APPENDICES

ENVIRONMENTAL ASSESSMENT

for

SHORELINE STABILIZATION

at

PUULOA RANGE TRAINING FACILITY, OAHU, HAWAII

August 2019

Appendix A

Endangered Species Act Section 7 and Magnuson-Stevens Act Documentation

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UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/059-18
AUG 0 3 2018

Mary Abrams, Ph.D.
Field Supervisor
U.S. Fish and Wildlife Service
Pacific Islands Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

Dear Dr. Abrams,

SUBJECT: SECTION 7 INFORMAL CONSULTATION FOR THE PUULOA SHORELINE STABILIZATION PROJECT MARINE CORPS BASE HAWAII

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) and its implementing regulations [50 CFR Part 402], Marine Corps Base Hawaii (MCBH) requests informal consultation related to the proposed shoreline stabilization project at Puuloa Range Training Facility (PRTF) for long term range sustainment. MCBH proposes to protect the range from continuing shoreline erosion that could compromise its use. Elements of this project include facilities setback, sheet pile installation, and vegetation restoration.

MCBH has developed this Biological Evaluation (BE) to assess the potential impacts to the green turtle (*Chelonia mydas*) listed as threatened under the Endangered Species Act (ESA). Based on the evaluation presented in this BE, MCBH has made an assessment that the proposed shoreline stabilization project may affect, but is not likely to adversely affect the green turtle. MCBH requests your concurrence with our finding based on the provided BE.

Please direct correspondence regarding this matter to Lance Bookless, MCBH Senior Natural Resources Manager at lance.booklessl@usmc.mil or 808-257-7000.

Sincerely,

T. B. POCHOP
Lieutenant Colonel, U.S. Marine Corps
Director, Environmental Compliance and Protection
Division, Facilities Department
By direction of the Commanding Officer

Enclosure: 1. Biological Evaluation for the Proposed Shoreline Stabilization Project at Puuloa Range Training Facility Puuloa, Ewa, Oahu

Biological Evaluation for the Proposed Shoreline Stabilization Project at Puuloa Range Training Facility Puuloa, Ewa, Oahu

Prepared by:
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258 Makalapa Dr., Suite 100
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July 2018

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1.0 Introduction and Details of the Action

1.1 Background

Erosion, shoreline recession, and sand migration have been noted at Puuloa Range Training Facility (PRTF) Puuloa, Ewa Beach, Oahu for many years. Marine Corps Base Hawaii (MCBH) natural resources manager began addressing these issues in 1998 by planting vegetation along the shoreline to capture sand fronting PRTF. This restoration functioned until 2014, when waves steepened the slope of the beach and undercut 90% of the vegetation.

Directly east of the property is the Kapilina residential area where the shoreline has receded 300 feet in the last 60 years. Shoreline loss prompted the Iroquois Point beach nourishment and stabilization project, completed in 2013, which consists of nine T-head groins. The nearest groin to the action area is 500 feet to the east of the PRTF boundary. Shoreline profiles surveyed one year after project completion showed an accumulation of sand in the groins and growth of the beach. However, the shoreline at PRTF currently appears to have an increase in erosion fronting ranges A, B, and F.

Figure 1.0 Current shoreline conditions. Left: Range A looking west. Right: east boundary of PRTF, looking east.

1.2 Purpose and Need for the Action

The project would initiate actions to mitigate coastal erosion at the Puuloa Range Training Facility. The need for the action is to ensure long-term sustainability of the heavily used range for training and equipping combat-capable forces. It is also congressionally mandated for the U.S. Marine Corps (USMC) to perform range management sustainment under Marine Corps Order P3550.10. The action is expected to commence as soon as funding becomes available.

1.3 Proposed Action

The action area is located on the southern coastline of Oahu, west of the Pearl Harbor entrance channel. The neighboring properties are Kapilina residential area and Ewa Beach Park. The action at Puuloa would consist of a combination of shoreline stabilization, setback of ranges, and revegetation, to prevent damage to the property and range berms. Sheet piling would be installed on the ocean end of ranges A and B, directly against the range backstop berms. Ranges C through F would be set back from the shoreline, to protect them from current shoreline erosion and potentially negating the need for shoreline protection. Native coastal strand vegetation would be planted along the shoreline as feasible. Sheet pile would be installed against the range backstop berm, landward of the unimproved road fronting the berm, where ever the road exists at the time of project implementation. The sheet pile is intended to be buried below the foot of the applicable range backstop berm, with no more than approximately 12 inches extending above the beach surface. The sheet pile is proposed to wrap-around the western boundary of Range A, as well as around the eastern boundary of Range B, to provide erosion protection at the ends of the berms. Ranges C through F would be set back an estimated 100 feet. Setback of any of the four short-distance ranges would require relocation of existing backstop berms, some structures, and utilities.

1.4 Species Addressed in this Biological Evaluation

Section 7(a)(2) of the Endangered Species Act states, "Each Federal agency shall, in consultation with and with the assistance of the Secretary of the Interior, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species." To "jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species [50 CFR §402.02].

Based on the MCBH Integrated Natural Resources Management Plan endangered species list for PRTF, the only ESA-listed species that may be affected within the action area and is therefore covered in the scope of this BE is the green turtle (**Table 1**).

Table 1. Species and affects determination covered under this consultation.

Common Name	Scientific Name	ESA Status	Affects Determination
Green turtle*	*Chelonia mydas*	Threatened	May affect, not likely to adversely affect

* This BE addressed the potential effects of the proposed action on nesting sea turtles. A separate BA is being prepared to address potential impacts to sea turtles in the marine environment that are under the jurisdiction of the National Marine Fisheries Service (NMFS).

1.5 Species Eliminated from Detailed Analysis

Other ESA species were considered as part of this BE, but are not further addressed because it was determined that there would be no effect from the proposed action. Historical data shows that the Hawksbill turtle (*Eretmochelys imbricate*) does not use the beach fronting PRTF for nesting and/or hauling out. This analysis concluded a "no effect" and thus the Hawksbill turtle has been eliminated from further analysis. Impacts to the Hawaiian monk seal (*Monachus schauinslandi*) in the water or on the beach, and sea turtles in the water, will be the subject of separate consultation with the National Oceanic and Atmospheric Administration (NOAA).

2.0 Details of the Proposed Action

Ranges C through F, would be set back approximately 100 feet from the shoreline to minimize future erosion and shoreline retreat. Physical components of the ranges would be moved, but the general dimensions and capacity of each affected range would remain essentially the same. Primary elements of the short ranges include the impact berm, side berms, firing line/shooting house, target assembly facilities, and parking area. Space permitting, a pre-existing unimproved access road on the shore side would be replaced or reconstructed fronting ranges C-F. The unimproved road would be used for security patrols, access, and a buffer between the shore and berm. Components of the range are illustrated in **Figure 2.1**. Material from the existing berm would be moved by bulldozer to build the new ranges.

Sheet pile fronting Ranges A-B would be installed on the berm side of the existing unimproved road. The pile would wrap-around the west and east edges of the berms, as appropriate, to provide erosion protection at the ends of the berms. Cross-sectional/end view illustration of the sheet pile installation is shown in **Figure 2.2**.

Figure 2.1 Critical elements of the proposed action.

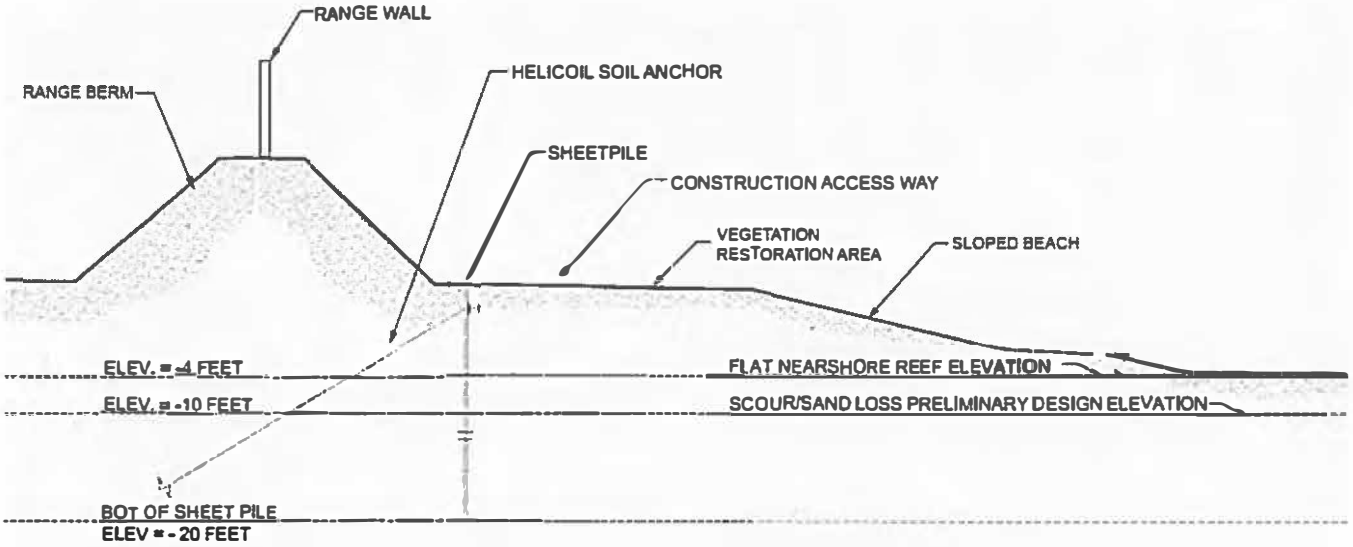

Figure 2.2 Sheet Pile Construction Conceptual Cross- Section Illustration

2.1 Site Preparation and Construction

An impact hammer would be the most-likely method used to drive sheet pile into the bedrock at 20 feet deep. Pile driving would be restricted to the upper shoreline. No in-water work is anticipated. Noise in-air from sheet pile driving is anticipated to be between 97-98 dB rms from 50 feet (NMFS 2015). Construction work would only occur on fast land. Noise is not expected to be transferred from land into the ocean. All construction would be done during the day and no night construction is anticipated to occur, and therefore, no lighting would be necessary.

After construction and sheet pile installation, shoreline vegetation would be planted in the construction site and along the shoreline. Vegetation restoration would extend along the entire PRTF shoreline using native species to the maximum extent practicable. It would include ground preparation, planting, temporary irrigation and maintenance. Restored vegetation would be installed over a bio-degradable erosion-control fabric. To minimize man-made erosion over time, protective fencing and walkways may also be installed. These solutions should discourage further development of informal paths.

2.2 Operation and Maintenance

Vegetation fronting the berms would be irrigated, and once established, watering would be used infrequently. It is expected that, eventually, irrigation would be eliminated completely, as the plantings adapt to the environment. Irrigation lines would be removed after plant establishment. The unimproved access road fronting the berm would be used for operation and security patrols.

Security personnel would be posted at both ends of the range to monitor unauthorized entry into the facility from the beach while the range is open. Range personnel are also required to report the presence of sea turtles to MCBH Natural Resources Managers and security patrols if turtles are on the beach/shoreline vegetation. MCBH Natural Resources Managers will educate security personnel on how to identify sea turtles and their tracks. Night lighting is not planned for the project and the ranges are closed during the night.

2.3 Best Management Practices (BMP)

The following measures would be implemented at the project site to avoid and minimize effects to sea turtles:

- The construction project manager shall designate at least one staff lookout that is approved by MCBH Environmental Office to monitor the shoreline and beaches adjacent to the proposed action for sea turtles.

• During construction, monitoring surveys shall be conducted prior to the start of each work day, and prior to resumption of work following any break of more than one- half hour, and every 2 hours throughout the day.
• The presence of any sea turtles on the shoreline will be reported to MCBH Natural Resources managers via the Range Office. Natural Resources Staff will record the sighting in their data base.
• All work shall be postponed or halted if an ESA-listed marine species is sighted within 150 feet (50 yards) of the proposed work, and/or if the ESA-listed species appears disturbed by construction activity regardless of distance, and shall only begin/resume after the animal(s) have voluntarily departed the area.
• All personnel will stay more than 100 feet (45.5 meters) from sea turtles that haul out on the beach.
• No work shall be performed within 100 feet of a known or suspected nesting turtle.
• Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available. In the event of a hazardous material spill, the Environmental Department will be immediately notified and standard remediation measures implemented.
• 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 100 feet away from the water, preferably over an impervious surface.
• Turbidity and siltation from project-related work runoff shall be minimized and contained through the appropriate use of erosion control practices, and effective silt containment devices. Work will be ceased or restricted during adverse weather and tidal/flow conditions.
• Landscaping will be consistent with the MCBH Base Landscape Manual; copies are available through the Environmental Department. Native vegetation will be used to the extent practicable to re-vegetate the site.

3.0 Endangered Species within the Action Area

3.1 Green Turtles Legal Status, Ecology, and Current Known Range

In 1978, green turtles were listed under the Endangered Species Act (USFWS, 1978, 2001). In most U.S. jurisdictions, green turtles were listed as threatened, except in Florida (and Pacific Mexico), where breeding populations were listed as endangered. In 2015, a petition was filed by the Association of Hawaiian Civic Clubs to re-classify green turtles in Hawaii as a distinct population segment (DPS) and to de-list them from ESA protection. Although the FWS determined that Hawaiian green turtles did constitute a DPS, they did not find justification to de-list them, and the species remained listed as threatened. Despite global population decline,

the Hawaiian DPS is closer to recovery than anywhere throughout the turtles' range (Balazs and Chaloupka 2004a, Chaloupka and Balazs 2007).

The green turtle is the largest hard-shelled sea turtle, with adults commonly exceeding 3.5 ft (1 m) in carapace length and 220 lb (110 kg) in weigh. The term "green" refers to the color of the turtle's subdermal fat and not to the external coloration. Adult carapaces range in color from solid black to gray, yellow, green, and brown in muted conspicuous patterns; the plastron is a much lighter yellow to white. Hatchlings are distinctively black in the dorsal surface and white on the ventral, and the carapace coloration changes as the turtle grows from a hatchling to an adult (NMFS and USFWS 1998).

The recognition that Hawaiian green turtles are a DPS is supported by a number of findings that have implications for conservation and management. The typical life cycle for green turtles outside Hawaii includes a prolonged coastal and open water juvenile phase, a phase within nearshore areas where they grow and mature, and an adult phase marked by long reproductive migrations to natal beaches, often crossing multiple international jurisdictions. Green turtles take 27-50 years to reach sexual maturity, the lengthiest age to maturity for any sea turtle species. Adult females migrate to breed once every 2 or more years, while adult males often migrate on an annual basis. However, in Hawaii, most green turtles stay within the Hawaiian Archipelago where they feed in the main Hawaiian Islands and nest in the Northwestern Hawaiian Islands at French Frigate Shoals (Balazs et al., 1994). Another unique feature of the Hawaiian green turtle DPS is that they haul-out onto shorelines to bask (passively increasing body temperature).

3.1.1 Threats

Major threats to green turtles worldwide are the loss of nesting and foraging habitat due to increased coastal development and human presence, direct harvesting turtles and eggs for food, nest predation, and by-catch from commercial fishing. While understanding impacts from harvesting a long-lived and slow-to-mature species is more straightforward, understanding the impacts of loss in habitat can be more complicated. Nesting habitat may be lost or degraded through erosion control measures (armoring and beach nourishment), and by invasions of non-native vegetation that can restrict access. Additionally, artificial lighting on the coastline may act as a deterrent to nesting females and could lethally disorient hatchlings. Foraging habitat can be degraded through impaired water quality (sedimentation and/or pollution via storm water runoff), or by direct impact to the physical structure (breakage of limestone features that provide refugia) and biological features (change in community structure affecting food source availability). Floating ocean debris such as nets, fishing line, and plastics can entangle turtles

and drown them. Entanglement in lost or discarded fishing gear is the second leading cause of strandings and mortality in the main Hawaiian Islands (USFWS NMFS 2016).

3.1.2 Species Base Line Conditions at Puuloa

Beach sightings or stranding data for sea turtles was requested from NOAA via the stranding data base from 2011 to 2016 (Report number IR-17-017D, Shawn Murakawa). No data was available for the beach fronting PRTF, but beached turtles did occur at Kapilina residential area east of the range complex and at Ewa Beach Park, indicating that turtles could beach at PRTF. In the report, turtles were beached due to stressors such as fishing gear entanglement, Fibropapillomatosis, shark attack, boat impact, and other, unknown reasons. In some cases, it is unknown if turtles were present on the beach to bask, or due to a stressor. Although not recorded at the beach fronting PRTF, the presence of green turtles there is plausible. The beach fronting PRTF may be less favorable for turtles to bask due to the steep beach slope. Security monitors for PRTF have documented only one occurrence of a turtle hauled out on the beach, in 2012 (MCBH Range Manager pers comm). Nesting attempt during this event was not observed.

3.1.3 Critical Habitat

In July 2016, the USFWS and NOAA notified the DOD that they were required to designate critical habitat for green turtles in the listing of Central North Pacific turtles as a threatened DPS. The shoreline of Puuloa was a candidate area for critical habitat designation. In discussions to designate critical habitat, conservation measures were described and justification to preclude designation was accepted by the USFWS. Measures described in the 2017 INRMP include reporting turtle occurrences and preventing unauthorized access to the beach by beach guards (USMC 2017). Additionally, the beach is eroded, very narrow, and the impact berm blocks turtle use.

4.0 Analysis of Potential Effects to the Green Turtle

This section presents an analysis of direct and indirect effects on federally listed species from implementation of the action. Direct effects are the direct or immediate effects of the project on the species or its habitat. Indirect effects are those that are caused by the proposed action and are later in time, but are reasonably certain to occur (e.g., attraction of predators due to development and human presence).

As they relate to the federally listed species and critical habitat considered in this BE, direct and indirect effects from proposed activities within the action area have been evaluated herein based upon: (1) an understanding of the methods and equipment that would be used during construction and operation of facilities, (2) knowledge of the potential for such methods and

equipment to disturb the natural resources on which the subject species depend, and (3) awareness of the types of effects that have resulted from similar actions in the past.

4.1 Direct Physical Impacts

The use of heavy equipment for the proposed action has the potential to become a strike hazard for sea turtles within the action area. Direct physical impact to sea turtles can be severe, especially on land, and can lead to death. Beached turtles have occurred on properties next to PRTF and it is possible that green turtles could haul out on the beach fronting PRTF during construction. However, the beach fronting PRTF may be less favorable to turtle haul-out due to the steep beach slope. The BMPs described in Section 1.6 will be used to avoid direct physical impacts from heavy equipment.

Given the low occurrence of turtles at the beach and regular monitoring surveys that will be conducted during construction as described in the BMP, direct strike of green turtles during the use of heavy equipment is unlikely to occur and exposure to this stressor is discountable. MCBH has determined that physical impacts from equipment may affect, but is not likely to adversely affect green turtles.

4.2 Exposure to Elevated Noise Levels During Construction

The effects of noise on marine animals vary with frequency, intensity, and duration of the source of the sound and hearing characteristics of the animal. The proposed action will install sheet pilings by hammering, which will introduce high intermittent noise levels into the terrestrial environment. Sea turtle hearing is poorly understood; however the best available information suggests that sea turtles can hear low frequencies between 200 and 700 hertz (Ridgway et al., 1969). Generally, sea turtles react to seismic signals at levels between 166-179 dB re 1µPa (Moein et al., 1995; McCauley et al., 2000). Noise is considered to be the most likely factor to disturb sea turtles as a result of the proposed action.

As a BMP, MCBH has established a safety distance of 150 ft between turtles and the construction in order to avoid noise disturbance (see section 2.3). If an ESA-listed species is detected within 50 yards (150 feet), or if it appears disturbed by construction, work shall be postponed or halted. This measure will reduce the exposure of turtles to elevated noise levels. Activities would begin after the animal(s) has voluntarily departed the area. As mentioned earlier, sound exposure at 50 feet from the impact pile driving would be 98 dB. If a turtle is 150 feet from the action, the decibel level should be less than 90 dB. Sea turtles could move to adjacent areas where sound levels are reduced. However, this would cause the turtle to use more energy moving across the shoreline. As a general rule for sea turtle protection, all personnel will stay more than 100 feet from sea turtles. As a result of these measures, MCBH

has determined that exposure to noise during the proposed action may affect, but is not likely to adversely affect green turtles.

4.3 Exposure to Sedimentation, Wastes, and Discharges

Construction of new berms and ground disturbance could increase storm water runoff and increase the potential for green turtles to experience direct or indirect impacts from sedimentation, wastes, and discharges from the facility. Construction BMPs would ensure that runoff is contained on-site during construction to protect water quality in nearshore waters adjacent to the PRTF shoreline. Also, any accidental hazardous waste spills would be contained and prevented from entering the marine environment. During construction the waterfront would be protected by silt fences and/or erosion control coir logs to prevent runoff during rainfall. Trash generated would be contained to prevent it from blowing onto the beach or into the ocean. Therefore, exposure to increased runoff carrying sediment, waste, and discharge may affect, but is not likely to adversely affect the green turtle because effects would be insignificant.

After installation of the sheet pile the shoreline would be revegetated to minimize further shoreline erosion. Specific trails to access the shoreline would be established within the revegetated shoreline. Patrol and facility vehicles would be restricted to the established vehicle path to minimize further erosion.

5.0 Conclusion of Impacts to Green Sea Turtles

In this Biological Evaluation, MCBH examined the potential impacts from noise disturbance, physical impact, and exposure to waste and discharge to the green turtle. Best management practices are incorporated into the proposed action (section 2.4) to avoid impacts or reduce the risk toward the species. Noise from pile driving has the potential to disturb green turtles. However, turtles may not hear in the decibel range of pile driving. Based on the impact analysis, MCBH has made the determination that the action may affect, but is not likely to adversely affect green turtles within the shoreline of PRFT. MCBH request USFWS concurrence on this determination.

6.0 Works Cited

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2018-I-578
5090
LE/059-18

September 24, 2018

Lieutenant Colonel T. B. Pochop
U.S. Marine Corps
Director, Environmental Compliance and Protection Division
Facilities Department
Marine Corps Base Hawaii
Box 63002
Kaneohe Bay, Hawaii 96863-3002

Subject: Informal Consultation for the Puuloa Shoreline Stabilization Project, Marine Corps Base Hawaii, Ewa, Oahu

Dear Lieutenant Colonel Pochop:

The U.S. Fish and Wildlife Service (Service) received your letter on September 4, 2018, requesting our concurrence with your determination that the proposed Puuloa Shoreline Stabilization Project may affect, but is not likely to adversely affect the federally threatened green sea turtle (*Chelonia mydas*) Central North Pacific Distinct Population Segment. The proposed project is located at the Puuloa Range Training Facility (PRTF) on the southern coastline of Oahu in Ewa Beach.

The PRTF is a heavily used range to train and equip combat-capable forces. Erosion, shoreline recession, and sand migration have been documented at PRTF for many years. Several projects have been undertaken to address these issues, however, the shoreline at PRTF continues to show an increase in erosion fronting the range. The purpose of the project is to ensure the long term sustainment of the range by protecting it from continued shoreline erosion.

Our findings and recommendations in this consultation are based on your incoming letter and other information available to us. A complete administrative record is on file in our office. Our response is in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq*.).

Project Description

The project involves a combination of actions: shoreline stabilization, setback of ranges, and revegetation. Shoreline stabilization involves installing sheet piling against the range backstop berms on the ocean side of Ranges A and B. The sheet pile will be buried below the foot of the applicable range backstop berm, with no more than approximately 12 inches (30

centimeters) extending above the beach surface. The sheet pile is proposed to wrap-around the western boundary of Range A, as well as around the eastern boundary of Range B, to provide erosion protection at the ends of the berms. An impact hammer would most likely be used to drive sheet pile into the bedrock to a depth of 20 feet (ft.) (6 meters). Pile driving would be restricted to the upper shoreline.

For the setback of ranges, Ranges C through F would be set back approximately 100 ft. (30 meters) from the shoreline to minimize future erosion and shoreline retreat. Physical components of the ranges would be moved, but the general dimensions and capacity of each affected range would remain essentially the same. Physical components of the short ranges include: the impact berm, side berms, firing line/shooting house, target assembly facilities, and parking area. Space permitting, a pre-existing unimproved access road on the shore side would be replaced or reconstructed fronting Ranges C through F. The unimproved road would be used for security patrols, access, and a buffer between the shore and berm. Material from the existing berm would be moved by bulldozer to build the new ranges.

All construction would be done during the day and no night construction is anticipated therefore, no lighting would be necessary. No in-water work is anticipated. After construction and sheet pile installation, shoreline vegetation would be planted in the construction site and along the shoreline. Vegetation restoration would extend along the entire PRTF shoreline using native species to the maximum extent practicable. It would include ground preparation, planting, temporary irrigation and maintenance.

Green sea turtle
Green sea turtles may nest on any sandy beach area in the Pacific Islands and exhibit strong nesting site fidelity. Nesting occurs on beaches from May through September, peaking in June and July, with hatchlings emerging through November and December.

Construction on, or in the vicinity of, beaches can result in sand and sediment compaction, sea turtle nest destruction, beach erosion, contaminant and nutrient runoff, and an increase in direct and ambient light pollution which may disorient hatchlings or deter nesting females. Off-road vehicle traffic may result in direct impacts to sea turtles and nests, and also contributes to habitat degradation through erosion and compaction.

To avoid and minimize potential project impacts to green sea turtles the following will be implemented as part of the project:

- The construction project manager shall designate at least one staff lookout that is approved by Marine Corps Base Hawaii (MCBH) Environmental Office to monitor the shoreline and beaches adjacent to the proposed action for sea turtles.
- During construction, monitoring surveys shall be conducted prior to the start of each work day, and prior to resumption of work following any break of more than one-half hour, and every 2 hours throughout the day.
- The presence of any sea turtles on the shoreline will be reported to MCBH Natural Resources managers via the Range Office. Natural Resources Staff will record the sighting in their data base.

- All work shall be postponed or halted if an ESA-listed marine species is sighted within 150 ft. (46 meters) of the proposed work, and/or if the ESA-listed species appears disturbed by construction activity regardless of distance, and shall only begin/resume after the animal(s) have voluntarily departed the area.
- All personnel will stay more than 100 ft. (30 meters) from sea turtles that haul out on the beach.
- No vehicles will be used on the beach during the sea turtle nesting or hatching season (May to December).
- No work shall be performed within 100 ft. (30 meters) of a known or suspected nesting turtle.
- Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available. In the event of a hazardous material spill, the Environmental Department will be immediately notified and standard remediation measures implemented.
- 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 100 ft. (30 meters) away from the water, preferably over an impervious surface.
- Turbidity and siltation from project-related work runoff shall be minimized and contained through the appropriate use of erosion control practices, and effective silt containment devices. Work will be ceased or restricted during adverse weather and tidal/flow conditions.
- Landscaping will be consistent with the MCBH Base Landscape Manual; copies are available through the Environmental Department. Native vegetation will be used to the extent practicable to re-vegetate the site.

Analysis of Effects

Green sea turtles have been documented to nest and may bask on the shoreline within the vicinity of the proposed project area. By incorporating the above avoidance and minimization measures for green sea turtles, crushing of nests, eggs, and adults and/or disorienting of hatchlings or nesting females are not probable, and therefore discountable. Because effects from the action are discountable, the proposed project is not likely to adversely affect green sea turtles.

Summary

Based upon the above, we concur that the proposed action may affect, but is not likely to adversely affect the green sea turtle. Unless the project description changes, or new information reveals that the action may affect listed species in a manner or to an extent not considered, or a new species or critical habitat is designated that may be affected by the proposed action, no further action pursuant to section 7 of the ESA is necessary.

We appreciate your efforts to conserve protected species. If you have questions regarding this letter, please contact Leila Nagatani, Fish and Wildlife Biologist (phone: 808-792-9400, email: leila_nagatani@fws.gov). When referring to this project in correspondence or emails, please include the following reference number: 01EPIF00-2018-I-0578.

Sincerely,

Aaron Nadig

Digitally signed by Aaron Nadig
Date: 2018.09.24 06:17:12 -10'00'

Island Team Manager
Oahu, Kauai, Northwestern Hawaiian Islands and American Samoa

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
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LFE-044-19
MAR 2 9 2019

Michael Tosatto
Regional Administrator
National Marine Fisheries Services
Pacific Islands Regional Office
1845 Wasp Boulevard, Building 176
Honolulu, Hawaii 96818

Dear Mr. Tosatto:

SUBJECT: EFFECTS OF THE PUULOA RANGE TRAINING FACILITY SHORELINE STABILIZATION PROJECT ON PROTECTED SPECIES AND ESSENTIAL FISH HABITAT, EWA BEACH, HAWAII

Pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 USC § 1531 et seq.), the Navy requests concurrence from National Marine Fisheries Service (NMFS) on determination of effects to ESA-listed species from proposed shoreline stabilization activities at the Puuloa Range Training Facility (PRTF) in Ewa Beach, Hawaii. The United States Marine Corps (USMC), which proposes to complete this action, makes this request. The Navy has determined that the species listed pursuant to the Endangered Species Act (ESA) that may occur in the action area are the Hawaiian monk seal (*Neomonachus schauinslandi*), the hawksbill sea turtle (*Eretmochelys imbricata*), and the Central North Pacific distinct population segment (CNP DPS) of the green sea turtle (*Chelonia mydas*). The shoreline and marine waters at PRTF are not designated as Hawaiian monk seal critical habitat. This letter also requests your concurrence to fulfill Navy's requirements to consider the impacts of its actions on Essential Fish Habitat (EFH) as required by the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1801 et seq.). The proposed shoreline stabilization activities are described below. The accompanying document in Enclosure 1 "Analysis of the Effects of the Puuloa Range Training Facility Shoreline Stabilization Project on Protected Species and Essential Fish Habitat, Ewa Beach, Hawaii" describes the proposed action and the Navy's analysis and rationale in greater detail.

The USMC proposes to initiate measures to mitigate coastal erosion of fast land in order to protect existing range structures (impact berms at the PRTF), Puuloa, Ewa Beach, on the south central shore of Oahu. The purpose of the proposed action is to protect existing range structures, such as impact berms, from impacts of advancing erosion and sea level rise. The need for the proposed action is to ensure long-term sustainability of the heavily used range for training and equipping combat-capable forces ready to deploy worldwide. Measures of the proposed action include installation of a subsurface structure (i.e., sheet pile) inland from the shoreline, behind the fast-land access road which fronts the two long-distance ranges. In addition, the four short-distance firing ranges would be retreated from the shoreline to the maximum distance practicable. Revegetation of available fast land areas fronting all ranges would also occur, as feasible. The proposed action would be expected to commence when funding becomes available.

