HALE‘IWA SMALL BOAT HARBOR MAINTENANCE DREDGING AND BEACH RESTORATION PROJECT

HALE‘IWA, ISLAND OF O‘AHU, HAWAI‘I

SECTION 1122
WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 2016

DRAFT INTEGRATED FEASIBILITY REPORT
AND ENVIRONMENTAL ASSESSMENT

August 2023

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Honolulu District

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Executive Summary

This report presents the evaluation of maintenance dredging of the Hale‘iwa Small Boat Harbor including dredged material disposal alternatives and feasible alternatives for beneficial uses of dredged material (BUDM) at Hale‘iwa Beach, Hale‘iwa, Island of O‘ahu, Hawai‘i. BUDM can provide benefits under the U.S. Army Corps of Engineers (USACE) navigation, coastal storm risk management, recreation, and environmental missions. Despite general perceptions of the pristine sandy beaches of Hawai‘i, sandy beaches are relatively scarce and are threatened by natural and manmade erosive forces and sea level rise. The study area contains one of the most visited beaches outside of Waikiki: Hale‘iwa Beach Park. Hale‘iwa Beach Park was a previously authorized federal shore protection project over 50 years ago. Due to damaging wave action and shoreline erosion along the beach park, the beach has continued to experience significant erosion since construction. The non-federal sponsor (NFS) for this project is the State of Hawai‘i as represented by the State of Hawai‘i Department of Land and Natural Resources’ (DLNR) Division of Boating and Ocean Recreation (DOBOR).

Based on previous Regional Sediment Management studies conducted by USACE, sand from Hale‘iwa Beach Park accumulates in the federal navigation channel. Routine maintenance dredging of the channel with transport of beach-grade sand for ocean disposal, rather than returning it to the shoreline, is a missed opportunity and increases risk for erosion of park and nearby infrastructure. As such, Hale‘iwa Beach Park presents a high-value opportunity for receipt of beach-grade sand, i.e., dredged material, pursuant to Section 1122 of WRDA 2016, as amended.

BUDM for the purposes of beach restoration is strongly supported by local stakeholders including the NFS, DLNR Office of Conservation and Coastal Lands (OCCL) and the City and County of Honolulu Department of Parks and Recreation. Two virtual public meetings were held in January 2021 to provide outreach and receive comments on the initial Draft Integrated Feasibility Report/Environmental Assessment (IFR/EA). Concerns regarding the effects of the proposed plan on the Loko Ea Fishpond were raised during the public comment period and responses were coordinated with the Malama Loko Ea Foundation resulting in modification of the concept design to avoid impacts to the fishpond. USACE decided to release this second draft IFR/EA to adequately describe evaluation of certain environmental effects not clearly described in the first draft IFR/EA. The Recommended Plan has not changed, however discussion of environmental effects related to disposal of dredged material not suitable for BUDM has been augmented. Through this second draft IFR/EA, USACE seeks public comment on the additional environmental evaluation.

This study formulated and evaluated the feasibility of alternative BUDM measures based on economic, engineering, environmental and other factors. The Recommended Plan maximizes economic benefits, constituting the National Economic Development (NED) Plan, while also providing ancillary ecological opportunities.

The Recommended Plan, Alternative 4, consists of BUDM maintenance dredged from the HSBH federal navigation channel down to -13 ft MLLW depth (1-foot deeper than the authorized depth, plus 1-foot over-depth), and additional material dredged from the following non-federal sources: a shoaling deposit caused by a state-owned breakwater, hereafter referred to as, “state breakwater settling basin”, an offshore sand borrow area, and a barge access zone. The Corps anticipates dredging from these four areas will yield 24,638 cubic yards (cy) of dredged material, of which, 22,638 cy is expected to be suitable for beneficial use. Dredged material that is deemed suitable for placement on the beach, i.e., “beach-grade”, will be used to nourish the adjacent Haleʻiwa Beach fronting Haleʻiwa Beach Park. To facilitate efficient transport and unloading of dredged material to the beach, a barge access zone will be excavated along the north face of the root of the southern groin of the Haleʻiwa Beach Shore Protection Project to a depth of -10 feet MLLW. Material excavated to construct the barge access zone is beach sand and will also be placed along the shoreline fronting Haleʻiwa Beach Park.

ES Table 1. Pertinent Data for the Recommended Plan

Sand Placement	
Placement Amount (cubic yards)	22,638
Length of Placement Area (feet)	1,600
Width of Placement Area (feet)	115
Area of Beach (acres)	4.2
Note: These dimensions are assumptions made at the time of plan formulation and may be altered over the development of detailed design plans.	

Haleʻiwa Beach is part of the federally authorized Haleʻiwa Beach Shore Protection Project. A policy exception was approved by the Assistant Secretary of the Army for Civil Works to allow nourishment of the federal project with dredged material, which will help to restore the beach. This will produce storm damage reduction benefits and recreational benefits. In addition, the project will result in ecological opportunities for sea turtles and Hawaiian Monk Seals. The Recommended Plan is the NED plan and provides an incremental average annual economic benefit of $430,000 with a benefit to cost ratio of 3:1.

Under Section 204 of the USACE Continuing Authorities Program, the cost of beneficial use of dredged material projects must be limited solely to construction costs that are in excess of the Base Plan, referred to as an incremental cost. The total project first cost (constant dollar cost at FY23 price levels) of the Recommended Plan is estimated at $6,753,000. This is the incremental cost and includes construction, preconstruction, engineering, and design, construction management, lands, easements, rights-of-way, relocations, and disposals. It does not include the feasibility study costs to date.

The Base Plan for this project was based on the costs of maintenance dredging of the federal navigation features with disposal of dredged material at the South Oʻahu Ocean Dredged Material Disposal Site. The non-federal cost-share of the project components, based on the total project first cost, is estimated at $2,731,000 and will be funded by the non-federal sponsor. The federal cost-share of the project components, based upon the project first cost, is estimated at $1,170,000.

ES Table 2. Economic Information for Recommended Plan

Economic Information	
Item	**Amount ($)**
Total Project First Costs	6,753,000
Total Annual NED Cost (50 years)	248,000
Incremental Average Annual Benefits	453,000
Net Annual Benefits	252,000
Benefit to Cost Ratio	2.9
Note: Totals may not sum due to rounding.	

LIST OF ABBREVIATIONS AND ACRONYMS

AAC	Average Annual Cost
APE	Area for Potential Effect
BCR	Benefit-Cost Ratio
BMP	Best Management Practice
BUDM	Beneficial Use of Dredged Material
CAA	Clean Air Act
CAP	Continuing Authorities Program
CEQ	Council for Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
CY	Cubic yards
CZMA	Coastal Zone Management Act
DLNR	Department of Land and Natural Resources
DMMP	Dredged Material Management Plan
DOBOR	Division of Boating and Ocean Recreation
DPS	Distinct Population Segments
EA	Environmental Assessment
EFH	Essential Fish Habitat
EO	Executive Order
ER	Engineering Regulation
ESA	Endangered Species Act
EPA	Environmental Protection Agency
FEP	Fishery Ecosystem Plans
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
FWCAR	Fish and Wildlife Coordination Act Report
GNF	General Navigation Feature
HBP	Haleʻiwa Beach Park
HSBH	Haleʻiwa Small Boat Harbor
HBSPP	Haleʻiwa Beach Shore Protection Project
HTRW	Hazardous Toxic Radioactive Waste
IFR/EA	Integrated Feasibility Report/Environmental Assessment
IWR	Institute for Water Resources
MBTA	Migratory Bird Treaty Act
MLLW	Mean Lower Low Water
MPRSA	Marine Protection, Research, and Sanctuaries Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MUS	Management Unit Species
NED	National Economic Development
NEPA	National Environmental Policy Act
NFS	Non-Federal Sponsor
NHO	Native Hawaiian Organization
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OCCL	Office of Conservation and Coastal Lands
ODMDS	Ocean Dredged Material Disposal Site
OHA	Office of Hawaiian Affairs
O&M	Operations and Maintenance
PED	Pre Engineering Design and Construction
PL	Public Law

PPA	Project Partnership Agreement
PDT	Project Delivery Team
RSM-TN	Regional Sediment Management Technical Note
S&A	Supervision and Administration
SHPD	State Historic Preservation Division
SLC	Sea Level Change
SLR	Sea Level Rise
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USC	United States Code
WOTUS	Water of the U.S.
WRDA	Water Resources Development Act
WQC	Water Quality Certification

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES:

1.0 INTRODUCTION

This chapter provides information on the study authority, purpose and scope, the study area, study participants and coordination, and previous studies that contributed to this report.

This USACE Feasibility Report has been integrated with the Environmental Assessment (EA) to both examine the economic feasibility and evaluate the environmental impact of implementing BUDM measures at Hale‘iwa Beach, Hale‘iwa, Island of O‘ahu, Hawai‘i. The Feasibility Report components of this combined report documents the Corps' application of the USACE 6-Step Planning Process at Engineering Regulation (ER) 1105-2-100. The EA components of this combined report were developed pursuant to the National Environmental Policy Act (NEPA) of 1969 and in accordance with the Council on Environmental Quality (CEQ) NEPA Implementation Regulations, Title 40 Code of Federal Regulations (CFR), Part 1500-1508, and ER 200-2-2, Procedures for Implementing NEPA.

This Integrated Feasibility Report and EA (IFR/EA) documents the study and coordination conducted to determine whether USACE should participate in BUDM measures by dredging suitable materials from Hale‘iwa Small Boat Harbor (HSBH) and other suitable areas in the vicinity for placement at Hale‘iwa Beach of the Hale‘iwa Beach Shore Protection Project (HBSPP) that is adjacent to and fronting the Hale‘iwa Beach Park (HBP) in Hale‘iwa, Island of O‘ahu, Hawai‘i. Studies of potential BUDM measures considered a wide range of alternatives and the environmental impacts of those alternatives but focused mainly on actions that would provide efficient and effective benefits to navigation, coastal storm risk management, recreation, and ecological opportunities to the study area.

1.1 Authority

This feasibility study is being conducted under authority of Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law (PL) 114-322), as amended. Section 1122 is a pilot program and states,

> "*the Secretary shall establish a pilot program to carry out projects for the beneficial use of dredged material, including projects for the purposes of— (1) reducing storm damage to property and infrastructure; (2) promoting public safety; (3) protecting, restoring, and creating aquatic ecosystem habitats; (4) stabilizing stream systems and enhancing shorelines; (5) promoting recreation; (6) supporting risk management adaptation strategies; and (7) reducing the costs of dredging and dredged material placement or disposal, such as projects that use dredged material for— (A) construction or fill material; (B) civic improvement objectives; and (C) other innovative uses and placement alternatives that produce public economic or environmental benefits*."

In general, Section 1122 provides that projects under the pilot program will be cost shared in accordance with the cost sharing requirements for projects carried out under the Section 204 of the U.S. Army Corps of Engineers' (USACE) Continuing Authorities

Program (CAP), Beneficial Use of Dredged Material (BUDM). However, for projects under the pilot program that utilize dredged material from federal navigation projects, Section 1122(e)(2) provides that the incremental costs above the Base Plan for transporting and depositing such dredged material will be borne entirely by the Federal Government.

If such pilot projects involve additional activities other than transportation and placement of dredged material, those costs shall be shared in accordance with the cost sharing requirements of Section 204. If additional material is dredged from a federal navigation project solely for purposes of a pilot project, the costs associated with the additional dredging will be cost-shared with the non-federal sponsors (NFS) of the pilot project in accordance with Section 204. If a pilot project relies upon dredged material from a non-federal navigation project, or an area outside a navigation project, the dredging and transportation costs will be 100 percent non-federal. All other costs associated with the pilot project will be cost-shared in accordance with Section 204.

1.2 Purpose and Scope

The implementation of BUDM measures is growing in interest not only for USACE, but also for other groups interested in the benefits that these measures can provide. The measures proposed by this report generate notable National Economic Development (NED) benefits. Additionally, the Honolulu District stakeholders expressed interest in BUDM measures given notable observations of the effects of climate change on the island communities that comprise the Honolulu District area of responsibility. Partnership of federal and non-federal interests in BUDM helps ensure that the selected plan will effectively serve both local and national needs.

This project is being developed for the purposes of reducing storm damage to property and infrastructure, and promoting public safety, recreation, and ecological opportunities.

