

**2020 SECRETARY OF DEFENSE ENVIRONMENTAL AWARD**  
**NATURAL RESOURCES CONSERVATION – SMALL INSTALLATION**  
**MARINE CORPS BASE HAWAII**

**INTRODUCTION AND BACKGROUND**

**Mission, Population, Acreage, Geographic, and Community Setting:** Marine Corps Base (MCB) Hawaii encompasses 4,500 acres within five parcels on the Island of O’ahu, and a 12-acre parcel on Moloka’i. On “leeward” O’ahu, we manage buildings and grounds at 220-acre Camp H. M. Smith; 162-acre Pu’uloa Range Facility; 27-acre Pearl City Warehouse Annex; and 63-acre Manana Housing Area. The remaining three parcels composing 90% of MCB Hawaii’s acreage are found on “windward” (eastern side) O’ahu--MCB Hawaii, Kaneohe Bay (KBay) on 2,951-acre Mokapu Peninsula; 1,074-acre Marine Corps Training Area Bellows (MCTAB) in Waimanalo, and a 187-acre portion in Waikane Valley. KBay and MCTAB parcels contain the highest concentration of natural resources under MCB Hawaii jurisdiction, with 11 threatened/endangered marine and terrestrial species requiring focused management attention. MCB Hawaii’s mission is to provide forward-based, sustainable and secure training and operational support, facilities, and services to enable Operational Forces to accomplish their mission. We support over 24,000 personnel - Marines, Sailors, family members, civilian/contract employees using base service facilities. Additionally, another several thousand Marines and family members are expected to arrive on MCB Hawaii in the near future, which will bring even more challenges to balancing the sustainability of our natural resources with supporting the military mission.

Hawaii is the world’s most isolated land mass, with distinctive evolution and biological diversity, but has become imperiled by habitat loss, recreation, and introduced invasive species; 434 threatened and endangered species are found in Hawaii, which does not include highly vulnerable rare species. This region is a dramatic tropical landscape, with steeply-contoured drainage basins from Ko’olau mountain peaks to off-shore reefs of Kane’ohe, Kailua, and Waimanalo Bays.

**MCB Hawaii (KBay) Mokapu Peninsula Context:** Mokapu peninsula is 75% flat, supporting the “built environment”, with 20% being coastal sand dunes, wetlands, and beaches. There are 3 volcanic features: Ku’au (Pyramid Rock), Pu’u Hawai’i’loa, and Ulupa’u Crater—whose 683-foot head is the highest point on Base. MCB Hawaii is bordered on the east by Kailua Bay, north by the Pacific, and south/southwest by Kane’ohe Bay and the Nu’upia Ponds. Adjacent Kailua and Kane’ohe communities contain a combined population of 73,579 residents (2016 statistic). We enforce a 500-yard Naval Defensive Sea Area around our 11-mile peninsular coastline. Adjacent bays host corals (two rare species), threatened green turtles and endangered hawksbill sea turtles, endangered Hawaiian monk seals, state seabird island sanctuaries, and public recreation. MCTAB is sandwiched between Waimanalo Bay and the town of Waimanalo, a rural community of small farm lots, native Hawaiian homesteads, and parks along O’ahu’s largest white sand beach.



Amphibious Assault Vehicles (AAVs) from KBay utilize MCTAB’s critical beach for landing maneuvers - the only convenient, cost effective Hawaii amphibious training location. MCTAB supports - non-live fire ground maneuvers, helicopter insertion/parachute and heavy equipment operators training, visiting Marine Expeditionary Units (MEUs), civil defense exercises, law enforcement agencies, and a 48-acre tenant training facility run by Hawaii Army National Guard. Military trainers use MCTAB’s south shoreline on weekdays. Weekend public beach access is licensed by the City & County (C&C) of Honolulu. Adjacent Bellows Air Force Station also supports military recreation.

**Significant Natural Resources and Features** – Many stunning landscapes, seascapes, and shoreline natural resources are under our jurisdiction, all rich in Hawaiian culture, military history, and biological diversity.

