



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 22 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,

A handwritten signature in blue ink, appearing to read "Kristi Young".

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.	<p>Develop Biosecurity Plan (STEP – in planning)</p> <ul style="list-style-type: none"> 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. 	<p>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.</p>

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.	<p>Bird Surveys (Routine Management)</p> <ul style="list-style-type: none"> Semiannual Hawai'i DLNR waterbird survey (Nu'upia Ponds and other MCBH wetlands) 	<p>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</p>

	<ul style="list-style-type: none"> Annual Hawai'i Audubon Society sponsored Christmas Bird Count, (all bird species on MCBH, including the red-footed boobies in Ulupa'u Crater) 	actions.
	<p>Wedge-tailed Shearwater Monitoring (Routine Management)</p> <ul style="list-style-type: none"> Annual census of occupied wedge-tailed shearwater burrows. 	<p>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.</p>
	<p>Avian Botulism Monitoring (Routine Management)</p> <ul style="list-style-type: none"> Hawaiian waterbirds that utilize the MCBH WRF (and other sites nearby) will be closely monitored during summer months for symptoms of avian botulism. 	<p>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.</p>
	<p>Endangered Hawaiian Hoary Bat Survey (STEP – programmed)</p> <ul style="list-style-type: none"> Survey protocols would include multiple visits and utilize both acoustic surveys and visual detection. 	<p>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.</p>
	<p>Inventory and Study the State Endangered Hawaiian Owl (STEP – programmed)</p> <ul style="list-style-type: none"> Procedures would be developed regarding how to protect, promote, and monitor the owl in concert with Hawai'i DLNR DOFAW and USFWS. 	<p>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.</p>
	<p>Endangered Waterbirds Study – Nu'upia Ponds and MCTAB (STEP – programmed)</p> <ul style="list-style-type: none"> The last time a focused study at 	<p>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</p>

	<p>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.</p>	<p>Hawaiian waterbirds, including any actions (e.g., military operations, recreational activities) that occur around their habitats and may impact the species.</p>
	<p>Flyway-Flight Pattern Analysis of Migratory and Endangered Birds – MCBH Kaneohe Bay (STEP – programmed)</p> <ul style="list-style-type: none"> 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). 	<p>This project is necessary to support future construction plans or introduction of different aircraft systems.</p>
	<p>Non-Native Invertebrate and Vertebrate Pest Species Management Study (STEP – in planning)</p> <ul style="list-style-type: none"> 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. 	<p>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).</p>
	<p>Terrestrial Invertebrates Survey and Recommendations for Management – MCBH Kaneohe Bay and MCTAB (STEP – in planning)</p>	<p>An inventory of terrestrial invertebrates will support conservation of native species and control of invasive species. Confirmation of locations where <i>Hylaetus anthracinus</i> are present will help avoid inadvertent take of the species. Management actions to protect</p>

		<p>native species or combat invasive species will be identified.</p>
<p>Objective 7.1.2: Manage and enhance wildlife species and their habitat.</p>	<p>Activity Analysis (Routine Management)</p> <ul style="list-style-type: none"> 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. 	<p>Benefits all native species (listed and nonlisted) by limiting disturbance caused from authorized and prohibited human activity.</p>
	<p>Feral and Nuisance Animal Control (Routine Management)</p>	<p>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).</p>
	<p>Invertebrate Pest Control (Routine Management)</p>	<p>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.</p>

	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) <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 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.