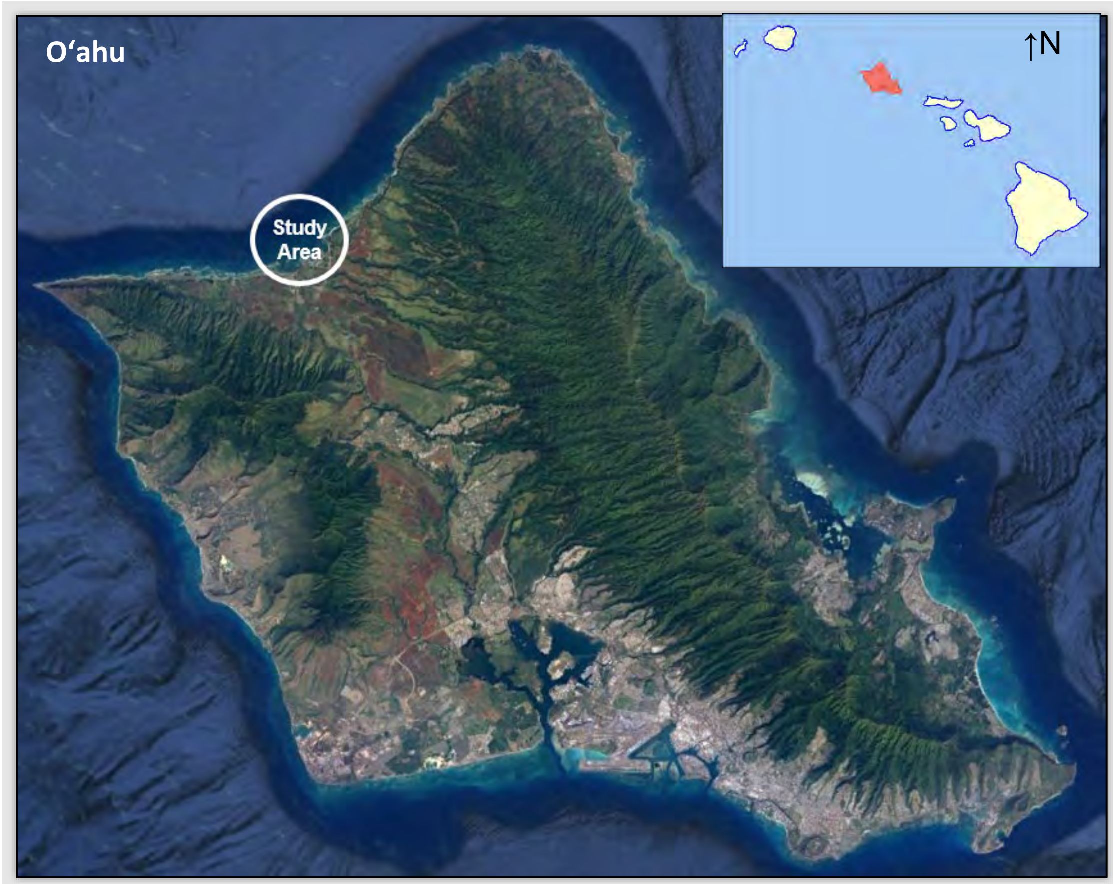

Figure 1. Project Location

1.3 Location and Study Area

The project is located in the town of Hale‘iwa, on the northwestern shore of the island of O‘ahu, approximately 30 miles north of the Hawai‘i State Capitol, Honolulu (Figure 1).

The study area (Figure 2) generally encompasses the Hale’iwa region longshore sediment transport region and adjacent shoreline and beach and marine waters, inclusive of the federally authorized HSBH and HBSPP and their federal structures, and the HBP and immediate vicinity. The west end of the study area includes Ali‘i Beach which is bordered to the east by the state-owned breakwater that attenuates waves at the HSBH. The far northeast end of the study area ends at Pua‘ena Point.

The study area is in Hawai‘i’s Second Congressional District, which has the following Congressional delegation: Senator Mazie Hirono; Senator Brian Schatz and Representative Jill Tokuda (HI-02).

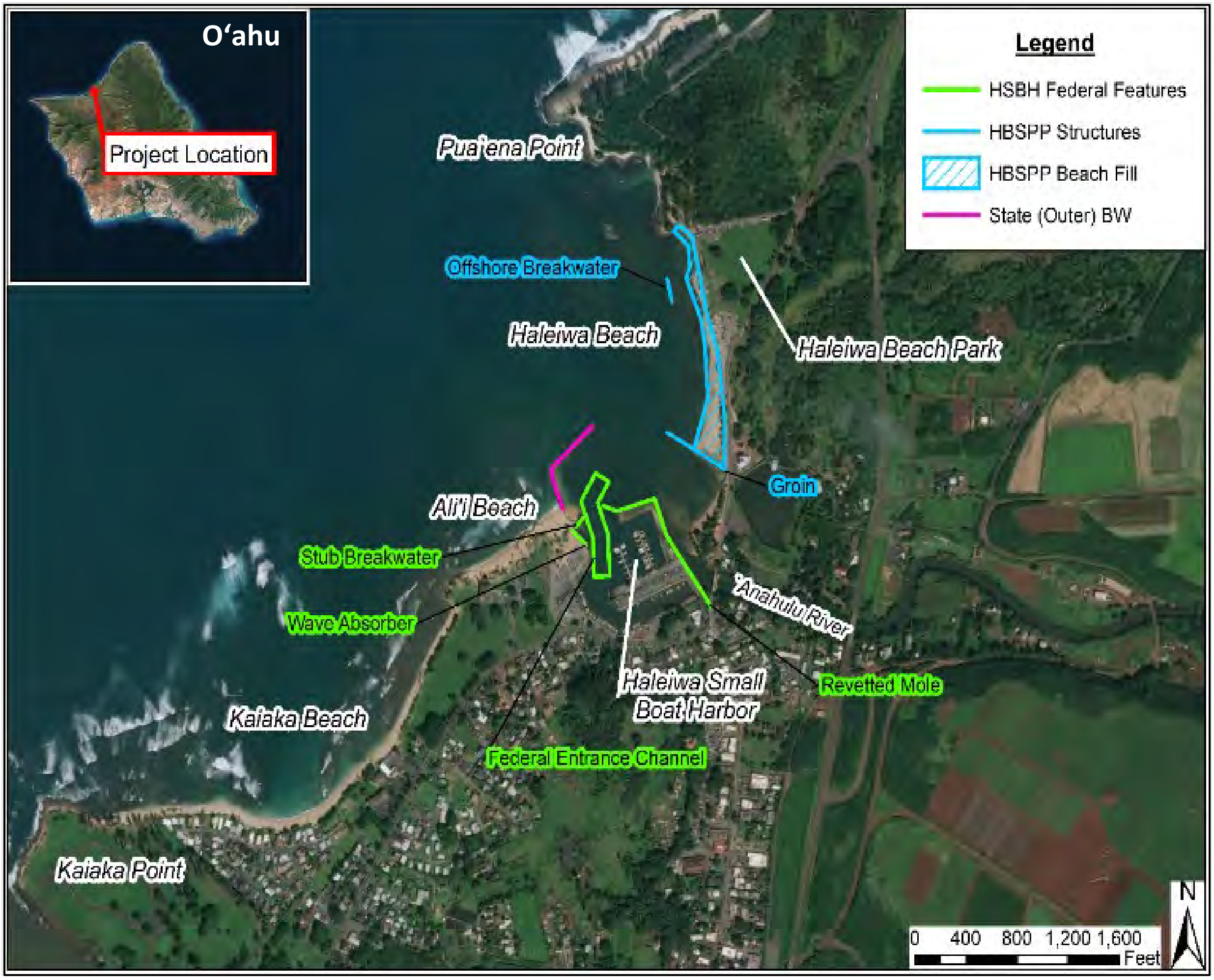

Figure 2. Project Location and Study Area

1.3.1 Description of Federal Projects

The federal projects within the study area include the HSBH and HBSPP.

1.3.1.1 Haleʻiwa Small Boat Harbor

HSBH is located at the mouth of the Anahulu River. The State of Hawaiʻi constructed the outer breakwater for the harbor in 1955. On March 26, 1964, the HSBH federal project (referred to as, *the Haleʻiwa Harbor for Light Draft Vessels*) was constructed by the Corps, under the authority of Section 107 of the Rivers and Harbors Act of 1960, as amended. This project consisted of an entrance channel (610 ft long, 120 ft wide and 12 ft deep), a revetted mole (1,200 ft long), a trapezoidal riprap river diversion channel (480 ft long and 80 ft wide), and a dike (300 ft long). This project was completed in November 1966 and was the first joint federal-state harbor constructed on Oʻahu.

Improvements to the harbor were approved on October 25, 1974, under the authority of Section 107 of the Rivers and Harbors Act of 1960, as amended. These improvements consisted of an entrance channel (700 ft long, 100 to 120 ft wide, and 12 ft deep); a revetted mole (1,200 ft long with a 110 ft long breakwater at its seaward end), a wave absorber (140 ft long), and a west breakwater 80 ft long.

The current federal general navigation features (GNF) of HSBH consist of an entrance channel (740 ft long, 100 to 120 ft wide, with an authorized depth of -12 ft mean lower low water (MLLW)), a revetted mole (1,310 ft long); a stub breakwater (80 ft long); and a wave absorber (140 ft long) (Figure 3). Non-federal project features include 64 berths, 26 moorings, 2 loading docks, and 3 ramps. The NFS for the harbor is the State of Hawai‘i, represented by the Department of Land and Natural Resources' (DLNR), Division of Boating and Ocean Recreation (DOBOR).

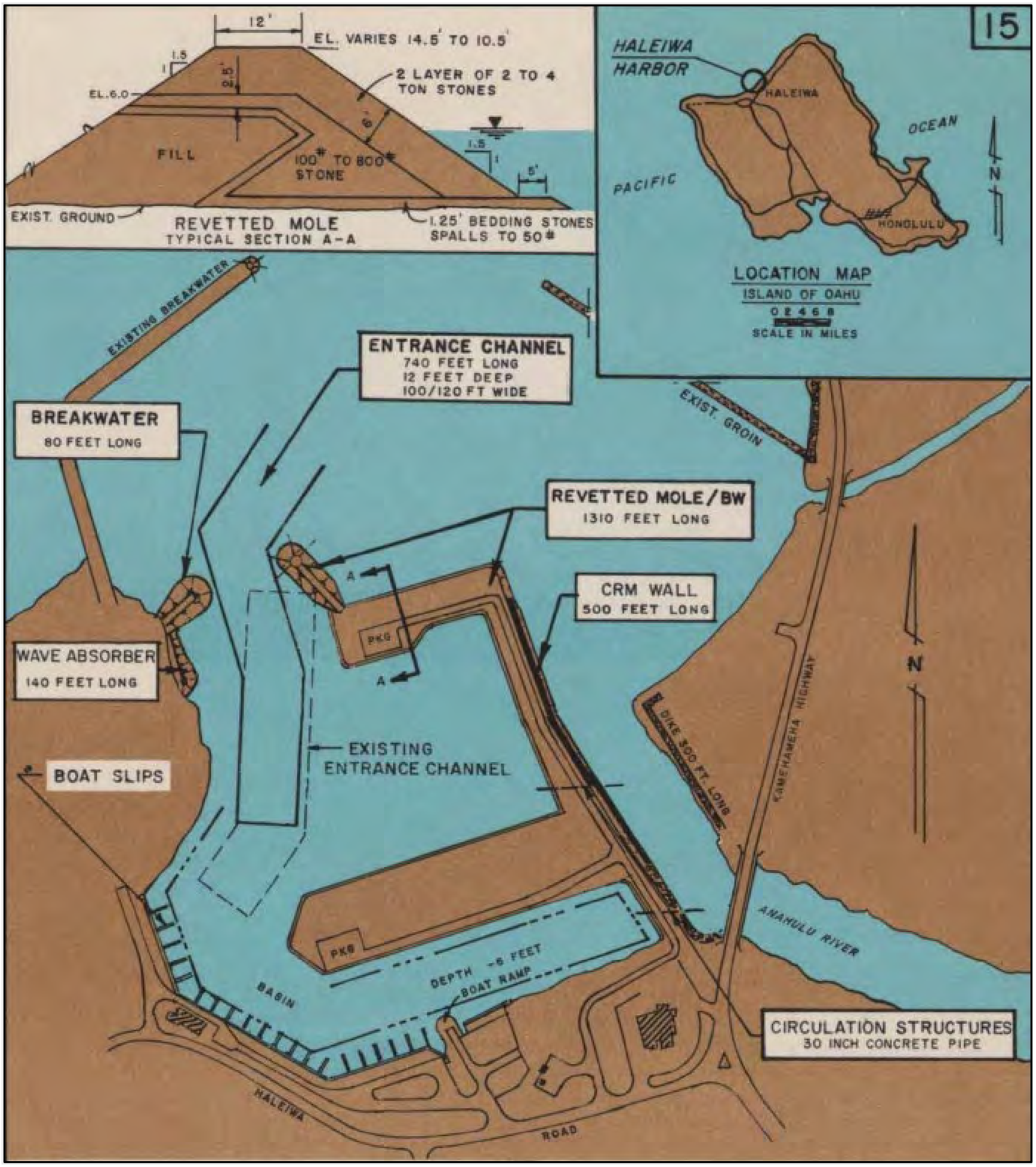

Figure 3. Hale‘iwa Small Boat Harbor Federal Projects

1.3.1.2 Maintenance Dredging of Hale‘iwa Small Boat Harbors

HSBH was dredged twice since initial construction: (1) 7,214 cubic yards (cy) in 1999 and (2) 4,556 cy in 2009 (Table 1). Both times, the dredged material was disposed upland. Many of Hawai‘i's small boat harbors (including HSBH) are dredged relatively infrequently (10 to 15 year interval) due to low shoaling rates, high mobilization and construction costs for small projects, and limited impacts of shoaling on small boat navigation. HSBH is typically dredged mechanically with a barge-mounted excavator. The material was placed upland in 1999, because at that time, it was understood by the Corps to be the least cost option.