**Wildlife Management/Wetland Areas** – Together, MCB Hawaii’s KBay and MCTAB properties support 133 acres of jurisdictional wetlands. About 112 of these acres are a component of the 517-acre Nu'upia Ponds Wildlife Management Area (NPWMA) on KBay. The NPWMA hosts 5% of the endangered Hawaiian stilt population and about 15% of the endangered Hawaiian coot population along with two other endangered waterbirds (Hawaiian moorhen, and Hawaiian duck). Over 50 species of native and migratory birds (resident and visiting) have been recorded here and/or at several other smaller coastal and inland freshwater wetlands. KBay hosts about 12 acres of coastal wetlands along our Kane’ohe Bay-facing shoreline, and about 6 acres of inland, freshwater wetlands. They all perform valuable stormwater retention and biofiltration roles as well as provide bird and fish habitat. MCTAB has 2.2 wetland acres located along Waimanalo stream, where waterbirds and native aquatic fish are found. The Nu'upia Ponds supports 16 native fish species. Also, wedge-tailed shearwater seabirds have colonized the eastern shoreline of Nu’upia Ponds WMA, with over 900 active burrows identified (2018 count). Our 25-acre Ulupa'u Head WMA, located in the heart of the KBay Range Training Facility (RTF), an active weapons firing range, hosts one of only two red-footed booby seabird colonies in the main Hawaiian Islands, supporting over 2,000 birds.



**Diverse Coastal and Marine, Flora and Fauna** - Sea cliffs and coastal sand dunes at KBay support native strand vegetation treasured in Hawaiian folklore and gathering traditions. In 2008, two endangered ‘Ohai plants (*Sesbania tomentosa*) were discovered, self-established within a native plant community along Nu’upia Ponds WMA’s eastern shoreline - the first sighting here since the 1930s. MCBH is the only Marine Corps installation with coral reef resources. Mokapu's 500-yard Naval Defensive Sea Area, a.k.a, the security buffer zone around the peninsula, contains a dozen native coral species, native algae, reef fish, limpets, cowries, culturally important seaweeds, and native seagrass beds that support rare sea horses and threatened Hawaiian green turtles. Coastal waters support transiting spinner dolphins, federally-protected humpback whales, and the critically endangered Hawaiian monk seals who routinely haul out on MCBH beaches to rest. Over the last ten years we have documented nesting success of threatened Hawaiian green turtles and a rare nesting event of a threatened Olive-Ridley turtle, normally found in waters around Mexico and in the Indian Ocean.

**Organization and Staffing** - The base Environmental Compliance and Protection Division (ECPD) is comprised of a Marine Corps Lieutenant Colonel (O-5) as Director, GS-13 civilian Deputy Director, and over 40 military, civilian, and contracted environmental professionals. The natural resources staff within the Conservation section consists of a GS-12 program manager/senior natural resources manager; GS-11 natural resource manager; and GS-9 biological science (wildlife) technician. For most of the award period, the GS-9 bioscience technician position was vacant. The natural resources team works closely with other ECPD staff in overlapping program areas (conservation law enforcement, NEPA, clean air/water, solid/hazardous waste management, cultural resources, environmental management, spill response, recycling, pollution prevention, and geographic information system applications). Off-base partners include US Fish & Wildlife (FWS), National Oceanic and Atmospheric Administration (NOAA)-Fisheries, US Geological Survey (USGS), Hawaii Department of Land and Natural Resources (DLNR), US Department of Agriculture (USDA) Wildlife Services, O’ahu Invasive Species Committee, University of Hawaii (UH), Sierra Club, contractors, and volunteers.

**MCB Hawaii's Integrated Resources Management Plan (INRMP)** – Since 2001, when MCBH completed our first INRMP in accordance with the Sikes Act, it has guided our ecosystem-based approach to natural resource management that supports quality of life and “no net loss” in military training options. There have been three succeeding 5-year updates since 2001. During the past two years (2018-2019) of INRMP implementation, MCBH completed over \$835,000 worth of discrete management actions. INRMP management actions are within seven “courses of action” categories: wildlife, wetlands, watershed, coastal and marine resources, landscape maintenance and vegetation management, outdoor recreation/outreach/public access, and resource information management

### **PROGRAM SUMMARY/OUTSTANDING ACCOMPLISHMENTS (FY18-FY19)**

**INRMP Program/Progress Summary** – We successfully executed 50% of the management actions programmed to occur during the timeframe of this awards submission. A total of 8 out of 16 discrete management actions listed in the 2017-2021 INRMP Update are on-going, started, in-progress, or completed by the end of FY19. Some actions were implemented ahead of schedule while some optional action opportunities were pursued that were unforeseen at the time of the 2017 Update. Some less critical actions were deferred in order to address existing and emergent priorities. Overall, our INRMP is being implemented on time and within budget.

**Outstanding Highlights - Integrated Natural Resources Management Program** - Our INRMP is a "living" document, continuously improving through adaptive management after completion of each action, stakeholder input, and environmental project evaluation. Highlighted below are key management actions or events that were completed, are on-going or initiated in each of the seven INRMP categories during FY18 – FY19.