The sheet pile to be installed would be primarily a sub-surface structure, emerging a few inches to a few feet above the surface of the ground. The preferred location of the sheet pile is on the berm

side of the existing fast-land unpaved road fronting the long-distance ranges. The sheet pile is proposed to wrap-around the eastern and western boundaries of the long-distance ranges, in order to provide erosion protection at the ends of the berms. Increased erosion and scouring may occur when active waves reach the sheet pile in the event of future sea level rise and erosion; however, the proposed installation location currently is fast land, above the tidal influence. To avoid an abrupt end of the proposed sheet pile, it would be angled away from the shoreline at both the west and east ends. This "rounding off" of the proposed sheet pile would minimize potential impacts to adjacent shorelines, and would protect the sheet pile from erosion working its way back behind the structure. The end of the proposed sheet pile would end well short of the west installation boundary; the boundary would be an estimated 230 feet from the west end of the proposed sheet pile. This buffer area would further serve to mitigate any potential future impacts to adjacent shorelines. Sheet pile would be installed using either a vibratory or impact hammer, with impact hammer being the most likely method. The proposed construction activities would take place during the daytime, generally on weekdays, for approximately six months in duration.

The four short-distance firing ranges would be retreated from the shoreline to the maximum distance practicable, possibly 100 feet or more. To the maximum extent practicable, the earthen materials that comprise the existing range berms would be moved and reused to form the new berms for the retreated ranges, but additional soils and/or fill may be required to ensure that the relocated range berms provide the necessary coverage of the retreated ranges. To the extent possible earthwork would be balanced to maintain existing drainage patterns. Retreat of the ranges would require the relocation of all physical components of the ranges to be retreated, but the general dimensions and capacities of the ranges would remain the same.

Revegetation of available fast land areas fronting the entire range would also occur, as feasible, facilitating retention of sand and reducing erosion. Shoreline vegetation restoration and landscape repair - utilizing principally native species to the maximum extent practicable - would be included in any areas damaged by the sheet pile construction, including an area extending at least 15 to 20 feet on either side of the proposed sheet pile if space allows. Vegetation restoration would extend along the entire PRTF shoreline, beyond the limits of the proposed sheet pile. Restored vegetation would be installed over a bio-degradable erosion-control fabric. To minimize manmade erosion over time at the training facility, the proposed action may include landscape treatment consisting of planting, protective fencing, and walkways. These solutions would establish traffic control for beach users, reducing erosion from foot traffic, and discourage development of informal paths. Best Management Practices (BMPs) and proposed adaptive management as discussed in this letter, and as detailed in Enclosure 1, would serve to reduce impacts from potential stressors to ESA and EFH.

The Navy's Determination Regarding ESA:

Hawaiian monk seals and green sea turtles could potentially be present in the action area. A species not considered further due to the low likelihood to occur in the action area is the hawksbill sea turtle; the Navy has determined that the action will have no effect on this species. Stressors which may affect ESA-listed species include acoustic and visual disturbance from construction activities, exposure to sedimentation, waste, and discharge during construction, and habitat loss stemming from shoreline changes.

Hawaiian monk seals or green sea turtles may exhibit brief behavioral responses to the visual or acoustic disturbance from construction activities. BMPs, as detailed herein, and in Enclosure 1, will

ensure that potential responses would be limited to transient responses, such as looking and returning to previous activity, which would not be significant to the individual or population. Personnel shall remain alert for marine mammals and sea turtles before and during construction. If marine protected species are seen, information will be recorded on the species, numbers, behavior, time of observation, location, start and end times of project activity, sex or age class (when possible), and any disturbances (visual or acoustic) by the construction project. During all construction activities, surveys shall be made by qualified personnel prior to the start of work each day, and prior to resumption of work following any break of more than one half hour, checking for protected species presence, and also disturbance to the beach indicative of nighttime sea turtle nesting. A minimum distance of 150 feet will be maintained from ESA-listed species, and a distance of 300 feet will be maintained in the presence of a monk seal mother/pup pair. Work will be postponed or halted if ESA-listed species are observed within those radii from active operations, and would not resume until 30 minutes has elapsed since the sighting in the applicable area. In addition, the USMC will use the 100 dB (reference 20 µPa) threshold to determine a disturbance threshold for monk seals should they occur in the project area, however, this is expected to be a smaller radius than the 150-foot radius which will be maintained from the animals; the larger of the two exclusion zones, either 150-foot or the 100 dB re 20 µPa will be employed.

ESA-listed species could also be affected by exposure to sedimentation, wastes, and discharge during construction. However, BMPs will be employed requiring a contingency plan to control toxic materials, and also requiring that materials needed for cleaning up any spills would be stored on site. Equipment will be checked for potential leaks, and refueling of equipment would occur at least 100 feet away from the shore, 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. If turbidity is likely to result from construction activities, silt curtains shall be used to contain turbidity to the minimum area possible. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project. Due to the use of appropriate BMPs, the Navy has determined that exposure to sedimentation, wastes, and discharge during construction will not significantly impact ESA-listed species.

Relocation of the short-distance ranges would serve to protect the ranges, while also benefiting 900 feet of beach habitat. The short-distance ranges would be retreated the maximum distance practicable, possibly 100 feet, from the shore, which would provide space for natural replenishment of the beach in the event of future erosion or sea level rise. In addition, revegetation would occur across the entire range, approximately 3,000 feet of shoreline, facilitating sand retention, and reducing erosion. Sheet pile is proposed to be installed in front of 1,500 feet of shoreline fronting the long-distance ranges because relocation of the long-distance ranges is not currently feasible. Sheet pile is a reflective structure which could exacerbate erosion and shoreline loss when in the active wave zone. However, the location in which the sheet pile is to be installed is behind the existing fast land access road in front of the long-distance ranges, and above the current tidal influence. Adaptive management proposed involves continued assessments of the shoreline, and would facilitate further discussions between USMC and NMFS if sea level rise or erosion brings the active wave zone into regular contact with the existing access road fronting the long-distance range berms.

The shoreline and waters of PRTF are not classified as critical habitat for monk seals, and there is a discountable chance of shoreline changes as a result of the proposed action impacting critical habitat present in Ewa Beach west of PRTF, since there is about 230 feet of beach between the area

proposed for sheet pile installation and the boundary of the critical habitat designated area at Ewa Beach

The Navy requests your concurrence with our determination that the proposed action *may affect but is not likely to adversely affect Hawaiian monk seals and the Central North Pacific distinct population segment of the green sea turtle because the effiects,if any, will be discountable or insignificant, and the action will not adversely modify Hawaiian monk seal critical habitat.* The Navy requests your concurrence with our determination that the proposed action will result in *no effiectto hawksbill sea turtles.*

The Navy's Determination Regarding EFH:

EFH is present in the waters off PRTF, but the area is not within a Habitat Area of Particular Concern (HAPC). Potential stressors from the proposed action may include water quality changes, sediment transport, and exposure to sedimentation, waste and discharge during construction. As further detailed in Enclosure 1, BMPs to be employed in order to minimize potential impacts include the use of silt containment devices, a contingency plan to control toxic materials, a plan for prevention of debris and waste from entering or remaining in the water, inspection of equipment for leaks, and a minimum refueling distance from the water of 100 feet over an impervious surface.

Revegetation and relocation of the short-distance ranges would result in a benefit to water quality. Revegetation would occur across the entire range as feasible, and would improve sand retention, reduce erosion and sediment transport laterally along the shoreline, and improve water quality. The short-distance ranges span across about 900 feet of shoreline, which would benefit from the removal of the earthen impact berms from what may be the active wave zone in the event of future sea level rise and erosion.

Sheet pile fronting around 1,500 feet of shoreline along the long-distance berms may result in scouring of the beach at the base when it is in active wave action, resulting in transport of sand laterally and back out to sea which may exacerbate erosion and reduce water quality. However, the sheet pile would prevent the lead-filled earthen impact berms from eroding into the sea with associated sediments and potential contaminants until sea level rise and erosion brings the active wave zone high enough so as to wash over or past the sheet pile in the distant future. Adaptive management proposed would involve continued monitoring of the shoreline, and continued discussions between the USMC and NMFS at an unknown point in the future in which the active wave zones could begin regularly contacting the fast land fronting the proposed location for the sheet pile.

The nearshore environment of PRTF is not conducive to successful coral recruitment, due primarily to the movement of sand. The shoreline is fronted by a wide and shallow fringing reef. Sediment transport in the area occurs primarily by a west to east longshore current. Approximately one mile to the east of the project site is the 1,000-foot-wide and 50-foot-plus-deep Pearl Harbor entrance channel. A shoreline erosion engineering study at PRTF found that bottom conditions seaward of the existing shoreline consist primarily of a hard limestone (fossil calcareous reef rock) substrate that underlies the entire project reach. Over the limestone are various combinations of sand deposits, coral rubble and cobbles, and reef rock outcrops. Bottom surface composition is approximately 40% sand, 40% rubble (gravel, cobbles, rocks, debris), and 20% hard limestone reef rock. The sand is typically a light sand veneer, but also fills depressions in the hard substrate. No

living corals were observed along a recent profile swim, detailed in the engineering study, which extended approximately 150 feet from the shore. Sessile growth observed was comprised mainly of soft algae on the fossil reef complex. Surveys for nearshore marine biological resources in the western portion of the Iroquois Point area, immediately east of PRTF, documented a "wave scoured sand bottom with sparsely distributed small limestone outcrops covered by algal growth but with few other organisms present," and no fish were observed.

Due to the lack of biota such as coral and fish in the area, the use of BMPs which would reduce potential impacts, and adaptive management which would involve monitoring future shoreline changes and facilitate future discussions in the event that wave action does begin regularly contacting the fast land fronting the sheet pile, *the Navy has determined that water quality changes, sediment transport, and exposure to sedimentation, waste and discharge during construction may affect EFH, but that the effects will be minimal and insignificant.* During construction operations, *BMPs will be used to minimize and avoid effects to EFH.*

Thank you for your consideration of our request for your review and concurrence. Please feel free to contact us if you have any questions or wish to discuss the proposed action or marine resources. If you need additional information, please contact Ms. Angela Bostwick, NAVFAC Pacific at (808) 472-1426, angela.bostwick@navy.mil or Lance Bookless, Marine Corps Base Hawaii at (808) 257-7000, lance.bookless1@usmc.mil.

Sincerely,

T. B. POCHOP
LtCol, U. S. Marine Corps
Director, Environmental Compliance and Protection Division
By direction of the Commander

Enclosure: 1. Analysis of the Effects of the Puuloa Range Training Facility Shoreline Stabilization Project on Protected Species and Essential Fish Habitat Ewa Beach, Hawaii

Analysis of the Effects of the PUULOA RANGE TRAINING FACILITY SHORELINE STABILIZATION PROJECT on Protected Species and Essential Fish Habitat Ewa Beach, Hawaii



Prepared by:

Naval Facilities Engineering Command, Pacific

Prepared for:

United States Marine Corps

February 2019

Table of Contents

1. OVERVIEW

The United States Marine Corps (USMC) proposes to initiate measures to mitigate coastal erosion of fast land in order to protect existing range structures (impact berms at the Puuloa Range Training Facility [PRTF]), Puuloa, Ewa Beach, on the south central shore of Oahu (Figure 1). Measures of the proposed action include installation of a subsurface structure (i.e., sheet pile) on fast land inland from the shoreline, behind the access road which fronts the two long-distance ranges. In addition, the four short-distance firing ranges would be retreated back from the shoreline to the maximum distance practicable. Revegetation of available fast land areas along the entire range would also occur, as feasible. The proposed action would be expected to commence when funding becomes available. The shoreline and marine waters at PRTF are not designated as Hawaiian monk seal critical habitat. Endangered protected species under NMFS jurisdiction which could potentially present on the coastline of the range include Hawaiian monk seals, and in the nearshore waters, hawksbill sea turtles. Threatened species potentially present include the Central North Pacific distinct population segment of the green sea turtle. Sea turtles along the shoreline have been addressed in a separate consultation with United States Fish & Wildlife Service (USFWS). Essential fish habitat present along the coast of the range does not include any Habitat Areas of Particular Concern (HAPC).

Figure 1. Puuloa Range Training Facility is located in Ewa Beach, Hawaii.

2. BACKGROUND AND PURPOSE AND NEED FOR PROPOSED ACTION

PRTF is required for maintenance of small arms proficiency by U.S. Armed Forces personnel, as well as for law-enforcement personnel from many other agencies, and is the only range of its kind on Oahu. The purpose for the proposed action is to protect existing range structures, such as impact berms, from impacts of advancing erosion and sea level rise. The need for the proposed action is to ensure long-term sustainability of the heavily used range for training and equipping combat-capable forces ready to deploy worldwide.

The ocean area along the PRTF shoreline is located within the Pearl Harbor Naval Defensive Sea Area NDSA. PRTF is approximately 165 acres in size and stretches along about 3,000 feet of sandy shoreline. It consists of six small-arms ranges of different known distances for pistols, rifles up to 7.62 mm, and shotguns (Figure 2). Ranges A and B on the west end are "long-distance" ranges configurable to varying distances to a maximum of 1,000-yards (Range A) and 600 yards (Range B), and their ocean end consists of large earthen berms with concrete barrier walls on top (Figure 3). The other four ranges (C, D, E and F) are shorter rifle and pistol ranges from 150 to 250 feet in length, with earthen berms along the beach.

Figure 2. PRTF contains two long-distance ranges (A, B) and four short-distance ranges (C-F).

Figure 3. The ocean side of the long-distance ranges consists of tall earthen berms with concrete barriers on top.

Periods of erosion and shoreline recession at PRTF have been noted over many years. In recent years, MCBH addressed erosion issues of PRTF's fast land in 1998, and a successful restoration of vegetation, which included irrigation, was performed in the year 2000. This restoration functioned until about 2014, when increasing erosion led to a steepening of the slope and undermining of approximately 90% of the vegetation. Beginning immediately east of the range at Keahi Point, the west end of the Kapilina residential area, the shoreline had been chronically and severely eroding for more than 60 years, with 300 feet of shoreline recession occurring in the vicinity of Keahi Point. The erosion prompted the construction (mid-2013 completion) of the Iroquois Point beach nourishment and stabilization project, which included construction of nine T-head groins along the beach to the east of the PRTF area. The nearest groin to the project area is located about 500 feet east of the PRTF boundary.

A series of shoreline profiles were surveyed beginning in 2003 for the Iroquois Point beach nourishment project. Some of these profiles are located along the PRTF shoreline: the west PRTF boundary, between Ranges B and C, and the east PRTF boundary. Profiles were surveyed in December 2003 and August 2006. These same locations were resurveyed in March 2014 for the Puuloa Shoreline Erosion Study, thus providing a 10-year quantitative record of shoreline

change. Permit conditions for the Iroquois Point beach project require 10 years of post-construction beach performance monitoring including a series of shoreline profiles. Three profile locations are in the vicinity of PRTF – range A, range E/F boundary, and the west side of a rock groin were surveyed in June and November 2013, and June 2014. A summary of the monitoring data for all of the beach profiles is provided in Table 1.

Table 1. Summary of Shoreline Profile changes from 2003 to 2014

Shoreline profile location	*Years surveyed*	*Description of shoreline profile change*
West range border	2003, 2006, & 2014	25-foot seaward movement of the beach crest between 2003 and 2006, then no significant change in the beach from 2006 to 2014
Range A	2013 & 2014	No significant change in the beach over the one year period from 2013 to 2014
Range B/C boundary	2003, 2006, 2013 & 2014	No significant change over the 11 year period from 2003 to 2014
Range E/F boundary	2013 & 2014	Small seaward movement of the beach face below the 8+ foot elevation during the one year post Iroquois Point beach project construction, no change in the berm position above the +10 foot elevation.
East range border	2003, 2006, & 2014	Small landward recession of the beach crest above the +8 foot elevation between 2006 and 2014, no change in the beach face below the +8 foot elevation.
West side of rock groin	2013 & 2014	Significant seaward movement of the beach crest (30 feet) during the one year post Iroquois Point beach project construction.

The profile immediately west of the westernmost new rock groin shows significant accretion and seaward movement of the beach over the one-year post construction period, indicating that it is trapping sand and thus benefiting the PRTF eastern shoreline by preventing sand loss to the east. Numerical modeling conducted during the design of the Iroquois Point Beach Nourishment and Stabilization Project suggests that the predominant longshore transport is to the east toward the Pearl Harbor entrance channel, and that the sand was previously being transported into the channel and being lost to the system. Since the completion of the Iroquois Point Project, the sandy shoreline has been rapidly accreting along the west side of the westernmost groin (at PRTF's east end), which would seem to confirm that the groin is catching sand from this predominant west to east longshore sand transport. Otherwise, the profile measurements show small shoreline/beach changes, but no significant long term change in the shoreline position fronting the Range over the ten-year period from 2003 to 2014.

Irrespective of the varying rates of erosion and accretion which have been documented along the range, measurements confirm that the mean seal level has been rising on a global scale, and will continue to rise at accelerating rates. More than half a foot in global mean sea level rise has been measured since 1900 (seven to eight inches), and the rate at which the rise occurred was noted to increase with time (Figure 4); over three inches of the measured rise occurred in the last 25 years (HCCMAC 2017). According to NASA estimates, global sea level rise appears to be 3.16 mm per year, with the rate increasing with time (NASA 2015). Sea level change is variable,

however, and historical estimates for sea level rise in nearby Honolulu Harbor are around 1.48 mm per year (NOAA 2017). The Hawai‘i Climate Change Mitigation and Adaptation Commission (HCCMAC) recently evaluated coastal trends in the state, noting that estimates of global sea level rise range between 1 and 3 feet, or potentially as high as 6 feet by 2100, depending on future greenhouse gas emissions, and many other factors (2017). This report also contained maps showing to where the sea may be predicted to extend in various Hawaiian Islands, in the event of a 3.2-foot rise in sea level, which, as the report discusses, may be reached by the mid to latter half of this century.

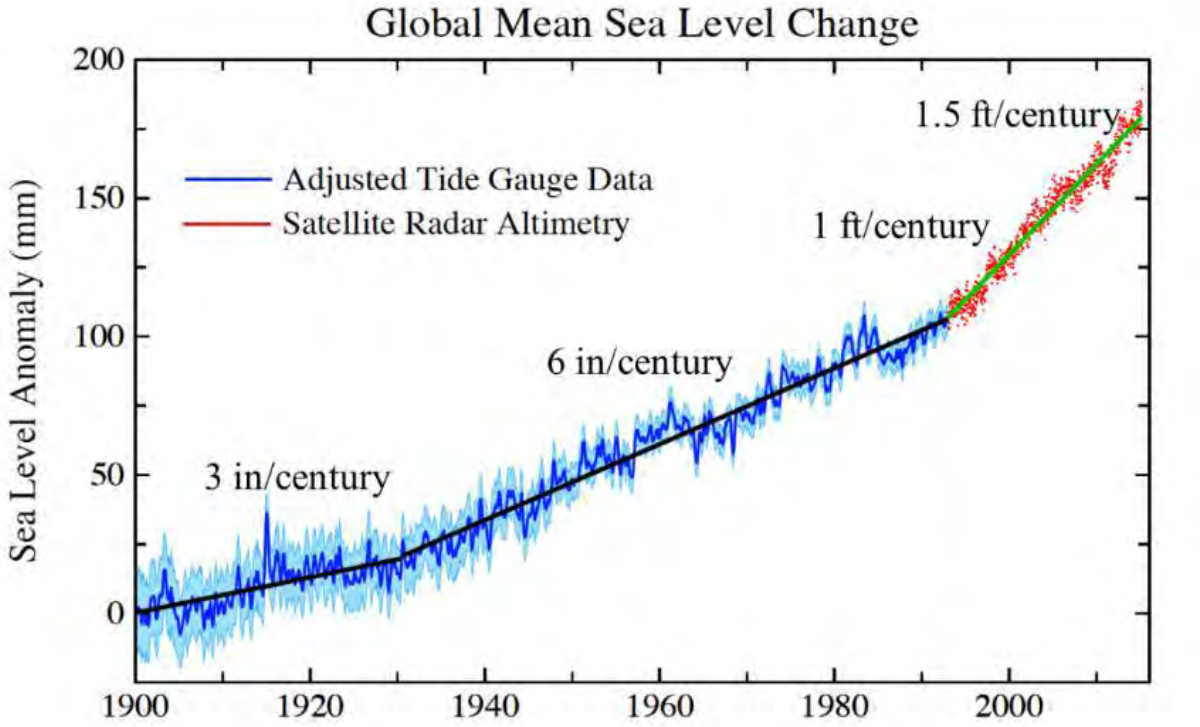

Figure 4. Observed global mean seal level rise since the year 1900. Sea level rise continues to be measured at ever increasing rates. Source: HCCMAC 2017

The Puuloa Shoreline Erosion Study modeled potential future shoreline changes at the range due to rising sea levels. Sea level rise will result in shoreline changes, shifting the shoreline profile higher and likely landward. The study modeled potential future shoreline changes over a 50-year period based on three sea level rise scenarios. The results of the model are provided in Table 2. While the results have a significant range in projected distance, they all suggest that the shoreline is likely to retreat as sea levels rise (NAVFAC HI 2015).

Table 2. Projected Shoreline Profile Change Due to Sea Level Rise (Year 2050).

Sea Level Rise Scenario	*Projected Sea Level Rise (feet)*	*Projected Inshore Shift of the Beach Crest (feet)*			
		West Range	*Range A*	*Range B/C*	*Range E/F*
USACE low scenario	0.25	2.0	1.8	2.1	1.4
USACE medium scenario	0.68	6.5	4.2	5.1	4.0
USACE high scenario	2.03	19.0	13.1	16.3	11.8

The University of Hawaii's online Hawaii Sea Level Rise Viewer from the Pacific Islands Ocean Observing System (PacIOOS 2017) is an interactive map which shows effects from passive flooding, annual high wave flooding, and coastal erosion which are all combined to create a "sea level rise exposure area," defined as the area in which chronic flooding and land loss may be experienced due to sea level rise. It was noted that in these areas, "Over time, recurring flooding at the highest tides in low-lying areas leads to chronic flooding and then to permanent flooding, and permanent loss" (HCCMAC 2017). With a sea level rise of two feet or more, large portions of the interior range from a few hundred feet north of the impact berms begin to experience chronic flooding due to passive flooding (flooding from groundwater, drainage or marine flooding), despite the presence of the berms (PacIOOS 2017) (Figure 5). Flooding due directly to sea level rise on the coast is depicted along the short-distance ranges, but only in front of portions of the long-distance berms, with a sea level rise of 3.2 feet. The elevation of the land surrounding the long-distance ranges may explain why less flooding due to active waves is predicted fronting the long-distance ranges. Reasons for the prediction of future passive flooding beginning a few hundred feet from the shore and behind the berms may be due to the fact that the land is at a lower elevation than that which surrounds the berms; land immediately around the berms is slightly elevated. One contributing factor to passive flooding can stem from changes to the water table; with a rise in sea level, the water table may rise as well, leaving low areas susceptible to flooding. As the report states, "It should be noted that seawalls may not be effective at preventing flooding with sea level rise in many low-lying areas as rising groundwater can infiltrate through porous geology." NOAA's sea level rise viewer also shows the interior of the range as a low-lying area susceptible to flooding (NOAA 2017a).

Figure 5. "Sea level rise exposure area" depicted in blue shows areas which may be prone to chronic and eventual permanent flooding and land loss in the event of a 3.2-foot rise in sea level, due to either passive processes such as groundwater flooding (the interior of the range), or wave action fronting the short-distance ranges, and portions of the long-distance ranges.

During a site visit coinciding with King Tide (a non-scientific term which indicates exceptionally high tides) on 9 August 2018, tidal levels were documented at 1.66 feet above mean seal level, and 0.58 feet above the mean higher high water line (MHHW) in the area (NOAA 2018). During this event, the water was contacting the vegetation which grows directly on the impact berms of the short-distance ranges (Figure 6 and Figure 7), with occasional swells washing over onto the access areas adjacent to the ranges. The water would occasionally wash 90 cm into the vegetation which fronts the fast land elevated access road in front of the impact berms of the long distance ranges, falling short of contact with the toe of the elevated road. Figure 8 shows water reaching the vegetation fronting the elevated access road fronting the long-distance "B" range during the King Tide event. It should be noted that sheet pile may not be a permanent solution to erosion and sea level rise impacts on the shoreline at PRTF; rock revetments installed around 40 years ago in the adjacent Iroquois Point beach area became offshore breakwaters in the face of advancing sea level rise and erosion. Some seawalls built at Iroquois Point were rendered virtually useless when sand accreted on the front, serving as a ramp for waves to run up and over the wall. Wave action has also damaged other walls in the Iroquois Point, and sea level rise has resulted in removal of houses from the area in the face of the advancing shoreline (JBPHH 2011).

Figure 6. The water line can be seen extending into the vegetation growing directly on the berm of the short distance ranges (F in this photo) during a King Tide event on 9 August 2018.

Figure 7. A view of the upper water line extending to the vegetation of the short distance F range during the King Tide event of 9 August 2018.

Figure 8. Water during a King Tide event on 9 August 2018 reaching the vegetation fronting the elevated access road in front of the long-distance "B" range.

3. PROPOSED ACTION

Measures of the proposed action, summarized in Figure 9, include installation of a primarily subsurface structure (i.e., sheet pile) inland from the shoreline, behind the access road which fronts the two long-distance ranges, relocation of the short-distance ranges further from the shoreline, and revegetation of areas fronting and adjacent to the range impact berms as feasible. Schematics for the proposed action may be found in Appendix A.

Figure 9. Sheet pile (depicted by the blue line) would be placed in front of the long-distance ranges (A, B), but not in front of the short-distance ranges. The four short-distance ranges (C-F) would be relocated back from the shoreline to the maximum extent practicable (possibly 100 feet back), since there is available land behind the ranges which would allow relocation. Revegetation would occur along and near all ranges, as feasible, in order to promote sand retention.

3.1 Sheet Pile Installation

The sheet pile would be primarily a sub-surface structure, emerging a few inches to a few feet above the surface of the ground. The preferred location of the sheet pile is on the berm side of the existing unpaved road fronting the long-distance ranges (Figure 10). The sheet pile is proposed to wrap-around the eastern and western boundaries of the long-distance ranges, in order to provide erosion protection at the ends of the berms. Further detail on sheet pile installation is shown in Figure 11. To avoid an abrupt end of the proposed sheet pile, it would be angled away from the shoreline at both the west and east ends. This "rounding off" of the proposed sheet pile would minimize potential impacts to adjacent shorelines, and would protect the sheet pile from erosion working its way back behind the structure. The end of the proposed sheet pile would end well short of the west installation boundary; the boundary would be approximately 230 feet from the west end of the proposed sheet pile. This buffer area would further serve to mitigate any potential future impacts to adjacent shorelines.

Figure 10. The access road fronting the long-distance ranges is in an elevated area of fast land fronting the berms; steel sheet pile is proposed to be installed behind the road.

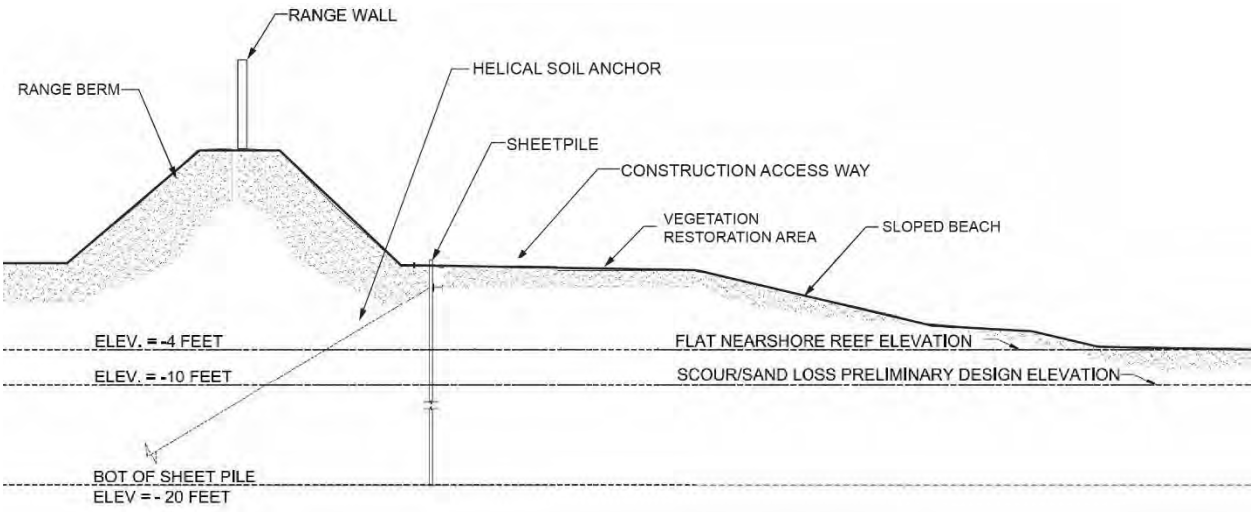

Figure 11. Sheet pile is intended to be primarily a sub-surface structure, and would be installed behind the existing elevated fast land access road which fronts the impact berms.

Should erosion reach a point of removal of all sand and soil up to the installed sheet pile, it would act as a defensive mechanism to minimize the loss of soil from the range berms. Conceptually, the sheet pile would function as a bulkhead assuming loss of sand due to scour of the beach by wave action, and migration of the sand laterally along the beach. At this preliminary stage, a reasonably conservative estimate of scour depth adjacent to the sheet pile is approximately -10 feet MLLW (Mean Lower Low Water, the average height of the lowest tide recorded at a tide station each day during the recording period). This is based on sand loss down to the depth of the flat nearshore reef elevation, about -4 feet MLLW, and a possible scour trench depth below the sea floor equal to the wave height at the wall, estimated at 5 to 6 feet. In a loss of sand down to elevation -10 feet were to occur on the shoreline, the sheet pile would be designed to retain up to 20 feet of sand (retaining 10 feet of sand below sea level and 10 feet of sand above sea level), to the inland side of the sheet pile.

