enhancement projects in these locations in 2003 and 2007 respectively.
- **Limiting disturbance.** Hawaiian ducks appear unfazed by human activity, including normal light and noise pollution associated with the Base, and it doesn't appear to affect their breeding success. Established BMPs and conservation measures are employed when a project may disturb or otherwise modify a koloa's behavior.
- **Predator Control.** Koloa benefit from the on-going trapping of cats, mongoose, and rats within the Wildlife Management Area and wetlands.
- **Wildlife Friendly Lighting.** Although lighting on Base does not appear to be an issue, Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Monitoring to help direct management activities.** Natural Resources staff record occurrences and consult with USFWS as needed. Due to recent outbreaks of avian botulism, koloa at MCBH Kaneohe Bay will be closely monitored during summer months for symptoms of avian botulism in an effort to detect the disease in the earliest stages allowing for treatment of sick ducks and potentially limiting the spread of disease and the number of associated deaths.
- **Education and Outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

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PHOTOS

1. Hawaiian Duck. USFWS, Pacific Islands Fish and Wildlife Office. https://www.fws.gov/refuge/Hanalei/wildlife_and_habitat/Hawaiian_Duck.html

Hawaiian Coot

COMMON NAME: Hawaiian coot
HAWAIIAN NAME: *'Alae ke'oke'o*
SCIENTIFIC NAME: *Fulica alai*
LEGAL STATUS: Endangered (Federal and State). Vulnerable (IUCN Red List). MBTA protected.

APPEARANCE: The Hawaiian coot is a small waterbird with a black head, a solid grayish-black body, a white bill, a prominent white frontal shield and white undertail feathers that are easily seen when the bird is swimming or displaying. Feet are lobed (not webbed) and are greenish-gray.

NATIVE RANGE: Endemic to Hawai'i, Hawaiian coots occur mainly in coastal plain wetlands below an elevation of 1350 feet. On the Island of Hawai'i Hawaiian coots use stock ponds at elevations up to 6600 feet and on Kaua'i they use ponds up to 4900 feet in elevation.

HABITAT: Hawaiian coots generally occur in lowland freshwater wetland habitats consisting of a mixture of emergent plant growth with open water. Occasionally they use brackish and saltwater habitats. They typically forage in shallow water (less than 12 inches), but will dive in water up to 48 inches deep.

DIET: Hawaiian coots generally feed close to nesting areas in somewhat open water. They are omnivorous, feeding on worms, snails, crustaceans, the adults and larvae of aquatic and terrestrial insects, small fish, and tadpoles. Coots also feed on the seeds and leaves of a variety of aquatic and terrestrial plants including sedges, grasses, and rushes. They will travel long distances, including between islands, to locate food sources.

REPRODUCTION: The coot nests primarily in fresh or slightly brackish shallow water (15–40 inches) interspersed with robust emergent wetland plants. They may construct floating nests with aquatic vegetation in open water or anchored to emergent vegetation. Nesting occurs year round but mainly between March and September. Clutch size is three to ten eggs.

ECOLOGICAL THREATS: Hawaiian coots are threatened by habitat loss, altered hydrology, non-native invasive plants, and introduced predators. Mongooses are especially harmful to ground nesting birds such as the Hawaiian coot. Other predators include dogs, feral cats, rats, and barn owls, which potentially prey on adults, young or eggs.

USFWS CONSERVATION STRATEGIES: Conservation actions are taken to protect current populations and breeding habitats as well as establish additional populations to reduce the risk of extinction. Efforts include restoration of wetland habitat, management of existing habitat, and continued monitoring of populations to assess the efficacy of management.

Hawaiian Coot

MCBH CONSERVATION MEASURES: Hawaiian coots occur in wetlands at MCBH Kaneohe Bay, primarily at the Percolation Ditch, the Klipper Golf Course Ponds, and fresh-water influenced portions of the Nu'upia Ponds Wildlife Management Area. They are also found at MCTAB. Conservation measures that benefit Hawaiian coots include:

- **Habitat protection and enhancement.** Although maintaining healthy non-invasive vegetation is important, Hawaiian coots on MCBH have adapted well to an urbanized environment.
- **Limiting disturbance.** Hawaiian coots appear unfazed by human activity, including normal light and noise pollution associated with the Base, and it does not appear to affect their breeding success. Established BMPs and conservation measures are employed when a project may disturb or otherwise modify a coot's behavior.
- **Predator Control.** Hawaiian coots benefit from the on-going trapping of cats, mongoose, and rats within the Wildlife Management Area and wetlands.
- **Wildlife Friendly Lighting.** Although lighting on Base does not appear to be an issue, Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Monitoring to help direct management activities.** Natural Resources staff record occurrences and consult with USFWS as needed.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

REFERENCES

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Sections 7.1, 7.2, Appendix C & D.

PHOTOS

1. Hawaiian Coot. David Schultz. http://www.arkive.org/hawaiian-coot/fulica-alai/
2. Hawaiian Coot family at enhanced Percolation Ditch wetland habitat, MCBH Kaneohe Bay. Dr. Diane Drigot.
3. Hawaiian Coot feeding young at enhanced Percolation Ditch wetland habitat. MCBH Kaneohe Bay. Carroll Cox.

Hawaiian Common Moorhen

COMMON NAME: Hawaiian common moorhen or Hawaiian common gallinule
HAWAIIAN NAME: *'Alae 'ula*
SCIENTIFIC NAME: *Gallinula galeata sandvicensis*
LEGAL STATUS: Endangered (Federal and State)

APPEARANCE: The Hawaiian common moorhen is black on the top portion of its body with dark slate blue below and a white stripe on the flanks. They have a red shield over their red and yellow bill and feet are lobed rather than webbed. The *'alae 'ula* is associated with the goddess Hina and with legends about bringing the secret of fire-making to the Hawaiian people.

NATIVE RANGE: The Hawaiian common moorhen is a non-migratory, endemic subspecies of the common moorhen (*Gallinula galeata sandvicensis*). Historically they occurred on all of the main Hawaiian Islands except Lāna'i and Kaho'olawe.

HABITAT: Hawaiian common moorhens generally occur in freshwater wetlands below 400 feet elevation. They are found in freshwater marshes, wetland agricultural areas, reservoirs, wet pastures, and occasionally brackish water.

DIET: The Hawaiian common moorhen's diet varies with habitat but includes algae, grass seeds, plant material, insects, and snails.

REPRODUCTION: Nesting habitat is restricted to areas of standing freshwater less than two feet deep with dense emergent vegetation. Nesting occurs year round, but mainly takes place during spring and summer months. Floating nests are constructed in dense vegetation.

ECOLOGICAL THREATS: Hawaiian common moorhens are threatened by habitat loss, non-native invasive plants, introduced predators, avian disease and environmental contaminants.

USFWS AND HAWAI'I DLNR CONSERVATION STRATEGIES: General conservation activities involve protecting current populations as well as establishing new populations to reduce the risk of extinction. Conservation efforts also include protection and management of existing habitat (including key breeding habitat), restoration of wetlands, and population monitoring.

Hawaiian Common Moorhen

MCBH CONSERVATION MEASURES: Hawaiian common moorhens occur in wetlands at MCBH Kaneohe Bay, primarily at the Klipper Golf Course Ponds, the Percolation Ditch wetland, and the fresh-water influenced sections of Nu'upia Ponds Wildlife Management Area. They are also found at MCTAB.

Regular conservation measures that benefit Hawaiian common moorhens include:

- **Habitat protection and enhancement.** Although maintaining healthy non-invasive vegetation is important, moorhens on MCBH have adapted well to an urbanized environment. Breeding activity documented at Klipper Golf Course Ponds and the Percolation Ditch wetland has increased since the implementation of habitat enhancement projects in these locations in 2003 and 2007 respectively. Established BMPs and conservation measures are employed when a project may have an effect on birds.
- **Limiting disturbance.** Hawaiian common moorhen appear unfazed by human activity, including normal light and noise pollution associated with the Base, and it does not appear to affect their breeding success.
- **Predator Control.** Moorhen benefit from the on-going trapping of cats, mongoose, and rats within the Wildlife Management Area and wetlands.
- **Wildlife Friendly Lighting.** Although lighting on Base does not appear to be an issue, Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Monitoring to help direct management activities.** Natural Resources staff record occurrences and consult with USFWS as needed.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

REFERENCES

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Sections 7.1, 7.2, 7.3, Appendix C & D.

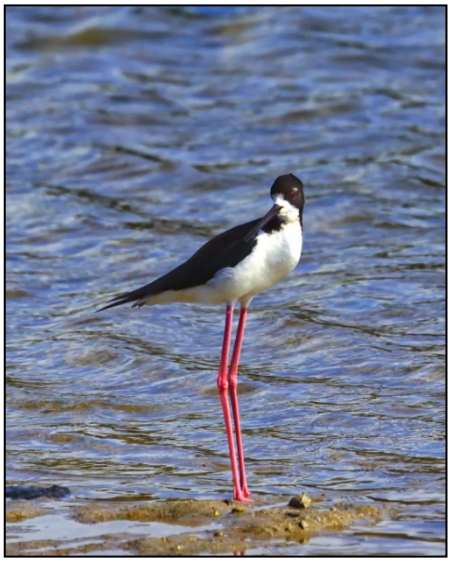
PHOTOS

1. Hawaiian common moorhen. MCBH.
2. Hawaiian common moorhen eggs. MCBH.
3. Hawaiian common moorhens parents and chicks. MCBH.

Hawaiian Stilt

COMMON NAME: Hawaiian stilt
HAWAIIAN NAME: *Ae'o*
SCIENTIFIC NAME: *Himantopus mexicanus knudseni*
LEGAL STATUS: Endangered (Federal and State). Vulnerable (IUCN Red List). MBTA protected.

APPEARANCE: The Hawaiian stilt is a slender, pink-legged, wading shorebird with black upper-parts, white under-parts, and a long black bill. It grows up to 15 inches in length. The Hawaiian subspecies differs from the North American stilt by having more black on its face and neck, a longer bill, tarsus, and tail.



NATIVE RANGE: Hawaiian stilts are non-migratory birds, endemic to Hawai'i. They were historically known to be on all major islands except Lāna'i and Kaho'olawe. They still occur on all major islands, except Kaho'olawe, with the majority of the population occurring on Maui and O'ahu.

HABITAT: Hawaiian stilts utilize fresh, brackish and saline coastal waters. They use little vegetation for nesting or feeding and breed in marshland, mudflats, shallow open water, flooded fields, borders of salt ponds, mangrove swamps, coastal playas and ephemeral wetlands. They require specific water depths of around five inches for optimal foraging. Nest sites are separated from feeding sites.

DIET: Hawaiian stilts feed in shallow water primarily on invertebrates, crustaceans, aquatic and terrestrial insects, and small fish.

REPRODUCTION: Hawaiian stilts nest on low relief shorelines, mudflats in wetlands, and small islands within bodies of water. Nesting occurs from March to August with a peak in May-June. At MCBH Kaneohe Bay stilt nesting season peaks in June-July, which is later than on the south side of O'ahu. During nesting, stilts move between a nesting area and a feeding area. Although chicks leave the nest immediately, immature birds stay in family groups through the winter until the next breeding season begins.

ECOLOGICAL THREATS: The primary cause of species decline is the loss and degradation of wetland habitat and predation by introduced species, especially the small Asian mongoose. Mongooses are voracious predators that are especially harmful to ground nesting birds such as the endangered Hawaiian stilt. Other factors include free roaming cats, alien plants, disease and some environmental contaminants.

USFWS AND HAWAI'I DLNR CONSERVATION STRATEGIES: Hawaiian stilts are listed as a species of primary importance in the U.S. Pacific Islands Regional Shorebird Conservation Plan. Although the population is considered stable, it remains at very low levels. State and Federal conservation efforts include wetland protection, enforcement of a stilt hunting ban, education, and working with private landowners.

MCBH CONSERVATION MEASURES: Hawaiian stilts have been recorded at coastal wetlands on MCBH Kaneohe Bay including Nu'upia Ponds Wildlife Management Area, on MCTAB, and at Pearl City Annex. The 'aeo is the mascot of Mokapu Elementary School on MCBH Kaneohe Bay.

Hawaiian Stilt

Conservation measures to benefit the stilt population include:

- **Habitat protection and enhancement**. Stilt habitat enhancement consists primarily of invasive weed removal. For example, invasive pickleweed (*Batis maritima*) is ground-up during the annual Mud Ops event. Other invasive weeds such as mangrove (*Rhizophora mangle*) are controlled through Weed Warrior service projects. Established BMPs and conservation measures are employed when a project may have an effect on bird behavior.
- **Limiting disturbance.** BMPs to benefit Hawaiian stilts include restrictions on construction and human activity at Nu'upia Ponds Wildlife Management Area and other wetlands. Hawaiian stilts appear unfazed by human activity, including normal light and noise pollution associated with the Base, and it does not appear to affect their breeding success.
- **Wildlife Friendly Lighting.** Although lighting on Base does not appear to be an issue, Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Predator control.** Hawaiian stilts benefit from the on-going trapping of cats, mongoose, and rats within Nu'upia Ponds Wildlife Management Area and other wetlands.
- **Monitoring to help direct management activities**. Natural Resources staff record occurrences and consult with USFWS as needed. Regularly conducted surveys for waterbirds indicate that the number of Hawaiian stilts at MCBH has remained steady since 1991.
- **Education and outreach.** Development and distribution of informational material regarding the Nu'upia Ponds habitat and stilts includes videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 7.1, 7.5, 9, Appendix C & D.

PHOTOS

1. Hawaiian stilt. MCBH.
2. Hawaiian stilt mother and chicks. MCBH.

Wedge-tailed Shearwater

COMMON NAME: Wedge-tailed shearwater
HAWAIIAN NAME: *ʻUaʻu kani*
SCIENTIFIC NAME: *Ardenna pacifica* [1]
LEGAL STATUS: MBTA protected

APPEARANCE: Wedge-tailed shearwaters are the largest tropical shearwater species with slender body, long thin wings, wedge-shaped tail, and hooked bill. Both sexes have two color phases, dark and light dusky brown. In Hawai'i, they tend to be light colored with grayish brown above, white underparts, and dark edges on wings and undertail.

NATIVE RANGE: Wedge-tailed shearwaters are indigenous to Hawai'i. "Wedgies" are among the most common nesting seabirds found on the main Hawaiian Islands.

HABITAT: Shearwaters spend most of their time airborne over the open ocean. They frequent offshore waters, land only to breed, and are site faithful to sand dune burrows and natural crevices in mountain cliffs.

DIET: Shearwaters feed on fish, squid and similar ocean food.

REPRODUCTION: Shearwaters nest annually, land only to breed, and are nocturnal at breeding sites. They nest underground in colonies at locations such as natural crevices or burrows dug in coastal sand dunes. Adults arrive to their nesting sites in February and March and lay a single white egg by mid-June. (At MCBH adults arrive in March). Once hatched (late July - August), chicks mature in-situ and are fed by their parents, who forage daily between dawn and dusk. On Kaua'i, the peak of chick fledging occurs in September and October. At MCBH, fledging occurs between November and December, peaking in mid-December.

ECOLOGICAL THREATS: Threats include mammalian predators, urban encroachment and avian malaria. Introduced mammalian predators, cats, dogs, rats, mongoose and pigs consume adults, eggs and young chicks. The native pueo is also suspected of predating on the wedgies at the Fort Hase colony. Another threat is collision with power cables, poles or other man-made structures, when young fledglings are disoriented by urban lights and fly inland rather than out to sea. This is known as "fallout." Shearwaters may become disoriented and collide with structures, potentially causing injury, or they become exhausted, causing them to land and making them more susceptible to injury or death by cars or predators. Yellow crazy ants can cause wedgies to abandon their nests due to infestation and can cause deformities in chicks due to their production of formic acid.

USFWS AND HAWAIʻI DLNR CONSERVATION STRATEGIES: State-organized recovery efforts save hundreds of immature birds annually and birders and resource managers note fall in Hawai'i as "shearwater fallout season."

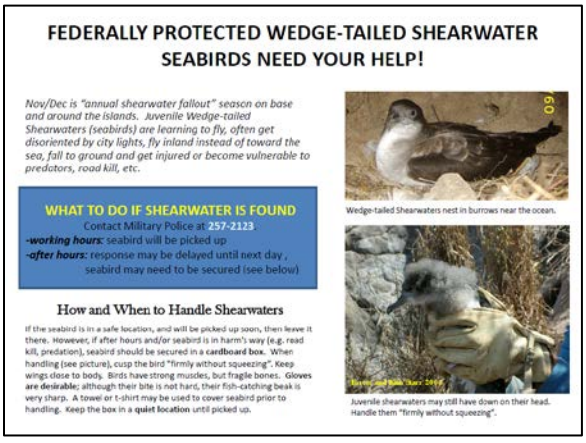
[1] In 2016 the scientific name for the wedge-tailed shearwater was changed from *Puffinus pacificus* to *Ardenna pacifica*.

Wedge-tailed Shearwater

MCBH CONSERVATION MEASURES: Wedge-tailed shearwaters occur at MCBH Kaneohe Bay and MCTAB. "Wedgies" have established a colony at the Nu'upia Ponds Wildlife Management Area near the Fort Hase shoreline. Since its 1994 discovery, it has expanded from about 24 to over 700 active burrows, as documented in annual bird surveys.

MCBH employs conservation measures to benefit the wedge-tailed shearwater population including:

- **Habitat protection and enhancement.** Non-native invasive plants are opportunistically removed in and around the shearwater colony. Periodic shoreline trash removal and ocean debris removal also occurs. Restricted access and control of invasive species are important to maintaining a healthy population of shearwaters at the colony. Established BMPs and conservation measures are employed when a project may have an effect on birds.
- **Limiting disturbance.** Human access to the burrow area is restricted and pets are prohibited.
- **Controlling invasive species (plants, animals and insects).** Yellow crazy ant (*Anoplolepis gracilipes*) control is performed during nesting season. Yellow crazy ants can cause adults to abandon nests and chicks, resulting in increased mortality. On-going mammalian predator control of cats, rats and mongoose is performed in the burrow area, with efforts intensified during nesting season.
- **Wildlife Friendly Lighting.** Natural Resources staff work with facility engineers to minimize lighting issues throughout MCBH. Particularly near shorelines, lights have been removed, numbers of lights limited, or not installed in the first place. When lighting is required, all exterior lights for new construction and renovations are required to use International Dark-Sky compliant fixtures, unless otherwise required by the military mission.
- **Monitoring to help direct management activities.** Natural Resources staff, supported by volunteers from USFWS and OISC, conduct an annual census of occupied shearwater burrows. Monitoring involves identifying potential issues (e.g., yellow crazy ant and predation). Consultation with USFWS occurs as needed.
- **Education and Outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers. Information is disseminated via a Base-wide email and distribution of fliers regarding "shearwater fallout season" and the proper protocols for reporting downed and disoriented birds. Since 1984, records have been kept on numbers of reported fallen shearwaters transferred to appropriate authorities for rest/release.



Wedge-tailed Shearwater

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 6, 7.1, 7.5, 8, 9, Appendix C & D.

PHOTOS

1. Forest and Kim Starr.http://www.starrenvironmental.com/images/image/?q=24894818446
2. Shearwater in burrow at MCBH Kaneohe Bay. Dr. Diane Drigot. 2010.

Red-footed Booby

COMMON NAME: Red-footed booby
HAWAIIAN NAME: *'A*
SCIENTIFIC NAME: *Sula sula rubripes*
LEGAL STATUS: MBTA protected.

APPEARANCE: Red-footed boobies are the smallest of the boobies. Adults have long white pointed wings trimmed in black, a long pointed tail, a long pale blue to bluish-green bill, and bright red webbed feet for swimming. Juveniles are usually brown, with a paler belly and darker band on the chest. Although several adult color phases exist, from white with black on the wings to entirely brown, most Hawaiian red-footed boobies are white. It is difficult to differentiate the sexes, except for subtle differences in beak color during mating season. See photo (male on left; female on right).

NATIVE RANGE: Red-footed boobies do not migrate, although they are far-ranging, year-round in the tropical and subtropical regions of the Atlantic, Pacific and Indian Oceans. They are indigenous to Hawai'i. The MCBH colony is only one of two in the Main Hawaiian Islands, and is the largest. The other is located at the USFWS Kilauea National Wildlife Refuge on Kaua'i.

HABITAT: Red-footed boobies feed at sea and nest and perch in colonies on coastal trees and shrubs.

DIET: Red-footed boobies feed on squid and fish and plunge dive to capture fish spotted from above, but are agile enough to snag flying fish from the air. They often hunt in large flocks and are strong flyers and swimmers. They can dive nearly 100 feet to pursue prey and travel up to 90 miles in search of food.

REPRODUCTION: Red-footed boobies build nest of twigs, grass and leaves on large open platforms, small trees and shrubs. Females lay one egg every 15 months. Parents mate for life and share parental duties, taking turns feeding their chick a semi-digested meal of fish and squid for about 18 to 20 weeks. During this time the chick transforms from being born naked, to acquiring a fluffy coat of white down, and finally donning flight feathers for an independent life (see right photo above of parent booby and downy white chick at MCBH).

ECOLOGICAL THREATS: Threats to red-footed boobies include decreasing food sources due to overfishing, predation on adults and nests, and habitat loss due to coastal development, especially the disappearance of shoreline trees and shrubs. In some Pacific islands, poaching them for food occurs.

USFWS CONSERVATION STRATEGIES: Conservation strategies include: the protection and enhancement of habitat, eradication or control of non-native plant and animal species (especially predators); effective oil spill response, marine debris removal, and mitigation of human disturbance.

Red-footed Booby

MCBH CONSERVATION MEASURES: Red-footed boobies roost and nest within Ulupa'u Head Wildlife Management Area on MCBH Kaneohe Bay at the northeast end of the impact area within an active weapons range training facility. Through diligent conservation measures, both "bullets and boobies" thrive there. The number of birds at the colony has more or less held steady over the last 15 years, at around 1,500 to 2,000+ birds, with up to 500 nesting pairs. The boobies build nests on kiawe and koa haole tree branches each year, primarily during the months of March through mid-September.

Conservation measures at MCBH that benefit the red-footed booby population include:

- **Habitat protection and enhancement.** Nesting platforms have been erected in less fire prone areas to supplement tree habitat. MCBH plans to replace the nesting platforms that have succumbed to age and fallen into disrepair. Thus far, efforts to establish native/Polynesian-introduced trees through planting have proven unsuccessful, mainly due to lack of water. Fire-adapted plants, primarily invasive grasses, cover the range and are responsible for carrying brush fires. Established BMPs and conservation measures are employed when a project may have an effect on birds.
- **Limiting disturbance.** The birds are not directly in the line of gunfire and do not appear to be bothered by the sound of gunfire or mortar rounds. Other than annual bird counts, public access to the colony is restricted, arranged in advance, and escorted on a non-interference basis with range training activities.
- **Predator Control.** The principal predatory threat is free-roaming (feral and domesticated) cats with a minimal concern about mongoose predation. Predator control poses challenges as the colony is located on an active range, so it has to be accomplished around the Range training schedule. Additionally, since the colony is located in an "impact area", EOD and sometimes medical support are required to access parts of the colony. Due to these limitations, predator control only occurs on an as needed basis.
- **Wildlife Friendly Lighting.** Although lighting on Base does not appear to be an issue, Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Fire suppression**. Dry invasive grasses combined with strong trade winds in the crater increases the threat of wildland fire. Invasive grasses are regularly herbicided along range roads. Fuel breaks and firebreaks within the impact area reduce the risk of fire spread. A water cannon system within Ulupa'u Crater is maintained to aid in quick suppression of any wildfires that venture too close to roosting and nesting trees. Strict regulations prevent accidental injury or killing of birds and ensure prompt reporting and response to fires should they occur.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

Red-footed Booby

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 6, 7.1, 7.5, Appendix C & D.

PHOTOS

1. Mated pair of red-footed boobies. Tim Sutterfield. 2007.
2. Red-footed booby adult with chick. David Pereksta.
3. View from booby colony indicating how firebreaks contain fires. MCBH.
4. Nesting platforms to supplement tree habitat at MCBH red-footed booby colony. Carroll Cox. 2006.

Hawaiian Short-eared Owl

COMMON NAME: Hawaiian short-eared owl
HAWAIIAN NAME: *Pueo*
SCIENTIFIC NAME: *Asio flammeus sandwichensis*
LEGAL STATUS: State listed as endangered on O'ahu.

APPEARANCE: The pueo measures 13.4 to 16.9 inches long with a wingspan of 33.5 to 44.5 inches. It weighs between 7.3 and 16.8 ounces. The head contains black-rimmed yellow eyes surrounded by pale facial feathers and tiny, often concealed ear-tufts set close together near the center of the forehead. The crown and the neck are distinctly streaky dark on tawny brown. Under parts are buff colored and streaked or spotted with darker brown or grey. The majority of feathers on the body have dark centers with pale edges.

NATIVE RANGE: Pueo is an endemic subspecies of the nearly pandemic short-eared owl (*Asio flammeus*). They occur on all main Hawaiian Islands from sea level to 8,000 feet.

HABITAT: Unlike most owls, pueo are active during the day. They occupy a variety of habitats including forests, shrublands and urban areas, but are most commonly seen utilizing open habitats like grasslands.

DIET: Pueo primarily consume small mammals, specifically mice and rats, as well as insects. They are also known to eat small birds, although probably not regularly.

REPRODUCTION: The breeding biology of pueo is not fully known. Males try to attract females by performing aerial displays know as sky dancing. Pueo females build nests that consist of simple scrapes in the ground lined with grasses and feathers. Pueo lay between three to six eggs over a span of several months, resulting in babies being born at different times. Pueo nest on the ground and active nests have been found year round. On January 23, 2016, the first pueo nest was found in the Nu'upia Ponds WMA. Females build the nests and also perform incubation and brooding. Males feed females and defend nests. Chicks are fed by females with food delivered by males. Young depend on their parents for approximately six to eight weeks, and may fledge from the nest on foot before they are able to fly.

ECOLOGICAL THREATS: The primary cause of species decline is the loss and degradation of habitat and predation by introduced species, such as dogs, cats, rats and the small Asian mongoose. Collisions with moving vehicles and the hunting of pueo are increasing concerns. Other factors include disease and some environmental contaminants. It is believed that pueo are resistant to avian malaria and avian pox that threaten other native bird species.

Hawaiian Short-eared Owl

GENERAL CONSERVATION STRATEGIES: The State of Hawai'i does not have a standalone management plan but the pueo does benefit from conservation plans that outline actions designed to conserve other endangered birds. Additionally they may benefit from game bird management as high densities of pueo occur on lands where game birds are common. Public education and outreach is a continuing strategy of Hawai'i DLNR.

MCBH CONSERVATION MEASURES: Although pueo are occasionally seen at MCBH properties, the first known occurrence of a nesting pueo with eggs at MCBH occurred in January 2016 within Nu'upia Ponds Wildlife Management Area. Although predator traps are regularly deployed in the area, a subsequent visit to the nest did not reveal eggs or chicks.

Conservation measures to benefit pueo include:

- **Habitat protection and enhancement.** Maintaining healthy non-invasive vegetation and opportunistic and planned removal of non-native invasive vegetation. Pueo prefer tall grass for nesting.
- **Limiting disturbance.** Monitoring of vegetation removal. Limiting vegetation removal near any nests. Established BMPs and conservation measures are employed whenever management activities are performed in or around the Nu'upia Ponds WMA that may disturb or modify endangered waterbird behavior; the pueo would benefit from the same measures.
- **Predator Control.** Pueo benefit from the on-going trapping of cats, mongoose, and rats within the Wildlife Management Area. Mammalian predator control is increased in the event of nesting activity.
- **Wildlife Friendly Lighting.** Although lighting on Base does not appear to be an issue, Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Monitoring to help direct management activities.** Natural Resources staff record occurrences and consult with USFWS as needed.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 6, 7.1, Appendix C & D.

PHOTOS

1. Pueo. Forrest and Kim Starr. http://mauiinvasive.org/2015/02/05/pueo-or-barn-owl-heres-the-difference/

1. Pueo nest and eggs. MCBH.

Nēnē

COMMON NAME: Hawaiian Goose
HAWAIIAN NAME: Nēnē
SCIENTIFIC NAME: *Branta sandvicensis*
LEGAL STATUS: Endangered (Federal and State). MBTA protected.

APPEARANCE: Nēnē are medium sized geese in the family *Anatidae* and genus *Branta*. Males and females have the same coloration but adult females are smaller in stature than males. Nēnē measure 24 to 27 inches long and are mostly dark brown with a black crown, face, bill and tail feathers and cream colored cheeks. Their necks are cream colored with diagonal black streaks on the front and sides, which gives the appearance of black and white stripes. Their rumps are pure white and legs and feet are dusty black. Nēnē have longer legs and less webbing on their feet than other geese, enabling them to run and climb over very rugged terrain.

NATIVE RANGE: Endemic. Before and during Polynesian colonization, nēnē occurred on all or most of the MHI and likely were widespread. Presently nēnē are found in the wild between sea level and 7,800 feet elevation on the islands of Hawai'i, Maui, Kaua'i and Moloka'i. In 2014, nēnē translocated to the Big Island from Kaua'i were found nesting on O'ahu. The pair of nēnē showed up at the USFWS James Campbell National Wildlife Refuge (near the north shore) and hatched three goslings. This was the first pair of nēnē known to nest on O'ahu since the 1700s. It is hypothesized that these geese were trying to return to nest from where they fledged (Kaua'i), as nēnē typically do.

HABITAT: Nēnē occupy a variety of open habitat types including grasslands, shrub/scrublands, cinder deserts, and woodland interfaces. They will utilize areas where grass is browsed or cut short, e.g., ranches and golf courses. They forage and nest in areas occupied by both native and non-native plant species. Nēnē do not require open water but will use it if it is near their nests. Nēnē typically do not move between islands, although they are capable of it.

DIET: Nēnē forage on seeds, leaves, buds, flowers, and fruits of at least 50 different species of native and non-native plants. Nēnē forage almost solely on land.

REPRODUCTION: Nēnē have the longest nesting season of any wild goose species. They nest on the slopes of volcanoes and in some lowland areas, typically in dense vegetation. Nēnē construct nests in hollows on the ground and fill them with plant material and down. Breeding season is from August to April, and pairs will usually return to the previous years' nest site. Breeding occurs once a year but not all pairs lay eggs every year. Females lay one to six eggs (usually three) and incubate the clutch for 30 days. Males will guard females while nesting, though not constantly. Young are not fed by their parents but will remain with them for up to one year. Nēnē mate for life and pairs typically remain together throughout the year.

ECOLOGICAL THREATS: The initial decline of the species in the 1800s and early 1900s is attributed to overhunting, with predation and loss of habitat being contributing factors. Currently the main threats to the species include loss of habitat, predation, human caused disturbance, and mortality due to dehydration, nutritional deficiencies, and exposure to the elements at high elevations.

Nēnē

USFWS CONSERVATION STRATEGIES: In the late 1940s and early 1950s the total population was near extinction, estimated to be approximately 30 individuals in the wild in 1951. Concerns over extinction led to the initiation of a variety of conservation efforts, including captive breeding. As of 2009, captive breeding programs have resulted in over 2,700 captive bred nēnē being released into the wild on private and public lands. The total population of nēnē living in the wild is approximately 2,000 individuals. This represents an increase from a 1998 estimate of around 885 birds. There are also approximately 2,000 nēnē held in captivity in zoos and breeding facilities worldwide. All wild populations have been or are being supplemented by captive-bred birds.

MCBH CONSERVATION MEASURES: In December 2014, four nēnē briefly visited the Klipper Golf Course. Base Water Reclamation Facility (WRF) personnel reported five nēnē in their compound in February 2016. These birds are believed to be the same nēnē that showed up uncharacteristically at the USFWS James Campbell National Wildlife Refuge.

Conservation measures at MCBH properties that benefit nēnē include:

- **Habitat protection and enhancement.** Although natural areas and maintaining healthy non-invasive vegetation is important, nēnē on other islands have been found grazing in areas with maintained landscapes and mowed grass such as golf courses and parks; both that are prominent aboard MCBH.
- **Limiting disturbance.** If nēnē nest, barriers and signs would be erected to warn people to keep their distance. If nēnē visit the Klipper Golf Course, golfers will be reminded before entering the course that harassment of protected species is illegal. Established BMPs and conservation measures used around other endangered wildlife will be employed should nēnē become more common place on Base as a visitor or permanent resident.
- **Predator Control.** Mammalian predator control would be initiated or increased near the nest in the event of nesting activity.
- **Wildlife Friendly Lighting.** Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Monitoring to help direct management activities.** Natural Resources staff record occurrences and consult with USFWS as needed.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 6, 7.1, Appendix C & D.

PHOTOS

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Yellow-Faced Bees

COMMON NAME: Yellow-faced bee
HAWAIIAN NAME: nalo meli maoli
SCIENTIFIC NAME: *Hylaeus anthracinus / Hylaeus longiceps*
LEGAL STATUS: Endangered (Federal and State).

APPEARANCE: *Hylaeus* species have a wasp like appearance but can be distinguished from wasps because they have hair on their bodies.

Hylaeus anthracinus is a medium-sized black bee with clear to smoky wings and black legs. Males have a single large yellow spot on the face below the antennal sockets. Females are entirely black and can be distinguished from males by the black hairs on the end of the abdomen and a mandible containing three teeth.

Hylaeus longiceps is a medium-sized black bee with clear to slightly smoky wings. Distinguishing characteristics are its long head and facial marks on males. The male's lower face is entirely yellow and the yellow area extends to the sides in a broad stripe above the antennal sockets. Females are black and unmarked.


Male


Female

NATIVE RANGE: *Hylaeus* species are the only genus of bees native to Hawai'i. *Hylaeus anthracinus* are endemic to the Hawaiian Islands. They are known to occur on the islands of O'ahu, Moloka'i, and Maui, Hawai'i, Kaho'olawe, and formerly Lāna'i. *Hylaeus longiceps* are endemic to the Hawaiian Islands. They are known to occur on the islands of O'ahu, Moloka'i, and Maui.

HABITAT: *Hylaeus anthracinus* are generally found in coastal strand habitat, rarely at higher elevations in dry forest. *Hylaeus longiceps* are generally found in coastal strand habitat, but also inhabit dry shrubland.

DIET: *Hylaeus anthracinus* and *Hylaeus longiceps* have an affinity for native plants including naupaka (*Scaevola sericea*), ilima (*Sida Fallax*), akoko (*Chamaesyce* spp.), pohuehue (*Ipomea pes-caprae subsp. brasiliensis*), 'ohai (*Sesbania tomentosa*) and naio (*Myoporum sandwicense*). The non-native tree heliotrope or beach heliotrope (*Heliotropium foertherianum*, aka *Tournefortia argentea*) is also a preferred food source.

Yellow-Faced Bees

REPRODUCTION: Egg, larva, pupa and nesting habits are not well understood. *Hylaeus anthracinus* are believed to nest in holes in the stems of coastal shrubs, holes in stems within tree and shrub litter, and holes in coral rock.

ECOLOGICAL THREATS: Habitat alteration of native coastal strand vegetation due to development and increased non-native species limits available habitat for yellow-faced bees. Yellow crazy ants (*Anoplolepis gracilipes*) exclude yellow-faced bees from coastal strand habitat both by direct predation and by feeding on the nectar bees rely on. *Hylaeus strenuus*, a non-native bee species present on O'ahu, is spreading through coastal and lowland areas throughout the island and will likely become a competitor of *Hylaeus anthracinus* due to its similar size and habits.

USFWS CONSERVATION STRATEGIES: Seven species of *Hylaeus* (yellow-faced bee) were federally listed as endangered, effective October 31, 2016, including *Hylaeus anthracinus* and *Hylaeus longiceps*. USFWS has not yet developed a Recovery Plan, and critical habitat has not been designated.

MCBH CONSERVATION MEASURES: Surveys conducted in November 2016 and May 2017 confirmed that significant populations of *Hylaeus anthracinus* occur in coastal strand habitat of MCBH Kaneohe Bay. Abundant populations were found along the Pyramid Rock and North Beach shorelines, while very limited distribution of bees was found along the Fort Hase shoreline. No bees were found at MCTAB. No *Hylaeus longiceps* was documented on MCBH properties.

Conservation measures that benefit yellow-faced bees include:

- **Habitat protection and enhancement.** Protecting nectar plants, such as naupaka, in occupied habitat. Allow planting of tree heliotrope or beach heliotrope, which *Hylaeus* species have an affinity for (the species is on the approved plant material list of non-native plants for MCBH and currently occurs on Base).
- **Limiting disturbance.** *Hylaeus* species do not appear to be bothered by human presence. Minimize the removal of litter below trees in preferred habitat. Minimize driving near *Hylaeus* nesting areas to avoid crushing nests. BMPs and conservation measures are employed when a project may have an effect on bees.
- **Predator control.** Yellow crazy ant control may be performed if needed. Currently bees and yellow crazy ants do not occupy the same habitat at MCBH Kaneohe Bay.
- **Monitoring for presence to help direct management activities**. Natural Resources staff survey appropriate habitats, record occurrences and consult with USFWS as needed.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 6, 7.1, Appendix C & D.

PHOTOS

1. Female *Hylaeus anthracinus*. Magnacca, K. N. (2013). https://www.flickr.com/photos/53189052@N08/20457882510
2. Male *Hylaeus longiceps*. Magnacca K. N. (2015). https://www.flickr.com/photos/53189052@N08/8642418296

Hawaiian Hoary Bat

COMMON NAME: Hawaiian hoary bat
HAWAIIAN NAME: ʻŌpeʻapeʻa
SCIENTIFIC NAME: *Lasiurus cinereus semotus*
LEGAL STATUS: Endangered (Federal)

APPEARANCE: ʻŌpeʻapeʻa have long, dense body fur that is brown to grey and tipped with white. The white tips give the ʻōpeʻapeʻa a hoary or frosted appearance from which it gets it common name, Hawaiian hoary bat. There is a patch of yellow fur on the throat and white patches on the wrists and shoulders. The ears of this species are short, round, and yellow, edged in black. Wings are long and narrow with a span of 10.5-13.5 inches. They measure 5.3 inches in total length with a 2.3 inch tail and weigh 0.4-0.7 oz. Females are typically larger than males.

NATIVE RANGE: Relatively little is known about the distribution and population status of ʻōpeʻapeʻa. Hawaiʻi's only native terrestrial mammal. They are endemic to the Hawaiian Islands and occur from sea level to the highest volcanic peaks. Historically they occurred on all of the main Hawaiian Islands except Niʻihau. In recent years there have been reported sightings from the islands of Hawaiʻi, Maui, Molokaʻi, Lanaʻi, Oʻahu, Kauaʻi and Kahoʻolawe, though substantial populations of ʻōpeʻapeʻa may only live on Hawaiʻi, Maui, and Kauaʻi.

HABITAT: ʻŌpeʻapeʻa are a nocturnal species that roosts solitarily during the day (except mothers and pups) in trees (native and non-native) or sometimes in rock crevices. Individuals begin to forage just after sunset and return to roost just before sunrise. ʻŌpeʻapeʻa may fly more than 12 miles one way while foraging over the course of a night. They usually return to their original roost but also have alternative roosts that may be located miles away from the original. ʻŌpeʻapeʻa switch roosts if original roost trees become unstable, or potentially in an effort to seek a warmer or cooler roost. They forage along the edges of forest and within shrublands and open spaces including pastures, windrows, roadways, forest gaps and over areas of fresh/brackish water as well as open saltwater.

DIET: ʻŌpeʻapeʻa are insectivorous bats that use echolocation to locate night flying insects and capture them in flight. They eat native and non-native insects including moths, beetles, crickets, mosquitoes, and termites. Each ʻōpeʻapeʻa establishes several small (approximately 300 yds diameter) feeding areas within their larger home range and it is believed that individuals move between these areas in a predictable sequence each night. Research suggests that individuals may utilize these same circuits for foraging for several years at a time.

REPRODUCTION: ʻŌpeʻapeʻa mate in autumn, most likely between September and December, at lower elevations. It is thought that after mating the female is able to store sperm until March/April. Females give birth to twins, but sometimes up to four pups, between May and July. Pups cling to the female or to a branch until they are able to fly, about 33 days after birth. They are weaned about six weeks after birth. Although the lifespan of ʻōpeʻapeʻa is currently unknown, their North American cousin, *Lasirus cinereus*, is believed to live six to seven years.

ECOLOGICAL THREATS: Habitat alteration, direct and indirect impacts of the use of pesticides, and roost disturbance are likely the primary threats to ʻōpeʻapeʻa. A reduction in tree cover is believed to be a large contributor to species decline, due to loss of roosting sites. Roosts are especially important for the growth, development, and survival of young bats and protection from the elements. Most bats use night roosts in close proximity to foraging areas. Roost disturbance can cause mothers to abandon pups. ʻŌpeʻapeʻa have been known to be injured or killed from collisions with man-made objects such as barbed wire fences, wind turbines, and other structures.

Hawaiian Hoary Bat

The effects of pesticides and herbicides on ʻōpeʻapeʻa in Hawaiʻi, or on bats in general, is not well understood. However, the effects of pesticides on birds may provide some insight. Studies have found that birds can suffer mortality from direct contact with pesticides and from feeding on invertebrates that are unable to escape predation because of pesticide intoxication.

USFWS CONSERVATION STRATEGIES: ʻŌpeʻapeʻa were federally listed as endangered on October 13, 1970. USFWS released a Recovery Plan on May 11, 1998. Critical habitat has not been designated. Lack of information on this species limits management recommendations for protection or recovery. However, an important conservation measure is limiting disturbance during times of breeding and roosting. This includes not clearing woody plants greater than 15 ft tall in ʻōpeʻapeʻa habitat during breeding season (June 1 - September 15).

MCBH CONSERVATION MEASURES: While it is unknown if ʻōpeʻapeʻa utilize MCBH properties for foraging, roosting or breeding, in 2014 the HIARNG RTI, located on leased property adjacent to MCTAB, conducted Hawaiian hoary bat surveys and captured numerous bat calls. The proximity indicates that the Hawaiian hoary bat may be present, whether foraging or breeding, on at least one MCBH property. During the 2017-2021 INRMP implementation period, MCBH plans to conduct surveys to try to determine if the species is present at MCBH properties. Conservation measures that benefit ʻōpeʻapeʻa include:

- **Habitat protection and enhancement.** ʻŌpeʻapeʻa that occur at MCBH benefit from maintaining healthy non-invasive vegetation and opportunistic and planned removal of non-native invasive vegetation.
- **Limiting disturbance.** Removal of trees greater than 15 ft tall that may be used for roosting and nesting will be monitored. MCBH will attempt to reconcile any issues associated with the Navy Landscape and Grounds maintenance contract for tree maintenance and potential impacts to roosting or nesting trees.
- **Predator control.** ʻŌpeʻapeʻa benefit from on-going mammalian predator control efforts.
- **Wildlife Friendly Lighting.** Although lighting on Base does not appear to be an issue, Natural Resources staff diligently work with Base and contract planners to incorporate International Dark-Sky lighting recommendations into all projects.
- **Monitoring for presence to help direct management activities**. Natural Resources staff will conduct surveys for and record occurrences. Consultation with USFWS will occur as needed.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Section 6 and 7.1.

PHOTOS

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Capparis sandwichiana

COMMON NAME: Native caper
HAWAIIAN NAME: *maiapilo* or *pua pilo*
SCIENTIFIC NAME: *Capparis sandwichiana*
LEGAL STATUS: None
CONSERVATION ASSESSMENT: Vulnerable (IUCN Red List)

APPEARANCE: Maiapilo is a perennial woody sprawling shrub that grows along the ground as well as upright. It can reach up to 16.5 feet tall and spread 6 or more feet wide. Leaves are light green in color and hairy when young but hairless when older. Leaves can measure up to 2.5 inches long and are ovate, elliptic, or broadly elliptic. Flowers, which open only after sunset, are solitary, white and have a lemon fragrance. At daylight they turn pink and wilt. Flowers are approximately 4 inches tall by 4 inches wide. Flowers contain long, delicate, white stamens. The approximately 2 inch long fruit resembles a small cucumber and is filled with orange pulp and several small brownish-black seeds. Several different species of birds eat the fruit.

NATIVE RANGE: Endemic. While maiapilo occurs on all of the main Hawaiian Islands as well as some atolls, the plant is rare over most of its range and is only common along parts of the Kona coast on the Island of Hawai'i.

HABITAT: Maiapilo occurs in dry areas such as on lava rock and exposed cliffs, emerged coral reefs, and rocky ravines. It is generally found on the coast or slightly inland.

REPRODUCTION & DISPERSAL: Flowers typically bloom in spring and summer and are pollinated by native moths that feed on the nectar at night. Seeds are dispersed by birds that feed on the pulp and seeds of the fruit.

ECOLOGICAL THREATS: Maiapilo is threatened by habitat modifications including development of coastal areas, habitat disturbance by off-road vehicles, fire, competition from non-native plants, fruit and seed predation by rats, and grazing and trampling by feral and introduced animals.

HAWAI'I DLNR CONSERVATION STRATEGIES: Monitoring. Seed collection for potential future propagation.

Capparis sandwichiana

MCBH CONSERVATION MEASURES: For over a decade Natural Resources staff periodically monitored the maiapilo plants growing on the ʻaʻā lava flows near the Pali Kilo beach cottages at MCBH Kaneohe Bay. Continued monitoring and seed collection is encouraged by Hawai'i DLNR DOFAW botanists, who informed MCBH that maiapilo is becoming increasingly rare to find on Hawaiian shorelines and is a State *Species of Greatest Conservation Need*. They also noted that MCBH may have the largest population of maiapilo found on O'ahu.

Conservation measures that benefit maiapilo include:

- **Habitat protection and enhancement.** Maintaining healthy non-invasive vegetation and opportunistic and planned removal of non-native invasive vegetation.
- **Limiting disturbance.** Control foot traffic in the area where the plants are found to the greatest extent possible.
- **Monitoring to help direct management activities.** Natural Resources staff monitor existing plants for threats to survival and occurrence of new individuals. MCBH will continue to work with DLNR to attempt to collect seeds for the State's seed bank.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers. MCBH provides DLNR access for seed collection for inclusion in the State seed bank.

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Sections 6 and 7.5

PHOTOS

1. Maiapilo. MCBH.
2. Bryan Harry. Plants of Kaloko-Honokohau National Historic Park. http://www.botany.hawaii.edu/basch/uhnpscesu/htms/kahoplnt/fish_pops/capparac/plant01.htm

Nama sandwicensis

COMMON NAME: Nama, Hawaiian fiddleleaf
HAWAIIAN NAME: *Hinahina kahakai*
SCIENTIFIC NAME: *Nama sandwicensis*
LEGAL STATUS: None
CONSERVATION ASSESSMENT: Vulnerable (IUCN Red List)

APPEARANCE: Herbaceous plant with less than a 1 foot by 1 foot spread and variable height between 4 and 12 inches tall. Small succulent leaves with many hairs and no leaf stalks. Flowers are small purple-blue to white tubular flowers. Fruits and seeds brown round capsules.

NATIVE RANGE: Endemic. Historically nama occurred on all of the main Hawaiian Islands, but is becoming more uncommon.

HABITAT: Nama prefers dry habitat in full sun. Mainly found on coastal dunes and cliffs with rocky or sandy soils.

REPRODUCTION & DISPERSAL: Nama is a short lived annual that reproduces by self-seeding.

ECOLOGICAL THREATS: Nama is threatened by habitat modifications including development of coastal areas, habitat disturbance by off-road vehicles, fire, competition from non-native plants, and grazing and trampling by feral and introduced animals.

HAWAI'I DLNR CONSERVATION STRATEGIES: Conservation activities should include habitat protection as this species occurs in habitat desirable for development. Collection and dispersal of seeds could help increase population, but is not currently practiced.

MCBH CONSERVATION MEASURES: Natural Resources staff has been monitoring nama plants growing on the sand dunes overlooking Pyramid Rock Beach at MCBH Kaneohe Bay for several years. Monitoring and seed collection was urged by Hawai'i DLNR DOFAW botanists who informed MCBH that nama is becoming increasingly rare to find on Hawaiian shorelines and is a State *Species of Greatest Conservation Need*.

Conservation measures that benefit nama include:

- **Habitat protection and enhancement.** Maintaining healthy non-invasive vegetation and opportunistic and planned removal of non-native invasive vegetation.
- **Limiting disturbance.** Control foot traffic and training in the area where the plants are growing to the greatest extent possible.
- **Monitoring to help direct management activities.** Natural Resources staff monitor existing plants for threats to survival and occurrence of new individuals.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers. MCBH is also developing a stand-alone interpretive exhibit that will include information and protective measures for nama. MCBH provides DLNR access for seed collection for inclusion in the State seed bank.

Nama sandwicensis

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For more information: MCBH Integrated Natural Resources Management Plan. 2016. Sections 6 and 7.5

PHOTOS

1. Nama at Pyramid Rock. MCBH.

Sesbania tomentosa

COMMON NAME: 'Ohai
HAWAIIAN NAME: *'Ohai*
SCIENTIFIC NAME: *Sesbania tomentosa*
LEGAL STATUS: Endangered (Federal and State)

APPEARANCE: 'Ohai is a sprawling shrub or small tree that grows up to 19 feet tall. It can be erect or prostrate. Each compound leaf is comprised of a series of 0.5 to 1.5 inch long, oblong leaflets. Leaves are silvery to dark green in color, hairy, and range in size depending upon habitat. Showy pea-like flowers are approximately one inch long and are salmon tinged with yellow, orange red, scarlet or yellow in color. Square bean shaped seeds occur in long (3 to 9 inch) green pods that turn brown when ripe.

NATIVE RANGE: Endemic. Historically occurred widely on all of the main Hawaiian Islands.

HABITAT: 'Ohai occurs on dry shrubland, sandy beaches, dunes, soil pockets on lava, rocky ridges, and occasionally on pond margins at elevations from sea level to an elevation of 1770 feet. Generally found on the coast and infrequently inland, 'ohai is tolerant of windy locations.

REPRODUCTION & DISPERSAL: 'Ohai reproduces by seed dispersed by wind.

ECOLOGICAL THREATS: 'Ohai is threatened by habitat modifications including development of coastal areas, habitat disturbance by off-road vehicles, fire, competition from non-native plants, and grazing and trampling by feral and introduced animals. Seed predation and grazing by deer and rats reduce survival and reproduction in some areas.

HAWAI'I DLNR CONSERVATION STRATEGIES: Critical habitat for 'ohai was approved in 2003. General conservation activities involve: protecting current populations as well as establishing new population to reduce the risk of extinction; creating barriers to protect plants from grazing and seed predation; and removal of non-native plants in order to reduce competition.

MCBH CONSERVATION MEASURES: In 2008, Natural Resources and USFWS staff discovered two self-established plants at MCBH Kaneohe Bay Nu'upia Ponds WMA. Observations in October 2009 that rodents were eating the leaves, stems, and flowers led staff to intensify rodent trapping in the area and protect plants with custom built exclosures. Although exclosures were removed in 2014, rodent trapping in the area continues. Plants are regularly monitored and assessed for rodent damage. There has been no new evidence of rodent damage to the 'ohai since removal of the exclosures.

Sesbania tomentosa

Conservation measures that benefit 'ohai include:

- **Habitat protection and enhancement.** Maintaining healthy non-invasive vegetation and opportunistic and planned removal of non-native invasive vegetation.
- **Limiting disturbance.** Monitoring any activities in the area to avoid disturbance of existing plants. 'Ohai benefits from trapping of rodents in the area.
- **Monitoring to help direct management activities.** Natural Resources staff monitor existing plants for threats to survival and occurrence of new individuals. Consultation with USFWS for all federally listed species occurs as needed.
- **Education and outreach.** Development and distribution of informational material including videos, fact sheets, and briefings for military personnel and civilians on Base including new arrivals, and outreach with volunteers. MCBH provides DLNR access for seed collection for inclusion in the State seed bank.

REFERENCES

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U.S. Fish and Wildlife Service (USFWS). 1999. Recovery Plan for Multi-Island Plants. U.S. Fish and Wildlife Service. Portland, OR. 206 pp.+ appendices. http://www.fws.gov/pacificislands/recoveryplans.html

For more information: MCBH Integrated Natural Resources Management Plan. 2016. Sections 7.5 and 8.

PHOTOS

1. Forest and Kim Starr. http://www.starrenvironmental.com/images/image/?q=24766271475
2. 'Ohai exclosure. MCBH.
3. 'Ohai. MCBH.

C3. SPECIES OF CONTROL CONCERN MANAGEMENT

This appendix includes general information on the approach to managing species of control concern (e.g., non-native invasive species) on MCBH properties. The key to addressing biosecurity concerns is focusing on minimizing the risk of introduction and spread of harmful non-native invasive species from other locales, through various pathways, to and within the MCBH properties or to other non-Marine Corps lands. As described throughout the INRMP, management actions, including control of species of concern, are implemented by Natural Resources staff, with assistance from other organizations (e.g., O'ahu Invasive Species Committee, USDA Wildlife Services). Control of invasive species is a priority both to prevent the increase and spread of invasive populations and because, in many instances, control and removal can provide benefits to wildlife and military training. For example, removal of invasive plants from wetland areas enhances waterbird habitat and can result in improved water retention capacity and flood control. Removal of flammable invasive grasses from military training areas reduces fire and erosion risks and helps prevent the degradation of training lands.

The information in this section is representative, but not exhaustive, and focuses on recent management efforts. Invasive species are also managed under the Integrated Pest Management Program (Section 8.1.9). While not all invasive species are actively managed, the Environmental Department is aware of and generally tracks their occurrence. A more comprehensive list of invasive and non-native species found on MCBH properties is included in Appendix C1. Detailed information on many of the invasive species and recommendations for control can be found in related plans including:

- *MCBH Landscape Manual* (MCBH Environmental Department 2014) (plants)
- *MCBH Integrated Pest Management Plan (IPMP)* (NAVFAC 2016) (plants and animals)
- *MCBH Invasive Species Management Study (ISMS)* (Garrison et al. 2002) (plants and animals)

In addition, the *National Invasive Species Management Plan*, developed by the National Invasive Species Council for years 2016-2018, identifies high priority, inter-departmental actions for the Federal government and its partners to take to prevent, eradicate, and control invasive species.[1]

BIOSECURITY

As the Marine Corps progresses with its plans to establish a base in Guam and develop training facilities and ranges on various islands within the Commonwealth of Northern Mariana Islands, the transfer of invasive species to Hawai'i, and MCBH Kaneohe Bay in particular, is a potential problem that could have significant consequences. Many foreign aircraft that can act as pathways for transporting invasive species visit MCAS from around the world (i.e., Australia, Japan) as well from the US mainland.