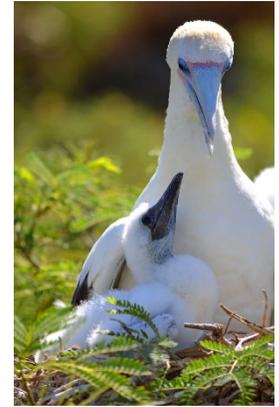
**Wildlife Management** – Wildlife Management Areas on Kaneohe Bay would be unable to support the protected bird diversity without regular control of both invasive plants and vertebrate/invertebrate predators. Due to the year-round growing season that supports non-native invasive plants and the fecundity of the introduced vertebrate species (cats, rats, mongoose), constant and on-going management actions are required.

Annual, supervised amphibious assault vehicle (AAV) “Mud Ops” training has been conducted in MCB Hawaii’s coastal wetlands, just before endangered Hawaiian stilt nesting season, since the 1970s. This annual training/habitat management breaks-up non-native invasive pickleweed flats that encroaches upon endangered stilt nesting/foraging grounds; this event also hones AAV operator skills. This enduring partnership supports bird conservation while enhancing combat readiness, resulting in favorable publicity and community good will; while also contributing to the survivability of the Hawaiian stilt whose numbers consistently average 100 birds as confirmed through three annual waterbird surveys.



Our contract with USDA Wildlife Services is a vital component to controlling feral, domestic, and nuisance animal populations that threaten our vulnerable wildlife and plants, provide a safe training environment, and reduce the spread of animal-borne diseases. USDA Wildlife Services has been invaluable in protecting our four endangered waterbirds, our tree and ground nesting seabirds, and endangered plants from feral (rats, mongoose, pigs) and domesticated (cats) predators. During the award period, 150 cats, 276 mongoose, and 275 rats were removed from the two wildlife management areas, wetlands, and peripheral areas.

In 2017, a 5-year seabird social attraction study was initiated on the Kaneohe Bay Range Training Facility, home to over 2000 Red-footed boobies, with the assistance of the Fish and Wildlife Service (FWS). In 2018, 150 decoys were installed on supports and trees in two areas of the WMA safe from bullets and fire. Recorded audio calls accompanied the decoys to entice boobies roosting and nesting close to the impact area of the range and threatened by fires resulting from training activities, to move to safer locations on the Range. At the same time, some roosting trees located in the most hazardous areas of the WMA were removed under the auspices of FWS and 30 seabirds utilizing the trees were banded to track their movements. Encouraging results from camera images have captured young boobies actively roosting near the trees with the decoys.



Working with the US Geological Survey (USGS), in FY18 audio surveys were initiated on all MCBH properties and determined we have endangered Hawaiian hoary bat activity on four of our properties. Currently, because the potential exists for bats to forage and roost in trees within our training areas, we have to consult with the USFWS for tree removal. This two year study will provide granularity on bat presence, with the expectation to reduce unnecessary Section 7 consultations and better define our management requirements.

For the last two years, we have partnered with the University of Hawaii (UH) as part of an island-wide (Oahu) study of the secretive State-listed Hawaiian short-eared owl, known as the Pueo. MCBH entered into a cooperative agreement in 2019 with UH to do a more in-depth two-year study. UH has obtained all FWS and State permits and provides post-doctoral field researchers and student interns to determine population size, distribution, and habitat use. UH already identified at least two nesting pairs that utilize the Nu’upia Ponds WMA with a total population of 8-10 pueos. Gaining advance knowledge of this raptor species will prepare MCBH should the pueo become federally listed.

MCBH’s wedge-tailed shearwater colony continues to thrive along the eastern shoreline of the base within the Nu’upia Ponds WMA. Invasion of an invasive ant, predation (feral & domestic), and human activity negatively impact this gentle ground-nesting seabird. In 2006, FWS helped identify a treatment to reduce ant numbers, predator trapping was increased, and fencing and signage has controlled unauthorized human access. Since 2009 FWS and the State of Hawaii Oahu Invasive Species Committee field crews have voluntarily supported annual burrow counts of the colony. From a low of less than 150 active burrows a decade ago, the colony has grown to over 900 active burrows (2018 census); however, continued trapping of predators and close monitoring of the ants is required to suppress resurgence of these populations.