Helical soil anchors in conjunction with a steel whaler beam may be used to laterally support the sheet pile. Other forms of lateral resistance include a deadman anchor to support the top of the sheet pile and resist lateral loading. Typically, deadman anchors are located outside of the soil failure plane which may not be possible in some areas due to the proximity of the existing range walls. The anchors are needed to hold the sheet pile in place should all the fast land erode away from in front of the sheet piling. As long as there is fast land in front of the sheet piling the anchors are not supporting any load.

At this time, installation of steel sheet pile is assumed. Steel sheet pile is the most widely available and most cost-effective type of sheet pile for this condition. To mitigate corrosion, a heavy duty coating system is assumed to be applied to the sheet pile. It should be noted that sheet pile is likely not a permanent solution to sea level rise and erosion in the area. Rock revetment installed around forty years ago in the Iroquois Point area, on what was beach at the time, became an offshore breakwater in light of advancing erosion and sea level rise (JBPHH 2011).

Sheet pile is typically installed using either a vibratory hammer or an impact hammer to drive the piles (typically connected to a hydraulic arm on a tracked vehicle). Vibratory hammer installation can provide advantages including reduced ground vibration and noise levels, but it can reduce the reliability of the sheet pile bearing capacity. The sheet pile installation method to be utilized for the proposed action would be determined during the design process. Based on the geotechnical review of the existing data, the soil conditions consist of sand overlaying coralline layers at varying depths. The existence of coralline material may require pre-drilling prior to the installation of the sheet pile. Further geotechnical investigation is required to determine the potential for liquefaction (loss of soil stability due to saturation and an applied stress). This would influence the sheet pile depth and installation method of the sheet pile because it is not recommended to use vibratory methods in soil with high liquefaction potential. Unweighted noise levels for impact hammers have been measured between 98 and 101 dB at a distance of 50 feet from 72-inch steel piles (Laughlin 2011). It is not currently known what size the individual

units of sheet pile may be, which would influence sounds levels during pile driving, however, a 100 dB re 20 µPa in-air sound mitigation zone would be identified and used as disturbance criteria for hauled-out marine protected species or those at the surface in nearshore waters; BMPs as detailed in Section 4 would be employed to prevent disturbance to Endangered Species Act (ESA)-listed marine species. It is possible that installation of sheetpile may take around six months to complete, with activities occurring for 8 hours per weekday.

3.2 Retreat of Short-Distance Ranges

The four short-distance firing ranges would be retreated from the shoreline to the maximum distance practicable. To the extent practicable, the earthen materials that comprise the existing range berms would be moved and reused to form the new berms for the retreated ranges, but additional soils and/or fill may be required to ensure that the relocated range berms provide the necessary coverage of the retreated ranges. To the extent possible, earthwork would be balanced to maintain existing drainage patterns. Retreat of the ranges would require the relocation of all physical components of the ranges to be retreated, but the general dimensions and capacities of the ranges would remain the same. The physical components of the ranges which would require relocation are illustrated in Figure 12.

Figure 12. Berms fronting the short-distance ranges, and other components of the ranges shown would be relocated up to 100 feet back from the shoreline.

3.3 Revegetation

Revegetation of available fast land areas fronting all ranges would also occur, as feasible. Shoreline vegetation restoration and landscape repair – utilizing native species to the maximum

extent practicable - would be included in any areas damaged by the sheet pile construction, including an area extending at least 15 to 20 feet on either side of the proposed sheet pile if space allows. Vegetation restoration would extend along the entire PRTF shoreline, beyond the limits of the proposed sheet pile. This would include the west end (between the western edge of the Range A and the installation boundary) (Figure 13), and the east end (between the eastern edge of Range F and the installation boundary). Vegetation restoration would include ground preparation, planting, temporary irrigation, and maintenance. Restored vegetation would be installed over a bio-degradable erosion-control fabric. To minimize manmade erosion over time at the training facility, the proposed action also includes landscape treatment consisting of planting, protective fencing, and walkways. These solutions would establish traffic control for beach users and discourage further development of informal paths.

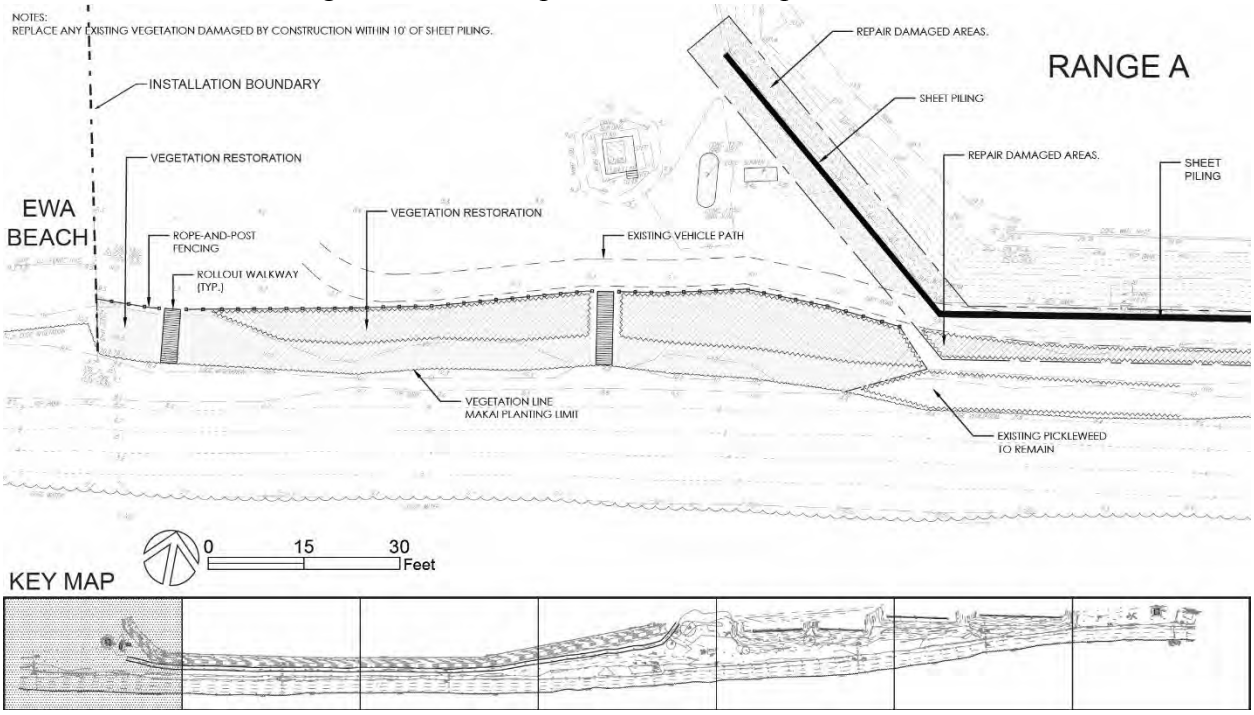

Figure 13. Revegetation would occur as feasible.

3.4 Site Preparation and Construction

During site preparation, surface vegetation in the areas to be disturbed would be cleared and grubbed (i.e., roots and stumps extracted) as necessary. Ground disturbance during construction would include the relocation of range components, support facilities, and utilities associated with range retreat; construction of an unpaved access road on the ocean side of Ranges C-F; installation of the sheet pile; ground preparation for vegetation restoration; and miscellaneous civil works (i.e., protective fencing, access roads, and laydown areas). For the relocation of loadbearing foundations associated with range retreat, the ground would be excavated and compacted at the proposed locations. During construction, materials would be transported to the project sites by truck, where they would be stored, assembled (as necessary), and moved into place. Temporary construction staging areas for materials, equipment, and vehicle parking would be provided on adjacent areas within PRTF. For installation of the sheet pile and shoreline

revegetation work, staging areas would likely be provided near one of the three shoreline access points at PRTF. This includes an area west of Range A (west end), between Ranges B and C (middle), and to the east of Range F (east end). Prior to construction, site boundaries or limits of disturbance would be surveyed and staked to identify areas where construction activities would occur.

4. BEST MANAGEMENT PRACTICES AND ADAPTIVE MANAGEMENT

A series of best management practices will be applied during operations for the proposed action. The BMPs are divided into two parts (A and B). Part A contains specific BMPs directed at minimizing effects from the project on protected species. BMPs in Part B are intended to minimize effects from the project on the environment. All workers associated with this project, irrespective of their employment arrangement or affiliation (e.g. employee, contractor, etc.) shall be fully briefed on these BMPs and the requirement to adhere to them for the duration of their involvement in this project. Adaptive management may also be employed, and would involve continued monitoring of the shoreline at PRTF; sheet pile is to be installed behind the existing elevated fast land access road which fronts the long-distance ranges, and discussions with NMFS would continue in the future if the waves do begin regularly contacting the elevated access road, since it is possible that further technologies or shoreline engineering methods will have been developed by that time.

A. Constant vigilance shall be kept for the presence of ESA-listed marine species during all aspects of the proposed action.

1. During all construction activities, surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour, checking for protected species presence, and also disturbance to the beach indicative of nighttime sea turtle nesting.
2. Personnel shall remain alert for marine mammals and sea turtles before and during construction. Do not commence operations if a marine mammal or sea turtle is observed either hauled out or in nearshore waters within 150 feet (45.5 m) of operations. If a monk seal/pup pair is seen, a minimum 300 foot (91 m) buffer will be observed with no humans approaching them. Wait 30 minutes after the last sighting of the marine protected species on land or in the nearshore water before recommencing activities.
3. All work shall be postponed or halted when ESA-listed marine species are within 150 feet (or 300 feet for seal/pup pairs) of the proposed work, and shall only begin/resume after the animals have voluntarily departed the area.
4. All personnel will stay more than 150 ft (45.5 m) from monk seals and sea turtles that haul out on the beach.
5. If marine protected species are seen, record information on the species, numbers, behavior, time of observation, location, start and end times of project activity, sex or age class (when possible), and any disturbances (visual or acoustic) by the construction project.
6. Personnel will not perform work on the beach if turtle nesting is known or suspected to be occurring.

7. Personnel will not perform work on the beach during the time that a Hawaiian monk seal is hauled out if the work would be so loud as to expose them to 100 dB re 20 µPa in-air.
8. Special attention will be given to verify that no ESA-listed marine animals are in the area where equipment or material is expected to contact the substrate before that equipment/material may enter the water.
9. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

B. Minimizing effects to the marine environment from project-related activities.

10. A contingency plan to control toxic materials is required.
11. Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available.
12. 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.
13. All project-related materials and equipment placed in the water shall be free of pollutants.
14. Fueling of land-based vehicles and equipment shall take place at least 100 ft away from the water, preferably over an impervious surface.
15. 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. If turbidity will result from construction activities, silt curtains shall be used to contain turbidity to the minimum area possible.
16. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

5. AFFECTED ENVIRONMENT

5.1 Critical Habitat

In the main Hawaiian Islands (MHI) Hawaiian monk seal critical habitat includes the seafloor and marine habitat to 10 m above the seafloor from the 200 m depth contour through the shoreline and extending into terrestrial habitat 5 m inland from the shoreline between identified boundary points in the islands. However, the PRTF shoreline is exempt from monk seal critical habitat designation, based on inclusion in the Marine Corps Base Hawaii (MCBH) Integrated Natural Resources Management Plan (INRMP), which was found to provide a benefit to Hawaiian monk seals in accordance with Section 4(a)(3)(B)(i) of the ESA. Waters extending a few miles seaward off PRTF are in the Pearl Harbor Naval Defensive Sea Area (NDSA), which is excluded from designation for Hawaiian monk seal critical habitat based on inclusion in the Joint Base Pearl Harbor Hickam (JBPHH) INRMP. In addition, the Puuloa Underwater Training Range has been excluded from Hawaiian monk seal critical habitat designation pursuant to ESA

section 4(b)(2), because the benefits of exclusion (for National Security) outweighed the benefits of designation (NMFS 2015a). Hawaiian monk seal critical habitat is present along the shoreline and in the waters off Ewa Beach, west of PRTF.

5.2 Endangered Species Act - Listed Species

The Endangered Species Act (ESA) - listed species in Table 3 were evaluated to determine possible presence within the project area, including the Hawaiian monk seal (*Neomonachus schauinslandi*), hawksbill sea turtle (*Eretmochelys imbricata*), and Central North Pacific distinct population segment (CNP DPS) of the green sea turtle (*Chelonia mydas*).

Table 3. ESA-listed species evaluated for presence in the area.

Species	ESA Status	Likelihood of Occurrence in Area
Hawaiian monk seal	Endangered	Possible
Hawksbill sea turtle	Endangered	Unlikely
Green sea turtle	Threatened (CNP DPS)	Possible

5.2.1 Hawaiian Monk Seal

The endangered Hawaiian monk seal occurs in low densities in the MHI year-round. They feed on a variety of prey on or near the seafloor. Tagging studies have found that seals in the MHI dive up to 489m (1,604 ft); however, most dives occur at depths shallower than 200 m (656 ft; NOAA 2014). Adults may reach lengths of 2.3 m (7.5 ft), weighing up to 273 kilograms (kg) (600 pounds).

At Iroquois Point, immediately adjacent to the PRTF on the east, there have been 76 documented seal sightings between 1993 and 2009 (JBPHH 2011). A NMFS PIFSC internal report summarized "Hawaiian Monk Seal Use of Pearl Harbor and the Surrounding Area from 2003-2012," listing 473 sightings of Hawaiian Monk Seals between Ewa Beach and Hickam Air Force Base; three quarters of these sightings were attributed to seventeen individual seals, and the greatest number of sightings was between Iroquois Point and Ewa Beach (Wurth 2013). A 2013-2015 NAVFAC study did not document monk seal sightings during 90 hours of effort for both beach and shore survey work at various locations around Pearl Harbor, including a shore survey site adjacent to PRTF (Richie et al. 2016). On the adjacent Iroquois Point Beach, NOAA volunteers documented a total of twenty Hawaiian monk seal haul outs in the year 2016; all identified seals were the same seal, an adult female named "Rocky" (Johanos 2017). "Rocky" has also been documented near the Puuloa Underwater Range waters on more than one occasion (Aschettino et al. 2013). Monk seal presence in the action area is considered possible.

5.2.2 Hawksbill Sea Turtle

The endangered hawksbill sea turtle is a medium-sized turtle which ranges between 25 and 35 inches in carapace length. Hawksbills feed primarily on sponges in coral reef habitats. The animals occur in very low numbers in the Hawaiian Islands, and nesting in the islands occurs mainly on the Big Island of Hawaii (NMFS 2018).

While impacts to sea turtles on the shoreline are addressed in a separate consultation with USFWS, nesting and stranding is discussed here, since it is an indicator of occurrence in the waters. Hawksbills are rare in Oahu waters, and nesting activity would not be expected in PRTF. Hawksbill presence in the water would be rare. Sea turtle stranding data supports the low occurrence of this species in the area. Of all known sea turtle strandings reported to the Marine Turtle Research Program of NMFS PIFSC between 1982 and 2014 for the greater Pearl Harbor area, only one hawksbill stranded in the area, but it was not at PRTF (the turtle stranded at Ford Island) (NMFS 2014a). Due to the low likelihood of occurrence of hawksbill sea turtles in the vicinity of the project area, the Navy has determined that potential impacts from the project are discountable, resulting in no effect to hawksbills, and they are not considered further in this document.

5.2.3 Central North Pacific Distinct Population Segment of the Green Sea Turtle

Green sea turtles are found regularly in nearshore waters around the MHI, and feed mainly on seagrasses and algae. Mean carapace length in the MHI is estimated for nesting females to be 89.21−91.69 cm (2.9-3 ft; Piacenza et al. 2016). Green sea turtle nest-laying and hatchling emergence activities often occur at night. Green sea turtles nest mainly in the Northwestern Hawaiian Islands, but have been increasingly nesting in the main Hawaiian Islands.

Shore and vessel-based studies from 2013-2015 documented a higher number of sea turtles at the mouth of Pearl Harbor, with fewer numbers noted at survey stations toward the west near PRTF. PRTF was not specifically included in this study, but is visible from some of the survey area. The data may support a year-round presence of green and unidentified sea turtles (which may have been green sea turtles) in Pearl Harbor, with potential peaks in winter, and a decline in numbers in the spring. Some evidence for site fidelity among individual turtles was also noted (Richie et al. 2016). Stranding data supports that, while green sea turtles may be found in higher numbers near the mouth of Pearl Harbor, fewer may be present in the PRTF (NMFS 2014a). A green sea turtle nest was documented in 2017 west of the PRTF on Ewa Beach, however, it has been noted that this was an unusual event for Ewa Beach. The eggs did not hatch, possibly due to inundation of the nest in the local tides. Of all strandings reported to the Marine Turtle Research Program of NMFS PIFSC between 1982 and 2014 for the Pearl Harbor area, only one green sea turtle was noted as stranding on the beach fronting PRTF, while there were various strandings of green sea turtles in the adjacent Iroquois Point area during this time. This could also be due to the lack of frequent human presence on the beach when compared to recreational beaches, however, the beach is routinely assessed prior to commencing activities at the range to ensure that no one will be present, and sea turtles on the beach would be recorded. Green sea turtles have been sighted in the Puuloa Underwater Range waters (Fagan and Shannon 2015). It is possible that green sea turtles could be present in the waters around PRTF.

5.3 Essential Fish Habitat

The Western Pacific Regional Fishery Management Council (WPRFMC) has approved a Fisheries Management Plan (FMP) for Hawaii that designates all the ocean waters surrounding

Oahu, from the shore to depths of over 100 feet, including waters fronting PRTF, as "Essential Fish Habitat" (EFH). The WPRFMC has also identified "Habitat Areas of Particular Concern" (HAPC). Waters off PRTF are not within a HAPC.

The PRTF shoreline is directly exposed to southern swell, refracted trade wind waves, Kona storm waves, and the infrequent hurricane. The morphology, orientation, and exposure of the beach the firing range is similar to the beach system fronting the Ewa Beach residential neighborhood (NAVFAC HI 2015). The nearshore environment of PRTF is not conducive to successful coral recruitment, due primarily to the movement of sand. The shoreline is fronted by a wide and shallow fringing reef. Water depths less than about 5 feet extend over 1,000 feet from the shore, with the 12-foot depth contour about 2,200 feet offshore, and the 5-foot depth contour more than 6,000 feet offshore. Sediment transport in the area occurs primarily by a west to east longshore current (NAVFAC HI 2015). Approximately one mile to the east of the project site is the 1,000-foot-wide and 50-foot-plus-deep Pearl Harbor entrance channel.

A study conducted in the direct footprint of the adjacent Iroquois Point groin area found that coral cover was less than 0.03% across the area, and consisted mainly of *Pocillopora damicornis*, a hardy coral common to the nearshore waters of Hawaii. The average size of the corals found were 5.9 in^2. Given that coral cover was less than 1/10th of one percent, the small size of the colonies, and the scattered distribution, the corals were not determined to be functioning ecologically as a coral reef. In addition, the corals present were very common species, and none of the colonies are remarkable, based upon their size and growth patterns. Few fish were observed; the most well represented fish families at Iroquois Point were the surgeon fishes (Acanthuridae) with nine taxa, the butterfly fishes (Chaetodontidae) with six taxa, and the wrasses (Labridae) with five taxa (JBPHH 2011).

A shoreline erosion engineering study at PRTF found that bottom conditions seaward of the existing shoreline consist primarily of a hard limestone (fossil calcareous reef rock) substrate that underlies the entire project reach. Over the limestone are various combinations of sand deposits, coral rubble and cobbles, and reef rock outcrops. Bottom surface composition is approximately 40% sand, 40% rubble (gravel, cobbles, rocks, debris), and 20% hard limestone reef rock. The sand is typically a light sand veneer, but also fills depressions in the hard substrate. No living corals were observed along a profile swim, which extended approximately 150 feet from the shore. Sessile growth observed was comprised mainly of soft algae on the fossil reef complex (NAVFAC HI 2015). Surveys for nearshore marine biological resources in the western portion of the Iroquois Point area, immediately east of PRTF, documented a "wave scoured sand bottom with sparsely distributed small limestone outcrops covered by algal growth but with few other organisms present" in the portions of the area that are adjacent to PRTF, and no fish were observed (JBPHH 2011).

6. EFFECTS ANALYSIS

Potential stressors which may affect ESA-listed species include habitat loss stemming from shoreline changes. Potential short term, transient stressors which may affect ESA-listed species include acoustic and visual disturbance from construction activities, and exposure to sedimentation, waste, and discharge during construction. Potential stressors to EFH as a result of the proposed action include water quality changes, sediment transport and exposure to sediments, waste, and discharge during construction.

Relocation of the short-distance ranges would have beneficial long term impacts, since it would move the currently-existing berms further from potential future sea level rise, and prevent degradation to the berms and reflection of wave energy which could impact the shoreline. The revegetation component of the proposed action would reduce erosion, and assist in shoreline stabilization. As discussed in the subsections addressing each stressor below, this would have beneficial impacts on ESA stressors such as habitat loss, and EFH stressors such as water quality changes, sediment transport and exposure to sediments, waste, and discharge during construction.

Relocating the long-distance ranges is not currently feasible, due to the presence of non-DoD lands behind the ranges. In addition, the resulting Surface Danger Zone from the relocated / reconfigured long-distance ranges could potentially encumber the civilian population located off-base. However, protective measures must be taken in order to prevent increasing sea level rise from eroding the berms, which would render the firing range unusable, and result in large amounts of sediment release into the ocean. For these reasons, sheet pile is proposed to be placed in front of the long-distance ranges. A consequence of the sheet pile installation could be scouring of the beach due to the reflective wave activity; this would only begin to occur if the active wave zone reaches the sheet pile, and the sheet pile is proposed to be installed behind an existing fast land elevated (and unpaved) access road. It is possible that the sheet pile could result in hardening of the shoreline if sea level rise and erosion result in the sheet pile exposure to active waves; reflected wave energy could result in scour fronting the long-distance ranges, because reflective barriers prevent natural sediment replenishment of the beaches as wave action naturally erodes the shoreline, resulting in a lowering of the beach profile. However, the pre-existing earthen berms, fronting the ranges would also exhibit similar initial drawbacks if waves were to reach the berms as sea level rises and waves strike against the berms, with the added drawback that dirt from the berms would wash into the water, along with any potential items present in the berms, such as lead. To avoid an abrupt end of the proposed sheet pile, it would be angled away from the shoreline at both the west and east ends. This “rounding off” of the proposed sheet pile would minimize potential impacts to adjacent shorelines, and would protect the sheet pile from erosion working its way back behind the structure. The end of the proposed sheet pile would be well short of the west installation boundary; the installation boundary is approximately 230 feet from the west end of the proposed sheet pile. This buffer area would further serve to mitigate any potential future impacts to adjacent shorelines. In its current state, the beach is narrow and not known to be frequently used by monk seals or sea turtles. In addition, adaptive management proposed would facilitate further discussions between the USMC

and NMFS in the event that waves begin regularly contacting the elevated access road fronting the sheet pile in the future; it is possible that further advances in coastal engineering science may be available at that time to consider as alternatives.

Groins or breakwaters were considered alternatives, but were not carried forward for detailed analysis in this EA because these types of structures may lead to unpredicted impacts to adjacent shoreline or to the shoreline they are designed to protect, and often require supplementation with beach nourishment with large amounts of sand that may not have locally-available sources. The Puuloa Shoreline Erosion Study (NAVFAC HI 2015) evaluated the construction of one or a series of groins along the PRTF shoreline to stabilize the beach. The study did not recommend construction of the groin(s) as a preferred alternative for several reasons. Due to the nature of the in-water construction, and the size of the undertaking, construction of the groins would be expensive and could have complex environmental effects within the project area and on adjacent shorelines. The project would require time-consuming and costly environmental studies to evaluate and monitor potential impacts. Finally, construction of the groin(s) would require beach nourishment, but at present there is no known source of readily available beach quality sand to meet this requirement. Beach nourishment is an alternative which would deposit beach-quality sand along the shoreline fronting the ranges. This alternative was considered but was not carried forward for analysis because it is generally a temporary measure, and there are currently no on-land sources of commercially available calcareous beach sand, and limited offshore deposits of suitable beach sand which can be recovered. Sandbags were not considered further, because they are temporary, break down, and may be less efficient where a shoreline is subject to long-term wave attack (NAVFAC HI 2015).

Studies from the University of Hawaii found that hardening the shoreline of Oahu where there is chronic coastal erosion causes narrowing and loss of the beach (Fletcher 1997). While erosion and accretion rates along the shoreline of PRTF have been variable over time, continued sea level rise noted in the area could eventually bring the water level to the current location of the range impact berms, regardless of current trends of erosion/accretion at various portions of the range, at which time the impact berms and their contents (dirt, lead) would begin eroding into the sea, compromising the range use, and negatively impacting water quality in the area.

The proposed sheet pile installation is intended to protect the pre-existing impact berms of the long distance ranges in the event of future sea level rise. In consideration of increasing sea level rise, installation of a protective structure, such as sheet pile, is considered the best option, when considering different drawbacks of other approaches, and in light of the unfeasibility of relocating the long-distance ranges. Future shoreline erosion associated with sea level rise and other natural shoreline processes could very well impact the PRTF and adjacent shorelines, but the proposed action is not expected to significantly contribute to shoreline erosion or beach loss adjacent to the PRTF installation boundary. The potential future loss of the sandy beach along the long distance ranges of PRTF shoreline does not represent a significant impact to the shoreline because it is not expected to contribute to future erosion along adjacent shorelines,

which would likely occur regardless (due to sea level rise), and as discussed in the following section, PRTF is only utilized by ESA-listed species for haul out on an infrequent basis.

6.1 ESA Effects Analysis

An organism's response to a stressor, whether behavioral or physiological, may determine the effect of the stressor. Likelihood of exposure to stressors and the most likely average response for a species, resulting in an effect, are discussed for each species. The expected effects, if any, are based on best available science on general species distribution and behavior. Potential stressors to ESA-listed species include acoustic or visual disturbance, exposure to waste and discharge during construction, and habitat loss stemming from shoreline changes.

Disruption of important behaviors such as feeding, resting, or reproduction is a potential effect from acoustic or visual disturbance. Many important behaviors such as foraging, resting, or reproduction occur on a diel cycle; disruption of these behaviors is not likely to be significant unless disruption occurs for a duration exceeding a day, or recurs on subsequent days, potentially impacting reproduction or survival (Southall et al. 2007). In general, if marine mammals react only briefly to a sound by changing behavior, or moving only a small distance, significant impacts to the individual are not likely. If protected species respond to noise or visual disturbance from the proposed action, temporary and minor behavioral responses are considered the most likely response. BMPs involving minimum distances which must be maintained from protected species will be enacted to reduce the potential for more energetic responses from ESA-listed species, such as fleeing the beach. Significant disruption of important behaviors during sheet pile installation is not expected to occur. While minor changes in behavior may be possible as a result of acoustic or visual disturbance from the proposed action activities, effects are expected to be limited to transient behavioral responses that would be insignificant to the individual. Displacement due to habitat loss for ESA-listed animals is not expected to occur, since the shoreline is only used by ESA-listed species on an infrequent basis.

6.1.1 Habitat Loss Stemming from Shoreline Changes

In general, reflective surfaces may exacerbate erosion and shoreline loss, due to blocking of natural sand replenishment of the shoreline, and transport of wave energy downward and laterally along the shoreline. A similar shoreline protection method, rock revetment, was considered as an alternative to the nearby Iroquois Point groin installation project; it was discussed that rock revetment "would reduce the ongoing shoreline recession and the release of dirt fill into the water, resulting in long-term improvement in water quality and nearshore marine habitat. The revetment would also likely result in the loss of the sand beach, and thus would result in the loss of sand beach habitat. This would have a negative impact on monk seals that occasionally haul out in the area. This alternative is therefore considered to have a minor negative impact on threatened and endangered species" (JBPHH 2011). Of note, rock revetment installed around forty years ago in the Iroquois Point area, on what was beach at the time, became an offshore breakwater in light of advancing erosion and sea-level rise (JBPHH 2011).

NMFS has noted that monk seals tend to select specific areas year after year, as evidenced by "non-random patterns in monk seal haul-out observations" (NMFS 2015). The potential loss of approximately 1,500 feet of shoreline (attributed to sea level rise, erosion, and impacts from sheet pile presence) is anticipated to result in only minor negative impacts to monk seals that would haul out in the area, and the action would not impact seals and sea turtles present in the nearshore waters. Displacement from the greater area is not expected to occur, since the shoreline of PRTF is currently only occasionally used as haulout for ESA-listed species. The shoreline of PRTF is narrow and offers little space for haulout due to shoreline erosion, the presence of the impact berms, and dense, thorny vegetation. The short-distance ranges front about 900 feet of shoreline. Relocating these ranges further from the shoreline can serve to benefit that amount of shoreline, allowing natural self-replenishment of the beach, and/or allowing further migration landward of the beach as sea levels rise, offsetting some of the potential negative impacts from the sheet pile armoring of shoreline in front of the long-distance ranges. In addition, the revegetation component of the proposed action will increase sand retention and reduce erosion rates across the entire range, which is about 3,000 feet. To avoid an abrupt end of the proposed sheet pile, it would be angled away from the shoreline at both the west and east ends. This "rounding off" of the proposed sheet pile would minimize potential impacts to adjacent shorelines, and would protect the sheet pile from erosion working its way back behind the structure. The end of the proposed sheet pile would end well short of the west installation boundary; the boundary will be 230 feet from the west end of the proposed sheet pile. This buffer area would further serve to mitigate any potential future impacts to adjacent shoreline. Potential effects to Hawaiian monk seal critical habitat present outside of PRTF will thus be discountable, and no destruction or adverse modification of Hawaiian monk seal critical habitat will occur as a result of the proposed action.

Determination of Effects from Habitat Loss Stemming from Shoreline Changes

The Navy has determined that habitat loss stemming from shoreline changes from the proposed action may affect, but is not likely to adversely affect ESA-listed species, because the impacts to listed species would be insignificant. Destruction or adverse modification of Hawaiian monk seal critical habitat is not likely to occur; the shoreline and waters off PRTF are not designated as critical habitat, and there is a discountable chance of impacts to critical habitat outside the boundaries of PRTF.

6.1.2 Disturbance from Acoustic Stressors

Acoustic stressors from construction may affect hauled out monk seals or green sea turtles which may be present in nearshore waters (impacts to sea turtles on the beach were evaluated under a separate USFWS consultation). While information regarding Hawaiian monk seal hearing is limited, evidence suggests that they may be less sensitive than that of other pinnipeds (NMFS 2014). Sea turtles, as a general taxon, are not considered to be acoustically sensitive. This has resulted in fewer mitigation measures being applied to noise-producing operations for sea turtles than for marine mammals. One study documented sea turtles occurring close to impulsive sound sources which are within measured hearing range for sea turtles, with "no obvious behavioural

avoidance" (Weir 2007). Effects to animals occurring below the water are discountable, due to the limited transfer of sound between air and water.