The vulnerability of Hawai'i to invasion has been attributed to a variety of factors. In general, biological communities on Hawai'i have evolved and diversified in relative isolation, with limited gene exchange, over many millennia. As a result, the Hawaiian Islands typically exhibit high species endemism, low numbers of top predators, and species and communities that are highly specialized. These characteristics, combined with other factors, make island flora and fauna especially vulnerable to impacts from the introduction of non-indigenous species (Vermeij 1991; Paulay 1994).

As of January 2017, Hawai'i had over 500 threatened or endangered species listed under the Federal ESA and is ranked first in the number of Federally-protected species among the 50 states.[2] The single greatest

[1] https://www.doi.gov/invasivespecies/management-plan
[2] http://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?state=HI&status=listed

threat to native wildlife in Hawai‘i is the large number and diversity of introduced species that has resulted in a myriad of impacts to native flora and fauna. There are numerous examples of harmful introductions, with the most notable being the impacts on the native bird fauna of the Hawaiian Islands by invasive species such as cats (*Felis catus*) and mosquitos (avian malaria); and on native Hawaiian flora by the coconut rhinoceros beetle (CRB) (*Oryctes rhinoceros*) that bores into and eventually kills palm trees, the erythrina gall wasp (*Quadrastichus erythrinae*) a destructive pest on native wiliwili trees, and a fungus (*Ceratocystis fimbriata*) that causes Rapid Ohi‘a Death. Public health concerns from mosquitos and their associated pathogens (dengue, Zika) has been extensive. Millions of dollars are expended each year to keep the brown tree snake (*Boiga irregularis*), which has heavily invaded Guam, from becoming established in Hawai‘i. Hawai‘i’s forested watersheds face major threats from feral ungulates (pigs) and invasive plants like miconia (*Miconia calvescens*) that degrade their health and negatively impact their ability to provide ecosystem services. Introduction of invasives like Fountain grass, devil weed, kiawe, and fire ants can severely degrade training lands and pose harm to those training. Invasive species pose a constant and costly threat to Hawai‘i’s native ecosystems, ecosystem functions, biodiversity, and watersheds, as well as DoD training lands. There may be economic and public health impacts, as well as a decline in the quality of life of the Base community – active duty and civilian.

The U.S. Department of Defense, Department of the Navy completed a Regional Biosecurity Plan for Micronesia and Hawai‘i in April 2015 (University of Guam and the Secretariat of the Pacific Community 2014). The plan is an unprecedented effort to analyze risks and coordinate enhancements in biosecurity. It was initiated as part of the environmental impact analysis for a plan to relocate military personnel from Okinawa, Japan. The relocation of military personnel could bring large-scale shifts in transportation patterns and the movement of goods to Hawai‘i and MCBH. Risk assessments identifying pathways and risk assessments regarding the potential for invasive species to be accidentally moved along shifting travel routes were conducted for terrestrial, freshwater, and marine ecosystems.

To address the risk of introducing unwanted and potentially harmful organisms to MCBH properties, which includes land and marine environments, MCBH needs to evaluate and begin planning how to reduce the risk of invasive introductions from military activities associated with movement between Hawai‘i (MCBH) and Commonwealth of Northern Mariana Islands, Guam, and other locations in the Pacific. Efforts to prevent the transport or import of potentially harmful species must focus on vector management. Vigilant monitoring is central to minimizing the risk of introductions and limiting their impacts.

Planning Considerations

The three principal methods of transporting potentially harmful vectors to MCBH are waterborne transportation (i.e., military ships and recreational boats), ground transportation (i.e., vehicles), and air transportation (principally military aircraft). To address these transportation avenues of concern, rules, regulations, and/or procedures will need to be established within the constraints of available funding and facilities. Essential biosecurity components are: capabilities for inspection, enforcement of regulatory requirements, and operable equipment and materials. In conjunction with existing policies and procedures, MCBH may adopt procedures from the USDA’s Animal and Plant Health Inspection Service (APHIS) Multi-Agency Coordination and individual animal product and plant port of entry manuals (USDA-APHIS-PPQ 2013). MIL-STD-904B, which provides guidance on the detection, identification, and prevention of pest infestations, may also be used.[3]

[3] MIL-STD-904B, Military Standard: Detection, Identification, and Prevention of Pest Infestation of Subsistence (10 Mar 2000). This standard describes a set of practices that enable DoD personnel to effectively detect and prevent the infestation or contamination of subsistence items from exposure to insects, rodents, birds, or other animals, and to reduce the impact of infestation or contamination.

Reductions in pest arrivals and introductions would ultimately be the best way to protect end points from the impacts of invasive species. This would also require lower levels of resources to intercept pests on arrival and to establish and support management and eradication programs. The following are actions to consider that may be adopted in whole or in part, or some variation on them:

Shipping: Develop SOPs, standards, and procedures to minimize the introduction of invasive organisms associated with commercial and military shipping. Explore whether the same standards should be applied to private and other recreational vessels arriving at the MCBH marina from outside Hawai‘i.

- Identify percent of time vessels spend outside Hawai‘i and are stationary to determine risk of transporting an organism by sea.
- Develop protocols for hull biofouling management associated with troop transports, supply vessels, barges, floating dry-docks, small craft, or auxiliaries associated with Navy and Marine Corps activities.
- Require all military and commercial vessels associated with MCBH visiting or conducting operations in Kān‘eohe Bay to have regular in-water inspections for extent and type of biofouling coverage.
- Require hull inspections that are good for a certain timeframe.
- Conduct in-water surveys using SCUBA to access biofouling communities on hull surfaces and niche areas on one side (non-dock side) of each vessel.
- Obtain agreement that Navy vessels perform ballast water exchanges at the extreme end of their current range of 3-12 nautical miles from shore to decrease the likelihood of non-native coastal species transfers.

Ground Arrivals: Develop SOPs, standards, and procedures to minimize the introduction of invasive organisms associated with US military ground transportation involving movement between countries, within the Hawaiian islands, and between different training areas on O‘ahu. Ground transportation includes vehicles and mobile combat equipment, as well as the Marine himself, clothing, and gear.

- Develop invasive species training initiatives and outreach efforts to the public, contractors, and military personnel. For deploying units, conduct briefings focused on the threats and risks of the deployment area before and after movement regarding the prevention of non-native introductions of animals, plants, and insects to Hawai‘i.
- Cargo, equipment, clothing, and vehicles should be thoroughly inspected and cleaned before departure from deployment or training areas. Sanitize if any soil, insects, or other animal life, plant parts, or seeds are discovered. Inspection and cleaning should occur before departing locations outside Hawai‘i if at all possible. If anything is discovered, contain it until it can be determined if it is a threat.
- Incorporate USDA-APHIS recommendations where appropriate.
- Develop on-site decontamination/treatment areas on MCBH should cleaning not be possible at the departure location.
- Include portable power washers that will be mobilized with the unit deploying or performing local training.
- Have well-trained and well-equipped staff perform the inspections.
- Curtail smuggling of illegal, invasive pet and plant species.

Air Arrivals: Develop SOPs, standards, and procedures to minimize the introduction of invasive organisms associated with US military aircraft arriving with cargo or visiting foreign aircraft.

- Identify percent of time aircraft spend outside Hawai'i and are stationary to determine risk of transporting an organism by air.
- Review and evaluate MCAS's ability to obtain, fund, maintain, and man infrastructure associated with inspection activities, for example:
    - Staging areas
    - X-ray equipment, detector dogs, and other inspection resources
    - On-site decontamination/treatment areas
    - On-site quarantine facilities
    - Dedicated inspection facilities within MCAS environs
    - Regulated garbage disposal equipment/facilities
    - Information technology and necessary equipment

MAMMALS

Removal of non-native mammalian predators (e.g., rats, cats, and mongoose) reduces predation of protected species, spread of disease, and damage to habitat. Ongoing since FY02, MCBH has maintained an agreement, currently with USDA Wildlife Services, for predator control services. Natural Resources staff are responsible for managing the predator control program and providing instruction to personnel performing control work on which control efforts have priority. USDA Wildlife Services field personnel communicates regularly with Natural Resources staff to determine which sites are high priority for predation control and where new traps or bait stations are needed.

Mammalian predator control is conducted primarily in areas that provide habitat for protected species. Control consists mainly of using live traps (Tomahawk) and humane kill traps (DOC 250). The greatest effort is at Nu'upia Ponds WMA and other jurisdictional wetlands because these locations provide nesting habitat for endangered waterbirds and ground-nesting seabirds. Ulupa'u Head WMA is monitored approximately every two months through spotlight surveys for cats, and control is conducted as needed. The results of a study by Russell and VanderWerf (2010) indicate that mongoose appear to be having little, if any, current impact on the breeding success of the nesting red-footed booby population at Ulupa'u Crater (the species of conservation concern at this location). Feral pigs cause habitat damage (e.g., facilitate the spread of invasive plants) and pose a risk to human health and safety (e.g., mosquito infestations in pig wallows). Feral pigs are controlled at periodically at MCTAB and monthly at Camp Smith or as circumstances dictate. A set of articles related to the threats feral cats pose to Hawaiian wildlife is included on the Reference CD. Measures of effort, including trap placement and species captured, are recorded to facilitate determining the success rate. Control of vertebrate predators is addressed in COA 7.1 and 7.2.

BIRDS

The Bird Airstrike Hazard (BASH) program is required to minimize accidental collisions between aircraft and birds in and around the MCBH flightline. The BASH program has been executed by cooperative agreement and under contract with MCAS airfield manager on Kaneohe Bay and USDA Wildlife Services, with the Environmental Department providing technical expertise and quality control oversight. The Environmental Department also maintains the depredation permit obtained from USFWS that authorizes the harassing and/or 'taking' of nuisance birds that pose flightline hazards, however lethal control is used as the last resort (Appendix E1). BASH is addressed in COA 7.1.

Two nuisance birds, chickens (*Gallus gallus*) and pigeons (*Columba livia*), have become more problematic in recent years. Increases in the populations of both species at Camp Smith are of concern due to sanitary and disease issues and have prompted additional monitoring and control.

TERRESTRIAL AND WETLAND PLANTS

Regular control of invasive plants is conducted to prevent and reduce protected species habitat loss and the spread of plant species that can affect the health and safety of military personnel in training and living areas. Invasive plants are controlled using mechanical and chemical treatments through in-house staff, contractor resources, regularly recurring interagency cooperative teams, or volunteer activities (e.g., "Weed Warrior" events).

Several species of concern have been actively managed for many years, resulting in enhanced habitat as revealed by an increase in native wildlife (i.e., protected waterbirds and seabirds). For decades, the annual Mud Ops, led by Natural Resources staff, has been conducted by the 3d Marines Combat Assault Company utilizing their AAVs in the Nu'upia Ponds. The plowing action of these 26-ton tracked vehicles helps control invasive pickleweed (*Batis maritima*) and shape the muddy substrate in a manner that improves endangered Hawaiian stilt (*Himantopus mexicanus knudseni*) habitat. Mangrove (*Rhizophora mangle*) removal efforts, which have been occurring since the 1980s, are conducted several times a year through volunteer "Weed Warrior" service projects. The banks of the Percolation Ditch wetland are periodically cleared of guinea grass, Christmasberry, koa haole and California grass (Appendix G2). Control of invasive plants is addressed in COA 7.1, 7.2, 7.3, and 7.5.

Other plant species of concern are tracked and controlled due to associated fire, erosion, loss of wildlife habitat, and/or flood risks. For example, California grass is periodically controlled in wetlands at Kaneohe Bay and in Waimānalo Stream at MCTAB for flood control, training area maintenance, and wildlife habitat enhancement purposes. Highly flammable fountain grass has also been found and controlled on MCTAB.

A new plant species of control concern, devil weed (*Chromolaena odorata*), was detected on the hillside above the housing area at Camp Smith in 2015. Follow-on surveys by OISC discovered it had spread into numerous forested and grassed areas across Camp Smith. Devil weed, which is an aggressive colonizer, is one of the world's worst tropical weeds. In the tropics it grows extremely fast and forms dense thickets, smothering other vegetation and preventing establishment of other species through competition and allelopathic effects. Devil weed reproduces mainly by seeds, which are easily dispersed by wind due to their small size and light weight. Seeds cling to hair, clothing, shoes, or equipment; are transported on and blown around by mowers and line trimmers; and are spread by feral pigs moving about after foraging in the infested areas. Devil weed also reproduces vegetatively as pieces of the crown of the plant can readily take root and grow. Control of devil weed is difficult due to its prolific seed production and ability to reproduce easily. When dry, it is a flash fuel that promotes wildland fire. MCBH, OISC, and the Army Garrison Schofield Barracks have an ongoing collaboration to eradicate devil weed at and around Camp Smith.

REPTILES

The brown tree snake poses an enormous threat to Hawai'i, based on the impact it has had on Guam. It is responsible for the extirpation of most of Guam's native terrestrial vertebrates, including fruit bats, lizards, and virtually all of the island's forest birds. Although there have been no confirmed sightings of brown tree snakes on MCBH properties, with the increasing air traffic to MCBH Kaneohe Bay from Guam, its introduction is possible, and raises significant biosecurity concerns. General inspections are performed by the U.S. and State Departments of Agriculture, as well as other agencies, on all aircraft arriving from areas other than the Hawaiian Islands or U.S. Mainland to MCBH. Flights arriving from Guam require a brown tree snake inspection for both the aircraft and all cargo. Procedures are in place for rapid response from the State in the event of a sighting of a brown tree snake.[4] However, procedures need to be developed and

[4] Through Federal and State funding, multi-agency "Rapid Response" teams have been training periodically in Guam to be able to respond to possible sightings of brown tree snakes in Hawai'i.

implemented regarding how to handle cargo and personnel that will arrive in the future from Guam, Commonwealth of Northern Mariana Islands, and other Pacific island locations where the brown tree snake occurs. Snakes are an invasive species, and no military personnel are authorized to bring snakes into Hawai‘i. If anyone has any information about a snake sighting aboard Base, they should call the 24-hour MCBH Military Police Department Desk Sergeant or the State of Hawai‘i’s toll-free pest hotline [808-643-PEST (7378)] immediately.

INSECTS

Yellow crazy ants (*Anoplolepis gracilipes*), introduced to Hawai‘i in the 1950s as a stowaway on cargo ships, have infested the wedge-tailed shearwater colony at Nu‘upia Ponds. They have a detrimental effect on breeding success of seabirds by causing adult birds to abandon eggs and chicks, as well as causing distress to and deformities of the chicks. The colony at MCBH is treated prior to nesting season with a killing bait to reduce the population of yellow crazy ants. Presence and control of yellow crazy ants is addressed in Section 6 and COA 7.1 and 7.5.

Coconut rhinoceros beetle, an invertebrate pest that lives in decaying material, has detrimental effects on coconut palm trees, other palms, as well as the native hala. It was first identified on O‘ahu in 2013 at JBPHH and the nearby Mamala Bay Golf Course. In March 2014, CRB adults and larvae were discovered at Pu‘uloa RTF. Grubs feed on decaying wood and organic material for about 4-6 months before pupating. Grubs and adults can be spread through green waste disposal. Adults can spread though flight, hitchhiking, and high wind events. At the time of this update, Pu‘uloa RTF and Iroquois housing area remain hotspots of CRB detection. Trials conducted utilizing a variety of control methods have mostly failed to control CRB. Applying pesticide in the crown of the tree was successful, however it required monthly application to the 27 coconut palms that is not worth the ecological risk to beneficial pollinators or the cost of labor/pesticide to do indefinitely. State agencies and organizations (HDOA, OISC) and the military are working to eradicate this destructive pest beetle. Presence and control of CRB is addressed in Section 6 and COA 7.1 and 7.5.

Mosquito-borne diseases are a potential threat to human and native wildlife. The mosquito-borne diseases like dengue, chikungunya, and Zika may cause serious illness in humans bitten by infected mosquitoes. They are transmitted by the day-biting *Aedes* (*Stegomyia*) mosquitoes, which are found in Hawai‘i. Avian malaria, which has been devastating to Hawai‘i’s native bird population is transmitted by the mosquito *Culex quinquefasciatus*.

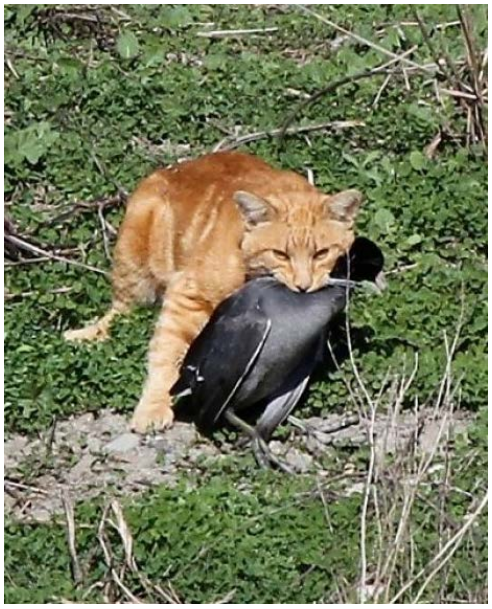
MARINE SPECIES

Identification and monitoring of invasive marine species is an important part of eradicating accidental invaders before they can spread. Invasive marine species may consume or outcompete native species for food, space, and light, resulting in loss of biodiversity and altering the structure of coral reef communities. *Avrainvillea amadelpha*, an invasive algae that has recently been discovered offshore of MCTAB, forms thick communities that cover the substrate, and invade the reef community outcompeting other algae and the endemic seagrass *Halophila hawaiiana*. Gorilla ogo (*Gracillaria salicornia*) can occur throughout Nu‘upia Ponds and previously infested the five seaplane ramps that are periodically used for recreational events. Three of the five seaplane ramps have healthy corals growing on or near them that can be injured by disturbing the invasive algae. Identification and control of invasive marine species at MCBH requires interagency cooperation. DLNR Division of Aquatic Resources removed the invasive Gorilla ogo algae using their “super sucker” in 2017. When green sea turtles enter Nu‘upia Ponds they eat the algae, reducing the infestation. Further information on the invasive marine species present at MCBH may be found in COA 7.4 and the USFWS and USGS Benthic Community Surveys (2013, 2017 in prep).

SPECIES THAT POSE THE GREATEST THREATS TO MCBH WILDLIFE

Small Asian Mongoose (*Herpestes javanicus*)

Wild Pig (*Sus scrofa*)



Cat (*Felis catus*)

1

Brown Tree Snake (*Boiga irregularis*)

Rat (*Rattus* sp.)

Yellow crazy ants (*Anoplolepis gracilipes*)

Wedge-tailed shearwater (*Ardenna pacifica*)

Deformity caused by yellow crazy ants.

C4. ESA AND MBTA BIRD SPECIES PROTECTION MEASURES

This appendix highlights laws and regulations, management actions, and data analysis at MCBH to support birds protected under the ESA and MBTA.

LAWS AND REGULATIONS

A set of laws and regulations calls for DoD to promote the conservation of ESA and MBTA-listed bird populations while sustaining the use of military managed lands and airspace for testing, training, and operations (Appendix A).

- Endangered Species Act (ESA): provides a framework to conserve and protect endangered and threatened species and their habitats. By providing States with financial assistance and incentives to develop and maintain conservation programs the ESA also serves as a method to meet many of the United States' international responsibilities to treaties and conventions such as the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.
- Migratory Bird Treaty Act (MBTA): makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations.
- *Memorandum of Understanding to Promote the Conservation of Migratory Birds* between the DoD and USFWS: details specific actions that should be taken by the DoD including advance conservation, minimize take, and comply with the MBTA.
- DoD Migratory Bird Rule (50 CFR Part 21): provides authorization of take incidental to military readiness activities with clearly defined limitations and process requirements.
- Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds): directs agencies to take actions to further implement the MBTA by outlining responsibilities of Federal agencies to protect migratory birds.

Not all MBTA-protected birds are protected under the ESA and not all birds protected under the ESA are protected under the MBTA.

MANAGEMENT ACTIONS

Conservation measures (Appendix D4) and management actions that support protection of ESA and MBTA-listed birds are detailed in this INRMP. This appendix highlights routine management actions aimed at conservation of ESA and MBTA-listed birds that are detailed in the COAs (Table C4-1).

Table C4-1. Routine Management Actions Supporting Conservation of ESA and MBTA-Listed Birds

Routine Management Action	COA
Support interagency cooperative management to benefit MCBH natural resources.	7.0
Bird surveys	7.1
Wedge-tailed shearwater monitoring	7.1
Avian botulism monitoring	7.1
Activity analysis	7.1

Routine Management Action	COA
Feral and nuisance animal control	7.1
Invertebrate pest control	7.1
BASH/Depredation Permit	7.1
Injured bird treatment	7.1
Plant trees at KBRTF	7.5
Operation of wireless controlled water cannons that protect the red-footed booby colony	7.5
Invasive vegetation control activities	7.5
Informational sessions	7.6
Educational materials	7.6
Support for scientific research	7.6
Support for educational tours and service projects	7.6
Natural resources data maintenance	7.7
Spatial GIS data maintenance	7.7
Ensure MCBH staff and contractors adhere to procedures that must be followed when a project (e.g., construction, dredging) may have an effect on any native birds	App D4

The 2001 MCBH INRMP/EA and each successive update detailed specific projects aimed at conservation of migratory birds. While some of these are considered routine management actions, as they have been performed regularly for years, others are specific one-time projects intended to be initiated during that INRMP implementation period. This INRMP details the following non-recurring management actions that may be initiated during this INRMP implementation period to benefit conservation efforts for ESA and MBTA-listed birds (Table C4-2).

Table C4-2. STEP Projects to be Implemented in Support of Conservation of ESA and MBTA-Listed Birds

STEP Projects	COA
~~Endangered Hawaiian hoary bat survey~~	7.1
~~Inventory and study the State endangered Hawaiian owl~~	7.1
~~Endangered waterbirds study - Nu'upia Ponds and MCTAB~~	7.1
Flyway-flight pattern analysis of migratory and endangered birds at MCBH, Kaneohe Bay	7.1
~~Replace~~ existing fence - Pa'akai Pond	7.1
~~Endangered species observation towers~~	7.1
Construct water crossing points to improve access within Nu'upia Ponds	7.1
Repair / replace Nu'upia Ponds footbridge	7.1
~~Seabird relocation study~~	7.1
Repair / replace artificial nesting platforms for migratory birds in Ulupa'u Crater	7.1
Wetland inventory and delineation - Nu'upia Ponds and MCTAB	7.2
Wetland restoration plan - Kaneohe Bay and MCTAB	7.2
Nu'upia Hema wetland restoration	7.2
Salvage Yard wetland restoration	7.2
Repair / replace aeration system and install waterline in Klipper Golf Course Ponds	7.2
Percolation Ditch: using salt water to control California grass	7.2
Invasive vegetation control: H3-Kāne'ohe Bay	7.5
Invasive vegetation control: Nu'upia Ponds and Base wetlands	7.5
~~Integrated Wildland Fire Management Plan~~	7.5
Expand Oyster Restoration project	7.3
Gate construction for towers	7.1
Develop alternative stilt nesting	7.1

STEP Projects	COA
Maintenance and repair of water cannons supporting migratory bird conservation	7.5
KBRTF fire suppression system	7.5
~~Environmental Learning Center~~	7.6
Nu‘upia Ponds Recreational Running Trail Signage	7.6

MONITORING DATA

Data and trends are used to inform Natural Resources staff on the need for and efficacy of management actions. The information is used in a variety of ways including to: conduct analysis to track changes and prioritize natural resources management activities (e.g., population trends); inform proposed actions (e.g., military training exercises, recreational activities, infrastructure changes); and provide information for various reports (e.g., annual INRMP implementation evaluation, ESA reports to Congress); and inform other departments and agencies. Examples of data analysis are presented, illustrating the value of maintaining a coordinated bird monitoring plan and database that allows managers to track population changes.

Red-Footed Boobies

The number of red-footed boobies present in Ulupa‘u Crater is surveyed annually during the Hawai‘i Audubon Christmas Bird Count. Anecdotal observations indicate that the number of red-footed booby utilizing the colony has more or less been steady over the last 15 years, at around 1,000 to 2,000 birds. Natural Resources staff attribute data fluctuations to the time of day that the colony was surveyed. MCBH has recently changed its practice to conduct the survey at twilight when the majority of birds would be at the colony roosting. Management actions that support the continued sustainability of the red-footed booby colony include tree planting in the crater, nesting platform replacement, the relocation study, and the expansion of the water cannon system.

Table C4-3. Red-Footed Booby Census at MCBH (2001-2015)

Year	Number of Red-Footed Boobies
2001	1085
2002	1136
2003	515
2004	995
2005	829
2006	267
2007	432
2008	337
2009	333
2010	525
2011	875
2012	522
2013	866
2014	1473
2015	1750
Average	796

Wedge-tailed Shearwaters

Fallout of wedge-tailed shearwaters is monitored year round at MCBH (COA 7.1). MCBH maintains a bird handling database that includes known wedge-tailed shearwater fallout incidence since 1984. The database includes the date, status of the bird, the location where the bird was found, and the outcome of the action (where the bird was transferred or relocated to). Table C4-4 is an excerpt of the most recent data added to this database.

Table C4-4. Total Reported Fallout of Shearwaters at MCBH (2011-2016)

Year	Number of Shearwaters Reported[1]
2011	133
2012	108
2013	54
2014	22
2015	14
2016	168
Total	499

Tracking locations of active burrows (using GPS) and reproductive success occurred in 2006 and has been ongoing since 2010.[2] Tracking both the locations of active burrows and the number of chicks provides an understanding of utilization patterns and population stability. Figure 5a, Appendix B represents a cluster of GPS points collected for burrows counted in 2006 and for 2010 through 2016.

The data indicates that chick density at most of the colony is stable. Tracking the locations of active burrows allowed MCBH to determine that one area (adjacent to the fenceline shared with Kaimalino community), had 128 chicks in 2014, but only three in 2015. It is hypothesized that this is due in part to feral cat predation.

Table C4-5. Active Burrows and Reproductive Success of Shearwaters at MCBH

Year	Number of Active Burrows	Number of Chicks
2006	426	186
2010	520	94
2011	667	235
2012	881	359
2013	805	443
2014	812	355
2015	733	333
2016	708	343
2017	856	475

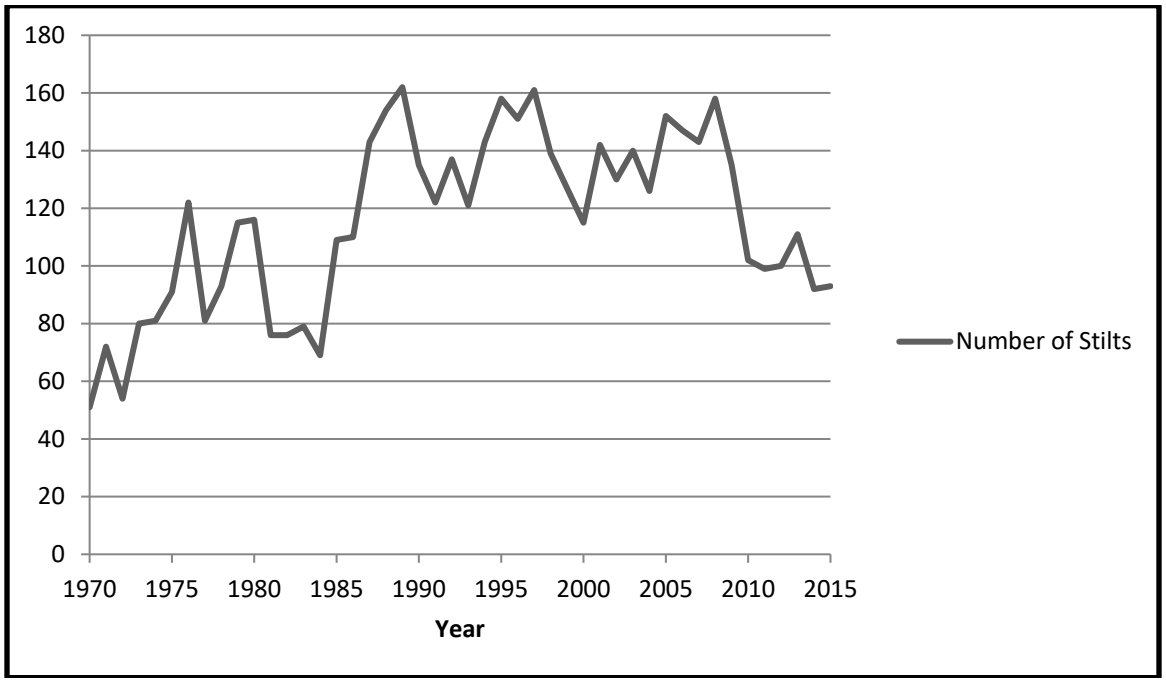
[1] Fallout seems to vary widely based on the weather and moon phase, and probably the fledging success (the more juvenile birds that fledge, the more that will fallout). Also, not all fallouts are reported. MCBH makes a concerted effort to get the word out about reporting fallout, and the Environmental Department provides datasheets to anyone who responds.

[2] USFWS and OISC field staff assist Natural Resources staff with the annual burrow count.

Hawaiian Stilts

Management actions to enhance habitat for endangered Hawaiian stilts have been conducted at MCBH since 1970 (e.g., wetland enhancements including the annual "Mud Ops" maneuvers at Nu'upia Ponds and mangrove removal). Monitoring the presence of Hawaiian stilts and, when possible, nesting activity, helps gauge the success of these efforts (Figures 5b & 5c, Appendix B; Exhibit C4-1). Fluctuations in counts may be due to weather, time of day, movement of birds to off-Base wetlands, or inability to access areas. However, the data does reveal an overall uptrend in the stilt population at MCBH, indicating that management actions are likely beneficial to the conservation of this species.

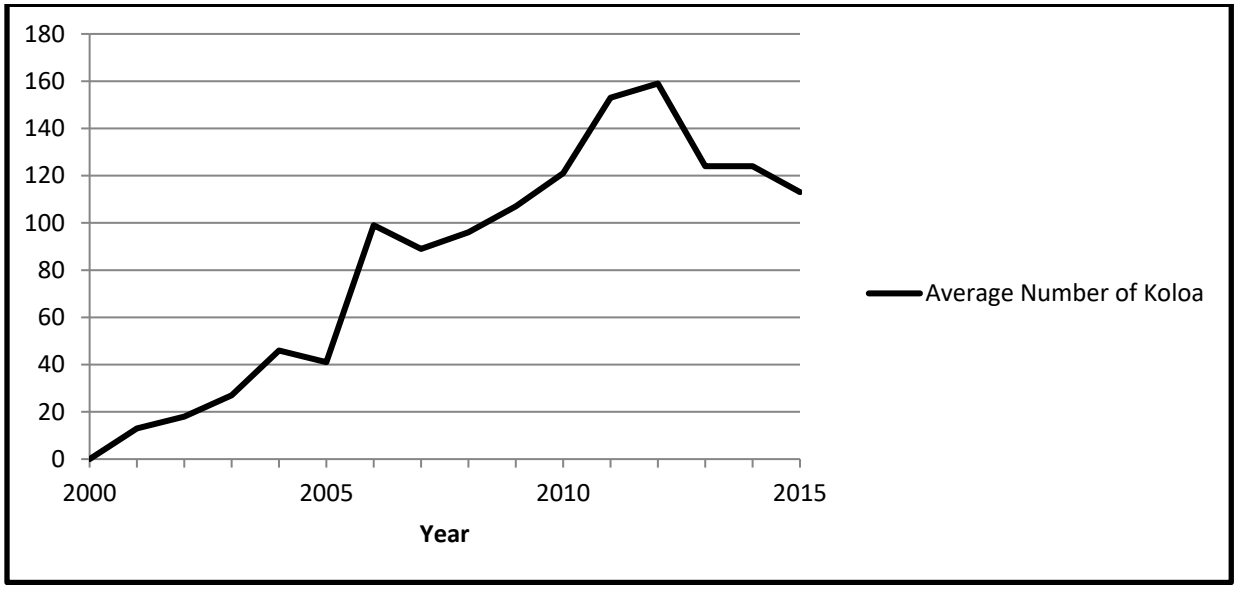
Exhibit C4-1: Hawaiian Stilt Counts at MCBH (1970-2015)

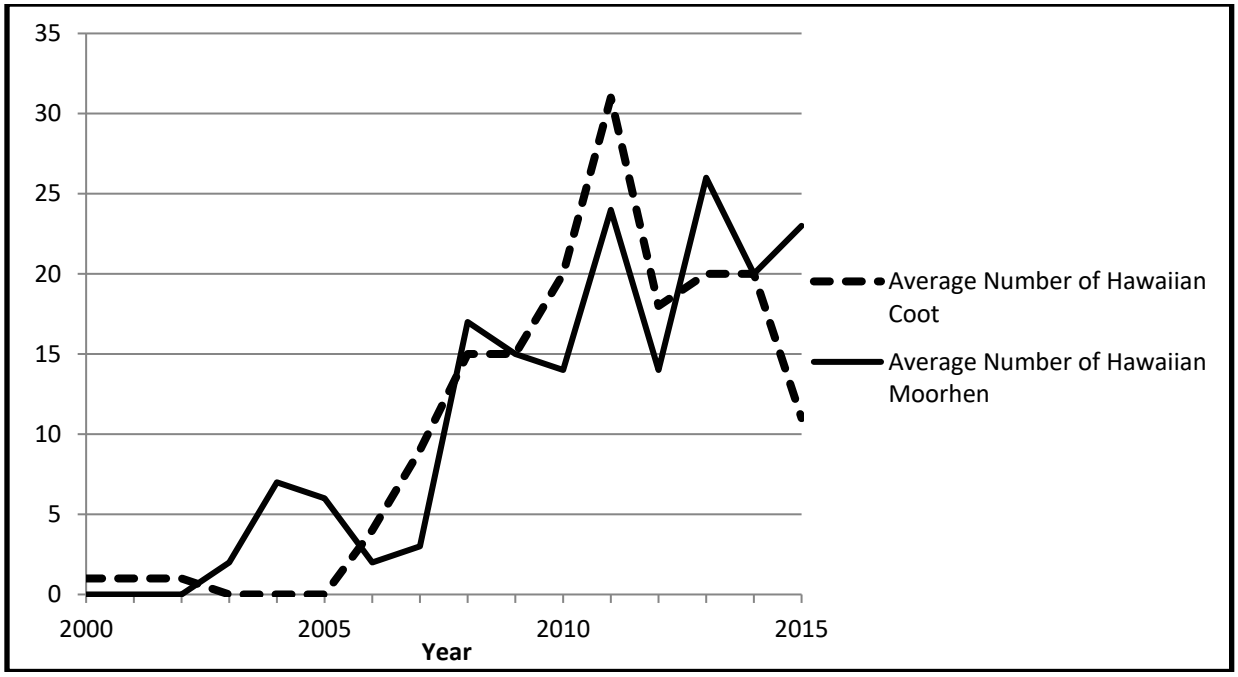


Waterbirds with Protected Status

The annual Audubon Christmas bird count data and the semi-annual Hawai'i DLNR waterbird count data provides valuable information for population trend analysis. Data can be analyzed in a variety of ways including by species and time of year. Of particular interest are any trends in the presence or absence of birds with protected status. As an example, Exhibit C4-2 represents the number of three waterbirds with protected status observed during these counts over a 15 year period.[3] Increased efforts to enhance waterbird habitat beginning in 2005, appear to have promoted increased use by these species.

Exhibit C4-2: Population Trend of Waterbirds with Protected Status at MCBH (2000-2015)





[3] Counts of Hawaiian duck include mallards (*Anas platyrhynchos*), hybrid koloas, and genetically pure koloas (*Anas wyvilliana*).

APPENDIX D
PROCEDURES

This appendix includes information on procedures used for MCBH INRMP implementation.

COA 7.1: Wildlife Management

D1. Briefing Information on MCBH Natural Resources

D2. Shearwater Fallout Procedures

D3. Bird Counts

D4. Protection Measures for ESA and MBTA Birds

COA 7.4: Coastal and Marine Resources Management

D5. Procedures to be Followed in Event of Hawaiian Monk Seal or Sea Turtle Encounter

D6. Designated and Proposed Critical Habitat at MCBH

COA 7.5: Landscape Maintenance and Vegetation Management

D7. Best Management Practices for Landscape Maintenance

COA 7.6: Natural Resources-Based Outdoor Recreation, Outreach, and Public Access Management

D8. Access for Research Activities

D9. Access for Educational Tours and Service Projects

COA 7.7: Resource Information Management

D10. MCBH Specifications for Digital Data

D1. BRIEFING INFORMATION ON MCBH NATURAL RESOURCES

Federally and State Protected Species found within MCBH properties and coastal waters.

There are **9** regularly present, Federally-listed Threatened and Endangered (T&E) flora and fauna species found on MCBH properties or in the surrounding coastal waters.

LAND-BASED

T&E resident species:

4 endangered waterbird species - **Hawaiian stilt** (*Himantopus mexicanus knudseni*), **Hawaiian moorhen** (or gallinule) (*Gallinula galeata sandvicensis*), **Hawaiian coot** (*Fulica alai*), and **Hawaiian duck** (koloa-like & hybrid) (*Anas wyvilliana*) residing in Nu‘upia Ponds Wildlife Management Area (WMA), as well as the Base wetlands: Klipper Golf Course, Sag Harbor, Salvage Yard, Percolation Ditch, Motor Pool, and TLF. Some species can be seen foraging/loafing at the Water Reclamation Facility, and in Waimānalo Stream on MCTAB.

1 endangered insect: **Hawaiian Yellow-faced bee** (*Hylaeus anthracinus*). They are found on coastal native vegetation and the non-native tree heliotrope on the Mōkapu Peninsula shorelines.

1 endangered plant: **‘Ohai** (*Sesbania tomentosa*), discovered in 2008. Two plants have established themselves along the eastern shoreline (Ulupaʻu dunes) of the Nu‘upia Ponds WMA.

1 State-listed (Oʻahu only) endangered raptor (not Federally-listed) - the **Hawaiian short-eared owl or pueo** (*Asio flammeus sandwichensis*).

Possible, but not documented: Future surveys are planned for MCBH properties for the Federally-endangered **Hawaiian hoary bat** (*Lasirus cinereus semotus*).

Rare species:

2 rare coastal strand plants (State Species of Greatest Conservation Need) - both could be listed as threatened in the future.

- ***Hinahina kahakai*** *(Nama sandwichensis),* found on the sand dunes of our northern beach at Pyramid Rock; and
- ***Maiapilo*** *(Capparis sandwichiana),* endemic to Hawai‘i, found on the lava field near the beach cottages.

OCEAN ENVIRONMENT

T&E resident species:

1 endangered marine mammal, the **Hawaiian monk seal** (*Neomonachus schauinslandi*), frequently hauls out on all Mōkapu beaches, and sometimes at Pu‘uloa Range Training Facility (RTF) and MCTAB.

1 threatened reptile – **Hawaiian green sea turtle** (*Chelonia mydas*).

1 endangered reptile – **Hawaiian Hawksbill sea turtle** (*Eretmochelys imbricata*).

Federally-protected semi-resident species:

Humpback whales (*Megaptera novaeangliae*) seasonally winter in Hawai‘i (Dec-Apr). Their migration route passes close to our shorelines. NOAA delisted the Central North Pacific Distinct Population Segment (DPS) of the humpback whale in 2016. Humpback whales remain a State-listed endangered species and are also protected under the Marine Mammal Protection Act (MMPA).

Occasional T&E Visitors:

Olive ridley turtle (*Lepidochelys olivacea*). MCBH hosted a rare in-Hawai‘i hatching of a Federally-threatened olive ridley turtle, which nested on Pyramid Rock beach in 2009; only the third time documented nesting in Hawai‘i and the *first* successful hatching ever!

OTHER FEDERALLY-PROTECTED SPECIES

MCBH hosts 50+ species of birds (permanent residents and visitors) protected under the federal Migratory Bird Treaty Act (MBTA). Among those 50 species, MCBH preserves and protects the following resident nesting seabird colonies:

- Over 2,000 tree dwelling **red-footed boobies** (*Sula sula rubripes*) located in the heart of the Kaneohe Bay RTF in Ulupa‘u Crater in the 25 acre Ulupa‘u Head WMA; and
- Over 700 **wedge-tailed shearwaters** (*Ardenna pacifica*) that nest in sand dune burrows along the eastern shoreline of the Nu‘upia Ponds WMA.

PROTECTED AQUATIC RESOURCES

The Nu‘upia Ponds contain 16 species of native fish.

MCBH protects some of Hawai‘i’s most pristine coral reefs and marine life within the 500-yard buffer zone around the Mōkapu Peninsula. Per USFWS, some of MCBH’s coral reefs rival areas of the Northwest Hawaiian Islands.

MCBH has approximately 14 miles of shoreline.

D2. SHEARWATER FALLOUT PROCEDURES

The attached flyer is disseminated annually in October, prior to young shearwaters fledging. Natural Resources staff provides airfield operations and squadrons with a copy of the flyer for distribution. The flyer provides information on how to report or handle (if necessary) downed and disoriented birds.

FEDERALLY PROTECTED WEDGE-TAILED SHEARWATER SEABIRDS NEED YOUR HELP!

Nov/Dec is "annual shearwater fallout" season on base and around the islands. Juvenile Wedge-tailed Shearwaters (seabirds) are learning to fly, often get disoriented by city lights, fly inland instead of toward the sea, fall to ground and get injured or become vulnerable to predators, road kill, etc.

WHAT TO DO IF SHEARWATER IS FOUND

Contact Military Police at **257-2123**.

-working hours: seabird will be picked up

-after hours: response may be delayed until next day , seabird may need to be secured (see below)

How and When to Handle Shearwaters

If the seabird is in a safe location, and will be picked up soon, then leave it there. However, if after hours and/or seabird is in harm's way (e.g. road kill, predation), seabird should be secured in a **cardboard box**. When handling (see picture), cusp the bird "firmly without squeezing". Keep wings close to body. Birds have strong muscles, but fragile bones. **Gloves are desirable**; although their bite is not hard, their fish-catching beak is very sharp. A towel or t-shirt may be used to cover seabird prior to handling. Keep the box in a **quiet location** until picked up.

Wedge-tailed Shearwaters nest in burrows near the ocean.

Juvenile shearwaters may still have down on their head. Handle them "firmly without squeezing".

D3. BIRD COUNTS

Biannual Waterbird Surveys: Hawai‘i DLNR coordinates with Natural Resources staff to conduct biannual surveys at MCBH Kaneohe Bay (see example DLNR Bi-Annual Waterbird Survey notification sent out each year on following page). Surveys occur the second week of January and the second or third week of August. Waterbird survey protocol and data sheet are provided by Hawai‘i DLNR DOFAW. Waterbirds and shorebirds are counted at the Kaneohe Bay wetlands, which includes the Nu‘upia Ponds complex, and the Base Water Reclamation Facility. A complete copy of the survey protocol, data sheet, and identification guide is included on the Reference CD.

Audubon Christmas Bird Count. The Hawaiian Audubon Society hosts an annual Christmas bird count at MCBH Kaneohe Bay, which has been conducted aboard the Mōkapu Peninsula property since 1947. Surveys occur on or around December 15. All bird species – seabirds, shorebirds, waterbirds, and forest birds are counted throughout the Base, including the red-footed booby colony. The data is compiled by the Audubon representative and then provided to MCBH for entry in the database.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FORESTRY AND WILDLIFE
OAHU BRANCH
2135 Makiki Heights Drive
Honolulu, Hawaii 96822

January 8th, 2016

Memorandum

To: Jared Underwood—USFWS
Phil Bruner—Brigham Young University
Olive Vanselow—Hoomaluhia Park
Todd Russell—MCBH Hawaii
Laurent Poole—Waimea Falls Arboretum
Megan Laut—USFWS
Darren Phelps—USDA-Wildlife Services
Joy Hiromasa-Browning—USFWS
Rebecca Smith—NAVFAC HI
Peter Donaldson
Hugo DeVries

From: Jason Misaki, Oahu Wildlife Manager

Subject: Bi-Annual Waterbird Survey

Our bi-annual waterbird survey is scheduled for **Wednesday, January 20th, 2016**. Please try to complete the survey on this date but if necessary, use Thursday the 21st. Spend at least 10-15 minutes at each site even if no birds are immediately visible.

Record the following data:

1. Number of all waterfowl seen
2. Shorebirds that are using the wetland (not perched on adjacent lawns, roads, etc.)
3. Record time surveyed, wetland condition and weather on codes provided on field forms
4. Count all mallards
5. Note location and approximate size of any egret rookeries.

Do Not:

1. Separate male and female stilts (count all as adults)
2. Conduct coot shield separation

Please include notes on the following:

1. Habitat observations, trends or extreme changes
2. Anything that is inconsistent with previous waterbird surveys.
3. Please check stilts for bands, and band combos. Banded birds have three plastic color bands and one aluminum band, or a single aluminum band on the right leg.

Waterbird Survey Field Form

Wetland Condition Codes		Weather Codes	
Water Level (WL): 0 = dry 1 = lower than normal 2 = normal 3 = higher than normal	Human Impact (HI): 0 = indirect (little garbage, few people present) 1 = moderate 2 = heavy (many people present) (e.g. on boat, wading, fishing, etc.)	Rain Fall (RF): 0 = no rain 1 = mist or fog 2 = drizzle 3 = light rain 4 = heavy rain 5 = snow or hail	Wind: 0 = no wind, <1 mph 1 = smoke drifts, 1-3 mph 2 = wind felt on face, 4-7 mph 3 = leaves and twigs rustle, 8-10 mph 4 = dust raises, branches stir, 13-18 mph 5 = small trees sway, >19 mph
Vegetation Cover (VC): 0 = open water (<25%) 1 = 26-50% cover 2 = 51-75% cover 3 = >75% cover	Shoreline Condition of Tidal Wetlands (SC): 0 = water at high tide mark (leave blank if NA) 1 = 25 feet from high tide mark 2 = 50 feet from high tide mark 3 = >50 feet from high tide mark	Cloud Cover (CC): estimate to nearest 10%	

Date: _____ Observers: _____

Island: _____ _____

_____

Wetland Name																				
Condition	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC
Weather	CC		RF	Wind	CC		RF	Wind	CC		RF	Wind	CC		RF	Wind	CC		RF	Wind
Time	Start		Stop		Start		Stop		Start		Stop		Start		Stop		Start		Stop	
COOT - adult																				
- juvenile																				
MOORHEN - adult																				
- juvenile																				
STILT - adult																				
- juvenile																				
KOLOA - adult																				
- juvenile																				
Koloa/Mallard hybrid																				
Mallard (domestic)																				
Muscovy																				
Other Dom. Waterfowl																				
Black-cr. Night-Heron																				
Cattle Egret																				
Pacific Golden Plover																				
Ruddy Turnstone																				
Sanderling																				
Wandering Tattler																				

COMMENTS: Note all chicks, stilts or other birds with bands, and anything interesting or unusual.

Retain a copy of this form for your records version June 2005

1


Ulupa'u Head WMA
FINISH
Fossil Beach
Ulupa'u Crater
Pacific Ocean
Kaneohe Klipper Ponds
Koloa
'Ae'ae
'Iwa
Pu'u Hawai'iloa
Pyramid Rock
Kekepa Island (Turtle Rock)
Hale Koa
Sag Harbor
Fort Hase Beach
Motor Pool
Percolation Ditch
MCDC
Salvage Yard
START
Heleloa
Temporary Lodging Facility
Halekou
Nu'upia 'Ekahi
Nu'upia 'Elua
Nu'upia 'Ekolu
Wai Pina
Pa'aka
Kaluapuhi
Nu'upia 'Eha
Nu'upia Ponds WMA
Nu'upia Hema
NOTES: Access along route by government vehicle (van) except at Klipper Golf Course Ponds (dotted line = golf course access) and within Nu'upia Ponds complex (by teams on foot on dotted line or by van along pond maintenance access road on solid line).
There are minor variations in the route each year based on temporary or permanent road alterations or detours. If time is running short the route may be cut short through housing in order to make it to the Range gate in time for escorted access to the boobies.
Source: MCB Hawaii GIS Data Repository
Aerial photo from ESRI
N
Miles
0 0.125 0.25 0.5 0.75
Legend
Wildlife Management Area
ACOE Jurisdictional Wetlands (Ching 2010)
Transit Type
Van
Golf Cart
Walk
MCB Hawaii, Kaneohe Bay
Audubon Christmas Count Survey Route
November 2016

D4. PROTECTION MEASURES FOR ESA AND MBTA BIRDS

MCBH has established a set of BMPs and conservation measures to follow when a project (e.g., construction, dredging) may have an effect on birds - endangered or otherwise. The following will be implemented at the project site to avoid and minimize effects to ESA and MBTA-listed birds. They will be instituted as appropriate, before, during, and after the project work is performed. These protection measures will be referenced in any informal or formal consultation with USFWS.

BMPs

- All workers associated with a project (e.g., employee, contractor) shall be fully briefed on the conservation measures and the requirement to adhere to them for the duration of their involvement in the project.
- Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available.
- All project-related materials and equipment placed in the water shall be free of pollutants.
- The project manager and heavy equipment operators shall perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
- Fueling of land-based vehicles and equipment shall take place at least 50 feet away from the water, preferably over an impervious surface.
- Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion control practices, effective silt containment devices, and the curtailment of work during adverse weather and tidal/flow conditions.
- A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project. Silt curtains spanning the waterway will be placed upstream and downstream of the work site.
- Excavation, mowing, and other vegetation treatments will not be conducted in waterbird nesting habitat during the breeding season for endangered waterbirds.

Conservation Measures

- Given that waterbirds in Hawai'i have been known to nest year-round, in areas where endangered waterbirds have been observed, particularly the Hawaiian moorhen, nest searches will be conducted by Natural Resources staff prior to any work being conducted and after any subsequent delay of three or more days (during which birds may attempt nesting).
- If a nest with eggs is discovered, work should cease in the vicinity for a minimum of seventy days (10 weeks); if a nest with chicks is discovered, work should cease for a minimum of 49 days (7 weeks). These guidelines are intended to protect chicks, and may be shortened if monitoring is conducted often enough to note when chicks have fledged (usually five to six weeks after hatching).

If a previously undiscovered nest is found after work begins, all work should cease within a minimum radius of 100 feet of the nest and USFWS will be contacted within 48 hours.

D5. PROCEDURES TO BE FOLLOWED IN EVENT OF HAWAIIAN MONK SEAL OR SEA TURTLE ENCOUNTER

For the Public

Hawaiian monk seals (*Neomonachus schauinslandi*) are observed hauling out to rest at MCBH beaches, mainly at Mōkapu Peninsula. Sea turtles infrequently come ashore on MCBH beaches and shorelines. MCBH has a duty and responsibility to protect them in accordance with Federal and State laws. The ESA and its amendments impose severe penalties (fines and jail sentences) if a person intentionally harasses or harms an endangered monk seal or threatened or endangered sea turtles. Procedures to be followed in the event of a Hawaiian monk seal or sea turtle encounter have been developed based on protocols set forth by NOAA Fisheries for such incidences.

In the event a monk seal or sea turtle appears on any of the MCBH beaches or shorelines, do NOT approach them, but notify any of the following:

Monk Seal Sighting Hotline (NOAA Fisheries)
808-220-7802

Turtle Stranding Hotline (NOAA Turtle Rescue)
808-725-5730

Military Police (Primary Point of Contact)
808-257-2123

Animal Control Officers
808-257-1821

Senior Natural Resources Manager
808-257-7000

Natural Resources Manager
808-216-7135

Wildlife Technician
808-257-7129

Conservation Enforcement Officer
808-216-5178 / 808-479-7361

If a monk seal or sea turtle comes ashore, all persons and pets must remain at least 100 feet away from them.

Do not harass monk seals or sea turtles, e.g., yelling, throwing things at them, poking them or in any manner annoying or disturbing them.

Do not attempt to give monk seals or sea turtles food or water.

If a monk seal is active in a surfing area, all surfing activity must cease until the monk seal departs the area.

D6. DESIGNATED CRITICAL HABITAT AT MCBH

Section 7 of the ESA requires all Federal agencies to ensure that any actions they take, fund, or authorize are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify its designated critical habitat.[1]

Designated Critical Habitat for the Hawaiian Monk Seal (Final)

The final rule to revise designated critical habitat for Hawaiian monk seals in the Northwestern Hawaiian Islands and MHI was issued by NOAA Fisheries, effective September 21, 2015.[2] In determining what areas should be included or excluded as part of designated critical habitat on O'ahu, NOAA Fisheries evaluated the conservation measures implemented under the 2011 MCBH INRMP to determine if they continue to provide a benefit to monk seals. NOAA Fisheries determined, as discussed in the final rule, "...the INRMPs for the MCBH, the PMRF, and the JBPHH each confer benefits to the Hawaiian monk seal and its habitat, and therefore the areas subject to these INRMPs are precluded from Hawaiian monk seal critical habitat" (80 Federal Register 50925). However, NOAA Fisheries determined that MCTAB offshore did not warrant exclusion due to potential impacts on national security because "The boundaries of this area remain ill-defined and other Federal activities occurring within this area may affect essential features." The area seaward of MCTAB from the seafloor to 10 meters above the seafloor from the mean lower low water mark to the 200 m depth contour line was designated critical habitat. MCTAB's terrestrial environment (shoreline) is precluded from critical habitat designation. MCBH continues the practices outlined in the 2011 INRMP and revises or adds procedures as necessary in light of any new information.

Proposed Critical Habitat for the Green Sea Turtle

The final rule to list eleven DPSs of the green sea turtle as threatened and endangered under the ESA was issued by NOAA Fisheries and USFWS, effective May 6, 2016.[3] The rule stated that "critical habitat is not determinable at this time, but will be proposed in a future rulemaking".