Since the discovery of the exceptionally large influx of endangered Hawaiian coot to the Nu’upia Ponds – Pa’akai and Kaluapuhi, in December 2018, counts have remained around 250-270 coots. Because of this ten-fold increase in coots, funding has been requested in FY20 to conduct a two-year study to gain a better understanding of the coot’s daily and seasonal movements, its breeding biology and life history, nesting range, and population structure. The study will include GPS tracking and banding of a small subset of the population. Due to the large population and with nesting occurring, areas of the ponds that were once prepared by AAV actions for the Hawaiian stilt, were avoided in 2019. The Study will also include gathering as much information on the few endangered Hawaiian gallinule whose population only averages 15 birds during yearly counts.

In 2018, MCBH began development of a Wildland Fire Management Plan (WFMP) to evaluate and develop plans to control fire on its ranges and all areas within or adjacent to burnable acreage. The Kaneohe Bay Range Training Facility (KBRTF) has incurred most of the wildland fires over the years. The most critical component for combatting fires on the Range are four wireless remotely operated water cannons strategically installed in the Red-footed booby colony located in the northern section of the Range. For years, fires started during training evolutions threatened this colony of over 2000 federally-protected seabirds. The cannons are the heart of a robust defense strategy, which includes low-profile fire hydrants, fuel and firebreaks, artificial nesting structures, and a concrete road to support firetrucks. The water cannons are strategically placed near vulnerable roosting/nesting trees where vegetation, terrain and winds would push fires.



In 2016, the FWS added seven Hawaiian bee species to the endangered species list, a first for bees. Native to Hawaii, the yellow-faced bees is facing extinction due to loss of shoreline vegetation and invasive species, e.g., ants. The O’ahu based Army Garrison natural resources program “loaned” MCBH their entomologist to survey our shorelines in 2016-2017; one of the endangered Yellow-faced bee species (*Hylaeus anthracinus*) was discovered along the entire north and east shorelines of the Mokapu peninsula; it inhabits a very narrow band of vegetation that borders MCBH beaches heavily used for recreation and military training. In 2018, UH included MCBH as part of a multi-site study to install bee “hotels” along the shoreline to try and increase their numbers. After a lag of seven months, nesting activity has finally been observed in the tubing of the hotels (see photo to the right). Nesting has been relatively successful in the blocks when they are not parasitized by a non-native wasp.



**Marinelife Management**

- In June 2019, a trained Environmental volunteer discovered threatened green turtle nesting activity on the base’s eastern shoreline on Ft Hase beach in the same area one was documented in 2015; over the next several weeks (June - mid-July) six more nesting episodes occurred; in total, seven nest sites were discovered. The nest sites were marked off and periodically monitored by volunteers. 70 days after date eggs were estimated to have been laid and the turtles hatched and departed, nest excavations were conducted with the support of biologists from U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries. NOAA collected samples of failed embryos for genetic testing. Due to the dunes containing ancient Hawaiian remains, the excavation required Sec 106 consultation. Of the seven nest sites, three were determined to have had viable nests and one was not excavated. Based on the results of nest excavations, at least 163 turtles hatched on a MCBH beach with a total combined 66% emergence success.



**Coastal and Marine Resources Management** – The geology of most coastlines in Hawaii is characterized by outcropping volcanic bedrock, lithified tephra (ash), and carbonate deposits. Beach erosion is a foreboding trend of shoreline change in Hawaii. It is the result of intense residential and commercial development that has hardened shorelines or caused a significant loss of vegetation that would normally reduce shoreline

vulnerability from marine inundation, flooding and drainage problems, storm surge, and sea-level rise (climate change).

Marine Corps Base Hawaii is currently the only Marine Corps base with extensive coral resources. Over the course of the last ten years we have completed coastal and marine resources surveys involving quantitative/qualitative investigations of the waters surrounding MCBH Kaneohe Bay and Marine Corps Training Area Bellows (MCTAB). The surveys were carried out by a FWS-led interagency team that included top Hawaii marine biologists from the USGS, NOAA Fisheries, and the State Department of Land and Natural Resources, Division of Aquatic Resources (DLNR/DAR). All surveys characterized the benthic conditions, photo-documented the underwater features and associated marinelife, and produced sensitivity maps for incorporation into the base Geographic Information System (GIS).



The final marine surveys were completed in 2018 that covered an ocean area 1-mile x 1.5 miles of ocean seaward of MCTAB. This crucial survey provided a picture of the underwater environment, so in-water training and ship-to-shore movements can be conducted in a manner that won't impact the marine resources, thus avoiding incidents that could shut down training.