Under the Operations and Maintenance (O&M) program, the USACE completed a Dredged Material Management Plan (DMMP) Preliminary Assessment (Appendix F) for the HSBH (USACE, 2018). The DMMP Preliminary Assessment concluded that a comprehensive DMMP study was not warranted and established the O&M Base Plan: maintenance dredging of the federal navigation features to the authorized depth with ocean disposal at the South Oʻahu Ocean Dredged Material Disposal Site (ODMDS). The South Oʻahu ODMDS has capacity sufficient to receive dredged material from the Haleʻiwa SBH for the next twenty years and is the least cost disposal alternative in comparison to upland alternatives considered under the DMMP Preliminary Assessment (stockpiling, landfill or beach nourishment). It is USACE policy to fully consider all aspects of the dredging and placement operations while maximizing benefits to the public. Beneficial use options for the dredged material should be given full and equal consideration with other alternatives (ER 1165-2-211).

Table 1. USACE Dredging History of HSBH

Year	Type of Work	Type of Disposal	Volume (cy)	Total Cost	Unit Cost
1999	Maintenance	Upland	7,200	$208,000	$29.00
2009	Maintenance	Upland	4,556	$1,300,000	$252.00

Note: This table provides estimated unit cost of dredging for prior maintenance actions. Until recently, all Honolulu District dredging contracts were solicited as lump sum contracts. So, unit prices are inferred from lump sum price, which introduces some uncertainty in the average costs. The 2009 dredging contract was a small business set aside, where contract line items indicated mobilization/demobilization as $150,000 and dredging as $1 million, which is likely unbalanced, causing an inflated unit price. The actual unit price is likely closer to $100/cy as shown in Appendix A, Table A4. This increase in unit price also reflects the continuously high cost of construction in remote locations, and the limited availability of dredging contractors, reducing competition.

1.3.2 Haleʻiwa Beach Shore Protection Project

The federally authorized HBSPP is adjacent to HBP and is less than one mile from HSBH (Figure 2). The HBSPP was authorized by Section 301 of the Rivers and Harbors Act of 1965 (PL 89-298) and was constructed in 1965 for the purpose of restoring the eroded public beach at HBP. The shoreline protection project consists of a sand beach (1,600 ft long and 140 to 265 ft wide), an offshore breakwater (160 ft long), and a terminal groin (500 ft long) at the southern end of Haleʻiwa Beach.

In December 1969, the USACE conducted emergency repairs on the groin and offshore breakwater in response to damages caused by severe storms and placed approximately 12,000 cy of sand on the beach. Figure 4 shows the shoreline of HBP in the year following the sand placement, in which a tombolo has formed between the beach and the offshore breakwater. A tombolo is a deposit of sand that forms between an island or detached breakwater and a shoreline, due to wave refraction and diffraction. Storms in January 1974 and November 1976 caused damages requiring emergency repair of the project, in 1975 and 1978, respectively. The Local Cooperation Agreement states that the NFS is responsible for ongoing maintenance of the project and that the USACE may conduct emergency repairs to the project in accordance with PL 84-99. The NFS for the HBSPP is the State of Hawaiʻi, represented by the Department of Transportation.

Figure 4. Photo of Haleʻiwa Beach Park, circa 1970, Depicting the Historic Extent of Beach and Tombolo (Sea Engineering Inc., 2019)

Regular maintenance of the HBSPP by the NFS has been limited. Haleʻiwa Beach is known to be erosive with current rates of erosion at an average of 2.2 ft per year (University of Hawaiʻi, 2010). Recent erosion exposed underlying beach rock, impacting recreational use of the beach and availability of suitable sandy habitat for Hawaiian Monk Seal and sea turtle resting habitat. Additionally, the erosion undermined the retaining wall associated with the HBP comfort station. The City and County of Honolulu completed repairs to the damaged seawall in 2019.

USACE coordinated with key stakeholders and interested parties to evaluate impacts and improve the quality of the study. While they are not the sponsor on the project, they are integral to successful implementation of the project. Key stakeholders for this study include the City and County of Honolulu, Waialua Hawaiian Civic Club and Malama Loko Ea Foundation.

1.4 Consultation Partners

In addition to the stakeholders listed above, USACE consulted the following organizations for information to develop this study: the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), U.S. Environmental Protection Agency (USEPA), State of Hawaiʻi Historic Preservation Division (SHPD), Hawaiʻi

Coastal Zone Management Program (CZMP), Hawaiʻi Department of Health (DOH), Office of Hawaiian Affairs (OHA), and Hawaiʻi Office of Planning.

1.5 Related Studies and Reports

The following reports provided pertinent information that was critical to the decision making and feasibility study process. Additional referenced reports are provided in Chapter 10.

1) *Concept Designs for Selected Beach Parks. Volume 1 Haleʻiwa Beach Park. May 2019. Prepared for City and County of Honolulu.*

   This report was prepared for the City and County of Honolulu. It presents the results of a coastal engineering study of HBP and concept design of alternatives. Key components of the study include wave, current, and circulation field studies; sand source investigations; concept structure and beach design. This report presents five alternative designs with estimated construction estimates.

2) *Hawaiʻi Regional Sediment Management: Advance Planning for the Beneficial Use of Dredged Material at Haleʻiwa Harbor, Island of Oʻahu, Hawaiʻi. 2018. U.S. Army Corps of Engineers. ERDC/TN RSM-18-9*

   This USACE Regional Sediment Management Technical Note (RSM-TN) brings together the information necessary to prepare for the next maintenance dredging event at HSBH. It describes previous maintenance dredging and sediment budgets, evaluates sediment quality data, and projects future sediment volumes and shoaling rates. Additionally, this RSM-TN identifies environmental coordination requirements and permits and documents discussions with the NFS and other stakeholders to identify stockpile, beneficial use, and disposal options.

3) *Potential Regional Sediment Management (RSM) Projects in the Haleʻiwa Region, Oʻahu, Hawaiʻi. May 2014. U.S. Army Corps of Engineers. ERDC/CHL-CHETN-XIV-37*

   This report describes opportunities for regional sediment management in the Haleʻiwa Region. Specifically, it describes opportunities to beneficially use sediment for beach restoration, reducing shoaling within the HSBH, and reducing loss of sand from existing beaches. This report describes the need and interest for using dredged sand to restore the beach at HBP.

4) *Regional Sediment Budgets for the Haleʻiwa Region, Oʻahu, Hawaiʻi. June 2014. U.S. Army Corps of Engineers. ERDC/CHL-CHETN-XIV-38*

   This report reviews the development of a conceptual regional sediment budget for the Haleʻiwa Region as part of the Regional Sediment Management Program. It describes the sources and deposition areas for sediment in the Haleʻiwa Region. A relevant conclusion of this study is that beach nourishment of Haleʻiwa beach could be used to address the erosion happening within this cell. However, the strong transport from north to south in this region would require tightening of the permeable groin and construction of new retention structures to aid in keeping the nourished sand within the cell. The study developed a sediment budget based on wave/circulation modeling, estimating an average annual volume loss from the HBP cell of 976 cy/year. Qualitative modeling of sediment pathways using the Particle Tracking Model estimated offshore transport from the cell as 593 cy/year. This sediment is likely moving out the Hale‘iwa channel and toward the offshore area identified as a potential borrow area in this study. This offshore loss may be altered by the addition of structures but will not be completely eliminated.

2.0 AFFECTED ENVIRONMENT-EXISTING CONDITIONS

The following sections describe the existing conditions, i.e., the affected environment, within the study area and include HBP, HSBH, and the nearshore areas of the Pacific Ocean in the vicinity of Haleʻiwa Beach. This section includes discussions of the physical, environmental, and social resources that are most pertinent to the plan formulation, future without project condition, and the environmental impact of the developed plans. Discussions of additional resources that were evaluated (as required by NEPA) are included in Appendix B.

2.1 Physical Setting

2.1.1 Terrestrial Habitats

HBP consists primarily of a sand beach that is used by a wide variety of fish and wildlife species. Sea turtles forage within the open water near the beach and use the beach to haul out and rest. Migratory shorebirds use the beach habitat for nesting and foraging. Hawaiian Monk Seals may also haul out on the sandy beach to bask.

2.1.2 Aquatic Resources

2.1.2.1 Surface Waters and Wetlands

Surface water resources include the ocean, lakes, rivers, streams and wetlands and are important for a variety of reasons including ecological, economic, recreational, aesthetic, and human health. USACE defines waters of the U.S. (WOTUS) subject to regulatory jurisdiction under the CWA at 33 CFR 328.3. WOTUS within the project area include the Waialua Bay of the Pacific Ocean (including the HSBH), the Anahulu River, Loko Ea Fishpond and Ukoa Pond. Waialua Bay is a water subject to the ebb and flow of the tide, the Anahulu River is a perennial tributary with end terminus in Waialua Bay, and Loko Ea Fishpond and Ukoa Pond are adjacent wetlands. Note that the boundaries of the adjacent wetlands have not been formally delineated by USACE.

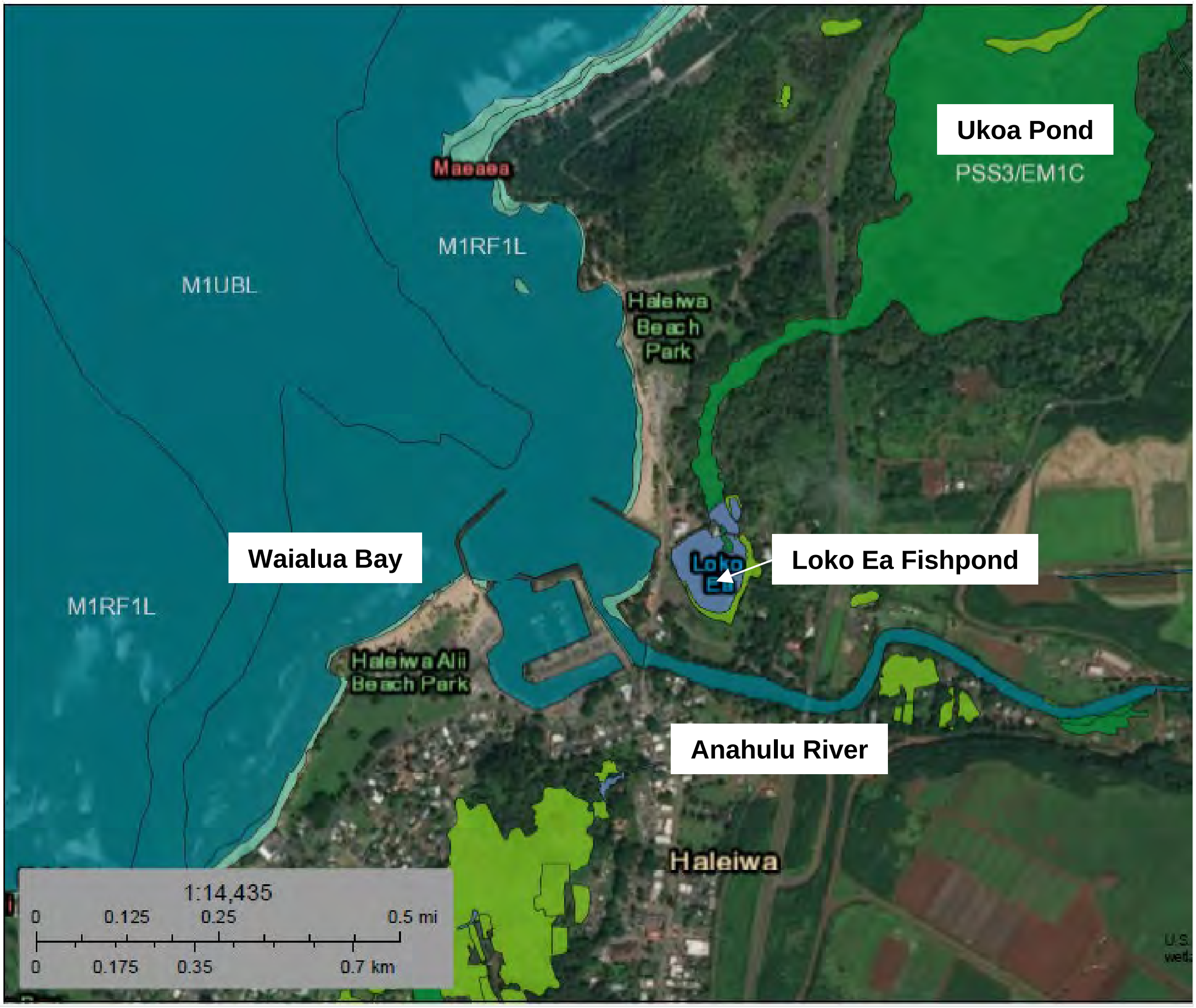

Figure 5. National Wetlands Inventory for Haleʻiwa Beach Park and vicinity. WOTUS are labelled in white.

2.1.2.2 Marine Environment

The USFWS conducted a dive survey of the dredge footprint to qualitatively characterize the habitat types and biological resources within the study area (Appendix B). The USFWS FWCA Report characterized the offshore sand borrow area as consisting almost entirely of high quality beach sand. The nearshore area between the two groins and where the Corps is considering beach nourishment alternatives consists of sand and mud. The outer portion of the HSBH Federal Channel consists of Unconsolidated Sediment closer to the inner harbor as well as Scattered Coral/Rock in Unconsolidated Sediment further from the inner harbor. In the nearshore area where the Corps proposes excavation of a barge access, the benthos consists entirely of mud and leaf litter and driftwood with no hard habitat. A small deposit of sand has accumulated adjacent to the groin.