Unweighted noise levels for impact hammers have been measured between 98 and 101 dB at a distance of 50 feet from 72-inch steel piles (Laughlin 2011). It is not currently known what size the individual units of sheet pile proposed under this action may be, which would influence sounds levels during pile driving, however, a 100 dB re 20 µPa in-air sound mitigation zone will be identified and used as disturbance criteria for hauled out marine protected species or those at the surface in nearshore waters; BMPs as detailed in Section 4 will be employed to prevent disturbance to Endangered Species Act (ESA)-listed marine species. Resultantly, responses to acoustic disturbance are expected to be limited to temporary and insignificant behavioral responses, which would not impact individual animal fitness or have population-level effects. Sound levels would not be loud enough to impact nearby critical habitat adjacent to PRTF.

The BMPs listed below would be employed in order to reduce impacts from acoustic disturbance:

A. Constant vigilance shall be kept for the presence of ESA-listed marine species during all aspects of the proposed action.

1. During all construction activities, surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour, checking for protected species presence, and also disturbance to the beach indicative of nighttime sea turtle nesting.
2. Personnel shall remain alert for marine mammals and sea turtles before and during construction. Do not commence operations if a marine mammal or sea turtle is observed either hauled out or in nearshore waters within 150 feet (45.5 m) of operations. If a monk seal/pup pair is seen, a minimum 300 foot (91 m) buffer will be observed with no humans approaching them. Wait 30 minutes after the last sighting of the marine protected species on land or in the nearshore water before recommencing activities.
3. All work shall be postponed or halted when ESA-listed marine species are within 150 feet (or 300 feet for seal/pup pairs) of the proposed work, and shall only begin/resume after the animals have voluntarily departed the area.
4. All personnel will stay more than 150 ft (45.5 m) from monk seals and sea turtles that haul out on the beach.
5. If marine protected species are seen, record information on the species, numbers, behavior, time of observation, location, start and end times of project activity, sex or age class (when possible), and any disturbances (visual or acoustic) by the construction project.
6. Personnel will not perform work on the beach if turtle nesting is known or suspected to be occurring.
7. Personnel will not perform work on the beach during the time that a Hawaiian monk seal is hauled out if the work would be so loud as to expose them to 100 dB re 20 µPa in-air.

8. Special attention will be given to verify that no ESA-listed marine animals are in the area where equipment or material is expected to contact the substrate before that equipment/material may enter the water.
9. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

Determination of Effects from Acoustic Stressors

Effects to protected species in water or along the PRTF coastline, if any, would be limited to transient, brief startle responses to acoustic stressors, which would not significantly impact individual or population fitness. BMPs limiting sound exposure of monk seals to levels below 100 dB re 20 μPa in-air will ensure that potential impacts of acoustic stressors are insignificant. The Navy has determined that disturbance from acoustic stressors may affect, but is not likely to adversely affect the Hawaiian monk seals and the Central North Pacific Distinct Population Segment of the green sea turtle, due to effects being insignificant. Sound levels will not adversely modify Hawaiian monk seal habitat in areas adjacent to PRTF.

6.1.3 Disturbance from Visual Stressors

Level of disturbance experienced may vary from species to species, and can also depend on factors such as an animal's level of habituation, and behavioral context (Smith et al. 2016). Monk seals could potentially return to water if disturbed while hauled out, or could leave the area if startled while in water. In the event that a seal or turtle were to be present in the area, Section A BMPs listed below would serve to reduce visual stressors to the animals. Operations would not occur if protected species are within 150 feet of construction. Resultantly, responses to visual disturbance are expected to be limited to temporary and insignificant behavioral responses, which would not impact individual animal fitness or have population-level effects, and visual stressors would not impact adjacent monk seal critical habitat in Ewa Beach.

The BMPs listed below would be employed in order to reduce impacts from visual stressors:

1. During all construction activities, surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour, checking for protected species presence, and also disturbance to the beach indicative of nighttime sea turtle nesting.
2. Personnel shall remain alert for marine mammals and sea turtles before and during construction. Do not commence operations if a marine mammal or sea turtle is observed either hauled out or in nearshore waters within 150 feet (45.5 m) of operations. If a monk seal/pup pair is seen, a minimum 300 foot (91 m) buffer will be observed with no humans approaching them. Wait 30 minutes after the last sighting of the marine protected species on land or in the nearshore water before recommencing activities.
3. All work shall be postponed or halted when ESA-listed marine species are within 150 feet (or 300 feet for seal/pup pairs) of the proposed work, and shall only begin/resume after the animals have voluntarily departed the area.

4. All personnel will stay more than 150 ft (45.5 m) from monk seals and sea turtles that haul out on the beach.
5. If marine protected species are seen, record information on the species, numbers, behavior, time of observation, location, start and end times of project activity, sex or age class (when possible), and any disturbances (visual or acoustic) by the construction project.
6. Personnel will not perform work on the beach if turtle nesting is known or suspected to be occurring.
7. Personnel will not perform work on the beach during the time that a Hawaiian monk seal is hauled out if the work would be so loud as to expose them to 100 dB re 20 µPa in-air.
8. Special attention will be given to verify that no ESA-listed marine animals are in the area where equipment or material is expected to contact the substrate before that equipment/material may enter the water.
9. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

Determination of Effect from Visual Stressors

Due to the use of BMPS, responses from monk seals and green sea turtles to construction activities are likely to be limited to curious inspection, or brief startle responses which would not be significant to the individual. The Navy has determined that visual stressors from the proposed action may affect, but are not likely to adversely affect Hawaiian monk seals and the Central North Pacific Distinct Population Segment of green sea turtles, due to effects being insignificant. Visual stressors will not adversely modify Hawaiian monk seal critical habitat on the adjacent shoreline.

6.1.4 Exposure to Sedimentation, Waste, and Discharge During Construction

Construction activity could increase storm water runoff and increase the potential for green sea turtles or monk seals to experience impacts from sedimentation, wastes, and discharges from the facility. BMPs will ensure that runoff is contained on-site during construction to protect water quality in nearshore waters adjacent to the PRTF shoreline. Also, any accidental hazardous waste spills will be contained and prevented from entering the marine environment. During construction the waterfront will be protected by silt fences and/or erosion control to prevent runoff during rainfall. After installation of the sheet piles and relocation of the short-distance ranges from the shoreline, the shoreline will be revegetated to prevent further shoreline erosion. Specific trails to access the shoreline will be established but the entire beach front will be vegetated. Patrol and facility vehicles will be restricted to the established vehicle path to prevent further erosion.

The following BMPs would be instituted in order to reduce impacts from exposure to sedimentation, waste, and discharge during construction:

10. A contingency plan to control toxic materials is required.
11. Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available.

12. 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.
13. All project-related materials and equipment placed in the water shall be free of pollutants.
14. Fueling of land-based vehicles and equipment shall take place at least 100 ft away from the water, preferably over an impervious surface.
15. 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. If turbidity will result from construction activities, silt curtains shall be used to contain turbidity to the minimum area possible.
16. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

Determination of Effects from Exposure to Sedimentation, Waste, and Discharge During Construction

Due to the requirement for BMPs, exposure to increased runoff carrying sediment, waste, and discharge during construction may affect, but is not likely to adversely affect Hawaiian monk seals and green sea turtles because effects would be insignificant.

6.2 EFH Effects Analysis

Potential stressors to EFH from the Proposed Action include effects from water quality changes, sediment transport into the water resulting in turbidity and siltation, and exposure to waste and discharge during construction.

6.2.1 Water Quality Changes

Revegetation and relocation of the short-distance ranges would result in a benefit to water quality. Revegetation would occur across the entire range as feasible, and would improve sand retention, reducing erosion. The short-distance ranges span about 900 feet of shoreline, and relocating the short-distance ranges back from the shoreline would result in a benefit to water quality, because it would remove the earthen berms from what may be the active wave zone within the mid to latter half of the century.

Sheet pile fronting around 1,500 feet of shoreline at the long-distance berms may result in scouring of the beach at the base at a point in the future when it may be exposed to active waves, resulting in transport of sand laterally and back out to sea which may exacerbate erosion and reduce water quality. However, sheet pile is proposed for installation behind the existing fast land elevated access road which fronts the berms. The sheet pile would prevent the lead-filled earthen impacts berms from eroding into the sea with associated sediments and potential contaminants until sea level rise brings the active wave zone high enough so as to wash over or past the sheetpile. It is not known when this may occur, but estimates from an engineering study conducted at PRTF predicted that with 2.1 feet of rise in sea level, there could be a

corresponding shift of the beach crest by 12 feet (NAVFAC HI 2015). With a 3.2 feet of sea level rise, which is predicted by the mid to latter half of the century, models predict inundation of the lower-lying portions of the interior of the range due to passive flooding, with some flooding issues from the active shoreline in front of the long-distance berms. In contrast, the short-distance ranges may experience significant flooding in front of the berms if they are not relocated (Figure 5) (PacIOOS 2017). These predictions seen in the Hawaii Seal Level Rise Viewer for the area (more flooding in front of the short-distance berms at their current location, and less in front of the long-distance berms) (PacIOOS 2017) may be accurate as the recent site visit in 2018 during King Tide documented water extending further towards the short-distance ranges. Adaptive management proposed would facilitate further discussion between USMC and NMFS in the event that waves may begin regularly contacting the elevated fast land access road in front of the sheet pile to be installed fronting the long-distance ranges in the future, as more science may be available at the point in order to address issues relating to sea level rise and erosion.

Determination of Effect from Water Quality Changes

Two components of the proposed action, relocation of the short-distance ranges, and revegetation of the PRTF shoreline, would have beneficial impacts to water quality. Installation of the sheet pile may exacerbate erosion and lead to loss of the beach fronting the long-distance ranges when coupled with the effects of sea level rise and erosion, however, the sheet pile would prevent a significant negative impact to water quality that would result from the earthen berms washing into the sea when the active wave zone reaches them. The Navy has determined that the proposed action may adversely affect water quality and EFH, but the beneficial impacts of short-distance range relocation and revegetation, and adaptive management proposed, would allow the effects to be managed and mitigated and would resultantly be minimal and insignificant.

6.2.2 Sediment Transport

Two components of the proposed action, revegetation of land fronting and adjacent to the ranges, and relocation of the short-distance ranges, could improve sand retention in the area, and reduce erosion rates. Sediment transport in the area occurs primarily by a west to east longshore current. Revegetation increases sand retention rates, while relocating the short distance berms back from the shoreline is expected to remove them from the active wave zone in the event of future expected sea level rise of 3.2 feet by the mid to latter half of the century. Sheet pile is proposed for installation in front of the long-distance range berms, which is currently fast land. In the event that future erosion or sea rise brings the active wave zone to the sheet pile, the structure could potentially exacerbate erosion, and when coupled with flooding from sea level rise, leading to increased sedimentation as the sand scours from the base of the structure. However, in absence of the sheet pile, the impact berms present would exhibit similar drawbacks, and also contribute to increased sediment transport from the berms and into the marine environment, along with any contaminants which may be present in the berms. Adaptive management proposed, involving continued shoreline monitoring and continued discussions between USMC and NMFS in the event that the waves begin to regularly contact the elevated

access road, could potentially identify other engineering methods in response to sea level rise and erosion, if available at that point in the future.

Most corals can withstand mild sedimentation by trapping it in mucus and carrying it off by cilia, however, sedimentation in excess can impact corals if it settles atop corals, resulting in shading of the coral, and potential blockage of coral feeding structures. If coral contains photosynthetic zooxanthellae, shading can reduce photosynthesis which occurs, thereby reducing metabolic functions of the coral (Nybakken 2001). However, no living corals were observed along a profile swim, which extended approximately 150 feet from the shoreline at PRTF. Sessile growth observed was comprised mainly of soft algae on the fossil reef complex, and no fish were observed (NAVFAC HI 2015).

While construction can potentially result in sediment mobilization, the following BMPs will be followed to avoid sediment transport into the water during construction:

15. 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. If turbidity will result from construction activities, silt curtains shall be used to contain turbidity to the minimum area possible.
16. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

Determination of Effect from Sediment Transport

Due to the lack of biota such as coral and fish in the area, and the use of BMPs in order to reduce potential impacts, the Navy has determined that sediment transport as a result of the proposed action will not significantly impact EFH. Relocation of short distance ranges will benefit 900 feet of shoreline, and revegetation of the entire shoreline (3,000 feet) will result in less sediment transport into the water, which may counteract negative impacts from erosion/sediment transport as a result of the sheet pile presence fronting 1,500 feet of shoreline fronting the long-distance ranges; adaptive management may also serve to reduce the likelihood of adverse impacts from the wave action when it may begin contacting the sheet pile.

6.2.3 Exposure to Sedimentation ,Waste, and Discharge During Construction

Construction activities could adversely impact EFH if sedimentation, waste or discharge were to enter the ocean during construction. Heavy rains could result in discharge of materials into the water. However, BMPs requiring the use of containment devices would be employed in order to contain construction materials on site, and a plan would be developed to prevent water or debris from entering or remaining in the marine environment. Mandatory assessments of machinery to be used would reduce potential for contaminants to be released into the marine environment. Additionally, fueling of vehicles would occur at least 100 feet from the water, preferably over an impervious surface.

The following BMPs will be followed to minimize impacts from exposure to sedimentation waste, and discharge during construction:

10. A contingency plan to control toxic materials is required.
11. Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available.
12. 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.
13. All project-related materials and equipment placed in the water shall be free of pollutants.
14. Fueling of land-based vehicles and equipment shall take place at least 100 ft away from the water, preferably over an impervious surface.
15. 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. If turbidity will result from construction activities, silt curtains shall be used to contain turbidity to the minimum area possible.
16. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

Determination of Effect from Exposure to Sedimentation, Waste, and Discharge During Construction

The Navy has determined that exposure to sedimentation, waste, and discharge during construction activities in the proposed action may adversely affect EFH, however, BMPs will be employed to reduce potential impacts from the stressor, and effects will be consequently insignificant.

7. SUMMARY OF DETERMINATIONS

7.1 ESA Determinations

Potential stressors to ESA-listed species from implementing the proposed action include habitat loss stemming from shoreline changes, acoustic and visual disturbance, and exposure to sedimentation, waste, and discharge during construction. The Navy has determined that the action may affect, but is not likely to adversely affect species which could potentially encounter a stressor, as listed in Table 4, and that there will be no destruction or adverse modification of critical habitat. The Navy requests NOAA's concurrence with this determination.

Table 4. Summary of ESA Determinations of Effect.

Species	Acoustic Disturbance	Visual Disturbance
Hawaiian monk seal	NLAA	NLAA
Hawaiian monk seal critical habitat	NM	NM
Hawksbill sea turtle	NE	NE
Green sea turtle (CNP DPS)	NLAA	NLAA

NLAA – May affect, not likely to adversely affect
NE – No effect
NM – No adverse modification

7.2 EFH Determinations

Based on the proposed action, the quality and quantity of the EFH in the area, the incorporation of BMPs, and adaptive management, the Navy submits that the proposed action may adversely affect designated EFH, but that the effects would be minimal and insignificant.

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APPENDIX A

Alternative 1: Sheet Pile Bulkhead

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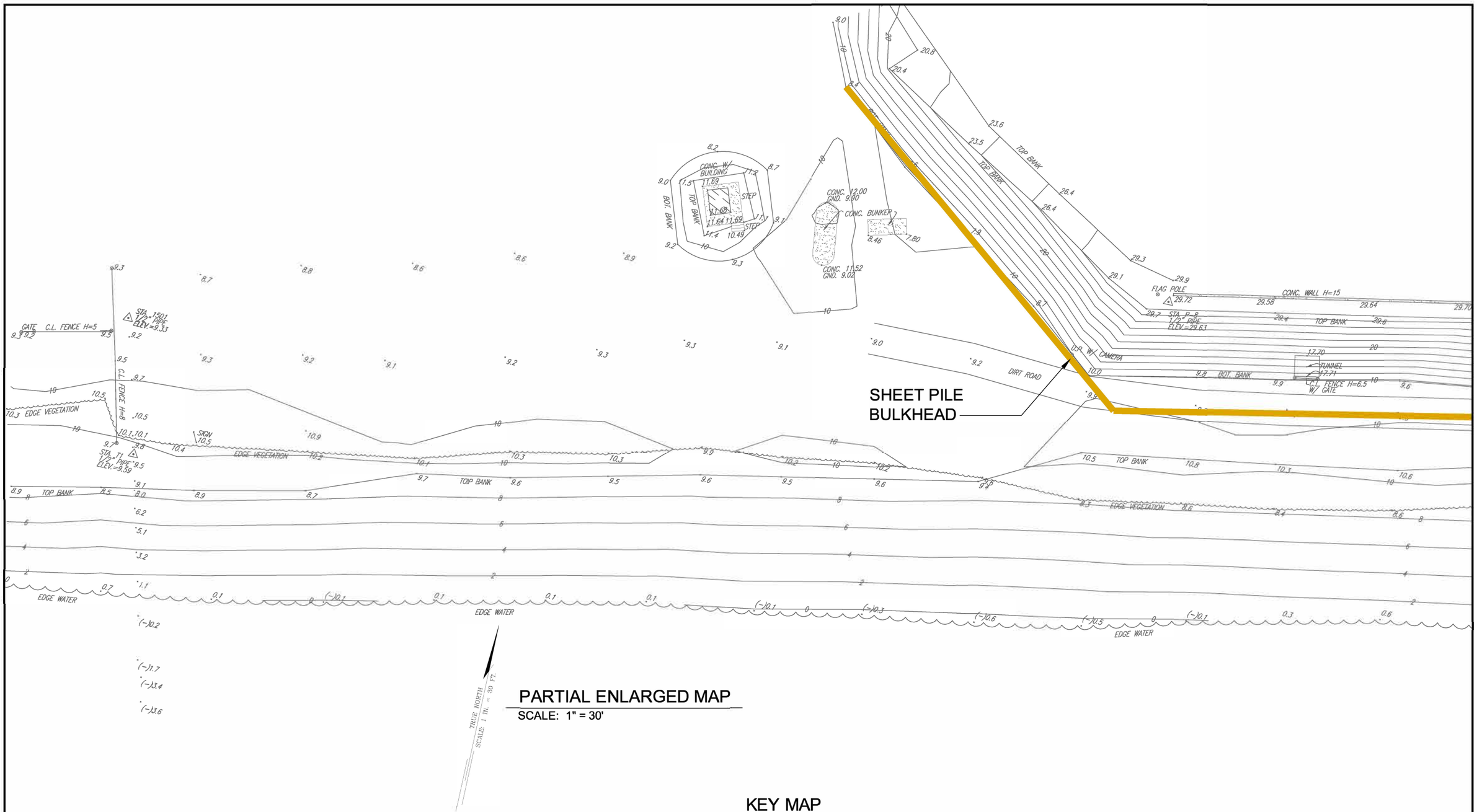


PARTIAL ENLARGED MAP

SCALE: 1" = 30'

KEY MAP

SSFM INTERNATIONAL

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

ALTERNATIVE 1: SHEET PILE BULKHEAD
PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/11/14

SHEET
S1.1

SHEET PILE
BULKHEAD

TOP BANK
BOT. BANK
DIRT ROAD
TOP BANK
BOT. BANK
TOP BANK
EDGE VEGETATION
HIGH WATER MARK
EDGE VEGETATION
EDGE WATER
EDGE WATER

STA. 12+13.02
I.E. = PIPE
ELEV.=12.21

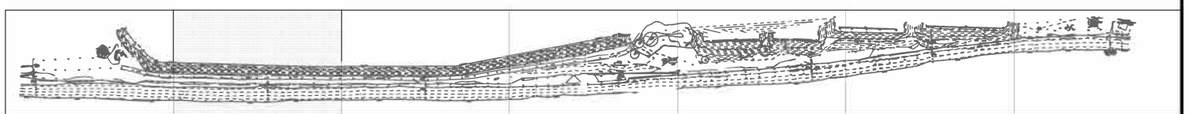
STA. 12+ Para
ELEV.=8.87

TRUE NORTH
SCALE: 1 IN. = 30 FT.

PARTIAL ENLARGED MAP

SCALE: 1" = 30'

KEY MAP



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PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/11/14

SHEET
S1.2

SHEET PILE
BULKHEAD

CONC. WALL H=15

TOP BANK

BOT. BANK

DIRT ROAD

STA. 15+03
1/2" PIPE
ELEV.=9.59

EDGE VEGETATION

STA. 13
1/2" PIPE
ELEV.=7.77

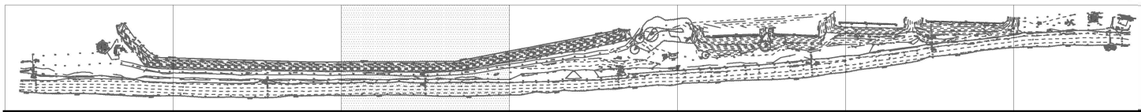
EDGE WATER

TRUE NORTH
SCALE 1 IN. = 30 FT.

PARTIAL ENLARGED MAP

SCALE: 1" = 30'

KEY MAP



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ALTERNATIVE 1: SHEET PILE BULKHEAD
PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30'

DATE - 11/11/14

SHEET
S1.3

SHEET PILE
BULKHEAD

CONC. WALL H=15

FLAG POLE

TOP BANK

BOT. BANK

DIRT ROAD

TREE LINE

TREE
D=4'
H=40'

TREE
D=3'
H=25'

TREE
D=1'
H=25'

SHED W/
BUNKER

CONC. 8.26
GND. 7.8

CONC.

CONC. 8.32
GND. 7.9

8.70

STA. 1504
12" PIPE
ELEV.=5.71

P.P.

U.P.

STA. 3874
CONC.
CUT
ELEV.=9.67

STA. 3875
CONC.
CUT
ELEV.=10.01

STA. 74
12" PIPE
ELEV.=10.73

TOP 10.92
GND. 9.9

WOOD
DECK

TOP 10.71
GND. 9.7

EDGE VEGETATION

HIGH WATER MARK

EDGE WATER

(-)0.7

(-)1.3

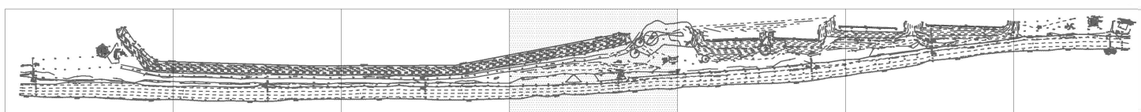
(-)3.6

TRUE NORTH
SCALE: 1 IN. = 30 FT.

PARTIAL ENLARGED MAP

SCALE: 1" = 30'

KEY MAP



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ALTERNATIVE 1: SHEET PILE BULKHEAD
PU'ULOA SHORELINE EROSION STUDY

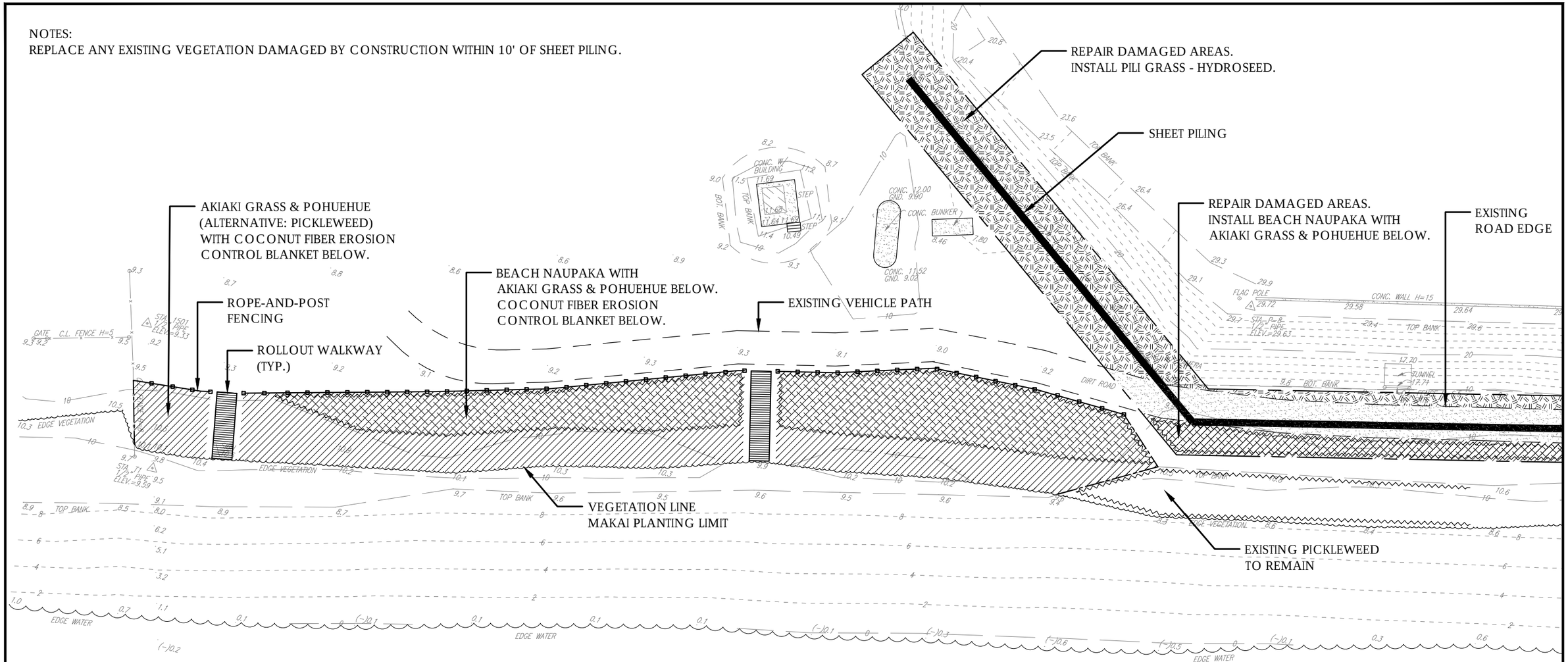
PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30'

DATE - 11/11/14

SHEET
S1.4

NOTES:
REPLACE ANY EXISTING VEGETATION DAMAGED BY CONSTRUCTION WITHIN 10' OF SHEET PILING.

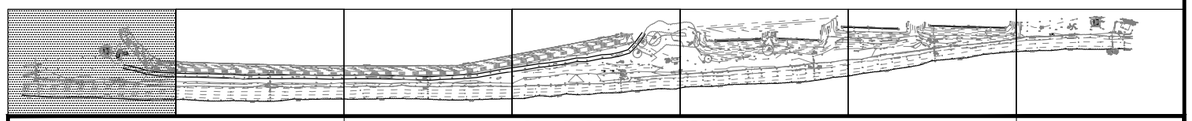


TRUE NORTH
SCALE: 1 IN. = 30 FT.

PARTIAL ENLARGED PLANTING PLAN - ALTERNATIVE 1

SCALE: 1" = 30'

KEY MAP



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Honolulu, Hawaii 96817

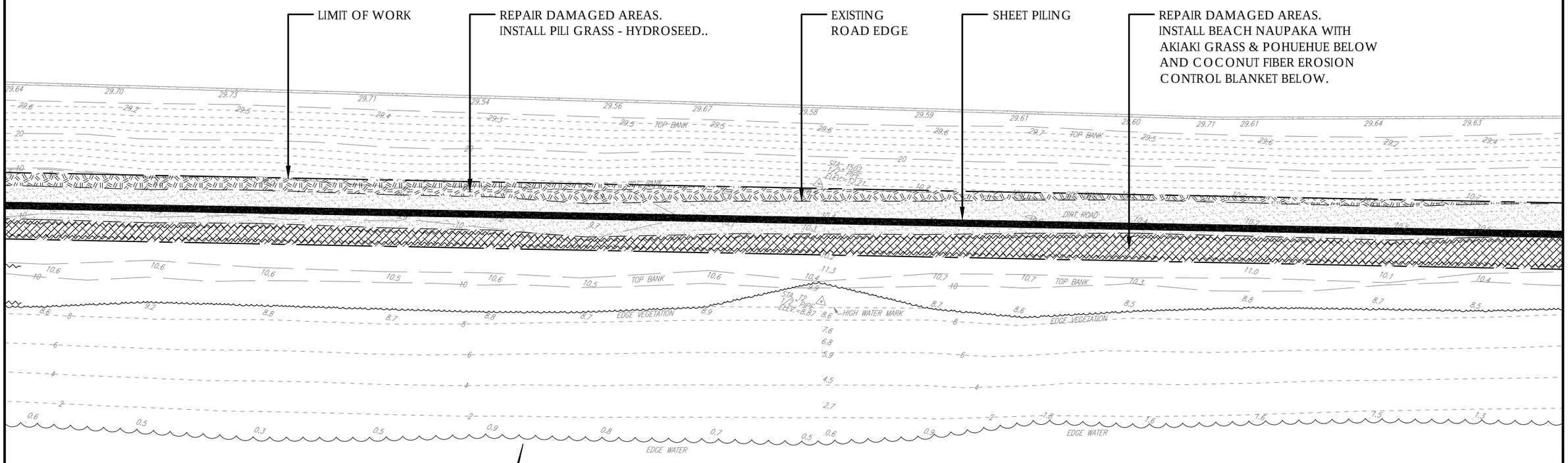
TOPOGRAPHIC SURVEY MAP
PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/07/14

SHEET
L1.1

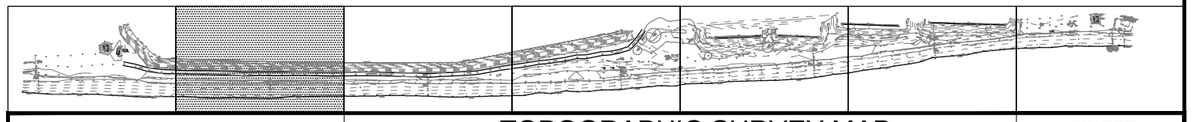
NOTES:
REPAIR ANY EXISTING VEGETATION AREAS DAMAGED BY CONSTRUCTION WITHIN 10' OF SHEET PILING.