In July 2016, USFWS notified DoD that upon its final listing determination for listing the Central North Pacific green sea turtle DPS as threatened, NOAA and USFWS were required to designate critical habitat "to the maximum extent prudent and determinable". In the notification, USFWS identified the shorelines of Pu'uloa RTF and Fort Hase as candidates for critical habitat designation. Follow-on discussions with USFWS also identified MCTAB's shoreline as a candidate due to the successful hatching of sea turtles on Bellows AFS over the last two years. The letter identified numerous conservation measures that were included in this 2017 INRMP Update and that may preclude areas from being designated critical habitat based on those areas being managed by MCBH in a way that provides a benefit to the species (Appendix C2).

[1] The ESA requires the Federal government to designate 'critical habitat' for any species it lists under the ESA. 'Critical habitat' is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation (ESA Sec 3(5)(A); 50 CFR Section 424.02). Section 4(a)(3)(B)(i) of the ESA allows exemptions to critical habitat designation if a military installation's INRMP is providing adequate conservation measures and species benefit as determined by USFWS or NOAA.

[2] https://www.federalregister.gov/articles/2015/08/21/2015-20617/endangered-and-threatened-species-final-rulemaking-to-revise-critical-habitat-for-hawaiian-monk#h-34

[3] https://www.federalregister.gov/documents/2016/04/06/2016-07587/endangered-and-threatened-wildlife-and-plants-final-rule-to-list-eleven-distinct-population-segments

Proposed Critical Habitat for Yellow-Faced Bees

The final rule to list seven species of yellow-faced bees native to Hawai'i as endangered under the ESA was issued by USFWS, effective October 11, 2016.[4] The rule stated that "critical habitat is not determinable at this time".

Proposed Critical Habitat for Main Hawaiian Islands Insular False Killer Whale

On May 4, 2017 NOAA Fisheries provided notice of areas under consideration for the main Hawaiian Islands (MHI) insular false killer whale critical habitat under the ESA and requested information regarding areas utilized by the Department of Defense or U.S. Coast Guard that overlap with potential designation in waters surrounding the Hawaiian Islands. On June 1, 2017 MCBH provided a response to NOAA Fisheries indicating that due to the depths of the whale's habitat, the proposed critical habitat is outside MCBH's area of influence and control. The response also outlined MCBH actions that may indirectly benefit the insular false killer whale.

[4] https://www.federalregister.gov/documents/2016/09/30/2016-23112/endangered-and-threatened-wildlife-and-plants-endangered-status-for-49-species-from-the-hawaiian

FEDERAL REGISTER

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Part II

Department of Commerce

National Oceanic and Atmospheric Administration

50 CFR Part 226

Endangered and Threatened Species: Final Rulemaking To Revise Critical Habitat for Hawaiian Monk Seals; Final Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 226

[Docket No. 110207102–5657–03]

RIN 0648–BA81

Endangered and Threatened Species: Final Rulemaking To Revise Critical Habitat for Hawaiian Monk Seals

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: We, the National Marine Fisheries Service (NMFS), issue a final rule to revise the critical habitat for the Hawaiian monk seal (*Neomonachus schauinslandi*) pursuant to the Endangered Species Act. Specific areas for designation include sixteen occupied areas within the range of the species: ten areas in the Northwestern Hawaiian Islands (NWHI) and six in the main Hawaiian Islands (MHI). These areas contain one or a combination of habitat types: Preferred pupping and nursing areas, significant haul-out areas, and/or marine foraging areas, that will support conservation for the species. Specific areas in the NWHI include all beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and including marine habitat through the water's edge, including the seafloor and all subsurface waters and marine habitat within 10 meters (m) of the seafloor, out to the 200-m depth contour line around the following 10 areas: Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, Maro Reef, Gardner Pinnacles, French Frigate Shoals, Necker Island, and Nihoa Island. Specific areas in the MHI include marine habitat from the 200-m depth contour line, including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor, through the water's edge 5 m into the terrestrial environment from the shoreline between identified boundary points on the islands of: Kaula, Niihau, Kauai, Oahu, Maui Nui (including Kahoolawe, Lanai, Maui, and Molokai), and Hawaii. In areas where critical habitat does not extend inland, the designation ends at a line that marks mean lower low water. Some terrestrial areas in existence prior to the effective date of the rule within the specific areas lack the essential features of Hawaiian monk seal critical habitat because these areas are inaccessible to seals for hauling out (such as cliffs) or lack the natural areas necessary to support monk seal conservation (such as hardened harbors, shorelines or buildings) and therefore do not meet the definition of critical habitat and are not included in the designation. In developing this final rule we considered public and peer review comments, as well as economic impacts and impacts to national security. We have excluded four areas because the national security benefits of exclusion outweigh the benefits of inclusion, and exclusion will not result in extinction of the species. Additionally several areas are precluded from designation under section 4(a)(3) of the ESA because they are managed under Integrated Natural Resource Management Plans that we have found provide a benefit to Hawaiian monk seals.

DATES: This final rule becomes effective September 21, 2015.

ADDRESSES: The final rule, maps, and other supporting documents (Economic Report, Endangered Species Act (ESA) Section 4(b)(2) Report, and Biological Report) can be found on the NMFS Pacific Island Region's Web site at *http://www.fpir.noaa.gov/PRD/prd_critical_habitat.html.*

FOR FURTHER INFORMATION CONTACT: Jean Higgins, NMFS, Pacific Islands Regional Office, (808) 725–5151; Susan Pultz, NMFS, Pacific Islands Regional Office, (808) 725–5150; or Dwayne Meadows, NMFS, Office of Protected Resources (301) 427–8403.

SUPPLEMENTARY INFORMATION:

Background

The Hawaiian monk seal (*Neomonachus schauinslandi*) was listed as endangered throughout its range under the ESA in 1976 (41 FR 51611; November 23, 1976). In 1986, critical habitat for the Hawaiian monk seal was designated at all beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 10 fathoms (18.3 m) around Kure Atoll, Midway Islands (except Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island, and Nihoa Island in the NWHI (51 FR 16047; April 30, 1986). In 1988, critical habitat was expanded to include Maro Reef and waters around previously designated areas out to the 20 fathom (36.6 m) isobath (53 FR 18988; May 26, 1988).

On July 9, 2008, we received a petition dated July 2, 2008, from the Center for Biological Diversity, Kahea, and the Ocean Conservancy (Petitioners) to revise the Hawaiian monk seal critical habitat designation (Center for Biological Diversity 2008) under the ESA. The Petitioners sought to revise critical habitat by adding the following areas in the MHI: Key beach areas; sand spits and islets, including all beach crest vegetation to its deepest extent inland; lagoon waters; inner reef waters; and ocean waters out to a depth of 200 m. In addition, the Petitioners requested that designated critical habitat in the NWHI be extended to include Sand Island at Midway, as well as ocean waters out to a depth of 500 m (Center for Biological Diversity 2008).

On October 3, 2008, we announced a 90-day finding that the petition presented substantial scientific information indicating that a revision to the current critical habitat designation may be warranted (73 FR 57583; October 3, 2008). On June 12, 2009, in the 12-month finding, we announced that a revision to critical habitat is warranted because of new information available regarding habitat use by the Hawaiian monk seal, and we announced our intention to proceed toward a proposed rule (74 FR 27988). Additionally, in the 12-month finding we identified the range of the species as throughout the Hawaiian Archipelago and Johnston Atoll.

Following the 12-month finding, we convened a critical habitat review team (CHRT) to assist in the assessment and evaluation of critical habitat. Based on the recommendations provided in the draft biological report, the initial Regulatory Flexibility Analysis and section 4(b)(2) analysis (which considers exclusions to critical habitat based on economic, national security and other relevant impacts), we published a proposed rule on June 2, 2011 (76 FR 32026) to designate sixteen specific areas in the Hawaiian archipelago as Hawaiian monk seal critical habitat. In accordance with the definition of critical habitat under the ESA, each of these sixteen areas contained physical or biological features essential to conservation of the species, and which may require special management consideration or protections. In the proposed rule, we described the physical or biological features that support the life history needs of the species as essential features, which included (1) areas with characteristics preferred by monk seals for pupping and nursing, (2) shallow, sheltered aquatic areas adjacent to coastal locations preferred by monk

Although the Army and the Air Force provided INRMPs for review, areas under consideration for Hawaiian monk seal critical habitat no longer overlap with Army or Air Force INRMP managed areas; therefore, these INRMPs require no review under section 4(a)(3)(B)(i).

The Marine Corps' MCBH, and the Navy's PMRF and the JBPHH INRMPs continue to overlap with areas under consideration for monk seal critical habitat, and these INRMPs were reviewed in accordance with section 4(a)(3)(B)(i) of the ESA. Areas subject to the MCBH INRMP that overlap with the areas under consideration for critical habitat include the 500-yard buffer zone in marine waters surrounding the MCBH–KB on the Mokapu Peninsula, Oahu; and Puuloa Training Facility, on the Ewa coastal plain, Oahu. Overlap areas for the PMRF INRMP include Kaula Island and coastal and marine areas out to 10 m in depth around the island of Niihau, which are leased for naval training activities and use. Overlap areas for the JBPHH INRMP include Nimitz Beach, White Plains Beach, the Naval Defensive Sea Area, the Barbers Point Underwater Range, and the Ewa Training Minefield, all on Oahu.

To determine whether a plan provides a benefit to the species, we evaluated each plan with regard to the potential conservation benefits to the species, the past known implementation of management efforts, and the management effectiveness of the plan. Plans determined to be a benefit to the species demonstrated strengths in all three areas of the review. While considering the third criterion, we determined that an effective management plan must have a structured process to gain information (through monitoring and reporting), a process for recognizing program deficiencies and successes (review), and a procedure for addressing any deficiencies (allowing for adaption for conservation needs).

Although we previously determined that the 2006 MCBH INRMP provided a benefit to the Hawaiian monk seal (76 FR 32026; June 2, 2011), the 2012 MCBH INRMP was evaluated for this final rule to ensure that conservation measures implemented under the renewed INRMP continue to provide a benefit to the Hawaiian monk seal as well as the refined essential features. In review, the MCBH INRMP identifies multiple conservation measures that may confer benefits to the Hawaiian monk seal or its habitat, including debris removal, prohibitions against lay nets and gill nets in the 500-yard buffer zone, restrictions on fishing, enforcement of established rules by a Conservation Law Enforcement Officer, interagency cooperation for rehabilitation events, use of established procedures for seal haul-out and pupping events, educational outreach for protected species (including classroom briefs, Web page, news articles, brochures, service projects, and on-site signage and monitoring), protected species scouting surveys prior to training exercises along the beach; invasive species removal (*e.g.,* removing invasive mangroves to support native species habitat), ecological assessments in marine resources surveys and inventories, and water quality projects (minimizing erosion and pollution). Additionally, management effectiveness and plan implementation are demonstrated in the plan's appendices, which outline the conservation measures goals and objectives, provide reports and monitoring efforts from past efforts, report on the plan's implementation, and describe the achievement of the goals and objectives. Meeting all three criteria for review, we have determined that the MCBH INRMP provides a benefit to the Hawaiian monk seal and its habitat.

In 2011, we found the Navy's two INRMPs did not meet the benefit criteria established for review and identified concerns with plan implementation and management effectiveness (76 FR 32026; June 2, 2011). Since 2011, the Navy has worked with us to recognize and revise plan deficiencies. Additionally, the Navy has enhanced the management efforts associated with Hawaiian monk seal conservation that are implemented under the JBPHH and PMRF INRMPs. Plan effectiveness has been addressed for both INRMPs by including a performance monitoring element to the INRMPs, which creates an annual review with State and Federal wildlife agencies. During review, management measures and outcomes are evaluated to ensure that plan deficiencies are identified and addressed. Additionally, the Navy has enhanced the management efforts associated with Hawaiian monk seal conservation that are implemented under these INRMPs as follows. In review, the JBPHH INRMP demonstrates conservation benefits for the species, including marine debris removal, monitoring, and prevention; pet restrictions; restriction of access; protocol to prevent disturbance during naval activities; staff and public education; training to prevent ship groundings; marine mammal stranding and response training and protocols; enforcement (through base police and the game warden); and compliance and restoration programs for contaminants. Based on these benefits provided for the Hawaiian monk seal, and in combination with the concerted effort made by the Navy to enhance the plan's implementation and management effectiveness, we determined that the JBPHH INRMP provides a benefit to the Hawaiian monk seal and its habitat.

Since 2011, the Navy has revised the PMRF INRMP's monitoring plan for Kaula Island to better reflect logistical constraints and accurately identify monitoring capabilities for this area. Additionally, the Navy has coordinated with NMFS staff to improve the effectiveness of monitoring activities for the Island. In addition to these changes, the Navy has amended the PMRF INRMP to include coastal and marine areas out to 10 m in depth surrounding the Island of Niihau, which are leased for Navy training activities and use. Conservation measures on Niihau related to Hawaiian monk seals or their habitat include the following: a coastal monitoring program for Hawaiian monk seals and sea turtles, periodic removal of feral pigs, bans on ATVs (to preserve the sand dunes and coastal areas), bans on dogs (to prevent disturbance to native wildlife), and continued limited access for guests. In review, the PMRF INRMP demonstrates elements of a successful conservation program that will benefit the species, including marine debris removal, monitoring, and prevention; trapping of feral pigs, cats, and dogs; pet restrictions; restriction of public access in certain areas; protocols to prevent wildlife disturbance; public education; training to prevent ship groundings; monk seal monitoring and reporting; and compliance and restoration programs for contaminants. Based on these benefits provided for the Hawaiian monk seal, and in combination with the concerted effort made by the Navy to enhance the plan's implementation and management effectiveness, we determined that the PMRF INRMP provides a benefit to the Hawaiian monk seal and its habitat.

In conclusion, we have determined that the INRMPs for the MCBH, the PMRF, and the JBPHH each confer benefits to the Hawaiian monk seal and its habitat, and therefore the areas subject to these INRMPs are precluded from Hawaiian monk seal critical habitat.

ESA Section 4(b)(2) Analysis

Section 4(b)(2) of the ESA requires the Secretary to consider the economic, national security, and any other relevant impacts of designating any particular area as critical habitat. Any particular

TABLE 2—SUMMARY OF THE ASSESSMENT OF PARTICULAR AREAS REQUESTED FOR EXCLUSION BY THE DOD BASED ON IMPACTS ON NATIONAL SECURITY—Continued

DOD Site (size); Agency	Overlapping particular area (size)	Exclusion warranted?	Significant weighing factors
(6) Commercial Anchorages B, C, D (1 mi^2, or 2.6 km^2)—Navy.	Area 14—Oahu (363 mi^2, or 940 km^2).	No	It is unlikely that Navy activities will affect essential features at this site and the Navy has no control over other Federal activities occurring within this area. The benefits of designation outweigh the benefits of exclusion.
(7) Fleet Operational Readiness Accuracy Check Site (FORACS) (9 mi^2, 22 km^2)—Navy.	Area 14—Oahu (363 mi^2, or 940 km^2).	No	This area is believed to be of high conservation value to Hawaiian monk seals. It is unlikely that Navy activities will affect essential features at this site and other Federal activities occurring within this area may affect these features. The benefits of designation outweigh the benefits of exclusion.
(8) Marine Corps Training Area Bellows Offshore—Navy and USMC (size not estimated).	Area 14—Oahu (363 mi^2, or 940 km^2).	No	The boundaries of this area remain ill-defined and other Federal activities occurring within this area may affect essential features. The benefits of designation outweigh the benefits of exclusion.
(9) Shallow Water Minefield Sonar Training Range off Kahoolawe (4 mi^2, or 11 km^2)—Navy.	Area 15—Maui Nui (1,445 mi^2, or 3,742 km^2).	Yes	The area requested is relatively small in comparison to the total area. Impacts to national security may result from section 7 consultations specific to the construction and maintenance of the training range. The benefits of exclusion outweigh the benefits of designation for this area.
(10) Kahoolawe Danger Zone (49 mi^2, or 127 km^2)—Navy.	Area 15—Maui Nui (1,445 mi^2, or 3,742 km^2).	No	Area supports all three essential features and is considered of high conservation value for Hawaiian monk seals. Navy activities in this area are infrequent and other Federal activities may benefit from section 7 consultation requirements for this area. The benefits of designation outweigh the benefits of exclusion.

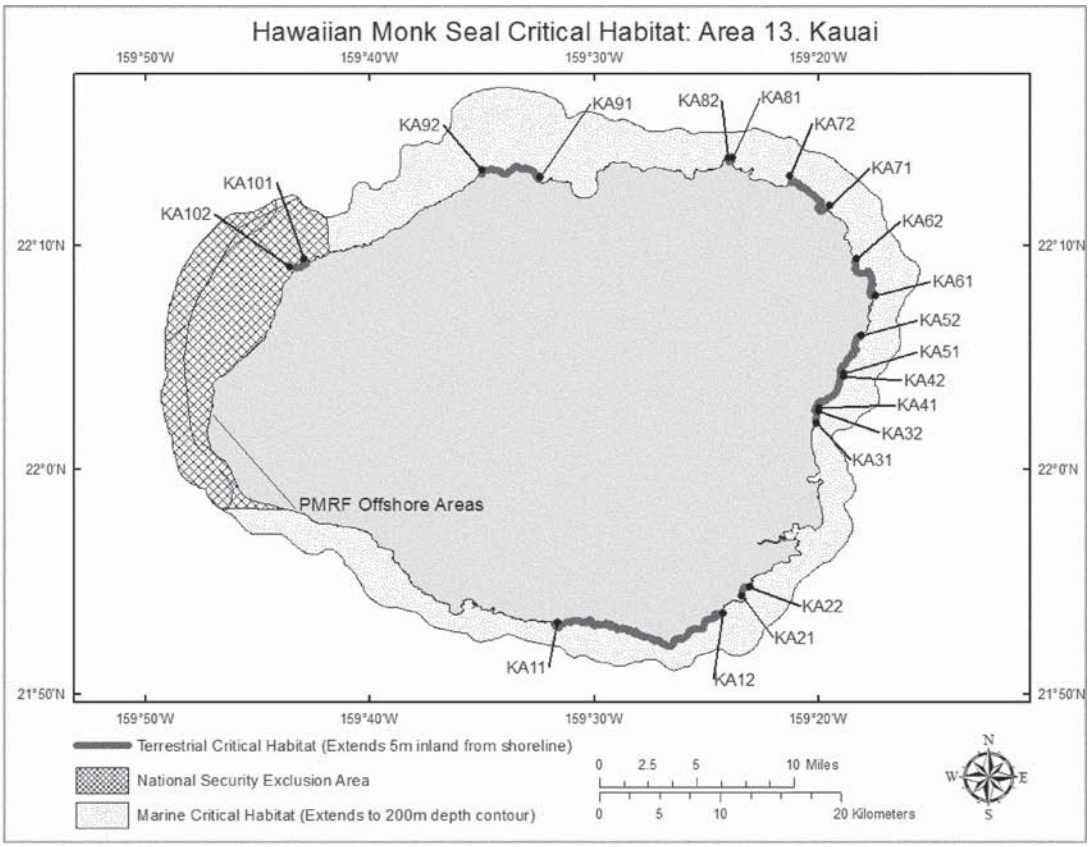
Exclusions Based on Other Relevant Impacts

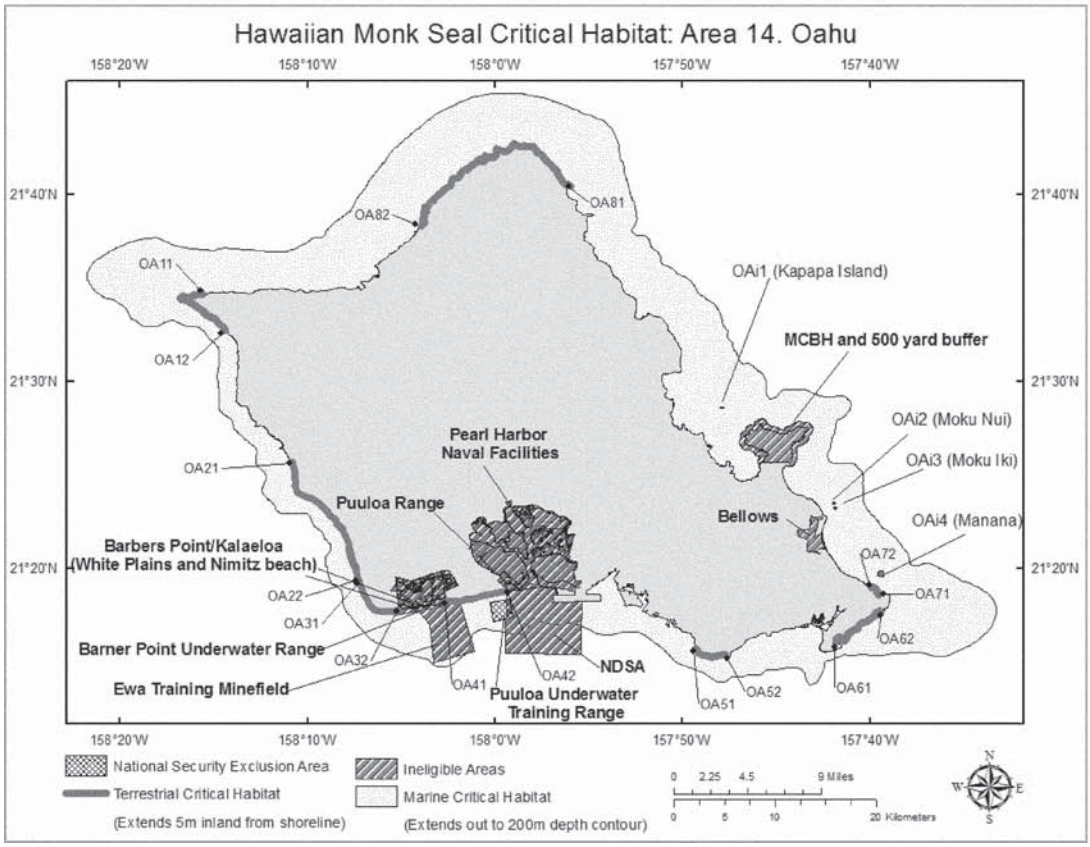
Section 4(b)(2) of the Act also allows for the consideration of other relevant impacts associated with the designation of critical habitat. Prior to the proposed rule we received comments from the USFWS requesting exclusion for Sand Island at Midway Islands due to economic and administrative burdens from the proposed designation. Similar to the National Security Analysis, we could not quantify the impacts on the USFWS in monetary terms or in terms of some other quantitative measure. To assess the benefits of excluding Sand Island, we evaluated the relative proportion of the area requested for exclusion, the intensity of use of the area, and the likelihood that actions on site will destroy or adversely modify habitat requiring additional section 7 delays, costs, or burdens. We also considered the likelihood of future section 7 consultations and the level of protection provided to critical habitat by existing USFWS safeguards. Sand Island at Midway Islands provides important habitat with the essential features of significant haul-out areas and preferred pupping areas in the northwest end of the NWHI chain. USFWS noted that their management plans provide protections for Hawaiian monk seals from disturbance and revealed no additional plans to encroach on haul-out areas. In considering the above-listed factors we were not able to identify any additional costs, *i.e.,* activities that the USFWS wished to engage in at this site that would require additional management measures or modifications to protect Hawaiian monk seal essential features. Therefore, Sand Island at Midway Islands was not proposed for exclusion in the proposed rule (76 FR 32026; June 2, 2011) because we found that the benefit of designation outweighed the benefits of exclusion.

For the final designation, due to the refinements made to the designation and additional comments received from USFWS, we re-evaluated the benefit of excluding Sand Island. Because Sand Island provides Hawaiian monk seals with preferred pupping and significant haul-out areas and we have no new information regarding the extent to which consultations would produce an outcome that has economic or other impacts, we conclude that the benefits of designation outweigh the benefits of exclusion. Therefore, this area has not been excluded from designation.

Critical Habitat Designation

Based on the information provided above, the public comments received and the further analysis that was done since the proposed rulemaking, we hereby designate as critical habitat for Hawaiian monk seals Specific Areas 1–16, of marine habitat in Hawaii, excluding the four military areas discussed under Exclusions Based on Impacts to National Security and in this section. The designated critical habitat areas include approximately 6,712 mi^2 (17,384 km^2) and contain the physical or biological features essential to the conservation of the species that may require special management considerations or protection. This rule excludes from the designation the following areas based on national security impacts: Kingfisher Underwater Training area in marine areas off the northeast coast of Niihau; PMRF Offshore Areas in marine areas off the western coast of Kauai; the Puuloa Underwater Training Range in marine areas outside Pearl Harbor, Oahu; and the Shallow Water Minefield Sonar Training Range off the western coast of Kahoolawe in the Maui Nui area. Based on our best scientific knowledge and expertise, we conclude that the exclusion of these areas will not result in the extinction of the species, nor impede the conservation of the species. Additional areas are precluded from designation under section 4(a)(3) of the ESA because the areas are subject to management under three different DOD INRMPs that we found to provide a benefit to Hawaiian monk seals. These areas include Kaula Island; coastal and marine areas out to 10 m in depth around the Island of Niihau; and, on Oahu, the 500-yard buffer zone in marine waters surrounding the Marine Corps Base Hawaii (on the Mokapu Peninsula) (MCBH–KB), Puuloa Training Facility on the Ewa coastal plain, Nimitz Beach, White Plains Beach, the Naval Defensive Sea Area, the Barbers Point Underwater Range, and the Ewa Training Minefield.


Hawaiian Monk Seal Critical Habitat: Area 13. Kauai
159°50'W
159°40'W
159°30'W
159°20'W
22°10'N
22°0'N
21°50'N
KA91
KA82
KA81
KA92
KA72
KA71
KA101
KA102
KA62
KA61
KA52
KA51
KA42
KA41
KA32
KA31
PMRF Offshore Areas
KA22
KA21
KA11
KA12
Terrestrial Critical Habitat (Extends 5m inland from shoreline)
National Security Exclusion Area
Marine Critical Habitat (Extends to 200m depth contour)
0 2.5 5 10 Miles
0 5 10 20 Kilometers
N
W
E
S


Hawaiian Monk Seal Critical Habitat: Area 14. Oahu
158°20'W
158°10'W
158°0'W
157°50'W
157°40'W
21°40'N
21°30'N
21°20'N
OA82
OA81
OA11
OAi1 (Kapapa Island)
MCBH and 500 yard buffer
OA12
OAi2 (Moku Nui)
Pearl Harbor
Naval Facilities
OA21
OAi3 (Moku Iki)
Puuloa Range
Bellows
OAi4 (Manana)
Barbers Point/Kalaeloa
(White Plains and Nimitz beach)
OA72
OA22
OA71
OA31
Barner Point Underwater Range
OA62
OA32
NDSA
OA42
OA41
Ewa Training Minefield
Puuloa Underwater
Training Range
OA51
OA52
OA61
National Security Exclusion Area
Terrestrial Critical Habitat
(Extends 5m inland from shoreline)
Ineligible Areas
Marine Critical Habitat
(Extends out to 200m depth contour)
0 2.25 4.5 9 Miles
0 5 10 20 Kilometers
N
W
E
S

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 • Fax: (808) 725-5215

MAY 04 2017

Major William Rowley
Attn. MCB Hawaii, Environmental Dept.
PO Box 63062 B1359
MCBH Kaneohe Bay, HI 96863-3062

Dear Major Rowley:

This letter provides notice of areas under consideration for main Hawaiian Islands (MHI) insular false killer whale (*Pseudorca crassidens*) critical habitat under the Endangered Species Act of 1973, as amended (ESA; 16 USC 1531-1544) and is a request for information regarding areas utilized by the Department of Defense or U.S. Coast Guard, which overlap with the potential designation in waters surrounding the Hawaiian Islands.

On November 28, 2012, the National Marine Fisheries Service (NMFS) listed the MHI insular false killer whale Distinct Population Segment (DPS) as endangered under the ESA (77 FR 70915). The ESA requires NMFS to designate critical habitat for listed species and NMFS is currently gathering information for a proposed critical habitat rule for this endangered DPS.

Critical habitat is defined under section 3(5)(a) of the ESA as:

> (i) the specific areas within the geographical area occupied by the species at the time it is listed…, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed… upon a determination by the Secretary that such areas are essential for the conservation of the species."

Section 4(a)(3)(B)(i) of the ESA precludes from designation any lands owned by, controlled by, or designated for the use of the Department of Defense that are covered by an integrated natural resources management plan (INRMP) that the Secretary [of Commerce] has found in writing will benefit the listed species.

Section 4(b)(2) of the ESA requires NMFS to designate critical habitat for threatened and endangered species based on the best available scientific data after taking into consideration the economic, national security, and other relevant impacts of the designation. This section grants the Secretary discretion to exclude any area from critical habitat where the impacts outweigh the benefits of designation and where exclusion will not result in the extinction of the species.

In accordance with the ESA, NMFS is notifying the U.S. Marine Corps of the areas under consideration for MHI insular false killer whale critical habitat. Enclosed you will find a brief description and a preliminary map of the areas under consideration for designation. Additional enclosed materials include: the final rule which listed this distinct population segment as endangered, as well as brief description of the physical and biological features that are essential to conservation and are under consideration for the proposed critical habitat designation.

Please review the enclosed materials and maps and provide us with:

1. **4(a)(3) Preclusion Information:** The identity and location of any lands or geographical areas owned or controlled by the Department of Defense that may overlap with the areas under consideration for MHI insular false killer whale critical habitat and which are subject to a U.S. Marine Corps INRMP.
    a. Indicate whether these areas are owned and/or controlled by the U.S. Marine Corps and describe the regulatory control granted and applied to the areas.
    b. Provide a copy or access to the INRMP that requires review by NMFS, to determine if the INRMP provides a benefit to the endangered MHI insular false killer whale DPS.

2. **4(b)(2) Exclusion Information:** A list of all areas that overlap with the potential designation and which the U.S. Marine Corps would like considered for national security exclusion.
    a. For areas considered for exclusion provide a map or detailed description of the area, a list of U.S. Marine Corps activities that occur in the area, how those activities may impact MHI insular false killer whale habitat, and describe those impacts that are expected to U.S. Marine Corps activities as a result of this critical habitat designation.

For consideration prior to publication of the proposed designation, please submit materials for review by May 23, 2017.The Pacific Islands Regional Office of NMFS is working hard to incorporate all necessary information into the proposed rulemaking to allow for thorough review and consideration. If you have any questions, would like to discuss areas of concern, or would like to schedule a meeting please contact Jean Higgins, Endangered Species Biologist, by phone (808)725-5151 or by email at jean.higgins@noaa.gov.

Sincerely,

Ann M. Garrett
Assistant Regional Administrator
Protected Resources Division

Enclosure

CC: Lance Bookless

Attachment to NMFS 4(a)(3) and 4(b)(2) Request for Information Areas and features under consideration for main Hawaiian Islands insular false killer whales.

CRITICAL HABITAT UNDER THE ESA

The ESA defines critical habitat under Section 3(5)(A) as:

> *(i) the specific areas within the geographical area occupied by the species at the time it is listed…, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and*
>
> *(ii) specific areas outside the geographical area occupied by the species at the time it is listed… upon a determination by the Secretary that such areas are essential for the conservation of the species.*

The ESA does not specifically define physical or biological features, but Joint NMFS-USFWS regulations at 50 CFR 424.02 (79 FR 27066; May 12, 2014) defines physical or biological features to be:

> *The features that support the life-history needs of the species, including but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic, or a more complex combination of habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity*.

Features and Areas under Consideration for Critical Habitat

NMFS has identified the following four features that are essential to the conservation of main Hawaiian Island (MHI) insular false killer whales:

1. ***Island-associated marine habitat for MHI insular false killer whales***
   MHI insular false killer whales are an island-associated population of false killer whales that relies entirely on the productive submerged habitats of the main Hawaiian Islands to support all of their life-history stages. Adapted to an island-associated foraging strategy and overall ecology, these whales are generally found in deeper waters just offshore, moving primarily throughout and among the shelf and slope habitat on both the windward and leeward sides of all the Islands. These areas offer a wide range of depths for insular false killer whales to travel, forage, and move freely around and between the main Hawaiian Islands.

Attachment to NMFS 4(a)(3) and 4(b)(2) Request for Information Areas and features under consideration for main Hawaiian Islands insular false killer whales.

Special Management or protections for island-associated features - Tracking information indicates that some areas of island-associated habitat are used more heavily than others, but that these whales circumnavigate and move quickly throughout the waters surrounding the MHI. These island-associated habitats provide conditions that support this DPS' ability to find food and to interact with other insular false killer whales (supporting socialization and reproduction). The significance of High-use areas are not fully understood, but high-density use may indicate areas where foraging or social interactions are increased. Activities or conditions that may negatively impact island-associated marine habitat include those that occur over a large scale and over a long duration. Large-scale permanent activities are more likely to interrupt these whales' ability to move throughout island-associated habitat and may reduce the availability or access to high-use or other island-associated habitats.

2. ***Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth.***
MHI IFKW are top predators that feed on a variety of large pelagic fish as well as squid. Within waters surrounding the main Hawaiian Islands, habitat conditions should support the successful growth, recruitment, and nutritional quality of prey to support the individual growth, reproduction, and development of MHI Insular False Killer Whales.

Special Management or protections for prey features - Sustained decreases in prey quantity and availability in island-associated waters can influence foraging success of these whales and eventually lead to reduced individual growth, reproduction, and development. Additionally, factors that influence prey size and contaminant or toxin levels reduce the quality of prey for these whales. Decreased prey size reduces the energetic value gained and requires additional foraging efforts to meet their energetic needs. Contaminants and toxins introduced through prey consumption may put these whales' individual health or reproduction at risk (see water quality also).

3. ***Waters free of toxins or other agents of a type and amount harmful to MHI insular false killer whales***
Water quality plays an important role as a feature that supports the MHI insular false killer whales' ability to forage and reproduce free from disease and impairment. Biomagnification of some pollutants can adversely affect health in these top marine predators, causing immune suppression, decreased reproduction, or other impairments. Water pollution and changes in water temperatures may also increase pathogens, naturally occurring toxins, or parasites in surrounding waters. Environmental exposure to these toxins may adversely affect their health or ability to reproduce.

Special Management or protections for prey features - Environmental contaminants, such as organochlorines, heavy metals, and other chemicals, persisting and accruing in surrounding waters accumulate through the food chain into prey species and subsequently into MHI insular false killer whales. Biomagnification of some of these pollutants can adversely affect health in these top marine predators, causing immune suppression,

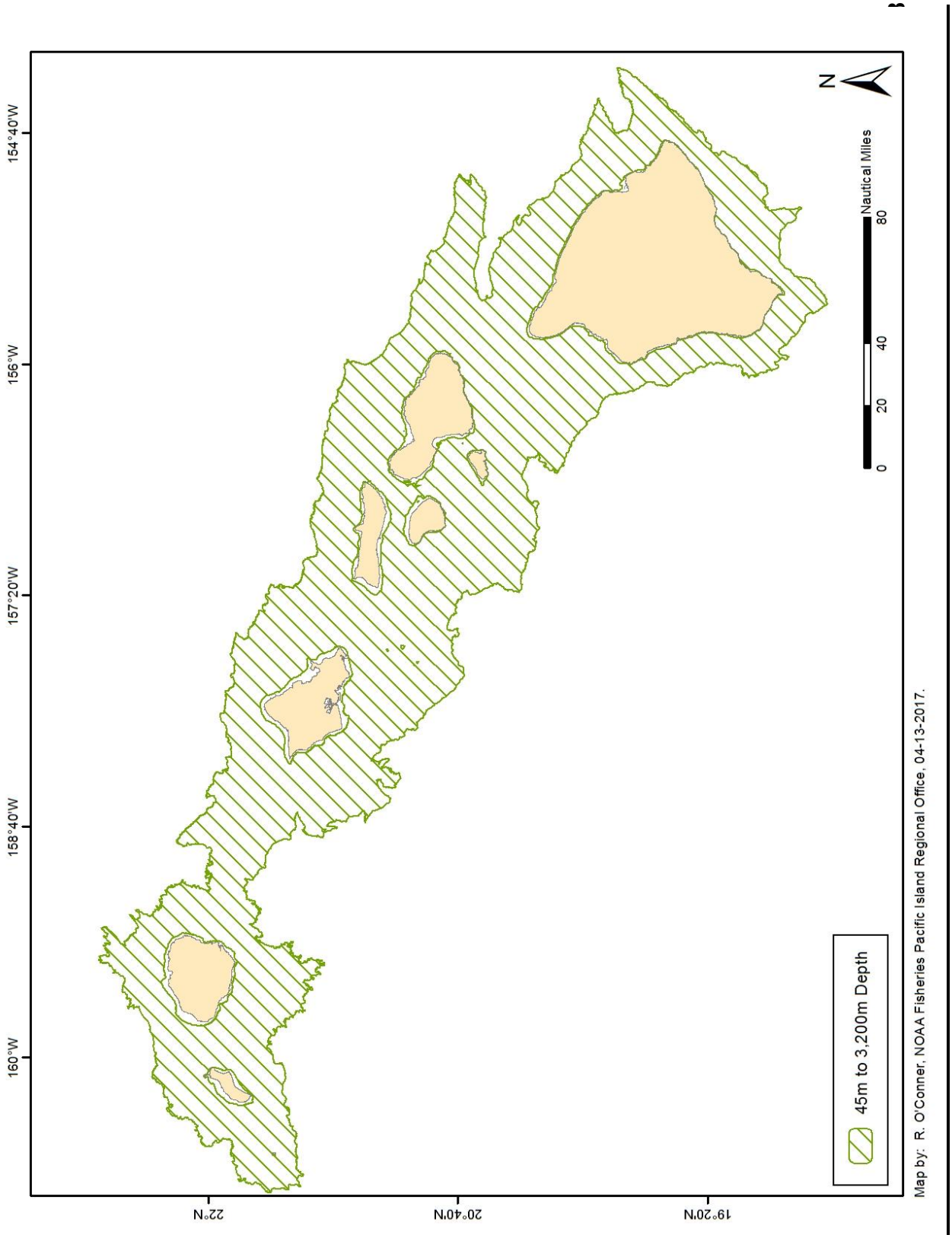
decreased reproduction, or other impairments. Water pollution and changes in water temperatures may also increase pathogens, naturally occurring toxins, or parasites in surrounding waters. MHI insular false killer whales' may be exposed to these infectious or harmful agents (such as bacteria, viruses, toxins, or parasites) either through their prey or directly through ingestion of contaminated waters. Environmental exposure to these toxins may adversely affect their health or ability to reproduce.

4. ***Waters with in-water noise below levels that impact false killer whales' ability to detect, interpret, and utilize acoustic cues that support important life history functions.*** False killer whales rely on their ability to produce and receive sound within their environment to navigate, communicate, and detect predators and prey. Habitats that support conservation of MHI insular false killer whales provide environments with noise levels that allow for the detection and interpretation of important acoustic cues, which ultimately supports successful foraging, reproduction, and recruitment of this endangered DPS.

   Special Management or protections for Noise - These whales rely on their ability to produce and receive sound within their environment to navigate, communicate, and detect predators and prey. In particular, the production, detection, and interpretation of acoustic cues associated with echolocation allow these animals to find prey at a distance within surrounding waters. The production, detection, and interpretation of other acoustic cues allows subgroups of animals to stay in communication at a distance as they travel throughout surrounding waters, to convey information about available food resources, and support socialization. The introduction of frequently occurring or chronic noise at certain levels within their habitat can mask - or alter these animals' ability to detect or interpret - important acoustic cues that support life history functions such as foraging, reproduction, socialization, travel, and predator avoidance. Chronic noise at certain levels can also deter marine mammals from using habitat, ultimately acting as a "barrier" to certain resources.

Given these essential features, waters surrounding the main Hawaiian Islands **from 45 meters to 3200 meters in depth** have been identified as meeting the definition of critical habitat and this area is under consideration for the designation of MHI insular false killer whale critical habitat. Please review the following maps, which depict the areas under consideration for designation.

Attachment to NMFS 4(a)(3) and 4(b)(2) Request for Information Areas and features under consideration for main Hawaiian Islands insular false killer whales.



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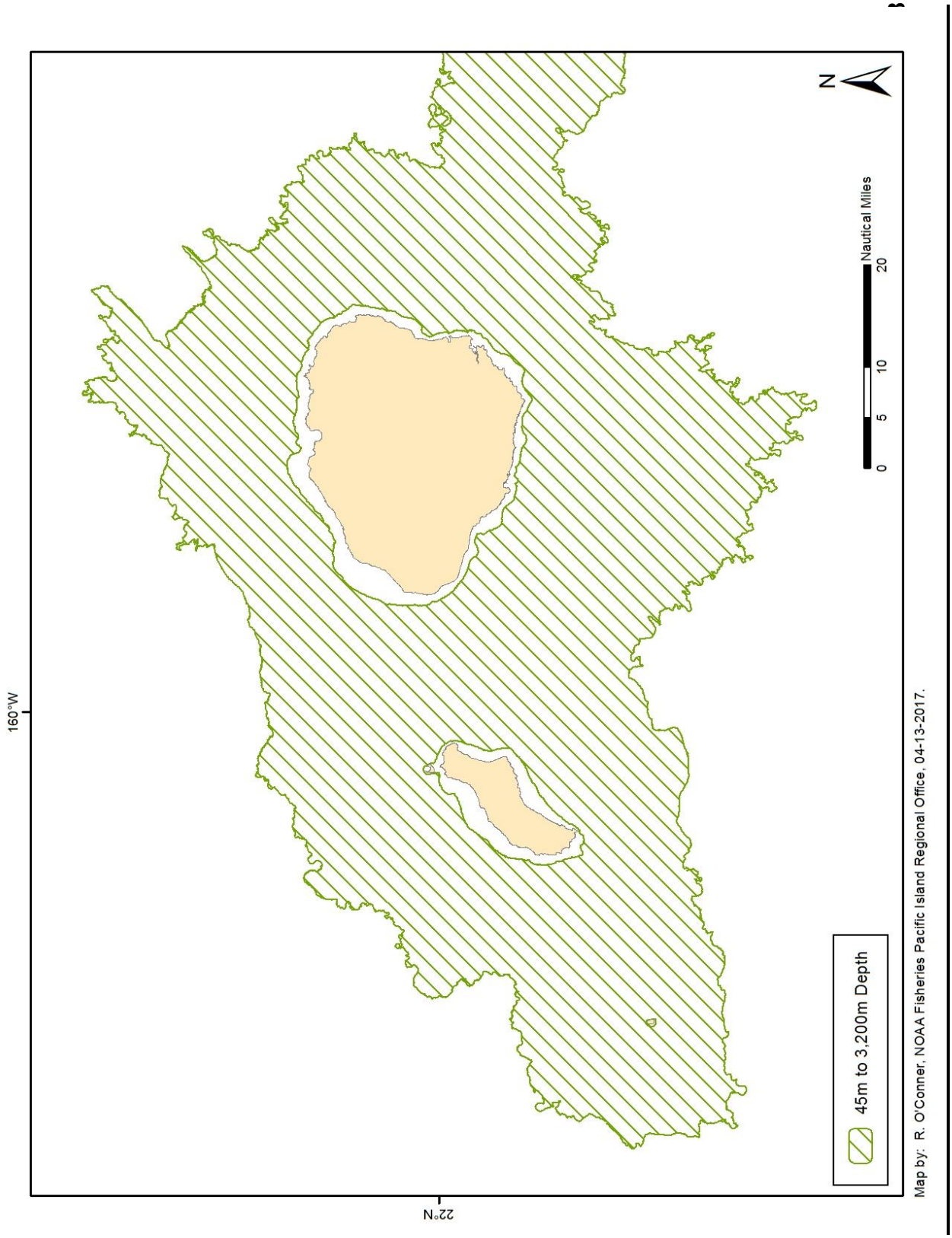

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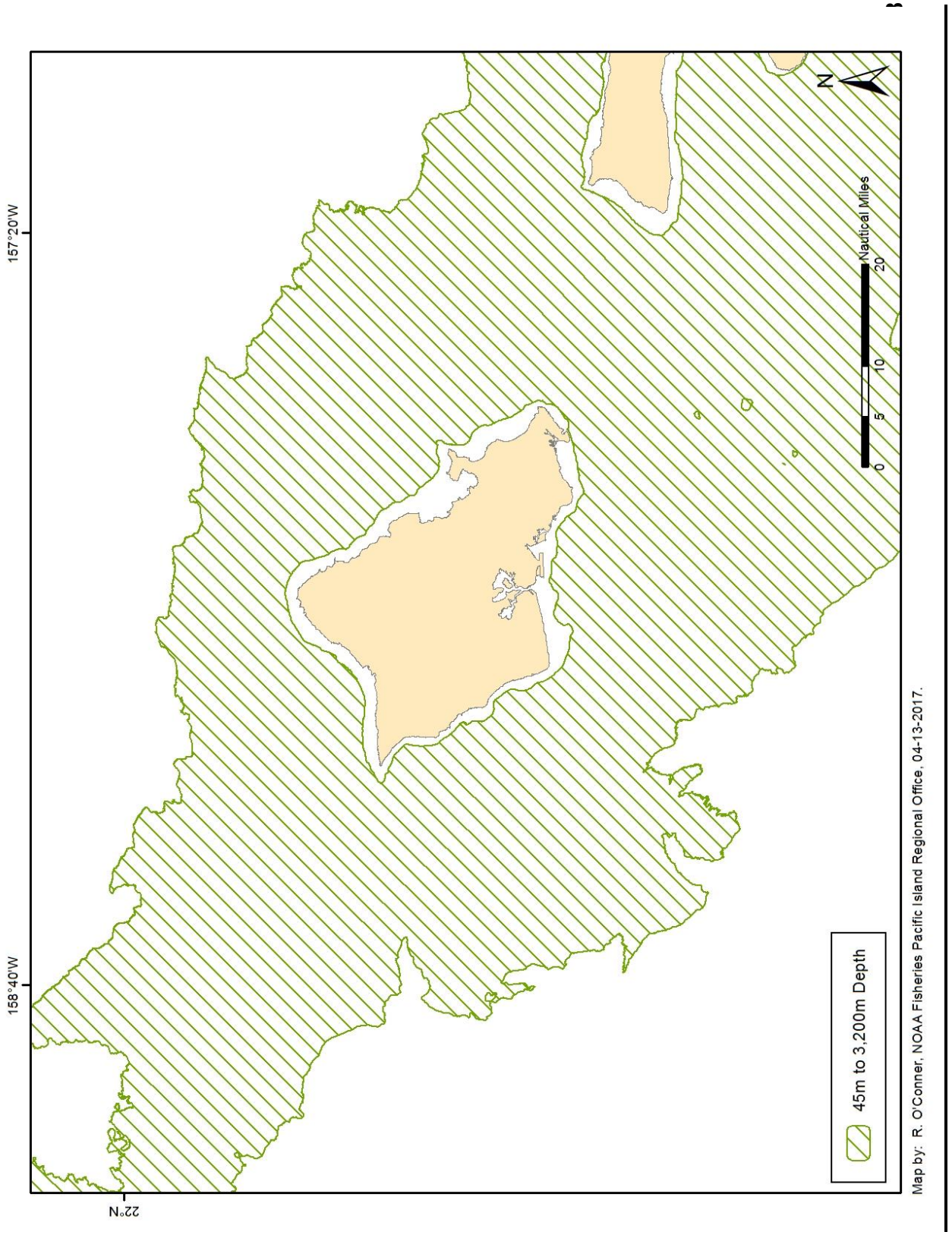

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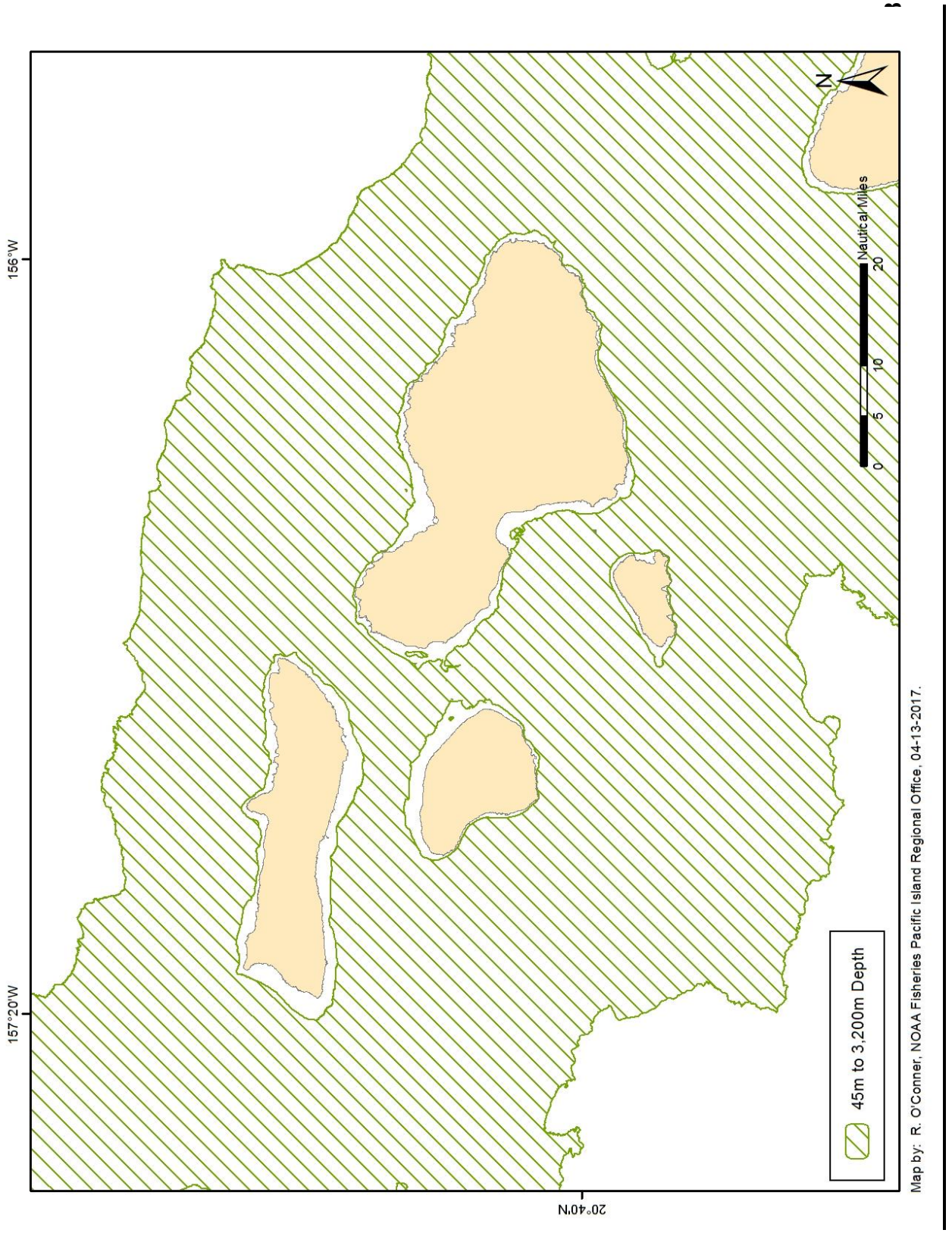

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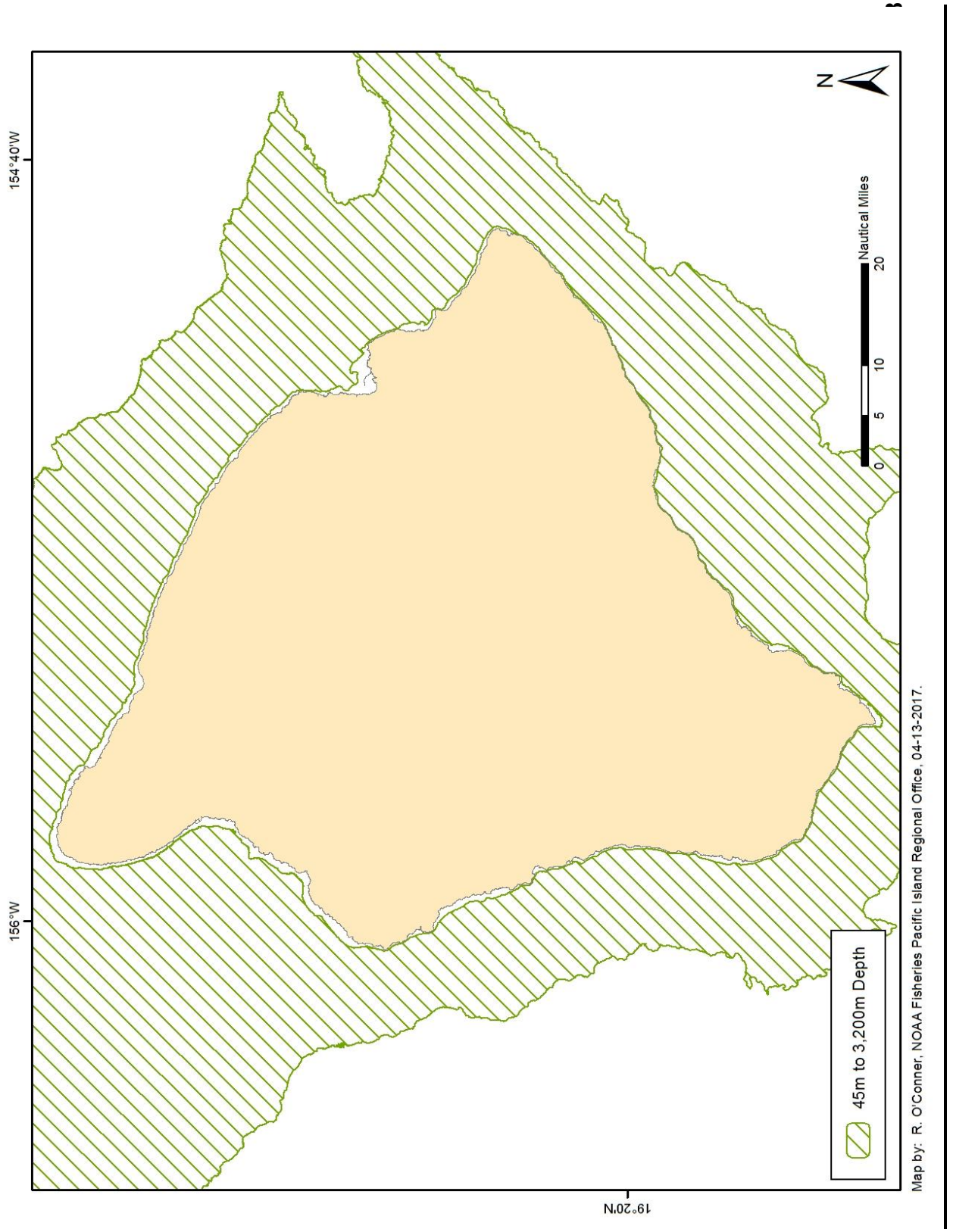

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
ENVIRONMENTAL COMPLIANCE AND PROTECTION DEPARTMENT
BOX 63062
KANEOHE BAY HAWAII 96863-3062

5090
LE 066-17
JUN 0 1 2017

Ms. Ann M. Garrett
Assistant Regional Administrator
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (PIRO)
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818

Dear Ms. Garrett:

SUBJECT: REQUEST FOR INFORMATION REGARDING AREAS UNDER CONSIDERATION FOR CRITICAL HABITAT DESIGNATION FOR THE MAIN HAWAIIAN ISLANDS INSULAR FALSE KILLER WHALE

The following is in response to your May 4, 2017 letter requesting information from Marine Corps Base Hawaii (MCBH) regarding areas utilized by the Department of Defense, which overlap with potential insular false killer whale (*Pseudorca crassidens*) critical habitat (CH).