2.1.2.3 Coral Reefs

Coral reefs are present outside the project footprint in the offshore areas of Haleʻiwa Beach and the HSBH. Coral reefs provide habitat for nearshore fisheries, protect coasts from waves and storms, and support tourism and fishing industries worth billions of dollars. Hawai‘i’s coral reefs experienced recent bleaching events. The heatwaves of 2014 and 2015 caused unprecedented bleaching with up to 50 percent of Hawaiian reefs impacted. Combined with other factors like population density, increased coastal development, land-based sources of pollution, increased sediments in the water, damage by tourists and divers, groundings, poor water quality from runoff and sewage treatment, and overfishing; climate change is critically affecting coral reefs and the benefits thereof. Other effects from climate change like SLR and larger and stronger storms will also contribute to reef degradation.

USFWS completed a biologic survey (June 2020) of the nearshore waters within the project area. The FWCAR (December 2020) characterizes the coral reef habitat, adjacent to HBP, as “Resource Category 3”. The FWCAR notes “this coral reef area should be considered medium to high value due to the marine resources documented in this survey. However, this reef has been classified as Category 3…while most Hawaiian coral reefs are rated at Category 2.” Coral reefs are also designated as Special Aquatic Sites under the CWA. Special Aquatic Sites are defined by 40 CFR 203.03 (m) as “geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region.”

Table 2. Resource Categories and Mitigation Goals (USFWS, August 2020)

Resource Category	Designation Criteria	Mitigation Planning Goal
1	High value for evaluation species and unique and irreplaceable	No loss of existing habitat value
2	High value for evaluation species and scarce or becoming scarce	No net loss of in-kind habitat value
3	High to medium value for evaluation species and abundant	No net loss of habitat value while minimizing loss of in-kind habitat value
4	Medium to low value for evaluation species	Minimize loss of habitat value

Designations of Resource Category 3 and Special Aquatic Site require USFWS to recommend ways to mitigate losses via measures to avoid or minimize significant adverse impacts. In the event of unavoidable losses, measures to rectify immediately, reduce, or eliminate losses commensurate with project permitting/implementation will be recommended under the Fish and Wildlife Coordination Act (FWCA).

2.1.2.4 Ground Water

The study area is geologically part of the Koolau Formation. Water in the study area’s groundwater occurs as basal non-artesian water floating on sea water (Stearns and Vaksvik, 1935). A dike-impounded system holds water to heights as high as 1,600 feet above sea level, though the depth of the water is unknown in many places within this system. Horizontal shaft wells (sometimes called Maui shafts) are used to pump the water by skimming from the upper levels of the freshwater lens (Gingerich and Oki, 2000).

2.1.3 Water Quality

Section 305(b) of the CWA requires states to assess the water quality of the waters of the state and prepare a comprehensive report documenting the water quality. The report is to be submitted to the EPA every two years. In addition, Section 303(d) of the CWA requires states to prepare a list of impaired waters on which total maximum daily loads (TMDLs) where corrective actions must be implemented. The EPA has delegated the Hawaiʻi DOH, Clean Water Branch (CWB) as the agency in Hawaiʻi responsible for enforcing the water quality standards and preparing the comprehensive report for submittal to the EPA. The CWB looks at both inland and marine sections of waterways.

Surface water quality in the study area is influenced by agricultural practices and residential, commercial, and industrial areas associated with urban development. The Anahulu River flows into the project area and (Water Body ID 3-6-08-E) is classified as an impaired waterbody due to elevated Total Nitrogen (TN), nitrite (NO2) and nitrate (NO3), and total phosphorous (TP). The DOH categorizes the priority for establishing TMDLs for streams as high, medium, or low. Anahulu River is assigned as a low TMDL priority category.

2.1.4 Air Quality

The EPA has the primary responsibility for regulating air quality nationwide. The Clean Air Act (CAA; 42 USC 7401 et seq.), as amended, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment.

EPA set NAAQS for six principal pollutants, which are called “criteria” pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), sulfur dioxide (SO2), and lead (Pb). If the concentration of one or more criteria pollutants in a geographic area is found to exceed the regulated “threshold” level, the area may be classified as a non-attainment area. Areas with concentrations of criteria pollutants that are below the levels established by the NAAQS are considered in attainment. There are no non-attainment areas within the State of Hawaiʻi (EPA, 2020).

2.1.5 Climate

The island of Oʻahu has a tropical wet and dry/savanna climate with pronounced dry season in the high summer months. Generally featuring mild and fairly uniform temperatures throughout the year. Honolulu’s mean annual temperature is 76°F with a maximum of 93°F and a minimum of 56°F. Between 1989 and 2018 the average rainfall was 20.1 inches/yr. The predominance of this rain falls between October and April when intense rains can cause severe flooding. In general, the west side of the island is much drier than the east side.

It is anticipated that climate change and increasing global temperatures will influence key processes that will affect the coastal system. Most pertinent to this project, climate change is anticipated to accelerate sea level rise (SLR). Rising sea levels will escalate the threat to coastal infrastructure and property. SLR is described further in Section 2.1.7.

2.1.6 Geology and Geomorphology

The island of Oʻahu is made of two volcanoes: Waiʻanae and Koʻolau. Waiʻanae, the older of the two volcanoes, makes up the west part of the island. The shield of Waiʻanae volcano formed between 3.8 and 2.95 million years ago. A caldera is located near the center of the Waiʻanae Range and rift zones extend to the northwest and southeast.

The northwest coast of Oʻahu extends from Kahuku Point to Haleʻiwa, and is characterized by massive winter surf, long sandy beaches, rocky points, and patches of exposed beach rock. The beach rock is particularly exposed in the winter, when foreshore slopes steepen, and large quantities of sand are moved by high surf from the water's edge toward the back of the beach. During relatively calm summer conditions, the beaches are flat and wide. Sand at the shoreline is mostly coarse grained and calcareous, a signature of the high energy waves that impact this coast in the winter. A fringing reef of variable width and depth is present offshore. The coastal plain is variable in width and is composed largely of fossiliferous limestone and unconsolidated sand.

Shoreline Change

The shoreline of Oʻahu is dominated by erosion processes. Compared with Kauaʻi and Maui, Oʻahu has lost the greatest total length of beach to erosion (5.4 miles). An analysis of shoreline change rates indicated the maximum long-term erosion rate to be -4.3 +/- 2.6 ft/yr at Haleʻiwa Beach (USACE, 2014). This is the highest erosion measured in the north Oʻahu region. At these average rates, 4,300 square ft (0.1 ac) of beach would be lost each year.

2.1.6.1 Soils

The soil of the study area consists primarily of sand beaches and the Jaucus soil series. The Jaucus series consists of very deep, excessively drained, very rapidly permeable soils on vegetated beach areas along the seacoast. The adjacent back beach areas of HBP that are vegetated with turf grasses and other vegetation are designated as the Mamala cobbly silty clay loam. This soil series consists of shallow, well drained soils that formed from alluvium deposited over coral limestone and consolidated calcareous sand.

2.1.6.2 Benthic Substrate

Haleʻiwa Small Boat Harbor and Navigation Channel

In 2008, sediment samples at HSBH were collected from the channel and inner harbor and physical and chemical analyses were conducted to determine suitability for upland disposal alternatives (MRC, 2008). This sampling effort was conducted in support of the O&M dredge cycle at the time. The 2008 dredge cycle constitutes the last, most recent dredge cycle. In addition, the 2008 sampling effort collected and analyzed sediments from Waiʻanae SBH. Those results are not discussed in this report.

With respect to HSBH, there is a very distinct boundary between mud in the inner harbor that is outside the federal channel and marine carbonate sand within the federal channel. Fine-grained black mud of terrigenous origin is likely deposited in the innermost reaches of the harbor from the Anahulu River. The sediments at the seaward end of the federal navigation channel are extremely clean, well-sorted coarse-grained sand of marine origin with less than 1% fines. The sediments at the inland end of the federal navigation channel, furthest from the open ocean, is 45% sand and gravel and 55% fines. Only sandy material with varying mixture of fine grain sediments from the navigation channel will be dredged under this scope and considered for beneficial use at HBSPP. Approximately 2,400 cy of sandy, beach quality material is expected to be located at the front of the navigation channel.

Sediment chemistry analysis of the inner harbor mud indicates that none of the samples contained detectable cyanide, diesel, pesticides, PCB's, acid/base neutral extractables, total and soluble sulfides, oil and grease, gasoline or Volatile Organic Compounds. In addition, for total metals, all detected constituents (Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Zinc) were below the effects range median concentration and all but two constituents (denoted in italics) were detected at below the effects range low. Effects range low and median are measures of toxicity in marine sediment, indicating the likely toxicity to biota and are used for screening purposes. The purpose of this testing was not for ocean disposal suitability, so no toxicity assays were conducted. Typical of a harbor, motor oil (12 mg/Kg) and total recoverable petroleum hydrocarbon (14 mg/Kg) were present in the sediment samples in the amounts indicated. Note the reporting limit for these constituents ranges from 25-100+mg/Kg. The amount of hydrocarbons in Haleʻiwa sediments is well below either of these limits.

USACE completed a Tier 1 evaluation of existing sediment information and other available information concerning potential for recent contamination of harbor sediments and concluded the sediment in Haleʻiwa is likely suitable for ocean disposal (See Tier 1 Evaluation at Appendix B)

State Breakwater Settling Basin Area

The 0.3 ac sand shoaling deposit caused by a state-owned breakwater, referred to as the State Breakwater Settling Basin, is located immediately to the east of the state breakwater and consists primarily of beach quality sand that has migrated through the breakwater as a result of wind and wave energy.

Offshore Sand Borrow Area

The 1.7 ac Offshore Sand Borrow Area was identified in a report prepared for the City and County of Honolulu in 2019. The deposit appears to be an extension of a relict stream bed to the west of Aliʻi Beach Park and may be at the confluence of that streambed and one extending from the Anahulu River, now used as an entrance channel for HSBH. Grain size analysis (discussed in Appendix A) indicates that it is similar to the beach sand currently at HBSPP. It is estimated that approximately 20,000 cy of sand could be recovered by dredging 15 inches of sand throughout this area.

Barge Access Zone

To facilitate offloading of scows directly to the HBSPP, a barge access zone would be excavated along the north side of the southern groin (see Section 4.1.3). The access zone would be 50 ft wide, approximately 140 ft long, and would be dredged to a depth of -10 MLLW. The scow barge would travel from the harbor channel to the access zone along a direct path of approximately 450 ft, in an area with existing depths of -10 ft MLLW or greater. Excavation of this access zone is anticipated to produce approximately 1,300 cy of beach suitable dredged material.

2.1.6.3 Bathymetry and Nearshore Bottom Conditions

The offshore bottom in the vicinity of Hale‘iwa Beach is composed of distinct areas of reef and sand. The shallower portions are made up of fossil and living reef, which create surf breaks and dissipates nearshore wave energy. The HSBH Channel is likely an ancient stream bed from the Anahulu River with depths as great as 90 ft further out in Waialua Bay. The Fish and Wildlife Coordination Act Report (FWCAR) divides the near shore substrate into five strata: Sand, Pavement, Scattered Coral/Rock in Unconsolidated Sediment, Rocky Shoreline Intertidal, and Sandy Shoreline Intertidal strata. The FWCAR can be found in Appendix B.

The nearshore bathymetry and topography of Hale‘iwa Beach is shown in Figure 6, along with profile cross-sections. The backshore includes the highway, seawalls and the comfort station, and has typical elevations of between +6 ft and +11 ft MLLW, while sea floor elevations vary from -2 ft to -7 ft MLLW in the area between 100 and 200 ft from the shoreline.