	<p>boobies to alternative locations around Ulupa'u Crater.</p> <p>Repair/Replace Artificial Nesting Platforms for Migratory Birds in Ulupa'u Crater (STEP – programmed)</p> <ul style="list-style-type: none"> 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. 	<p>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.</p>
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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
<p>Objective 7.2.1: Identify, delineate, characterize, and monitor wetlands.</p>	<p>Wetland Inventory and Delineation – Nu'upia Ponds and MCTAB (STEP – programmed)</p>	<p>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.</p>
<p>Objective 7.2.2: Implement wetland management and enhancement opportunities.</p>	<p>Wetland Restoration Plan – MCBH Kaneohe Bay and MCTAB (STEP – in progress)</p> <ul style="list-style-type: none"> 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. 	<p>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.</p>

	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) <ul style="list-style-type: none"> 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.
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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.	<p>Monitoring of Military and Recreational Exercises (Routine Management)</p> <ul style="list-style-type: none"> 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. <p>Coastal and Marine Resource Survey – MCBH Kaneohe Bay (STEP – in planning)</p> <ul style="list-style-type: none"> 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 	<p>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.</p> <p>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.</p>

	<p>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.</p>	
	<p>Biological Study of Nu'upia Ponds (STEP – in planning)</p> <ul style="list-style-type: none"> • 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. 	<p>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.</p>
	<p>Shoreline Assessments to Address Erosion (STEP – in planning)</p> <ul style="list-style-type: none"> • 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. 	<p>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.</p>
	<p>Develop Climate Change Vulnerability</p>	<p>Natural Resources staff can use this information to help decide</p>

	Assessments (STEP – in planning)	<p>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.</p>
Objective 7.4.2: Manage and enhance coastal and marine biological resources and geophysical conditions.	<p>Marine Resources Protection Initiatives (Routine Management)</p> <ul style="list-style-type: none"> 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. 	<p>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.</p>
	Marine Debris Removal (Routine Management)	<p>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.</p>
	<p>Invasive Marine Species Removal (Routine Management)</p> <ul style="list-style-type: none"> 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 	<p>The removal of invasive species preserves marine habitat and features utilized by green turtles and prey species of MBTA protected seabirds.</p>

	priorities, and available personnel allow.	
	<p>Marine Protected Species Management and Response (Routine Management)</p> <ul style="list-style-type: none"> Natural Resources staff respond and direct others in the event protected marine species occur in MCBH coastal areas. 	<p>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.</p>
	<p>Coral Reef Mitigation (Routine Management)</p> <ul style="list-style-type: none"> 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) 	<p>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).</p>

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.	<p>Invasive Vegetation Inventory and Management Plan (STEP – programmed)</p> <ul style="list-style-type: none"> The inventory will support the development of vegetation management strategies. The field-based inventory will cover five 	<p>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).</p>

	<p>properties and training areas: Kāneʻohe Bay, Waikāne Valley, Camp Smith, Puʻuloa RTF, and Pearl City Annex; MCTAB was inventoried in 2006.</p>	
<p>Objective 7.5.2: Take a sustainable approach to managing and enhancing natural and man-made landscapes.</p>	<p>Plant Trees at KBRTF (Routine Management)</p> <ul style="list-style-type: none"> • 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 (<i>Myoporum sandwicense</i>), and naupaka (<i>Scaevola sericea</i>)). • Tree planting is performed in conjunction with creating and maintaining artificial nesting platforms at KBRTF. 	<p>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.</p>
	<p>Invasive Vegetation Control Activities: Mud Ops (Routine Management)</p> <ul style="list-style-type: none"> • Annual Mud Ops event to help control invasive pickleweed (<i>Batis maritima</i>) and enhance Hawaiian stilt habitat. 	<p>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.</p>
	<p>Invasive Vegetation Control: Weed Warriors (Routine Management)</p> <ul style="list-style-type: none"> • Target invasive plants include: mangrove (<i>Rhizophora mangle</i>), 	<p>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 Nuʻupia Ponds WMA.</p>