Your letter states that the insular false killer whale (IFKW) is generally found in deeper waters just offshore primarily moving and foraging among the shelf and slope habitat in waters ranging in depth from 45 meters to 3200 meters. Those depths are found more than a half-mile offshore of Marine Corps Base Hawaii at Kaneohe Bay and over a mile offshore of Marine Corps Training Area Bellows. The offshore waters at our Puuloa Range Training Facility falls under the jurisdiction of Pearl Harbor and their Naval Defensive Sea Area. The proposed CH is well outside our area of influence and control, which limits our ability to conduct conservation actions that would directly support the IFKW habitat and benefit the species.

Of the four features essential to conservation of the insular false killer whale that NMFS identified in the subject letter, MCBH performs the following actions that may indirectly benefit the IFKW:

a. MCBH conducts actions and activities and has developed programs that prevent contaminants and toxins from entering the marine environment such as storm water management and monitoring, enforcing the base's national pollutant discharge and elimination system permit, maintaining oil water separators, recycling metals, plastics, and paper, and conducting water quality testing at numerous points around the base. We have programs that control hazardous material disposal and minimize hazardous material waste streams. And finally, we have a trained Spill Response team to respond to any spills on land or in Kaneohe Bay.

b. MCBH has an active feral animal control program that helps prevent the introduction of bacteria, viruses, and parasites that may contaminate the aquatic environment and adversely affect the health of the IFKW. In particular, we control cats at-large that minimizes the spread toxoplasmosis into the marine environment.

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LE 066-17

c. MCBH monitors coastal and in-water construction and takes action to mitigate sound that could interfere with the IFKW production, detection, and communication that they rely upon to support life history functions and foraging.

We include in our Integrated Natural Resources Management Plan (INRMP) conservation measures that benefit other marine animals that may also provide a benefit to the IFKW. In conclusion, should areas beyond MCBH's naval defensive security area in the open ocean around MCB Hawaii properties be designated as critical habitat, it should have minimal impact to our amphibious training and other military operations vital to the Marines preparing for combat operations around the world. In accordance with the Sikes Act and the National Environmental Policy Act, we will continue to coordinate or consult with NOAA Fisheries on federal undertakings that require your review and input.

Thank you for providing us the opportunity to review and comment on the proposed critical habitat for the MHI insular false killer whale. The point of contact for this matter is Lance Bookless, Senior Natural Resources Management Specialist, phone 257-7000, or email lance.bookless1@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department

D7. BEST MANAGEMENT PRACTICES FOR LANDSCAPE MAINTENANCE

Concerns about the potential spread of invasive species require institution of BMPs for landscape maintenance. Dumping of soil and green waste in open land spaces not designated for that specific purpose (i.e., Base landfill, off-site private landfill) with land use controls/BMPs, is not authorized. The following protocols apply to anyone managing green waste or soil at MCBH, including Facilities ground maintenance staff and contractors.

GREEN WASTE DISPOSAL

- Storage of stockpiles green waste or mulch piles is not permitted on any MCBH properties due to the threat of the coconut rhinoceros beetle (CRB).
- Soil removed from areas that potentially contain weed seeds of highly invasive plants (i.e., devil weed at Camp Smith) will not be stored or utilized in areas that do not contain the same weed species. The only exception to stockpiling soils is at MCTAB where, upon O&T approval, soils from any area at MCTAB could be beneficially reused for military training, (i.e., heavy equipment training that requires moving around large volumes of soil).
- Soil and green waste generated by landscaping shall be disposed of only in designated authorized areas or per contract terms.
- All landscape equipment (e.g., mowers, line trimmers) shall be cleaned prior to moving to another site to avoid the spread of highly invasive weeds (e.g., devil weed) and invertebrate pest species (e.g., CRB).

COMBATING COCONUT RHINOCEROS BEETLE

CRB, a pest species that lives in decaying plant material or green waste, is a concern of HDOA, OISC, DoN, and MCBH as it has been responsible for the death of many coconut palms and poses injurious concerns for other palms and related plant species. There is currently a two mile CRB quarantine/buffer area extending outward from JBPHH that encompasses Pu‘uloa RTF, Manana, Pearl City Annex, and Camp Smith. Efforts to contain the spread of this species requires adherence to the following BMPs.

- Green waste created at Pu‘uloa RTF should be inspected prior to removal from the site. If green waste is known or thought to contain CRB larvae, juveniles, or adults, it will be disposed of by incineration and will not be transported to any landfill.
- **Manana, Pearl City Annex, and Camp Smith**: Routine green waste disposal is in effect. The grounds maintenance and tree trimming contractor puts green waste in a Honolulu Disposal Service container on Camp Smith and Honolulu Disposal Service removes and disposes of the waste.
- **Pu‘uloa RTF**: Due to the CRB threat, special green waste disposal procedures are in place. At the time of writing, all material is being taken to the Kalaeloa (Barbers Point) green waste facility. Only whole, not chipped material is currently permitted there; chipped material disposal has been suspended, but may be authorized again at some future date.
- Chipped material will no longer be allowed to be stockpiled on any MCBH property. For the western properties, chipped material not immediately transported and kept overnight must be tightly covered to prevent the CRB from getting into it.
- Any green waste transported from Pu‘uloa RTF, Manana, Pearl City Annex, and Camp Smith needs to be tightly covered to prevent the escape of CRB in the event there is any CRB that was not discovered in the material.

D8. ACCESS FOR RESEARCH ACTIVITIES

Natural Resources staff coordinate access requests for Federal and State agencies, educational institutions, and other non-Federal entities to come aboard MCBH to engage in natural resource-related research activities. All requests to perform scientific research on MCBH properties must have a nexus to the natural resources program and support its management objectives. Research must benefit the researcher and MCBH if it is to be conducted within the Base's jurisdiction. Research requests are closely scrutinized as they can take significant staff time to process and monitor. Only non-commercial, non-profit research will be given consideration; research supporting commercial activities will not.

The process to obtain access for research involves:

1. Requester provides a hardcopy letter to the MCBH CO and an electronic copy to Natural Resources staff that includes:
    a. a detailed project description
    b. how the project can benefit/support the natural resources program
    c. what reciprocal support is needed from the Base
    d. timeframe of the project
    e. other agencies involved with the project
    f. number of participants/vehicles/equipment requiring access.
2. Natural Resources staff may be required to draft an informational paper for command review.
3. Natural Resources staff consults with Sikes Act partners if needed.
4. Natural Resources staff coordinates with other departments (e.g., O&T, WFO, MPD, Water Safety, Base Safety).
5. Natural Resources staff drafts an Access Authorization letter, with terms and conditions, for command signature.

If approval for the research is given, Natural Resources staff will be required to:

1. Provide an orientation brief to the researchers
2. Escort/supervise researchers as necessary
3. Monitor progress of researchers
4. Follow-up to obtain reports on their research.

Examples of terms and conditions to grant access to conduct research are attached.

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEOHE BAY, HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/112-14
May 9, 2014

Molly Hagemann
Vertebrate Zoology Collection Manager
Bishop Museum
1525 Bernice Street
Honolulu, Hawaii 96817

Dear Ms. Hagemann:

We acknowledge your April 23, 2014 letter requesting a Right of Entry permit to collect avian and mammalian fossils from the Ulupa'u Crater area aboard Marine Corps Base Hawaii, Kaneohe Bay.

Your right of entry permit is granted from 1 June, 2014 and expires June 30, 2015. While two specific dates are requested, it is understood that there may be follow-on visits to collect more data in the near future. Please ensure that all future visits outside of the dates requested are coordinated with the point of contact listed below. Furthermore, please have Carla Kishinami, Teresa Lopez, Nicholas Griffith, Noa Dettweiler, and yourself review the enclosed "Concurrence and Release" form, initial the lower right hand corner of each page, sign and return it to this office. Copies are authorized. Also, send proof of Third Party Liability Insurance coverage as indicated in the release form.

This letter, together with our receipt of your signed copies of the enclosure and proof of insurance constitutes our approval of your revocable right of entry to the installation. Before accessing the site, you must also provide a signed and dated Hold Harmless and Waiver of Liability (enclosure 2). Please continue to send us all lists of catalogued collected material pertinent to your collection at Ulupa'u as it becomes available. Point of contact on these matters is Lance Bookless, Senior Natural Resources Management Specialist, phone (808) 257-7000 or lance.bookless1@usmc.mil.

Sincerely,

D. R. GEORGE
Captain, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department
By direction of the Commanding Officer

Enclosure: (1) Concurrence and Release form
(2) Hold Harmless and Waiver of Liability

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEOHE BAY HAWAII 96863-3002

IN REPLY REFER TO:
11000
LE
February 23, 2015

Ms. Angela Richards Donà & Mr. Raphael Ritson-Williams
University of Hawaii - Manoa
Hawaii Institute of Marine Biology
Honolulu, HI 96822

Dear Ms. Donà and Mr. Ritson-Williams:

SUBJECT: UH DOCTORAL CANDIDATE'S REQUEST TO CONDUCT BLUE RICE CORAL RESEARCH WITHIN MCB HAWAII'S 500 YARD NAVAL DEFENSE SEA AREA (NDSA)

Per review of your February 02, 2015 email requesting access to MCB Hawaii's 500 yard Naval Defense Sea Area (NDSA) to conduct scientific research involving Blue Rice Coral (*Montipora flabellata*), we hereby grant you access for the period March 1, 2015 to February 29, 2016, with a one year extension based on your adherence to the conditions, rules, and regulations of Marine Corps Base Hawaii and those noted in this letter.

Your access is subject to a number of understandings and conditions, as identified below:

- Technical review and approval must be performed by the Marine Corps Base Hawaii (MCB Hawaii) Environmental Department on any data collected within our NDSA, also known as the buffer zone, and before any report or publication is released to other agencies or the public. Submit data and report in digital format in either Microsoft Word or Adobe Acrobat.

- You will email, to the Environmental Department's point of contact (POC) found at the end of this letter, a copy of your government issued ID. Each of you must sign, date, and return to the POC, a Hold Harmless and Waiver of Liability Agreement (Enclosure (1)).

- Each of you must have on your person or the ability to quickly access your government-issued (federal or state) personal identification.

- You shall NOT sponsor other people aboard MCB Hawaii. If other researchers are needed, you must submit a separate request to the Environmental Department for their access.

- Before conducting your research in the water, you must receive a briefing from Base Safety, which will be coordinated through the Environmental Department

- Coordination must be made with MCB Hawaii's natural resources staff, three days before entering the NDSA for the first time. You must contact them by voice or voicemail each day you enter the NDSA and upon departure. The natural resources points of contact are Lance Bookless at(808) 257-7000 or Todd Russell at (808) 216-7135

- Your activities, vehicle, and personal belongings are subject to questioning and inspection at any time by the Federal Conservation Law Enforcement Officers (CLEOs).

11000
LE
February 23, 2015

- Your access to the research site is only from the shoreline by the Pali Kilo recreational beach cottages. Boat access is not authorized without special permission and prior coordination with the Environmental Department Authorized parking and access to the shoreline is identified on Enclosure (2).

- Extreme caution must be taken when operating in the ocean environment. There will be no water safety personnel on site or emergency rescue readily available to assist you.

- Keep all valuables with you or secured in your vehicle.

- No marine life, to include live coral, is to be taken for recreation, commercial, or scientific purposes.

- You must always enter the Base through the H-3 security gate and take the most direct route to and from the beach cottages where you will be conducting your research. You are not authorized to use any facility or access other shorelines without written permission from the Environmental Department.

- Report any suspect, unauthorized or illegal activity occurring in the area you will be conducting research as soon as possible to the CLEOs at (808) 216-5178 or (808) 479-7361; if you are unable to reach the CLEOs, contact the Military Police Department desk sergeant at 257-2123. Inform the natural resources staff within 24 hours regarding what you observed.

My point of contact is Mr. Lance Bookless, Senior Natural Resources Management Specialist, at (808) 257-7009 or lance.booklessl@usmc.mil.

Sincerely,

ROBERT M. LOTTIE
Director, Installations, Environment
and Logistics
By direction of the Commanding Officer

Enclosures: 1. Hold Harmless and Waiver of Liability Agreement
2. Authorized Parking Location and Beach Access

Copy to: MPD/O&T/MCCS/LE

2

HOLD HARMLESS AND WAIVER OF LIABILITY AGREEMENT

For and in consideration of the permission granted by the United States Marine Corps to enter upon Marine Corps Base Hawaii, Kaneohe Bay, Hawaii on: [Date] _____/_____/ 2015, to participate in the **UH Coral Research in the Pali Kilo Cove**, and being informed of all the activities that I will engage in during this project, I, [*Insert name (print)*]:_____, forever discharge and hold harmless the United States/United States Marine Corps, and all of its officers and personnel, employees, representatives, successors, and assigns, including the Commanding Officer, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii from any and all liability under the Federal Tort Claims Act (28 U.S.C., Sections 1346(b), 2671-2680). I also waive all claims, demands, damages, actions, or suits of any nature or legal basis against the United States of America, United States Marine Corps, and their agencies, departments, officers, employees, personnel, successors, or assigns arising from any injury or alleged injury, including death, and property damage or loss that occurs incident to my entering upon, engaging in any physical activities while conducting **UH Coral Research in the Pali Kilo Cove** conducted within Marine Corps Base Hawaii's 500 yard Naval Defensive Sea Area (NDSA), transportation aboard government or private vehicles or vessels, or use of any facilities located on Marine Corps Base Hawaii, Kaneohe Bay, Hawaii.

I understand and am aware that recreational watercraft uses the area. I am aware that potentially hazardous conditions may exist in the area of the project, including, but not limited to the following: natural and man-made obstacles that may be visible or camouflaged, hazardous surf conditions, strong currents, normal or rogue waves, rip-rap, and other terrain and underwater features. I understand that there will be no food, water, or emergency medical services provided by the government at any the areas to be visited in the course of the underwater filming project.

This waiver is legally binding on me and my heirs, executors, and administrators.

I acknowledge that I am aware of the risks involved in my participation in the **UH Coral Research in the Pali Kilo cove** on: [Date] _____/_____/2015__. I acknowledge my understanding that I am not authorized to collect, sample, or remove any coral, sediment, other marine life or any natural or cultural resource specimens of any kind from Marine Corps Base Hawaii and its waters.

I further acknowledge that I have carefully read this release, understand the contents thereof and sign this release as my free and voluntary act.

_____	_____	____/_____/ 2015
Participant's signature	Participant [Print name]	Date
_____	_____	____/_____/ 2015
Parent or Guardian's Signature (participants under 18 years old)	Parent or Guardian [Print name]	Date

ENCLOSURE (1)

D9. ACCESS FOR EDUCATIONAL TOURS AND SERVICE PROJECTS

Natural Resources staff accommodate on- and off-Base public access requests for resource-compatible educational tours and service projects as limited time and staff permit.

The following applies to educational tours or field trips involving natural resources:

- Must be coordinated with Natural Resources staff
- If non-Federal entity, must be coordinated with the Community Relations section of the Strategic, Plans & Engagement (SP&E) Directorate
- Tour group size limited to 10-20 people; individual tours are not provided due to staff limitations
- Vehicle access is limited to ten vehicles due to parking limitations and the ability to maintain control of a long caravan of vehicles.

Coordination and planning effort by Natural Resources staff involves:

- Coordinate tour date and time with the requestor
- Sponsor tour participants aboard Base
  - Ensure drivers have a current driver's license, safety check, registration, and proof of insurance
  - Large tours can be expedited if participants provide full name and SSN. This info is provided to the Provost Marshal's Office 10 days in advance of tour.
- Prepare a talk.

Common educational tours and services projects include:

Red-footed Booby Tour

- Requires Range Facility Management Support System request
- Only conduct 2-3 tours a year so as to minimize stress on the colony
- Must be requested 90 days in advance
- May require EOD and/or medical/corpsman support; none required if only going to the "Lollipop Rd"
- Has to be conducted around Range operations
- No private vehicles allowed on Range, only Government vehicles – participants have to walk.

Nu'upia Ponds Tour

- Requires moderate coordination and planning effort
- Only conduct 2-4 tours a year, depending on workload and staff availability.
- Depending on the current Base Commander's guidance and SP&E desired level of involvement, Community Relations can assist with sponsoring personnel aboard Base and evaluating non-Federal entity access.

Natural Resources Service Project

- Mainly involves removing invasive species (e.g., bi-monthly "Weed Warrior" event)
- Many of these projects occur during non-working hours on weekdays and weekends when volunteers are most available, resulting in an extended work week for MCBH staff.
- Participants can be sponsored aboard the Base the day of the event.

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEOHE BAY, HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/021-13
February 26, 2013

Ms. Ruby Hodges
740 Oneawa Street
Kailua, HI 96734

Dear Ms. Hodges:

SUBJECT: ACCESS FOR HALA TREE LEAF HARVEST

This responds to your February 20, 2013 updated request for access to Marine Corps Base Hawaii to harvest leaves from hala trees in locations depicted in enclosure (1). We are happy to inform you that access is hereby granted for one day a week from February - August 2013. Individuals covered by this permit are: Ruby Hodges and Ann Ng. Both individuals are subject to conditions below and attached. Please ensure that each individual listed herein have a copy of this letter in their possession and available for inspection on each access date.

- Harvesting is limited to the tree areas depicted in enclosure (1).
- The Environmental Office must be notified by phone or email, each time you will be on the Base to collect hala leaves.
- Access for hala leaf harvesting is permitted once per week, Monday - Friday, between 7:00 a.m. and 4:30 p.m. and enclosure 2 must be submitted by each individual prior to commencing this schedule.
- Harvesting is on a not-to-interfere basis. For example, access is not permitted near the WWII Memorial if a ceremony is in progress.
- Green waste generated during the project must be removed off-site (on the day it is generated) to a proper off-base disposal area.
- Authorized harvesting tools are hand-held clippers and a long pole with attached hook as used before.
- Ladders or climbing trees are not allowed; trees will not be totally stripped of leaves.
- Leaves gathered from this access will be used to make products for personal and educational enjoyment and not offered for commercial sale.
- This access permit is not "open-ended" and future requests will be considered on a case-by-case basis.

5090
LE/021-13
February 26, 2013

Our point of contact for coordination and receiving liability waivers prior to your first visit is Lance Bookless, Senior Natural Resources Management Specialist, phone: (808) 257-7000 or lance.bookless1@usmc.mil

Sincerely,

D. R. GEORGE
Captain, U.S. Marine Corps
Director, Environmental Compliance and Protection Department
By direction of the Commanding Officer

Enclosures: 1. Authorized Hala Plant Access Locations
2. Hold Harmless and Waiver of Liability Agreement

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEOHE BAY HAWAII 96863-3002

IN REPLY REFER TO:
11000
CO
Nov 14, 2013

Mr. Jordan Ching
Sanctuary Ocean Count Project Coordinator
Hawaiian Islands Humpback Whale
National Marine Sanctuary
6600 Kalanianaole Hwy, Suite 301
Honolulu, HI 96825

Dear Mr. Ching:

SUBJECT: BASE ACCESS FOR OCEAN COUNT OF HUMPBACK WHALES

Per review of your request for National Marine Sanctuary volunteers to access Marine Corps Base Hawaii for the purpose of counting Humpback whales, is hereby granted. This authorization approves you indefinitely for Base access each year in January, February, and March, but can be revoked at any time at the Base's discretion and without advance notice. Access is subject to the following conditions, as listed below:

- You will coordinate with the Environmental Department point of contact (POC) listed below prior to each event.
- A list of participants will be provided to the POC in advance of each event via email. Additionally, all participants must sign, date, and return to the POC, a hold harmless and waiver of liability (enclosure (1)). This requirement is necessary regardless of whether or not the participant has base access for another purpose.
- Participants will attend a safety and environmental awareness brief on the morning of each event.
- The number of participants for each site is limited to 20 individuals.
- Pets are not allowed.
- All participants must have on their person some form of government-issued (federal or state) personal identification.
- Participants must park in the designated public parking area at Pyramid Rock Beach. At the Monument Point designated location near the Range, volunteers must use the KBay RTF graveled parking lot. Carpooling is encouraged due to limited parking availability.
- Participants are not allowed to deviate from the authorized activity of counting whales.
- Following each event, please provide a summary of data collected to the POC.

My primary point of contact is Todd Russell, Natural Resources Management Specialist, MCB Hawaii at phone:(808) 216-7135, or via email todd.russell@usmc.mil. The alternate POC is Lance Bookless, Senior Natural Resources manager at (808) 257-7000.

Sincerely,

D. R. GEORGE
Captain, U. S. Marine Corps
Director, Environmental Compliance and Protection Department
By direction of the Commanding Officer

Enclosures: 1. Hold Harmless and Waiver of Liability Agreement
2. Approved Whale Count Locations and Routes

D10. MCBH SPECIFICATIONS FOR DIGITAL DATA

ATTACHMENT A
STATEMENT OF WORK
SPECIFICATIONS FOR DIGITAL DATA
MARINE CORPS BASE HAWAII

SPECIFICATIONS FOR DIGITAL DATA. Any maps, drawings, figures, sketches, databases, spreadsheets, or text files prepared for this contract shall be provided in both hard copy and digital form. The hard copy deliverables are defined in a previous section of this statement of work.

Text, Spreadsheet, and Database Files:

The Marine Corps standard computing software is Microsoft Office 2003. Final Reports and other text documents shall be provided in Microsoft Word format **AND** Adobe Portable Document Format (PDF). Spreadsheet files shall be provided in Microsoft Excel format. Databases shall be provided in Microsoft Access format, unless specified otherwise, as approved by the Government. **Prior to database development, the contractor shall provide the Government with a Technical Approach Document** for approval, which describes the contractor's technical approach to designing and developing the database. All text, spreadsheet, and database files shall be delivered on a compact disk read-only memory (CD-ROM) with ISO-9660 format.

Maps, Drawings, and Sketches (Digital Geospatial Data):

1. **Geospatial Data Software Format**:
Geographic data must be provided in a form that does not require translation, preprocessing, or post processing before being loaded to the installation's regionally hosted geodatabase. The Contractor shall validate any deviation from this specification in writing with the Government (Installation Geospatial Information & Services (IGI&S) Manager via the Project Manager). Digital geographic maps and the related data sets shall be delivered in one of the following software formats:

A. CADD: All CADD data shall be provided in AutoCAD 2008 and shall be in the same projection and use the same coordinate system, datum, and units as stated below in the paragraph #3 titled Geospatial Data Projection. Drawing files shall be full files, uncompressed, unzipped, and Geo-referenced.

Note: The Government **may** approve the use of AutoCAD when it is determined that the format will not compromise the spatial accuracy or structure of the delivered data and that the data will easily integrate with the enterprise GIS system.

- AND / OR -

B. GIS: Personal geodatabase format (Access database file) using ArcGIS 9.2. The personal geodatabase must be importable to a multi-user geodatabase using ArcSDE 9.2. The delivered data layer(s) shall be provided with x,y domain precision of 1000.

(NOTE: AutoCAD is software produced by Autodesk,Inc. ARC/INFO, ArcGIS, and ArcSDE are geographic information system software produced by the Environmental Systems

Research Institute (ESRI) of Redlands, California. These software are used by the Marine Corps GEO*Fidelis* Program)

2. Geospatial Data Structure:

A. CADD Drawings/Data – The Contractor shall develop all CADD data in conformance with the latest version of the following standards and policies:

U. S. National CADD Standards (NCS)
CADD/GIS Technology Center's AEC CADD Standards (same address above)
NAVFACINST 4250.1, Electronic Bid Solicitation

-AND / OR-

B. GIS Data Sets – When developing/delivering geospatial data, the Contractor shall develop the initial structure consistent with the most current version of the GEOFidelis Data Model. The GEOFidelis Data Model shall be followed for geospatial database table structure, nomenclature, and attributes. The Contractor shall consult with the Government concerning modifications or additions to the GEOFidelis Data Model. The Government may approve modifications to the Model if it is determined that the Model does not adequately address subject datasets. Copies of the GEOFidelis Data Model may be obtained by contacting the Facilities Department POC. When delivering updates to existing feature classes, the Contractor shall obtain a copy of the subject data in a personal geodatabase to use as a template for all subsequent data collection processes. As installations sometimes modify the SDSFIE structure for many feature classes to accommodate operational needs, the SDSFIE structure may not reflect the actual structure used in the geodatabase. If further modifications to structure are required as a result of this Scope, the Contractor will consult with the Government (IGI&S Manager) for direction and final approval.

3. **Geospatial Data Projection**:

Geographic data (regardless of format) shall be delivered in the **projected** coordinate system North American Datum 1983 (NAD83), adjusted to the HARN, Hawaii State Plane Zone #3, distance unit: meters. This is also known as NAD_1983_HARN_StatePlane_Hawaii_3_FIPS_5103, distance units meters.

The maps and data shall use the Geodetic Reference System (GRS) 1980 spheroid and the North American Datum 1983 (NAD83) readjusted to the High Accuracy Reference Network (HARN). This projection requirement applies to all CADD drawings such as as-designed and as-built project plans, as well as GIS data layer deliverables. Each data set shall have a projection file if appropriate based on format. Map or drawing **scales** will be determined by the Project Manager, if applicable. Mapping **accuracy** for the agreed scales will conform to the American Society for Photogrammetry and Remote Sensing (ASPRS) "Accuracy Standards for Large-Scale Maps", "Interim Accuracy Standards for Large-Scale Maps", and "Geospatial Positioning Accuracy Standards". Copies of these standards can be obtained on the Internet at http://www.asprs.org, and/or at http://www.fgdc.gov, or by contacting:

American Society for Photogrammetry and Remote Sensing
5410 Grosvenor Lane, Suite 210
Bethesda, MD 20814-2160

4. **Geospatial Data Collection:**

A. **Mapping grade Global Positioning System** (GPS) data collection (+ 1-5 meters horizontal accuracy) shall be performed when specified in the statement of work and shall be completed in accordance with the National Geodetic Survey's Hawaii State Plane Zone 3, NAD83 adjusted to the HPGN/HARN. Default horizontal accuracy for mapping grade GPS data collection efforts shall meet a sub-meter threshold unless otherwise specified to be survey grade, sub-foot or sub-5 meter in the statement of work. Note: NGS no longer adjusts projections to the OLD HI datum. *Spatial accuracy requirements are as follows:*

- Sub foot: 95 % of all points are within ± 12 inches

-OR-

- Sub meter: 95% of points are within ± 1 Meter

*-OR_*

- Sub 5 meter: 95% of points are within ± 5 Meter

-AND / OR-

B. **Survey grade GPS** data collection shall be performed in lieu of mapping grade when specified in the statement of work. . As survey processes are highly regulated by federal, state, and/or local technical and licensing requirements, they are in general beyond the scope of this document. However, survey grade GPS data collection shall at a minimum use the Geoid2003 CONUS epoch (or a more current epoch if available at the time of this project) and spatial accuracy requirements for survey grade are 95 % of GPS points are within ± 1 centimeter. Every effort shall be made to capture feature locations without using offsets unless obstructions are present. Any offsets used shall be annotated in the "user flag" field.

Data sets derived from GPS data collection efforts (mapping or survey grade) shall include metadata to record descriptions of the receiver and other equipment used during collection and processing, base stations used for differential corrections, software used for performing differential corrections, estimated horizontal and vertical accuracies obtained, and conversion routines used to translate the data into final geographic data delivery format. All metadata shall comply with the metadata format requirements as described in this document. Final geographic data delivery format shall comply with the specifications described in this document.

> **NOTE: None of the GPS collection information is to be included in the table structure of the delivery, unless it is specifically part of the SDSFIE or established installation feature format.**

5. **Media for Geospatial Data Deliverables**:

Geographic data shall be delivered on a separate compact disk read-only memory (CD-ROM) –or-, digital versatile disk read-only memory (DVD-ROM), or other digital media such as external hard drives or flash drives if approved by the government. This media shall **contain only the value-added data sets** as designated in the Task sections of the statement of work. Do not include the Contractor's working files or original installation data sets that may have been used by the Contractor to develop the deliverables. "READ ME" files may be included on the geographic data media if such files provide explanation of the delivered data sets. However, these "READ ME" files should not be delivered in lieu of standard metadata.

6. **Geographic Data Documentation (Metadata):**

For each digital file delivered containing geographic information (regardless of format), **the Contractor shall provide documentation** consistent with the Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata (CSDGM). Both 'Mandatory' and 'Mandatory as Applicable' fields shall be completed for each geographic data set. The documentation shall include, but not be limited to, the following:

- The name, description, abstract, and purpose of the data set/data layer
- The source of the data and any related data quality information such as accuracy and time period of content
- Descriptions of the receiver and other equipment used during collection and processing, base stations used for differential corrections, software used for performing differential corrections, estimated horizontal and vertical accuracies obtained, and conversion routines used to translate the data into final geographic data delivery format.
- Type of data layer (point, line, polygon, etc.),
- Field names of all attribute data and a description of each field name
- Definition of all codes used in the data fields
- Ranges of numeric fields and the meaning of these numeric ranges
- The creation date of the map layer and the name of the person who created it
- A point of contact shall be provided to answer technical questions.

Metadata generation tools included in the ArcGIS suite of software (or equivalent technology) shall be used in the production of the required metadata in XML format. Regardless of the tools used for metadata creation, the Contractor must insure that the metadata is delivered in XML format and can be easily imported to the installation's enterprise geodatabase. Copies of the FGDC metadata standard can be obtained on the Internet at http://www.fgdc.gov or by contacting:

FGDC Secretariat
c/o U.S. Geological Survey
590 National Center
Reston, Virginia 22092,
(703) 648-5514

NOTE: The metadata should be formatted from the installation database perspective, not the Contractor project perspective. Therefore such items as Point of Contact should be the installation POC currently associated with the data and NOT the Contractor's Project Manager. The Contractor shall use language and format consistent with existing installation metadata.

7. **Geographic Data Review**:

The digital geographic maps, related data, and text documents shall be included for review in the draft and final contract submittals. The data will be analyzed for discrepancies in subject content, correct format in accordance with these specifications, and compatibility with the existing GIS system. The Contractor shall incorporate review comments to data and text prior to approval of the final submittal. For each review of digital geospatial data deliverables, the Contractor shall provide a technical consultant to meet on-site at the installation with the IGI&S Manager and functional area subject matter experts to visually review the data deliverables on a Windows 2000 compatible system unless otherwise approved by the government.

Ownership:
All digital files, final hard-copy products, source data acquired for this project, and related materials, including that furnished by the Government, shall become the property of *Marine Corps Base Hawaii* and will not be issued, distributed, or published by the Contractor.

Contact Information:

For project inquiries, please contact the Project Manager. For specific geospatial questions, upon the approval of the Project Manager, you may contact:

Mr. Richard Cassidy
IGI&S Manager
(808) 257-2718
richard.cassidy@usmc.mil

Or

Jon Chun
GIS/Geographer
808-257-7138
jon.chun@usmc.mil

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APPENDIX E
NATURAL RESOURCES GUIDANCE AND REGULATIONS

MCBH follows a suite of Federal, State, and Base laws, regulations, orders, and guidance in protecting its natural resources (Section 5 and Appendix A3). This appendix highlights several items directly related to MCBH INRMP implementation as outlined in the COA. These selected items provide a snapshot of some of the key regulations that Natural Resources staff either directly oversee or implement, or those they have input into based on the current status of potentially affected natural resources.

COA 7.1: Wildlife Management

E1. MCBH Kaneohe Bay Migratory Bird Depredation Permit

COA 7.5: Landscape Maintenance and Vegetation Management

E2. NPDES Pesticides General Permit

E3. *Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes (Reference CD only)*

COA 7.6: Natural Resources-Based Outdoor Recreation, Outreach, and Public Access Management

E4. Marine Corps Base Hawaii Fishing Regulations (per Base Order P1710.1: Base Recreational Activities)

E5. Rules and Regulations for the Nu‘upia Ponds Recreational Running Trail (per Base Order P1710.1: Base Recreational Activities)

E6. Summary of Hunting Regulations for Marine Corps Base Hawaii (per Base Order 1711)

E7. Memo on Trespassing at Haiku Stairs

E8. *Pet and Wildlife Regulations (Base Order P5233.2) (Reference CD only)*

E9. *Base Recreational Activities (Base Order P1710.1) (Reference CD only)*

E10. *Hunting Regulations for Marine Corps Base Hawaii (Base Order 1711) (Reference CD only)*

E1. MCBH KANEOHE BAY MIGRATORY BIRD DEPREDATION PERMIT

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
Migratory Bird Permit Office
911 NE 11th Ave. - Portland, OR 97232
Tel: 503-872-2715 Fax: 503-231-2019
Email: permitsR1MB@fws.gov

FEDERAL FISH AND WILDLIFE PERMIT

2. AUTHORITY-STATUTES
16 USD 703-712

REGULATIONS
50 CFR Part 13
50 CFR 21.41

1. PERMITTEE

MARINE CORPS BASE HAWAII
COMMANDING OFFICER
ATT: ENVIRO DEPT (TODD RUSSELL)
BOX 63002
MCBH KANEOHE BAY, HI 96863-3062
U.S.A.

3. NUMBER
MB684851-0

4. RENEWABLE	5. MAY COPY
☒ YES ☐ NO	☒ YES ☐ NO

6. EFFECTIVE	7. EXPIRES
02/01/2015	01/31/2016

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
W. M. ROWLEY
DIRECTOR, ENVIRONMENTAL COMPLIANCE AND PROTECTION DEPARTME

9. TYPE OF PERMIT
DEPREDATION AT AIRPORTS

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
Physical location: MARINE CORPS BASE HAWAII; KANEOHE BAY
Records maintained at: Address in block 1 above
ISLAND OF OAHU, HONOLULU COUNTY, HI

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL, TRIBAL, OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. You are authorized to take, temporarily possess, and transport the migratory birds specified below to relieve or prevent injurious situations impacting public safety. All take must be done as part of an integrated wildlife damage management program that emphasizes nonlethal management techniques. You may not use this authority for situations in which migratory birds are merely causing a nuisance.

(1) The following may be lethally taken:

500 Migratory Birds not native to Hawaii (primarily Barn Owl, Cattle Egret, House Finch, Mourning Dove, Northern Cardinal)

(2) The following may be live-trapped and relocated:

20 Laysan Albatross (eggs may be donated for research/education purposes or placed in foster nests with state approval)

Unlimited - shearwater and other seabird fall out (birds may be picked-up and relocated into the wild in a predator-free area or transported to a federally permitted rehabilitator)

E. You are authorized in emergency situations only to take, trap, or relocate any migratory birds, nests and eggs, including species that are not listed in Condition D (except bald eagles, golden eagles, or endangered or threatened species) when the migratory birds, nests, or eggs are posing a direct threat to human safety. A direct threat to human safety is one which involves a threat of serious bodily injury or a risk to human life.

You must report any emergency take activity to your migratory bird permit issuing office *PermitsR1MB@fws.gov* within 72 hours after the emergency take action. Your report must include the species and number of birds taken, method, and a complete description of the circumstances warranting the emergency action.

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
Annual reports are due by January 31
Report Take Jan 1 - Dec 31
Forms are available on the Internet at: http://www.fws.gov/forms/3-202-9.pdf

ISSUED BY	TITLE	DATE
[signature]	CHIEF, MIGRATORY BIRD PERMIT OFFICE - REGION 1	06/09/2015

F. You are authorized to salvage and temporarily possess migratory birds found dead or taken under this permit for (1) disposal, (2) transfer to the U.S. Department of Agriculture, (3) diagnostic purposes, (4) purposes of training airport personnel, (5) donation to a public scientific or educational institution as defined in 50 CFR 10.12, (6) donation to persons authorized by permit or regulation to possess them, or (7) donation of migratory game birds only to a public charity (those suitable for human consumption). Any dead bald eagles or golden eagles salvaged must be reported within 48 hours to the National Eagle Repository at (303) 287-2110 and to the migratory bird permit issuing office at *PermitsR1MB@fws.gov*. The Repository will provide directions for shipment of these specimens.

G. You may not salvage and must immediately report to U.S. Fish and Wildlife Service Office of Law Enforcement any dead or injured migratory birds that you encounter that appear to have been poisoned, shot, electrocuted, have collided with industrial power generation equipment, or were otherwise killed or injured as the result of potential criminal activity. See USFWS OLE contact information below.

H You may use the following methods of take: (1) firearms; (2) nets; (3) registered animal drugs (excluding nicarbazin), pesticides and repellents; (4) falconry abatement; and (5) legal lethal and live traps (excluding pole traps). Birds caught live may be euthanized or transported and relocated to another site approved by the appropriate State wildlife agency, if required. When using firearms, you may use rifles or air rifles to shoot any bird when you determine that the use of a shotgun is inadequate to resolve the injurious situation. You may use paint ball guns to haze birds or deter birds only when other methods of hazing are ineffective.

Anyone who takes migratory birds under the authority of this permit must follow the American Veterinary Medical Association Guidelines on Euthanasia when euthanization of a bird is necessary (http://www.avma.org/issues/animal_welfare/euthanasia.pdf).

I. You may temporarily possess and stabilize sick and injured migratory birds and immediately transport them to a federally licensed rehabilitator for care.

J. The following subpermittees are authorized: MCB Hawaii - Environmental Department (Todd Russell, Lance Bookless, Gordon Olayvar) and USDA-WS personnel (Darrin Phelps, John Cody, Ronald Ige, Erik Rutka)

In addition, any other person who is (1) employed by or under contract to you for the activities specified in this permit, or (2) otherwise designated a subpermittee by you in writing, may exercise the authority of this permit.

K. You and any subpermittee(s) must comply with the attached Standard Conditions for Migratory Bird Depredation Permits. **These standard conditions are a continuation of your permit conditions *and must remain with your permit.***

For suspected illegal activity, immediately contact USFWS Law Enforcement at: 808.861.8525

Standard Conditions
Migratory Bird Depredation Permits
50 CFR 21.41

All of the provisions and conditions of the governing regulations at 50 CFR part 13 and 50 CFR part 21.41 are conditions of your permit. Failure to comply with the conditions of your permit could be cause for suspension of the permit. The standard conditions below are a continuation of your permit conditions and must remain with your permit. If you have questions regarding these conditions, refer to the regulations or, if necessary, contact your migratory bird permit issuing office. For copies of the regulations and forms, or to obtain contact information for your issuing office, visit: http://www.fws.gov/migratorybirds/mbpermits.html.

1. To minimize the lethal take of migratory birds, you are required to continually apply non-lethal methods of harassment in conjunction with lethal control.
   [*Note: Explosive Pest Control Devices (EPCDs) are regulated by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). If you plan to use EPCDs, you require a Federal explosives permit, unless you are exempt under 27 CFR 555.141. Information and contacts may be found at http://www.atf.gov/explosives/how-to/become-an-fel.htm.*]

2. Shotguns used to take migratory birds can be no larger than 10-gauge and must be fired from the shoulder. You must use nontoxic shot listed in 50 CFR 20.21(j).

3. You may not use blinds, pits, or other means of concealment, decoys, duck calls, or other devices to lure or entice migratory birds into gun range.

4. You are not authorized to take, capture, harass, or disturb bald eagles or golden eagles, or species listed as threatened or endangered under the Endangered Species Act found in 50 CFR 17, without additional authorization.

   For a list of threatened and endangered species in your state, visit the U.S. Fish and Wildlife Service's Threatened and Endangered Species System (TESS) at: http://www.fws.gov/endangered.

5. If you encounter a migratory bird with a Federal band issued by the U.S. Geological Survey Bird Banding Laboratory, Laurel, MD, report the band number to 1-800-327-BAND or http://www.reportband.gov.

6. This permit does not authorize take or release of any migratory birds, nests, or eggs on Federal lands without additional prior written authorization from the applicable Federal agency, or on State lands or other public or private property without prior written permission or permits from the landowner or custodian.

7. Unless otherwise specified on the face of the permit, migratory birds, nests, or eggs taken under this permit must be:
   (a) turned over to the U.S. Department of Agriculture for official purposes, or
   (b) donated to a public educational or scientific institution as defined by 50 CFR 10, or
   (c) completely destroyed by burial or incineration, or
   (d) with prior approval from the permit issuing office, donated to persons authorized by permit or regulation to possess them.

8. A subpermittee is an individual to whom you have provided written authorization to conduct some or all of the permitted activities in your absence. Subpermittees must be at least 18 years of age. As the permittee, you are legally responsible for ensuring that your subpermittees are adequately trained and adhere to the terms of your permit. You are responsible for maintaining current records of who you have designated as a subpermittee, including copies of designation letters you have provided.

9. You and any subpermittees must carry a legible copy of this permit, *including these Standard Conditions*, and display it upon request whenever you are exercising its authority.

10. You must maintain records as required in 50 CFR 13.46 and 50 CFR 21.41. All records relating to the permitted activities must be kept at the location indicated in writing by you to the migratory bird permit issuing office.

11. Acceptance of this permit authorizes the U.S. Fish and Wildlife Service to inspect any wildlife held, and to audit or copy any permits, books, or records required to be kept by the permit and governing regulations.

12. You may not conduct the activities authorized by this permit if doing so would violate the laws of the applicable State, county, municipal or tribal government or any other applicable law.

(DPRD - 12/3/2011)

E2. NPDES PESTICIDES GENERAL PERMIT

As of November 1, 2011, point source discharges from the applications of pesticides to waters of the State require National Pollutant Discharge Elimination System (NPDES) Permits, as required by the Clean Water Act. These discharges include applications of pesticides (including insecticides, herbicides, fungicides, rodenticides, and various other substances to control pests) to, over, or near waters of the State. HIDOH CWB is responsible for implementation of the NPDES pesticides permit program in the State of Hawai‘i.

The CWB’s amendments to HAR, Chapter 11-54 (Water Quality Standards) and 11-55 (Water Pollution Control), were adopted and became effective on October 21, 2012. These amendments added the new NPDES General Permit for discharges from the application of pesticides to State waters (HAR, Chapter 11-55, Appendix M). The CWB website (http://health.hawaii.gov/cwb/) website contains the final rules and instructions to submit the Appendix M Notice of Intent. Refer to the Base *Integrated Pest Management Plan* for more information on pesticides and this permit (Section 8.1.9).

E3. GUIDANCE FOR FEDERAL AGENCIES ON SUSTAINABLE PRACTICES FOR DESIGNED LANDSCAPES

Reference CD only

Includes:

- Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes (October 2009)
- Supporting the Health of Honey Bees and Other Pollinators (October 2014); Introduction only

E4. MARINE CORPS BASE HAWAII FISHING REGULATIONS

Summary of MCBH Fishing Regulations, which are detailed in Base Order P1710.1: Base Recreational Activities (Appendix E9, Reference CD).

Marine Corps Base Hawaii
Fishing Regulations

Update per base order P1710.1

New base order P1710.1 is a revision to base order P5500.15V Chapter 11. Included in this revision is species specific take and size limits.

You Must Obey State and Federal Laws Regarding Fishing Prohibitions and Regulations on Marine Corps Base Hawaii

In Addition to State and Federal Laws, Marine Corps Base Hawaii Has Its Own Prohibitions and Regulations

Gear Restrictions:

You must attend all of your fishing gear at all times

You are not allowed to possess gill nets, lay nets or cross nets and throw nets must have a minimum stretched mesh size of more than two inches.

Do not have crab nets more than three feet in diameter and the use of more than three nets per person is prohibited.

You must accompany children under 13 years old if they are using or possessing a spear gun ("arbolete" type).

Spear guns must be registered with MPD (Base Security and Access Control Order).

You may have scoop nets for the capture of bait fish, but do not have nets exceeding three feet (including the handle).

1

Prohibitions:

Reef Fish - for use in personal aquariums

Due to the difficult enforcement of the prohibition of aquarium fish sales (among other associated problems), you may not collect marine animals for use in personal aquariums on MCBH.

Release of Aquatic Animals in MCBH Waters

Do not release any type of aquatic animal in MCBH waters because it may contribute to non-native animal invasions.

Taking or Damaging "Live Rock"

Do not take or damage any type of rock or coral that has marine animals living in or attached to it. Many animals depend on rocks or coral to survive.

'Opihi (Limpet) Picking

Do not take limpets (otherwise known as 'Opihi) on MCBH. In many areas of Hawai'i, the size and number of 'Opihi are declining, this is largely due to over-picking.

Wana (Sea Urchin)

Don't take Wana (sea urchin) on MCBH. The number of Wana on base are declining and the venom associated with their sting may be hazardous to your health.

Ula (Spiny Lobster) and Ula papa (Slipper Lobster)

Due to massive declines of lobster populations in the waters of O'ahu, fishing of these animals is prohibited on MCBH.

Catch Regulations:

Species	Min size	Max Number
Uhu* (all parrot fish)	12 inches	1 per day

***Uhu spear fishing is prohibited at night and violators will be prosecuted**

Ulua (all jacks / trevally)	10 inches	5 per day

Kumu (white-saddled goat fish)	10 inches	5 per day

Moano (many-barred goat fish)	7 inches	5 per day

Kala (unicorn fish)	14 inches	5 per day

Kole (yellow-eyed surgeon fish)	5 inches	5 per day

Manini (convict tang)	5 inches	10 per day

Tako (octopus)	1 pound or larger	2 per day

E5. RULES AND REGULATIONS FOR THE NU‘UPIA PONDS RECREATIONAL RUNNING TRAIL

Rules and regulations for the Nu‘upia Ponds Recreational Running Trail are found in Base Order P1710: Base Recreational Activities, Section 1003 Water Sports, 4.a(4), which discusses the Nu‘upia Ponds WMA (Appendix E9, Reference CD).

This endangered species habitat and Federally-protected wetland area includes eight interconnected ponds/wetlands, adjacent mudflats, and vegetated shoreline areas as depicted in the attached figure.

Authorized recreational activities allowed in the Nu‘upia Ponds WMA are foot traffic and bicycles along the Nu‘upia Ponds Recreational Running Trail. Individual runners, unit physical training, and special ‘run’ events are allowed along this designated run trail route. Runner use is further governed by restrictions contained in an EA and Section 7 ESA consultation agreement with USFWS that were required prior to opening this once restricted running trail. Additional restrictions include, but are not necessarily limited to: dogs or any other pets are prohibited on the trail, no unaccompanied children, no cadence chanting, no contractors without authorized official business in the area, and access by authorized runners during daylight hours only (6 am to 6 pm).

All water sports and fishing are strictly prohibited within the entire Nu‘upia Ponds WMA. Watercraft use for scientific monitoring or any other such non-consumptive, non-recreational purpose is subject to written permission from the CO after review by the Environmental Compliance and Protection Department and other appropriate staff.


NO Surfing
Fence
Pa'akai
Wai Puna
Kaluapuhi
Nu'upia 'Eha
Nu'upia 'Ekolu
Halekou
Nu'upia 'Elua
Heleloa
Nu'upia 'Ekahi
Nu'upia Hema
MCDC
PROHIBITED ACTIVITIES
• NO Dogs or Cats
• NO Fishing, netting, crabbing, hunting
• NO Walking, bicycling, running, or hiking, except on the authorized Nu`upia Ponds Recreational Running Trail
• NO Off-Highway Vehicles (OHVs), ATVs , POVs
• NO Kayaking or Surfing
• NO Military Training
• NO Commercial Activities
Nu`upia Ponds Wildlife Management Area Boundary
Authorized Nu`upia Ponds Running Trail
Gates/Barriers – NO Access
Off-Limits-Restricted Access:
For access, contact the Environmental Department Natural Resources staff

1

E6. SUMMARY OF HUNTING REGULATIONS FOR MARINE CORPS BASE HAWAII

A recreational bow hunting program for wild pigs at MCTAB was initiated in September 2014 per Base Order 1711. The O&T Directorate is charged with administrating this Order, with input from the Environmental Compliance and Protection Department, which is charged with managing the fish and wildlife programs aboard MCBH. The hunting program provides a recreational activity, and does not serve as a primary means for invasive species control. Nuisance, invasive, and feral animals, including pigs, will continue to be controlled at MCTAB. Hunting Regulations are outlined in Chapter 2 of the Order and summarized below. A copy of the Base Order is included in Appendix E10 (Reference CD).

Hunting Areas

Recreational bow hunting at MCBH is currently allowed at the MCTAB property in five defined hunting areas (HA1 – HA5). The hunting areas are co-located on Training Areas 2 and 3. No hunting is authorized in Training Area 1 or other areas of MCTAB. Hunters are only permitted to hunt in assigned areas. All hunting areas are inside areas bordered by the MCTAB fenceline, which are currently off-limits to the general public. Hunters will not have the potential to interact with individuals using the Bellows beach recreational areas (at Bellows AFS or MCTAB). No hunting is allowed in off-limit areas established to protect sensitive resources (i.e., wetlands or streams, coastal areas, cultural resources), or no-shoot areas designated for safety. Hunters shall park in designated locations associated with the assigned hunting area. No hunting will be allowed at any other MCBH property.

Hunting Method and Targeted Game

Archery equipment (long bows, recurved bows, compound bows) is the only form of hunting allowed. Feral pigs are the only allowed wildlife authorized to be hunted, with a bag limit of one pig per hunter per day. Harvested pigs must be removed from MCTAB.

Hunters

The hunting program is open to the general public, with sponsor, as well as DoD affiliated personnel. All members of the general public must pass a background check before being allowed on Base. Hunting parties are restricted to three hunters per party. Access, in terms of number of hunters, is limited to ensure a high-quality experience, to facilitate effective program management, and to ensure the safety and security of individuals and property.

Hunting Periods

Hunting will be scheduled on weekends or holidays when there is no training taking place at MCTAB. This is estimated to be one weekend and one holiday a month, year round. Training always takes precedence over hunting, and if any training activities are scheduled at MCTAB, no hunting will be allowed.

On hunting days, access is allowed from one half hour before sunrise to one half hour after sunset. Hunters are required to check-in and check-out with MCBH Range Control. Exceptions may be made, on a case-specific basis, to allow for late check-out.

Rules and Regulations

The hunting program is implemented under Base Order 1711: Hunting Regulations for Marine Corps Base Hawaii. All applicable Hawai‘i hunting regulations apply (HAR §13-123 *Rules Regulating Game Mammal Hunting*).

All hunters are required to have a valid Hawai‘i hunting license, which is obtained from Hawai‘i DLNR DOFAW and includes hunter education requirements. In addition, hunters must have a Base hunting permit

administered by MCBH, which requires passing a written test and an archery proficiency test every three years. The written test will cover Hawai‘i State hunting regulations, Base hunting regulations, and hunter ethics. Use of privately owned weapons is outlined in Base Regulations (Base Order 5532, Base Security and Access Control). Per Base Order 1711, it is unlawful to possess a loaded firearm in MCTAB, with the exception of law enforcement and nuisance animal control officials.

Safety and Security

Safety and security are primary concerns. All permitted hunters need to pass a background check. Hunters are issued a key and enter the hunting areas through a locked gate. Secure areas, including the Military Operations on Urban Terrain (MOUT) training facilities, are off limits. A 50 yard no-shoot zone has been established on the interior of the installation boundary in areas adjacent to residential areas and the golf course to protect life and property. Other than hunters and MCBH program enforcement (Conservation Law Enforcement Officer and O&T Directorate), no one is allowed in the hunting areas during active hunting periods. Similarly, no hunting is allowed if the areas are being used for training.

Resource Protection

Off-limit areas are delineated, and are designed to protect wetlands and streams, endangered waterbirds, and cultural resources.

E7. MEMO ON HAIKU STAIRS TRESPASSING

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET, ROOM 202
HONOLULU, HAWAII 96813-3065
TELEPHONE: (808) 768-5010 • FAX: (808) 768-5011

IKAIKA ANDERSON
Council Vice Chair
Councilmember, District 3
Email: ***ianderson@honolulu.gov***
Phone: ***808-768-5003***
Fax: ***808-768-1235***

Colonel Sean Killeen
Commanding Officer
Box 63002
Kaneohe Bay, HI 96863-3002 *Sent via Email*
February 8, 2016

Aloha Colonel Killeen:

I write today regarding the Haiku Stairs hike, which is located on government property that has been closed to general public for many years. Nonetheless, people continue to trespass onto this closed area and hike the Haiku Stairs on a regular basis. Area residents have noted that many of the vehicles driven by trespassing hikers have "base tag" decals on their windshields, and are dressed in military-like gear. I would like to ask for your assistance in reminding all personnel under your command, and the families of said personnel, that the Haiku Stairs is indeed closed, and that those who decide to proceed hiking are trespassing onto government property. It would also be helpful to advise folks that if they are caught trespassing, a citation for criminal trespassing will be issued by the Honolulu Police Department.

In the past, a criminal citation was not a certainty; warnings were frequently issued. However, due to continuing complaints from area residents the Honolulu Police Department (HPD) has committed to a zero tolerance approach to those caught trespassing on and around the Haiku Stairs area. It is unfortunate that the continued impact on the community has necessitated a zero tolerance approach and some individuals – especially those who have recently moved here – may not be fully aware of the potential consequences for something seemingly innocuous as hiking "off the beaten path". Understanding the severe consequences that a criminal charge can have on a servicemember's career, I want to ensure that every effort is made to educate our military community on this issue.

Thank you for your consideration, and the continued service of yourself and all members of our armed forces. If you have any questions, please contact me directly by phone at 808-768-5003 or by email at ianderson@honolulu.gov.