At the Pu'uloa Range Training Facility located on the southern shores of O'ahu, a shoreline erosion environmental assessment (EA) was completed in FY2019 and the FONSI was signed in Nov 2019 to evaluate the proposed mitigation measures that may be taken to forestall further shoreline loss of the training area's beach and shoreline and protect impact berms critical to training Marines in marksmanship. Over 25 feet of shoreline has eroded away in the last 5 years; the erosion of the shoreline has already reached the backside of lead-filled impact berms that supports small arms training. Mitigation may take the form of installing subsurface sheet piling, restoring the vegetated shoreline, and moving some ranges back approximately 100-ft from the shoreline.

**Wetland Management** – MCBH KBay has nine wetlands - the Nu'upia Ponds complex and eight smaller wetland pockets located on historical estuarine of marshlands. The smaller wetlands were either created for storm water retention or are located in low-lying fill areas along the Mokapu shoreline where wetland conditions have evolved. Due to Hawaii's year-round growing season and the introduction of non-native invasive plant species, many of the wetlands are degraded to a point they no longer adequately support endangered species habitat and their flood control capabilities have been compromised. We have embarked on a multi-year plan to reinvigorate and restore these wetlands.

In FY2018, we completed a 35% design for two of the wetlands determined to be the most productive when restored; funds have been requested to complete the 100% design and complete a biological assessment for the endangered waterbirds we expect to utilize the restored wetlands. Innovative planning to utilize the salinity of sea water to control much of the invasive grasses and aquatic plants is being incorporated into the plans. Once restored these two wetlands will have a fresh and saltwater component that will support endangered waterbirds with nesting habitat, capture freshwater run-off, and survive sea level rise that will eventually inundate other coastal wetlands.

**Natural Resources Access/Educational Outreach/Outdoor Recreation Management** - Providing public access to/outreach about Base natural resources is a Sikes Act requirement to be accomplished in such manner

as to not compromise security, military training, or resource conservation. In 2018, a two person staff coordinated 12 service projects, five wildlife management tours, nine natural resources briefs to military units and civilian employees, involving 1164 military and civilian participants. Military service members and civilians from environmental organizations and the University of Hawaii (UH) volunteered to conduct natural resources management actions. Hawaii chapter Audubon Society bird counts have been hosted for over 6 decades. Collaborative bi-annual State waterbird counts have been conducted each year for over 25 years. For the last 10 years, we have partnered with UH on projects involving wildlife and marine surveys. These enduring partnerships testify to sustained program bonds with the community.

In FY2019, MCBH contracted outreach services dedicated to promoting natural resources protection, preservation and awareness, which involves making contact with tenant commands, Public-Private Venture Housing, MCCS organizations, Military Police, schools, and more. This extra capability ramped up our educational outreach and allowed us coordinate 14 service projects, conduct 10 wildlife management tours, 11 outreach events, post 12 conservation articles posted on the MCB Hawaii homepage, provide 40 natural resources briefs, and accomplish 7 natural resources conservation actions involving 8451 participants – eight times more than we reached in 2018. Additionally, the outreach specialist developed numerous new educational pamphlets and updated old ones. This gave the natural resources website a fresh look and updated information that can be readily accessed by the base population and off-base community.

**Recreational Resource Management** - MCB Hawaii provides public access to ocean/coastal resources within operational, environmental, and security constraints. The public is sponsored on base by families and for special events (e.g., surfing & body boarding competitions). The island community enjoys weekend access to MCTAB's training area along the beach under a licensing agreement with City & County of Honolulu, who manages weekend use. Marathon running/biking contests at KBay include access to scenic coastlines without disturbing native vegetation, wildlife nesting, or native Hawaiian burial grounds.

In 2019, after a hiatus of two years, recreational archery hunting for feral pigs at Marine Corps Training Area Bellows (MCTAB) was resurrected and put under the responsibility of the Conservation Law Enforcement Officers to manage. This activity is performed in conjunction with USDA Wildlife Services to reduce the number of pigs within the training area. The Sikes Act mandates that hunting programs be consistent with the conservation of natural resources and that public access is provided, subject to safety and military security requirements. It was critical to ensure this recreational program does not interfere with training or readiness. Although MCTAB has a limited capacity for hunters, and limited available days and times due to training, this program will provide a previously unavailable recreational hunting opportunity while enhancing invasive species control efforts.



## **CONCLUSION**

The Marine Corps Base Hawai'i Environmental Compliance & Protection Division is dedicated to meeting and exceeding expectations; *Continual Improvement in Pursuit of Excellence is Our Goal*.

Effective and efficient natural resource management by sustained INRMP implementation ensures MCB Hawaii can support combat readiness through protection and stewardship of the natural resources entrusted to our care. We appreciate the opportunity to share our team's accomplishments with you. Mahalo.