PARTIAL ENLARGED PLANTING PLAN - ALTERNATIVE 1

SCALE: 1" = 30'

KEY MAP



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Honolulu, Hawaii 96817

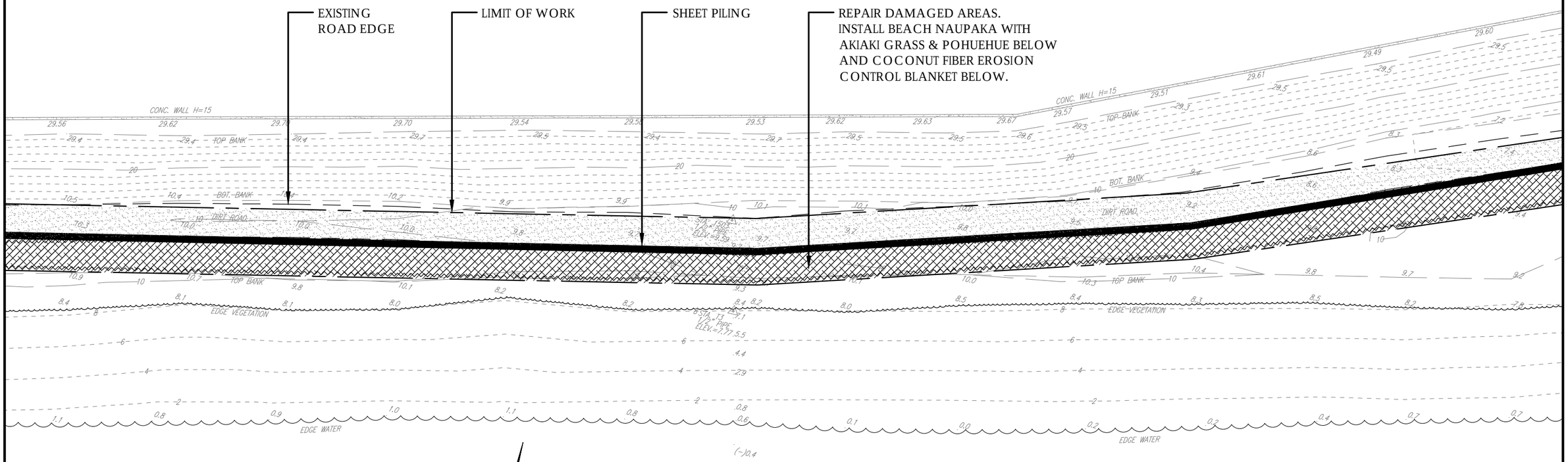
TOPOGRAPHIC SURVEY MAP
PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/07/14

SHEET
L1.2

NOTES:
REPAIR ANY EXISTING VEGETATION AREAS DAMAGED BY CONSTRUCTION WITHIN 10' OF SHEET PILING.

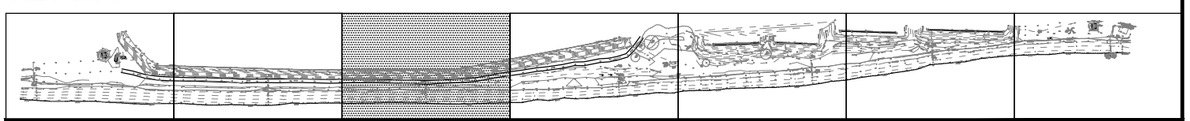


TRUE NORTH
SCALE: 1 IN. = 30 FT.

PARTIAL ENLARGED PLANTING PLAN - ALTERNATIVE 1

SCALE: 1" = 30'

KEY MAP



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TOPOGRAPHIC SURVEY MAP
PU'ULOA SHORELINE EROSION STUDY
PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/07/14

SHEET
L1.3

NOTES:
REPAIR ANY EXISTING VEGETATION AREAS DAMAGED BY CONSTRUCTION WITHIN 10' OF SHEET PILING.

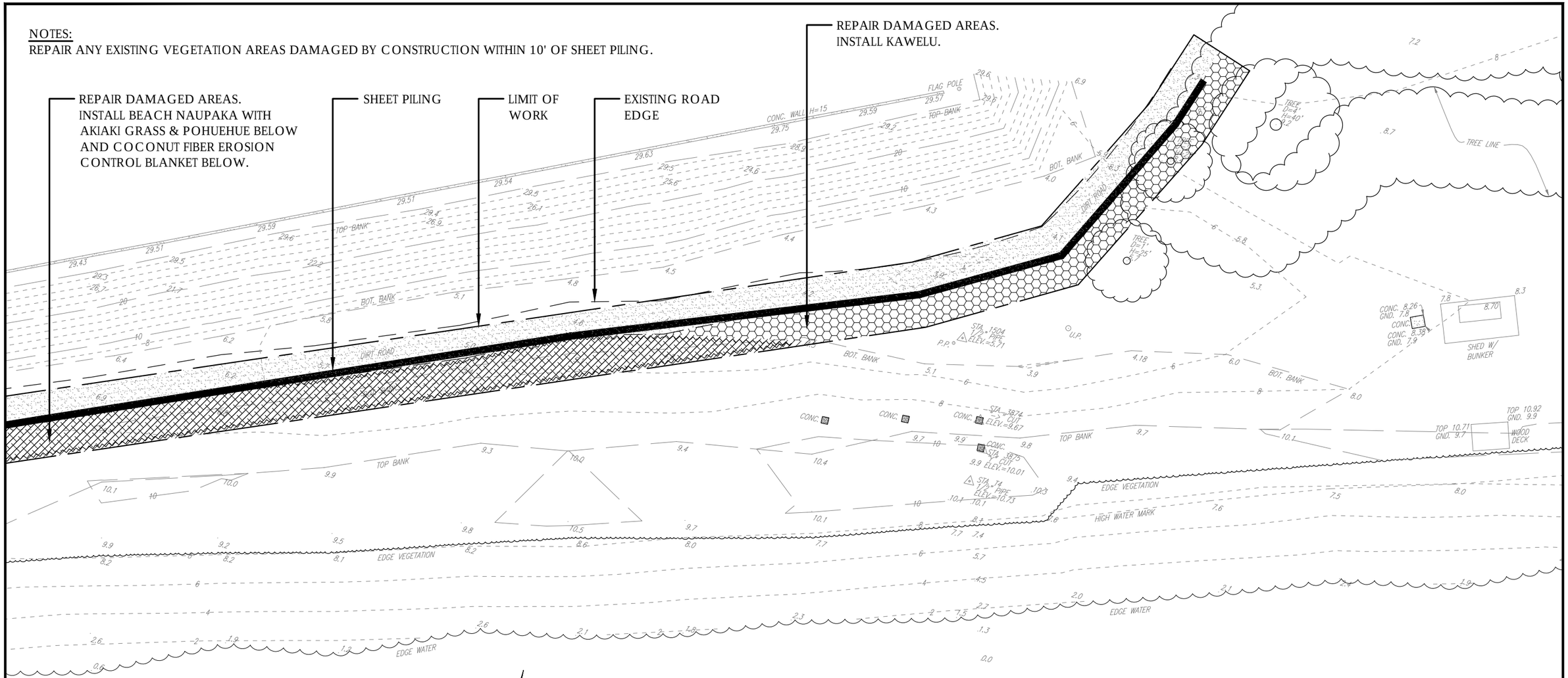
REPAIR DAMAGED AREAS.
INSTALL BEACH NAUPAKA WITH
AKIAKI GRASS & POHUEHUE BELOW
AND COCONUT FIBER EROSION
CONTROL BLANKET BELOW.

SHEET PILING

LIMIT OF
WORK

EXISTING ROAD
EDGE

REPAIR DAMAGED AREAS.
INSTALL KAWELU.

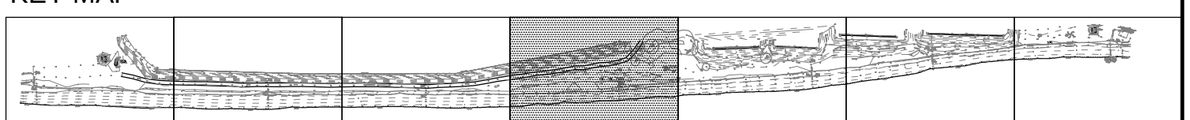


TRUE NORTH
SCALE: 1 IN. = 30 FT.

PARTIAL ENLARGED PLANTING PLAN - ALTERNATIVE 1

SCALE: 1" = 30'

KEY MAP



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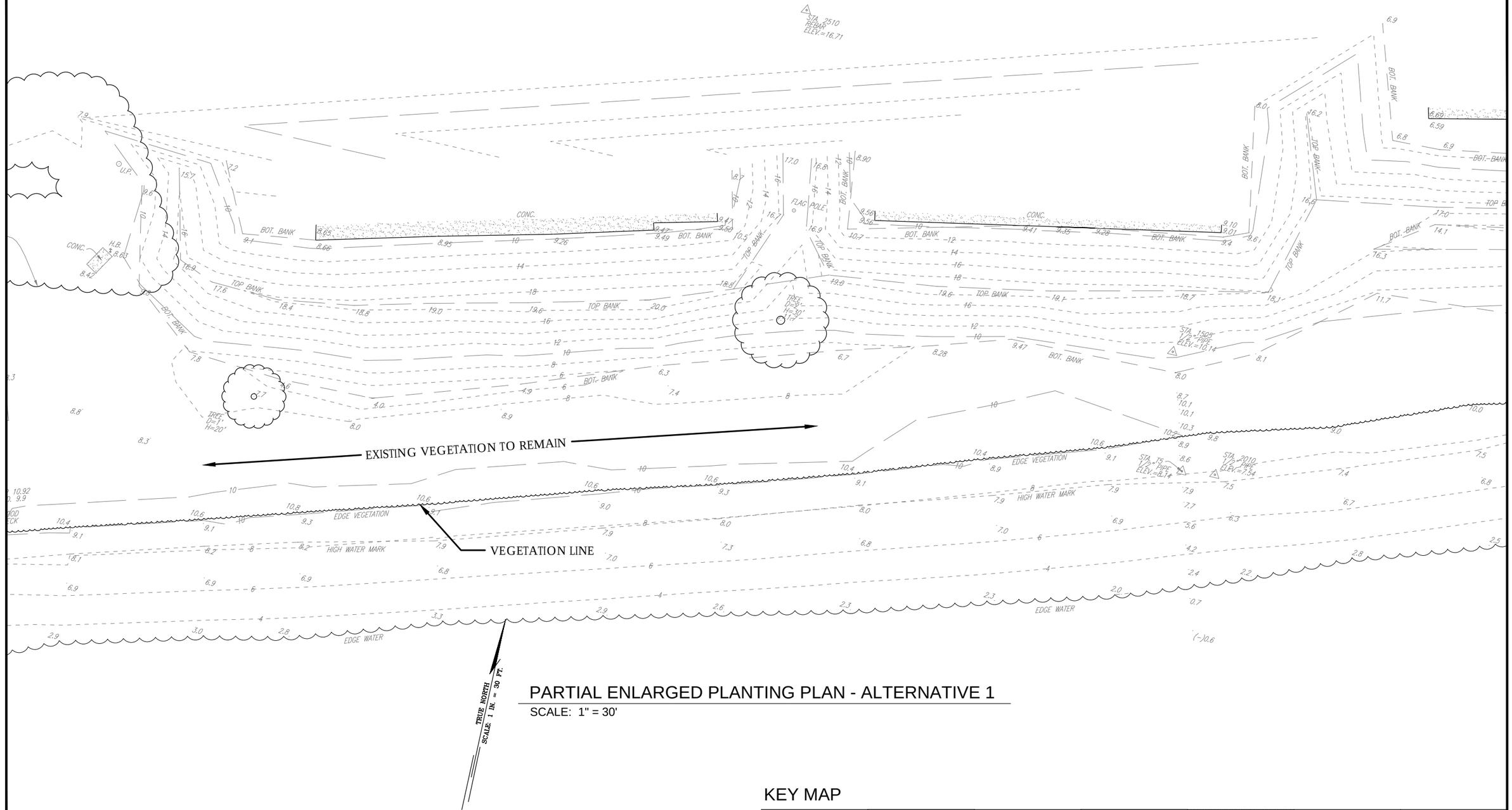
TOPOGRAPHIC SURVEY MAP
PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/07/14

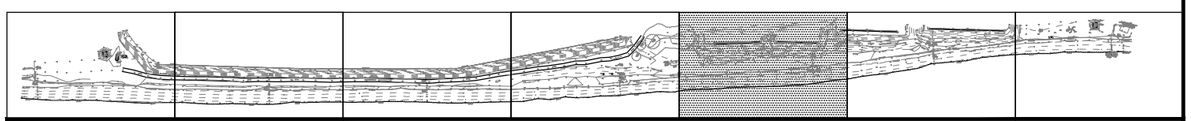
SHEET
L1.4



PARTIAL ENLARGED PLANTING PLAN - ALTERNATIVE 1

SCALE: 1" = 30'

KEY MAP



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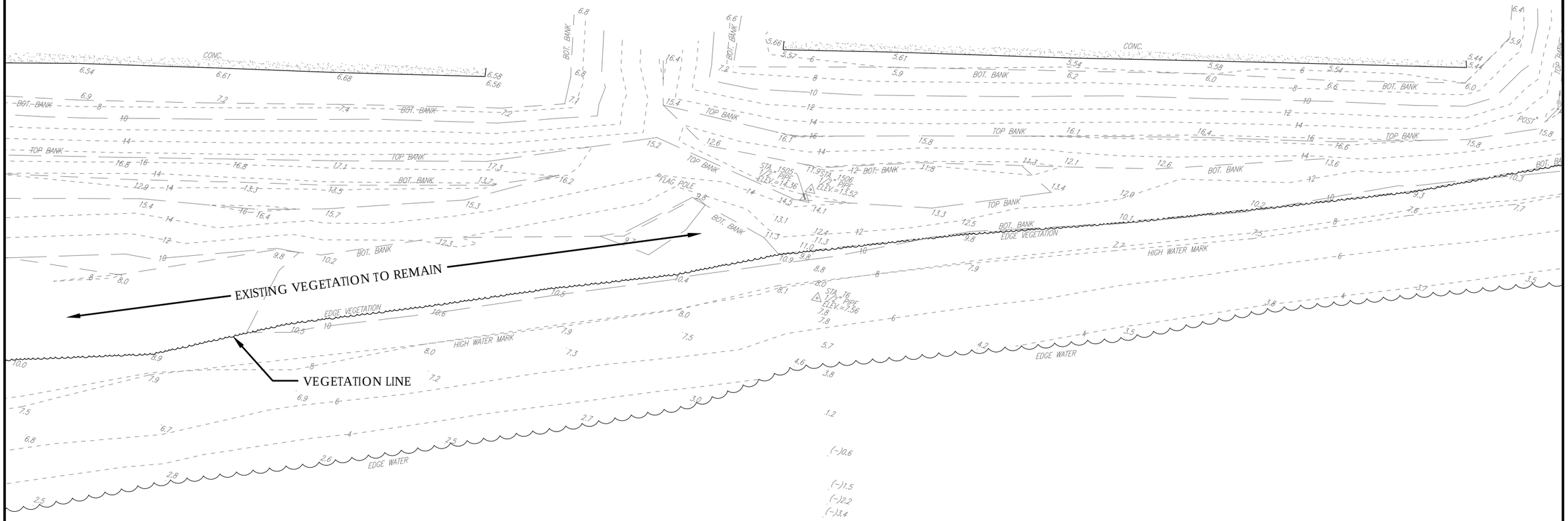
TOPOGRAPHIC SURVEY MAP
PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/07/14

SHEET
L1.5

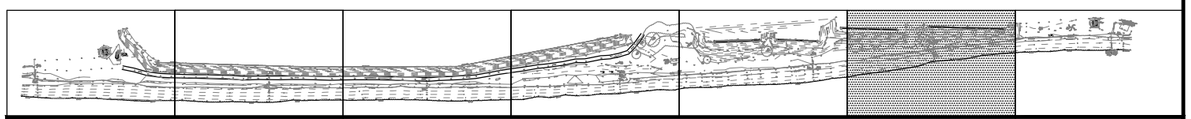


TRUE NORTH
SCALE: 1 IN. = 30 FT.

PARTIAL ENLARGED PLANTING PLAN - ALTERNATIVE 1

SCALE: 1" = 30'

KEY MAP



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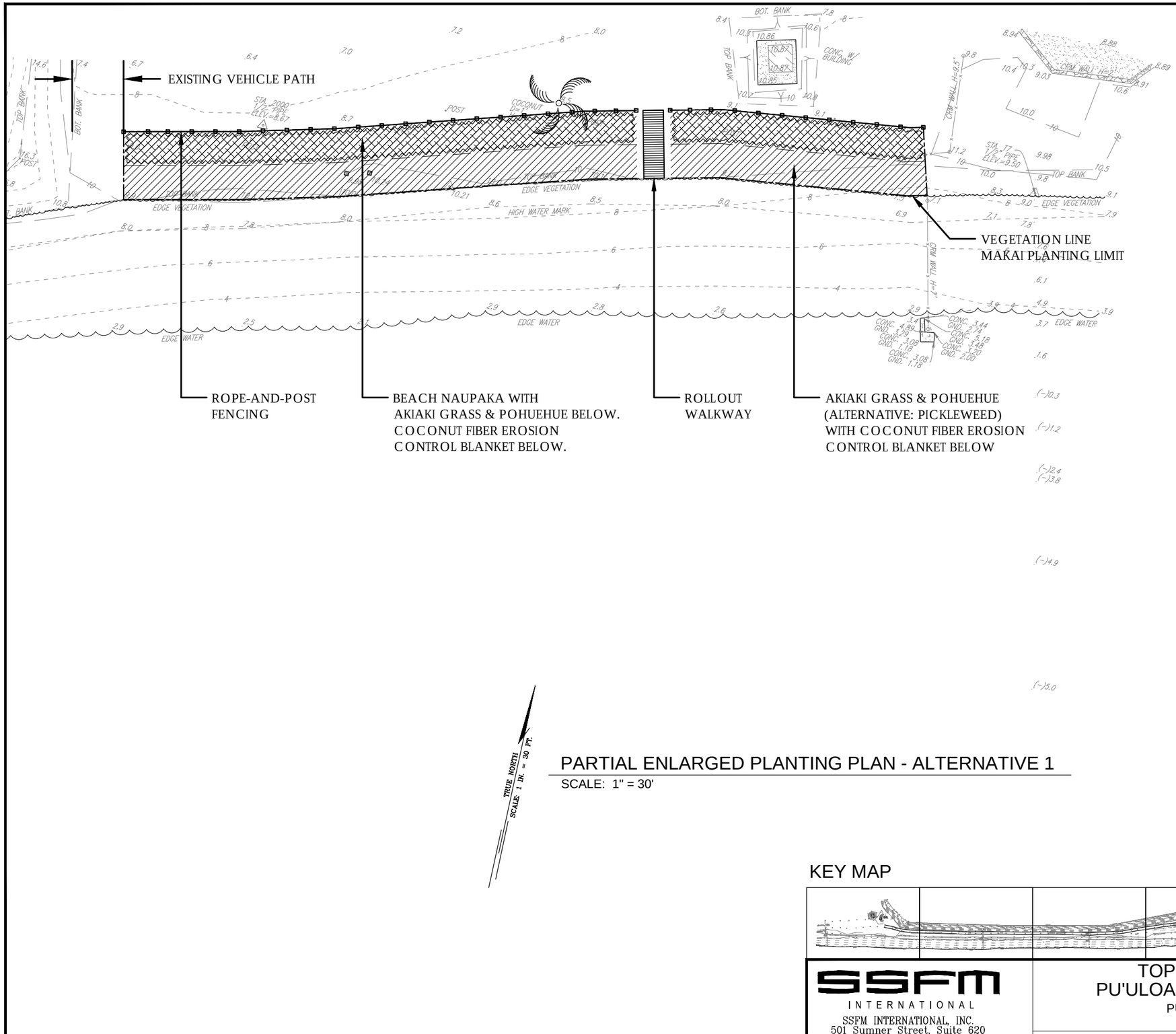
TOPOGRAPHIC SURVEY MAP
PU'ULOA SHORELINE EROSION STUDY

PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/07/14

SHEET
L1.6

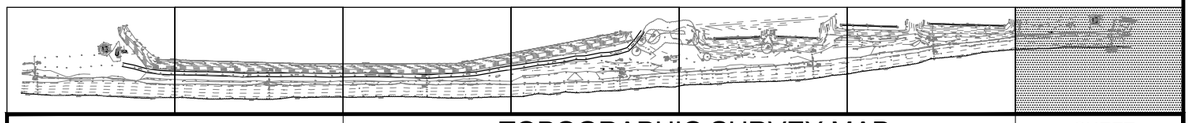


TRUE NORTH
SCALE: 1 IN. = 30 FT.

PARTIAL ENLARGED PLANTING PLAN - ALTERNATIVE 1

SCALE: 1" = 30'

KEY MAP



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TOPOGRAPHIC SURVEY MAP
PU'ULOA SHORELINE EROSION STUDY
PU'ULOA RANGE FACILITY, AMD. 16
EWA BEACH, OAHU, HAWAII

SCALE: 1" = 30' | DATE - 11/07/14

SHEET
L1.7

-----Original Message-----
From: Stuart Goldberg - NOAA Federal [mailto:stuart.goldberg@noaa.gov]
Sent: Thursday, April 25, 2019 1:22 PM
To: Bostwick, Angela S CIV USN NAVFAC PAC PEARL HI (US) <angela.bostwick@navy.mil>
Cc: Hanser, Sean F CIV USN NAVFAC PACIFIC (US) <sean.hanser@navy.mil>; Bookless CIV Lance S <lance.bookless1@usmc.mil>; Bigay, John C CIV USN NAVFAC PACIFIC (US) <john.bigay@navy.mil>; Gerry Davis - NOAA Federal <gerry.davis@noaa.gov>; Malia Chow - NOAA Federal <malia.chow@noaa.gov>
Subject: Re: [Non-DoD Source] Re: Consultation Package for Puuloa Range Training Facility Shoreline Stabilization Project

Aloha Angela,

The National Marine Fisheries Service, Pacific Islands Regional Office, received the U.S. Navy (hereafter, Navy) abbreviated essential fish habitat (EFH) consultation initiation request, Biological Evaluation (BE), and EFH assessment (EFHA) for a shoreline stabilization project at the Pu‘uloa Range Training Facility (PTRF) near ‘Ewa Beach, O‘ahu, Hawai‘i on April 1, 2019. NMFS requested additional information on April 8, 2018 and received your response on April 23, 2019. After reviewing your EFHA and April 23, 2019 response, it is clear that potential adverse effects to EFH can be further avoided and minimized.

NMFS appreciates your early coordination on this proposed project and we value and enjoy our strong working partnership with the Navy. While we do not support new coastal hardening projects in Hawai‘i because hardening exacerbates coastal erosion and may alter EFH, we are providing conservation recommendations under the EFH provisions under Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Adherence to these conservation recommendations would help you ensure that these unaddressed adverse effects are adequately avoided and minimized.

Project Description

Sea level rise, passive flooding, wave flooding, and coastal erosion (collectively hereafter, sea level rise) are predicted to result in the retreat and loss of Navy fast land at the PTRF (Anderson et al. 2018). The Navy proposes shoreline stabilization using a subsurface solid sheet pile wall to protect fast land at the PTRF from future effects of sea level rise. Project activities including installing subsurface sheet pile armor on the seaward side of impact berms, retreating four short-distance firing ranges from the shoreline to the maximum distance practicable, and revegetating fast land areas fronting all ranges, as feasible. The proposed action would be expected to commence when funding becomes available.

Sheet Pile Installation

Approximately 488 meters (m) of sheet pile wall armor would be installed using impact hammering to an approximate depth of 6.1 meters (m) below ground; the wall would emerge approximately 0.01-1 m above ground. The armor will be installed between the base of the PTRF berm and the landward edge of the existing unpaved access road fronting the ranges. The armor will be oriented landward (approximately 45 degree angle) at the eastern and western boundaries of the PTRF; this will attempt to protect fast land from future erosion caused by the sheet pile wall armor after sea level undoubtedly reaches the wall. The proposed construction activities would take place during the daytime for approximately six months.

Range Relocation

The four short-distance firing ranges would be retreated from the shoreline by 30.5 m or greater (i.e., the maximum distance). The existing earthen berms would be mechanically moved, reshaped, and reused to form new berms; additional soils and fill may be used to protect the ranges. Earthwork would be balanced to maintain existing drainage patterns, as practicable. While range retreat requires relocation of all physical components, their general dimensions and capacities would remain the same.

Revegetation

Revegetation of the entire area in front of the range would occur, as feasible; this would facilitate sand retention and reduce ongoing and future erosion. Revegetation would install principally native vegetation over bio-degradable erosion-control fabric. Revegetation would occur in any areas damaged by sheet pile construction, including an area extending at least 4.6-6.1 m on either side of the proposed sheet pile wall (if space allows). Revegetation would extend along the entire shoreline of the PRTF beyond the sheet pile footprint.

Landscape treatment (e.g., planting and installing protective fencing and walkways) may occur to minimize manmade erosion due to training activities conducted at the PTRF. These treatments would establish traffic control for beach users and discourage development of informal paths, thereby reducing erosion from foot traffic.

Essential Fish Habitat

The marine water column from the surface to a depth of 1,000 m from shoreline to the outer boundary of the EEZ (5,150 kilometers (km)/200 nautical miles/230 miles), and the seafloor from the shoreline out to a depth of 700 m around each of the Hawaiian Islands, have been designated as EFH. As such, the water column and bottom of Māmala Bay fronting the PTRF and all surrounding waters and submerged lands are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council's Pelagic and Hawai'i Archipelago Fishery Ecosystem Plan. The MUS and life stages found in these waters include: eggs, larvae, juveniles, and adults of Bottomfish MUS; eggs, larvae, juveniles, and adults of Crustacean MUS; and eggs, larvae, juveniles, and adults of Pelagic MUS. Specific types of habitat considered as EFH include coral reef, patch reefs, hard substrate, seagrass beds, soft substrate, mangrove, lagoon, estuarine, surge zone, deep-slope terraces and pelagic/open ocean.

Baseline Condition

The Navy references geomorphological and biological survey information from nearshore waters along the PTRF (e.g., the 2015 Pu'uloa Shoreline Erosion Study, hereafter 2015 Marine Survey) and nearshore waters nearby in the Iroquois Point T-groin footprint (e.g., the 2011 Iroquois Point Beach Nourishment and Stabilization, 'Ewa Beach, O'ahu, Hawai'i, hereafter, 2011 Iroquois Point EA). The 2015 Marine Survey included a qualitative swim profile extending 45.7 m offshore; the 2011 Iroquois Point EA included a quantitative marine survey that characterized coral species and size-frequency distributions.

While the information in the 2011 Iroquois Point EA is outdated, it provides a general idea of the resources that may be present in waters eastward of the PTRF that may be affected by future sedimentation imparted by the armor (i.e., reflection of water and wave energy) due to sea level rise.

The benthos of nearshore waters along the PTRF consist of a wide and shallow fringing reef; water depths range from 2-3 m out to approximately 671 m offshore. Bottom substrate in nearshore waters along the PTRF is mainly hard limestone, and bottom composition is approximately 40% sand, 40% rubble, and 20% hard limestone reef rock; sand, rubble, and reef rock outcrops often cover the limestone. Sediment transport is primarily west to east. No living corals were observed in nearshore waters along the PTRF, as per the 2015 PTRF Marine Survey; sessile growth was mainly soft macroalgae. The Navy's 2015 benthic habitat characterization in nearshore waters along the PTRF is consistent with NOAA benthic habitat maps from 2007 (Battista et al. 2007).

The 2011 marine survey from the Iroquois Point EA documented that nearby coral cover was less than 0.03%. Pocillopora damicornis was the most common coral species, with size averaging approximately 15 centimeters. Geomorphology in the T-groin footprint was similar to that in nearshore waters of the PTRF (Battista et al. 2007).

Adverse Effects

The PTRF shoreline protection project may result in short-term, long-term to permanent, and cumulative adverse effects to EFH. Short-term adverse effects may occur due to sedimentation, turbidity, and chemical contamination from equipment in the case that minimization measures fail; and noise. Long-term to permanent and cumulative adverse effects—including alteration and loss of EFH substrate and resources (e.g., burial of complex, hard-bottom habitat and coral mortality)—may occur as sea level rises and water and sediments reflect away (i.e., predominantly eastward) from the sheet pile armor wall.

Navy-proposed Best Management Practices

The Navy proposes to implement and adhere to the following best management practices (BMPs) to avoid and minimize potential adverse effects to EFH due to the proposed action:

* A contingency plan to control toxic materials.

* Implementation of an Oil Spill Prevention and Clean-up Plan.

* Inspection of equipment for cleanliness and leaks.

* Refueling vehicles over an impervious surface at least 48.3 km (30 miles) away from the marine environment.

* Erosion control measures (e.g., berms, silt fences, turbidity curtains, etc.) to minimize turbidity and sedimentation.

* Curtailing work during adverse weather and tidal/flow conditions, and developing a Debris and Waste Prevention Plan.

* Shoreline monitoring at the PRTF and the westernmost groin at Iroquois Point after installing sheet piles.

* Engaging NMFS in adaptive management discussions to manage resources (i.e., avoid and minimize adverse effects to EFH) if active waves regularly contact the sheet pile armor.

NMFS Concerns

The Navy has determined that, with implementation of their proposed BMPs, the proposed armoring project may adversely affect EFH, but the effects would be minimal and insignificant. We are concerned that the proposed armoring project may result in long-term to permanent and cumulative adverse effects to EFH including the degradation of water quality and benthic EFH complexity due to sediment resuspension and deposition, respectively.

Conservation Recommendations

NMFS provides the following EFH conservation recommendations pursuant to 50 CFR 600.920 that when implemented will ensure that potential adverse effects to EFH are avoided and minimized:

Conservation Recommendation 1: During sheet pile drilling, pre-drill sheet piles and use vibratory hammering as much as possible before using impact hammering methods.

Conservation Recommendation 2: Develop, implement, and share with NMFS a long-term plan to monitor how the sheet pile armor may alter EFH in nearshore waters as sea level rises. This would help to identify and adaptively manage potential future adverse effects to EFH due to the sheet pile armor. NMFS is ready and willing to assist with such a plan.

Please be advised that regulations (Section 305(b)(4)(B)) to implement the EFH provisions of the Magnuson-Stevens Act require that federal activities agencies provide a written response to this letter within 30 days of its receipt and, a preliminary response is acceptable if more time is needed. The final response must include a description of measures to be required to avoid, mitigate, or offset the adverse effects of the proposed activities. If the response is inconsistent with our EFH conservation recommendations, an explanation of the reason for not implementing the recommendations must be provided at least 10 days prior to final approval of the activities.