Malama Pono,

Ikaika Anderson
Council Vice Chair
Councilmember, District 3

E8. PET AND WILDLIFE REGULATIONS (BASE ORDER P5233.2)

Reference CD only

E9. BASE RECREATIONAL ACTIVITIES (BASE ORDER P1710.1)

Reference CD only

E10. HUNTING REGULATIONS FOR MARINE CORPS BASE HAWAII (BASE ORDER 1711)

Reference CD only

APPENDIX F
COURSE OF ACTION

This appendix contains information in support of Section 7: Course of Action.

F1. *Past Implementation Progress (Reference CD only)*

F2. Active and Programmed Management Actions

F3. *Funding Description (Reference CD only)*

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F1. PAST IMPLEMENTATION PROGRESS

As required by the Sikes Act Improvement Act and pertinent military directives, the INRMP is to be reviewed annually and updated and/or revised, as appropriate, no less than once every five years. This appendix documents MCBH's compliance with this requirement.

Documentation of INRMP implementation progress has been refined over the years. Review of the pertinent details of this INRMP reveal a close match between actions planned/carried out and between funds committed/spent over the history of INRMP implementation. Table F1-1 summarizes INRMP implementation progress since 2001.

Since 2001, MCBH has produced regular progress reports and sent them to regulators for review and comment as part of the annual review process. In addition, Natural Resources metrics have been used as required since 2007. During the most recent INRMP implementation period (2012-2016), the first two years of annual review (2012 and 2013) were combined into one progress report, while 2014 and 2015 were covered by single year progress reports.[1] Progress in 2016 will, in part, be covered by this INRMP update. Complete records of INRMP progress reports sent and any related correspondence received from reviewing agencies since the inception of the INRMP requirement are maintained in Environmental Department files. Highlights from the web-based Natural Resources Metrics component of the INRMP are retained in the on-line database managed by Marine Corps Installations Command (MCICOM).

The following tables demonstrate INRMP implementation progress:

Table F1-1. MCBH INRMP Projects Completed and/or In-Progress (2001 to 2016).

Table F1-2. Project-related reports completed 2012-2016.

Table F1-3. Summary of Changes to Goals and Objectives from the 2011 INRMP Update.

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update.

[1] The 2012 and 2013 annual INRMP reviews were combined due to the unexpected departure of the Senior Natural Resources Management Specialist for medical leave and change in staff.

Table F1-1: MCBH INRMP Projects Completed and/or In-Progress (2001 to 2016)

Project	Project Title	NEPA	ESA Sec 7	Permits	Project Value (Est $K)	Project Status (CY2017)
COA 7.0: INRMP PROGRAM MANAGEMENT AND IMPLEMENTATION						
HI20014[1]	Original MCBH INRMP/EA Development (2002-2006)	EA	N	N	250	Completed 2001
HI20014	MCBH INRMP Five-Year Review/Update (2007-2011)	N/A	N	N	150	Completed 2006
HI20014	MCBH INRMP Five Year Review/Update (2012-2016)	N/A	N	N	135	Completed 2011
N/A	MCBH INRMP Supplement[2]	EA	N	N	N/A[3]	Completed 2013
HI2010OPBCN1193[4]	MCBH INRMP Five Year Review/Update (2017-2021)	N/A	N	N	140	Completed 2017
COA 7.1: WILDLIFE MANAGEMENT						
HI20012	Invasive Species Management Study	N/A	N	N	250	Completed 2002
HI95156	MCBH Hawaiian Stilt Regional Recovery Study	N/A	N	N	100	Completed 2002
HI2CONESC1045804203	Nu‘upia Ponds Fencing Project – Fort Hase	CATEX	Y	N	220	Completed 2016
HI2015C22CN4255	Seabird Relocation Project	CATEX	N	N	200	In progress
HI2CONESOPB46134650	Wildlife and Predator Control Services	INRMP/EA	N	N	400[5]	On-going
COA 7.2: WETLAND MANAGEMENT						
HI21004	Endangered Species Habitat Improvements / Mangrove Removal	EA	Y	Y	920	Completed 2002
HI20004	Wetland Delineation Study	N/A	N	N	100	Completed 2002
HI80726	Design/Build Klipper Pond/Endangered Waterbird Enhancement Project	CATEX	Y	N	266	Completed 2003
HI60834	Design/Build Percolation Ditch Wetland Improvements	EA	Y	Y	1,000	Completed 2007
HI20004	Wetland Delineation Study Update	N/A	N	N	46	Completed 2009

[1] All numbers in this format are from the former COMPTRAK budgeting program. These projects are no longer accessible/available. Information is maintained in MCBH Environmental Department files and/or INRMPs.

[2] Supplement reflected changes related to proposed recreational bow hunting program at MCTAB. Completed in conjunction with an EA for the hunting program.

[3] Dollar value included in MCTAB Recreational Hunting Program (COA 7.6).

[4] All numbers in this format refer to STEP project tracking numbers in the Marine Corps environmental budget tracking system currently in use.

[5] Estimate of funds paid out to USDA Wildlife Services (2001-2016). Dollar value has varied based on amount of work required and in-house resources available. During the previous INRMP period (2011-2015) it was approximately $31k/yr. Beginning in 2016, and continuing through the period of this INRMP, the budget is estimated at $63k/yr.

Table F1-1: MCBH INRMP Projects Completed and/or In-Progress (2001 to 2016)

Project	Project Title	NEPA	ESA Sec 7	Permits	Project Value (Est $K)	Project Status (CY2017)
HI60834	Evaluation Study - Percolation Ditch Wetland Improvements	EA	N	N	50	Completed 2010
HI3CONWLC2245614213	Wetland Delineation Study Update	N/A	N	N	30	Completed 2017
HI2CONWLC2245694303	Wetland Restoration Plan – MCBH Kaneohe Bay and MCTAB	EA	Y	Y	366	In progress
COA 7.3: WATERSHED MANAGEMENT						
HI20033	MCTAB Watershed Impairment Study	N/A	N	N	200	Completed 2002
HI20013	ECE-Mandated Erosion Assessment of MCBH Properties	N/A	N	N	200	Completed 2004
HI20012	Sustain Weapons Range-Install Erosion Control BMPs	CATEX	N	N	515	Completed 2008
HI20010	Design/Construct Improved Mōkapu Central Drainage Channel	EA	Y	Y	1,300	Completed 2008
HI0820033M	Design Phase - MCTAB Watershed Impairment Solution	N/A	N	N	135	Completed 2010
HI0920013M	Install Erosion BMPs: Southeast Crater Shoreline	CATEX	N	N	1,600	Completed
HI0920014M	Install Erosion BMPs: North-Facing Crater Slopes	CATEX	N	N	300	Completed
HI2009C10EC0992	Waimānalo Stream Floodway Restoration	EA	N	Y	643	Completed 2014
COA 7.4: COASTAL AND MARINE MANAGEMENT						
HI10007	Design/Construct Pu‘uloa Range Impact Berm Repair	CATEX	N	Y	745	Completed 2002
HI20009	Coral Reef Ecosystem Management Study	N/A	N	N	250	Completed 2002
HI20009	Inventory/Improve Management Marine Species in MCBH Waters	N/A	N	N	216	Completed 2008
HI20009	Update 2008 Marine Species Inventory	N/A	N	N	80	Completed 2013
HI0920017M	Feasibility Study - Invasive Mangrove Removal – Kaneohe Bay Shoreline	N/A	N	N	90	Completed 2006
HI2013C22PP3616	Pu‘uloa Shoreline Erosion Study	N/A	N	N	168	Completed 2015
HI3CONONC2245554209	Pu‘uloa Shoreline Erosion Repair Project EA	EA	Y	Y	227	In progress
HI2010C22CN1249	MCTAB Coastal and Marine Resource Survey	N/A	N	N	186	Finishing 2017
COA 7.5: LANDSCAPE MAINTAINENCE AND VEGETATION MANAGEMENT						
HI21002	Master Landscape Study	N/A	N	N	200	Completed 2002
HI21005	Ulupa‘u Head Fire Management Study	N/A	N	N	125	Completed 2002
HI20012	Invasive Species Vegetation Mapping – MCTAB	N/A	N	N	100	Completed 2003

Table F1-1: MCBH INRMP Projects Completed and/or In-Progress (2001 to 2016)

Project	Project Title	NEPA	ESA Sec 7	Permits	Project Value (Est $K)	Project Status (CY2017)
HI20012	Invasive Species Management Study – MCTAB	N/A	N	N	250	Completed 2004
HI21007	Improve Ground Cover/Reduce Fire Risk/Sustain Birds/Weapons Training at Ulupa'u Crater (i.e., Geotextile Fire Breaks)	CATEX	N	N	350	Completed 2004
HI20011	Front Gate Static Display Project	CATEX	N	N	298	Completed 2005
HI21008	Improve Water Delivery/Reduce Fire Risk/Sustain/Birds/Weapons Training at Ulupa'u Crater (i.e., Water Cannons)	CATEX	N	N	350	Completed 2008
HI21008	Modifications to Water Cannons (Optimize performance and evaluate cost effectiveness of converting to a wireless mode of operation)	CATEX	N	N	50	Completed 2004
HI2015C10CN4308	Water Cannons (PH2) to Support Migratory Bird Conservation (KBRTF)	CATEX	N	N	545	Completed 2016
HI20031	MCBH Kaneohe Bay Tree Planting Project	CATEX	N	N	350	Completed
HI20032	MCTAB Cattle Grazing Feasibility Study	N/A	N	N	162	Completed 2012
HI21002	MCBH Landscape Manual[6]	N/A	N	N	12	Completed 2014
HI3CONFRC2243654204	Integrated Wildland Fire Management Plan	EA	Y	N	97	In progress
COA 7.6: NATURAL RESOURCES-BASED OUTDOOR RECREATION, OUTREACH, AND PUBLIC ACCESS MANAGEMENT						
N/A	Nu'upia Ponds Recreational Run Trail[7]	EA	Y	N	5	Completed 2002
HI20030	Outdoor Recreation Study – MCTAB	N/A	N	N	125	Completed 2009
N/A	MCTAB Recreational Hunting Program[8]	EA	N	N	61	Completed 2013
HI2012C22CN3416	Development of Interpretive Exhibits	N/A	N	N	96	In progress
COA 7.7: NATURAL RESOURCES INFORMATION MANAGEMENT						
HI20015	Natural Resources Electronic Database/ Retrieval/ Archive Project	N/A	N	N	77	On-going
TOTAL					**14731**	

Notes: This table excludes funding expenditures on staff salaries, supplies and equipment, and training. As shown in the above table, a cumulative total of about $14.7M has been invested in INRMP implementation from 2001 - 2016.

[6] NAVFACPAC was originally contracted for this project. When not completed after seven years, it was completed in-house.

[7] The EA for this project was written in-house.

[8] The O&T Directorate is primarily responsible for the logistics of this program.

Table F1-2. Project-Related Reports Completed 2012-2016

Report Title	Author	Date	Details	STEP[1]
7.0 Overall INRMP Program Management				
Marine Corps Base Hawaii Integrated Natural Resources Management Plan Supplemental	Sustainable Resources Group Intn'l Inc.	2013	The INRMP Supplement was prepared, along with a required EA, for a proposed recreational bow hunting program for feral pigs at one of MCBH's properties, Marine Corps Training Area Bellows (MCTAB).	HI20014
7.1 Fish and Wildlife Management				
None				
7.2 Wetland Management				
Pearl City Annex Wetland Marine Corps Base Hawaii, Island of Oahu, Hawaii (Draft)	U.S. Army Corps of Engineers Honolulu District	2016	Summarizes the U.S. Army Corps of Engineers wetland delineation of the Pearl City Annex wetland.	HI20004
7.3 Watershed Management				
None				
7.4 Coastal and Marine Resources Management				
Benthic Community and Habitat Maps of Marine Resources at Marine Corps Base Hawaii, Kaneohe Bay, Oahu Island, Hawaii.	U.S. Fish and Wildlife Service and U.S. Geological Survey	2013	Presents results of the study with the purpose of identify and spatially locate marine communities, habitats, features, and structures that exist within the 500-yard security buffer zone around Mōkapu Peninsula.	HI20009
Pu'uloa Shoreline Erosion Study, Pu'uloa, Ewa Beach, Oahu, Hawaii.	SSFM International, Inc., Sea Engineering, Inc., and Brownlie & Lee	2015	Presents results of the study with the purpose of investigating coastal processes in the project area and the condition and characteristics of the shoreline, determining historical shoreline changes, analyzing wave induced sand transport mechanisms, and developing possible erosion control alternatives.	HI2013C22PP3616
7.5 Grounds Maintenance and Landscape Management				
MCBH Landscape Manual	MCBH Environmental Department	2014	The *MCBH Landscape Manual* supersedes the *Landscape Study for Marine Corps Base Hawaii* (HDA 2002), and is the authoritative document for planting and maintaining MCBH trees and the landscaped environment.	HI21002
MCTAB Cattle Grazing Feasibility Study	Helber Hastert & Fee	2012	The purpose of the study was to determine the feasibility and logistics of implementing and operating cattle grazing operation at MCTAB as a means to control pyrophytic grass fuels as an alternative to using chemicals or mechanical means to control invasive plants.	HI20032

[1] STEP is a project tracking number in the online Marine Corps environmental budget tracking system. All numbers in the "HIXXXXX" format are from the former COMPTRAK budgeting program. These projects are no longer accessible or available in the online system. Information is maintained in MCBH Environmental Department files and/or INRMPs.

Table F1-2. Project-Related Reports Completed 2012-2016

Report Title	Author	Date	Details	STEP[1]
7.6 Quality of Life, Natural Resources-Based Outdoor Recreation and Public Access				
Environmental Assessment Marine Corps Training Area Bellows Recreational Bow Hunting Program.	Sustainable Resources Group Intn'l Inc.	2013	An Environmental Assessment prepared for a proposed recreational bow hunting program for feral pigs at one of MCBH's properties, MCTAB.	N/A
Other Reports—related to INRMP but not funded under the INRMP program				
Habitat affinities and at-sea ranging behaviors among chick rearing Red-footed Boobies on Oahu; Field Observation Report.	U.S. Geological Survey	2014 & 2015	Field reports detail results collected from GPS tagging projects of the birds to investigate habitat affinities and at-sea ranging behavior. The reports are not to be distributed without permission.	N/A
Habitat affinities and at-sea ranging behaviors among chick rearing Wedge-tailed Shearwaters on Oahu; Field Observation Report.	U.S. Geological Survey	2014 & 2015	Field reports detail results collected from GPS tagging projects of the birds to investigate habitat affinities and at-sea ranging behavior. The reports are not to be distributed without permission.	N/A

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Table F1-3. Summary of Changes to Goals and Objectives from the 2011 INRMP Update

Goals and Objectives: Changed, Removed or Consolidated

2011 INRMP	Action	2017 INRMP
7.0: Course of Action Organization and Implementation	Revised to reflect broader scope of this COA	**7.0: INRMP Program Management and Implementation**
Goal: Systematically apply an ecosystem-based management approach to wildlife and other natural resources management activities at all MCB Hawaii parcels.	Minor revisions for clarification.	Goal: Systematically apply an ecosystem-based management approach to wildlife and other natural resources management activities at all MCBH properties.
Objective 7.0.1: Develop, regularly update, and implement MCB Hawaii's INRMP, with qualified staff, adequately trained and supplied.	No change	Objective 7.0.1: Develop, regularly update, and implement MCBH's INRMP, with qualified staff, adequately trained and supplied.
	New addition representing consolidation of objectives from other COA	Objective 7.0.2: Compliance with applicable laws, regulations, policies, and guidance to support natural resources management.
	New addition representing consolidation of objectives from other COA	Objective 7.0.3: Optimize interagency cooperation to promote regional protection of natural resources.
7.1: Fish and Wildlife Management	Revised to reflect only terrestrial wildlife (fish added to COA 7.4)	**7.1: Wildlife Management**
Goal: Contribute to maintenance of healthy regional fish and wildlife populations by managing protected species and habitats that currently exist within MCB Hawaii lands/waters/air space, consistent with natural resources laws, military directives, interagency consultations, management programs and permits.	No change	Goal: Contribute to maintenance of healthy regional wildlife populations by managing protected species and habitats that currently exist within MCBH lands/waters/air space, consistent with natural resources laws, military directives, interagency consultations, management programs and permits.
Objective 7.1.1: Implement species and habitat enhancement by controlling invasive species.	Integrated into 7.1.2 and 7.5.2	Objective 7.1.1: Inventory and monitor wildlife species.
Objective 7.1.2: Identify and implement protected species monitoring and management activities.	Integrated into 7.1.2 and 7.2.2	Objective 7.1.2: Manage and enhance wildlife species and their habitat
Objective 7.1.3: Engage the public in species and habitat enhancement efforts.	Integrated into 7.6.2	

Table F1-3. Summary of Changes to Goals and Objectives from the 2011 INRMP Update

2011 INRMP	Action	2017 INRMP
Objective 7.1.4: Assist in implementation of the Bird Aircraft Strike Hazard (BASH) Management Program at MCB Hawaii, Kaneohe Bay's airfield.	Integrated into 7.1.2	
Objective 7.1.5: Track and manage impacts of other agency plans and policies on MCB Hawaii's protected and pest species management activities.	Integrated into 7.0.2	
Objective 7.1.6: Catalyze regional ecosystem-level protected species enhancement and invasive species control efforts.	Removed	
Objective 7.1.7: Optimize effectiveness of fish and wildlife protection and invasive/pest species control.	Integrated into 7.1.2 and 7.5.2	
7.2: Wetland Management	No change	**7.2: Wetland Management**
Goal: Protect, enhance, and restore wetlands from loss or degradation to the maximum extent possible, consistent with the military mission, wetland laws and regulations.	Minor revisions for clarification.	Goal: Protect, enhance, and restore MCBH wetlands from loss or degradation to the maximum extent possible, consistent with the military mission and Federal wetland laws and regulations.
Objective 7.2.1: Identify, map, and characterize all MCB Hawaii wetlands.	Integrated into 7.2.1	Objective 7.2.1: Identify, delineate, characterize, and monitor wetlands.
Objective 7.2.2: Identify wetland threats and implement strategies to address them.	Integrated into 7.2.1 and 7.2.2	Objective 7.2.2: Implement wetland management and enhancement opportunities.
Objective 7.2.3: Identify and implement wetland enhancement opportunities.	Integrated into 7.2.1 and 7.2.2	
Objective 7.2.4: Identify and implement wetland monitoring and management activities.	Integrated into 7.2.1 and 7.2.2	
Objective 7.2.5: Comply with wetland protection laws and regulations.	Integrated into 7.0.2	
7.3: Watershed Management	No change	**7.3: Watershed Management**
Goal: Use an ecosystem-based watershed approach to managing water quality, erosion, and flow/flooding issues on MCB Hawaii lands.	Minor revisions for clarification.	Goal: Use an ecosystem-based watershed approach to managing issues involving water quality, erosion, and flow/flooding on MCBH lands associated with streams, channels, land cover and drainages.

Table F1-3. Summary of Changes to Goals and Objectives from the 2011 INRMP Update

2011 INRMP	Action	2017 INRMP
Objective 7.3.1: Take a watershed approach to characterize and develop solutions to flooding, erosion and other watershed health issues.	Integrated into 7.3.1 and 7.3.2	Objective 7.3.1: Inventory and monitor watershed conditions.
Objective 7.3.2: Conduct or facilitate restoration activities that enhance watershed health.	Reworded to better reflect action	Objective 7.3.2: Conduct management and enhancement activities that promote watershed health.
Objective 7.3.3: Implement BMPs to improve watershed health.	Integrated into 7.3.2	
Objective 7.3.4: Ensure adequate awareness building and training about BMPs, watershed health and water quality.	Integrated into 7.0.1 and 7.6.2	
7.4: Coastal and Marine Resources Management	No change	**7.4: Coastal and Marine Resources Management**
Goal: Use an ecosystem-based watershed approach to manage and enhance shoreline and near-shore marine resources within MCB Hawaii control and/or use.	Minor revisions for clarification.	Goal: Protect, enhance, and manage the shoreline, beaches, and near-shore environment and off-shore marine resources within MCBH control and/or use.
Objective 7.4.1: Improve inventory and conditions of biological and geophysical processes and features in MCB Hawaii littoral areas.	Integrated into 7.4.1 and 7.4.2	Objective 7.4.1: Inventory and monitor coastal and marine biological resources and geophysical conditions.
Objective 7.4.2: Identify and address impacts and threats to MCB Hawaii coastal and marine resources.	Integrated into 7.4.1 and 7.4.2	Objective 7.4.2: Manage and enhance coastal and marine biological resources and geophysical conditions.
Objective 7.4.3: Improve implementation of policies, guidelines, and procedures on shoreline and offshore coastal and marine resources.	Integrated into 7.0.2	
Objective 7.4.4: Improve awareness and training on coastal and marine resources.	Integrated into 7.0.1 and 7.6.2	
Objective 7.4.5: Optimize interaction with regional stakeholders to address coastal and marine conservation impacts and opportunities.	Integrated into 7.6.2	
7.5: Grounds Maintenance and Landscape Management	Minor revisions for clarification.	**7.5: Landscape Maintenance and Vegetation Management**

Table F1-3. Summary of Changes to Goals and Objectives from the 2011 INRMP Update

2011 INRMP	Action	2017 INRMP
Goal: Maintain grounds and landscaped areas through cost-effective, environmentally sound, sustainable grounds maintenance and landscaping practices, emphasizing use of native plants, to support training needs, recreation, and natural resources compliance.	Minor revisions for clarification.	Goal: Maintain landscaped areas and manage natural vegetation through cost-effective, environmentally sound, sustainable practices, emphasizing use of native plants, habitat integrity, coastal protection, and water and soil conservation in a manner that supports training needs and natural resources conservation.
Objective 7.5.1: Take a sustainable landscape approach to improve grounds maintenance and landscape management.	Integrated into 7.5.2	Objective 7.5.1: Survey, inventory, characterize, and monitor vegetation.
Objective 7.5.2: Take a sustainable landscape approach to maintaining healthy training landscapes.	Integrated into 7.5.2	Objective 7.5.2: Take a sustainable approach to managing and enhancing natural and man-made landscapes.
Objective 7.5.3: Create and maintain a 'flame-retardant' landscape at Ulupa'u Crater to sustain live fire training and a healthy booby colony.	Integrated into 7.5.2	
Objective 7.5.4: Improve landscape monitoring and management.	Integrated into 7.5.1 and 7.5.2	
Objective 7.5.5: Optimize effectiveness of education and outreach on sustainable landscaping.	Integrated into 7.5.2 and 7.6.2	
7.6: Quality of Life, Natural Resources-Based Outdoor Recreation, and Public Access	Minor revisions for clarification.	**7.6: Natural Resources-Based Outdoor Recreation, Outreach, and Public Access Management**
Goal: Support high quality, natural-resource-based (not activity-based) outdoor recreation and public access, consistent with natural resource conservation.	No change	Goal: Support high quality, natural-resource-based (not activity-based) outdoor recreation and public access, consistent with natural resource conservation.
Objective 7.6.1: Provide opportunities for appropriate natural resources-related recreational/outreach activities within sustainable limits.	Integrated into 7.6.2	Objective 7.6.1: Inventory and monitor public engagement activities and their potential impact on natural resources natural resources.
Objective 7.6.2: Improve awareness of recreation uses, impacts, and constraints regarding MCB Hawaii natural resources.	Integrated into 7.6.2	Objective 7.6.2: Promote and enhance opportunities for public engagement in natural resources management-related activities.

Table F1-3. Summary of Changes to Goals and Objectives from the 2011 INRMP Update

2011 INRMP	Action	2017 INRMP
Objective 7.6.3: Optimize interaction with regional stakeholders to address outdoor recreation impacts and opportunities.	Integrated into 7.6.2	
7.7: Resource Information Management	No change	**7.7: Resource Information Management**
Goal: Develop and use information management 'tools' to assist in implementing the INRMP and supporting integrated natural resources management on MCB Hawaii properties.	No change	Goal: Develop and use information management 'tools' to assist in implementing the INRMP and supporting integrated natural resources management on MCBH properties.
Objective 7.7.1: Manage natural resources information for ease of storage, accessibility, reporting, trend analysis, and management decision support.	Reworded to better reflect action	Objective 7.7.1: Inventory and maintain natural resources information and data for currency, accessibility, reporting, and management decision support.
Objective 7.7.2: Maintain and enhance natural resource management databases for MCB Hawaii properties.	Reworded to better reflect action	Objective 7.7.2: Improve natural resources information and data.
Objective 7.7.3: Optimize interaction with other entities to facilitate sharing of natural resource management data.	Integrated into 7.0.3	
Objective 7.7.4: Optimize technical capacity of and access to natural resource databases.	Integrated into 7.7.1	

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Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

1 **Management Actions: Completed, Removed, or Consolidated**

Management Action	Obj	Remarks
Course of Action: 7.1 Wildlife Management (Previously: Fish and Wildlife Management)		
Controlling Invasive Plants		
Control invasive plants with established in-house and contractor resources and methods.	7.1.1	Integrated into routine management actions in COA 7.5.2
Control invasive plants with established volunteer-conducted activities.	7.1.1	Integrated into routine management actions in COA 7.5.2
Evaluate and improve (systematically) invasive plant control methods.	7.1.1	Integrated into routine management actions in COA 7.5.2
Replace fire-prone vegetation using established methods.	7.1.1	Integrated into routine management actions in COA 7.5.2
Help maintain established fire-fighting capabilities.	7.1.1	Integrated into routine management actions in COA 7.5.2
Assist in development of improved fire-fighting capabilities	7.1.1	Integrated into routine management actions in COA 7.5.2
Controlling Invasive Animals (Vertebrate and Invertebrate)		
Control mammalian vertebrate predators using established methods.	7.1.1	Integrated into routine management actions in COA 7.1.2
Evaluate and improve (systematically) mammalian vertebrate predator control methods.	7.1.1	Integrated into routine management actions in COA 7.1.2
Control other invasive animal pests with established methods.	7.1.1	Integrated into routine management actions in COA 7.1.2
Evaluate and improve (systematically) other invasive animal pest control methods.	7.1.1	Integrated into routine management actions in COA 7.1.2
Invasive Species Management - General		
Evaluate and implement appropriate recommendations from the HI20012 Invasive Species Management Study (ISMS).	7.1.1	Integrated into routine management actions in COA 7.1.2 and 7.5.2
Implement closer integration between established pest management plans and invasive species management activities.	7.1.1	Integrated into routine management actions in COA 7.1.2 and 7.5.2
Implement revisions in data management system as necessary.	7.1.2	Integrated into routine management actions in COA 7.7
Conduct habitat protection and enhancement projects to benefit protected species.	7.1.2	Integrated into routine management actions in COA 7.1.2

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
Limit disturbance of protected species with established methods.	7.1.2	Integrated into routine management actions in COA 7.1.2
Continue established approach (opportunistic) to monitor fish and wildlife, evaluate results, and improve management.	7.1.2	Integrated into routine management actions in COA 7.1.1 and 7.4.1
Monitor fish and wildlife (systematically), evaluate results, and improve management.	7.1.2	Integrated into routine management actions in COA 7.1.1 and 7.4.1
Explore interagency cooperative partnerships to monitor natural resources.	7.1.2	Integrated into COA 7.0.3
Provide established resource-compatible on-site public access.	7.1.3	Integrated into routine management actions in COA 7.6.2
Provide additional resource-compatible on-site public access on a case-by-case basis.	7.1.3	Integrated into routine management actions in COA 7.6.2
Provide off-site public education about MCB Hawaii's fish and wildlife management program.	7.1.3	Integrated into routine management actions in COA 7.6.2
Display/distribute available presentation materials on fish and wildlife management.	7.1.3	Integrated into routine management actions in COA 7.6.2
Develop/distribute additional presentation materials on fish and wildlife management.	7.1.3	Integrated into routine management actions in COA 7.6.2
Host established project-specific volunteer service actions.	7.1.3	Integrated into routine management actions in COA 7.6.2
Expand project-specific volunteer service actions.	7.1.3	Integrated into routine management actions in COA 7.6.2
Support required on-site access by natural resource partner agencies.	7.1.3	Integrated into COA 7.0.3
Explore interagency cooperative partnerships to coordinate public education/access activities.	7.1.3	Integrated into COA 7.0.3
Develop interagency mechanisms to inform the public about resources, access and volunteer service options.	7.1.3	Integrated into COA 7.0.3
Track airfield staff in proper execution of their BASH Program responsibilities as spelled out in the BASH Plan, including required regular updates of the plan.	7.1.4	Integrated into routine management actions in COA 7.1.2

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
Ensure MCAS and their USDA Wildlife Services contractors continue the established BASH data collection and management system as described in the BASH Plan.	7.1.4	Integrated into routine management actions in COA 7.1.2
Ensure MCAS and their USDA Wildlife Services contractors develop an improved data collection and management system for BASH.	7.1.4	Removed.
Identify and assist appropriate MCB Hawaii and contractor personnel to incorporate BASH considerations into airfield and other Base SOWs, plans, and project specifications.	7.1.4	Integrated into routine management actions in COA 7.1.2
Participate in interagency initiatives on invasive species problems.	7.1.5	Integrated into COA 7.0.3
Collect and evaluate information on other agency plans and policies impacting MCB Hawaii fish and wildlife activities.	7.1.5	Integrated into COA 7.0.3
Evaluate and implement appropriate recommendations from the HI95156 MCB Hawaii Hawaiian Stilt Regional Recovery Study.	7.1.6	Removed.
Host appropriate projects to enhance fish and wildlife habitat on and around MCB Hawaii land and water parcels.	7.1.6	Integrated into COA 7.0.3 and 7.1
Improve regional capacity to plan for, reduce risks, assess and recover from damages to fish and wildlife due to catastrophic events.	7.1.6	Removed.
Improve regional capacity to protect, reduce risks to, and rehabilitate fish and wildlife and/or their habitat affected by programs to clean up military contaminated sites.	7.1.6	Removed.
Ensure relevant personnel obtain focused training on proper protection and/or control of fish and wildlife species.	7.1.7	Integrated into COA 7.0.1
Regularly review and update staff training to ensure latest management and/or control policies, regulations, and techniques are included.	7.1.7	Integrated into COA 7.0.1
Course of Action: 7.2 Wetland Management		
HI20004 Wetland Delineation/Mapping/Review and Update.	7.2.1	Completed.
Maintain current wetland GIS boundary layers.	7.2.1	Integrated into routine management actions in COA 7.7.1
Continue invasive plant and animal species control to reduce threats to MCB Hawaii, Kaneohe Bay wetlands.	7.2.2	Integrated into routine management actions in COA 7.1.2 and 7.5.2

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
Continue invasive plant and animal species control to reduce threats to MCTAB wetlands.	7.2.2	Integrated into routine management actions in COA 7.1.2 and 7.5.2
Identify and assist appropriate personnel (e.g., planners, operators) to detect and address threats to MCB Hawaii wetlands.	7.2.2	Integrated into routine management actions in COA 7.2
Explore interagency cooperative projects to control wetland threats that transcend Base borders.	7.2.2	Integrated into COA 7.0.3
Complete HI0821015M Sag Harbor Wetland Restoration	7.2.3	Project subsumed into the overall wetland restoration studies and efforts.
HI0080726M Restore Endangered Waterbird Wetlands at Golf Course (Post-Project Evaluation Study)	7.2.4	Project subsumed into the overall wetland restoration studies and efforts.
Ensure assigned personnel obtain appropriate training on wetland delineation, regulations, and/or monitoring protocols	7.2.4	Integrated into COA 7.0.1
Explore interagency cooperative projects to implement regional wetland enhancement and monitoring opportunities.	7.2.4	Integrated into COA 7.0.3
Display/distribute available wetland presentation materials on wetland resources and management.	7.2.4	Integrated into COA 7.6.2
Develop/distribute additional presentation materials on wetland resources and management.	7.2.4	Integrated into COA 7.6.2
Continue established approach (opportunistic) to monitor MCB Hawaii wetlands, evaluate results and improve management.	7.2.4	Integrated into routine management actions in COA 7.2.1
Evaluate and improve (systematically) wetland monitoring methods.	7.2.4	Removed.
Clarify jurisdictional status of wetlands when necessary.	7.2.5	Integrated into 7.0.2
Obtain wetland-related permits (e.g., 404, 401, 27) as needed.	7.2.5	Integrated into 7.0.2
Course of Action: 7.3 Watershed Management		
Initiate systematic monitoring of ambient erosion conditions and implement appropriate follow-on actions.	7.3.1	Integrated into routine management actions in COA 7.3.1
Conduct follow-on monitoring of erosion control project results and adaptive management.	7.3.1	Integrated into routine management actions in COA 7.3.1
HI0920013M Install Erosion BMPs: Southeast Crater Shoreline (Post-Project Evaluation Study).	7.3.1	Integrated into routine management actions in COA 7.3.1

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
HI0920014M Install Erosion BMPs: North Facing Crater Slopes (Post-Project Evaluation Study).	7.3.1	Integrated into routine management actions in COA 7.3.1
HI20018 Assess Natural Resources Status of Waikane Valley	7.3.1	Included in INRMP Update.
HI20010 Watershed Repair/Restore, Mokapu Central Drainage Channel (Post-Project Evaluation Study).	7.3.2	Completed. Ongoing monitoring and cleaning integrated into routine management actions in COA 7.3.2
HI22033M Design/Construct MCTAB Watershed Impairment Solution	7.3.2	Completed.
Continue established approach to voluntary service and outreach in MCB Hawaii watersheds.	7.3.2	Integrated into COA 7.6
Explore interagency cooperative projects to enhance regional watershed restoration opportunities for all stakeholders.	7.3.2	Integrated into COA 7.0.3
Review and update all relevant plans and projects to integrate watershed BMPs.	7.3.3	Integrated into 7.0.2
Identify and assist appropriate personnel to incorporate relevant BMPs into operational guidelines and SOPs.	7.3.3	Integrated into 7.0.2
Ensure relevant personnel obtain appropriate training on watershed BMPs.	7.3.4	Integrated into COA 7.0.1
Display/distribute available presentation materials on watershed health, assessment and BMPs.	7.3.4	Integrated into COA 7.6.2
Display/distribute additional presentation materials on watershed health, assessment and BMPs.	7.3.4	Integrated into COA 7.6.2
Course of Action: 7.4 Coastal and Marine Resources Management		
Continue Coastal Zone Management (CZM) Consistency/Shoreline Determination.	7.4.1	Integrated into 7.0.2
Conduct monitoring of ambient shoreline and off-shore erosion conditions and implement appropriate follow-on actions.	7.4.1	Integrated throughout COA 7.4.
HI20009 Inventory/Improve Management of Marine T&E/Invasive Species in MCB Hawaii Waters.	7.4.1	Integrated into routine management actions in COA 7.4.1
Evaluate and implement appropriate recommendations from coastal and marine resource studies.	7.4.1	Removed. New surveys have been conducted.

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
HI20009 Inventory/Improve Management of Marine T&E/Invasive Species in MCB Hawaii Waters (Post-FY10 Study-Implementation Phase)	7.4.1	Removed. No action taken. Information provided by new benthic habitat surveys will guide implementation of any recommendations.
HI0920017M Invasive Mangrove Remove-K-Bay Shoreline	7.4.1	This project is on-hold until such time funding or an alternate means of removal can be identified and implemented
Coordinate natural resources component of spill drills conducted with Federal and State agencies.	7.4.2	Integrated into 7.0.3
Coordinate appropriate natural resources component of the spill response in event of an actual spill.	7.4.2	Integrated into 7.0.2
Locate and remove other threats to natural resources in MCB Hawaii coastal and near-shore marine areas.	7.4.2	Integrated throughout COA 7.4.
Inventory and improve maps and data about coastal and marine resources and threats in MCB Hawaii coastal areas, and integrate into GIS.	7.4.2	Integrated into COA 7.4.1
Conduct appropriate response protocols in the event of protected marine species occurrences.	7.4.2	Integrated into routine management actions in COA 7.4.2
Identify and assist appropriate personnel (e.g., planners, operators) to detect and address threats to coastal and marine resources.	7.4.2	Integrated into COA 7.4
Incorporate updated coastal and marine resource management policies into Base Plans, Projects and Protocols.	7.4.3	Integrated into COA 7.0.2
Monitor recreational use of MCB Hawaii's marine coastal zone (systematically), evaluate results and improve management.	7.4.3	Integrated into COA 7.6
Ensure relevant personnel receive appropriate training in marine resource management, enforcement, and related subjects.	7.4.4	Integrated into COA 7.0.1
Display/distribute available presentation materials on coastal and marine resources.	7.4.4	Integrated into COA 7.6.2
Develop/distribute additional presentation materials on coastal and marine resources.	7.4.4	Integrated into COA 7.6.2
Explore interagency cooperative projects to manage threats to MCB Hawaii's coastal and marine resources.	7.4.5	Integrated into COA 7.0.3
Explore interagency cooperative projects to implement regional coastal and marine conservation opportunities.	7.4.5	Integrated into COA 7.0.3

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
Course of Action: 7.5 Landscape Maintenance and Vegetation Management (Previously: Grounds Maintenance and Landscape Management)		
Continue established approach (opportunistic) to improve existing grounds maintenance and landscape management.	7.5.1	Integrated into COA 7.5.2
Evaluate and implement appropriate recommendations from landscape studies.	7.5.1	Completed and included in the finalized MCBH Landscape Manual (2014).
Ensure relevant Base Orders, plans, SOPs, and contract specifications adhere to the latest guidance on sustainable landscape practices.	7.5.1	Integrated into COA 7.0.2
Ensure incorporation of not less than 50% native plants into new or renovated tree, shrub, and understory landscaping.	7.5.1	Removed. This is policy and detailed in the MCBH Landscape Manual (2014).
Ensure a phased approach to inventory and eliminate/replace invasive, nuisance, high maintenance vegetation.	7.5.1	Integrated throughout 7.5
Implement vegetation mapping and ecological field analysis studies where needed.	7.5.2	Integrated into COA 7.5.1
Evaluate and implement appropriate recommendations from vegetation mapping and ecological field analysis studies completed.	7.5.2	Integrated into COA 7.5.1
HI0820012M Replace Invasive Vegetation-Reduce Fire Risk-MCTAB	7.5.2	Removed. Project cancelled, not feasible to accomplish.
Continue established approach (opportunistic) to eliminate invasive weeds.	7.5.2	Integrated into routine management actions in COA 7.5.2
Continue established vegetation and grounds maintenance management practices for Ulupaʻu Head WMA and Ulupaʻu Weapons Range Facility.	7.5.3	Relevant portions integrated into routine management actions in 7.5.2
Evaluate and implement appropriate recommendations from fire management studies.	7.5.3	Removed.
Ensure assigned personnel obtain appropriate training on sustainable landscaping BMPs and monitoring protocols.	7.5.4	Integrated into COA 7.0.1
Evaluate and implement appropriate recommendations from the HI20012 Invasive Species Management Study (ISMS).	7.5.4	Integrated into routine management actions in COA 7.5.2
Sustain and improve the HI20011 Front Gate Static Display Project's native landscaping component.	7.5.5	Removed. This is the responsibility of the Facilities Department.

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
Course of Action: 7.6 Natural Resources-Based Outdoor Recreation, Outreach, and Public Access Management (Previously: Quality of Life, Natural Resources-Based Outdoor Recreation, and Public Access)		
Complete HI41786 Outdoor Recreation/Outreach Study for MCB Hawaii, Kaneohe Bay.	7.6.1	Removed. Project deferred due to other emergent priorities and limited staff. Plan is outdated and needs to be rewritten so it aligns with current priorities.
Evaluate and implement appropriate recommendations from the completed HI41786 Outdoor Recreation/Outreach Study for MCB Hawaii, Kaneohe Bay.	7.6.1	Removed. Recommendations will be reviewed when plan is completed.
Evaluate outdoor recreation improvements needed on MCB Hawaii parcels other than MCB Hawaii, Kaneohe Bay.	7.6.1	Integrated into routine management actions in COA 7.6.2
Improve programs by which on- and off-Base stakeholders participate in natural resource-based projects as an educational, scientific, and/or improvement activity.	7.6.1	Integrated into routine management actions in COA 7.6.2
Continuously assess and improve user awareness of environmental constraints associated with Nu‘upia Ponds Recreational Run Trail.	7.6.2	Integrated into COA 7.6.2 within routine management actions in COA as well as a STEP project to improve signage
Display/distribute available presentation materials on outdoor recreation opportunities and constraints.	7.6.2	Integrated into routine management actions in COA 7.6.2
Develop/distribute additional presentation materials on outdoor recreation opportunities and constraints.	7.6.2	Integrated into routine management actions in COA 7.6.2
Review and update Base SOPs, LOIs, and other published guidelines covering outdoor recreation activities that impact sensitive natural resources.	7.6.2	Integrated into COA 7.0.2
Review and update fishing policies, practices, and access protocols to reflect latest laws, best science, and use constraints.	7.6.2	Integrated into routine management actions in COA 7.6.2
Explore interagency cooperative projects to reduce regional ORV impacts.	7.6.3	Removed.
Review State and local government and other military outdoor recreation activities, outreach programs, and plans for INRMP compatibility and collaborative project opportunities.	7.6.3	Integrated into COA 7.0.3
Course of Action: 7.7 Resource Information Management		
Inventory available natural resources data and bibliographic databases, and determine archival priorities.	7.7.1	Integrated into routine management actions in COA 7.7.1

Table F1-4. Summary of Changes to Management Actions from the 2011 INRMP Update

Management Action	Obj	Remarks
HI20015 Natural Resources Data Archival/Electronic Retrieval System.	7.7.1	Completed.
Implement archival action priorities, as appropriate.	7.7.1	Integrated into routine management actions in COA 7.7.1
Use and maintain the currency of existing natural resources databases to track information about MCB Hawaii's protected and pest species and habitats.	7.7.2	Integrated into routine management actions in COA 7.7.1
Develop new natural resources databases as needed for MCB Hawaii properties.	7.7.2	Integrated into routine management actions in COA 7.7.2
Review and update natural resources GIS data for accuracy and compliance with DoD standards.	7.7.2	Integrated into routine management actions in COA 7.7.1
Report on inventory and monitoring efforts and perform related data management in response to specific requests and requirements.	7.7.3	Integrated into routine management actions in COA 7.7.1
Utilize GIS and other databases developed by other entities with similar natural resource mandates.	7.7.3	Integrated into COA 7.0.3 and routine management actions in COA 7.7.1
Implement cooperative data sharing agreements with other entities, as appropriate.	7.7.3	Integrated into COA 7.0.3
Evaluate and update natural resources databases, GIS, and administrative and technical support systems, as appropriate.	7.7.4	Integrated into routine management actions in COA 7.7.2
Inventory need for and ensure that needed database management training is implemented for natural resources staff.	7.7.4	Integrated into COA 7.0.1
Maintain a readily accessible standard set of natural resource management data for internal and external use.	7.7.4	Integrated into routine management actions in COA 7.7.1
Ensure that natural resource contractors follow established protocols for requesting and providing natural resources digital data.	7.7.4	Integrated into routine management actions in COA 7.7.2

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F2. ACTIVE AND PROGRAMMED MANAGEMENT ACTIONS

This appendix summarizes information related to active and programmed management actions in this INRMP Update. It includes the following tables:

Table F2-1. MCBH INRMP Projects Funded and Programmed for Funding (2017 – 2021)

Table F2-2. MCBH INRMP Update - COA Five Year Implementation Plan (2017 – 2021)

Routine management actions are conducted at regular intervals.

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Table F2-1. MCBH INRMP Projects Funded and Programmed for Funding (2017 – 2021)

Project	STEP Number	Obj	Prev Yr $K*	FY17 $K	FY18 $K	FY19 $K	FY20 $K	FY21 $K	FY17-21 Total
COA 7.0: INRMP Program Management and Implementation									
Natural Resources Labor**	HI3CONNROPB46064600	7.0.1		557	562	567	572	577	2835
Equipment/Supplies Natural Resources Program Support	HI3CONONOPB46164651	7.0.1		35	35	35	35		140
Training & Associated Travel (Natural Resources Staff)***	HI2CONNTOPB45394208 / HI2CONNTOPB46144652	7.0.1		27	7	7	7	7	55
Update MCBH INRMP (Technical Support)	HI3CONIPC2245594211 / HI3CONONC2245604212	7.0.1					150		150
COA 7.1: Wildlife Management									
Endangered Hawaiian Hoary Bat Survey	HI2CONESC2244034200	7.1.1			205				205
Inventory and Study the State Endangered Hawaiian Owl	HI2CONESC2245654215	7.1.1					100		100
Endangered Waterbirds Study – Nu‘upia Ponds and MCTAB	HI2CONESC2245584210	7.1.1		250	10	10			270
Flyway-Flight Pattern Analysis of Migratory and Endangered Birds – MCBH Kaneohe Bay	HI2CONONC2245754220	7.1.1				200			200
Endangered Species Observation Towers – Nu‘upia Ponds WMA	HI2CONESC1044684205	7.1.2		10	442				452
Construct Water Crossing Points to Improve Access within Nu‘upia Ponds	HI2CONESOPB45844221	7.1.2			20				20
Repair/Replace Nu‘upia Ponds Footbridge	HI2CONESC1045854222	7.1.2						450	450
Seabird Relocation Study (2015)	HI2015C22CN4255	7.1.2	200						--
Repair/Replace Artificial Nesting Platforms for Migratory Birds in Ulupa‘u Crater	HI2CONONC1045674217	7.1.2				305			305
Wildlife and Predator Control Services	HI2CONESOPB46134650	7.1.2	63	64	71	72.5	74	75.5	357
COA 7.2: Wetland Management									
Wetland Inventory and Delineation – Nu‘upia Ponds and MCTAB	HI3CONWLC2245614213	7.2.1				200			200
Wetland Restoration Plan – MCBH Kaneohe Bay and MCTAB (2015)	HI2CONWLC2245694303	7.2.2	366						--
Nu‘upia Hema and Salvage Yard Wetland Restoration Environmental Assessment	HI3COMPLC2244734304	7.2.2			67				67
Nu‘upia Hema Wetland Restoration	HI2CONWLC1044744305	7.2.2				1500			1500
Salvage Yard Wetland Restoration	HI2CONWLC1044754306	7.2.2				1750			1750

Table F2-1. MCBH INRMP Projects Funded and Programmed for Funding (2017 – 2021)

Project	STEP Number	Obj	Prev Yr $K*	FY17 $K	FY18 $K	FY19 $K	FY20 $K	FY21 $K	FY17-21 Total
Repair / Replace Aeration System and Install Waterline in Klipper Golf Course Ponds	HI2CONESOPB45664216	7.2.2				100			100
COA 7.3: Watershed Management									
No current STEP projects.									--
COA 7.4: Coastal and Marine Resources Management									
Pu‘uloa Shoreline Erosion Repair Project EA (2016)	HI3CONONC2245554209	7.4.2	227	10					10
Shoreline Erosion Repair – Pu‘uloa RTF	HI3COMPLC2244054202	7.4.2					2000		2000
COA 7.5: Landscape Maintenance and Vegetation Management									
GIS – Vegetation Feature Class Mapping	HI2CONONC2245184307	7.5.1		285					285
Invasive Vegetation Inventory and Management Plan	HI2CONISC2244044201	7.5.1		200					200
MCBH Base Landscaping	HI2CONEVOPB48104231	7.5.2					175		175
Invasive Vegetation Control: H3-Kane‘ohe Bay	HI2CONISC2245684218	7.5.2		75		250		50	375
Invasive Vegetation Control: Nu‘upia Ponds and Base Wetlands	HI2CONISOPB45694219	7.5.2		40	30	30	30	30	160
Integrated Wildland Fire Management Plan	HI3CONFRC2243654204	7.5.2		97					97
Maintenance and Repair of KBRTF Water Cannons Supporting Migratory Bird Conservation	HI3CONONC2245324206	7.5.2		15	60	60	60	60	255
COA 7.6: Natural Resources-based Outdoor Recreation, Outreach, and Public Access Management									
Development of Interpretive Exhibits (2012)	HI2012C22CN3416	7.6.2	96						--
Outreach Coordinator	HI3CONESC2245624214	7.6.2			100				100
COA 7.7: Resource Information Management									
No current STEP projects.									--
TOTALS:			**952**	**1665**	**1609**	**5086.5**	**3203**	**1249.5**	**12813**

NOTES:
*Projects funded in previous fiscal years and still in progress across INRMP review period. Year started noted after project title.
**Labor Costs reflect fully-burdened rates of core Natural Resources staff and a portion of the fully-burdened rates of other Environmental Staff contributing to Natural Resources Program
***Training/Travel Costs reflect only those of core Natural Resources staff
In-house costs for projects are usually 10-15% of contract costs.
Project costs are either based on government estimates provided by the Navy or other entity, or estimates based on history doing these types of projects at MCBH.