	<p>silver buttonwood (<i>Conocarpus erectus</i>), ironwood, koa haole, kiawe, Christmasberry, plucheia (<i>Plucheia</i> spp.), and Guinea grass (<i>Megathyrsus maximus</i>).</p>	
	<p>Invasive Vegetation Control: Sea Grape (Routine Maintenance)</p> <ul style="list-style-type: none"> • Sea grape (<i>Coccoloba uvifera</i>), 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 Kāneʻohe Bay. 	<p>Benefit to nesting wedge-tailed shearwater, eggs and chicks.</p>
	<p>Invasive Vegetation Control: Fountain Grass and Fireweed (Routine Management)</p> <ul style="list-style-type: none"> • Fountain grass (<i>Cenchrus setaceum</i>), Fireweed (<i>Senecio madagascariensis</i>), and Devilweed (<i>Chromolaena odorata</i>) surveys, including opportunistic identification of other unknown/undiscovered plants, are conducted biannually to identify and remove incipient populations at MCTAB. 	<p>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.</p>
	<p>Invasive Vegetation Control: H3-Kāneʻohe Bay (STEP – programmed)</p> <ul style="list-style-type: none"> • This project will remove and maintain approximately seven acres of invasive vegetation along the Kāneʻohe Bay shoreline. 	<p>Encroachment of invasive vegetation (e.g., mangrove, kiawe, Christmasberry, koa haole, Guinea grass) on a strip of land located between H-3 and the Kāneʻohe Bay shoreline, has deleterious effects on Nuʻupia Ponds and other wetlands throughout the Kāneʻohe Bay ecosystem. This project would help provide better water quality and habitat for endangered Hawaiian waterbirds and MBTA species that utilize Nuʻupia Ponds.</p>

	<p>Invasive Vegetation Control: Nu'upia Ponds and Base Wetlands (STEP – programmed)</p> <ul style="list-style-type: none"> Control of invasive species that are encroaching on trails and unimproved roads in and around Nu'upia Ponds WMA. 	<p>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.</p>
	<p>Maintenance and Repair of KBRTF Water Cannons Supporting Migratory Bird 25 Conservation (STEP – programmed)</p> <ul style="list-style-type: none"> 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. 	<p>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.</p>
	<p>KBRTF Fire Suppression System (STEP – in planning)</p> <ul style="list-style-type: none"> 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- 	<p>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.</p>

	up irrigation system.
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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
<p>Objective 7.6.1: Inventory and monitor public engagement activities and their potential impact on natural resources.</p>	<p>Recreational Use Assessment: Beaches of MCBH Kaneohe Bay (STEP – in planning)</p> <ul style="list-style-type: none"> Will focus on MCBH Kane’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. 	<p>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.</p>
	<p>Recreational Fishing Survey (STEP – in planning)</p> <ul style="list-style-type: none"> 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, 	<p>Repeating surveys over time provides managers with information to engage in adaptive management.</p>

<p>Objective 7.6.2: Promote and enhance opportunities for public engagement in natural resource management-related activities.</p>	<p>following an approach similar to and building upon baseline data gathered in 2002 (Carnevale and Allen 2011).</p> <p>Planned Base or Community Events (Routine Management)</p> <ul style="list-style-type: none"> 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”). 	<p>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.</p>
	<p>Educational Materials (Routine Management)</p> <ul style="list-style-type: none"> 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 interpretive information and often work together to develop these materials. 	<p>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.</p>
	<p>Signs/Exhibits (Routine Management)</p> <ul style="list-style-type: none"> 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. 	<p>Informs the public regarding sensitive natural resources that are present within the vicinity and about unacceptable and harmful behavior to avoid.</p>

	<p>Outreach Coordinator (STEP – programmed)</p> <ul style="list-style-type: none"> • 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). 	<p>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).</p>
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	<p>Environmental Learning Center (STEP – in planning)</p> <ul style="list-style-type: none"> An underutilized room in the building would be the hub of the learning center with the hallways containing professionally produced wall displays. 	<p>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.</p>
	<p>Nu’upia Ponds Recreational Running Trail Signage (STEP – in planning)</p> <ul style="list-style-type: none"> Some signs have already been fabricated but, due to staff shortage and heavy workload, have not yet been installed. 	<p>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.</p>
	<p>MCTAB TA-1 Educational Material (STEP – in planning)</p>	<p>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.</p>

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
<p>Objective 7.7.2: Improve natural resources information and data.</p>	<p>Natural Resources Database Management (Routine Management)</p> <ul style="list-style-type: none"> New databases are developed as needed. 	<p>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.</p>