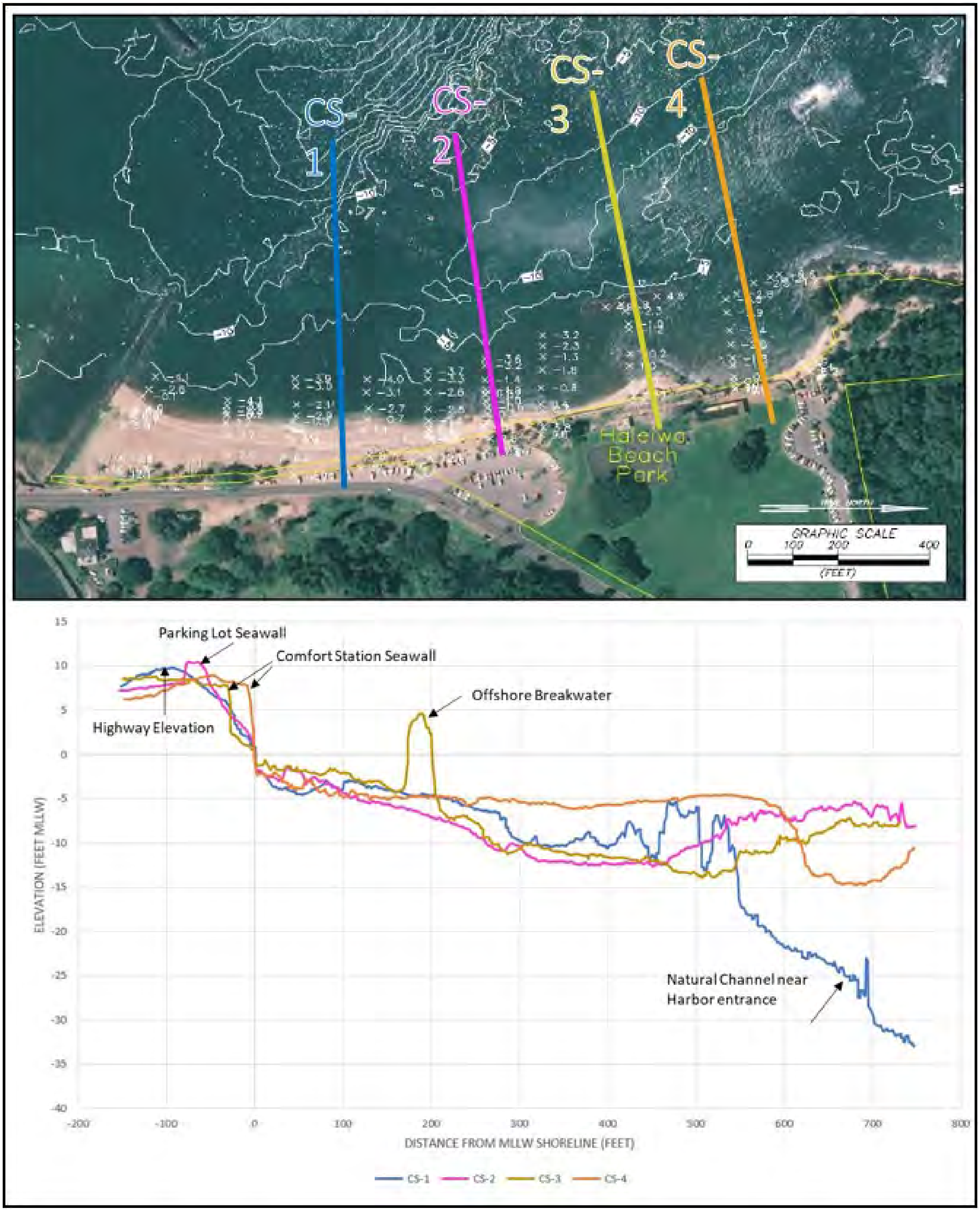

Figure 6. Bathymetry and Topography, Beach Profile Cross Sections, Hale‘iwa Beach Park

2.1.6.4 Littoral Sand Transport

A 2014 analysis of regional sediment budgets for the Haleʻiwa Region (USACE, 2014) quantifies the movement of littoral sediment along the various reaches of shoreline in the vicinity of Haleʻiwa Beach and HSBH. Some of the pertinent conclusions for this analysis are summarized below.

- A portion of the sand from Haleʻiwa Beach is being directed offshore into the channel at the harbor entrance, a phenomenon that may have been amplified by the construction of HSBH. Some of this sand may be staying within the littoral system but based on consistent erosion of HBP in recent years, it is likely that some of this sand is being moved into deep water by the offshore current in the channel and is being lost from the system. SLR in combination with periodic high-water levels and limited sediment supply are also contributing factors to recent erosion.
- The remainder of sand leaving Haleʻiwa Beach is ending up in the harbor channel in the lee of the breakwater and nearby areas. This is likely adding to maintenance dredging.
- Nourishment of Haleʻiwa Beach could address the erosion happening in this area. However, the strong transport from north to south in this region, and the transport mechanisms out of the area would require tightening the permeable groin and construction of some form of new retention structures.

The sediment budget for the Haleʻiwa region (Appendix A) estimates that the Haleʻiwa Beach littoral cell erodes at a rate of approximately 976 cy/year. To estimate how long a volume of placed sand is expected to remain, the total volume of beach fill (cy) can be divided by 976 cy/year. See the descriptions of the alternatives at Section 4.1 and a discussion of the impact of erosion on the alternatives at Section 3.5. The wave and circulation modeling completed as part of a USACE report entitled "Regional Sediment Budgets for Haleʻiwa Region, Oʻahu, Hawaiʻi" (USACE 2014) was used with the Particle Tracking Model to visualize sediment transport pathways. These models, combined with shoreline change analysis and dredging records, were used to develop a regional sediment budget (Figure 7). Refer to Appendix A for further details.

Figure 7. Sediment Budget for the Hale‘iwa Region (Podoski, 2014)

When potential for future SLC is considered, the rate of erosion along Hale‘iwa Beach (either with or without the project) will likely increase due to the inability of much of the shoreline to shift landward to reach an equilibrium with higher water levels. This is due to the backshore development such as the comfort station, the parking areas, and the highway, that are unlikely to be relocated or removed in the near future; as well as the lack of a backshore dune to allow natural landward migration of the shoreline and provide additional sediment to the shoreline under rising sea levels. The ability for larger waves to reach the shoreline under higher sea levels would also lead to greater erosion of the sand along the shoreline. With future SLC and a higher erosion rate, the estimated duration of all of the beach fill alternatives stated above would be reduced, making each an upper-bound estimate. Though future SLC will reduce the longevity of any beach fill completed, this also highlights the fact that any addition of sand to the chronically eroding shoreline will delay the impacts of SLC to the infrastructure in an around HBP. The alternatives for this project were formulated with fill volumes based on the availability of sand, rather than specific dimensions of the proposed beach fill. However, this cursory evaluation of SLC and its future impacts illustrates that the larger the volume of sand placed (up to the limit that the littoral cell can hold), the longer the backshore infrastructure will be protected from SLC and storm damage impacts, including increased frequency of overtopping and increased erosion.

2.1.7 Hydrology: Tides, Water Levels, and Sea Level Change

Tides

Tides in Hawaiʻi are semi-diurnal with pronounced diurnal inequalities (i.e., two high and low tides each 24 hour period with different elevations). Tidal datums established for a National Oceanic Atmospheric Administration (NOAA) Center for Operational Oceanographic Products and Services (CO-OPS) subordinate tidal station at HSBH are shown below. Tide predictions for subordinate stations are generated by first generating high/low tide predictions for a "reference station" (Honolulu Harbor in this case); then time and height adjustments are applied to correct the high/low predictions to the tidal conditions at the subordinate station. No continuous tidal observations are collected at HSBH.

Table 3. Tidal datums for HSBH

Datum	Elevation (MLLW)	Elevation (Mean Sea Level)
Mean Higher High Water	1.9 ft	1.0 ft
Mean High Water	1.6 ft	0.7 ft
Mean Sea Level	0.9 ft	0.0 ft
Mean Low Water	0.3 ft	-0.6 ft
Mean Lower Low Water	0.0 ft	-0.9 ft

Hawaiʻi is subject to periodic extreme tidal levels due to large scale oceanic eddies that propagate through the islands. These eddies produce tide levels up to 0.5 to 1 ft higher than normal for periods of up to several weeks.

Non-Tidal Water Levels

Water level plays a critical role in design of coastal projects, particularly in those locations where waves are depth limited. The super-elevation of water level near the coast can be a controlling factor in determining the amount of wave energy affecting the harbor and shorelines. It can significantly affect coastal processes such as harbor seiching (oscillating waves can resonate within a harbor or other enclosed body of water), wave breaking, wave generated currents, wave runup and inundation, and sediment transport.

Water level is a combination of many factors that can occur over different temporal and spatial scales. Longer-term water level increases may be due to sea level change (SLC), and/or annual or decadal anomalies such as El Niño/La Niña or the Pacific Decadal Oscillation. These phenomena will be discussed in the next section. Shorter-term effects on nearshore still water level are, astronomic tide (presented above), storm surge (which includes wind setup and localized increase due to low pressure), and wave setup. Wave runup can be added to the still water level in areas where inundation along the shoreline or overtopping of a structure is a concern.

Extreme water levels calculated at the Honolulu Harbor tide gauge (Figure 8) can be viewed as a generalized representation of still water level conditions at HSBH. However, since wave and storm exposure can vary dramatically on different coasts of Oʻahu, actual still water level probabilities at HSBH are likely different than those shown below. Figure 8 shows that the 1 percent annual exceedance probability still water level is 2.5 ft (0.76 m) above mean sea level for the period between 1983 -2001. This type of short-term water surface elevation in combination with longer-term increases such as SLR will cause increasing erosion, wave runup, and threats to habitat, recreation and coastal infrastructure at HBP.

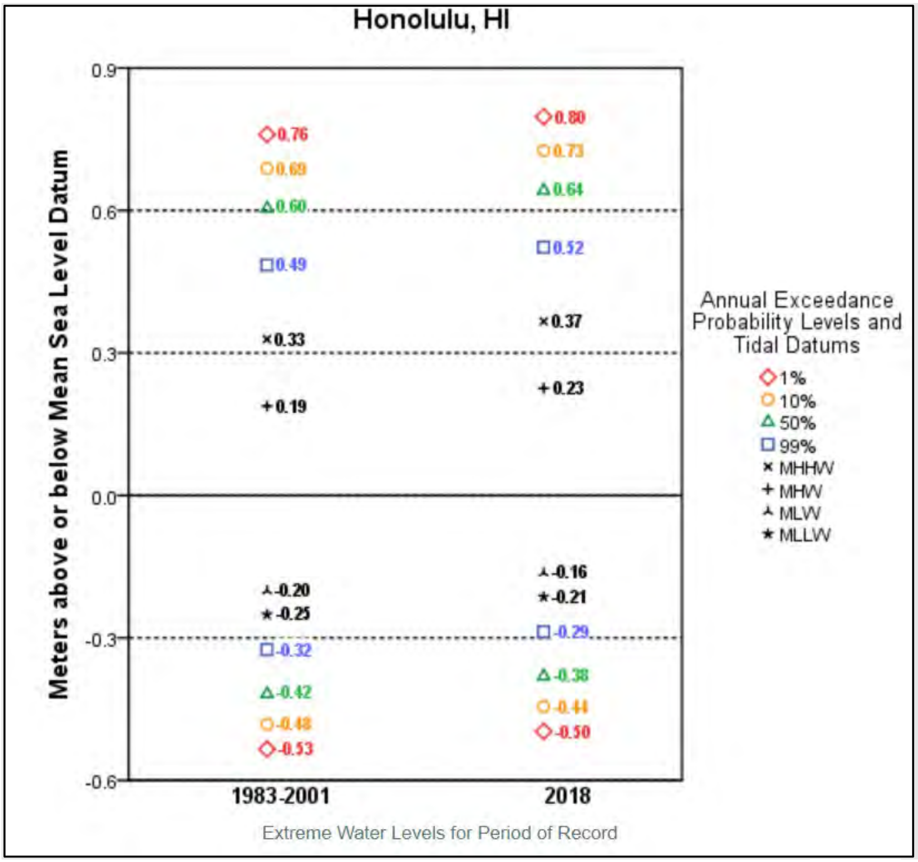

Figure 8. Extreme Water Levels at Honolulu Harbor, O‘ahu

Sea Level Change

Relative SLC is the local change in sea level relative to the elevation of the land at a specific point on the coast, including the lowering or rising of land through geologic processes such as subsidence and glacial rebound. Relative SLC is a combination of both global and local SLC caused by changes in estuarine and shelf hydrodynamics, regional oceanographic circulation patterns (often caused by changes in regional atmospheric patterns), hydrologic cycles (river flow), and local and/or regional vertical land motion (subsidence or uplift). Thus, relative SLC is variable along the coast.

At Honolulu Harbor (on the south coast of O‘ahu), relative sea level has risen at an average rate of 0.0049 ft/year (1.51 mm/yr) over the 114-year period of record for the long-term NOAA tide station at this location (Figure 9). This is equivalent to an increase of 0.50 ft over the past century. Yang and Francis (2019) note that the VLMR (vertical land-motion rate) results at both Honolulu and Moku o Lo‘e Island provide support towards O‘ahu being vertically ‘stable’ (i.e., near-zero vertical land movement within uncertainties). Thus, the data point towards the conclusion that the relative SLC on O‘ahu is dominated by the absolute sea level change, rather than the vertical land movement. This also provides confidence in the use of the Honolulu Harbor tide station to represent HSBH. This long-term trend of relative SLR exacerbates hazards such as coastal erosion, impacts from seasonal high waves, and coastal inundation due to storm surge and tsunamis. It has also increased the impact of short-term fluctuations such as extreme tides along coastlines of O‘ahu.

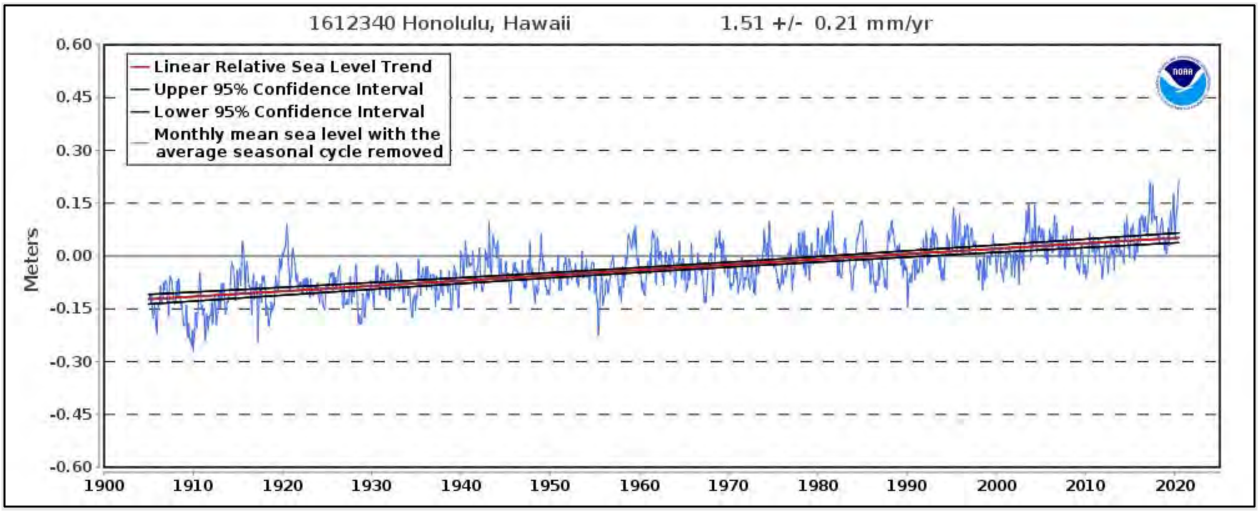

Figure 9. Sea Level Trend for Honolulu, Hawai‘i (NOAA, 2020)

Multi-decadal tradewind shifts in the Pacific (1950-1990 had weak tradewinds, while 1990-present have shown strong tradewinds) are likely related to the Pacific Decadal Oscillation (Merrifield et al., 2012), a recurring pattern of ocean-atmosphere climate variability centered over the mid-latitude Pacific basin. These low frequency tradewind changes can contribute on the order of 1 cm variations in sea level in the tropical Pacific. Multi-decadal variations such as these can lead to linear trend changes over 20-year time scales that are as large as the global SLC rate, and even higher at individual tide gauges, such as Honolulu, Hawai‘i (Merrifield, 2011 and Merrifield et al., 2012).