Table F2-2. MCBH INRMP Update - COA Five Year Implementation Plan (2017 – 2021)

Obj	Management Action	Type	FY Execution	STEP Number
COA 7.0: INRMP Program Management and Implementation				
7.0.1	Natural Resources Labor	STEP – in progress	Recurring	HI3CONNROPB46064600
7.0.1	Equipment/Supplies Natural Resources Program Support	STEP – in progress	Recurring	HI3CONONOPB46164651
7.0.1	Training & Associated Travel (Natural Resources Core Staff)	STEP – in progress	Recurring	HI2CONNTOPB45394208 / HI2CONNTOPB46144652
7.0.1	Update MCBH INRMP (Tech. Support)	STEP – programmed	2020	HI3CONIPC2245594211 / HI3CONONC2245604212
7.0.2	Ensure Relevant Operational Materials Adhere to the Most Recent Guidance on Natural Resources Management		Recurring	N/A
7.0.2	Develop Biosecurity Plan	STEP – in planning		
7.0.3	Evaluate Agency Policies, Plans, and Activities for Relevance and Impact to Management		Recurring	N/A
7.0.3	Support Interagency Cooperative Management to Benefit MCBH Natural Resources		Recurring	N/A
7.0.3	Facilitate Natural Resource Management Data Sharing		Recurring	N/A
COA 7.1: Wildlife Management				
Routine Management Actions				
7.1.1	Bird Surveys	Routine	Recurring	N/A
7.1.1	Wedge-tailed Shearwater Monitoring	Routine	Recurring	N/A
7.1.1	Avian Botulism Monitoring	Routine	Recurring	N/A
Projects				
7.1.1	Endangered Hawaiian Hoary Bat Survey	STEP – programmed	2018	HI2CONESC2244034200
7.1.1	Inventory and Study the State Endangered Hawaiian Owl	STEP – programmed	2020	HI2CONESC2245654215
7.1.1	Endangered Waterbirds Study – Nu‘upia Ponds and MCTAB	STEP – programmed	2017	HI2CONESC2245584210
7.1.1	Flyway-Flight Pattern Analysis of Migratory and Endangered Birds – MCBH Kaneohe Bay	STEP – programmed	2019	HI2CONONC2245754220

Table F2-2. MCBH INRMP Update - COA Five Year Implementation Plan (2017 – 2021)

Obj	Management Action	Type	FY Execution	STEP Number
7.1.1	Non-Native Invertebrate and Vertebrate Pest Species Management Study	STEP – in planning		
7.1.1	Terrestrial Invertebrates Survey and Recommendations for Management – MCBH Kaneohe Bay and MCTAB	STEP – in planning		
Routine Management Actions				
7.1.2	Activity Analysis	Routine		N/A
7.1.2	Feral and Nuisance Animal Control	Routine (STEP)	Recurring	HI2CONESOPB46134650
7.1.2	Invertebrate Pest Control	Routine		N/A
7.1.2	BASH/Depredation Permit	Routine		N/A
7.1.2	Injured Bird Treatment (oiled, botulism)	Routine		N/A
Projects				
7.1.2	Replace Existing Fence – Paʻakai Pond	STEP – in planning		
7.1.2	Endangered Species Observation Towers – Nuʻupia Ponds WMA	STEP – programmed	2017	HI2CONESC1044684205
7.1.2	Construct Water Crossing Points to Improve Access within Nuʻupia Ponds	STEP – programmed	2018	HI2CONESOPB45844221
7.1.2	Repair/Replace Nuʻupia Ponds Footbridge	STEP – programmed	2021	HI2CONESC1045854222
7.1.2	Seabird Relocation Study	STEP – in progress	2016	HI2015C22CN4255
7.1.2	Repair/Replace Artificial Nesting Platforms for Migratory Birds in Ulupaʻu Crater	STEP – programmed	2019	HI2CONESOPB45664216
COA 7.2: Wetland Management				
Projects				
7.2.1	Wetland Inventory and Delineation – Nuʻupia Ponds and MCTAB	STEP – programmed	2019	HI3CONWLC2245614213
7.2.2	Wetland Restoration Plan – MCBH Kaneohe Bay and MCTAB	STEP – in progress	2015	HI2CONWLC2245694303
7.2.2	Nuʻupia Hema and Salvage Yard Wetland Restoration Environmental Assessment	STEP – programmed	2018	HI3COMPLC2244734304
7.2.2	Nuʻupia Hema Wetland Restoration	STEP – programmed	2019	HI2CONWLC1044744305
7.2.2	Salvage Yard Wetland Restoration	STEP – programmed	2019	HI2CONWLC1044754306
7.2.2	Motor Pool, Hale Koa, and Puha ʻEkahi Wetland Restoration Design	STEP – in planning		

Table F2-2. MCBH INRMP Update - COA Five Year Implementation Plan (2017 – 2021)

Obj	Management Action	Type	FY Execution	STEP Number
7.2.2	Motor Pool Wetland Restoration Environmental Assessment	STEP – in planning		
7.2.2	Motor Pool Wetland Restoration	STEP – in planning		
7.2.2	Repair/Replace Aeration System and Install Waterline in Klipper Golf Course Ponds	STEP – programmed	2019	HI2CONESC1045664216
7.2.2	Control California Grass Using Salt Water in Percolation Ditch	STEP – in planning		
COA 7.3: Watershed Management				
Routine Management Actions				
7.3.1	Monitoring of General Erosion Conditions and Hot Spots	Routine	Recurring	N/A
Projects				
7.3.1	Water Quality and Ecosystem Health Monitoring of Nu‘upia Ponds	STEP – in planning		
7.3.1	Assess Natural Resources Status of Waikane Valley	STEP – in planning		
Routine Management Actions				
7.3.2	Regular Monitoring and Cleaning of the Mōkapu Central Drainage Channel (MCDC)	Routine	Recurring	N/A
Projects				
7.3.2	Design/Study for Developing Solutions for Managing Stream Debris in Waimānalo Stream (MCTAB) and the MCDC (Kaneohe Bay)	STEP – in planning		
7.3.2	Sediment Dredging – Nu‘upia ‘Ekahi	STEP – in planning		
7.3.2	Control of Surface Runoff and Erosion	STEP – in planning		
COA 7.4: Coastal and Marine Resources Management				
Routine Management Actions				
7.4.1	Marine Protected Species Monitoring	Routine	Recurring	N/A
7.4.1	Monitoring of Military and Recreational Exercises	Routine	Recurring	N/A
Projects				
7.4.1	Coastal and Marine Resource Survey – MCBH Kaneohe Bay	STEP – in planning		

Table F2-2. MCBH INRMP Update - COA Five Year Implementation Plan (2017 – 2021)

Obj	Management Action	Type	FY Execution	STEP Number
7.4.1	Biological Study of Nu'upia Ponds	STEP – in planning		
7.4.1	Shoreline Assessments to Address Erosion	STEP – in planning		
7.4.1	Assess Seaplane Ramps	STEP – in planning		
7.4.1	Monitor for Sea Level Rise	STEP – in planning		
7.4.1	Develop Climate Change Vulnerability Assessments	STEP – in planning		
Routine Management Actions				
7.4.2	Marine Resources Protection Initiatives	Routine	Recurring	N/A
7.4.2	Recreational Activity Control	Routine	Recurring	N/A
7.4.2	Marine Debris Removal	Routine	Recurring	N/A
7.4.2	Marine Protected Species Management and Response	Routine	Recurring	N/A
7.4.2	Coral Reef Mitigation	Routine		N/A
Projects				
7.4.2	Pu'uloa RTF Shoreline Erosion Repair Project Environmental Assessment	STEP – in progress	2016	HI3CONONC2245554209
7.4.2	Shoreline Erosion Repair – Pu'uloa RTF	STEP – programmed	2020	HI3COMPLC2244054202
7.4.2	Sand Dune Stabilization – North Beach	STEP – in planning		
7.4.2	Shoreline and Sand Stabilization – MCTAB	STEP – in planning		
COA 7.5: Landscape Maintenance and Vegetation Management				
Projects				
7.5.1	GIS – Vegetation Feature Class	STEP – programmed	2017	HI2CONONC2245184307
7.5.1	Invasive Vegetation Inventory and Management Plan	STEP – programmed	2017	HI2CONISC2244044201
Routine Management Actions				
7.5.2	Landscape Beautification	Routine	Recurring	N/A
7.5.2	Tree Maintenance Workshop	Routine	Recurring	N/A
7.5.2	Clear Roads and Trails to Provide Access	Routine	Recurring	N/A

Table F2-2. MCBH INRMP Update - COA Five Year Implementation Plan (2017 – 2021)

Obj	Management Action	Type	FY Execution	STEP Number
7.5.2	Plant Trees at KBRTF	Routine	Recurring	N/A
7.5.2	Operation of Wireless Controlled Water Cannons the Protect Red-footed Booby Colony	Routine	Recurring	N/A
7.5.2	Invasive Vegetation Control Activities (Mud Ops, Weed Warriors, Sea Grape, Fountain Grass, Fireweed, Devil weed, Specialized Eqpmnt)	Routine	Recurring	N/A
7.5.2	Harvest of Invasive Plants	Routine	Recurring	N/A
Projects				
7.5.2	MCBH Base Landscaping	STEP – programmed	2020	HI2CONEVOPB48104231
7.5.2	Invasive Vegetation Control: H3-Kane‘ohe Bay	STEP – programmed	2017/2019/2021	HI2CONISC2245684218
7.5.2	Invasive Vegetation Control: Nu‘upia Ponds and Base Wetlands	STEP – programmed	Recurring	HI2CONISOPB45694219
7.5.2	Invasive Tree Replacement: Pu‘uloa RTF	STEP – in planning		
7.5.2	Integrated Wildland Fire Management Plan	STEP – in progress	2017	HI3CONFRC2243654204
7.5.2	Maintenance and Repair of KBRTF Water Cannons Supporting Migratory Bird Conservation	STEP – programmed	Recurring	HI3CONONC2245324206
7.5.2	KBRTF Fire Suppression System	STEP – in planning		
COA 7.6: Natural Resources-based Outdoor Recreation, Outreach, and Public Access Management				
Projects				
7.6.1	Recreational Use Assessment: Beaches of MCBH Kaneohe Bay	STEP – in planning		
7.6.1	Recreational Fishing Survey	STEP – in planning		
Routine Management Actions (Outdoor Recreation)				
7.6.2	Nu‘upia Ponds Recreational Running Trail	Routine	Recurring	N/A
7.6.2	Review/Update Base Fishing Regulations	Routine	Recurring	N/A
7.6.2	MCTAB Recreational Hunting	Routine	Recurring	N/A
Routine Management Actions (Outreach)				
7.6.2	Informational Sessions	Routine	Recurring	N/A

Table F2-2. MCBH INRMP Update - COA Five Year Implementation Plan (2017 – 2021)

Obj	Management Action	Type	FY Execution	STEP Number
7.6.2	Planned Base or Community Events	Routine	Recurring	N/A
7.6.2	Educational Materials (Print Material, Signs/Exhibits, Videos, Website)	Routine	Recurring	N/A
Projects (Outreach)				
7.6.2	Outreach Coordinator	STEP – programmed	2018	HI3CONESC2245624214
7.6.2	Environmental Learning Center	STEP – in planning		
7.6.2	Nu'upia Ponds Recreational Running Trail Signage	STEP – in planning		
7.6.2	MCTAB TA-1 Educational Material	STEP – in planning		
Routine Management Actions (Public Access)				
7.6.2	Support for Scientific Research	Routine	Recurring	N/A
7.6.2	Support for Educational Tours and Service Projects	Routine	Recurring	N/A
COA 7.7: Resource Information Management				
Routine Management Actions				
7.7.1	Archival Data Maintenance	Routine	As required	N/A
7.7.1	Natural Resources Data Maintenance	Routine	As required	N/A
7.7.1	Spatial GIS Data Maintenance	Routine	As required	N/A
7.7.1	Manage GIS Data According to Latest DoD Standards	Routine	As required	N/A
Projects				
7.7.1	Historical Natural Resources Information Archiving	STEP – in planning		
Routine Management Actions				
7.7.2	Natural Resources Database Management	Routine	As required	N/A
7.7.2	Spatial GIS Data Management	Routine	As required	N/A
7.7.2	Digital Data Exchange	Routine	As required	N/A
7.7.2	Project Documentation and Closeout	Routine	As required	N/A

F3. FUNDING DESCRIPTION

This appendix reviews and summarizes the funding sources used to implement the MCBH INRMP. It also includes current guidance on funding.

INRMP FUNDING

Executive Order 12088 of October 13, 1978, requires the Marine Corps: 1) to ensure that adequate funds are planned, programmed, and budgeted to meet Marine Corps environmental responsibilities; and 2) to ensure that, once budgeted, these funds are not reprogrammed to cover other non-environmentally-related shortfalls in the year of execution.

MCBH has a long history of increasing support for its natural resource projects through building conservation staff and securing project funding from a range of sources. During the 2001-2016 timeframe of the INRMP implementation, the program was funded at about the $15.4M level (Table F1-1). Funding at about the same or slightly reduced level is expected to continue in the implementation period of this INRMP update (2017-2021) (Table F2-1). A sustained level of funding and staffing support illustrates the adequacy of funding to support implementation of this INRMP.

INRMP FUNDING OBLIGATIONS AND LIMITATIONS

The HQMC INRMP Handbook (p. 27-28) states: *"Since the Sikes Act requires implementation of the INRMP, there is a clear fiscal connection between INRMP preparation and budgeting. Implementation of the INRMP is subject to availability of funds. Funding to implement natural resources management will largely come from the installation. Accordingly, it is vital the installation comptroller actively participate in INRMP preparation and/or revision. HQMC funding sources should be requested only for emergent, unforeseen or emergency funding situations." AND "Formal adoption of an INRMP by the installation commander constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with specific timeframes identified in the INRMP. Under the Sikes Act, any natural resources management activity that is specifically addressed in the plan must be implemented (subject to availability of funds). Failure to implement the INRMP is a violation of the Sikes Act and may be source of litigation"* (HQMC 2006).

MCBH's INRMP funding tables display projects that have been programmed to occur as part of the long-term funding commitment planning process (Table F2-1), and HQMC reviewers have validated that the programmed projects meet valid needs of the program. This means that MCBH has every intention of funding these projects, based on current trends and projections of available resources. However, as per the INRMP Handbook, "All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under Federal law. Nothing in this INRMP is intended to be nor shall be construed to be a violation of the Anti-Deficiency Act, 31 USC § 1341."

FUNDING SOURCES

Most of the natural resources project funds for implementation of the INRMP program come from Operations and Maintenance Marine Corps dollars (O&MMC). These are financed from one of two sources: 1) Installation operating budget (OPBUD) and 2) HQMC centrally managed funds (CMEP). Both installation OPBUD and HQMC CMEP O&MMC funds are appropriated for one year. Installations must obligate these funds in the same fiscal year they are received, but implementation of any project using these funds can extend up to five years. The Environmental Projects program provides another source of funds to perform projects in the M2/R2 program. These are maintenance and construction projects of a design/build nature and are funded by CMEP dollars.

There are other potential funding sources for natural resources projects: reimbursable accounts (e.g., Agricultural Outlease; Forestry; and Hunting, Fishing and Trapping Access Fees) that are centrally managed by HQMC; DoD special fund accounts; and cost sharing grants. Hunting, Fishing and Trapping Access Fees are generated by the sale of installation-specific licenses and used to improve related installation programs. Although MCBH allows both fishing and hunting on its properties, it does not charge a fee for either, so it does not participate in this program. Although MCBH has received funds from special fund accounts such as the Legacy Resources Management Program and the Strategic Environmental Research and Development Program (SERDP), due to competition for limited dollars, specific types of funded projects, and limited in-house resources to develop proposals, it is challenging for MCBH to compete for these funds. See Sections 9.3.1 and 9.3.2, 2001 INRMP/EA.

FUNDING CLASS DEFINITIONS AND FUNDING PRIORITIES

Due to inherent budgetary limitations and a host of environmental compliance responsibilities, DoD has devised an implementation priority and funding priority-rating system to determine how to ration environmental dollars in any given fiscal year. When programming INRMP actions, these rating systems apply and are applied to the management actions listed in Table F2-2. Enclosure 4 of DoD Instruction 4715.03 of March 18, 2011, “Programming and Budgeting Priorities for Natural Resources Programs,” further describes the rating system (see attached). The MCBH INRMP funding plan is highly likely to be funded since it is based on historical funding trends and is a consistent projection of the ongoing level of funding and staff support. Barring any unforeseen national military mobilization emergency, Continuing Resolutions, or other Congressionally-driven dictates at the time of this INRMP publication, the Proposed Funding plan is expected to be implemented.

ENCLOSURE 4

PROGRAMMING AND BUDGETING PRIORITIES FOR NATURAL RESOURCES PROGRAMS

1. RECURRING NATURAL RESOURCES CONSERVATION MANAGEMENT REQUIREMENTS

a. Administrative, personnel, and other costs associated with managing the DoD Natural Resources Conservation Program that are necessary to meet applicable compliance requirements in Federal and State laws, regulations, E.O.s, and DoD policies, or in direct support of the military mission.

b. DoD Components shall give priority to recurring natural resources conservation management requirements associated with the operation of facilities, installations, and deployed weapons systems. These activities include day-to-day costs of sustaining an effective natural resources management program, as well as annual requirements, including manpower, training, supplies, permits, fees, testing and monitoring, sampling and analysis, reporting and recordkeeping, maintenance of natural resources conservation equipment, and compliance self-assessments.

2. NON-RECURRING NATURAL RESOURCES MANAGEMENT REQUIREMENTS. DoD Components shall prioritize non-recurring requirements using these classifications:

a. Current Compliance. Includes installation projects and activities to support:

(1) Installations currently out of compliance (e.g., received an enforcement action from an authorized Federal or State agency or local authority).

(2) Signed compliance agreement or consent order.

(3) Meeting requirements with applicable Federal or State laws, regulations, standards, E.O.s, or DoD policies, including those listed in Enclosure 1.

(4) Immediate and essential maintenance of operational integrity or military mission sustainment.

(5) Projects or activities that will be out of compliance if not implemented in the current program year. Those activities include:

(a) Environmental analyses for natural resources conservation projects, and monitoring and studies required to assess and mitigate potential impacts of the military mission on conservation resources.

(b) Planning documentation, master plans, compatible development planning, and INRMPs.

(c) Natural resources planning-level surveys.

(d) Reasonable and prudent measures included in incidental take statements of biological opinions, biological assessments, surveys, monitoring, reporting of assessment results, or habitat protection for listed, at-risk, and candidate species so that proposed or continuing actions can be modified in consultation with the USFWS or NOAA Fisheries Service.

(e) Mitigation to meet existing regulatory permit conditions or written agreements, such as those required in chapter 26 of Reference (ai), and included in documents required by the DoD Chesapeake Bay Strategic Action Plan (Reference (ap)).

(f) Nonpoint source pollution or watershed management studies or actions needed to meet compliance dates cited in approved State coastal nonpoint source pollution control plans, as required to meet consistency determinations consistent with Coastal Zone Management.

(g) Wetlands delineation critical for the prevention of adverse impacts to wetlands, so that continuing actions can be modified to ensure mission continuity, as required by chapter 26 of Reference (ai).

(h) Compliance with missed deadlines established in DoD executed agreements (e.g., Reference (ap)).

b. Maintenance Requirements. Includes those projects and activities needed to meet an established deadline beyond the current program year and maintain compliance. Examples include:

(1) Compliance with future deadlines.

(2) Conservation, GIS mapping, and data management to comply with Federal, State, and local regulations, E.O.s, and DoD policy.

(3) Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives.

(4) Wetlands enhancement to minimize wetlands loss and enhance existing degraded wetlands as required in chapter 26 of Reference (ai).

(5) Conservation recommendations in biological opinions issued pursuant to the ESA.

c. Enhancement Actions Beyond Compliance. Includes those projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required by law, regulation, or E.O., and are not of an immediate nature. Examples include:

(1) Community outreach activities, such as International Migratory Bird Day, Earth Day, National Public Lands Day, Pollinator Week, and Arbor Day activities.

(2) Educational and public awareness projects, such as interpretive displays, oral histories, Watchable Wildlife areas, nature trails, wildlife checklists, and conservation teaching materials.

(3) Restoration or enhancement of natural resources when no specific compliance requirement dictates a course or timing of action.

(4) Management and execution of volunteer and partnership programs.

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APPENDIX G
DOCUMENTATION OF PUBLIC OUTREACH, ENGAGEMENT, AND INVOLVEMENT

This appendix documents stakeholder involvement and public outreach in the implementation of the MCBH INRMP.

G1. Recurring Natural Resources Service Projects

G2. *MCBH INRMP-Related Public Access and Outreach History (Reference CD only)*

G3. Examples of Public Outreach

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G1. RECURRING NATURAL RESOURCES SERVICE PROJECTS

Table G1-1 identifies recurring natural resources related service projects that require coordination by or with Environmental Department staff. A detailed description of recurring projects is included in Section 9.

It is noteworthy that the Sierra Club Hawaii Chapter regularly partners with MCBH. Their members routinely participate in Weed Warrior events along with Base volunteers. Notably, Daniel Anderson and Deborah Blair have been regular attendees representing the Sierra Club for the last 10-15 years. This partnership enhances the environment while strengthening community bonds with the Base.

A Base-wide cleanup, "Malama i ka Aina", consisting of teams of volunteers at Kaneohe Bay had been hosted annually in May. The Natural Resources section would get approximately ten Marine volunteers for 2-3 days to use as deemed necessary. The event has been cancelled; the last cleanup was held November 18-20, 2014.

Table G1-1.Recurring Natural Resources Service Projects

RECURRING EVENT	TIMEFRAME	ACTIVITY
January		
State Biannual Waterbird Count	2nd week of month	Count waterbirds/shorebirds in MCBH Kaneohe Bay wetlands
Humpback Whale Ocean Count	Jan/Feb/Mar: Last Saturday of month	Coordinate with NOAA Fisheries/Humpback Whale Sanctuary
Fountain Grass Survey	2nd/3rd week of month every other year	Survey and control efforts conducted at MCTAB include Natural Resources staff, HIARNG, OISC, Bellows AFS
Chronological Summary	1st week of month	Summary of events by month for previous calendar year
INRMP Annual Review	Whenever regulators are available. Send out meeting request and information packet in Nov/Dec	Review by DLNR, USFWS, NOAA Fisheries, EPA of the Natural Resources Program INRMP implementation progress
February		
Mud-Ops	Feb: Whenever AAVs are available	Preparing Nu'upia Ponds mudflats for stilt nesting season utilizing AAVs to break-up pickleweed
Swamp Romp	1st or 2nd Saturday of month	Conducted by CLB-3/MCCS. Begin coordination in Nov/Dec of previous calendar year
Humpback Whale Ocean Count	Last Saturday of month	Coordinate with NOAA Fisheries/Humpback Whale Sanctuary
Sierra Club Service Projects	Feb/Mar/Apr/Jun/Aug/Oct/Dec: 2nd Saturday of month	Conduct environmental service project with Sierra Club, Marines and community volunteers
March		
Humpback Whale Ocean Count	Last Saturday of month	Coordinate with NOAA Fisheries/Humpback Whale Sanctuary
April		
Sierra Club Service Projects	2nd Saturday of month	Conduct environmental service project with Sierra Club, Marines, community volunteers
Earth Day	3rd or 4th Saturday of month	Event held at Risley Field.

RECURRING EVENT	TIMEFRAME	ACTIVITY
May		
None		
June		
Sierra Club Service Projects	2nd Saturday of month	Conduct environmental service project with Sierra Club, Marines, community volunteers
July		
None		
August		
Sierra Club Service Projects	2nd Saturday of month	Conduct environmental service project with Sierra Club, Marines, community volunteers
State Biannual Waterbird Count	2nd or 3rd week of month	Count waterbirds/shorebirds in MCBH Kaneohe Bay wetlands
September		
Shearwater Burrow Count	1st week of month	Count occupied shearwater burrows located along Fort Hase shoreline, Nu‘upia Ponds WMA; Natural Resources staff, OISC, DLNR/DOFAW
October		
Sierra Club Service Projects	2nd Saturday of month	Conduct environmental service project with Sierra Club, Marines, community volunteers
November		
Shearwater Fallout Season	Nov-Dec	Notify Airfield ops/squadrons. Provide informational flyer. Information is disseminated in October, before young shearwaters begin to fledge.
December		
Sierra Club Service Projects	2nd Saturday of month	Conduct environmental service project with Sierra Club, Marines, community volunteers
Audubon Christmas Bird Count	~15 Dec	Count all birds around the Base, including Booby Colony

1

G2. MCBH INRMP-RELATED PUBLIC ACCESS AND OUTREACH HISTORY

This appendix details public access (i.e., on-Base tours, service projects) and outreach (off-Base) activities coordinated by Environmental Department staff pertaining to the natural resources management program. It supports information about stakeholder involvement in INRMP preparation and implementation (Section 9). All volunteers are essential to successful implementation of the INRMP.

Table G2-1 shows the total number of people involved (on- and off-Base) in natural resources-related activities from CY1999-CY2016.[1] It documents that since 1999 over 13,000 people have participated in INRMP implementation.

Table G2-2 and **Table G2-3** represent the entire array of natural-resources related public engagement activities (access/outreach/service) over the past five years (2012-2016).[2]

Table G2-2 tallies access/outreach activities that involve tours or educational presentations. A wide audience has been reached (e.g., schools, national and foreign dignitaries, scientists, scouts, military spouses, conference attendees, elected officials, and civic organizations).

Table G2-3 tallies details about volunteer natural resources service projects and total number of volunteer labor-hours associated with each project. Service projects include vegetation removal and rubbish/debris removal from wildlife management areas, ponds, wetlands, beaches, streams and the MCDC. The data shows that between 2012 and 2016, over 1,100 individuals performed more than 5,800 labor-hours of service.

[1] A detailed breakdown of these activities for 2012-2016 is presented in Tables G1-2 and G1-3. Detailed tables for 1999-2011 are included in earlier INRMP editions (2001 INRMP/EA and 2006 and 2011 INRMP Updates).

[2] The data from 2012 and 2013 are not representative of all activities. Records for these years are incomplete due to illness and subsequent retirement of the former Senior Natural Resources Manager, and staff changes.

Table G2-1. Participants in Environmental Department Natural Resources-Related Public Access and Outreach Activities (1999-2016)

Year	Number of Participants		
	On-Site*	Off-Site**	Total
1999	901	60	961
2000	1649	390	2039
2001	136	450	586
2002	504	1074	1578
2003	520	80	600
2004	469	257	726
2005	244	80	324
2006	292	80	372
2007	419	62	481
2008	315	265	580
2009	540	0	540
2010	483	0	483
2011	894	80	974
2012[+]	33	0	33
2013[+]	210	0	210
2014	898	0	898
2015	1189	0	1189
2016	624	0	624
Total	**10,311**	**2,878**	**13,198**

* This includes natural resources-related on-site tours, service projects, and/or educational presentations conducted on MCBH properties.

** This includes presentations, lectures, conferences, and interagency meetings at locations off-Base.

[+] Although activities occurred during these years, the data from 2012 and 2013 are incomplete due to illness and subsequent retirement of the former Senior Natural Resources Manager, and staff changes.

Weed Warrior Service Project

Table G2-2. MCBH Environmental Department Natural Resources-Related Tours and Presentations (2012-2016)

1

DATE	LOCATION KBay, MCTAB, Camp Smith	AUDIENCE	ORIENTATION General, Natural, Cultural, Academic	NUMBER OF ATTENDEES	GENERAL SUBJECTS
2016					
1/25/16	KBay	Military & Civilian	Natural	24	CECOS Advanced Environmental Management Course
2/27/16	KBay	Hawai'i Audubon Society	Natural	35	Booby Colony Tour
3/15/16	KBay	Military & Civilian	Natural	30	Environmental Awareness Class
3/19/16	KBay	Military & Civilian	Natural	30	Environmental Compliance Coordinator Meeting
4/19/16	KBay	Military & Civilian	Natural	17	Environmental Compliance Coordinator- Fishing Regulations
4/19/16	KBay	Nat Res Staff & USFWS	Natural	*	Earth Day
7/19/16	KBay	Military & Civilian	Natural	30	Environmental Awareness Class
9/1/16	KBay	Military & Civilian	General	176	Safety Stand-Down
TOTAL 2016				**342**	
2015					
1/27/15	KBay	Military & Civilian	Natural	34	Environmental Awareness Class
3/15/15	KBay	Civilian	Natural	16	Bishop Museum Science Alive
3/17/15	KBay	Military & Civilian	Natural	25	Environmental Awareness Class
4/15/15	KBay	Military & Civilian	General	482	Volunteers Opportunity Fair
4/26/15	KBay	Nat Res Staff & Other Nat Res Agencies & Orgs	Natural	X	Earth Day @ MCX
4/30/15	KBay	Paepae o He'eia (Non-Profit) 7th Graders	Natural	20	Nu'upia Ponds Tour (Wedge-tailed Shearwater Colony)
6/30/15	KBay	Facilities, MCCS	Natural	152	Tree Maintenance Workshop
7/10/15	KBay	Hawaii Audubon Society	Natural	42	Booby Colony Tour
7/15/15	KBay	Military & Civilian	Natural	34	Environmental Awareness Class
8/4/15	KBay	Military & Civilian	General	3	National Night Out
9/15/15	KBay	Military & Civilian	Natural	34	Environmental Awareness Class
TOTAL 2015				**842**	
2014					
1/14/14	KBay	Military & Civilian	Natural	34	Environmental Awareness Class
2/15/14	KBay	Ecology Camp - SC High School Hikers, UH Geology Dept, Bishop Museum	Natural	33	Ecology Camp Tours - Booby Colony, Geology, Bird Fossils
2/15/14	KBay	Ecology Camp - SC High School Hikers	Natural	40	Ecology Camp - Natural Resources Awareness Brief
2/16/14	KBay	Ecology Camp - SC High School Hikers	Natural	40	Ecology Camp - Hala Weaving Instruction
4/4/14	KBay	Navy Helo Squadron	Natural	15	Overview of Nu'upia Ponds

Table G2-2. MCBH Environmental Department Natural Resources-Related Tours and Presentations (2012-2016)

DATE	LOCATION KBay, MCTAB, Camp Smith	AUDIENCE	ORIENTATION General, Natural, Cultural, Academic	NUMBER OF ATTENDEES	GENERAL SUBJECTS
4/12/14	KBay	Dr Moberly (Retired) and Students	Natural	22	UH Geology/Environmental Tour (Fort Hase Beach Below RTF)
4/15/14	KBay	Military & Civilian	Natural	36	Environmental Awareness Class
4/26/14	KBay	Nat Res Staff & Other Nat Res Agencies & Orgs	Natural	7	Earth Day @ MCX
5/21/14	KBay	CLB-3	Natural	200	Safety Standdown Brief on Hazardous Wildlife
5/22/14	KBay	CLB-3	Natural	60	Safety Standdown Brief on Hazardous Wildlife
5/31/14	KBay	Hawaii Audubon Society, Bishop Museum, USFWS	Natural	26	Booby Colony Tour
6/4/14	KBay	Military Family Members	Natural	12	Booby Colony Tour
7/15/14	KBay	Military & Civilian	Natural	26	Environmental Awareness Class
9/6/14	KBay	Kailua Hawaiian Civic Club and Ahahui Malama I Ka Lokahi	Natural	26	Tour of Booby Colony, Nu‘upia WMA, KT
12/14/14	KBay	Dallas Cowboy Cheerleaders	Natural	15	Booby Colony Tour
TOTAL 2014				**592**	
			2013		
12/4/2013	KBay	Young Marines Organization, HQBN, & MCAS	Natural	20	Gave Natural Resources Briefing before Beach Clean-Up at Fort Hase for Malama I ka Aina Day
TOTAL 2013				**20**	
			2012		
		No Records			
TOTAL 2012				**0**	
GRAND TOTAL (2012-2016)				**1,796**	

Table G2-3. MCBH Environmental Department Natural Resources-Related Service Projects (2012-2016)

DATE	# OF PARTICIPANTS	# HOURS ON SITE	TOTAL # OF PARTICIPANT HOURS	TYPE OF PARTICIPANTS	SITE AND TYPE OF PROJECT
2016					
1/20/16	2	5	10	Nat Res Staff & Pacific Rim Employees	Biannual State Waterbird Count
1/23/2016	35	3	105	MCBH HQBN and Young Marine Program	Weed Warrior Service Project Nu'upia Ponds - Mangrove Removal
1/30/16	X	4	X	NOAA volunteers (Military & Civilian)	NOAA Whale Count
2/11/16	7	6	42	Nat Res Staff & OISC	Invasive Species Control
2/13/16	30	3	90	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds - Mangrove Removal
2/18/16	6	6	36	Nat Res Staff & OISC	Invasive Species Control
2/26/16	14	3	42	NOAA volunteers (Military & Civilian)	NOAA Whale Count
3/1-3/16	26	16	416	CSC AAV/ Nat Res Staff	Mud-Ops
3/26/16	20	4	80	NOAA volunteers (Military & Civilian)	NOAA Whale Count
4/6-7/16	4	14	56	Nat Res Staff & OISC	Invasive Species Control
6/8/16	20	2	40	Central Union Chirch	Trash Clean-up and Mangrove Removal Nu'upia Ponds
6/11/16	25	3	75	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds & Perc Ditch
8/13/16	18	3	54	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds
8/17/16	4	5	21	Nat Res Staff & USFWS	Biannual State Waterbird Count
9/12/16	15	3	45	OISC, USFWS, ENV	Wedge-tailed Shearwater Burrow Count
10/8/16	31	3	93	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds
12/10/16	20	3	60	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds
12/20/16	5	10	50	Hawaii Audubon Society, Professional Birders	Annual Hawai'i Audubon Christmas Bird Count
TOTAL 2016	**282**	**96**	**1,315**		
2015					
1/21/15	3	4	12	Nat Res Staff	Biannual State Waterbird Count
1/28/15	21	4	84	NOAA volunteers (Military & Civilian)	NOAA Whale Count
2/3-5/2015	20	20	400	CSC AAV/Nat Res staff	MudOps
2/14/15	34	3	102	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds - Mangrove Removal
2/17/15	8	4	32	Nat Res Staff, HIARNG, OISC	Fountain Grass Survey
2/21/15	25	3	75	14-18 yr olds, CAC, 21st Dental	PMO DEFY Program - Shoreline Clean-Up
2/27/15	43	4	172	Kailua HS (Community Service Project)	MCTAB - Vegetation Removal
2/28/15	15	4	60	NOAA Volunteers (Military & Civilian)	NOAA Whale Count

Table G2-3. MCBH Environmental Department Natural Resources-Related Service Projects (2012-2016)

DATE	# OF PARTICIPANTS	# HOURS ON SITE	TOTAL # OF PARTICIPANT HOURS	TYPE OF PARTICIPANTS	SITE AND TYPE OF PROJECT
3/29/15	8	4	32	NOAA Volunteers (Military & Civilian)	NOAA Whale Count
4/11/15	18	3	54	Sierra Club, Military & Civilian (1/3, MALS-24, Wounded Warriors, Punahou, Kamehameha, Chaminade)	Weed Warriors Nu'upia Ponds (MCTAB TA-1-'Opiuma, ironwood, vines)
4/15-16/15	10	12	120	Marines	Malama i ka aina - 1st half
4/19/15	X	X	X	Nat Res Staff, Le Jardin Academy Seniors	Earth Day activities (Beach Clean-Up, Invasive Plant Removal) at MCTAB
6/4/15	30	2	60	1/3 & JROTC	MCDC Clean-up
6/13/15	18	3	54	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds (MTR)
8/8/15	22	3	66	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds (MTRl)
9/15/15	16	7	112	OISC, USFWS, ENV	Wedge-tailed Shearwater Burrow Count
10/10/15	26	3	78	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds
12/5/15	10	4	40	Halau Haumana	Hala Trimming With Weavers
12/12/15	16	3	48	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds
12/20/15	4	10	40	Hawaii Audubon Society, Professional Birders	Annual Hawai'i Audubon Christmas Bird Count
TOTAL 2015	**347**	**100**	**1,641**		
2014					
1/10/14	3	3	9	Lauhala weavers	Hala Leaf Collection
1/15/14	6	4	24	USFWS, Nat Res Staff	Biannual State Waterbird Count
1/25/14	10	3	30	Sierra Club, Military & Civilian	Booby Nest Repair
1/25/14	21	4	84	NOAA Volunteers, Military & Civilian	NOAA Whale Count
2/8/14	4	5	20	CLEOs & Nat Res Staff	Swamp Romp Monitoring
2/11/14	3	3	9	OISC Field Crew	Survey for Coconut Rhinoceros Beetle
2/16/14	50	3	150	Ecology Camp, Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds – Pluchea
2/18-19/14	17	16	272	CSC AAV/ Nat Res Staff	Mud-Ops
2/22/14	13	4	52	NOAA Volunteers, Military & Civilian	NOAA Whale Count
3/17/14	4	7	28	Nat Res Staff & HIARNG	Fountain Grass Survey
3/29/14	10	4	40	NOAA Volunteers, Military & Civilian	NOAA Whale Count
4/12/14	30	3	90	Sierra Club, Boyscouts, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds (Mangrove Removal)
4/15-16/14	10	12	120	Marines	Malama i ka aina - 1st half

Table G2-3. MCBH Environmental Department Natural Resources-Related Service Projects (2012-2016)

DATE	# OF PARTICIPANTS	# HOURS ON SITE	TOTAL # OF PARTICIPANT HOURS	TYPE OF PARTICIPANTS	SITE AND TYPE OF PROJECT
4/19/14	22	3	66	Nat Res Staff, Le Jardin Academy Seniors	Earth Day Activities (Beach Clean-Up, Invasive Plant Removal) at MCTAB
6/1-7/14	4	6	120	USGS Contracted Biologists	GPS Tagging of Red-Footed Booby (5 Total Nights)
6/2-3/14	5	8	40	Bishop Museum	Avian Fossil Collection - KBay RTF (Below R-9)
6/14/14	21	3	63	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds (MTR)
8/9/14	18	3	54	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds (Running Trail)
8/20/14	4	4	16	Nat Res Staff	Biannual State Waterbird Count
10/11/14	17	3	51	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds
11/18-19/14	10	12	120	Marines	Malama I ka aina - 2nd Half
12/13/14	22	3	66	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds (?)
12/20/14	6	8	48	Hawaii Audubon Society, Professional Birders	Annual Hawai'i Audubon Christmas Bird Count
TOTAL 2014	**306**	**124**	**1,572**		
2013					
1/16/2013	6	4	24	Nat Res Staff	Biannual State Waterbird Count
1/26/2013	33	4	132	NOAA Volunteers, Military & Civilian	NOAA Whale Count
2/5-7/2013	˜18	˜16	˜288	CSC AAV/ Nat Res Staff	Mud-Ops
2/12/2013	12	3	36	Sierra Club, Military & Civilian	Weed Warrior Service Project Nu'upia Ponds
2/23/2013	20	4	80	NOAA Volunteers, Military & Civilian	NOAA Whale Count
3/30/2013	19	4	76	NOAA Volunteers, Military & Civilian	NOAA Whale Count
4/13/2013	13	4	52	Sierra Club Volunteers, Active Duty Marines	MCTAB- Golden Crown Beard & Ironwood Removal
6/8/2013	27	3	81	Sierra Club Volunteers, Active Duty Marines	MCTAB- Golden Crown Beard & Ironwood Removal
8/10/2013	13	3	39	Sierra Club Volunteers, Active Duty Marines	MCTAB- Golden Crown Beard & Ironwood Removal
8/21/2013	7	4	28	Nat Res Staff	Biannual State Waterbird Count
10/12/2013	16	3	48	Sierra Club, Punahou School, 3rd Marines, MAG-24, Coast Guard	Perc Ditch - Clear Banks of Guinea Grass, Christmasberry, Koa Haole, California Grass
12/15/2013	6	10	60	Hawaii Audubon Society, Professional Birders	Annual Hawai'i Audubon Christmas Bird Count
TOTAL 2013*	**190**	**62**	**944**		

Table G2-3. MCBH Environmental Department Natural Resources-Related Service Projects (2012-2016)

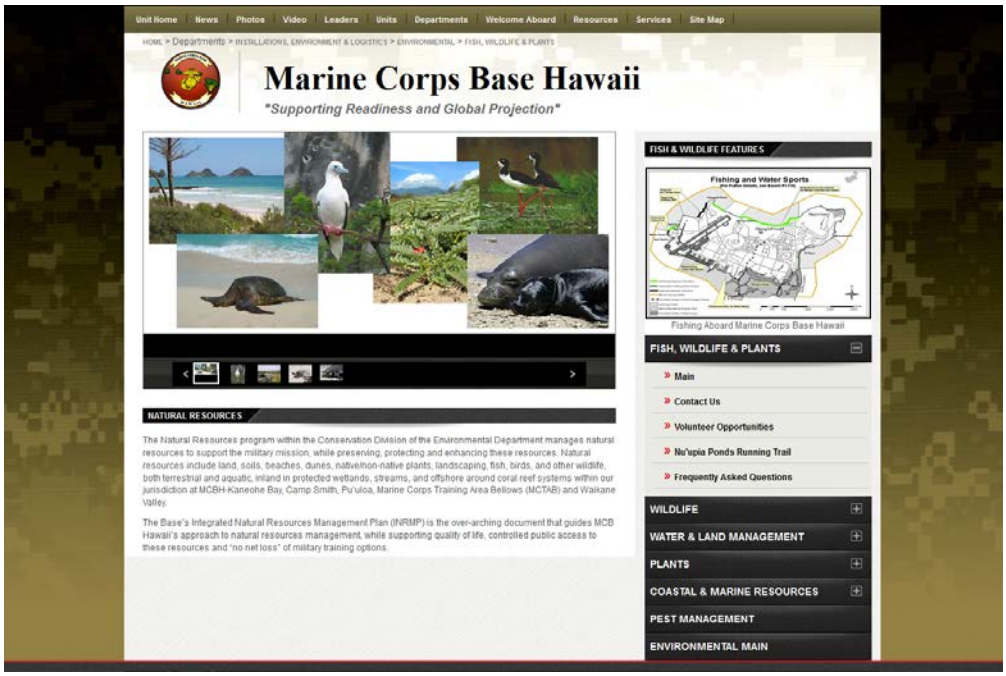
DATE	# OF PARTICIPANTS	# HOURS ON SITE	TOTAL # OF PARTICIPANT HOURS	TYPE OF PARTICIPANTS	SITE AND TYPE OF PROJECT
2012					
1/18/2012	3	4	12	Nat Res Staff	Biannual State Waterbird Count
3/2-4/2012	˜18	˜16	˜288	CSC AAV/ Nat Res Staff	Mud Ops
8/15/2012	7	4	28	Nat Res Staff	Biannual State Waterbird Count
12/15/2012	5	10	50	Hawaii Audubon Society, Professional Birders	Annual Hawai'i Audubon Christmas Bird Count
TOTAL 2012*	**33**	**34**	**378**		
GRAND TOTAL (2012-2016)	**1,158**	**426**	**5,850**		

* During 2012 and 2013, recurring events such as Weed Warriors and NOAA whale counts occurred as regularly scheduled, however due to the illness and subsequent retirement of the Senior Natural Resources Manager, records for dates and numbers of participants are incomplete, and thus not included. Dates for the Mud Ops event are confirmed, but the number of participants estimated.

G3. EXAMPLES OF PUBLIC OUTREACH

This appendix contains recent examples of public outreach relating to the MCBH natural resources management program. The MCBH natural resources management program is made visible through a website, as well as publications, signs, interpretive exhibits, handouts, and articles. Pamphlets on coral reefs, marine animals, harmful organisms, off-roading, and other topics are under development.

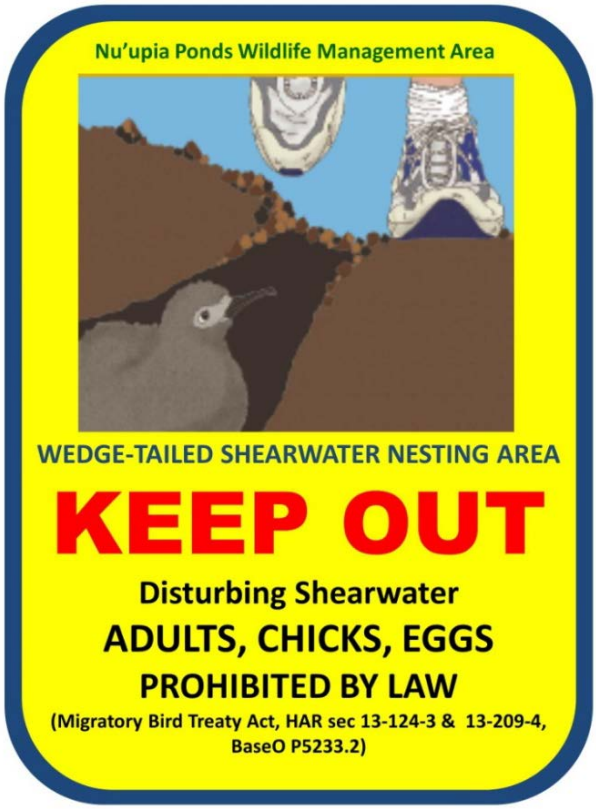
The MCBH Environmental Compliance and Protection Department website provides up to date information on compliance, pollution protection, conservation, installation restoration, and education and outreach.



http://www.mcbhawaii.marines.mil/Departments/Installations,EnvironmentLogistics/Environmental.aspx

Until October 2015, when the Command stopped publishing the *Hawaii Marine* newspaper, a section titled "Environmental Corner" provided a forum for educating on MCBH natural resources, as well as occasional feature stories. The newspaper also listed volunteer, Base, and community events, and often included opportunities to participate in natural resources related service projects.

Signs and handouts are used to inform individuals about MCBH natural resources, measures for protection and what activities violate Base Orders and County, State and Federal laws.



Common fish of the Nu'upia Ponds

The Nu'upia Ponds support at least 16 different species of native fish who find sanctuary here. Fish tagging studies verify that they swim elsewhere and are caught outside of the ponds- in open fishing areas, making these ponds an important nursery. **Fishing is strictly prohibited** in these ponds which helps replenish depleted, near-shore fish populations. Fishing is regulated around the state by both Federal and State laws.

'Ama'ama, striped mullet (*Mugil cephalus*)

- 'Ama'ama were a favorite fish to raise in fishponds by the ancient Hawaiians
- They would enter through the *mākāhā* (gates) as *pua 'oma* ("baby" 'ama'ama) and would be referred to as 'ama'ama when they reached about 20 cm
- The large adult stage are called 'anae, which is about 30 cm fork length

Awa, milkfish (*Chanos chanos*)

- This *'ono* (delicious) fish has white meat that looks almost milky when cooked into a soup
- Awa was a favorite fish to raise in fishponds, and still can be found in the ponds today!

Kākū, Great Barracuda (*Sphyraena barracuda*)

- Kākū are the predators of *loko i'a*
- These aggressive fish have a large appetite and can reach lengths of 6 ft.!
- They prey on most fish that are found in and around fishponds, and occasionally attacked the pond keepers
- Attracted to silvery flashes in the water, it is recommended to not wear any jewelry or anything flashy while in the ocean in order to reduce the likelihood of getting bit by this giant

Awa 'aua, awa awa, Hawaiian Ladyfish (*Elops hawaiensis*)

- These fish became particularly *momona*, or fat, when raised in fishponds as opposed to those found out in open waters
- This fish is also sometimes referred to as the giant herring and can be found in large schools

'Ō'io, Short jaw Bonefish (*Albula glossondonta*)

- 'Ō'io are a prized sport fish today, and it takes a lot of experience to catch these tasty fish
- The ancient Hawaiians were able to raise 'ō'io and capture the fish right in the fishponds
- One of the favorite ways to enjoy this fish is to make *lomi* out of it, or cut up into small pieces, "massaged" by hand and served raw

Ulua, Giant Trevally (*Caranx ignobilis*)

- With being capable of reaching weight up to 190 lbs., this fish is what fisherman dream of!
- There are many different species of ulua found around Hawai'i, all belonging to the jack, or trevally family
- An ulua is referred to as a *pāpio* in the juvenile stage, once the fish is about 10 lbs. it is considered an ulua
- A male sweetheart is often referred to as an ulua in Hawaiian poetry, which is an example of *kaona*, or a hidden, double meaning

Hua 'Ōlelo (Hawaiian words):

- I'a- fish
- Loko i'a- fishpond
- Makāhā- Sluice gate, as of a fishpond
- Kuapā- wall of a fishpond
- 'Ono- delicious
- Momona- fat or sweet
- Lomi- a type of fish dish created by hand, the fish is "massaged", cut into small pieces and served raw
- Kaona- a word with a hidden, double meaning in Hawaiian poetry

Mahalo to Keoki Stender www.marinelifephotography.com for the photos. For more information contact the Base Environmental Department 257-7000, 216-7135

1

Predators & Threats to Hawai'i

Animals **non-native & invasive** to the Hawaiian Islands pose serious threats to the native ecosystem. The term **non-native species** refers to a species transported or established outside its native range by the activities of humans, whether done so intentionally or not. **Invasive species**, which are non-native, are species that significantly disrupt the community structure or proper function of an ecosystem.

Free Roaming Cats (*Felis catus*)

Free roaming cats, whether feral or domestic, pose a serious threat health hazard to humans. They are prolific and efficient predators of birds and other wildlife- even if well fed .

Neuter and release of cats is PROHIBITED on MCB Hawaii. Per Base Order P5500.15B, the release or abandonment of domesticated animals is prohibited

- Since there was no natural evolution of cats in Hawai'i there is no natural predator to control the populations
- There are many diseases that can be transmitted to humans and wildlife by cats
- If you own a cat, or dog, for your safety and the well being of your pet, you must keep it indoors or on a leash at all times

Small Indian Mongoose (*Herpestes javanicus*)

The Indian Mongoose is a small, weasel like animal with a long, brownish body & tail, short legs and a pointed muzzle.

- Introduced in 1883 as a bio control for rats, however, this was unsuccessful as the rats are active during the night and the mongoose is active during the day
- Pose a serious threat to native fauna; they prey on birds, baby sea turtles, eggs, and other various animals
- Are vectors for disease, such as leptospirosis, which can be fatal to humans

Rats (*Rattus rattus, Rattus exulans, Rattus norvegicus*)

- The first rat species introduced in the islands was the Polynesian Rat, *Rattus exulans*, which was brought aboard canoes from the first Polynesian settlers to Hawai'i about 1600 years ago
- Two other species of rats later made their way into Hawai'i aboard European ships are roof rats (*Rattus rattus*) and the Norway rat (*Rattus norvegicus*)
- Besides being a pest to humans as well as a threat to human health, these species have a large impact on the native ecosystem as both predators and competitors
- Rats threaten not only water birds, but all forest birds as well by preying on chicks, eggs and even adult birds, amongst many other species

Tropical Fire Ant (*Solenopsis geminata*)

- Thought to have been established in the 1870s
- Colonies are large, with tens to hundreds of thousands of workers
- Average size is 3-5mm in length, equivalent to the length of a half a grain of rice
- Nests are usually in the form of a large exposed soil mound but can form smaller nests on paved areas
- Mating takes place 300 to 800 feet in the air
- Workers have powerful stings; if you mistakenly stand on a nest, workers will slowly cover your feet and lower legs and then sting you
- Fire ants prefer food with high protein content, but will feed on almost anything, plant or animal

Feral Pig (*Sus scrofa*)

- Descendant of the small Asiatic domestic pigs introduced by Polynesians in the early colonization period (400AD) and the larger European pigs first introduced by Captain James Cook in 1778
- Found on all main islands except Lāna'i
- Responsible for great ecological damage by rooting and trampling native vegetation and spreading invasive plant species
- Native forest bird habitat and numbers have been significantly reduced as a result of the feral pig's introduction

Brown Tree Snake (*Boiga irregularis*)

Native to the Solomon Islands, New Guinea, Australia and Indonesia this snake has the potential to become a serious threat to the Hawaiian Islands.

- Between 1981 and 1998 nine brown tree snakes have been observed at airfields on O'ahu
- The secretive and nocturnal qualities of this snake make it difficult to detect
- Their diets consist of birds, lizards, small mammals, eggs and small household pets
- Accidental introduction of this snake on Guam has wrecked havoc on not only the native flora and fauna but economically as well
- Brown tree snakes are also mildly venomous to humans, can reach lengths of 10 ft. and weight up to 5 lbs.
- It is critically important that if you see ANY snake, keep an eye on it and **report its location to the Military Police immediately!**

Yellow Crazy Ant (*Anoplolepis gracilipes*)

- Named for their erratic behavior and also known as the "long-legged ant," this ant is one of the largest species of invasive ants, capable of forming super colonies
- Subdues their prey with formic acid, which irritates the eyes and feet of birds causing their eyes to swell shut and their feet to break out with painful sores
- Nests occasionally hosting hundreds of queens and thousands of workers

For more information please contact the Base Environmental Department, 257-7000, 216-7135

APPENDIX H
DOCUMENTATION OF INRMP REVIEW AND CONCURRENCE

This appendix documents review and concurrence for MCBH's INRMP.

H1. *MCBH Review and Concurrence (Reference CD only)*

FONSI from 2001 MCBH INRMP/EA

Copies of Public Notices for 2001 MCBH INRMP/EA

MCBH EIRB Concurrence Letter

H2. *Agency Correspondence and Concurrence with MCBH INRMP Update (2016) (Reference CD only)*

H3. *Agency Review Comments on MCBH INRMP Update (2016) (Reference CD only)*

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H1. MCBH REVIEW AND CONCURRENCE

This appendix contains historical documentation of MCBH review and concurrence with the 2001 INRMP/EA, in particular, documenting compliance with NEPA review:

- FONSI from 2001 Final MCBH INRMP/EA (2002-2006)
- Copies of public notices for 2001 Final MCBH INRMP/EA (2002-2006)
- MCBH Record of EIRB Concurrence with 2001 Final MCBH INRMP/EA (2002-2006)

DEPARTMENT OF DEFENSE

UNITED STATES MARINE CORPS

FINDING OF NO SIGNIFICANT IMPACT FOR THE MARINE CORPS BASE HAWAII INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (2002 - 2006)

Pursuant to the President's Council on Environmental Quality Regulations (40 CFR Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA), the U.S. Marine Corps gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement is not required for the proposed Integrated Natural Resources Management Plan (2002 - 2006) at Marine Corps Base Hawaii (MCBH).

The proposed action is to implement an Integrated Natural Resources Management Plan (INRMP) on MCBH properties using an ecosystem management approach. Management actions in this plan cover a five-year time frame. The 1997 Sikes Act Improvement Act (SAIA) requires all military installations with significant natural resources to prepare and implement INRMPs. These plans must support "no net loss" in capability of the installation's lands and waters to support military readiness while also complying with federal laws governing natural resources management and protection, and public access to the same, subject to resource tolerance limits, safety, and military security. These plans must be reviewed annually and updated no less than once every five years.

MCBH's Integrated Natural Resources Management Plan and Environmental Assessment (MCBH INMP/EA) (2002-2006) is a two-volume document that comprises a combined plan and programmatic environmental assessment for its implementation. Implementing this INRMP involves completing many management actions, covering multiple natural resources and geographic areas which comprise MCBH. These management actions are organized and described under seven categories covering Fish and Wildlife, Wetlands, Watersheds, Coastal and Marine Resources, Grounds Maintenance and Landscape Management, Outdoor Recreation and Quality of Life, and Resources Information. Three alternative sets of programmatic actions across these categories are described and assessed: (1) the proposed alternative, or Operational Stewardship--continuing the current level and type of effort; (2) Compliance-focused Stewardship--reduced level and type of effort; and (3) Optimal Stewardship--increased level and type of effort. In each, the set of proposed management actions are consistent with ecosystem management principles and the objective of integrating land use needs for conservation and military readiness. In addition, compliance is a top priority on all MCBH parcels and in each alternative.

The proposed actions are applicable to five MCBH properties with natural resources concerns: Mokapu Peninsula, Marine Corps Training Area Bellows (MCTAB), Camp H. M. Smith, Puuloa Range Facility, and Waikane Valley Impact Area. The proposed or Operational Stewardship alternative consists of 123 management actions across the seven categories and five properties listed above. The alternative of Compliance-focused Stewardship reduces the number of management actions to 68 while the Optimal Stewardship alternative increases the number of management actions to 208. As further explained in the INRMP/EA, the proposed Operational Stewardship Alternative continues the above-minimum level of effort ongoing for the past twenty years and reflects what is most realistic to accomplish under current levels of staff and funding at MCBH. In keeping with ecosystem management principles of *adaptive management* and *continuous improvement*, sustaining the current level of effort does not preclude also implementing actions unique to the Optimal Stewardship action set. As documented in MCBH's experience over the past twenty years, unforeseen opportunities do arise to complete Optimal Stewardship management actions in areas such as interagency partnering, community volunteer assistance, and securing supplemental funds from outside sources. For example, supplemental special funds from Department of Defense enabled eradication of alien mangrove from Nu'upia Ponds and more extensive community involvement in streamside native plantings activities.

In all three alternatives, established methods of controlling invasive species in land/water areas of MCBH will continue (e.g., alien mangrove and pickleweed control in wetlands/shoreline areas, and alien fire-adapted grass control in upland areas such as the Crater booby seabird colony). Natural resources improvement studies will continue to completion. These ongoing studies address improvements needed in wetland delineations, invasive species control, coral reef ecosystem management, regional stilt waterbird recovery, native plant landscaping, Crater fire management, and nature-oriented outdoor recreation. Evaluation and adoption of appropriate study recommendations will lead to additional projects being programmed and reflected in future updates of this plan. Some projects already funded for design will be implemented across the five years and the three alternatives. They include site-specific improvements in wetland and watershed functioning, erosion and invasive species control, landscaping and endangered waterbird habitats. Details of how and when these projects will be completed are explained in the INRMP/EA. Some of them will require additional project-specific EAs, permits, interagency consultation, and public review prior to final design and build. The main differences among Alternatives considered for INRMP implementation are level and type of effort invested in: public outreach/involvement; field monitoring of changes in environmental conditions as a result of management actions; quantity and quality of data collected, analyzed, automated, and shared; amount of training received and provided by natural resources staff; interagency data sharing and cost-shared partnering to improve regional ecosystem management. The INRMP/EA displays a detailed breakdown and cost comparison of planned management actions among the three alternatives.

Likely environmental consequences of implementing the three Alternatives are described and compared in the INRMP/EA. The discussion of consequences is broad due to the programmatic nature of the proposed action. Site-specific environmental review and analyses, including additional EAs as needed, will be prepared for some specific planned site improvements as explained in the INRMP/EA. None of the sets of management action alternatives will have significant adverse environmental consequences, individually or collectively. As more thoroughly reviewed in forthcoming site-specific EAs, some projects will require short-lived environmental disturbances (e.g., dredging, soil and alien vegetation removal), in order to obtain long-term environmental improvements (e.g., restored wetlands and stream corridor contours, revegetation of disturbed areas with native species). Necessary mitigative measures will be implemented where appropriate, such as: silt curtains to control turbidity during in-water work; soil testing for contaminants and development of appropriate disposal protocols; archaeological monitoring to ensure no inadvertent disturbance of artifacts or human remains, and seasonal control of actions to avoid disturbance of protected native waterbirds during breeding months. In general, to varying degrees, the natural resources management actions in the INRMP/EA will result in long term, cumulative improvements in environmental conditions which support more viable regional native fish and wildlife populations and habitat; wetland conditions, watershed functioning, sustainable landscaping, coastal and marine resource management; improved landscape conditions for military training; improved qualify of life and outdoor recreation; more public involvement and outreach; more stakeholder communication, data sharing, and cost-shared partnering to help achieve a vision of improved regional ecosystem health.