Conclusion

We appreciate your coordination on this proposed coastal armoring project at the PRFT near ʻEwa Beach, Oʻahu, Hawaiʻi. We are concerned that this proposed project may result in long-term cumulative adverse effects to EFH including the degradation of water quality and benthic EFH complexity due to sediment resuspension and deposition, respectively. We have provided conservation recommendations that when implemented will ensure that potential adverse effects to EFH are avoided and minimized. We are committed to providing continued cooperation and subject matter technical expertise as identified in the conservation recommendations, and as requested, to the Navy in order to achieve the project goals and sufficiently comply with the EFH provisions of the Magnuson-Stevens Act. Please do not hesitate to contact Stuart Goldberg at 808-725-5093 and/or stuart.goldberg@noaa.gov

<mailto:stuart.goldberg@noaa.gov> with any comments, questions or to request further technical assistance.

Best,

Stu

References

Anderson TR, Fletcher CH, Barbee MM, Romine BM, Lemmo S, Delevaux JMSMS. 2018. Modeling multiple sea level rise stresses reveals up to twice the land at risk compared to strictly passive flooding methods. Scientific Reports. 8(1):14484.

Battista TA, Costa BM, Anderson SM. 2007. Shallow-water benthic habitats of the main eight Hawaiian islands. NOAA Technical Memorandum NOS NCCOS, 61.

On Tue, Apr 23, 2019 at 6:50 PM Bostwick, Angela S CIV USN NAVFAC PAC PEARL HI (US) <angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil> > wrote:

Hi, Stu,

Please find the Navy responses to NMFS' inquiries regarding the PRTF Shoreline Stabilization Project below, as supplement to the EFH Analysis provided within the BE.

NMFS Request for Additional Information

Liquefaction and Groundwater Flows

Page 13 of the BE states "Further geotechnical investigation is required to determine the potential for liquefaction (loss of soil stability due to saturation and an applied stress). This would influence the sheet pile depth and installation method of the sheet pile because it is not recommended to use vibratory methods in soil with high liquefaction potential." The 2015 Report further states that groundwater flow was detected at many of the boreholes from one to 17.5 feet [0.3 to 5.3 meters (m), respectively].

NMFS Request: We are concerned that drilling a sheet pile structure 6.1 m into the sediment may restrict or alter groundwater flow and submarine groundwater discharge into the nearshore ocean; this may alter the quality of water column and substrate EFH. The Navy has not accounted for or analyzed potential adverse effects to EFH due to these potential changes. We request the following additional information:

a. Can the sheet pile structure be erected if liquefaction and groundwater flows are found under the foundation? If so, is there a threshold at which it cannot, and what is this threshold?

Navy Response

Geotechnical investigations will be conducted prior to placement of sheetpile to further investigate site-specific engineering considerations related to determining whether vibratory or impact hammer would be used in installation of the structure and the site's potential for supporting the sheetpile. Determinations regarding site suitability in relation to groundwater or other engineering concerns can be made at the time when these investigations occur. Engineering solutions, such as "weep holes" which would permit groundwater flow through the sheetpile will be considered, if they are determined to be a viable option for the site.

b. Please consider the effect of the sheet pile structure on groundwater flow and, if needed, provide an EFH effects analysis on the changes/alterations (if any) that it may impart to water column and benthic EFH.

Navy Response

The Puuloa Shoreline Stabilization Study, "2015 Report," states that sites around PRTF contained groundwater between 1 and 17.5 feet (0.3 to 5.3 m) below grade, in borings taken up to 31.5 feet (9.6 m) in depth. The Range Environmental Vulnerability Assessment (REVA) for MCBH (2014) discusses groundwater at the range. This report can be accessed at the following link: https://www.mcbhawaii.marines.mil/Portals/114/WebDocuments/IEL/Environmental/MCBH_REVA_Dec2014.pdf. Groundwater conditions at PRTF were also described in the 2009 REVA for the site. The 2009 REVA discussed that shallow groundwater beneath PRTF is unconfined and located within coralline limestone. The caprock layer at Puuloa is likely over 800 feet in depth. The shallow groundwater beneath PRTF is hydraulically connected to the ocean, making it brackish. Groundwater has also been documented on PRTF at one foot in depth during a construction project, and the depth was noted to

change with the tide. The caprock layer extends to over 8 miles at sea. Caprock groundwater likely discharges within those 8+ miles at unknown locations. It is possible that some basaltic groundwater may leak up into the caprock in small amounts. The sheetpile would be 1,500 feet in length, and just a few inches in thickness. It is expected that the groundwater would either divert around the sheetpile structure, or travel below the structure to release at sea along the current routes of groundwater dispersion at sea. In the event that groundwater diverts under or around the sheetpile below ground, it is not expected that this would result in significant changes to groundwater flow in the area overall, or significantly increase freshwater flow to EFH, as the groundwater in the area is thought to disperse at various locations over a wide area. In addition, engineering solutions, such as “weep holes” which would permit groundwater flow through the sheetpile will be considered, if they are determined to be a viable option for the site.

c. Please provide a timeline for when the Navy will complete the liquefaction study.

Navy Response

Geotechnical investigations will be conducted prior to placement of sheetpile to determine whether vibratory or impact hammer would be used in installation of the structure, and to investigate other geotechnical concerns regarding sheetpile installation at the site. This will be at an undetermined date in the future when funding may become available. The investigation will occur prior to construction. The results of the investigation can be made available to NMFS.

Beach Erosion Estimates

The Navy's nearshore current modeling effort in the 2015 Report and the BE suggest current flow is west to east at this site; however, no prediction appears to be provided on where sediment/sand will accumulate.

NMFS Request: We are concerned that the sheet pile structure may enhance beach erosion relative to other approaches, and that sand will accumulate westward of the first T-groin at Iroquois Point. The latter phenomenon may alter water column and benthic EFH quality in ways that the Navy has yet to consider. We request the following additional information:

a. Please provide clarification as to whether the sheet pile structure will enhance beach erosion compared to the No Action Alternative?

Navy Response

The Hawai'i Climate Change Mitigation and Adaptation Commission (HCCMAC) recently evaluated coastal trends in Hawaii, noting that estimates of global sea level rise range between 1 and 3 feet, or potentially as high as 6 feet by 2100. While sea level rise and the resulting increased erosion will occur statewide regardless of the sheetpile presence, it is possible that a bulkhead structure such as sheetpile could contribute to erosion from the beach, however, the structure would also prevent increased erosion and transfer of sediment fills or other materials from the long-distance impact berms into the ocean; for this reason, it is not expected that the presence of the sheetpile would result in significantly increased erosion above the level of the no action alternative; if the sheetpile is not installed, ocean currents and wave action will begin eroding the berms, potentially destabilizing them and releasing a substantial amount of sedimentation into the ocean. With or without sheetpile, the loss of fast land may increase nearshore sedimentation temporarily. Significant impacts to EFH from sedimentation from erosion attributed to the sheetpile are not considered likely, given the sparse nature of benthic biota and associated fauna in that area. In addition, components of the proposed action such as revegetation of the shoreline, and relocation of the short-distance ranges further from the shoreline, would benefit EFH; revegetation would facilitate retention of sand and reduce erosion, while relocation of the short-distance ranges further from the shoreline would allow natural migration of the shoreline in the event of a rise in sea level. Adaptive management has been proposed in which the Navy would engage in resource management discussions with NMFS in the event that active waves begin regularly contacting the sheetpile. Continued discussion as part of adaptive management would facilitate communication regarding future technologies which may provide advancements on the issues concerning shoreline erosion. As discussed in the 2015 Report, there are no known current technological measures that can be implemented to protect the impact berms which do not have potential drawbacks.

b. Please provide clarification as to where eroded sand will be deposited, while taking into account the first T-groin structure at Iroquois Point. If necessary, please provide an updated EFH effects analysis that considers these issues.

Navy Response

Answered in below response.

c. Does the Navy expect sand deposition to reach the corals along the Pearl Harbor entrance channel?

Navy Response

Sea Engineering, which worked on the 2015 study, notes that in general, the prevailing beach sand transport is from west to east, and in general, most of the transport is along the beach face - very close to shore. It is expected that most sand could deposit near the westernmost groin at Iroquois Point. Sand is not likely to move far offshore, and it is not likely that a significant amount of sand would be transported past the groins at Iroquois Point beach. Adaptive management and monitoring that is proposed would involve continued monitoring of the shoreline at PRTF. In addition, the westernmost groin at Iroquois Point will be monitored, subsequent to installation of the sheetpile. Sheet piles are to be installed behind the existing elevated fast land access road which fronts the long-distance ranges. Discussions with NMFS would continue in the future if waves do begin regularly contacting the elevated access road.

Thank you for your consideration of our request for your review and concurrence on the Navy's EFH Assessment for the PRTF Shoreline Stabilization Project.

Thank you,

Angela Bostwick

Natural Resources Specialist for Marine Resources

Naval Facilities Engineering Command, Pacific

258 Makalapa Drive | Pearl Harbor, HI | 96860

Office: 808.472.1426

angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil>

From: Stuart Goldberg - NOAA Federal <stuart.goldberg@noaa.gov <mailto:stuart.goldberg@noaa.gov> >
Sent: Monday, April 8, 2019 1:13 PM

To: Bostwick, Angela S CIV USN NAVFAC PAC PEARL HI (US) <angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil> >
Cc: Ian Lundgren - NOAA Federal <ian.lundgren@noaa.gov <mailto:ian.lundgren@noaa.gov> >; Joel Moribe - NOAA Federal <joel.moribe@noaa.gov <mailto:joel.moribe@noaa.gov> >; Hanser, Sean F CIV USN NAVFAC PACIFIC (US) <sean.hanser@navy.mil <mailto:sean.hanser@navy.mil> >; Bookless, Lance S Environmental, Environmental Department <lance.bookless1@usmc.mil <mailto:lance.bookless1@usmc.mil> >; Bigay, John C CIV USN NAVFAC PACIFIC (US) <john.bigay@navy.mil <mailto:john.bigay@navy.mil> >; Anne Chung - NOAA Affiliate <anne.chung@noaa.gov <mailto:anne.chung@noaa.gov> >
Subject: Re: [Non-DoD Source] Re: Consultation Package for Puuloa Range Training Facility Shoreline Stabilization Project

Aloha Angela,

I have completed an initial review of the Navy's essential fish habitat (EFH) assessment in the Biological Evaluation (BE) for the subject project; I have also re-read the Navy's 2015 Puuloa Shoreline Stabilization Study (hereafter, 2015 Report). Below, please find our our additional information request for the project, including requests for potential EFH impacts analyses that have not been provided. We look forward to working closely with you to better understand the project as we move forward with the consultation together.

NMFS Request for Additional Information

Liquefaction and Groundwater Flows

Page 13 of the BE states "Further geotechnical investigation is required to determine the potential for liquefaction (loss of soil stability due to saturation and an applied stress). This would influence the sheet pile depth and installation method of the sheet pile because it is not recommended to use vibratory methods in soil with high liquefaction potential." The 2015 Report further states that groundwater flow was detected at many of the boreholes from one to 17.5 feet [0.3 to 5.3 meters (m), respectively].

NMFS Request: We are concerned that drilling a sheet pile structure 6.1 m into the sediment may restrict or alter groundwater flow and submarine groundwater discharge into the nearshore ocean; this may alter the quality of water column and substrate EFH. The Navy has not accounted for or analyzed potential adverse effects to EFH due to these potential changes. We request the following additional information:

a. Can the sheet pile structure be erected if liquefaction and groundwater flows are found under the foundation? If so, is there a threshold at which it cannot, and what is this threshold?

b. Please consider the effect of the sheet pile structure on groundwater flow and, if needed, provide an EFH effects analysis on the changes/alterations (if any) that it may impart to water column and benthic EFH.

c. Please provide a timeline for when the Navy will complete the liquefaction study.

Beach Erosion Estimates

The Navy's nearshore current modeling effort in the 2015 Report and the BE suggest current flow is west to east at this site; however, no prediction appears to be provided on where sediment/sand will accumulate.

NMFS Request: We are concerned that the sheet pile structure may enhance beach erosion relative to other approaches, and that sand will accumulate westward of the first T-groin at Iroquois Point. The latter phenomenon may alter water column and benthic EFH quality in ways that the Navy has yet to consider. We request the following additional information:

a. Please provide clarification as to whether the sheet pile structure will enhance beach erosion compared to the No Action Alternative?

b. Please provide clarification as to where eroded sand will be deposited, while taking into account the first T-groin structure at Iroquois Point. If necessary, please provide an updated EFH effects analysis that considers these issues.

c. Does the Navy expect sand deposition to reach the corals along the Pearl Harbor entrance channel?

NMFS greatly appreciates the strong partnership that we enjoy with the Navy as we work together on this and other projects. We have reviewed your BE and have requested additional information (see above) as we move forward on this consultation. Please don't hesitate to contact me with questions or concerns.

Best,

Stu

On Wed, Apr 3, 2019 at 4:25 PM Bostwick, Angela S CIV USN NAVFAC PAC PEARL HI (US) <angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil> > wrote:

Thanks, Stu,

I had heard that you were relocating to CA, but didn't know that you were working remotely from that location. Good luck with the move to the west coast! Let us know any questions you may have regarding the shoreline stabilization project or the EFH Assessment.

Regards,

Angela Bostwick
Natural Resources Specialist for Marine Resources

Naval Facilities Engineering Command, Pacific
258 Makalapa Drive | Pearl Harbor, HI | 96860
Office: 808.472.1426
angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil>

-----Original Message-----
From: Stuart Goldberg - NOAA Federal <stuart.goldberg@noaa.gov <mailto:stuart.goldberg@noaa.gov> >
Sent: Wednesday, April 3, 2019 1:12 PM
To: Bostwick, Angela S CIV USN NAVFAC PAC PEARL HI (US) <angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil> >
Cc: Ian Lundgren - NOAA Federal <ian.lundgren@noaa.gov <mailto:ian.lundgren@noaa.gov> >; Joel Moribe - NOAA Federal <joel.moribe@noaa.gov <mailto:joel.moribe@noaa.gov> >; Hanser, Sean F CIV USN NAVFAC PACIFIC (US) <sean.hanser@navy.mil <mailto:sean.hanser@navy.mil> >; Bookless, Lance S Environmental, Environmental Department <lance.bookless1@usmc.mil <mailto:lance.bookless1@usmc.mil> >; Bigay, John C CIV USN NAVFAC PACIFIC (US) <john.bigay@navy.mil <mailto:john.bigay@navy.mil> >; Anne Chung - NOAA Affiliate <anne.chung@noaa.gov <mailto:anne.chung@noaa.gov> >
Subject: [Non-DoD Source] Re: Consultation Package for Puuloa Range Training Facility Shoreline Stabilization Project

Hi Angela,

NMFS has received your request to initiate EFH consultation for the subject project. I will be the POC for this consultation. I am reviewing the consultation package and EFH Assessment and will let you know of any questions

and/or concerns.

Also, FYI, I am working remotely from San Diego, CA through mid-July. Please keep the time difference in mind with any requests. If you need a face-to-face meeting with me we can arrange for video chat via Google Hangout or Zoom. If you'd like to chat with an EFH program staff member in Honolulu, that can also be arranged. I have cc'd Ian Lundgren and Anne Chung for their situational awareness.

Best,
Stu

On Mon, Apr 1, 2019 at 1:21 PM Bostwick, Angela S CIV USN NAVFAC PAC PEARL HI (US) <angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil> <mailto:angela.bostwick@navy.mil <mailto:angela.bostwick@navy.mil> > > > wrote:

Hi,

The United States Marine Corps (USMC) is requesting consultation with NMFS in regards to the Shoreline Stabilization Project at Puuloa Range Training Facility in Ewa Beach, Hawaii. The attached cover letter and Biological Evaluation contains an analysis of potential impacts to ESA-listed species, critical habitat, and EFH. USMC, NAVFAC Pacific, and NMFS had previously met in pre-consultation regarding this project on November 6, 2017. As discussed in that meeting, the attached consultation package includes a discussion of current and expected trends along the shoreline, potential impacts of the project on those conditions, and the resulting potential impacts to ESA and EFH resources.

Thank you for your consideration of our request for your review and concurrence.

Sincerely,

Angela Bostwick

Natural Resources Specialist for Marine Resources

Naval Facilities Engineering Command, Pacific

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Office: 808.472.1426

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--

Stuart Goldberg, Ph.D.
EFH Consultation Specialist

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NATIONAL MARINE FISHERIES SERVICE
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T.B. Pochop
Director, Environmental Compliance and Protection Division
United States Marine Corps
Marine Corps Base Hawaii
Box 63002
Kaneohe Bay, Hawaii 96863-3002

May 2, 2019

RE: Request for Informal ESA Consultation on the Pu'uloa Range Training Facility Shoreline Stabilization Project, Ewa Beach, Hawaii (I-PI-19-1725-AG)

Director Pochop:

On March 29, 2019, NOAA's National Marine Fisheries Service (NMFS) received your written request for concurrence and biological evaluation (BE; NAVFAC 2019) that the United States Marine Corps' (USMC) Pu'uloa Range Training Facility (PRTF) Shoreline Stabilization Project is not likely to adversely affect (NLAA) the following endangered or threatened under NMFS' jurisdiction: endangered Hawaiian monk seals and threatened Central North Pacific DPS green turtles. We requested additional information, which was received on April 2, 2019 and informal consultation was initiated on that date. Critical habitat does not occur in the action area. This response to your request was prepared by NMFS pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 *et seq*.), implementing regulations at 50 CFR 402, and agency guidance for the preparation of letters of concurrence.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The concurrence letter will be available through NMFS' Public Consultation Tracking System [https://pcts.nmfs.noaa.gov]. A complete record of this consultation is on file at the Pacific Island Regional Office, Honolulu, Hawaii.

Proposed Action

The USMC proposes to implement measures to mitigate coastal erosion of fast land (dry land above the high tide mark) in order to protect existing range structures at the PRTF, Pu'uloa, Ewa Beach, on the south central shore of Oahu. The purpose of the proposed action is to protect existing range structures, such as impact berms, from advancing erosion and sea level rise. The need for the proposed action is to ensure long-term sustainability of the range, which is used for training and equipping combat-capable forces ready to deploy worldwide. Elements of the proposed action include installation of a below-ground sheet-pile substructure inland from the

shoreline, behind the fast-land access road which fronts the two long-distance ranges. In addition, the four short-distance firing ranges would be moved back from the shoreline to the maximum distance practicable. Revegetation of available upland areas fronting all ranges would also occur, as feasible. The proposed action would be expected to commence when funding becomes available. The sheet pile substructure would be primarily below-ground, emerging a few inches to a few feet above the surface of the ground. The preferred location of the sheet pile is on the berm side of the existing upland unpaved road fronting the long-distance ranges. The sheet pile is proposed to wrap-around the eastern and western boundaries of the long-distance ranges, in order to provide erosion protection at the ends of the berms. Increased erosion and scouring may occur if active waves reach the sheet pile in the event of future sea level rise and erosion; however, the proposed installation location currently is fast land, above the tidal influence. To avoid an abrupt end of the proposed sheet pile, it would be angled away from the shoreline at both the west and east ends. This rounding off of the proposed sheet pile would minimize potential impacts to adjacent shorelines, and would protect the sheet pile from erosion working its way back behind the structure. The terminus of the proposed sheet pile would end well short of the west installation boundary; the boundary would be an estimated 230 feet from the west end of the proposed sheet pile. This buffer area would further serve to mitigate any potential future impacts to adjacent shorelines. Sheet pile would be installed on dry land using either a vibratory or impact hammer, with impact hammer being the most likely method. The proposed construction activities would take place during the daytime, generally on weekdays, for approximately six months in duration.

The four short-distance firing ranges would be moved back away from the shoreline to the maximum distance practicable, possibly 100 feet or more. To the maximum extent practicable, the earthen materials that comprise the existing range berms would be moved and reused to form the new berms for the retreated ranges, but additional soils and/or fill may be required to ensure that the relocated range berms provide the necessary coverage of the retreated ranges. To the extent possible earthwork would be balanced to maintain existing drainage patterns. Retreat of the ranges would require the relocation of all physical components of the ranges, but the general dimensions and capacities of the ranges would remain the same.

Revegetation of available fast land areas fronting the entire range would also occur, as feasible, facilitating retention of sand and reducing erosion. Shoreline vegetation restoration and landscape repair would utilize principally native species, to the maximum extent practicable, and would also occur in any areas damaged by the sheet pile construction, including an area extending at least 15 to 20 feet on either side of the proposed sheet pile, if space allows. Vegetation restoration would extend along the entire PRTF shoreline, beyond the limits of the proposed sheet pile. Restored vegetation would be installed over a bio-degradable erosion-control fabric. To minimize manmade erosion over time at the training facility, the proposed action may include landscape treatment consisting of planting, protective fencing, and walkways. These solutions would establish traffic control for beach users, reducing erosion from foot traffic, and discourage development of informal paths. Best Management Practices (BMPs: Appendix A) and proposed adaptive management as described in the BE would minimize effects to monk seals and sea turtles. Adaptive management may be employed based on continued monitoring of the shoreline at PRTF. Discussions with NMFS would continue and if, in the future, waves do begin regularly contacting the elevated access road, it is possible that further technologies or shoreline engineering methods will be developed.

Action Area

The action area includes the PRTF including long- and short-distance ranges, adjacent shorelines and nearshore areas. The ocean area along the PRTF shoreline is located within the Pearl Harbor Naval Defensive Sea Area. PRTF is approximately 165 acres in size and stretches along about 3,000 feet of sandy shoreline. It consists of six small-arms ranges of different known distances for pistols, rifles up to 7.62 mm, and shotguns (Figure 2). Ranges A and B on the west end are "long-distance" ranges configurable to varying distances to a maximum of 1,000-yards (Range A) and 600 yards (Range B), and their ocean end consists of large earthen berms with concrete barrier walls on top (BE Figure 3). The other four ranges (C, D, E and F) are shorter rifle and pistol ranges from 150 to 250 feet in length, with earthen berms along the beach.

Figure 1. Proposed action area

Listed Species

The ESA-listed threatened and endangered species under NMFS' jurisdiction listed in Table 1 are known to occur, or could reasonably be expected to occur, in the action area, and may be affected by the proposed activities. Detailed information about the biology, habitat, and conservation status of the animals listed in Table 1 can be found in their status reviews, recovery plans, federal register notices, and other sources at http://www.nmfs.noaa.gov/pr/species/esa/.

Table 1. Common name, scientific name, ESA status, effective listing date, and Federal Register references for ESA-listed species considered in this consultation.

Species	Scientific Name	ESA Status	Effective Listing Date	Federal Register Reference
Green Sea Turtle Central North Pacific Distinct Population Segment (DPS)	*Chelonia mydas*	Threatened	4/06/2016	81 FR 20057
Hawaiian Monk Seal[1]	*Neomonachus schauinslandi*	Endangered	11/23/1976	41 FR 51612

Analysis of Effects

In order to determine that a proposed action is not likely to adversely affect ESA-listed species, NMFS must find that the effects of the proposed action are expected to be insignificant, discountable, or completely beneficial. As defined in the joint USFWS-NMFS Endangered Species Consultation Handbook, beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs[1]. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: 1) be able to meaningfully measure, detect, or evaluate insignificant effects; or 2) expect discountable effects to occur (USFWS & NMFS 1998). This standard, as well as consideration of the probable duration, frequency, and severity of potential interactions, was applied during the analysis of effects of the proposed action on ESA-listed marine species, as is described in the consultation request and BA.

The BE identified the following stressors that have the potential to affect ESA-listed marine species in the action area:

- Disturbance from human activity and equipment operations
- Waste discharge during construction
- Habitat loss from shoreline changes

Section 4.0 of the BE lists BMPs included in the proposed action to minimize impacts during construction.

Disturbance from human activity and equipment operations

The proposed action will involve construction work on dry land and will not directly disturb marine waters where ESA-listed marine species may be exposed to project-related activities. Disruption of important behaviors such as feeding, resting, or reproduction are potential effects from acoustic or visual disturbances on land. While visual and auditory changes will occur during construction, the work will occur on dry land and in an area with existing high levels of

[1] Take" is defined by the ESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species. NMFS defines "harass" as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." NMFS defines "harm" as "an act which actually kills or injures fish or wildlife." Such an act may include significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering. Take of species listed as endangered is prohibited at the time of listing, while take of threatened species may not be specifically prohibited unless NMFS has issued regulations prohibiting take under section 4(d) of the ESA.

ambient noise. NMFS expects behavioral responses to be influenced by a level of tolerance to vessel traffic and industrialization around the work area and that animals may be habituated to such noise. The work area is a naturally noisy environment and pile driving will be on land, intermittent in nature and at a stationary source. This may alleviate stress and reactions. Further, the proposed BMPs are appropriate and are expected to be effective in minimizing potential adverse effects. Hawaiian monk seals or sea turtles may respond to noises by avoiding, halting their activities, experience reduced hearing by masking, or attraction to source noises. Avoidance is most likely, and a common natural reaction by listed species and considered low risk. Hawaiian monk seals and sea turtles are large and agile, and capable of swimming away safely from any disturbance that would harm them.

NMFS expects that sea turtles and seals will avoid the nearshore areas where work will occur due to human activity. However, monitoring for turtles and monk seals will occur and work will be halted if listed species are within 50 yards of project activities, and would not resume until the animal has left the area on its own volition. The proposed sheet pile-driving on dry land is not expected to generate impulsive sounds under water or create sound intensities underwater that could damage lungs or eardrums in sea turtles or monk seals, or cause Permanent Threshold Shifts (PTS) or Temporary Threshold Shifts (TTS) in hearing, or behavioral responses. Effects to animals occurring below the water are expected to be discountable, due to the limited transfer of sound between air and water.

NMFS expects that exposure to disturbance from human activity and equipment operations would be unlikely because all activity will occur on dry land and the risk of injury or behavioral responses is extremely unlikely due to the proposed monitoring. NMFS has determined that there is a low risk of exposure of green turtles and monk seals and disturbance from human activity in the work area is extremely unlikely, and therefore discountable.

Waste discharges during construction

Construction wastes may include plastic trash and bags that may be ingested by marine organisms and/or cause entanglement; however, all plastic and construction waste will be contained and disposed of at an approved disposal location. It is anticipated that discharges and spills are unlikely to occur and if so, they would be infrequent, small, contained, and quickly cleaned up. BMPs requires a spill containment plan and waste prevention procedures including for petroleum, concrete and chemicals. NMFS expects that exposure to waste discharges would be insignificant. The risk of impacts is extremely unlikely due to the proposed prevention and containment of construction wastes. NMFS has determined that there is a low risk of exposure of green turtles and monk seals and impacts from waste discharges are extremely unlikely, and therefore discountable.

Habitat loss from shoreline changes

Although there is no designated critical habitat in the action area, the proposed project may affect up to 1,500 feet of dry land adjacent to the shoreline, an area that has already been impacted by sea level rise and erosion. The shoreline of PRTF is narrow and offers little space for haul out by ESA-listed species due to shoreline erosion, the presence of the impact berms, and dense, thorny vegetation. The short-distance ranges front about 900 feet of shoreline and relocating these ranges further back from the shoreline may benefit shoreline habitat by allowing natural self-replenishment of the beach, and/or allowing further migration landward of the beach as sea levels rise. The revegetation component of the proposed action will increase sand retention and reduce erosion rates across the entire PRTF, which is about 3,000 feet. To avoid an abrupt end of

the proposed sheet pile, it would be angled away from the shoreline at both the west and east ends. This "rounding off" of the proposed sheet pile would minimize potential impacts to adjacent shorelines, and would protect the sheet pile from erosion working its way back behind the structure. The end of the proposed sheet pile would end well short of the west installation boundary; the boundary will be 230 feet from the west end of the proposed sheet pile. This buffer area would further serve to mitigate any potential future impacts to adjacent shoreline. Potential effects to habitat for monk seals and sea turtles will thus be discountable, and no destruction or adverse modification of Hawaiian monk seal critical habitat will occur as a result of the proposed action.

Conclusion

Considering the information and assessments presented in the consultation request and available reports and information, and in the best scientific information available about the biology and expected behaviors of the ESA-listed marine species considered in this consultation; NMFS concurs with your determination that the proposed action is not likely to adversely affect endangered Hawaiian monk seals and threatened Central North Pacific DPS green turtles.

This concludes your consultation responsibilities under the ESA for species under NMFS's jurisdiction. If necessary, consultation pursuant to Essential Fish Habitat would be completed by NMFS' Habitat Conservation Division in a separate communication.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on ESA-listed species or designated critical habitat (50 CFR 402.02).

Actions or measures that could further minimize or avoid adverse effects of the proposed action on sea turtles and monk seals include:

1) No new permanent lighting should result from this project. Minimize the effects of existing lighting in the project area, construction lighting and post-project lighting. All light visible from potential nesting beaches should be shielded, directed only where light is needed, placed as low as practicable, and use long wavelength lamps (e.g., red/amber LEDs, low pressure sodium) and black baffles. Avoid the use of bright white light, such as metal halide, halogen, fluorescent, mercury vapor, and incandescent lamps and avoid use where such light could be visible from the beach.
2) If there is evidence of an active sea turtle nest in the vicinity of the project, implement a 300-ft buffer, and cease work activities within the buffer.
3) Cease work during adverse weather conditions, stabilize all work areas at the end of each work day.
4) Ensure that all emergency response materials are on site each work day as described in the BE's BMPs.
5) Continue to take climate change and sea level rise into consideration for all potential projects affecting marine shorelines.

Reinitiation Notice

ESA Consultation must be reinitiated if: 1) Take occurs to an endangered species, or to a threatened species for which NMFS has issued regulations prohibiting take under section 4(d) of the ESA.; 2) new information reveals effects of the action that may affect ESA-listed species or designated critical habitat in a manner or to an extent not previously considered; or 3) the identified action is subsequently modified in a manner causing effects to ESA-listed species or designated critical habitat not previously considered.

If you have further questions, please contact Randy McIntosh at 808-725-5154 or randy.mcintosh@noaa.gov. Thank you for working with NMFS to protect our nation's living marine resources.