In addition, higher frequency interannual variations in Pacific water levels can be caused by the effect of the El Niño Southern Oscillation (ENSO); the climate phenomenon in the Pacific evidenced by alternating periods of ocean warming and high air pressure in the western Pacific (El Niño) and cooler sea temperatures accompanied by lower air pressure in the western Pacific (La Niña). In fact, it is the largest interannual variability of sea level around the globe that occurs in the tropical Pacific, due to these climate patterns (Widlansky et al., 2015). Additionally, and throughout the tropical Pacific, prolonged interannual sea level inundations are also found to become more likely with greenhouse warming and increased frequency of extreme La Niña events, thus exacerbating the coastal impacts of the projected global mean SLR (Widlansky et al., 2015).
These phenomena are documented here to emphasize the large variability in sea level that is experienced in the tropical Pacific, and to indicate that sea level trends reported by the nearest NOAA tide gage at Honolulu, Hawai‘i are affected by this variability.

Figure 10 shows the interannual variation of monthly mean sea level at Honolulu Harbor and the 5-month running average, with average seasonal cycle and linear sea level trend have been removed. Variability of up to +/- 0.5 ft (+/- 0.15 m) in the trend is comparable to the relative SLC over the past century.

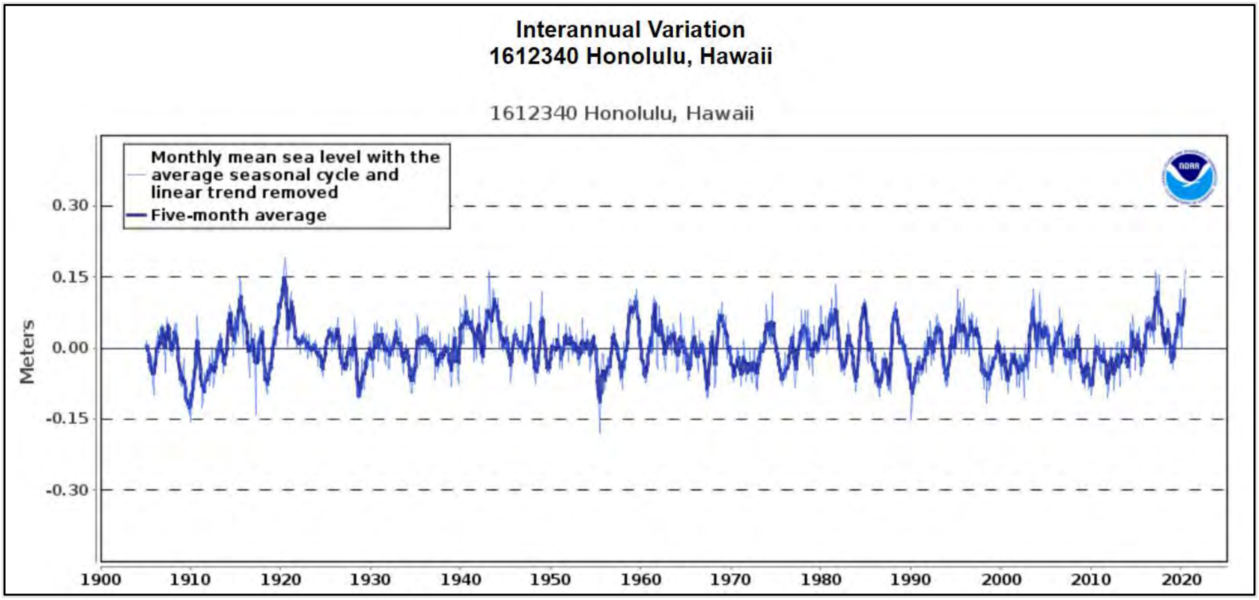

Figure 10. Interannual variation at Honolulu Harbor NOAA tide station

To incorporate the direct and indirect physical effects of projected future SLC on design, construction, operation, and maintenance of coastal projects, the USACE provided guidance in the form of ER 1110-2-8162 (USACE, 2013). ER 1100-2-8162 provides both a methodology and a procedure for determining a range of SLC estimates based on global SLC rates, the local historic SLC rate, the construction (base) year of the project, and the design life of the project. Three estimates are required by the guidance, a baseline (or “low”) estimate, which is based on historic SLC and represents the minimum expected SLC, an intermediate estimate (NRC Curve I), and a high estimate (NRC Curve III) representing the maximum expected SLC. These projections are shown in Figure 11, with annotations for year 2023 (estimated project start year), 2073 (50-year planning horizon) and 2123 (100-year adaptation horizon). Refer to Appendix A, paragraph 5.7 for evaluation of SLC rates on alternatives and project performance.

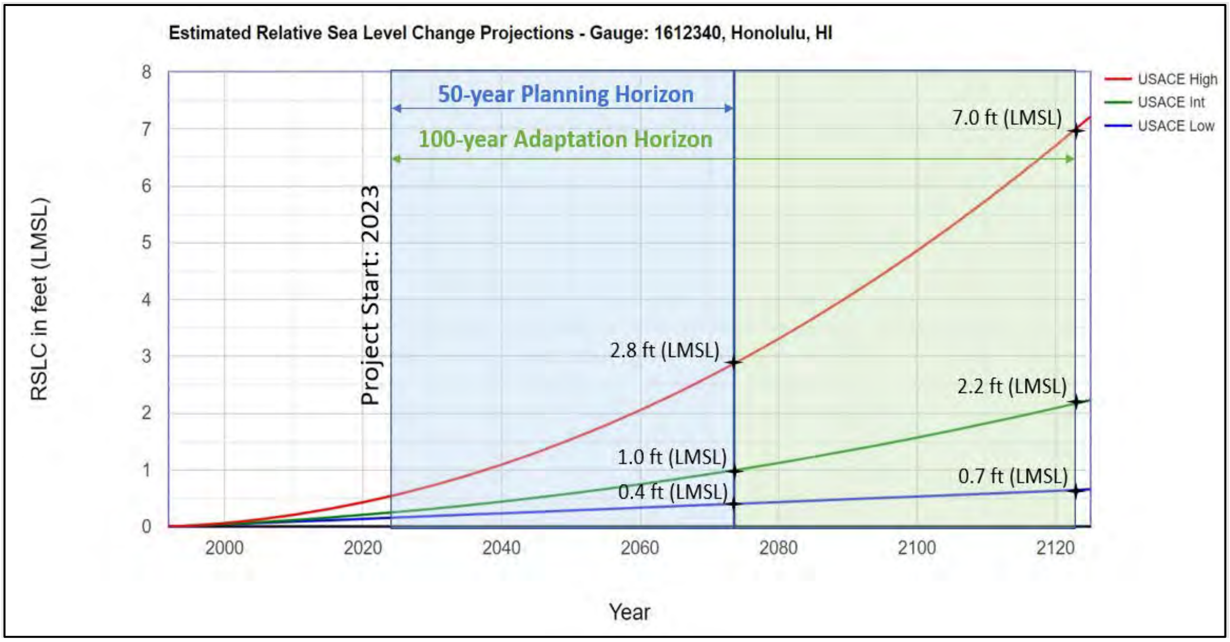

Figure 11. Relative SLC Curves at Honolulu Harbor NOAA Tide Station

2.1.8 Winds

The prevailing wind direction in the Hawaiian Islands is the northeasterly trade wind. During the summer period (May through September) the trades are prevalent 80 to 95 percent of the time. During winter/spring months (October through April), the trade wind frequency is 50 percent to 80 percent in terms of average monthly values. Locally generated low-pressure systems known as Kona lows situated to the west of the island chain can generate winds from a southerly to southwesterly direction, but this condition is relatively infrequent.

Figure 12 shows a wind rose diagram from a Wave Information Study (WIS) hindcast station located off the north shore of Oʻahu.

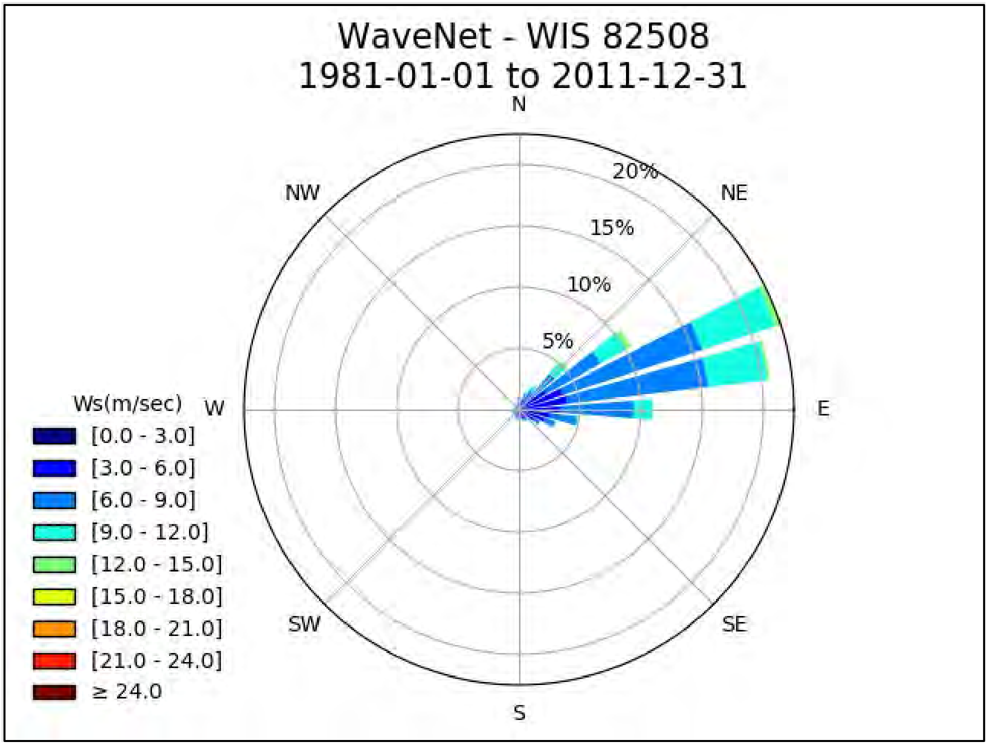

Figure 12. Wind Rose from WIS Station 82508

2.1.9 Waves

The Hawaiian Island chain is subject to a wide variety of incident wave conditions. Consistent tradewinds generate local wind waves while distant storms in the North and South Pacific Ocean generate significant swell energy that travels thousands of miles before reaching Hawaiʻi's coastline. Nearshore exposure to these wave conditions is highly dependent on location as well as shoreline orientation, due to the significant wave sheltering by adjacent islands and land features such as peninsulas and headlands. Refraction due to wave propagation over rapid changes in bathymetry also greatly affects wave climate in the islands.

HSBH and Haleʻiwa Beach are exposed to north swell during the winter months and refracted tradewind waves year-round. Measured directional wave data is available for Buoy 106 of the Coastal Data Information Program (CDIP), which is located about five miles north of Haleʻiwa. A wave rose plot from this buoy data is shown in Figure 13, and a wave period rose plot is shown in Figure 14. These plots show that longer period swell arrives from the west-northwest to north directions, while trade wind generated shorter-period seas arrive from north-northeast through northeast.