This INRMP has been prepared in cooperation with US Fish and Wildlife Service (USFWS), and Hawaii Department of Land and Natural Resources as required by the Sikes Act Improvement Act. Since the INRMP also covers coastal and offshore marine natural resources within MCBH jurisdiction, the plan was also coordinated with US National Marine Fisheries Service. A record of this cooperation and emergent concurrence with INRMP/EA contents by all three of these agencies is contained in the INRMP/EA document. In addition, since many programmed management actions will likely have positive impact on listed endangered species, concurrence with a determination of "no adverse effect" to these species was solicited under Section 7 of the Endangered Species Act. US FWS concurred with the determination that general activities outlined in the INRMP are not likely to adversely affect listed species. NMFS refrained from a specific section 7 concurrence, saying that such consultation was not appropriate for the overall plan, but that it would be expected when the individual planned projects come "on line." In sum,

both USFWS and NMFS concurred with MCBH's own admission that, due to the general programmatic nature of this INRMP/EA, MCBH fully expects to complete site-specified EAs, Section 7 Endangered Species Act consultations, for relevant projects, and complete other agency reviews and permit applications, as appropriate to the specific projects, when they came "on line" during the five-year time frame covered by this plan. The INRMP/EA also describes that a separate Integrated Cultural Resources Management Plan (ICRMP) is being prepared by MCBH, which will have overlapping activities in some areas covered by natural resource projects in this INRMP/EA. This plan acknowledges the existence of cultural resource sensitivities in certain areas of natural resource activities, and pledges a continuation of the existing practice to perform historic preservation consultations under Section 106 of the National Historic Preservation Act and under the Native American Graves Protection and Repatriation Act, when appropriate, and to involve Native Hawaiian stakeholders in appropriate projects as has already occurred. Reviewing historic preservation agencies (State Historic Preservation Division and Office of Hawaiian Affairs) concurred in this understanding and are relying on MCBH's assurances that proper mitigation and consultation will occur should any unidentified cultural, historic, or burial sites and/or resources be encountered during implementation of projects covered by the INRMP/EA. Other reviewing agencies generally concurred with the plan contents, pointed out areas of specific interest to their agencies, and indicated that they look forward to further interaction with MCBH during implementation of specific plan projects. A List of Reviewing Agencies and a record of these communications is contained in the INRMP/EA.

Based on information gathered during the preparation of this INRMP/EA, and concurring comments received from reviewing agencies, the U.S. Marine Corps finds that the proposed INRMP/EA (2002 - 2006) will not significantly impact the environment. In conclusion, this document demonstrates how MCBH intends to achieve an overall ecosystem management goal of improving the sustainability and native biological diversity of the ecosystems of which it is a part, while supporting MCBH's military mission, and addressing regulatory and community stakeholder concerns.

The INRMP/EA addressing this action may be obtained from: Commander, Marine Corps Base Hawaii, Box 63062, Kaneohe Bay, Hawaii 96863-3062 (Attention: Dr. Diane Drigot, Senior Natural Resources Management Specialist, MCBH Environmental Department), telephone (808) 257-6920 x224.

16 Nov 2001
Date

J. A. LEMOINE
Colonel, U.S. Marine Corps
Commander, Marine Corps Base Hawaii

O‘ahu Notices

DECEMBER 8, 2001

Permits Required: Demolition, grading, construction

The Housing and Community Development Corporation of Hawai‘i (HCDCH) is proposing to redevelop a portion of State-owned property in ‘Iwilei. HCDCH has selected Pacific Assistance Housing Corporation, a non-profit corporation, to develop and manage the proposed elderly residential complex. The project will be constructed on approximately 1.6 acres located between the OR&L Terminal building and the ‘Iwilei Business Center. It will include 156 affordable rental units, an adult day care center with assisted and supportive living services, parking, utilities, and landscaping. The facility will consist of a 21-story residential tower connected to a two-story community services building that will house the adult day program, offices, and a recreation deck. A separate five-story parking structure will contain 139 parking stalls.

In the early 1990s, a State office complex known as Liliha Civic Center was planned for the project site. An EIS for the proposed Liliha Civic Center was prepared and accepted in 1992, but the project was postponed indefinitely. Because of substantive changes in project description and loss of timeliness, HCDCH is preparing a Supplemental EIS for the proposed elderly residential complex.

The housing development will occupy approximately 28 percent of the site formerly planned for Liliha Civic Center. At present the State’s ‘Iwilei property is comprised of some 18 individual parcels. HCDCH plans to consolidate the affected parcels and to subdivide the site to create a separate lot for residential development. Easements on the 1.6-acre portion will be canceled or relocated.

National Environmental Policy Act (NEPA)

(5) Marine Corps Base Hawai‘i Integrated Natural Resources Management Plan (EA/FONSI)

District: Ko‘olaupoko

Applicant: Commanding General
Attn: Environmental Dept.
Marine Corps Base Hawai‘i
Box 63002
Kane‘ohe Bay, Hawaii 96863-3062
Contact: Dr. Diane Drigot (257-6920 x 224)

Per the 1997 Sikes Act Improvement Act and federal regulations implementing the National Environmental Policy Act (40 CFR Parts 1500-1508), the U.S. Marine Corps gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement is not required for the proposed Integrated Natural Resources Management Plan (2002-2006) at Marine Corps Base Hawai‘i (MCBH).

The combined INRMP/EA covers MCBH Kane‘ohe Bay, Marine Corps Training Area-Bellows, Waikane Valley Impact Area, Camp H.M. Smith, and Pu‘uloa Training Facility. The proposed action is to implement the INRMP using an ecosystem management approach. It must result in “no net loss” of combat readiness while complying with natural resources and public access laws.

None of the three alternatives assessed will have significant adverse environmental consequences. They each contribute, in varying degrees, to long term, cumulative, improved environmental conditions for supporting: more viable regional native wildlife populations and habitat; improved wetland/watershed functioning, sustainable landscaping; marine resource management; quality of life, public involvement, communication, data- and cost-shared partnering.

U.S. Fish and Wildlife Service (USFWS), Hawai‘i Department of Land and Natural Resources, and National Marine Fisheries Service concur in the INRMP. USFWS also concurs with a determination of “no adverse effect” to listed endangered species. Based on the assessment and agency comments, the U.S. Marine Corps finds that the proposed INRMP will not significantly impact the environment or generate significant controversy.

Copies of the FONSI and INRMP/EA are in public libraries near affected MCBH parcels. Direct inquiries to: Commander, Marine Corps Base Hawai‘i, Box 63062, Kane‘ohe Bay, Hawaii 96863-3062 (Attn: Dr. Diane Drigot, Senior Natural Resources Management Specialist, Environmental Department), telephone (808) 257-6920 x 224.

NOTICE OF AVAILABILITY

NOTICE OF AVAILABILITY

Per the 1997 Sikes Act Improvement Act and the President's Council on Environmental Quality Regulations (40 CFR Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA), the U.S. Marine Corps gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement is not required for the proposed Integrated Natural Resources Management Plan (2002-2006) at Marine Corps Base Hawaii (MCBH).

The combined plan and programmatic EA covers five MCBH properties with significant natural resources: MCBH Kaneohe Bay, Marine Corps Training Area-Bellows, Waikane Valley Impact Area, Camp H. M. Smith, and Puuloa Training Facility. The proposed action is to implement the INRMP using an ecosystem management approach. This plan must support "no net loss" in capability of MCBH's lands and waters to support military readiness while also complying with federal laws governing natural resources management and protection, and public access to the same, subject to resource tolerance limits, safety, and military security.

Implementing this INRMP covers multiple natural resources and management action. Three alternative sets of management actions are described and assessed: (1) the proposed Operational Stewardship alternative - continuing current above-minimum level and type of effort; (2) the Compliance-focused Stewardship alternative--reducing level and type of effort to minimum; and (3) the Optimal Stewardship alternative--increasing level and type of effort to optimum. The proposed alternative does not preclude implementing actions unique to the Optimal Stewardship alternative if opportunities arise through partnering, volunteer, and/or supplemental funding assistance.

None of the INRMP alternatives will have significant adverse environmental consequences, individually or collectively. Site-specific environmental analyses, including EAs, will be prepared for certain actions during the five-year time frame. In general, implementing INRMP actions will contribute to long term, cumulative, improved environmental conditions. Among them: more viable regional native fish and wildlife populations and habitat; wetland and watershed functioning; sustainable landscaping; coastal and marine resource management; improved quality of life and outdoor recreation; more public involvement, stakeholder communication, data sharing, and cost-shared partnering toward improved regional ecosystem health.

This INRMP has been prepared with cooperation and concurrence from US Fish and Wildlife Service (USFWS), Hawaii Department of Land and Natural Resources, and National Marine Fisheries Service. Concurrence with a determination of "no adverse effect" to listed endangered species was also obtained from USFWS under Section 7 of the Endangered Species Act. This does not preclude additional consultations on specific projects as appropriate.

Based on information gathered during the preparation of this INRMP/EA, and concurring comments from reviewing agencies, the U.S. Marine Corps finds that the proposed INRMP/EA (2002-2006) will not significantly impact the environment or generate significant controversy.

Copies of the FONSI and INRMP/EA addressing this proposed action are located in public libraries near affected MCBH parcels. Direct inquiries to: Commander, Marine Corps Base Hawaii, Box 63062, Kaneohe Bay, Hawaii 96863-3062 (Attn: Dr. Diane Drigot, Senior Natural Resources Management Specialist, Environmental Department), telephone (808) 257-6920 x224.

(Hon. Adv.: Nov. 25, 26, 27, 2001) (A-175067)

AFFIDAVIT OF PUBLICATION

STATE OF HAWAII
City and County of Honolulu *ss.*

Grace Santos *being duly sworn, deposes and says that she is a clerk, duly authorized to execute this affidavit of THE HONOLULU ADVERTISER, a division of GANNETT PACIFIC CORPORATION, that said newspaper is a newspaper of general circulation in the State of Hawaii, and that the attached notice is a true notice as was published in the aforereferenced newspaper as follows:*

The Honolulu Advertiser: 3 *time(s), on* 11/25/2001, 11/26/2001, 11/27/2001

and that affiant is not a party to or in any way interested in the above entitled matter.

Grace Santos

Subscribed and sworn to before me this 27th day of November A.D. 2001

Jeanette T. Ching

Notary Public of the First Judicial Circuit JEANETTE T. CHING

State of Hawaii

My commission expires JUN 16 2002

AFFIDAVIT OF PUBLICATION

STATE OF HAWAII)
City & County of Honolulu) S. S.

Dawn Goto being duly sworn, deposes and says that she/he is a clerk, duly authorized to execute this affidavit of Midweek Printing, Inc., publisher of MidWeek and the Honolulu Star-Bulletin, that said newspapers are newspapers of general circulation in the State of Hawaii, and that the attached notice is true notice as was published in the aforementioned newspapers as follows:

MidWeek: _____ times, on _____

Honolulu Star-Bulletin: 3 times, on November 25, 26 and 27, 2001

And that affiant is not a party to or in any way interested in the above entitled matter. Dawn Goto

Subscribed and sworn to before me this 30th day of NOVEMBER A.D. 20 01

Patricia K. Reese

Notary Public of the First Judicial Circuit
State of Hawaii
My commission expires: October 07, 2002

PATRICIA K. REESE
Notary Public
State of Hawaii

1016 Notices of Availability | 1016 Notices of Availability

NOTICE OF AVAILABILITY

Per the Sikes Act Improvement Act and the President's Council on Environmental Quality Regulations (40 CFR Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA), the U.S. Marine Corps gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement is not required for the proposed Integrated Natural Resources Management Plan (2002 - 2006) at Marine Corps Base Hawaii (MCBH).

The combined plan and programmatic EA covers five MCBH properties with significant natural resources: MCBH Kaneohe Bay, Marine Corps Training Area-Bellows, Waikane Valley Impact Area, Camp H. M. Smith, and Puuloa Training Facility. The proposed action is to implement the INRMP using an ecosystem management approach. This plan must support "no net loss" in capability of MCBH's lands and waters to support military readiness while also complying with federal laws governing natural resources management and protection, and public access to the same, subject to resource tolerance limits, safety, and military security.

Implementing this INRMP covers multiple natural resources and management actions. Three alternative sets of management actions are described and assessed: (1) the proposed Operational Stewardship alternative--continuing current, above-minimum level and type of effort; (2) the Compliance-focused Stewardship alternative--reducing level and type of effort to minimum; and (3) the Optimal Stewardship alternative--increasing level and type of effort to Optimum. The proposed alternative does not preclude also implementing actions unique to the Optimal Stewardship alternative if opportunities arise through partnering, volunteer, and/or supplemental funding assistance.

None of the INRMP alternatives will have significant adverse environmental consequences, individually or collectively. In general, implementing INRMP actions will contribute to long term, cumulative, improved environmental conditions. Among them: more viable regional native fish and wildlife populations and habitat; wetland and watershed functioning; sustainable landscaping; coastal and marine resource management; improved quality of life and outdoor recreation; more public involvement, stakeholder communication, data sharing, and cost-shared partnering toward improved regional ecosystem health.

This INRMP has been prepared with cooperation and concurrence from US Fish and Wildlife Service (USFWS), Hawaii Department of Land and Natural Resources, and National Marine Fisheries Service. Concurrence with a determination of "no adverse effect" to listed endangered species was also obtained from USFWS under Section 7 of the Endangered Species Act. This does not preclude additional consultations on specific projects in the plan, as appropriate.

Based on information gathered during the preparation of this INRMP/EA, and concurring comments from reviewing agencies, the U.S. Marine Corps finds that the proposed INRMP/EA (2002 - 2006) will not significantly impact the environment or generate significant controversy.

Copies of the FONSI and INRMP/EA addressing this proposed action are located in public libraries near affected MCBH parcels. Direct inquiries to: Commander, Marine Corps Base Hawaii, Box 63062, Kaneohe Bay, Hawaii 96863-3062 (Attn: Dr. Diane Drigot, Senior Natural Resources Management Specialist, Environmental Department), telephone (808) 257-6920 x224. (SB05505536 11/25, 11/26, 11/27/01)

DISTRIBUTION OF MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT TO EIRB MEMBERS:

Received by:	Received for:	Date
SGT ALTAMIRANO	1ST RADIO BN	6 NOV 01
Sgt Melvin M.D.	3rd MAR	6 Nov 01
MSGT DeWITH	CSSG 3	6 NOV 01
MAJOR LAMBERT	MPRO/PMO	6 Nov 01
SGTMAJ GARIBAY	MCAT	6 NOV 01
LtCol Erb	ASEK	6 Nov 01
Wendy Kojima	G4	6 NOV 01
John Claucherty	G-3	6 Nov
CHRIS HUGHES	PAO	6 NOV 01
Sharon K. Zauner	MCCS	7NOV 01
Maj Hitesman	SJA	7Nov01

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: **MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)**

LOCATION: **MARINE CORPS BASE HAWAII**

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

(Concur) **Non-concur** **(CIRCLE ONE)**

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: Timothy L. Matt Date: 11/14/01

Title: XO

Activity: 1ST RADIO BN

Telephone: 257-5203

Comments: (If non-concurring, state reason(s))

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: **MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)**

LOCATION: **MARINE CORPS BASE HAWAII**

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

(Concur) **Non-concur** **(CIRCLE ONE)**

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: _____ Date: 11-14-01

Title: AC/S G4

Activity: MCBH

Telephone: 257 8821

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: **MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)**

LOCATION: **MARINE CORPS BASE HAWAII**

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

(Concur) **Non-concur** **(CIRCLE ONE)**

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: _____ Date: 14 NOV 01

Title: PROVOST MARSHAL

Activity: PMO

Telephone: 257-3110 x 1

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)

LOCATION: MARINE CORPS BASE HAWAII

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

Concur Non-concur (CIRCLE ONE)

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: _____ Date: 11/14/01

Title: G-3A

Activity: MCBH

Telephone: 257-8818

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)

LOCATION: MARINE CORPS BASE HAWAII

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

Concur Non-concur (CIRCLE ONE)

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: _____ Date: 11/14/1

Title: MCBH AC/S MCCS Director

Activity: MCCS

Telephone: (808) 254-7540

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: **MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)**

LOCATION: **MARINE CORPS BASE HAWAII**

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

Concur **Non-concur** **(CIRCLE ONE)**

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: _____ Date: 13 Nov 2001

Title: DSJA

Activity: MCBH

Telephone: 257-5742

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: **MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)**

LOCATION: **MARINE CORPS BASE HAWAII**

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

Concur **Non-concur** **(CIRCLE ONE)**

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: _____ LtCol. USMC Date: 14 Nov 2001

Title: ASEK Executive Officer

Activity: 1st MAW ASEK

Telephone: 257-2898

Comments: (If non-concurring, state reason(s))

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: **MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)**

LOCATION: **MARINE CORPS BASE HAWAII**

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

Concur **Non-concur** **(CIRCLE ONE)**

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: C. W. [illegible] Date: 01/11/14

Title: DIRECTOR, PUBLIC AFFAIRS

Activity:

Telephone: 257-8841

ENVIRONMENTAL IMPACT REVIEW BOARD ENDORSEMENT

PROJECT: **MCBH INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT (MCBH/EA) (2002 - 2006)**

LOCATION: **MARINE CORPS BASE HAWAII**

As a member of the Marine Corps Base Hawaii Environmental Impact Review Board, I have reviewed the combined MCBH INRMP/EA and Draft Finding of No Significant Impact (FONSI) and

Concur **Non-concur** **(CIRCLE ONE)**

in the conclusion of the command environmental staff that the document adequately addresses potential impacts of the proposed action, and supports the FONSI.

Signature: [illegible] Date: 13 NOV 01

Title: CO, 3D MARINES

Activity: 3D MAR. DIV

Telephone: 257-2621

H2. AGENCY CORRESPONDENCE AND CONCURRENCE

This appendix documents communication exchanged between MCBH and Sikes Act partner agencies (i.e., USFWS, NOAA Fisheries, and Hawai'i DLNR) regarding review of the *MCBH INRMP Update (2017-2021*).[1] The table below summarizes agencies who reviewed the document and provided comments. Review comments were received from reviewing staff members via emails to the MCBH Senior Natural Resources Management Specialist. Appendix H3 depicts the comments received from each reviewer and how each comment was addressed. An administrative record of this email exchange, including final acceptance from each reviewer that the recommended changes were addressed to their satisfaction is maintained in the MCBH Environmental Department files. Appendix H2 incorporates copies of letters requesting review and letters of concurrence with the *Final MCBH INRMP Update (2017-2021)* received from each reviewing agency. Final concurrence was requested on a Pre-Final digital review copy distributed in January 2017. As of the publication date of the Final INRMP Update (August 2017), written concurrence has been received from NOAA and USFWS. Even though a letter of concurrence has not been received from DLNR after seven months, we anticipate receiving a letter at some point as verbal concurrence has been received. The Final INRMP Update will be updated to include this concurrence letter once received.

The 2017 INRMP Update was also submitted for internal MCBH staff review, and concurrence was received as reflected in the approval signature of the Base Commanding Officer on the title page of the final document. A complete record of this internal review process is maintained in the MCBH Environmental Department files.

SIKES ACT PARTNER AGENCIES RECEIVING MCBH INRMP UPDATE (2017-2021) FOR REVIEW AND RECORD OF RESPONSES RECEIVED/ADDRESSED

Name	Received Draft for Review	Provided Comment on Draft	Provided Written Concurrence	Received Final INRMP[2]
U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu	X	X	X	X
National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office, Honolulu	X	X	X	X
State of Hawai'i, Department of Land and Natural Resources	X	X		X

[1] Correspondence regarding review of the MCBH INRMP Supplemental (2013) that was prepared in conjunction with an EA to detail changes related to establishment of a Recreational Bow Hunting Program at MCTAB is maintained in Environmental Department files.

[2] "X" in final column means agency will be given copies of the 2017 Final INRMP Update (both hard copy and in pdf).

DRAFT INRMP UPDATE DISTRIBUTION LETTERS

UNITED STATES MARINE CORPS
IE&L (ENVIRONMENTAL)
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

5090
LE/080-16

JUL 2 7 2016

Mr. Michael Tosatto
Regional Administrator
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Pacific Islands Regional Office
1845 Wasp Blvd, Bldg 176
Honolulu, Hawaii 96818

Dear Mr. Tosatto:

SUBJECT: REVIEW OF THE 2016 DRAFT UPDATE TO MARINE CORPS BASE HAWAII'S (MCBH) INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) (2017- 2021)

Pursuant to the Sikes Act Improvement Act, MCBH is submitting its 2016 draft INRMP update for your review and comment. Enclosure (1) includes one hardcopy of the draft INRMP. Enclosure (2) consists of a digital copy of the draft INRMP update and the review comment form. The INRMP update is two volumes, volume 1 is the main text and volume 2 is the appendices. To ensure the MCBH's INRMP is finalized by the end of January 2017, please submit all comments by 25 September 2016. We will address all comments and return a revised electronic final draft for NOAA PIRO staff review by 1 November 2016. We anticipate receiving your letters of concurrence by 30 December 2016 to allow sufficient time to incorporate all agency letters into the INRMP by 10 January 2016.

We request your written or emailed acknowledgement that this request has been received within 15 days of receipt of this letter. We wish to take this opportunity to express our appreciation for your active participation in the annual reviews of MCBH's INRMP implementation over the years.

My point of contact for any inquiries regarding the INRMP update is Lance Bookless, Senior Natural Resources Management Specialist, phone 257-7000, or email lance.booklessl@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department

Enclosures: 1. Draft hardcopy: 2016 MCBH INRMP Update (2017-2021)
2. CD: Digital copies of the draft 2016 INRMP and Review Comment Sheet.

received
7/28/16

UNITED STATES MARINE CORPS
IE&L (ENVIRONMENTAL)
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

5090
LE/080-16

RECEIVED JUL 27 2016

JUL 28 2016

U.S. FISH & WILDLIFE SVC
PACIFIC ISLANDS FWD
HONOLULU, HI 96850

Ms. Mary M. Abrams
Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

Dear Ms. Abrams:

SUBJECT: REVIEW OF THE 2016 DRAFT UPDATE TO MARINE CORPS BASE HAWAII'S (MCBH) INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) (2017- 2021)

Pursuant to the Sikes Act Improvement Act, MCBH is submitting its 2016 draft INRMP update for your review and comment. Enclosure (1) includes one hardcopy of the draft INRMP. Enclosure (2) consists of a digital copy of the draft INRMP update and the review comment form. The INRMP update is two volumes, volume 1 is the main text and volume 2 is the appendices. To ensure the MCBH's INRMP is finalized by the end of January 2017, please submit all comments by 25 September 2016. We will address all comments and return a revised electronic final draft for Fish and Wildlife staff review by 1 November 2016. We anticipate receiving your letters of concurrence by 30 December 2016 to allow sufficient time to incorporate all agency letters into the INRMP by 10 January 2016.

We request your written or emailed acknowledgement that this request has been received within 15 days of receipt of this letter. We wish to take this opportunity to express our appreciation for your active participation in the annual reviews of MCBH's INRMP implementation over the years.

My point of contact for any inquiries regarding the INRMP update is Lance Bookless, Senior Natural Resources Management Specialist, phone 257-7000, or email lance.bookless1@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department

Enclosures: 1. Draft hardcopy: 2016 MCBH INRMP Update (2017-2021)
2. CD: Digital copies of the draft 2016 INRMP and Review Comment Sheet.

UNITED STATES MARINE CORPS
IE&L (ENVIRONMENTAL)
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

5090
LE/080-16
JUL 27 2016

Ms. Suzanne Case
Chairperson
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96813

Dear Ms. Case:

SUBJECT: REVIEW OF THE 2016 DRAFT UPDATE TO MARINE CORPS BASE HAWAII'S (MCBH) INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) (2017- 2021)

Pursuant to the Sikes Act Improvement Act, MCBH is submitting its 2016 draft INRMP update for your review and comment. Enclosure (1) includes one hardcopy of the draft INRMP. Enclosure (2) consists of a digital copy of the draft INRMP update and the review comment form. The INRMP update is two volumes, volume 1 is the main text and volume 2 is the appendices. To ensure the MCBH's INRMP is finalized by the end of January 2017, please submit all comments by 25 September 2016. We will address all comments and return a revised electronic final draft for Department of Land and Natural Resources (DLNR) staff review by 1 November 2016. We anticipate receiving your letters of concurrence by 30 December 2016 to allow sufficient time to incorporate all agency letters into the INRMP by 10 January 2016.

We request your written or emailed acknowledgement that this request has been received within 15 days of receipt of this letter. We wish to take this opportunity to express our appreciation for your active participation in the annual reviews of MCBH's INRMP implementation over the years.

My point of contact for any inquiries regarding the INRMP update is Lance Bookless, Senior Natural Resources Management Specialist, phone 257-7000, or email lance.booklessl@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department

Enclosures: 1. KH Draft hardcopy: 2016 MCBH INRMP Update (2017-2021)
2 KH CD: Digital copies of the draft 2016 INRMP and Review Comment Sheet.

FINAL INRMP UPDATE CONCURRENCE LETTERS

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

5090
LE/002-17

JAN 1 8 2017

Ms. Mary M. Abrams
U.S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

Dear Ms. Abrams:

SUBJECT: CONCURRENCE WITH THE 2016 MARINE CORPS BASE HAWAII (MCBH) INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) (2017- 2021)

The Draft INRMP Update was provided for your review on July 27, 2016. Comments from US Fish and Wildlife Service staff were reviewed and many recommendations were incorporated into the INRMP. Appendix H3 of the Final INRMP contains a table showing how your staff's comments were addressed, as well as those received from other agencies.

Pursuant to the Sikes Act Improvement Act, MCBH submits its Final 2016 MCBH INRMP Update (2017-2021) for your concurrence. An electronic copy is being sent to you via the AMRDEC Safe File Exchange. The Pre-Final digital review copy is comprised of two pdfs: (1) Main Text and selected Appendices (to mimic the hard copy); and (2) all Appendices. Please respond with your signed concurrence letter by February 18, 2017. Your concurrence letter will be inserted into Appendix H of the subject plan along with those received by other reviewing agencies. After external agency signatures are received, it will be ready for final cover page endorsement by the MCBH Commanding Officer. The fully signed plan will then be printed and distributed, both electronically and in hard copy form, to all interested parties.

Be aware that we have condensed the former two volume Plan into one volume. To accomplish this the Final 2017 INRMP Update hard copy will include the main text, select commonly referenced appendices, and a Reference CD. The Reference CD, kept in a sleeve attached to the hardcopy binder, will include a digital version of the 2017 INRMP Update, those appendices not included in the hardcopy version, as well as copies of the previous MCBH INRMPs.

We thank you and your staff for participating in the review and providing input to the INRMP Update. My point of contact for any inquiries regarding the INRMP update is Lance Bookless, Senior Natural Resources Management Specialist, phone 257-7000, or email lance.bookless1@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department
By direction of the Commanding Officer

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

5090
LE/002-17
JAN 18 2017

Mr. Michael Tosatto
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Pacific Islands Regional Office
1845 Wasp Blvd, Bldg 176
Honolulu, Hawaii 96818

Dear Mr. Tosatto:

SUBJECT: CONCURRENCE WITH THE 2016 MARINE CORPS BASE HAWAII (MCBH) INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) (2017- 2021)

The Draft INRMP Update was provided for your review on July 27, 2016. Comments from NOAA Fisheries staff reviewers have been satisfactorily addressed per direct communications with them or by incorporating the recommended change. Appendix H3 of the INRMP Final contains a table showing how their comments were addressed, as well as those received from other agencies.

Pursuant to the Sikes Act Improvement Act, MCBH submits its Final 2016 MCBH INRMP Update (2017-2021) for your concurrence. An electronic copy is being sent to you via the AMRDEC Safe File Exchange. The Pre-Final digital review copy is comprised of two pdfs: (1) Main Text and selected Appendices (to mimic the hard copy); and (2) all Appendices. Please respond with your signed concurrence letter by February 18, 2017. Your concurrence letter will be inserted into Appendix H of the subject plan along with those received by other reviewing agencies. After external agency signatures are received, it will be ready for final cover page endorsement by the MCBH Commanding Officer. The fully signed plan will then be printed and distributed, both electronically and in hard copy form, to all interested parties.

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We thank you and your staff for participating in the review and providing input to the INRMP Update. My point of contact for any inquiries regarding the INRMP update is Lance Bookless, Senior Natural Resources Management Specialist, phone 257-7000, or email lance.bookless1@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department
By direction of the Commanding Officer

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

5090
LE/002-17

JAN 18 2017

Ms. Suzanne Case
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96813

Dear Ms. Case:

SUBJECT: CONCURRENCE WITH THE 2016 MARINE CORPS BASE HAWAII (MCBH) INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) (2017- 2021)

The Draft INRMP Update was provided for your review on July 27, 2016. Comments from the DLNR Division of Forestry and Wildlife and Division of Aquatic Resources staff reviewers have been satisfactorily addressed per direct communications with them or by incorporating the recommended change. Appendix H3 of the Final INRMP contains a table showing how their comments were addressed, as well as those received from other agencies.

Pursuant to the Sikes Act Improvement Act, MCBH submits its Final 2016 MCBH INRMP Update (2017-2021) for your concurrence. An electronic copy is being sent to you via the AMRDEC Safe File Exchange. The Pre-Final digital review copy is comprised of two pdfs: (1) Main Text and selected Appendices (to mimic the hard copy); and (2) all Appendices. Please respond with your signed concurrence letter by February 18, 2017. Your concurrence letter will be inserted into Appendix H of the subject plan along with those received by other reviewing agencies. After external agency signatures are received, it will be ready for final cover page endorsement by the MCBH Commanding Officer. The fully signed plan will then be printed and distributed, both electronically and in hard copy form, to all interested parties.

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We thank you and your staff for participating in the review and providing input to the INRMP Update. My point of contact for any inquiries regarding the INRMP update is Lance Bookless, Senior Natural Resources Management Specialist, phone 257-7000, or email lance.bookless1@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U.S. Marine Corps
Director, Environmental Compliance
and Protection Department
By direction of the Commanding Officer

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

In Reply Refer To:
01EPIF00-2017-TA-0197

JUN 2 2 2017

W. M. Rowley
Major, U.S. Marine Corps
Director, Environmental Compliance and Protection Department
Marine Corps Base Hawai'i
Box 63002
Kāne'ohe Bay, Hawai'i 96863-3002

Subject: Final Draft Marine Corps Base Hawai'i (MCBH) Integrated Natural Resources Management Plan (INRMP) Update (2017- 2021)

Dear Major Rowley:

The Pacific Islands Fish and Wildlife Office has reviewed your Final Draft Marine Corps Base Hawai'i (MCBH) Integrated Natural Resources Management Plan (INRMP) Update (2017-2021) (provided to our office on January 19, 2017) pursuant to the Sikes Act (16 USAC 670a *et seq.*). The 2017 INRMP outlines a wide variety of biodiversity and conservation goals for MCBH.

An INRMP is a planning document intended to ensure military operations and natural resources conservation are integrated and consistent with stewardship and legal requirements. The role of the U.S. Fish and Wildlife Service is to assist in INRMP development and reviews with military installation natural resource managers and other stakeholders.

The U.S. Fish and Wildlife Service and U.S. Marine Corps agree that the INRMP will be programmatic in nature and will be a planning document. For this reason, we anticipate that consultation under section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.; 87 Stat. 884), as amended, will be undertaken on a project-specific basis prior to implementation of proposed projects. It is our understanding the U.S. Marine Corps will consult on their actions that may affect listed species.

Enclosure 1 summarizes the **Conservation Objectives** identified your MCBH INRMP that we believe will provide a benefit to federally listed, and native Hawaiian species, and their habitats. To meet the stated objectives, the INRMP specifies a series of **Conservation Actions** that will be undertaken during the operational lifespan of the plan, from 2017-2021. From these actions certain **Conservation Benefits** can be expected, which are identified within the enclosure. All objectives, actions, and benefits will be evaluated by the MCBH and updated on an annual basis.

Based on our review and coordination, this letter serves to communicate that the Service and U.S. Marine Corps are in mutual agreement with regard to the MCBH INRMP content, consistent with paragraph (a)(2) of the Sikes Act.

We commend the exemplary job the MCBH has done to conserve and protect listed resources on lands and waters under your jurisdiction. You successfully monitor threatened and endangered species and marine ecosystems, manage wetland ecosystems aiding in the recovery of endangered waterbirds, work collaboratively with other agencies, and maintain communication with the Service through development of ongoing plans and restoration efforts.

We appreciate the opportunity to work with you to ensure the INRMP addresses natural resource issues at MCBH. Please contact Jiny Kim, Fish and Wildlife Biologist, or Kevin Foster, Marine Biologist, Pacific Islands Fish and Wildlife Office, if you have any questions regarding this letter (Phone: 808-792-9400). When referring to this project, please include this reference number: 01EPIF00-2017-TA-0197.

Sincerely,

Kristi Young
Deputy Field Supervisor –
Programmatic Operations

Enclosure (1)

cc: USFWS Region 1, NMFS – PIRO, Honolulu, Hawaii DOFAW

Enclosure 1: MCBH INRMP Actions to Benefit to Federally Listed and Native Hawaiian Species

Goal 7.0: INRMP Program Management and Implementation. Systematically apply an ecosystem based management approach to wildlife and other natural resources management activities at all MCBH properties.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.0.2: Comply with applicable laws, regulations, policies, guidance, and plans to support natural resources management.	Develop Biosecurity Plan (STEP – in planning) • Analyze the risks of introducing unwanted and potentially harmful organisms to MCBH properties and other locales where Marines train (land and marine environments). • Plan will outline coordinated efforts across Base departments and tenant commands to address principal methods of transporting potentially harmful vectors to MCBH – waterborne, ground, and air transportation.	A completed Biosecurity Plan can be used to implement actions to prevent and minimize the threat of harmful species and actions to contain or remove the threat from MCBH properties and other locales where Marines train. The plan can be used to implement a contingency plan to prevent or minimize the threat of harmful species to native, ESA, and MBTA protected species.

Goal 7.1: Wildlife Management. Contribute to maintenance of healthy regional wildlife populations by managing protected species and habitats that currently exist within MCBH lands/waters/air space, consistent with natural resources laws, military directives, interagency consultations, management programs, and permits.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.1.1: Inventory and monitor wildlife species.	Bird Surveys (Routine Management) • Semiannual Hawai'i DLNR waterbird survey (Nu'upia Ponds and other MCBH wetlands)	These surveys provide valuable data on species presence and population trends for MCBH for all native and non-native birds, as well as birds protected under the ESA and MBTA. Information used for larger State and Federal surveys to help guide conservation

	• Annual Hawai'i Audubon Society sponsored Christmas Bird Count, (all bird species on MCBH, including the red-footed boobies in Ulupa'u Crater)	actions.
	Wedge-tailed Shearwater Monitoring (Routine Management) • Annual census of occupied wedge-tailed shearwater burrows.	Shearwater colony monitoring helps identify any stressors (e.g., yellow crazy ants, predation) or benefits (e.g., application of insecticide, fencing) of current management actions for nesting wedge-tailed shearwaters (MBTA protected species) as well as inform other agencies or organizations of the health and threats to the species as a whole.
	Avian Botulism Monitoring (Routine Management) • Hawaiian waterbirds that utilize the MCBH WRF (and other sites nearby) will be closely monitored during summer months for symptoms of avian botulism.	Monitoring Hawaiian waterbirds at the MCBH WRF helps to detect signs of disease at the earliest stages. This allows for treatment of sick waterbirds and potentially limiting the spread of disease and the number of associated deaths. Monitoring for the symptoms of the disease also provides a chance for sick birds to be given a dose of botulism anti-toxin provided by the USGS Wildlife Health Center.
	Endangered Hawaiian Hoary Bat Survey (STEP – programmed) • Survey protocols would include multiple visits and utilize both acoustic surveys and visual detection.	Surveys would help determine if the species is present and allow for preemptive documentation and to plan for mitigation in case activities are programmed in areas the Hawaiian hoary bat may occupy.
	Inventory and Study the State Endangered Hawaiian Owl (STEP – programmed) • Procedures would be developed regarding how to protect, promote, and monitor the owl in concert with Hawai'i DLNR DOFAW and USFWS.	This survey would support State research priorities, which include analysis of population trends and changes in habitat occupancy, especially on O'ahu. It would also allow for improved planning and protection of this species.
	Endangered Waterbirds Study – Nu'upia Ponds and MCTAB (STEP – programmed) • The last time a focused study at	This study will provide updated information on breeding/nesting success, population size, distribution, habitat/site condition, and threats. Results will be used to inform management of endangered

	MCBH was completed on all the endangered waterbirds was in the late 1990s. The study is planned to involve at least two years of observation at Nu'upia Ponds WMA and MCTAB.	Hawaiian waterbirds, including any actions (e.g., military operations, recreational activities) that occur around their habitats and may impact the species.
	Flyway-Flight Pattern Analysis of Migratory and Endangered Birds – MCBH Kaneohe Bay (STEP – programmed) • The analysis will be conducted for seabirds and shorebirds (MBTA and ESA protected bird species) over different time periods (e.g., day/night, migrations, breeding season).	This project is necessary to support future construction plans or introduction of different aircraft systems.
	Non-Native Invertebrate and Vertebrate Pest Species Management Study (STEP – in planning) • The study would focus on identifying organisms of highest priority biosecurity threat to training and protected natural resources target species currently of OISC and HDOA concern (e.g., CRB, brown tree snake, mosquitos, fire ants, marine organisms), and those that could be introduced as Marine Forces build-up in Guam, the Marianas, and other Pacific islands.	This study would help identify the most effective control methods and BMPs to avoid introduction and spread. This information would be used in developing the Biosecurity Plan (COA 7.0.2).
	Terrestrial Invertebrates Survey and Recommendations for Management – MCBH Kaneohe Bay and MCTAB (STEP – in planning)	An inventory of terrestrial invertebrates will support conservation of native species and control of invasive species. Confirmation of locations where *Hylaeus anthracinus* are present will help avoid inadvertent take of the species. Management actions to protect

		native species or combat invasive species will be identified.
Objective 7.1.2: Manage and enhance wildlife species and their habitat.	Activity Analysis (Routine Management) • Routinely perform actions aimed at limiting disturbance of protected species due to authorized and prohibited human activity. These include: review and update SOPs and Base Orders (e.g., people interacting with or feeding wildlife); installation and maintenance of signs and physical barriers (e.g., fences, gates); and conducting regular security patrols with an emphasis on deterring prohibited activities (e.g., trespassing, disregarding animal control laws). Since night-lighting is a threat to seabirds and shorebirds, Natural Resources staff ardently promotes incorporating International Dark Sky policies and initiatives for reducing light pollution associated with construction projects.	Benefits all native species (listed and nonlisted) by limiting disturbance caused from authorized and prohibited human activity.
	Feral and Nuisance Animal Control (Routine Management)	Management of feral and nuisance animal control agreements and activities at all properties (targeting rats, mongoose, cats, chickens, pigeons, pigs, and the occasional dog) to minimize predation or disturbance to native species (listed and nonlisted).
	Invertebrate Pest Control (Routine Management)	Implementing control efforts for invertebrate pests as needed (e.g., yellow crazy ants, CRB) benefit native (listed and nonlisted) species by minimizing impacts while species are nesting, roosting, or foraging at MCBH properties.

	Injured Bird Treatment (oiled, botulism) (Routine Management)	Proper and timely treatment of injured birds can reduce mortality of listed Hawaiian waterbirds.
	Replace Existing Fence – Pa'akai Pond (STEP – in planning)	Because military units are allowed to conduct foot patrols on the AAV trail that passes through Nu'upia Ponds WMA, this fence is important to prevent unauthorized access into endangered Hawaiian waterbird habitat.
	Endangered Species Observation Towers – Nu'upia Ponds WMA (STEP – programmed)	The towers would help to monitor, evaluate, and study the foraging and nesting/breeding behavior of endangered Hawaiian waterbirds as well as be used to monitor numerous Base recreational events conducted within and around Nu'upia Ponds WMA to ensure no violations occur with the protected wildlife or wetlands. The CLEOs would use the towers to monitor the WMA for resource violations and unauthorized access.
	Construct Water Crossing Points to Improve Access within Nu'upia Ponds (STEP – programmed)	Access within the interior of Nu'upia Ponds is necessary to conduct monitoring and management of ESA listed waterbirds; conduct vegetation control to preserve endangered species habitat; and conduct removal of trash and debris that enters the ponds from Base housing and Kaneohe Bay.
	Repair/Replace Nu'upia Ponds Footbridge (STEP – programmed) • The only readily accessible point into the Nu'upia Ponds is this concrete footbridge that crosses the MCDC.	The repair/replacement will help conduct ESA management activities for endangered Hawaiian waterbirds.
	Seabird Relocation Study (STEP- in progress) • Natural Resources staff are currently working with USFWS on a five-year project to assess the viability of using social attraction methods (e.g., decoys and recorded audio) and habitat manipulation (e.g., artificial nesting) to attract red-footed	The goal of the project is to allow for greater training flexibility and red-footed booby protection by enticing the birds to re-locate a portion of the nesting colony to areas further away from the impact area at KBRTF.

	boobies to alternative locations around Ulupa'u Crater.	
	Repair/Replace Artificial Nesting Platforms for Migratory Birds in Ulupa'u Crater (STEP – programmed) • This project will fund the repair, replacement, and construction of additional artificial platforms to encourage the colony to find suitable nesting locations outside of the impact area of the range.	This will benefit native nesting and roosting Red-footed Boobies that currently use some nesting sites on the range that will need to be removed.

7.2 Wetland Management. Protect, enhance, and restore MCBH wetlands from loss or degradation to the maximum extent possible, consistent with the military mission and Federal wetland laws and regulations.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.2.1: Identify, delineate, characterize, and monitor wetlands.	Wetland Inventory and Delineation – Nu'upia Ponds and MCTAB (STEP – programmed)	This project will assess the health and vitality of the wetlands and inventory vegetation and wildlife found within the wetlands. It will overlap with the planned wetland restoration, Project HI2CONWLC2245694303, to better plan how to manage habitat for endangered Hawaiian waterbirds as well as migratory wintering waterbirds.
Objective 7.2.2: Implement wetland management and enhancement opportunities.	Wetland Restoration Plan – MCBH Kaneohe Bay and MCTAB (STEP – in progress) • Plan to assess wetland characteristics, any presence of contaminants, groundwater depth and salinity, and surface water salinity. Vegetation surveys focus on invasive species that will be targeted for removal, with the intent of replacing them with native wetland plants.	This plan will benefit five wetlands at MCBH Kaneohe Bay (Nu'upia Hema, Salvage Yard, Motor Pool, and Hale Koa) and MCTAB (Puha 'Ekahi) by evaluating for opportunities to enhance habitat for endangered waterbirds, improve water circulation, capture storm water run-off, and restore native wetland vegetation (Project HI2CONWLC2245694303) for waterbirds.

	Nu'upia Hema Wetland Restoration (STEP – programmed)	Benefits endangered waterbird species as a result of restoring wetland functions, including better habitat to support migratory and endangered birds, by clearing accumulated sediment from the wetland, removing invasive weeds, establishing native plants, and improving water circulation with the Nu'upia Ponds Complex.
	Salvage Yard Wetland Restoration (STEP – programmed)	Benefits endangered waterbird species as a result of restoring coastal wetland functions, including creating better habitat to support endangered and migratory birds, by clearing some soil from the wetland, removing invasive weeds, and introducing freshwater into the northern end of the wetland.
	Motor Pool Wetland Restoration (STEP – in planning)	Benefits endangered waterbird species as a result of restoring wetland functions, including creating better habitat to support migratory and endangered birds, by clearing accumulated sediment from the wetland, removing invasive trees and grasses, establishing native plants, and restoring hydrological functioning.
	Repair/Replace Aeration System and Install Waterline in Klipper Golf Course Ponds (STEP – programmed)	On-going management seeks to maintain the health of the pond's ecosystems and ensure that they continue to function as storm water retention basins, healthy wetlands, and endangered and migratory bird habitat.
	Control California Grass Using Salt Water in Percolation Ditch (STEP – in planning)	Improve endangered Hawaiian waterbird habitat quality and reduce flood storage capacity.

Goal 7.3: Watershed Management. Use an ecosystem-based watershed approach to managing issues involving water quality, erosion, and flow/flooding on MCBH lands associated with streams, channels, land cover and drainages.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.3.2: Conduct management and enhancement activities that promote watershed health.	Design/Study for Developing Solutions for Managing Stream Debris in Waimānalo Stream (MCTAB) and the MCDC (Kaneohe Bay) (STEP – in planning) • This project will analyze the types of debris impacting the waterways and off-shore resources	This study will investigate ways to capture and facilitate debris removal, which will benefit adjacent wetland habitats used by endangered Hawaiian waterbirds as well as resources within the shore, near shore, and coral reef ecosystems.

	Sediment Dredging – Nu'upia 'Ekahi (STEP – in planning)	Deep sediments degrade the pond environment, cause a foul odor, provide a medium for mangrove seed pods to get established, and create hazardous conditions for staff and volunteers working along the edge of the pond. This project will dredge Nu'upia 'Ekahi to improve habitat conditions, reduce odors, and provide safer accessibility for the benefit of native and endangered Hawaiian waterbirds.

Goal 7.4: Coastal and Marine Resources Management. Protect, enhance, and manage the shoreline, beaches, and nearshore environments and off-shore marine resources within MCBH control and/or use.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.4.1: Inventory and monitor coastal and marine biological resources and geophysical conditions.	Monitoring of Military and Recreational Exercises (Routine Management) • Natural Resources staff monitor ship-to-shore and shoreline training activities to ensure appropriate documentation and response procedures are followed should a Hawaiian monk seal, sea turtle, or whale be found in the area.	Prior to the start of any exercises or training events, nearshore waters are surveyed for the presence of protected species as their presence can alter or cancel a planned military exercise. This helps staff to implement measures to avoid or minimize impacts from military and recreational activities to the green sea turtle, and other marine protected species.
	Coastal and Marine Resource Survey – MCBH Kaneohe Bay (STEP – in planning) • Considering the dynamic nature of the marine environment, especially under current climate change trends, regular updates of marine resources surveys (about once every ten years subject to availability of funding) are needed to assess changes, detect new	This will inform management to the effects of current ongoing MCBH activities and help to determine what actions should be taken to combat the effects of MCBH activities and other threats to current habitat for the green turtle, and other marine protected species on shoreline and oceanic habitats.

	threats and inform management. New qualitative and quantitative surveys within Kaneohe Bay's 500-yard buffer zone will be conducted and results compared with previous surveys.	
	Biological Study of Nu'upia Ponds (STEP – in planning) • A biological study is planned to identify the species of native and non-native fish, shellfish, invertebrates, and algae in Nu'upia Ponds. • The study will also measure sedimentation that has occurred as a result of mangrove removal and "Mud Ops" management activities conducted in support of endangered species habitat improvement.	Increased siltation of the ponds may be degrading its health. Information provided by this study will be used to assess if management actions are necessary to protect marine life in the ponds. Additionally, this study will help to inform the status of habitat management actions on endangered Hawaiian waterbirds.
	Shoreline Assessments to Address Erosion (STEP – in planning) • There is a need to evaluate the previous erosion mitigation projects to determine what worked or did not work and the way forward. There is an additional need to develop a systematic assessment of shoreline erosion especially at highly-dynamic areas such as North Beach, Pyramid Rock, and Fort Hase shorelines at MCBH Kāne'ohe Bay.	These assessments will be used to identify site-specific erosion repair projects to mitigate against future problems in the coastal and marine zones, as well as track seasonal and human induced changes to shorelines. The assessments will also provide a baseline to evaluate the potential erosive effects of sea level rise associated with climate change. Shoreline assessments will be a recurring action and the knowledge gained will allow for site-specific erosion repair projects to be programmed as necessary. This information is a benefit to native and federally protected sea turtles and seabirds that use habitats in the shoreline environment. Information from these assessments will help inform future management direction to prevent the loss or degradation of sea turtle and seabird habitat.
	Develop Climate Change Vulnerability	Natural Resources staff can use this information to help decide

	Assessments (STEP – in planning)	which native and federally endangered species should be regularly monitored for early detection of changes, and what might be done to prepare for the increased pressures from rising sea level. Information from these assessments can help to inform the appropriate management action for habitats that are used by these species.
Objective 7.4.2: Manage and enhance coastal and marine biological resources and geophysical conditions.	Marine Resources Protection Initiatives (Routine Management) • Natural Resources staff review current Base regulations and practices related to coastal and marine resources as needed and determine if recommendations should be made to revise existing regulations or practices or initiate new ones.	Procedures will be developed outlining actions that damage coral reefs and describing a code of conduct to be followed when recreating or training in order to lessen impacts on coral reefs. This provides assessments and guidance to help protect against damaging actions to important marine habitats for native marine species as well as seabirds that utilize the resources within these coral ecosystems.
	Marine Debris Removal (Routine Management)	Periodic beach and in-water cleanups are conducted by Natural Resources staff and others to retrieve marine debris and derelict fishing gear that would otherwise harm marine life within MCBH jurisdictional waters. This management action helps to prevent net or line entanglement to sea turtles and MBTA protected seabirds that may forage within the MCBH marine habitat.
	Invasive Marine Species Removal (Routine Management) • Invasive plants (e.g., cyanobacteria, red algae) have invaded the coral in the cove near the Pali Kilo shoreline cottages at MCBH Kaneohe Bay. Removal of these threats to MCBH marine resources will be accomplished with the help of volunteers and possibly support from Sikes Act partners. This will be accomplished as time, other	The removal of invasive species preserves marine habitat and features utilized by green turtles and prey species of MBTA protected seabirds.

	priorities, and available personnel allow.	
	Marine Protected Species Management and Response (Routine Management) • Natural Resources staff respond and direct others in the event protected marine species occur in MCBH coastal areas.	Appropriate response procedures are followed to ensure protection of marine mammals and reptiles (e.g., haul-out of Hawaiian monk seals or sea turtles to rest on MCBH beaches, monitor for and limit disturbance to protected species on land or in water during training exercises). Any seabird, marine mammal, or reptile that is sick, injured, stranded, entangled, or dead in MCBH waters or on beaches is reported, protected, and if necessary transferred to appropriate authorities at NOAA Fisheries for rehabilitation and/or necropsy.
	Coral Reef Mitigation (Routine Management) • MCBH will continue to explore, develop and implement coral reef mitigation strategies (e.g., relocation, seeding, avoidance) and procedures to minimize impacts from direct and indirect factors (including bleaching and die off, the presence of invasive algae, and damage due to spills)	These management actions benefit coral reefs and native species that use resources coral reefs provide (e.g., native fish, federally protected seabirds that forage within the marine environment that use resources provided by coral reefs).

Goal 7.5: Landscape Maintenance and Vegetation Management. Maintain landscaped areas and manage natural vegetation through cost-effective, environmentally sound, sustainable practices, emphasizing use of native plants, habitat integrity, coastal protection, and water and soil conservation in a manner that supports training needs and natural resources conservation.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.5.1: Survey, inventory, characterize, and monitor vegetation.	Invasive Vegetation Inventory and Management Plan (STEP – programmed) • The inventory will support the development of vegetation management strategies. The field-based inventory will cover five	An inventory is needed to comply with the National Invasive Species Act and to identify the occurrence, distribution, and status of invasive vegetation species that could degrade training sites or potentially spread to off-Base locations through recreational activities or construction activities (e.g., transporting soil with seed material off-Base).

	properties and training areas: Kāne'ohe Bay,Waikāne Valley, Camp Smith, Pu'uloa RTF, and Pearl City Annex; MCTAB was inventoried in 2006.	
Objective 7.5.2: Take a sustainable approach to managing and enhancing natural and man-made landscapes.	Plant Trees at KBRTF (Routine Management) • Tree heliotropes, a Polynesian naturalized species, have been planted and this effort will continue as the existing highly invasive and very thorny kiawe trees die and/or are removed as needed to provide habitat. Any new trees planted at KBRTF will either be native or Polynesian introduced species (e.g., tree heliotrope, naio (*Myoporum sandwicense*), and naupaka (*Scaevola sericea*)). • Tree planting is performed in conjunction with creating and maintaining artificial nesting platforms at KBRTF.	Trees at KBRTF provide nesting areas for the red-footed booby that inhabit the WMA located at the top part of the active range. The intent is to eventually rid KBRTF of undesirable kiawe as it is spreading to other locations on the range, especially into the impact area, where it may attract the red-footed boobies.
	Invasive Vegetation Control Activities: Mud Ops (Routine Management) • Annual Mud Ops event to help control invasive pickleweed (*Batis maritima*) and enhance Hawaiian stilt habitat.	Helps control the invasive non-native pickleweed and reshapes the mudflat substrate to provide a more attractive foraging and nesting habitat for the endangered Hawaiian stilt. This exercise also raises community awareness of the protection the Marine Corps affords the Hawaiian stilt and its habitat.
	Invasive Vegetation Control: Weed Warriors (Routine Management) • Target invasive plants include: mangrove (*Rhizophora mangle*),	Remove highly invasive non-native plants that encroach on and degrade endangered species and migratory bird habitat, fill in wetlands, and overwhelm trails and roads that provide access to various parts of Nu'upia Ponds WMA.

	silver buttonwood (*Conocarpus erectus*), ironwood, koa haole, kiawe, Christmasberry, pluchea (*Pluchea* spp.), and Guinea grass (*Megathyrsus maximus*).	
	Invasive Vegetation Control: Sea Grape (Routine Maintenance) • Sea grape (*Coccoloba uvifera*), an invasive plant present in the area near the wedge-tailed shearwater colony known to harbor the invasive yellow crazy ants, is removed as part of general invasive plant control efforts at Kāne'ohe Bay.	Benefit to nesting wedge-tailed shearwater, eggs and chicks.
	Invasive Vegetation Control: Fountain Grass and Fireweed (Routine Management) • Fountain grass (*Cenchrus setaceum*), Fireweed (*Senecio madagascariensis*), and Devilweed (*Chromolaena odorata*) surveys, including opportunistic identification of other unknown/undiscovered plants, are conducted biannually to identify and remove incipient populations at MCTAB.	Routine surveys and management for invasive species removal help maintain the habitat used by MBTA protected birds as well as prevent the risk of vegetation likely to catch fire and degradation of habitat occurring within MBCH properties.
	Invasive Vegetation Control: H3-Kāne'ohe Bay (STEP – programmed) • This project will remove and maintain approximately seven acres of invasive vegetation along the Kāne'ohe Bay shoreline.	Encroachment of invasive vegetation (e.g., mangrove, kiawe, Christmasberry, koa haole, Guinea grass) on a strip of land located between H-3 and the Kāne'ohe Bay shoreline, has deleterious effects on Nu'upia Ponds and other wetlands throughout the Kāne'ohe Bay ecosystem. This project would help provide better water quality and habitat for endangered Hawaiian waterbirds and MBTA species that utilize Nu'upia Ponds.