Sincerely,

DEAN.RONNIE.J.1399531868

Digitally signed by DEAN.RONNIE.J.1399531868
Date: 2019.05.02 11:19:51 -10'00'

For: Ann M. Garrett
Assistant Regional Administrator
Protected Resources Division

Cc: Ms. Angela Bostwick, NAVFAC
Angela.bostwick@navy.mil

PIRO Reference No.: I-PI-19-1725-AG
NMFS ECO No.: PIRO-2019-00153

Literature Cited

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National Marine Fisheries Service (NMFS). 2015. Endangered and Threatened Species: Final Rulemaking to Revise Critical Habitat for Hawaiian Monk Seals. National Marine Fisheries Service, Silver Spring, MD. 80 FR 50925. August 21, 2015. https://federalregister.gov/a/2015-20617.

Rodkin, R. and K. Pommerenck. 2014. Caltrans compendium of underwater sound data from pile driving – 2014 update.

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U.S. Navy. 2017. Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III). 194 pages. https://hstteis.com/portals/hstteis/files/reports/Criteria_and_Thresholds_for_U.S._Navy_Acoustic_and_Explosive_Effects_Analysis_June2017.pdf

Naval Facilities Engineering Command (NAVFAC) Pacific. 2019. Analysis of the Effects of the Pu‘uloa Range Training Facility Shoreline Stabilization Project on Protected Species and Essential Fish Habitat Ewa Beach, Hawaii. February.

Appendix A

A.1. Best Management Practices (BMP) for General In-Water Work Including Boat Operations

January 2015

NMFS Protected Resources Division recommends implementation of the following BMP to reduce potential adverse effects on protected marine species. These BMPs are not intended to supplant measures required by any other agency, and compliance with these BMP shall always be considered secondary to safety concerns.

All workers associated with this project, irrespective of their employment arrangement or affiliation (e.g. employee, contractor, etc.) should be fully briefed on required BMP and the requirement to adhere to them for the duration of their involvement in this project.

A. Constant vigilance shall be kept for the presence of ESA-listed marine species during all aspects of the proposed action, particularly in-water activities such as boat operations, diving, and deployment of anchors and mooring lines.

1. The project manager shall designate an appropriate number of competent observers to survey the areas adjacent to the proposed action for ESA-listed marine species.
2. Surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour. Periodic additional surveys throughout the workday are strongly recommended.
3. All work shall be postponed or halted when ESA-listed marine species are within 50 yards of the proposed work, and shall only begin/resume after the animals have voluntarily departed the area. If ESA-listed marine species are noticed within 50 yards after work has already begun, that work may continue only if, in the best judgment of the project supervisor, that there is no way for the activity to adversely affect the animal(s). For example, divers performing surveys or underwater work would likely be permissible, whereas operation of heavy equipment is likely not.
4. Special attention will be given to verify that no ESA-listed marine animals are in the area where equipment or material is expected to contact the substrate before that equipment/material may enter the water. This includes the requirement to limit anchoring to sandy areas well away from coral.
5. All objects will be lowered to the bottom (or installed) in a controlled manner. This can include the use of buoyancy controls such as lift bags, or the use of cranes, winches, or other equipment that affect positive control over the rate of descent.
6. In-water tethers, as well as mooring lines for vessels and marker buoys shall be kept to the minimum lengths necessary, and shall remain deployed only as long as needed to properly accomplish the required task.
7. When piloting vessels, vessel operators shall alter course to remain at least 100 yards from whales, and at least 50 yards from other marine mammals and sea turtles.
8. Reduce vessel speed to 10 knots or less when piloting vessels at or within the ranges described above from marine mammals and sea turtles. Operators shall be particularly

vigilant to watch for turtles at or near the surface in areas of known or suspected turtle activity, and if practicable, reduce vessel speed to 5 knots or less.

9. If despite efforts to maintain the distances and speeds described above, a marine mammal or turtle approaches the vessel, put the engine in neutral until the animal is at least 50 feet away, and then slowly move away to the prescribed distance.
10. Marine mammals and sea turtles shall not be encircled or trapped between multiple vessels or between vessels and the shore.
11. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

B. No contamination of the marine environment shall result from project-related activities.

12. A contingency plan to control toxic materials is required.
13. Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available.
14. All project-related materials and equipment placed in the water shall be free of pollutants.
15. 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.
16. Fueling of land-based vehicles and equipment shall take place at least 50 feet away from the water, preferably over an impervious surface. Fueling of vessels shall be done at approved fueling facilities.
17. 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.
18. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

IN REPLY REFER TO:
5090
LFE/078-19
MAY 3 0 2019

Michael Tosatto
Regional Administrator
National Marine Fisheries Services
Pacific Islands Regional Office
1845 Wasp Boulevard, Building 176
Honolulu, Hawaii 96818

SUBJECT: ESSENTIAL FISH HABITAT ASSESSMENT FOR THE PUULOA RANGE TRAINING FACILITY SHORELINE STABILIZATION PROJECT ESSENTIAL FISH HABITAT, EWA BEACH, HAWAII

Dear Mr. Tosatto:

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1801 et seq.) (MSA) and regulations governing conservation of Essential Fish Habitat (EFH), the United States Marine Corps is providing this letter as a response to the National Marine Fisheries Service's (NMFS) April 25, 2019 email with conservation recommendations for the Puuloa Range Training Facility (PRTF) Shoreline Stabilization Project. The Marine Corps' responses to the two (2) EFH conservation recommendations offered in NMFS' April 25th letter pursuant to Section 305(b)(4)(A) of the MSA are:

NMFS EFH Conservation Recommendation 1: During sheet pile drilling, pre-drill sheet piles and use vibratory hammering as much as possible before using impact hammering methods.

Navy Response to Conservation Recommendation 1: Geotechnical investigations will evaluate site suitability for pre-drilling and vibratory vs. impact hammer methods. Pre-drilling sheet piles, and the use of vibratory versus impact hammering methods will be considered.

NMFS EFH Conservation Recommendation 2: Develop, implement, and share with NMFS a long-term plan to monitor how the sheet pile armor may alter EFH in nearshore waters as sea level rises. This would help to identify and adaptively manage potential future adverse effects to EFH due to the sheet pile installation. NMFS is ready and willing to assist with such a plan.

Navy Response to Conservation Recommendation 2: A Draft EFH Monitoring plan, as detailed in Enclosure 1, is currently in development. The methods for monitoring EFH may consist of, but are not limited to, the methods listed in the current draft plan. In agreement with Conservation Recommendation 2, the Marine Corps will implement and share the final plan with NMFS, once it is available. The Marine Corps would also welcome continued cooperation and subject matter technical expertise offered by NMFS in the development of the plan as a part of adaptive management.

We appreciate the time and careful consideration that went into both evaluating the proposed project and providing EFH Conservation Recommendations. If you need additional information, Ms. Angela Bostwick with NAVFAC Pacific or Mr. Lance Bookless, Marine Corps Base Hawaii are your points of contact and can be reached at (808) 472-1426 or angela.bostwick@navy.mil and (808) 257-7000 or lance.booklessl@usmc.mil respectively.

Sincerely,

T. B. POCHOP
LtCol, U. S. Marine Corps
Director, Environmental Compliance and Protection Department
By direction of the Commanding Officer

Enclosure 1. Memorandum: EFH Monitoring Plan Currently in Development for the Puuloa Range Training Facility Shoreline Stabilization Project, Ewa Beach, O'ahu, Hawai'i

MEMORANDUM

Date: 22 May 2019
Subject: EFH Monitoring Plan Currently in Development for the Puuloa Range Training Facility Shoreline Stabilization Project, Ewa Beach, O'ahu, Hawai'i
Prepared by: Naval Facilities Engineering Command Pacific and United States Marine Corps
POCs: Angela.Bostwick@navy.mil NAVFAC PAC, Lance.Bookless1@usmc.mil USMC

Purpose

The purpose of this document is to list the methods currently being considered for an Essential Fish Habitat (EFH) Monitoring Plan, which would assess how potential impacts of the sheet pile component from the Puuloa Range Training Facility (PRTF) Shoreline Stabilization Project may alter EFH in nearshore waters as sea level rises at the United States Marine Corps (USMC) PRTF. As outlined in this document, components of the EFH Monitoring Plan will involve continued monitoring of the PRTF shoreline, monitoring of the westernmost groin in Iroquois Point after installation of the sheetpile, and monitoring of turbidity levels at both the western and eastern ends of the PRTF shoreline.

Puuloa Range Training Facility Shoreline Stabilization Project Summary

Sea level rise, passive flooding, wave flooding, and coastal erosion (collectively hereafter, sea level rise) are predicted to result in the retreat and loss of fast land at the PRTF. The USMC proposes shoreline stabilization using a primarily subsurface solid sheet pile wall about 1,500 feet in length to protect the two long-distance impact berms at the PTRF from future effects of sea level rise. Other components of the Shoreline Stabilization Project include retreating the four short-distance firing ranges from the shoreline to the maximum distance practicable, and revegetating fast land areas fronting all ranges, as feasible. The action would be expected to commence when funding becomes available.

NMFS Conservation Recommendation Regarding Sheet Pile

In response to the USMC request for consultation with NMFS on impacts to EFH (dated 1 April, 2019), NMFS expressed concern that the proposed sheetpile installation project may result in "long-term to permanent and cumulative adverse effects to EFH including the degradation of water quality and benthic EFH complexity due to sediment resuspension and deposition, respectively." NMFS provided two Conservation Recommendations on 25 April, 2019. The second recommendation is as follows:

Conservation Recommendation 2: Develop, implement, and share with NMFS a long-term plan ta monitor how the sheet pile armor may alter EFH in nearshore waters as sea level rises. This would help to identify and adaptively manage potential future adverse effects to EFH due to the sheet pile armor. NMFS is ready and willing to assist with such a plan.

EFH Monitoring Plan for PRTF

The potential for *sediment resuspension and deposition* (as a result of both sea level rise and sheetpile presence) is a central component to NMFS' concerns regarding potential impacts on water quality and benthic EFH complexity. The USMC proposes to monitor sediment activity by monitoring the shoreline at PRTF, and by visually monitoring sand on the westernmost groin in Iroquois Point after installation of the sheetpile. USMC also proposes monitoring of turbidity levels at the western and eastern ends of the PRTF shoreline. These evaluations will help to identify where sedimentation is originating from, e.g., along the Ewa Beach shoreline to the west of PRTF or from the sheet pile installation. UMSC will utilize

adaptive management to address potential future adverse effects to EFH and determine whether turbidity is the result of the sheet pile installation. USMC will also attempt to identify the magnitude and duration of increased sediment resuspension and deposition which could be attributed to sheetpile versus sea level rise in absence of the sheetpile. Potential methods for both objectives are listed below.

Shoreline Monitoring Methods

Monitoring of historical and recent trends of the shoreline retreat and accretion at PRTF was documented in the 2015 Puuloa Shoreline Erosion Study. In addition, NAVFAC PAC documented the shoreline condition at PRTF during a King Tide event on 2018, taking photos facing eastward and westward from various GPS points along the range. Per the Navy's 23 April 2019 email response to NMFS inquiries, current and future monitoring will include the shoreline at PRTF. After installation of the sheetpile, the shoreline condition at PRTF, and the amount of sand on the westernmost groin at Iroquois Point will be monitored (as visible from the PRTF shoreline). Methods under consideration for continued shoreline monitoring are listed below. A final EFH Monitoring Plan may include, but is not limited to, one or more of these methods.

- Photographs will be taken along various established GPS points to document shoreline changes along the range in various tidal level conditions. Photographs for each location would be taken facing east and west along the beach. Markers may be established along the shoreline in order to facilitate relocating the survey points. Tidal levels under a metric such as Mean Higher High Water (MHHW) will be documented for each monitoring event. NOAA defines MHHW as the average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch; for stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch (https://tidesandcurrents.noaa.gov/datum_options.html). Higher high water is the higher of the two high waters of a tidal day where the tide is of the semidiurnal or mixed type; the single high water occurring daily during periods when the tide is diurnal as considered to be higher high water. High water is the maximum height reached by a tide in a given day (https://shoreline.noaa.gov/glossary.html).
    - Tidal levels may be checked with the NOAA Tides & Currents tool at the following url: https://tidesandcurrents.noaa.gov/noaatidepredictions.html?id=1612366. Tidal levels will be obtained from the "**1612366 Fort Kamehameha, Bishop Point, Pearl Harbor, HI**" location on Oahu.
    - Photos may be taken one month preceding sheetpile installation, then once per month post-installation for one year, and quarterly for the next four years. However, frequency of photo-documentation of shoreline condition would also be based on changes to the shoreline and how rapidly changes are occurring.
- Witness posts could be used at key locations which are marked with a baseline level as the "zero mark," ensuring measurements can be determined to be above or below baseline. Witness posts may also serve as a marker for locations where photographs may be taken along the shoreline to document shoreline conditions.
- Periodic elevation measurements of the coastline will be performed using surveying equipment to document shoreline loss.

Turbidity Monitoring Methods

Turbidity monitoring is expected to commence prior to installation of the sheet pile to establish baseline sedimentation rates, and would continue for five years after installation of the sheetpile. Turbidity sensors may be placed in the water fronting PRTF's beach, and potentially at a location further towards the westernmost groin.

- The data could be collected wirelessly or by downloading from the datalogger on a planned interval.
- The sensors could be associated with other dataloggers to collect other relevant measures of water quality. Data would be collected on a schedule that provides meaningful granularity to the measurements being taken.
- If downloaded via a data logger, observations are currently expected to occur on an approximately monthly basis during initial deployment of device, and if little change in data is observed over time, frequency of measurements would be decreased.
- Potential locations for turbidity sensors include the westernmost edge of the range and a location along the easternmost portion of PRTF.

Appendix B

National Historic Preservation Act Section 106 Documentation

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UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEOHE BAY, HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/052-15

APR 2 0 2016

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

RE: INSTALL SHORELINE IMPROVEMENTS AT PUULOA RANGE TRAINING FACILITY ABOARD MCB HAWAII, DISTRICT OF EWA, AHUPUA'A OF HONOULIULI, ON THE ISLAND OF O'AHU, TMK 1-9-10-001:001.

Dear Dr. Downer:

Marine Corps Base (MCB) Hawaii is consulting with your office in compliance with Section 106 of the National Historic Preservation Act regarding the proposed project to install shoreline improvements at Puuloa Range Training Facility (RTF) aboard MCB Hawaii. This letter initiates our Section 106 consultation for this project.

PROJECT DESCRIPTION

The proposed project is located along the shoreline of Puuloa RTF [enclosures 1 to 3]. The project is being conducted to stabilize the shoreline and will include revegetation with native plants such as akiaki (*Sporobolus virginicus*), pili grass (*Heteropogon contortus*), naupaka (*Scaevola sericea*) as well as non-native pickleweed or akulikui kai (*Batis maritima*). In addition, sheet pilings will be installed along the southern side of the access road [enclosure 4].

The proposed project to install shoreline improvements at Puuloa RTF is currently undergoing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA).

IDENTIFICATION OF HISTORIC PROPERTY

The proposed project is located along the shoreline of Puuloa RTF, which is on the Ewa Plain in the vicinity of Iroquois Point [enclosure 5]. An initial surface survey by Tuggle and Wilcox (1998) did not uncover any archaeological sites, nor did additional surveys near the shoreline (Fong 2012, Fong and West 2013, and Eakin 2012) [enclosure 6]. Only one area, a probable filled sink hole, was identified as possibly culturally sensitive. Tuggle and Wilcox (1998) noted that the area had been extensively disturbed during construction of the range. Nearby archaeological investigations at Iroquois Point Family Housing east of Puuloa RTF did not uncover cultural deposits (Magnuson et al. 2002:80-81) [enclosure 7]. Examination of the stratigraphy revealed that most of the area consists of fill overlying either clean beach sand or limestone bedrock. Archaeological deposits were uncovered along the coast at Keahi Point, about 1,000 ft (305 m) east of Puuloa RTF. This site, designated Site 5875, consists of a disturbed midden deposit that may be associated with 19th century historic structures that once stood along the coast. Archaeological monitoring conducted for various projects along the south and west portions of Puuloa RTF have uncovered similar fill and disturbed areas with no evidence of buried cultural deposits (Eakin 2012; Fong 2012; and Fong and West 2013).

The area that was to become Puuloa RTF was acquired by the Army between 1904 and 1905 as part of the Coastal Defense System of Oahu. It was transferred to the Navy between 1915 and 1916 and became known as Puuloa Military Reservation [enclosure 8]. The Navy developed this area into a small arms range. By 1927, Puuloa Naval Reservation became known as Navy Rifle Range. It was maintained by the Marine Corps for rifle and pistol practice. By 1934, the range was known as the Marine Corps Rifle Range. During the 1930s, the range included a main rifle and machine-gun range (Range A), a secondary rifle range (Range B), a range for 'free machine gunnery,' a pistol range, a .22 caliber range, and a grenade court (U.S. Army Corps of Engineers 2001 in Will Chee and Mason Architects 2009:66). A pistol range (Range C) was added to the eastern portion of the range in 1941. Additional improvements to the ranges began in 1947 in order to support the use by the Marine Corps, Navy, and Army. Then, during the Vietnam era, Marine training intensified and a sniper school was established. The instructors developed the science of sniping, and men were taught to use telescopic sights and night-sighting equipment. The 1000 yard range supported the sniper school until 1979 when the school was transferred to Marine Corps Air Station, Kaneohe Bay (now called Marine Corps Base Hawaii).

A World War II concrete bunker is located along the southwestern side of shoreline north of the access road. This bunker (no facility number) is outside of the project area and will not be impacted by the project to stabilize the shoreline [enclosure 9]. This bunker is eligible for listing on the National Register of Historic Places and is one of three similar structures at Puuloa RTF. Although little is known about this bunker or the other two bunkers since they do not appear on installation plans (defensive structures from World War II area rarely found on wartime facilities maps), the bunkers were part of an island-wide defensive construction program undertaken in Hawaii directly following the 7 December 1941 attack and it is associated with the U.S. response to that attack, which included preparation for possible future strikes.

AREA OF POTENTIAL EFFECT

The area of potential effect (APE) has been determined to include only the shoreline of Puuloa RTF from the beach to impact wall along the southern side of Puuloa RTF.

DETERMINATION OF AFFECT

MCB Hawaii has determined that the proposed project to install shoreline improvements at Puuloa RTF will result in no historic properties affected in accordance with Section 106 Implementing Regulations at 36 CFR 800.4(d)(1) based on the following: 1) the area along the access road was previously disturbed during initial base construction and during road improvements and impact wall construction in 1997; 2) no archaeological sites or deposits have been identified along the shoreline of Puuloa RTF; 3) the sand along the shoreline migrates seasonally; 4) the World War II bunker located north of the access road will not be impacted by shoreline improvement project; and 5) in the unlikely event that Native American Graves Protection and Repatriation Act (NAGPRA) cultural items (including human skeletal materials) are discovered, all work in the vicinity will stop and the items will be stabilized and protected. Treatment will proceed under the authority of NAGPRA.

5090
LE/052-15

We request your review of and concurrence in these determinations within 30 days of receipt of this letter. As defined in 36 CFR 800.4(d)(1)(i) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. MCB Hawaii is forwarding a copy of this letter to additional consulting parties listed below as part of the Section 106 consultation process for this proposed undertaking. Thus, MCB Hawaii requests comments from these consulting parties, listed below regarding the aforementioned determinations within 30 days of receipt of this letter. Should you or your staff have any questions or concerns please contact Ms. June Cleghorn at 257-7126 or via email at june.cleghorn@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U. S. Marine Corps
Director, Environmental Compliance and Protection Department
By direction of the Commanding Officer

Enclosures:
(1) Location of the proposed Shoreline Improvements project at Puuloa RTF aboard MCB Hawaii.
(2) Shoreline of Puuloa RTF looking west near the southwestern side of the training area.
(3) Shoreline of Puuloa RTF looking west near the southeastern side of the training area.
(4) Diagram showing proposed sheet pile on the southern side of the access road.
(5) Portion of 1909/1913 U.S. Army survey map showing Puuloa674266
(6) Location of previous archaeological projects near the proposed Shoreline Improvement Project at Puuloa RTF.
(7) Location of an archaeological site identified outside of Puuloa RTF.
(8) Rifle butts (targets) at Puuloa in 1918.
(9) Southwestern corner of Puuloa RTF showing the access road and World War II bunker.

Copy to:

Mr. Kamana'opono Crabbe; Office of Hawaiian Affairs
Chair; Oahu Island Burial Council
Chair; Temple of Lono
Ms. Kiersten Faulkner; Historic Hawaii Foundation

Reference:

Eakin, Joanne
2012 Archaeological Monitoring in Support of Installation of Motorized Access Gate at Puuloa Training Facility, Marine Corps Base (MCB) Hawaii. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Southeastern Archaeological Research, Inc., Honolulu.

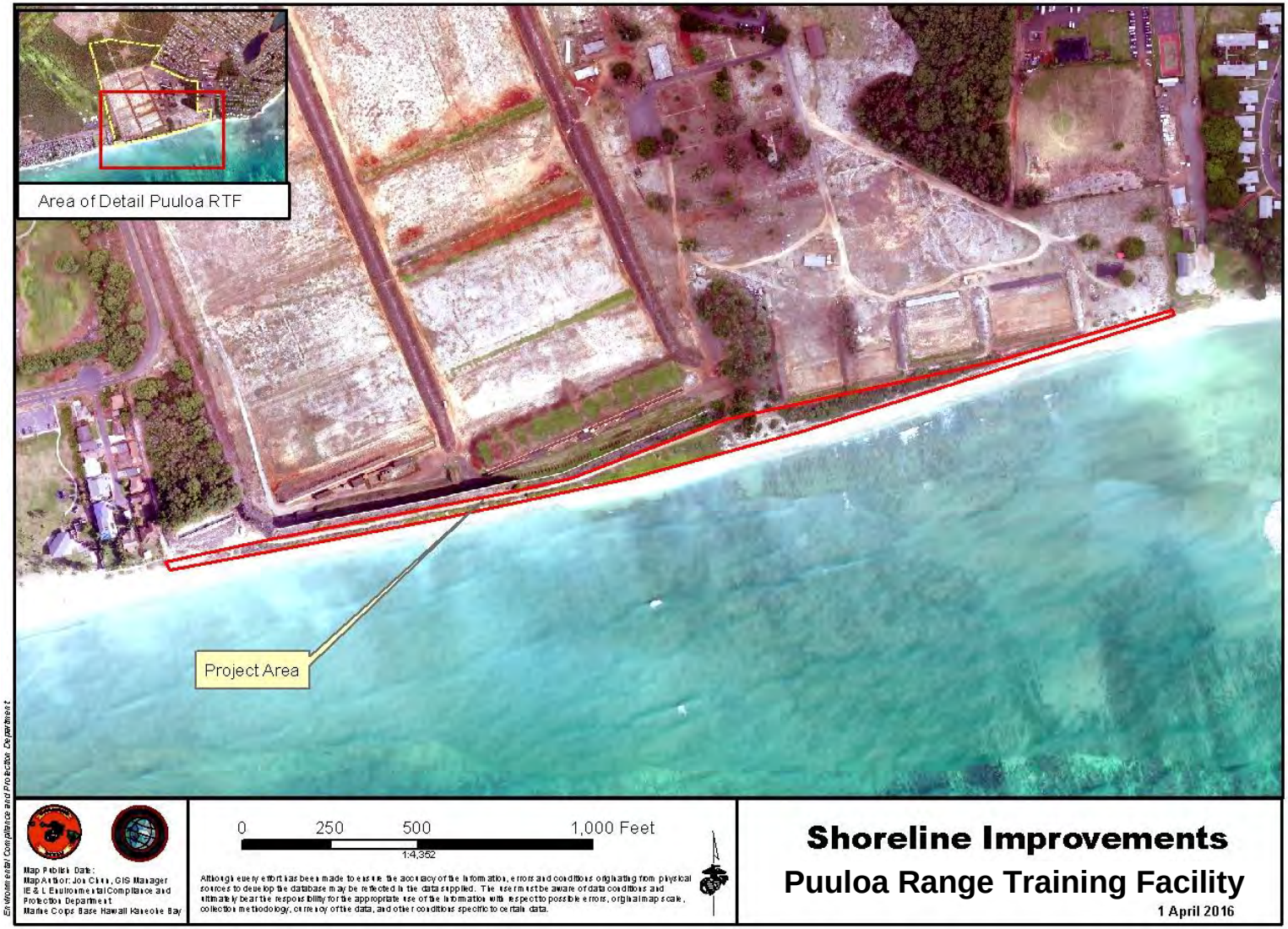
Fong, Jeffery
2012 End of Fieldwork Letter For Archaeological Monitoring in Support of the Replacement of Beach Guard Bunkers at Puuloa Training Facility, O'ahu, Hawai'i. Prepared for Marine Corps Base Hawaii, MCBH Kaneohe Bay, Hawaii. Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii.

Fong, Jeffery, and Eric West
2013 *Archaeological Monitoring Report In Support of the Installation of Lights and Receptacles for Ranges A and B at Marine Corps Base (MCB) Hawaii, Puuloa Range Training Facility*. Prepared for Marine Corps Base Hawaii, MCBH Kaneohe Bay, Hawaii. Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii.

Environmental Compliance and Protection Department Marine Corps Base Hawaii
2011 *Historic Building Inventory: World War II Era Buildings aboard Marine Corps Base Hawaii, Kaneohe Bay*. Prepared by Environmental Compliance and Protection Department Marine Corps Base Hawaii, Kaneohe Bay, Hawai'i.

Tuggle, H. David, and Bruce A. Wilcox
1998 *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* with contributions by Kepa Maly, Katharine Bouthillier, and Kristin Duin. Prepared for U.S. Army Corps of Engineers, Pacific Ocean Division, Fort Shafter, Hawaii.

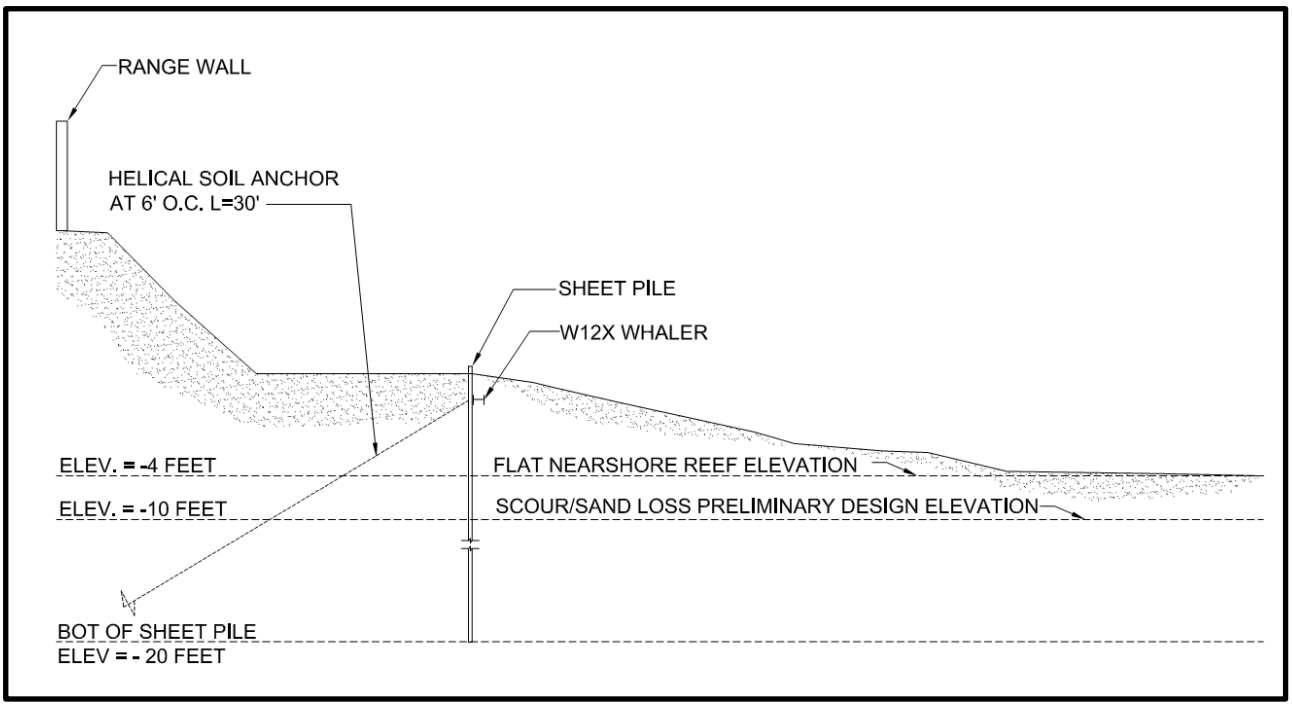
Wil Chee - Planning, Inc., Helber Hastert & Fee, Planners, and Mason Architects, Inc.
2012 Historic Context and Building Inventory Marine Corps Base Hawaii. Draft report prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Wil Chee – Planning, Inc., Helber Hastert & Fee, Planners, and Mason Architects, Inc., Honolulu, Hawaii.