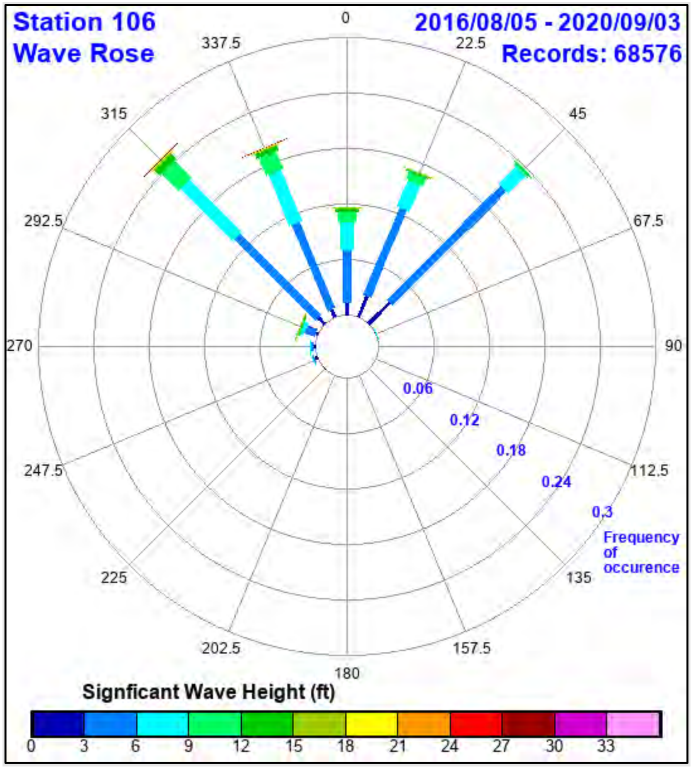

Figure 13. Wave Height Rose from CDIP Buoy 106

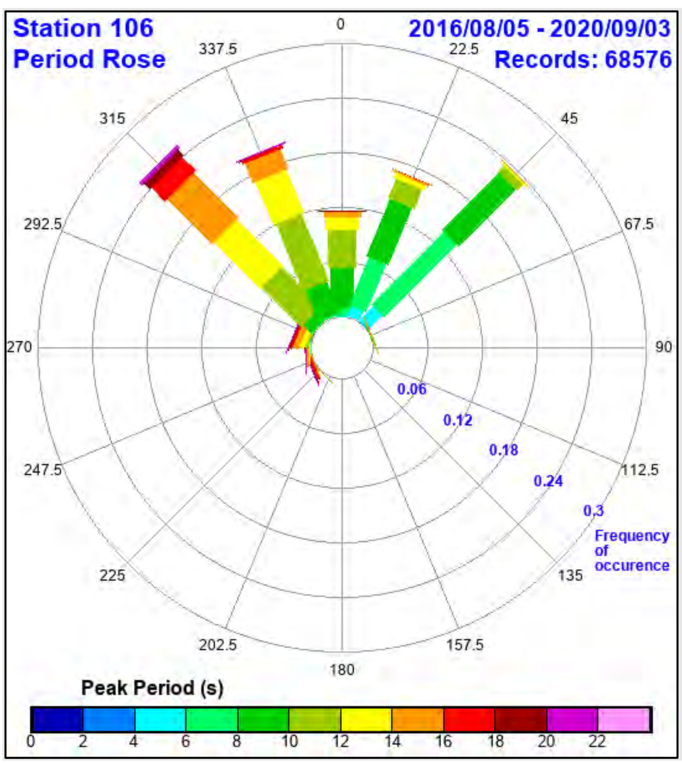

Figure 14. Wave Period from CDIP Buoy 106

2.2 Biological Setting

2.2.1 Fish and Wildlife Resources

Fish and wildlife resources in the study area include both terrestrial and aquatic species. Terrestrial species include those common of Oʻahu beach parks: common, introduced birds, some sea birds, feral mammals and rodents and protected sea turtles and monk seals on the beach. Aquatic species include infauna, invertebrates, fishes and mammals inhabiting both brackish and marine environments. Deep open ocean waters like the transit to and at the South Oʻahu ODMDS feature considerably higher fish diversity and density and larger marine mammals i.e., whales.

Based on the USFWS FWCA Report, the Corps understands that the offshore sand borrow area features relatively low biological diversity with few benthic organisms and may contain infaunal communities. Within the nearshore and intertidal area fronting HBP, USFWS noted very low diversity with few benthic organisms observed. The federal channel area has algae cover on the hard surfaces and is absent of coral within the channel, however, there are large coral colonies (approximately 2 meters in diameter) outside the federal channel, but within the area in which dredge barges or other equipment may work or anchor. The barge access zone also features very low biological diversity with few benthic organisms observed. No corals were observed, and a few small mollusks were observed near the groin and an occasional anemone in the mud.

The USFWS FWCA Report summarized the fish and wildlife resources in the marine waters surveyed within the study area as, "… relatively low diversity of marine species, with 10 species of corals, 7 species of algae, 13 species of fishes, and 60 species of invertebrates... Coral density was low across all sites, but was the most dominant in the Pavement and Scattered Coral/Rock in Unconsolidated Sediment strata, with the most abundant species being *Psammocora stellata* (0.48 colonies/m2) in the Pavement stratum. The density and biomass of fishes were low across all sites, with the highest density in the Rocky Shoreline Intertidal stratum and highest biomass in the Pavement stratum. The most abundant fish species was *Acanthurus triostegus* (0.08/m2), while *Acanthurus nigrofuscus* had the highest biomass (0.03 tonnes/ hectare). The highest invertebrate density was in the Rocky Shoreline Intertidal stratum, while the Pavement stratum had the highest invertebrate density for subtidal habitats. The most abundant invertebrates were *Nerita picea* (10.24/m2) in the intertidal habitat and *Echinometra mathaei* (1.75/m2) among subtidal habitats. An invasive alga, *Acanthophora spicifera*, made up the highest benthic biological cover in subtidal habitats (13.3% in Pavement stratum and 12.7% in Scattered Coral/Rock in Unconsolidated Sediment stratum)."

2.2.2 Marine Mammals

Several types of marine mammals including whales, dolphins, and seals are found in Hawaiian waters. Each year, thousands of Humpback whales (*Megaptera novaeangliae*) come to Hawaiian waters to mate, give birth, and nurse their calves. Hawaiʻi's humpback whale season runs from November through May, with January through March being the peak whale-watching months. Other common species include pilot and false killer whales, as well as bottlenose and spinner dolphins.

Hawaiian Monk Seals (*Neomonachus schauinslandi*) are among the most critically endangered mammals in the world and are endemic to the Hawaiian Islands. Only about 1,200 seals are alive today and most live in the Northwestern Hawaiian Islands. Hawaiian Monk Seals frequently haul out on shorelines to rest and molt. Female seals also haul-out on shore for up to seven weeks to give birth and nurse their pups.

Marine Mammals are protected under both the ESA and Marine Mammal Protection Act (MMPA). USACE evaluated effects to marine mammals pursuant to Section 7 of the ESA and the MMPA.

2.2.3 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 (16 United States Code [USC] § 1531 et seq.) established protection and conservation of threatened and endangered species and the ecosystems upon which they depend. Section 7 of the ESA requires all federal agencies to consult with USFWS and NMFS, as applicable, before initiating any action that may affect a listed species. The USACE defines the project ESA action area as the marine and terrestrial construction footprints and a 50-yard buffer surrounding these footprints wherein USACE has considered consequences of the Recommended Plan to listed species and their designated critical habitat.

ESA-listed species that are known to occur, or could reasonably be expected to occur in the ESA action area include the following:

- Green sea turtle (*Chelonia mydas*) Central North Pacific Distinct Population Segments (DPS) – Hawai‘i, threatened
- Hawksbill sea turtle (*Eretmochelys imbricate*), endangered
- Hawaiian monk seal (*Monachus schauinslandi*), endangered; and designated critical habitat
- Hawaiian Insular false killer whale (*Pseudorca crassidens*), endangered; and designated critical habitat
- Giant manta ray (*Manta birostris*), threatened
- Oceanic Whitetip shark (*Carcharhinus longimanus*), threatened

NMFS asserts jurisdiction over all the above marine ESA-listed species. USFWS asserts jurisdiction over the above listed sea turtles, when on land. The action area includes designated terrestrial and marine critical habitat for the Hawaiian Monk Seal and also provides suitable habitat for resting and haul out. In addition, the sandy beach provides suitable resting and haul out habitat for sea turtles. The marine portion of the ESA action area also includes marine critical habitat for the Hawaiian insular false killer whale. Green sea turtles are common in the nearshore waters in and around the harbor and fronting HBP.

2.2.4 Essential Fish Habitat

Essential Fish Habitat (EFH) consists of those habitats necessary for spawning, breeding, feeding, or growth to maturity of species managed by the Regional Fishery Management Councils, as described in a series of Fishery Management Plans, pursuant to the Act. The Magnuson-Stevens Fishery Conservation and Management

Act (MSA; 16 USC 1801 et seq.) requires federal agencies to consult with NMFS regarding any action that may adversely affect EFH.

The combined EFH for all federally managed fisheries in the Hawai‘i Archipelago and including the pelagic fishery is the water column from the surface to 1,000 m depth extending from the shoreline out 200 nautical miles, to the Exclusive Economic Zone, all bottom habitat from the shoreline to a depth of 400 m, and the outer reef slopes at depths between 400 m to 700 m, per the Hawai‘i Fishery Ecosystem Plans (FEP), Amendment 5 (Western Pacific Region Fishery Management Council, 2019). Fishery-specific EFH designations for the fisheries listed above are as follows:

Bottomfish Management Unit Species (MUS) EFH Designation

Amendment 5 retained the EFH designation described in Amendment 4 of the Hawai‘i FEP for Bottomfish and Crustaceans MUS in the Hawai‘i Archipelago. Accordingly, the EFH designation for non-deep and deep Bottomfish fishery species is:

Table 4. EFH Designation for Hawai‘i Bottomfish MUS

	Life Stage:			
	Egg	**Post-hatch pelagic**	**Post-settlement**	**Sub-Adult / Adult**
Non-Deep Bottomfish MUS	Water column from surface to 240m depth extending from the shoreline out 50 mi	Water column from surface to 240m depth extending from the shoreline to EEZ boundary	Water column from surface to 240m depth, including all bottom habitat, extending from the shoreline to 240m isobath	Water column from surface to 240m depth, including all bottom habitat, extending from the shoreline to 240m isobath
Deep Bottomfish MUS	Water column from surface to 400m depth extending from the shoreline out 50 mi	Water column from pelagic surface to 400m depth extending from the shoreline to EEZ boundary	Water column from 80 to 400m depth, including all bottom habitat, extending from the shoreline to 400m isobath	Water column from 80 to 400m depth, including all bottom habitat, extending from the shoreline to 400m isobath
Source: Hawai‘i FEP, Amendment 4 (Western Pacific Region Fishery Management Council, 2016)				

Crustaceans MUS EFH Designation

The EFH designation for Hawai‘i Crustaceans fishery species is:

Table 5. EFH Designation for Crustaceans MUS

	Life Stage:	
	Eggs and Larvae	**Juveniles/adults**
Crustaceans MUS	The water column from the shoreline to the outer limit of the EEZ down to a depth of 150m	All bottom habitat from the shoreline to a depth of 100m
Source: Hawai‘i FEP, Amendment 4 (Western Pacific Region Fishery Management Council, 2016)		

Pelagics MUS EFH Designation

The following EFH designation for Pelagics MUS has not changed since the publishing of the Pelagics FEP:

Table 6. EFH Designation for Pelagics MUS

	Life Stage:	
Pelagics MUS	**Eggs and Larvae**	**Juveniles/adults**
	The (epipelagic zone) water column down to a depth of 200 m extending from the shoreline to the outer limit of the EEZ	The water column to 1,000m depth extending from shoreline to outer limit of the EEZ
Source: Pelagic FEP (Western Pacific Region Fishery Management Council, 2009)		

Based on the depth and distances from shore, EFH for the fisheries listed above is designated, at least in part, across USACE's EFH review area for the proposed action. There is no designated Habitat Area of Particular Concern in or near the project area for any of the federally managed fishery species. Based on the NOAA Office of Coast Survey reported Maritime Limits and Boundaries, the approximate area of cumulative EFH designations for the Hawaiʻi Archipelago and Pelagic Fishery, from the shoreline to the EEZ, measures over 16 million acres of the Pacific Ocean.

MUS

USACE reviewed the Western Pacific Fishery Management Council (Council) FEP for the Hawaiʻi Archipelago (2009; Amendment 4, 2016; Amendment 5, 2019) and for Pelagics (2009) for the EFH designations for currently federally managed fishery species. Fisheries may comprise a group or complex of species. These fishery species are collectively referred to as MUS. Stocks that have been identified as "MUS" or "stocks in the fishery" by the Council are stocks that are in need of conservation and management. EFH is currently designated within the project area for the following federally managed MUS.

Hawaiʻi Bottomfish MUS

Per Amendment 5 to the Hawaiʻi FEP, there are 7 deep bottomfish species and one non-deep bottomfish MUS. Table 7 identifies relevant species in the Bottomfish MUS within the review area.

Table 7. Hawaiʻi Bottomfish MUS

Scientific name	Common name	Depth Range
Aprion virescens	gray jobfish	0-240m (non-deep)
Hyporthodus quernus	sea bass	0-360m
Aphareus rutilans	silver jaw jobfish	40-360m
Etelis carbunculus	squirrelfish snapper	80-520m
Etelis coruscans	longtail snapper	80-480m
Pristipomoides filamentosus	pink snapper	40-400m
Pristipomoides seiboldii	pink snapper	40-360m
Pristipomoides zonatus	snapper	40-360m

Hawaiʻi Crustaceans MUS

Per Amendment 5, the Crustacean Fishery species consists of two crustacean species: deepwater shrimp, *Heterocarpus* spp. and Kona crab, *Ranina ranina*. However, deepwater shrimp occur in waters deeper than the depths of the review area and are not considered in this assessment. Per Amendment 5 to the Hawaiʻi FEP, Table 8 identifies species of the Hawaiʻi crustacean MUS within the review area.