	Invasive Vegetation Control: Nu'upia Ponds and Base Wetlands (STEP – programmed) • Control of invasive species that are encroaching on trails and unimproved roads in and around Nu'upia Ponds WMA.	These trails and roads are critical to conducting management activities associated with endangered species, such as conducting bird surveys and counts and monitoring ESA species.
	Maintenance and Repair of KBRTF Water Cannons Supporting Migratory Bird 25 Conservation (STEP – programmed) • Biannual maintenance and/or repair of the wireless remote controlled water cannons is necessary to keep them operational in the high salt environment in which they operate. Since the cannons will not be in constant use, and will only be tested quarterly, they would quickly become corroded and dysfunctional if they do not receive regular servicing. This project requests annually recurring funds to support a contractor to conduct regular maintenance and repair of the water cannons.	The Crater is hot and dry, and covered with fire adapted grasses that burn readily once ignited. Since the red-footed booby colony is located in the heart of an impact range, fire suppression capabilities are limited. The water cannon system, designed to act as a secondary fire suppression system to protect the migratory red-footed booby colony from fire, became operational in March 2016. The water cannons are strategically placed near several of the primary nesting areas to provide a secondary protective measure against an approaching fire.
	KBRTF Fire Suppression System (STEP – in planning) • Although the water cannon system acts as a secondary fire suppression system, there are gaps in coverage that make parts of the red-footed booby colony vulnerable to fire. Such systems may include a ground-based pop-	This project would identify and design other potential fire suppression systems that would address these gaps in coverage and strengthen existing protective measures to protect the red-footed booby colony from the risk of the threat of fire.

	up irrigation system.	

Goal 7.6: Natural Resources-Based Outdoor Recreation, Outreach, and Public Access Management. Support high quality, natural-resource-based (not activity-based) outdoor recreation, outreach and education, and controlled public access, consistent with natural resource conservation.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.6.1: Inventory and monitor public engagement activities and their potential impact on natural resources.	Recreational Use Assessment: Beaches of MCBH Kaneohe Bay (STEP – in planning) • Will focus on MCBH Kāne'ohe Bay, and will inventory and evaluate natural resources-related outdoor recreation activities occurring on and around beaches. This will include determining how many people are using the beaches, what kinds of activities they are engaging in, and how recreational activities are affecting natural resources.	The assessment will recommend improvements in management (e.g., improved education, enforcement) to minimize impacts on sensitive natural resources and to maintain recreation at sustainable levels. Restrictions on access and activities will be considered for locations with sensitive resources (e.g., Beach Cottage Cove, Pali Kilo Cove). The evaluation is necessary to balance pressures of outdoor recreation with priority uses of land and water spaces to support the military mission while minimizing impacts to sensitive natural resources under MCBH stewardship.
	Recreational Fishing Survey (STEP – in planning) • Data, including number, types, and size of fish; fishing methods; and hours fished, is collected from individual anglers. Analysis provides information about the effort, harvest, and size distribution of target species of fish, along with an idea of fishing quality and recreational pressure. Creel surveys were recommended in the MCBH Coral Reef Ecosystem Study (Shafer et al. 2002). A limited creel survey was conducted in 2011,	Repeating surveys over time provides managers with information to engage in adaptive management.

	following an approach similar to and building upon baseline data gathered in 2002 (Carnevale and Allen 2011).	
Objective 7.6.2: Promote and enhance opportunities for public engagement in natural resources management-related activities.	Planned Base or Community Events (Routine Management) • Natural Resources staff has manned a booth at Base-wide events (e.g., Earth Day, Volunteer Opportunity Fair, National Night Out), as well as supported off-Base community events (e.g., Bishop Museum's "Science Alive").	These types of activities are meant to reach broad cross sections of the on- and off-Base communities to make them aware of the natural resources over which MCBH has stewardship responsibility; to educate them on how to interact with resources without causing damage or harm; and to advise them how they can help protect and preserve sensitive and unique wildlife, habitat, and marine resources.
	Educational Materials (Routine Management) • Natural resources interpretive information used for outreach must be reviewed regularly for currency with regard to laws and regulations, species status, and protection and conservation measures. Many agencies and organizations in Hawai'i use interpretative information and often work together to develop these materials.	MCBH uses a combination of in-house and contracted resources to accomplish updates and production, sometimes in conjunction with information provided by outside agencies and organizations.
	Signs/Exhibits (Routine Management) • Regulatory, warning, or interpretive signs and exhibits are used at MCBH properties to inform users at a particular location about items of interest as well as prohibited activities.	Informs the public regarding sensitive natural resources that are present within the vicinity and about unacceptable and harmful behavior to avoid.

	Outreach Coordinator (STEP – programmed) • Develop information pamphlets and interpretive exhibits pertaining to MBTA and ESA-listed terrestrial and marine species. • Design and install protective measures (e.g., regulatory and interpretive signs) to safeguard endangered species and their habitats. • Educate the Base community about MCBH's wildlife and marine life and the need to protect and preserve these species and their habitat. • Provide educational briefings to civilian and military members. • Coordinate volunteer activities to control invasive vegetation encroaching on endangered species habitat. • Coordinate volunteer activities to conduct shoreline/beach/waterway clean-up events. • Coordinate all requests for tours and access to Nu'upia Ponds and Ulupa'u Crater WMAs. • Conduct tours of Nu'upia Ponds WMA and migratory seabird colonies. Manage all outreach events involving the general public (e.g., Earth Day, National Night Out, Environmental Awareness briefs).	A person dedicated to performing outreach and education is needed to brief military and non-military personnel on a variety of natural resource issues (e.g., invasive species, coral reefs, ground fires, feral and domesticated animal control, beach use, pet owner responsibilities, native plants and landscaping, and endangered species).

	Environmental Learning Center (STEP – in planning) • An underutilized room in the building would be the hub of the learning center with the hallways containing professionally produced wall displays.	The learning center would inform people about the Base's natural and cultural resources, management activities, and upcoming events using posters, displays, hands-on items, and take away brochures and flyers.
	Nu'upia Ponds Recreational Running Trail Signage (STEP – in planning) • Some signs have already been fabricated but, due to staff shortage and heavy workload, have not yet been installed.	Existing signage along the Nu'upia Ponds Recreational Running Trail identifies restrictions (e.g., noise, pets) and provides interpretive information. Additional signage is needed to clearly identify the pathway, entry and exit points, prohibited areas, and update natural history/interpretive information.
	MCTAB TA-1 Educational Material (STEP – in planning)	Interpretive exhibits and educational materials are needed to inform the public about sensitive natural resources in the publicly accessible campground and beach areas of TA-1.

Goal 7.7: Resource Information Management. Develop and use information management 'tools' to assist in implementing the INRMP and supporting integrated natural resources management on MCBH properties.

Conservation Objectives	Conservation Actions	Conservation Benefits
Objective 7.7.2: Improve natural resources information and data.	Natural Resources Database Management (Routine Management) • New databases are developed as needed.	Existing databases may be revised or updated to incorporate information not previously included but necessary to guide management decisions under changing conditions. For example, if monk seal haul-outs increase, as is predicted for many areas in the main Hawaiian Islands, recording additional information such as length of stay or pupping events may be desirable to help guide decisions regarding military training and recreational uses.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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MAY 03 2017

W. M. Rowley
Major, United States Marine Corps
Director, Environmental Compliance
and Protection Department
Marine Corps Base Hawaii
Box 63002 Kaneohe Bay, Hawaii 96863-3002

Dear Major Rowley:

NOAA National Marine Fisheries Service (NMFS), Pacific Islands Regional Office (PIRO), has received and reviewed the Pre-Final Draft of the 2017 Marine Corps Base Hawaii (MCBH) Integrated Natural Resources Management Plan (INRMP) Update (2017 – 2021) for the military installation.

Your staff has worked closely with NMFS during the development of the original MCBH INRMP and subsequent updates. Most recently we have reviewed and provided comments on the draft 2017 – 2021 INRMP update, which have been addressed to our satisfaction in the Pre-Final document. In addition, we appreciate the efforts of your environmental staff, under Mr. Lance Bookless, to coordinate closely with NMFS and other federal and state resource agencies to assess proposed activities at MCBH which may impact marine resources and their habitats within the jurisdiction of the installation.

We look forward to working with you during the ongoing and future implementation of the INRMP.

Sincerely,

Michael D. Tosatto
Regional Administrator

Cc: US Fish and Wildlife Service, Honolulu
Hawaii Department of Land & Natural Resources

H3. AGENCY REVIEW COMMENTS

Appendix H2 lists of all the external agencies that were provided copies of the *Draft MCBH INRMP Update (2017-2021)* (June 2016) for review. This appendix details how review comments received on the draft report were addressed by MCBH. Also included is a letter from DLNR-DOFAW expressing support for protection of Maiapilo (*Capparis sandwichiana*) and Hinahina Kahakai (*Nama sandwicensis*) coastal habitats on MCBH.

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				Invasive algae is well documented to degrade coral reef resources by shifting native benthic communities, comprised of corals, native algae, and crustose coralline algae to algal-dominated communities. Several algae species that have invaded the MCBH 500-yard security zone at Mokapu Penninsula include: *Gracilaria salicornia*, *Kappaphycus*, and *Acanthopora spicifera*. Also, *Avrainvillea amadelpha*, mudweed, has been observed to invade both hard and soft sediment communities at Marine Corps Training Area at Bellows. We are concerned that if left unchecked, coral reef resources could be further degraded and in some cases, recovering infected coral reef communities to baseline conditions could be costly. The Service believes that a more aggressive effort should be undertaken to address the invasion of algae at MCBH and MCTAB. Therefore, the Service recommends that the MCBH Environmental Office establish a working group comprised of state and federal resource agencies to address invasive algae resources within the jurisdiction or operational area of Marine Corp training or operational activities. The working group would be comprised of the MCBH Environmental Office, Service, State of Hawaii Division of Aquatic Resources and the National Marine Fisheries Service. The purpose of the working group would be to evaluate invasive algae threats to MCBH coral reef resources and design strategies to protect or mitigate threats. Working together, state and federal resource agencies would use local resources, tap into funding opportunities and expertise to combat the invasive algae threats to benthic resources. The Service is willing to provide leadership to help coordinate an invasive algae working group for fiscal year 2017.	Concur that invasive algae removal would benefit coral reefs found within MCBH juridictional waters. MCBH is interested in exploring the idea of forming an invasive algae working group to develop control strategies, and if resources are available, to conduct control work.

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7.4-4	Coral Reef Protection		13	The INRMP states, "The most severe threats to coral reefs stem directly from human activities, including the following that are leading causes of coral degradation: coastal development, destructive fishing practices, over-fishing and over-exploitation, pollution, vessel groundings and anchoring, recreational activities and sedimentation. " Absent from this list is the impact to sessile coral reef resources is the threat of invasive algae. Invasive algae, such as Gracilaria salicornia, Kappaphycus spp. and Acanthopora spicifera, outcompete slower growing corals for space, in Kaneohe Bay. Native algae also has demonstrated to outcompete native algae and seagrass for space and results in the loss of native benthic habitat and reduced species diversity. In comparison to other threats, the Service considers the threat to native coral reef resources in Kaneohe Bay as the primary threat to the loss of coral reef habitat within the 500-yard security zone at MCBH. Therefore, we recommend that invasive algae appear first on the list of threats to the coral reefs at MCBH.	List updated to include invasive algae first on the list of threats to coral reefs at MCBH.
7.4-11	Assess Sea Plane Ramps (STEP – in planning)			To update this section, a Service biologist and MCBH Environmental Officer have collected data at each of the sea plane ramps to determine the presence of corals, native benthic organisms and invasive algae either on or in close proximity to the sea plane ramps. These data will be reported to MCBH for the purpose of managing recreational activities at the sea plane ramps and to avoid impacts to native resources.	Noted. Should future recreational event organizers want to utilize the seaplane ramps, the data provided will be taken into consideration to guide protective measures to minimize marine resources impacts. Text updated to state: **In October 2016, the USFWS and senior natural resources manager conducted a survey of all five seaplane ramps fronting the hangars. The survey found invasive algae and sedimentation covering all the ramps. There was little to no coral or other significant biologics found anywhere near seaplane ramps 1 and 2. However, coral was found growing on, to the side of, or in the waters a short distance from the end of seaplane ramps 3, 4, and 5. While this dive provided greater knowledge of the conditions of the seaplane ramps, agency input is needed regarding the impacts and effects of using these ramps for future recreational events, as well as proposed conservation measures to guide protective measures to minimize marine resources impacts.**

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7.4-14	Coral Reef Mitigation		12	The INRMP states, "MCBH will continue to explore, develop and implement coral reef mitigation strategies (e.g., relocation, seeding, avoidance) and procedures to minimize impacts." The Service recommends that MCBH form a working group, consisting of biologists from the Service, State of Hawaii Division of Aquatic Resources and the National Marine Fisheries Service to identify coral reef resources in areas that MCBH has direct jurisdiction (e.g., 500 yard security zone at Mokapu Peninsula) or conducts operations (e.g., MCTAB) that are under threat from activities previously identified in the INRMP. We also recommend that this working group be tasked with the responsibility to design and implement measures to reduce identified threat, such as invasive algae. Technical support could be solicited from the U.S. Geologic Survey, University of Hawaii and the Bishop Museum, as appropriate.	We support the formation of a working group to assess marine resources threats and develop strategies to reduce identified threats. However, implementation of recommendations would be accomplished as time, manpower, equipment, funding allows. Support from State assets like the "Super Sucker", would go a long way to accomplishing actions like removal of invasive algae from coral resources.

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6-3				Koloa. During the summer of 2014 there was an outbreak of avian botulism in koloa (*Anas wyvilliana*, 21 Hawaiian duck) at the Base WRF… Preliminary DNA testing by DLNR at the Aloha 35 Animal Hospital on koloas brought in for treatment by the Natural Resources staff indicate that many 36 of the koloa aboard MCBH are likely pure koloas. Service comment: Please keep us posted on the status of the ducks that go to rehab facilities and that ducks are pure koloa so we are not perpetuating hybrids.	MCBH has not received this information, but has asked for assistance from the DLNR/DOFAW Wildlife office to try and obtain the results since the person who collected the DNA samples was working for them at the time. We have also asked the FWS to help us track down the results. Text has been updated to state: **DNA samples were collected from the ducks that died in 2015. Even though the results have not yet been received by MCBH, the researcher who collected the samples, Stephen Turnbull, Koloa Communication and Outreach Coordinator for DLNR-DOFAW, indicated that these ducks appeared to be very koloa-like due to their small size, coloration, and other characteristics. MCBH will notify USFWS once it receives the results of the genetic testing.**
6-4				RFB results of the foraging described somewhere? And what are implications?	We would be happy to share the maps and information provided by USGS's field researchers involved in the RFBO GPS-TDR tagging project. GPS-TDR tagging was also conducted with the WTSH colony. Both the RFBO and WTSH ranged quite far from Base, but never crossed overland. Tracking data showed RFBOs foraging well north and south of O'ahu and all the way to Moloka'i.
6-4 and 6-5				Predator Control. Regular predator trapping of feral, nuisance, and free roaming animals continues at MCBH wetlands and WMAs with oversight from the Natural Resources staff. Funding provided to USDA was significantly increased to now include managing live capture traps in the WMA and perform additional control work at other MCBH properties. Due to the rodenticide "Ramik" pesticide label expiring and the concern of rodenticides being ingested by non-target species, they were eliminated from use. A new type of kill trap (DOC 250s) of Australian design, has replaced the use of pesticides. Other trapping methods like the new automatic self-resetting Goodnature® A24 rat trap are under consideration for use. Our comment: specify which predators…. i.e. Ramik expired, so use kill traps are used for mongoose, not cats.	Text revised: **A new type of kill trap of New Zealand design called a DOC 250 has replaced the use of pesticides for control of mongoose and rats.**

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7.5-6				Tree Maintenance Workshop. In June 2015, the Environmental Department conducted a one-day tree maintenance workshop for personnel who perform tree maintenance for the Base Facilities Department, MCCS, and Forest City (residential property manager). The class covered: tree biology; appropriate planting, staking, guying, and pruning techniques; a hands-on pruning demonstration; and proper chainsaw maintenance techniques. The workshop was well received and is planned to be repeated bi-yearly. Our comment: please inform on measures to avoid roosting or nursing bats and pups	Most of the attendees of the Tree Maintenance Workshop only perform low level tree trimming work; vary rarely would they be involved in major limb removal or canopy work. Most tree maintenance is performed by a Navy contractor. We will work with the Navy to try and educate the tree maintenance contractor regarding avoiding roosting bats and pups. The Natural Resources staff could benefit from training by the USFWS to become more knowledgeable about the Hawaiian bat's behavior. We hope to obtain funding within the next couple of years to conduct surveys for the Hawaiian hoary bat to better identify areas where bats may be present.
				Should stay consistent of Hawaiian spelling of words using diacriticals.	Noted. Document was reviewed again for Hawaiian spelling and diacriticals.
8-14				8.3.3.5 Recovery Plan for Hawaiian Hoary Bat The *Recovery Plan for the Hawaiian Hoary Bat* provides information on habitat requirements and limiting factors, as well as recovery objectives and criteria (USFWS 1988). The Hawaiian hoary bat (*Lasiurus cinereus semotus,* ʻōpeʻapeʻa) is currently listed as endangered both Federally and by the State of Hawaiʻi. It was detected at the HIARNG Regional Training Institute, located on leased property adjoining MCTAB. MCBH plans to survey for the bat at its properties and, if detected, manage to avoid any adverse impacts to the species (COA 7.1). Service comment: Please avoid tree trimming during bat pupping season. Bats have been documents on Oʻahu in many previously unknown locations. It is good to survey for bats, however, please also incorporate measure to avoid impacts to bats in the meantime.	See above response.

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				8.3.3.6 Other Recovery Plans Recovery efforts for the threatened Newell's shearwater or *ʻaʻo* (*Puffinus auricularis newelli*), which is found on the off-shore State bird sanctuaries managed by DLNR, albeit in smaller numbers than the wedge-tailed shearwater, at MCBH, are described in the *Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan* (USFWS and Telfer 1983). The plan discusses reasons for decline, threats including light attraction, habitat requirements, and details recovery objectives. Although the plan was released in 1983, most of the information is still relevant. The INRMP addresses actions regarding endangered and threatened bird species as well as those protected under the MBTA, including the Newell's shearwater (COA 7.1). The Recovery Plan for the Multi-Island Plants…. Service comment: I did not see any minimization measures regarding lighting…	Given that there is only a single questionable record of a Newell's Shearwater wing in December 1994 on the Mōkapu Peninsula, reference to Newell's shearwater occuring at MCBH has been removed from the INRMP. All references to the Newell's shearwater will be removed from the INRMP. We have addressed lighting concerns associated with the wedge-tailed shearwater. All actions we take to benefit the wedge-tailed shearwater would benefit the Newell's shearwater.
9-3				Avian Botulism 7.1 An avian botulism outbreak involving the Hawaiian duck (*Anas wyvilliana*, koloa) occurred at the Base WRF during the summers of 2014 and 2015; no other bird species appeared to be affected. Several dead ducks were delivered to Dr. Thierry Work, USGS veterinarian, for necropsy and avian botulism was confirmed. Sick birds were taken to Aloha Animal Hospital's Dr. Doug Chang for rehabilitation if possible. Stephen Turnbull, DLNR Koloa Communication and Outreach Coordinator took genetic samples of many of the ducks delivered to Dr. Chang. Upon initial examinations. The results indicate that many of the koloa on Base may be purebreds, although MCBH is awaiting a final report at the time of this writing. Service comment: Status of this?	MCBH has not yet received this information, but will inform USFWS when we receive the results.

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C2-2				Change Koloa moali to "maoli " Change scientific name of *puffinus newelii*.... Consider including Hawaiian petrel and band rumped storm petrel	Typo corrected. Newell's shearwater removed from table as it does not occur at MCBH. While we have retrieved petrels from our shorelines, we do not have any nesting birds or manage for them. So putting a Fact Sheet in the INRMP does not have a lot of relevancy. In addition, as noted previously, any benefical actions attributed to the WTSH, will benefit other groundnesting seabirds.
2	C2 (Bat)			Hawaiian hoary bat info section (page 2): Mcbh conservation measures: limiting disturbance: says mature plants but should be woody vegetation greater than 15 m ...	**Reworded: All removal of woody plants greater than 15 ft tall that may be used for roosting and nesting will be monitored.** We know from published USGS articles on the Hawaiian hoary bat that many tree species we manage on base aren't attractive to the native bat for roosting or nesting (e.g., kiawe, Christmasberry, coconut palms). It would be helpful if the USFWS could identify trees utilized by the Hawaiian bat so we could more narrowly focus our monitoring of tree maintenance actions.
	C2 (Turtles)			Green turtle section: reproduction section says "return when born" consider changing to where they hatched ...	Reworded as suggested.
	C2 (Turtles)			Need to increase conservation measure for exemptions to designation of critical habitat.	Conservation measures have been revised and will be reviewed with USFWS prior to Final.
	C2 (Nene)			Nene section says there were 5 nene that visited in 2016. They believe these are the same as James Campbell. Need to check to see if these are different?	No tag numbers or other readily identifiable markings were reported that could help determine where the nene came from.
	C2 (Shearwaters)			Shearwater section probably should be separated out as there is distinctions to newells and wedgies and are specific to both. For example the mcbh has wedgies but not newells and it's not clear in the handout. Threats are similar but nesting is not.	Reference to Newell's shearwater occuring at MCBH has been removed from the INRMP.

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	C2 (Shearwaters)			should include lighting disturbances for both species	Text exists under Threats: Another threat is collision with power cables, poles or other man-made structures, when young fledglings are **disoriented by urban lights** and fly inland rather than out to sea. A lighting section was added under MCBH Conservation Strategies: **Wildlife Friendly Lighting. Natural Resources staff work with facility engineers to minimize lighting issues throughout MCBH. Particularly near shorelines, lights have been removed, numbers of lights limited, or not installed in the first place. When lighting is required, all exterior lights for new construction and renovations are required to use International Dark-Sky compliant fixtures, unless otherwise required by the military mission.** The Base has actually embarked on a project to try and remove much of the above ground electrical lines and place them underground.
	C2 (Shearwaters)			Says that both shearwaters occur at MCBH… should explain that newell's may be affected by artificial light sources, but it is not known to nest on MCBH properties.	Reference to Newell's shearwater has been removed (see above).
	C2 (RFB)			Should remove education and outreach section if there is no description.	Text has been added to provide detail.
	C3 (Procedures)			need to improve on green turtle and conservation measures for purposes of precluding critical habitat.	Conservation measures have been revised and will be reviewed with USFWS prior to Final. They are located in Appendix C2.

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C4-2				Should explain that the transfer of live albatross their eggs occur at other locations not under the jurisdiction of the MCBH. As it's written in the document right now it sounds as if you have albatross on your airfield.	Reference to the "occassional transfer of live albatrosses and their eggs to other off base locations" has been removed since this is no longer current or relevant information. We used to have regular visitation, but we now only have infrequent occurrences (in 2016 USDA Wildlife Services saw laysan albatross near the airfield about 19 times) and nesting by laysan albatrosses on the airfield, but removal of many of the Ironwood trees along the peripheral of the airfield has discouraged their return. Previously, with approval from FWS, we used to collect all eggs laid and delivered them to UH. In recent years we have only seen albatross every once in a while at the Kaneohe Bay Range Training Facility.Although nesting is rare, an albatross did nest there a few years ago near the range training facility, and successfully reared a hatchling.
C4-3				Should briefly explain the yellow crazy ant has detrimental effects to breeding seabirds. And coconut rhinoceros beetle has detrimental effects to coconut tree and other palms.	Clarified by adding text in bold (now App C3) Yellow crazy ants (*Anoplolepis gracilipes*) have infested the wedge-tailed shearwater colony at Nu'upia Ponds. They have a detrimental effect on breeding success **of seabirds** by causing adult birds to abandon eggs and chicks, as well as causing distress to **and deformities of the** chicks. Coconut rhinoceros beetle (CRB) (*Oryctes rhinoceros*), an invertebrate pest that lives in decaying material, **has detrimental effects on coconut palm trees, other palms, as well as the native hala. It** was first identified as present on O'ahu in 2013 at Joint Base Pearl Harbor-Hickam **and the nearby Mamala Bay Golf Course**….**State agencies and organizations (HDOA, OISC) and the military are working to eradicate this destructive pest beetle.**
D-28				"Do not take lobsters… on 'Oahu." Should be O'ahu.	Typo corrected.
F-21				CRB section: should briefly explain why coconut rhinoceros beetle is a concern to HDOA… because it has detrimental effects to coconut tree and other palms.	Added text to first sentence of section (now App D7): Coconut rhinoceros beetle, a pest species that lives in decaying plant material or green waste, is a concern of Hawai'i Department of Agriculture (HDOA), OISC, Department of the Navy, and MCBH **as it has been responsible for the death of many coconut palms and poses injurious concerns for other palms and related plant species.**

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3-2	3.1		23-27	We seek clarity on the statement: "A new NEPA document is based on things not being materially different or result in biophysical consequences materially different from those described in 2001." Please clarify what "materially different" means? NMFS would argue that current ocean conditions, climate conditions, and sea turtle and monk seal populations (more for both) are different since 2001. Although NMFS is not requesting a new NEPA document be developed, we ask whether this document has considered and addressed changing conditions and circumstances from 2001 to 2016, and is the existing NEPA document still appropriate?	The 2001 INRMP/EA was developed as a programmatic document, looking at the current conditions and range of management activities at MCBH. With each subsequent update, updates to resource conditions have been taken into account (Section 6), and changes in management actions are programmed in Section 7. The existing NEPA document is still appropriate as the overall management approach has not changed. If MCBH were to change the level of management (e.g. lower level of managing resources) or change land use (e.g. WMA boundaries), a new NEPA document might be required. MCBH will continue to plan for 'current' resource conditions as part of future updates.
4-3	4.3 Base Growth		6-7	question: Have consultations (ESA section 7 or EFH) been done on the build up of up to 970 additional people, and infrastructural changes associated with the increased population at the base? Should we review your findings on your review of the build up?	MCBH is required to consult if it thought there was a potential for adverse affect. For the Grow the Force EA (2011), the Base determined there was no effect, therefore it did not trigger requirement to consult. Informal consultation under ESA Section 7 was conducted with USFWS in a subsequent EIS (Basing of MV-22 and H-1 Aircraft in Support of III MEF Elements in Hawaii), which was completed for MCBH by the Navy in 2012.
4-4	4.3.2		25-27	This section states that MCBH at Kaneohe has a 500-yard buffer. Does MCTAB have a buffer too? If not, make it clear to the reader that only MCBH at Kaneohe has a 500-yard buffer.	MCTAB does not have a National Defensive Sea Area/buffer zone; MCBH at MCTAB has authority to the high tide line or highest wave run-up. MCBH does have a drop zone located beyond the barrier reef where personnel can parachute and drop into the water. MCBH has some ability to control this area when parachute operations are being conducted. Text added to 4.3.2: **At MCTAB, MCBH has authority to the high tide line or the area of highest wave run-up, but can exert limited control over the off-shore waters during military maneuvers involving movement to shore and parachute operations.**
4-6	4.3.5			Same as comment 5. If Pu'uloa RTF does not have a buffer, make this clear to the reader that only MCBH Kaneohe has a 500-yard buffer.	The text in Section 4.3.5 has been modified to make more clear the protective zone seaward of Puuloa RTF: ~~The U.S. Navy has authority over the off-shore waters fronting Pu'uloa.~~ **The area seaward of Pu'uloa RTF falls within the Pearl Harbor Naval Defensive Sea Area controlled by the Navy.**

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4-9	GS07/09…		6-28	There are several places in the document stating that the GS-07/09 Wildlife/Bioscience technician position is vacant. How does MCBH plan to address this shortfall if this position is not filled by other means? e.g., would the GS-12 and GS-11 biologists, or other personnel pick up the slack, or have increase signage or distribution of education materials to cover the shortfall.	This position has been filled with a GS-09 (October 2016). Changes were made throughout the INRMP to reflect this, including in 4.4.1.
4-10	CLEO		38-39	We are very supportive of additional CLEOs because asking 2 officers to cover 8 bases is stretching those resources. Furthermore, the diversity of the duties being asked of the CLEOs widely vary. This could lead to specialization needs among CLEOs.	Acknowledged.
4-11	MCCS		4-12	How often or how much do Natural Resources staff work with the MCCS? Are Natural Resources staff reviewing the amount or adequacy of dissemination of natural resources education materials?	Natural Resources staff regularly interacts and coordinates with MCCS because of the types of events they conduct. The most common interactions occur with the Marina and the Temporary Lodging Facility (TLF), who manages the beach cottages and Cabanas. The Natural Resources staff prepares the educational information distributed by MCCS. As time and resources permits, we try to improve on existing material.
4-11	MCCS		4-12	We recommend the Natural Resources staff work with MCCS regarding trash (marine debris) reduction in anticipation of increased beach use. For example, restricting the use of straws and plastic bags or containers during food sales would reduce the amount or severity of marine debris inputs into marine waters.	Natural Resources staff will work with MCCS to help control the rubbish created from sales and will relay concerns to MCCS to see if there is a way of reducing rubbish produced from food sales by limiting plastic and other non-biodegradable rubbish. Trash collection is managed by Base Facilities Dept (collecting and removing garbage), however rubbish associated with the less developed recreational shorelines relies on individuals to remove it themselves. The intent is to modify behavior by promoting the "Pack it in, Pack it out" concept.
5	Laws…		5.1.1	The Endangered Species Act is also relevant to base natural resource programs, specifically under section 7(a)(1). 7(a)(1) states: The Secretary (of Defense) shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act.	The ESA is definitely relevant. As stated in the section introduction, Section 5 of the INRMP Update focuses on new or updated information. Text has been added to Section 5.1.1 to address changes in species listing over the past five years, and changes to critical habitat. The ESA is also addressed in Appendix A3 and referenced, as needed, throughout the document.

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6-6	Erosion		10-17	Sea level rise is also a factor and may likely increase shoreline erosion everywhere.	Added reference to sea level rise in this section: **Sea level rise associated with climate change will likely contribute to issues with erosion along MCBH shorelines.** There is a management action in COA 7.4.1 to begin addressing sea level rise.
7.1-7	Nuisance Animal Control		20-22	How are "nuisance" animals being prioritized as a whole? While NMFS appreciates that feral pigs and chickens are non-native species and are bothersome when human residents are trying to sleep, what tradeoffs are being made with other management actions in order to fund "nuisance" animal control? As these animals are deemed nuisances to human quality of life (more than natural resource issues), are other funding sources for nuisance species control available to address them?	As indicated in Section 4.4.2 "US Department of Agriculture Wildlife Services", MCBH has doubled the time and effort required of the USDA contract, which focuses on predator and nuisance animal control. The increase in the USDA WS's responsibilities as identified in their Work Plan specifically accounts for the additional wildlife control efforts needed to manage nuisance animals at Camp Smith in addition to managing the trapping program on KBay. The contract alllows for resources to be moved around to any of MCBH's properties to address problem areas.
7.4-4	Coral Reef Protection		13-20	Although the bulleted section includes six stressors, it excludes two major stressors that are identified later in the document: climate change and invasive marine species. Recommend adding these item to this section.	Added as suggested.
7.4-5	Nonpoint Source		4-15	Is this section particular to MCBH Kaneohe? or is it inclusive of all sites? Because water runs downstream, nonpoint source pollution is relevant at every one of the eight locations.	Section updated to indicate NPS pollution is a concern at all MCBH properties. **Control of nonpoint source pollution is a concern at all MCBH properties. Best Management Practices are included in construction projects to minimize potentially harmful discharges (e.g. sediment) that reach waterways. However, MCBH does not have control over upstream, off-Base activities that may be impacting waterways on-Base (i.e., farming, illegal dumping upstream of MCTAB on Waimanalo Stream).**
7.4-7	Nonpoint Source		15-17	Is there a systematic evaluation in place to find out whether this new "pack it in, pack it out" strategy is working at the same level as before the removal of trash bins? or is trash management better or worse?	There is no systematic evaluation. While the Natural Resources staff is trying to promote "Pack it in, Pack it out", this program is in its infancy. No signs have been fabricated nor educational material developed / distributed. This is a Base level issue that cannot be solely addressed by the Environmental Deparment. The Environmental Department can raise awareness of trash management and try to promote individual responsibility, but in the end it is a Base function over which we have limited ability to influence.

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7.4-8	Recreational Activities		14-26	An increase in base population, use of the beaches, and increase in cottages along with the increasing sea turtle and monk seal populations on Oahu are likely factors affecting the health of MCBH beaches and the resources that live there. We are counting on MCBH to manage these increased threats adaptively and aggressively.	Acknowledged. MCBH will do everthing within constraints of funding, manpower, and command priorities to manage increased threats. This includes continuing to coordinate with our agency partners and MCCS who has responsibility for promoting recreational activities on MCBH shorelines.
7.4-10	Coastal and Marine Resource Survey		23-33	We are supportive of this critical step as it is necessary for adequately evaluating increases of effects from projects mentioned in this section and in the document. These projects have received ESA section 7 consultations with conclusions based on the implementation of these surveys.	Acknowledged. We look forward to continuing to partner with NMFS and others on these surveys.
7.4-14	Coral Reef Mitigation		10-15	Also consider coral reef monitoring programs with methods for documenting coral bleaching impacts and helping identify resilient reef areas where pertinent for the base and use this info to inform coral reef management and mitigation programs.	It is understood that a monitoring program would be beneficial, but monitoring is limited by management priorities, staff time, funding, and limited in-house expertise. A successful monitoring program would require partnering with external management agencies/ organizations and/or expert volunteers.
7.4-15	Sand fences		19-20	Are these sand fences safe for sea turtles? Sea turtles are increasingly coming up on shore to bask or nest on beaches throughout Oahu. Nesting is occuring in neighboring Bellows AFB beaches.	Fences are a barrier, but they are necessary to try to stabilize dunes. MCBH would consult with USFWS prior to accomplishing such a project if funded.
7.6-6	Website and videos		24-31	We disagree with the statement that the MCCS website does much to assist with the natural resource program. On 9/13/16, NMFS staff spent 5 minutes looking for a link to MCBH's natural resources website and could not find it. If it is somewhere on the site, it isn't easy to find or seem to be a priority of the site. He found no information on the fishing regulations, and on the snorkeling and diving tab, there is nothing regarding protection of coral reefs, prohibited activities re: listed species or habitats, or prohibited areas. There is information on restricting firewood and "pack in, pack out", but not on leash laws or times when pets can go to beaches. Has anybody checked to see how effective the MCCS website is doing to educate their visitors on natural resources protection? How many beach goers or new personnel use the site? and what do they learn? Unlike 2001, websites, and especially mobile websites are often the primary source of information when planning activities. We must catch our audience when they are looking to rent snorkel equipment, or information on fishing.	The Natural Resources webpage is somewhat constrained by the overall format set by the Marine Corps. Website improvements and greater visibility are high on the list of outreach and educational actions that we will be working to improve upon during this iteration of the INRMP. The Natural Resources staff is working with MCCS to incorporate natural resources website links on MCCS webpages to provide other avenues to important resources information. While we do not monitor the MCCS website, we are taking advantage of opportunities to work with MCCS to incorporate access to the Natural Resources webpages via MCCS' website.

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PAGE	SECTION	PARA	LINE #	COMMENTS	REVIEW ACTION
. 7.6-6	Website and videos		25-26	Links to the base natural resources program are good but less effective because the people who would care enough to click on that website may be those who already know not to walk on reefs or leave trash, and may not be the intended target audience we would want to reach.	Noted. We are working on other ways to get the word out to a wider audience, which are identified in this same section.
7.6-6	Website and videos		28-31	Where are these videos being shown? On websites? Simalr to the above comment, websites are less effective because people often choose to go to the website or click on the video. If they don't want to click on the video, they choose not to and never get the message. These videos could be effective where people are waiting in lines. For example, have them shown on screens at food courts, or near the waiting line at the visitor's office where people pick up their temporary passes etc.	Videos have been provided to MCCS for placement in the Temporary Lodging Facility rooms, cabanas, and beach cottages. Videos are shown to people that attend bi-monthly Enviromenntal Awareness class. They are also shown to units when Environmental has an opportunity insert ourselves into their training sessions. We have explored other locales for showing the natural resources video, but most offices and units do not have an extra laptop or DVD player available to play the video. We are also working with MCCS' marketing department to see if there are other potential avenues for distribution of our 15 minute natural resources video, e.g., Base theater before movies start. The Natural Resources staff will continue to promote videos and explore other means of getting videos out to the Base popuation and possibly the off-base community.
9-1	Natural Resources videos		34-40	See above comment. Please evaluate and strategize where best to show these videos where we can reach the most end users.	See above answer.

NOAA Pacific Islands Regional Office, EFH Coordinator (Ian Lundgren) Comments on Draft

PAGE	SECTION	PARA	LINE #	COMMENTS	REVIEW ACTION
6-5	6		22	Pali Kilo is misspelled "Lilo"	Misspelling has been corrected.
6-7	6		10	Consider placing "monk seals/turtles/waterbirds/plants" in parenthesis. The sentence is incorrect as presently punctuated.	Parenthesis added: The exhibits will provide information on endangered species *(e.g., monk seals, turtles, waterbirds, plants)*, coral reefs, identification of native and invasive species, and wetland habitats.
6-11	6		21	This section does not address the coral reef resources in the defensive sea area and the underwater range are there plans for surveys like the other relevent parcels?	The Marine Corps does not have jurisdiction in the waters fronting the Puuloa RTF. That area falls within Pearl Harbor's naval defensive sea area and is covered under their INRMP. The underwater range belongs to the Navy not the Marine Corps. Recommend you contact Cory Campora, Natural Resources Manager at NAVFAC HI.

Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife (Jason Misaki) Comments on Draft

PAGE	SECTION	PARA	LINE #	COMMENTS	REVIEW ACTION
				We are pleased to see efforts are being made to survey the Hawaiian Hoary Bat and the Hawaiian Short Eared Owl. We support your efforts in the collaboration of surveys, inventories and management strategies as well. DOFAW Oahu Branch is also moving forward with studies for these species; our goals being the gathering of information regarding their populations numbers, ranges, and immediate threats. Any studies that can be supported and implemented will aid in the State's update of management actions and recovery plans. We look forward to working with MCB Hawaii on future projects.	Comment acknowledged. MCBH plans on sharing the results of our Hawaiian hoary bat surveys with DLNR-DOFAW.

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Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife (Lara Reynolds) Comments on Draft

PAGE	SECTION	PARA	LINE #	COMMENTS	REVIEW ACTION
6-3	Native Plants	1	7	What is the basis for the statement that it is anticipated that the State will consider the two species for recognition as threatened or endangered? I am not aware of this.	This was too strongly worded. It was based on a general conversation between you and Lance Bookless regarding how the loss of shoreline and dunes and other suitable habitat would be detrimental for these plants that are already under stress and rare to be found on the State's coastal areas. A question had been posed whether you thought that these two plants would ever be listed by the State as threatened and you had stated that it could be considered if their populations continued to decline. Since this can be said for any threatened plant species, the statement has been removed.
6-3	Native Plants	1	9	Inaccurate statement – DOFAW botanist successfully collected and germinated Nama sandwicensis seeds and added them to the Lyon Seed Conservation Lab seed bank. They did NOT collect maiapilo (Capparis sandwichiana) seeds, although attempts were made to do so but were unsuccessful because ripe fruit could not be found, possibly due to predation by rats.	Statement has been corrected.
6-3	Invasive Plants	1	10	Question: Was the Oahu Invasive Species Committee notified about the fountain grass detected on base? It is one of their target species and it would be very important to let them know if they haven't already been notified.	Yes, OISC has been made aware of the discovery. OISC is also involved in conducting biannual surveys for fountain grass and *Chromolaena odorata.*
Appendices	Capparis sandwichiana profile		1	Regarding ecological threats, I would suggest adding fruit and seed predation by rats as another threat.	Added as requested.

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DAVID Y. IGE
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BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 15, 2017

MEMORANDUM

TO: Lance Bookless, Senior Natural Resource Manager, MCB Hawaii, Environmental Dept.

FR: Susan N. Ching, Oahu Botanist, Division of Forestry and Wildlife

RE: DOFAW support for protection of Maiapilo (*Capparis sandwichiana*) and Hinahina Kahakai (*Nama sandwicensis*) Coastal Habitats

The Division of Forestry and Wildlife (DOFAW) Oahu branch has visited MCBH populations of Maiapilo (*Capparis sandwiciana*) and Hinahina kahakai (*Nama sandwicensis*) and their habitats and found them to be valuable natural resources to the State of Hawaii. The dry coastal shrub and herbland ecosystems containing these species on MCBH are rare examples of once-widespread communities that elsewhere have been highly impacted by humans and invasive species. These remnant populations are significant representatives of these species and their communities in comparison to the rest of the island of Oahu and may provide significant habitat for Hawaiian fauna such as the Endangered Hawaiian Yellow Faced Bees (*Hylaeus* sp.).

Species assemblages differ slightly between the two sites due to substrate differences. The Hinahina kahakai prefers the undisturbed, wide sandy beaches and dunes at Pyramid Rock (Kuau) beach. These coastal sand dunes on MCBH are one of two remaining locations for the Hinahina kahakai on Oahu (the other being along the Ka iwi coastline). Currently this coastal sand dune habitat is threatened by human recreation, military training activities, and invasive plant species. *Nama sandwicensis* is considered vulnerable by the Smithsonian Institute as a species likely to become endangered in the near future unless threats are removed. The invasive plant Silky Jackbean (*Canavalia sericea*) is becoming established at this site and should be controlled before it overtakes the habitat. We recommend limiting human recreational and training activities in this area and invasive plant removal where possible.

Capparis sandwichiana is also listed as a Species of Concern (SOC) by the State of Hawaii and as Vulnerable by IUCN as a species that is likely to become endangered unless threats are removed. The MCBH population occurs on raised coral substrate of the Palikilo sea cliffs. The large number of individuals of Maiapilo in this population is remarkable for the island of Oahu

and would be a good source of seeds for restoration at this and other locations. However, this population is currently threatened by human recreation (which includes trampling and large amounts of litter), invasive plant species, and is also highly impacted by rats (probably highly influenced by the close proximity to rental cottages). We recommend restricting entry by humans for recreation and long term rat control measures for the rental cottages. In order to do a fruit collection from this species we recommend a short-term rat control grid within the population during fruiting.

Oahu DOFAW is very supportive of MCBH in the preservation of these unique remnant coastal habitats and these important native plant species.

Mahalo,
Susan Nalani Ching
Oahu Botanist
DLNR-DOFAW

APPENDIX I
GLOSSARY

Adaptive management: "…a willingness to approach all management decisions as experiments to be tested. Rather than prescribe a management scenario, the manager working in an adaptive fashion tests possible solutions to problems in a scientific, experimental way, complete with controls. …under the adaptive management scenario, a final, prescriptive solution to a problem is never accepted, and the door is always left open to new ideas, new data, and revision of plans when better approaches are possible." (Taken from The U.S. DoD and The Nature Conservancy, A Handbook for Natural Resources Managers, Conserving Biodiversity on Military Lands, Leslie et al. 1996).

Alien species: with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem. (*Executive Order 13112, Invasive Species* (February 3, 1999)).

Avian Botulism: a paralytic disease of waterbirds caused by ingestion of a toxin produced by a naturally occurring bacteria in soil. The toxin is only produced by the bacteria under certain environmental conditions.

Best Management Practices (BMPs): methods, measures, or practices to prevent or reduce water pollution, including, but not limited to: (1) structural and nonstructural controls; (2) operation and maintenance procedures, and (3) other requirements and scheduling and distribution of activities. (UFP for a Watershed Approach to Federal Land and Resource Management, 65 FR 202 of Oct 18 2000, p. 62571).

Biosecurity: a strategic and integrated approach that encompasses policy and regulatory framework for analyzing and managing relevant risks to human, animal and plant life and health, and associated risks to the environment.

Bird Aircraft Strike Hazard (BASH): the potential of bird strike hazard to aircraft existing due to both resident and migratory bird species. The BASH program establishes procedures to minimize aircraft exposure to potentially hazardous bird strikes at and around MCBH. No single solution exists to the BASH problem, and a variety of techniques and organizations must be involved in the control program.

Candidate Species: any species that is undergoing a status review that USFWS or NMFS has announced in a Federal Register notice. Thus, any species being considered by the Secretary (of the Department of Commerce or Interior) for listing under the ESA as an endangered or a threatened species, but not yet the subject of a proposed rule (see 50 CFR 424.02). NMFS' candidate species also qualify as species of concern. "Candidate species" specifically refers to:

- species that are the subject of a petition to list and for which we have determined that listing may be warranted, pursuant to section 4(b)(3)(A), and
- species that are not the subject of a petition but for which we have announced the initiation of a status review in the Federal Register.

Categorical Exclusion (CATEX): Per 40 CFR 1508.4 and Section 12201.3 of MCO P5090.2A, actions that the Department of Navy has found to have no significant effect individually or cumulatively on the human environment and therefore do not require an Environmental Assessment (EA) or Environmental Impact Statement (EIS) are documented as such through a CATEX (i.e., a decision memorandum retained in the project file as evidence that some systematic environmental review was followed to reach this conclusion).

Compliant INRMP: An INRMP that has been both approved in writing, and reviewed, within the past five years, as to operation and effect, by authorized officials of DoD, DOI, and each appropriate State fish and wildlife agency (Sikes Act MOU, 2013).

Conservation Measures: methods, measures, or practices to prevent or reduce potential adverse impacts to natural resources. Conservation measures often focus on native species, particularly threatened or endangered species.

Critical habitat: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation (ESA Sec 3(5)(A); 50 CFR Section 424.02). Section 4(a)(3)(B)(i) of the ESA allows exemptions to critical habitat designation if a military installation's INRMP is providing adequate conservation measures and species benefit as determined by USFWS or NOAA.

Cumulative effect: the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. (40 CFR §1508.7).

Ecological Assessment: Monitoring and evaluating the condition of ecological resources to discover the current and changing conditions. Ecological assessments utilize surveys and existing inventories in order to assist in understanding the structure and function of ecosystems in order to develop informed management actions.

Ecosystem-based management: a goal-driven approach to managing natural and cultural resources that supports present and future mission requirements; preserves ecosystem integrity; is at a scale compatible with natural processes; is cognizant of nature's timeframes; recognizes social and economic viability within functioning ecosystems; is adaptable to complex and changing requirements; and is realized through effective partnerships among private, local, State, tribal, and Federal interests. Ecosystem-based management is a process that considers the environment as a complex system functioning as a whole, not as a collection of parts, and recognizes that people and their social and economic needs are a part of the whole. (DoDI 4715.03).

Endangered species: a species of fauna or flora that has been listed by the USFWS or NMFS for special protection and management under the Endangered Species Act. (MCO 5090.2A, Section 11105.15).

Endemic species: a species that is native by virtue of having evolved in a particular geographic location and found only in that location.

Enhancement: an activity increasing one or more natural or artificial ecosystem functions.

Erosion: the removal of the surface soil layers by wind, water or ice. The two processes involved are the detachment of individual soil particles and the subsequent transport by wind, water or ice.

Established program: a natural resource management program at MCBH, as described in the Existing Environment and Course of Action sections, whose components have been operating for at least two and up to twenty years or longer.

Geographic Information System (GIS): a computerized system of organizing and analyzing any spatial array of data and information.

Hydrological function: function performed in the context of a watershed or wetland, whose components may include, depending the context: groundwater infiltration (penetration of rainfall and surface water into soil), groundwater recharge (elevating the water table), regulation of water flow including floodwater regulation, and maintenance of estuarine water quality (the physicochemical milieu).

INRMP Revision: Any change to an INRMP that, if implemented, may result in a significant environmental impact, including those not anticipated by the parties to the INRMP when the INRMP was last approved and/or reviewed as to operation and effect. All such revisions require approval by all parties to the INRMP, and will require a new or supplemental NEPA analysis (Sikes Act MOU, 2013).

INRMP Update: Any change to an INRMP that, if implemented, is not expected to result in consequences materially different from those in the existing INRMP and analyzed in an existing NEPA document. Such changes will not result in a significant environmental impact, and installations are not required to invite the public to review or to comment on the decision to continue implementing the updated INRMP (Sikes Act MOU, 2013).

Indigenous species: a species that is native in a given region by virtue of having spread through the region on its own, but whose site of evolutionary origin is unspecified.

Indo-Pacific Region: a biogeographic region of the Earth's seas, comprising the tropical waters of the Indian Ocean, the western and central Pacific Ocean, and the seas connecting the two in the general area of Indonesia.

Introduced species: a non-native species that has been become established into a natural ecosystem outside its natural range.

Invasive species: an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. (*Executive Order 13112, Invasive Species* (February 3, 1999)).

Littoral zone: the shore zone from the high water mark to a depth where light is barely sufficient for rooted aquatic plants to grow.

Live Rock: any rock or coral to which marine life is visibly attached or affixed.

Migratory: traveling from one place to another at regular times of year, often over long distances.

Native species: one that occurs naturally in a particular region, ecosystem and/or habitat without direct or indirect human actions. (*Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds* (60 FR 40837 of August 10, 1995)); with respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem. (*Executive Order 13112, Invasive Species* (February 3, 1999)).

Nonpoint source pollution: pollution that comes from many diffuse sources that is caused by rainfall moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and underground sources of drinking water. Pollutants include: excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas; oil, grease, and toxic chemicals from urban runoff; sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks; and bacteria and nutrients from livestock, pet wastes, and faulty septic systems. (USEPA website).

Noxious Weeds: plant species identified by Federal or State Agencies as requiring control or eradication.

Outdoor recreation: includes any program, activity, or opportunity dependent on the natural environment, including picnicking, bird watching, hiking, fishing, and wildlife enjoyment. Per MCO P5090.2A, it does not include activity-based outdoor recreation such as in "developed or constructed facilities such as golf courses, tennis courts, riding stables, lodging facilities, boat launching ramps, and marinas…".

Polynesian-introduced species: one that was introduced by the earliest Polynesian settlers either intentionally or unintentionally, and is now naturalized. Treated as "de facto" natives for management purposes.

Pyrophytic: characteristic of plants that have adapted to tolerate fire

Restoration: management actions returning an area from a disturbed or altered condition with lesser functions to a previous condition with greater functions.

Review for operation and effect: A comprehensive, joint review by the parties to the INRMP, conducted no less often than every five years, to determine whether the plan needs an update or revision to continue to address adequately Sikes Act purposes and requirements (Sikes Act MOU, 2013).

SharePoint: web application platform in the Microsoft Office server suite that combines various functions which are traditionally separate applications: intranet, extranet, content management, document management, personal cloud, enterprise social networking, enterprise search, business intelligence, workflow management, web content management, and an enterprise application store. Used by MCBH to manage files and file sharing.

Species of concern: used by Federal agencies to describe species for which there is concern or great uncertainty about the status and might be in need of concentrated conservation actions. Species of concern status does not carry any procedural or substantive protections under the Endangered Species Act. However, Federal agencies do maintain a list of species of concern and fund grants to states and management agencies to support projects to conserve these species.

Species of greatest conservation need: used by the State of Hawai'i to describe species whose population are rare, declining or vulnerable to decline and might be in need of concentrated conservation actions. Species of greatest conservation concern status does not carry any procedural or substantive protections under the Endangered Species Act, but projects to conserve these species are eligible for Federal funds to support projects to conserve these species. http://dlnr.hawaii.gov/wildlife/hswap/cwcs/hawaii/species/

STEP, Status Tool for Environmental Program: web-based application that facilitates and supports project management and tracking of environmental program requirements.

Stony coral: marine corals which generate a hard skeleton and includes all reef corals.

Sustainable landscape management practices: standards set by the latest Executive Orders, Marine Corps Orders, and related regulations regarding sustainable landscape management including: preferential use of regionally native plants, pollution prevention practices through minimization of fertilizer/pesticide use, recycling landscape trimmings, and control of invasive plant species.

Threatened species: any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, as defined in the Endangered Species Act.

Vulnerability assessment: climate change vulnerability assessments typically determine (1) the sensitivity of a species or system to changes in the climate, (2) the level of exposure to change, and (3) the adaptive capacity of the species or system, in the context of existing threats.

Water quality: a set of parameters that describes the physical, chemical and biological condition of a water body.

Watershed: an area where rain and other water drains to a common location such as a river, lake, or wetland. A "watershed" is one of the functional units of ecosystem-level concern most useful for land use and resource managers. (USEPA 1997).

Watershed approach: a framework to guide watershed management that: (1) uses watershed assessments to determine existing and reference conditions; (2) incorporates assessment results into resource management planning; and (3) fosters collaboration with all landowners in the watershed. (UFP for a Watershed Approach to Federal Land and Resource Management, 65 FR 65266 of Oct 18 2000).

Watershed assessment: an analysis and interpretation of the physical and landscape characteristics of a watershed using scientific principles to describe watershed conditions as they affect water quality and aquatic resources. (UFP for a Watershed Approach to Federal Land and Resource Management, 65 FR 65266 of Oct 18 2000).

Watershed condition: the state of the watershed based on physical and biogeochemical characteristics and processes (e.g., hydrologic, geomorphic, landscape, topographic, vegetative cover, and aquatic habitat, water flow characteristics and processes (e.g., chemical, physical, and biological) as it affects water quality and water resources (UFP for a Watershed Approach to Federal Land and Resource Management, 65 FR 62566 of Oct 18 2000).

Wetlands: those areas that have a predominance of hydric soils, that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Jurisdictional wetlands are those that have been formally delineated in accordance with U.S. Army Corps of Engineers wetland delineation procedures.

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APPENDIX J
REFERENCES

This appendix contains citations for references included in this 2016 MCBH INRMP Update. In addition, the Environmental Department maintains a bibliographic database to support the MCBH natural resources management program (COA 7.7).

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