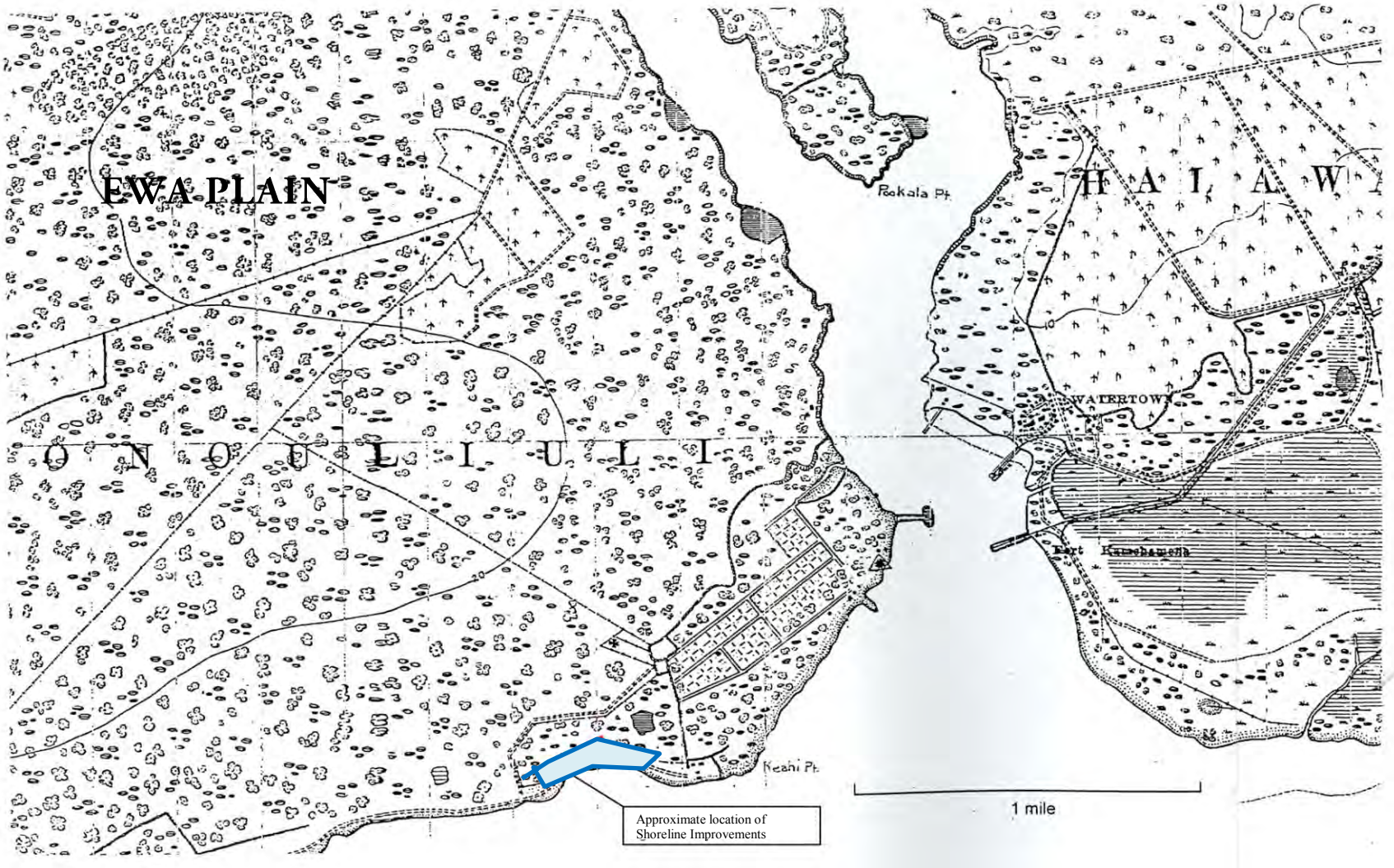
Enclosure 1. Location of the proposed Shoreline Improvements project at Puuloa RTF aboard MCB Hawaii.

Enclosure 2. Shoreline of Puuloa RTF looking west near the southwestern side of the training area.

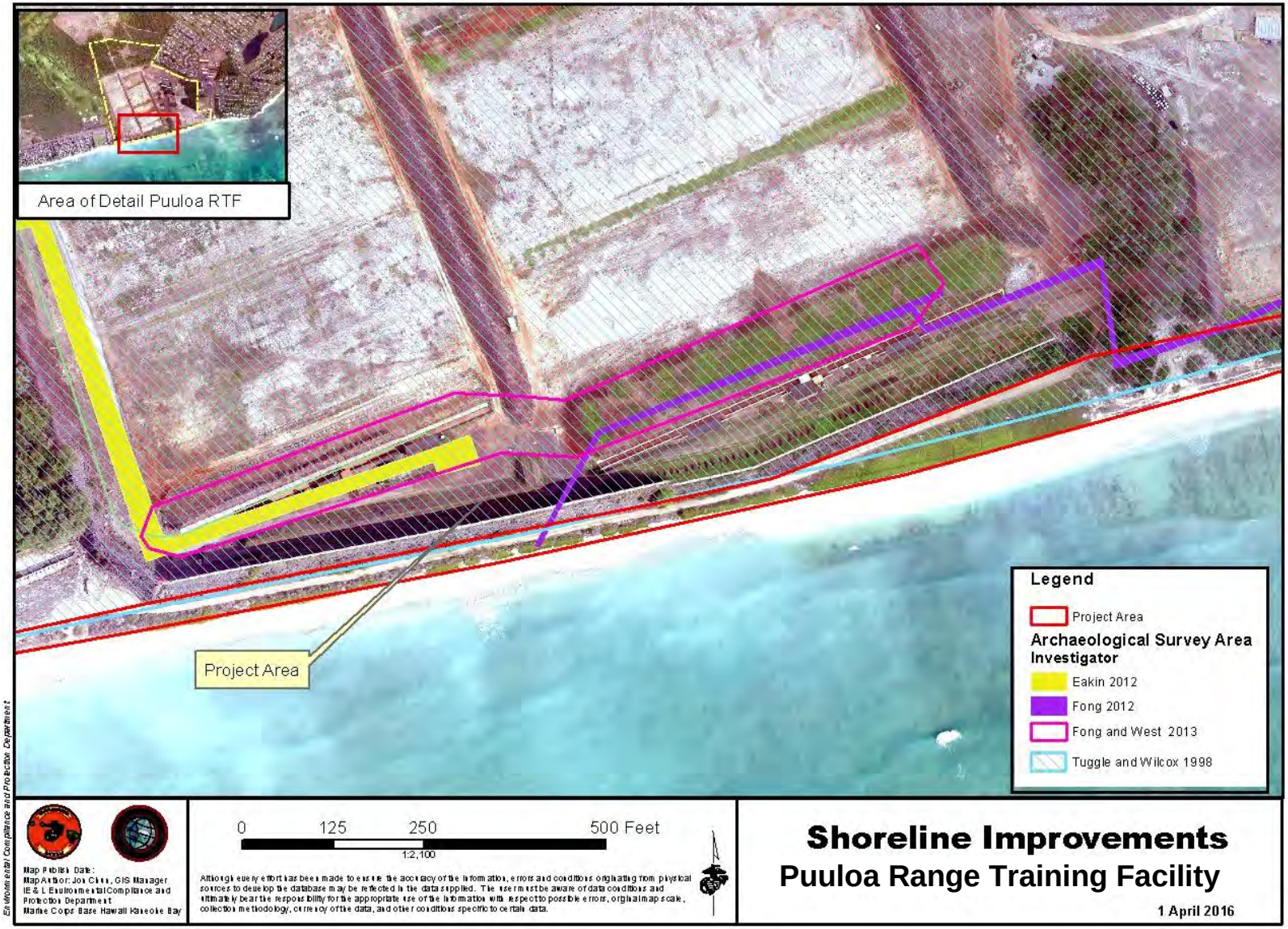
Enclosure 3. Shoreline of Puuloa RTF looking west near the southeastern side of the training area.



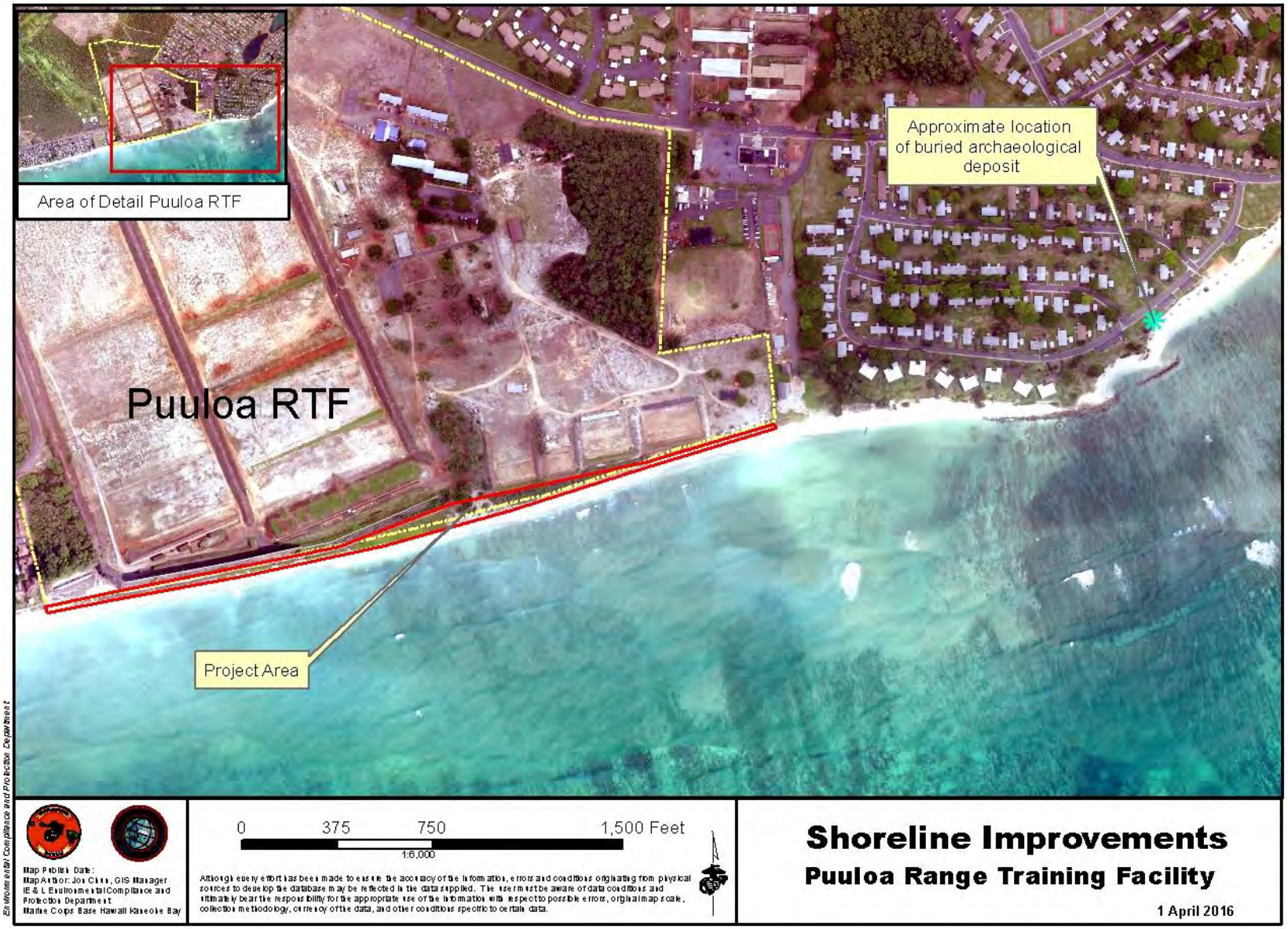
Enclosure 4. Diagram showing proposed sheet pile on the southern side of the access road.



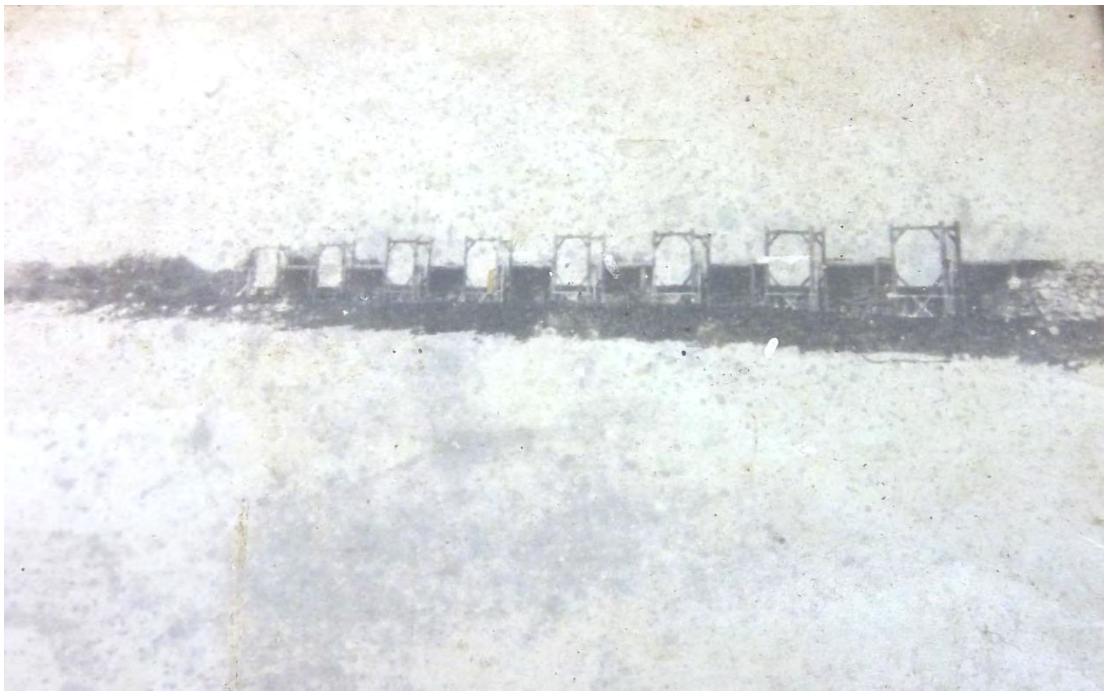
Enclosure 5. Portion of 1909/1913 U.S. Army survey map showing Puuloa. Note development of salt works (today known as Iroquois Point) east of the proposed shoreline improvement project.



Enclosure 6. Location of previous archaeological projects near the proposed Shoreline Improvement Project at Puuloa RTF.



Enclosure 7. Location of an archaeological site identified outside of Puuloa RTF.



Enclosure 8. Rifle butts (targets) at Puuloa in 1918.

Enclosure 9. Southwestern corner of Puuloa RTF showing the access road and World War II bunker.

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

June 3, 2016

IN REPLY REFER TO:
Log No. 2016.00975
Doc. No. 1606SL02
Archaeology, Architecture

W. M. Rowley, Major, US Marine Corps
Director, Environmental Compliance and Protection Department
United States Marine Corps
Marine Corps Base Hawaii
Box 63002
Kaneohe, Hawaii 96863

Dear Major Rowley:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Review –**
Request for Concurrence of "No Historic Properties Affected" - 5090 LE/052-15
Install Shoreline Improvements at Puuloa Range Training Facility
Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu
TMK: (1) 9-10-001:001

Thank you for initiating consultation and requesting the State Historic Preservation Officer's (SHPO) concurrence with the Marine Corps Base Hawaii's (MCB Hawaii) determination of "no historic properties affected" for the proposed project. SHPD received this submittal request on April 21, 2016. MCB Hawaii has determined the project to be a federal undertaking as defined by 36 CFR 800.16(y), requiring historic preservation review under Section 106 of the National Historic Preservation Act (NHPA). The project is currently undergoing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA).

The proposed project involves stabilizing the shoreline through re-vegetation with native plants and the installation of sheet pilings along the southern side of the access road. The area of potential effect (APE) is defined as including only the shoreline of Puuloa Range Training Facility (RTF) from the beach to the impact wall along the southern side of Puuloa RTF. No archaeological sites or deposits have been identified along the shoreline of Puuloa RTF. A World War II concrete bunker (unnumbered structure) is located along the southwestern side of the shoreline north of the access road. It is outside the project APE and will not be impacted. This bunker is eligible for listing on the National Register of Historic Places (NRHP) and is one of three similar structures at Puuloa RTF.

MCB Hawaii's determination of no historic properties affected is based on (1) previous disturbance of the APE, (2) no archaeological historic properties have been identified with the APE, (3) the sand along the shoreline migrates seasonally, (4) the World War II bunker is outside the APE, and (5) in the unlikely event that human remains or artifacts subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered, treatment will proceed under the authority of NAGPRA.

Based on the above, the **SHPO concurs** with the MCB Hawaii's determination is **no historic properties affected**.

MCB Hawaii is the office of record for this undertaking. Please maintain a copy of this letter with you environmental review record for this undertaking. Please reference our project number in any communication with this office regarding this understanding.

Please contact Jessica Puff, Architectural Historian, at (808) 692-8023 or at Jessica.L.Puff@hawaii.gov for any questions regarding architectural resources. Please contact Susan Lebo, Archaeology Branch Chief, at (808) 692-8019 or at Susan.A.Lebo@hawaii.gov for any changes in the project APE or scope of work or questions or concerns regarding archaeological resources or this letter.

Mahalo,

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: June Cleghorn, MCB Hawaii Cultural Resources Manager (june.cleghorn@usmc.mil)

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY, HAWAII 96863-3002

5090
LE-070-17

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

Dear Dr. Downer:

SUBJECT: SECTION 106 CONTINUED CONSULTATION: PROPOSED SHORELINE EROSION IMPROVEMENTS AT PUULOA RANGE TRAINING FACILITY ABOARD MARINE CORPS BASE HAWAII, DISTRICT OF EWA, AHUPUA`A OF HONOULIULI, ON THE ISLAND OF OAHU TMK 1-9-10-001:001.

Marine Corps Base Hawaii (MCBH) is continuing consultation with your office in compliance with Section 106 of the National Historic Preservation Act (NHPA) regarding the proposed undertaking to install shoreline erosion improvements at Puuloa Range Training Facility (RTF). MCBH sent the initial consultation letter (LE-052-15) on 20 April 2016 [enclosure 1]. A concurrence letter (Log:2016.00975/Doc:1606SL02) was received from SHPD on 3 June 2016 [enclosure 2]. However, following further analysis of shoreline erosion at the southern boundary of the range training facility, MCBH is now proposing to increase the scope of these improvements to include relocation of the small arms ranges away from the shoreline.

PROJECT DESCRIPTION

As indicated in the initial consultation letter, this undertaking has been proposed to stabilize the shoreline. The scope of work includes revegetation and stabilization and installation of sheet piling. Although sand migrates seasonally, not all the sand along this shoreline has been returning, which is destabilizing the shoreline.

This project is currently undergoing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act. During analysis for the EA, the proposed action alternatives were refined to include the installation of sheet piling along the entire shoreline of the Puuloa RTF, or in front of only Range A (Facility P-01) and Range B (Facility 2). Under any action alternative, it is now proposed that the small arms ranges, including Range C (Facility 3); Range D (Facility 173); Range E (Facility 179); and Range F (Facility 175) be relocated up to 150 feet inland (to the north) [enclosures 3 and 4]. This includes relocation of range berms, firing points, targets, and utilities. Several modern tension-fabric structures for holding targets, wooden personnel pavilions, and the equipment storage facility (Facility 19) would also be relocated away from the shoreline.

AREA OF POTENTIAL EFFECTS

The area of potential effects (APE) has been determined to include the shoreline of the Puuloa RTF and about 300 feet north of the shoreline as shown on enclosure 3.

IDENTIFICATION OF HISTORIC PROPERTIES

No archaeological sites (Tuggle and Wilcox 1998; Eakin 2012; Fong and West 2013a, 2013b) or historic buildings (Mason Architects et al. 2014) have been identified within the APE. The area around the shoreline as well as the area around the ranges was extensively disturbed during construction of the ranges. Previous archaeological monitoring during installation of a motorized gate on the west side of the range identified a layer of sod-covered, dark reddish-brown topsoil overlying calcareous sands in the area of the shooting range. Some of the sand had coral inclusions (Eakin 2012:23). Archaeological monitoring along the shoreline for installation of beach guard houses identified disturbed coralline beach sand with modern materials, such as aluminum cans, plastic, and lumbered wood down to about 50 cm below surface.

The small arms ranges being proposed for relocation, including Range C (Facility 3); Range D (Facility 173); Range E (Facility 179); and Range F (Facility 175) were constructed between 1960 and 1962 and have been evaluated as not eligible for listing on the National Register of Historic Places (NRHP) (Mason Architects 2014:B-58) [enclosure 5]. Facility 19, Equipment Shed, being proposed for demolition, has been evaluated as not eligible for listing (Mason Architects 2014:B-57).

DETERMINATION OF AFFECT

MCBH has determined that the proposed undertaking to install shoreline erosion improvements at Puuloa RTF will result in no historic properties affected in accordance with Section 106 Implementing Regulations at 36 CFR 800.4(d)(1) based on the following: 1) there is low to no potential for archaeological sites or deposits within the APE based on previous extensive disturbance and archaeological monitoring reports; 2) no historic buildings have been identified within the APE; and 3) in the unlikely event that Native American Graves Protection and Repatriation Act (NAGPRA) cultural items (including human skeletal materials) are discovered, all work in the vicinity will stop and the items will be stabilized and protected. Treatment will proceed under the authority of NAGPRA.

We request your review and concurrence within 30 days of receipt of this letter. As defined in 36 CFR 800.4(d)(1)(i) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. MCBH is forwarding a copy of this letter to additional consulting parties listed below as part of the Section 106 consultation process for this proposed undertaking. MCBH requests comments from the consulting parties listed below regarding the aforementioned determinations within 30 days of receipt of this letter. Should you or your staff have any questions or concerns please contact the MCBH Cultural Resources Management staff, Dr. Wendy Wichman at 257-7134 or via email at wendy.wichman.ctr@usmc.mil or Ms. June Cleghorn at 257-7126 or via email at june.cleghorn@usmc.mil.

Sincerely,

W. M. ROWLEY
Major, U. S. Marine Corps

5090
LE-070-17

Director, Environmental Compliance and
Protection Department
By direction of the Commanding Officer

Enclosures:

1. Initial section 106 consultation letter (LE-052-15), 20 April 2016.
2. SHPD concurrence letter (Log:2016.00975/Doc:1606SL02), 3 June 2016.
3. Map of shoreline and ranges along Puuloa RTF showing expanded area of potential effect (outlined in red).
4. Map showing proposed relocation of Ranges C, D, E, and F.
5. Oblique aerial of Puuloa RTF showing the ranges in 1979, view to east.

Copy to:

Dr. Kamana'opono Crabbe, Office of Hawaiian Affairs
Chair, Oahu Island Burial Council
Mr. Clive Cabral, Chair, Temple of Lono
Ms. Kiersten Faulkner, Historic Hawaii Foundation

References:

Eakin, Joanne
2012 *Archaeological Monitoring in Support of Installation of Motorized Access Gate at Puuloa Training Facility, Marine Corps Base (MCB) Hawaii.* Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Southeastern Archaeological Research, Inc., Honolulu.

Fong, Jeffery, and Eric West
2013a *Archaeological Monitoring Report In Support of the Installation of Lights and Receptacles for Ranges A and B at Marine Corps Base (MCB) Hawaii, Puuloa Range Training Facility.* Prepared for Marine Corps Base Hawaii, MCBH Kaneohe Bay, Hawaii. Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii.

2013b *Archaeological Monitoring in Support of the Replacement of Beach Guard Bunkers at Puuloa Training Facility, O'ahu, Hawai'i.* Prepared for Marine Corps Base Hawaii, MCBH Kaneohe Bay, Hawaii. Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii.

Mason Architects et al.
2014 *Historic Context and Building Inventory, Marine Corps Base Hawaii.* Prepared for Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Wil Chee - Planning, Inc., Helber Hastert and Fee, Planners, Mason Architects, Inc., Honolulu.

Tuggle, H. David, and Bruce A. Wilcox
1998 *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* with contributions by Kepa Maly, Katharine Bouthillier, and Kristin Duin. Prepared for U.S. Army Corps of Engineers, Pacific Ocean Division, Fort Shafter, Hawaii.

Enclosure 3. Map of shoreline and ranges along Puuloa RTF showing revised area of potential effect (in red).

Enclosure 4. Map showing the proposed relocation of Ranges C, D, E, and F.

Enclosure 5. Oblique aerial of Puuloa RTF showing the ranges in 1979, view to east.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

June 30, 2017

IN REPLY REFER TO:
Log No. 2017.01153
Doc. No. 1706SL10
Archaeology, Architecture

William M. Rowley, Major
U.S. Marine Corps
Marine Corps Base Hawaii
Box 63002
Kaneohe Bay, HI 96863-3002

Dear Major Rowley:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Review –**
Request for Concurrence of "No Historic Properties Affected" - 5090 LE/070-17
Install Shoreline Improvements at Puʻuloa Range Training Facility
Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu
TMK: (1) 9-10-001:001

Thank you for continuing consultation and requesting the State Historic Preservation Officer's (SHPO) concurrence with the Marine Corps Base Hawaii's (MCBH) determination of "no historic properties affected" for the proposed revised scope for the shoreline erosion improvements at Puuloa Range Training Facility (RTF). MCBH initiated consultation on April 20, 2016 (LE-052-15). The SHPO concurred with MCBH's determination of no historic properties affected (June 3, 2016; Log No. 2016.00975, Doc. No. 1606SL02). However, following further analysis of shoreline erosion at the southern boundary of the RTF, MCBH proposes to increase the scope of the improvements to include relocation of the small arms ranges away from the shoreline. The State Historic Preservation Division (SHPD) received this revised submittal on May 30, 2017.

The project is currently undergoing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA). The scope includes revegetation and stabilization of sheet piling. During analysis for the EA, the proposed action alternatives were refined to include the installation of sheet piling along the entire shoreline of the RTF, or in front of only Range A (Facility P-01) and Range B (Facility 2). Under any action alternative, it is proposed that the small arms ranges, including Range C (Facility 3), Range D (Facility 173), Range E (Facility 179), and Range F (Facility 175) be relocated to the north, up to 150 feet inland; these ranges were constructed between 1960 and 1962. The scope also includes relocation of range berms, firing points, targets, and utilities. Several modern tension-fabric structures for holding targets, wooden personnel pavilions, and the equipment storage facility (Facility 19) also would be relocated away from the shoreline.

The area of potential effects (APE) includes the shoreline of the Puuloa RTF and about 300 ft. north of the shoreline. Mason Architects (2014) has evaluated Facility 19 and the small arms ranges (C through F) as not eligible for listing on the National Register of Historic Places (Mason Architects 2014). No archaeological sites or deposits have been identified within the APE or along the shoreline of Puuloa RTF (Tuggle and Wilcox 1998; Eakin 2012; Fong and West 2013a, 2013b). A World War II concrete bunker (unnumbered structure) is located along the southwestern side of the shoreline north of the access road. It is outside the project APE and will not be impacted. This bunker is eligible for listing on the National Register of Historic Places (NRHP) and is one of three similar structures at Puuloa RTF.

MCBH's determination of no historic properties affected is based on (1) low potential for archaeological historic properties to be present within the previously disturbed APE, (2) no historic buildings have been identified in the APE, and (3) in the unlikely event that human remains or artifacts subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered, treatment will proceed under the authority of NAGPRA.

Based on the information provided, the SHPO **concurs** with the MCBH's determination of no historic properties affected.

Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Megan Borthwick, Architectural Historian, at Megan.Borthwick@hawaii.gov for any concerns regarding architectural resources, and Susan A. Lebo, Archaeology Branch Chief, at Susan.A.Lebo@hawaii.gov for questions regarding archaeological resources, this letter, or if there is an additional change in the project scope or APE.

Aloha,

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc:

Ms. June Cleghorn, june.cleghorn@usmc.mil
Dr. Wendy Wichman, wendy.wichman.ctr@usmc.mil

Appendix C

Coastal Zone Management Act de minimis Notification

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-----Original Message-----
From: Bigay, John CIV NAVFAC PAC, EV2 [mailto:john.bigay@navy.mil]
Sent: Tuesday, August 14, 2018 11:49 AM
To: Nakagawa, John D <john.d.nakagawa@hawaii.gov>
Subject: NAVY/MARINE CORPS CZM DEMINIMIS DETERMINATION FOR PROPOSED PUULOA RANGE SHORELINE STABILIZATION

Mr. Nakagawa,

Marine Corps Base Hawaii (MCBH) is proposing to initiate measures to mitigate coastal erosion of the fast land (i.e., above the tidal influence) in order to protect existing range structures - i.e., impact berms - at the Puuloa Range Training Facility (PRTF) small-arms training range at Puuloa, Ewa Beach, Oahu. See attached graphics.

The Naval Facilities Engineering Command, Pacific, has determined that the proposed action falls within the Navy/Marine Corps De Minimis Activities Under CZMA, Item #1, New Construction:

"Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements".

Periods of erosion and shoreline recession at PRTF have been noted over many years. MCBH addressed erosion issues of PRTF's fast land in 1998, and a successful restoration of vegetation, which included irrigation, was completed in the year 2000. This restoration functioned until about 2014, when increasing erosion led to a steepening of the slope and undermining of approximately 90% of the vegetation.

The preferred alternative for the proposed action would consist of the installation of sheet pile along the fast-land boundary of Ranges A and B; a maximum-feasible retreat/setback from the shoreline of Ranges C-F; and revegetation of available fast-land areas fronting all ranges as feasible. The sheet pile would be installed on the ocean side of the ranges to mitigate erosion to the toe of the impact berms. The top of the sheet pile would approximately match the existing finish grade (toe of the range berm). The sheet pile is proposed to wrap-around the eastern and western edges of the range impact berms in order to provide erosion protection at the ends of the berms. The maximum feasible retreat of the four short distance ranges (Ranges C-F) is estimated at 100-feet. Retreat of the ranges may require relocation of existing backstop berms, structures, and/or utilities. In-water construction is not anticipated. Coordination with the U.S. Army Corps of Engineers has taken place. Consultations with the U.S. Fish and Wildlife Service and National Marine Fisheries Service are in-progress.

The proposed action will meet the de minimis mitigations/conditions relevant to Item #1 as follows:

1. Meets definition of Navy/Marine Corps controlled property.

3. Turbidity/siltation from project-related work shall be minimized and contained.

6. No project-related materials will be stockpiled in the water.

8. No contamination of adjacent marine/aquatic environments shall result from project-related activities.

9. Fueling of project-related vehicles and equipment will take place away from the water, and a contingency plan to control accidentally spilled petroleum products shall be developed.

10. Any under-layer fills used during the project will be protected from erosion as soon after placement as practicable.

11. Any soil exposed near water as part of the project shall be protected from erosion after exposure and stabilized as soon as practicable.

13. Informal consultations have been initiated under the Endangered Species Act with the USFWS and NOAA.

14. A NEPA EA is under preparation and will be completed prior to any project-related work starts.

16. Notification of use of a de minimis list item as applicable to the proposed action is sent herein.

Please feel free to contact me if you require additional information.

John Bigay
NEPA Planner
NAVFAC Pacific
808-472-1196

-----Original Message-----
From: Nakagawa, John D <john.d.nakagawa@hawaii.gov>
Sent: Tuesday, August 14, 2018 12:43 PM
To: Bigay, John CIV NAVFAC PAC, EV2 <john.bigay@navy.mil>
Subject: [Non-DoD Source] RE: NAVY/MARINE CORPS CZM DEMINIMIS DETERMINATION FOR PROPOSED PUULOA RANGE SHORELINE STABILIZATION

Subject CZM de minimis determination and notification received.

John Nakagawa
Hawaii Coastal Zone Management (CZM) Program
Phone: (808) 587-2878
Email: john.d.nakagawa@hawaii.gov