Table 8. Hawaiʻi Crustaceans MUS

Scientific name	English common name
Ranina ranina	Kona crab

Pelagics MUS

Per the Pelagics FEP, Table 9 identifies species of the Pelagics fishery MUS in the review area.

Table 9. Pelagic MUS

Scientific name	Common name		Scientific name	Common name
TUNAS			**BILLFISHES**	
*Thunnus alalunga**	albacore		*Tetrapturus audax**	striped marlin
*T. obesus**	bigeye tuna		*T. angustirostris*	shortbill spearfish
*T. albacares**	yellowfin tuna		*Xiphias gladius**	swordfish
T. thynnus	northern bluefin tuna		*Istiophorus platypterus*	sailfish
*Katsuwonus pelamis**	skipjack tuna		*Makaira mazara**	blue marlin
Euthynnus affinis	kawakawa		*M. indica*	black marlin
Auxis spp. *Scomber* spp. *Allothunus* spp.	other tuna relatives			
SHARKS			**OTHER PELAGICS**	
Alopias pelagicus	pelagic thresher shark		*Coryphaena* spp.	mahimahi (dolphinfish)
A. superciliousus	bigeye thresher shark		*Lampris* spp.	moonfish
A. vulpinus	common thresher shark		*Acanthocybium solandri*	wahoo
Carcharhinus falciformis	silky shark		*Gempylidae*	oilfish family
C. longimanus	oceanic whitetip shark		*Bramidae*	pomfret family
*Prionace glauca**	blue shark		*Ommastrephes bartamii*	neon flying squid
Isurus oxyrinchus	shortfin mako shark		*Thysanoteuthis rhombus*	diamondback squid
I. paucus	longfin mako shark		*Sthenoteuthis oualaniensis*	purple flying squid
Lamna ditropis	salmon shark			
Source: Pelagics FEP (Western Pacific Region Fishery Management Council, 2009)				

2.2.5 Vegetation

Vegetation in the study area is limited as the cover type is primarily beach habitat, previously dredged areas, high wave energy near-shore areas, and deep-water areas. There is no marine submerged aquatic vegetation in the study area.

2.2.6 Birds

In addition to common bird species in Hawai'i lowlands including mynah birds, pigeons, zebra dove and cattle egret, less common seabirds that may occur within the study area include Brown Booby (*Sula leucogaster*) and the Laysan Albatross (*Phopebastria immutabalis)* are listed as Birds of Conservation concern and may be present in the project area. Brown Booby are found in tropical oceans including those around Hawaiʻi. Laysan albatross are pelagic birds of the open Pacific Ocean. Breeding populations of Laysan albatross are found on Oʻahu.

2.3 Social and Economic Resources

2.3.1 Land Use

All land in the State is divided into four state district boundaries: urban, rural, agricultural, and conservation. According to the Hawaiʻi Data Book, there is an approximate total of 4,112,388 acres of land in the State of Hawaiʻi, of which about 48 percent is designated as conservation, 47 percent is designated as agricultural, 5 percent is designated as urban, and less than 0.5 percent is designated as rural. The entirety of the land features within the project footprint is zoned urban. There is no land use district designated for ocean waters below the high tide line. Adjacent properties to HBP are zoned as Agricultural. HBP consists of a parking lot, comfort stations, and a sandy, eroded beach.

For reference, land management plans that cover the HBSPP, HSBH, and HBP areas include:

- City and County of Honolulu, Department of Planning and Permitting. 2021. Oʻahu General Plan. Adopted by the City Council on 1 December 2021 as Resolution 21-023, CD1, and signed by the Mayor on 14 January 2022.
- City and County of Honolulu, Department of Planning and Permitting. 2011. North Shore Sustainable Communities Plan (NSSCP). Currently under revision with anticipated publication in 2022.
- DLNR, DOBOR. Haleʻiwa Ocean Recreation Management Area.
- Revised Ordinances of Honolulu. Section 21-9.90 Haleʻiwa Special District.
- Sea Engineering, Inc. 2019. Concept Designs for Selected Beach Parks. Volume 1 Haleʻiwa Beach Park. Prepared for City and County of Honolulu.
- USACE). Hawaiʻi RSM-TN: Advance Planning for the Beneficial Reuse of Dredged Material at Haleʻiwa Harbor, Island of Oʻahu, Hawaiʻi.
- USACE. 2014. Potential Regional Sediment Management Projects in the Haleʻiwa Region, Oʻahu, Hawaiʻi. May 2014. U.S. Army Corps of Engineers. ERDC/CHL-CHETN-XIV-37.
- USACE. 2014. Regional Sediment Budgets for the Haleʻiwa Region, Oʻahu, Hawaiʻi. June 2014. ERDC/CHL-CHETN-XIV-38.

2.3.1 Haleʻiwa Small Boat Harbor

HSBH offers amenities to boaters as well as many recreation opportunities including sport fishing, sailing, whale watching, and shark cage encounters. It has 64 berths and 26 moorings.

Estimation of Harbor Shoaling

Historic dredging requirements and survey data were used to estimate shoaling rates in anticipation of future dredging (Table 10). Shoaling rates are calculated as the shoaled volume divided by the years of accumulation. Between the dredging events of 1999 and 2009, approximately 4,556 cy of material shoaled into the federal channel. This equates to an average shoaling rate of 455 cy/yr over this period. The high shoaling rate between 1999 and 2009 suggests that the harbor may fill-in episodically, such as during storm events, rather than steadily over many years. In addition, high shoaling between 1999-2009 could be due to the initiation of sand moving around the breakwater spur due to high wave events. Comparatively, recent hydro surveys in 2011, 2014, and 2018, suggest the shoaling rate to be less, at approximately 177 cy/yr. Based on this range of shoaling rates (155 to 455 cy/yr), 238 cy/yr was used as an estimate of future shoaling, for the purposes of cost estimating and design volume calculations.

The next anticipated dredging year is 2024. By this time, approximately 4,433 cy of material may need to be dredged; this is based on the average estimated shoaling rate of 238 cy/yr and an additional 1,100 cy to account for overdepths and infilling from side-slopes. The 2009 dredging indicated that the outer material is mostly sand, inner material is mostly silt, and middle material is a mixture of sand and silt. If the harbor needs to be dredged every ten to 15 years, over the next 20 years (2020 to 2040), the harbor will be dredged twice with a total dredged volume of approximately 5,000 cy.

Table 10. Shoaling Volume and Rate

Year	Type of Work	Shoaling Volume (cy)	Shoaling Rate (cy/yr)*
1999	Maintenance dredging	7,214	219
2009	Maintenance dredging	4,556	455
2011	Hydrosurvey	311	155
2014	Hydrosurvey	800	160
2018	Hydrosurvey	1,600	200
**Equal to shoaled volume/yr since last dredging*			

2.3.2 Haleʻiwa Beach Park

HBP is a 15.7- ac park located in the town of Haleʻiwa. It is adjacent to 2,500 ft of beach shoreline between HSBH and Puaʻena Point. The backshore facilities at HBP are protected by a 550 ft of vertical wall, and include a comfort station, World War II monument, pavilion, promenade, and a playground. A 160 ft long rubble mound breakwater, part of the HBSPP (discussed in Section 1.3.2) is located offshore of the wall.

The northern portion of the park has experienced significant erosion and the vertical wall has become undermined, leading to sinkhole formation on the landward side (Figure 15 and 16). The wall and sink holes were repaired; however, the risks of undermining and collapse remain. The erosion greatly reduced the recreation value of the beach (Figure 16). A report by Sea Engineering, Inc. (2019) gave Haleʻiwa Beach a High Erosion Hazard Priority Rating, compared with other beaches of Oʻahu. An analysis of shoreline change rates indicated the maximum long-term erosion rate to -4.3 +- 2.6 ft/yr at Haleʻiwa Beach (USACE, 2014). Utilizing a conversion factor of 0.4 cy per square foot (cy/sq ft) of shoreline change, the volume change rate for Haleʻiwa Beach is 980 cy/yr.

Southern Groin

The southern part of Haleʻiwa Beach abuts a rock rubble mound groin that separates the beach park from the outflows of Loko Ea wetland and Anahulu Stream. This profile groin has a crest elevation of 12 ft MLLW near Kamehameha Highway and follows the profile of the topography seaward a distance of approximately 500 ft to its offshore end, which has an elevation of +3.5 ft MLLW. The groin is considered to be in good condition; however, sand passes through it in the swash zone. It should also be noted that the nearshore bottom of the beach toe is muddy in the southern portion of the park.

Beach and Nearshore
The beach is widest adjacent to the groin, where the park is approximately 250 ft wide. The backshore is sandy and sparsely vegetated. This area is frequented by beachgoers and paddlers because it provides easy access to the water. There are no signs of erosion in this area.

The beach and park become narrower toward the north, with the narrowest part of the park being just south of a World War II monument. Erosion scarps are present in the vicinity of this monument. The root balls of palm trees are also exposed due to erosion on the upper beach in this area. Fossil reef is found beyond the beach toe, with little sand offshore. HBP widens north of the monument and opens up to a grassy backshore with shade trees, basketball and volleyball courts, soccer fields, playground facilities, a pavilion, comfort stations, and shower facilities.

Figure 15. Erosion Near WWII Monument Circa 2019 (Sea Engineering, 2019)

Figure 16. Beach in Front of Seawall and Comfort Station
Note exposed reef rock and root balls. Photo from 2017 (Sea Engineering, 2019)

The backshore in this area is separated from the shoreline by a vertical wall that was built in the 1950s. The vertical wall extends along approximately 550 ft of shoreline. Severe loss of sand fronting the wall resulted in its undermining. The wall shows signs of settling, spalling, and cracking with sinkholes directly behind it. Repairs to this wall were completed in 2019. However, continued wave action and scour of beach sand will likely cause additional damage to this wall in the future.

Offshore Breakwater
A rock rubble mound breakwater was constructed offshore to stabilize the shoreline as part of harbor development. The breakwater is approximately 160 ft long and is situated about 210 ft offshore of the seawall. The elevation of the breakwater crest is approximately +5.0 ft MLLW. Historic photos indicate a wide historic beach was present behind this breakwater that was nourished multiple times through 1974. At present, little or no sand beach is fronting the seawall in this area, and sharp slippery reef rock is exposed (Figure 6).

Northern Shoreline
The shoreline north of the seawall is sandy and has a curved (crenulate) shape for approximately 150 ft, because of diffraction around a small rocky headland. That shoreline reach contains an erosion scarp at the top of the beach. After turning toward Pua‘ena Point, the shoreline is composed of limestone outcrops.

Recreation

The North Shore of Oʻahu, from Kaʻena Point to Kahuku Point, is famous for the huge waves from strong Pacific Northern swells during the winter months and includes the area known as the "7-mile miracle" for the numerous world-class big wave surf breaks between Haleʻiwa and Sunset Beach. The north shore beaches host world championship surf contests in the winter and are among the most popular recreation sites for visitors and Oʻahu residents. The area generally has flat and wide beaches in the summer with relatively calm waters. In the winters, beaches are steeper and narrower. However, shoreline change is highly variable along the shoreline with some areas accreting sand in winter months and eroding in summer months with shifts in predominant wave direction.

The primary recreational activities at HBP include surfing, swimming, paddle boarding, sea turtle watching, and other general beach activities. Many of the beaches along the North Shore provide similar recreational activities to HBP, two examples are Mokuleʻia Beach to the west of Haleʻiwa and Kawela Bay Beach Park to the east. In the with-project condition, HBP would have greater capacity to allow for more visitors to visit the park at the same time and would provide better environmental quality for the sea turtles, thus improving the experience of those there to watch the sea turtles. In the without project condition, the reduced capacity at HBP would reduce the total number of visitors in attendance at one time and overall, which could lead to many choosing to visit alternative sites. This could put these alternate sites at or over capacity, particularly during peak seasons, diminishing the recreational value of visits or leaving some visitors unable to recreate there at all and be forced to seek out non-beach related activities. The without project condition also does not improve the environmental quality of HBP; so, visitors who wish to watch the sea turtles may have a less satisfactory experience as a result.

2.3.3 Demographics

Haleʻiwa is a community and census-designated place in the Waialua District of the island of Oʻahu, City and County of Honolulu. Based on data from the 2020 American Communities Survey, the population of this census-designated place is 4,589. Less than one-fifth of residents (16.2%) are under age 16. The demographic makeup of the population is primarily White (33%), followed by multi-racial (21.6%), Asian (24.4%), Hispanic or Latino (12.1%), and Native Hawaiian or Other Pacific Islander (6.9%). The most common racial or ethnic group living below the poverty line is multi-racial groups, followed by White, Native Hawaiian or Other Pacific Islander, and Hispanic or Latino.

2.3.4 Socioeconomic Resources and Environmental Justice

EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", requires federal agencies to identify and address any disproportionately high and adverse human health effects of its programs and activities on minority and low-income populations. The study area does not have specific populations of disproportionately low income or minority populations identified within its boundaries, because the resident population in the study area is 0. Accordingly, our evaluation of impacts to minorities and low-income populations was expanded to the Town of Haleʻiwa to be more representative of potential impacts.

In 2019, median household income in Honolulu County is $85,857, slightly higher than the median income for the entire U.S. ($65,712). Approximately 8 percent of the population live below the poverty line, a number that is lower than the national average of 13.4 percent. The largest demographic living in poverty are Females aged 25 to 34.

In 2017, employment in Haleʻiwa, Hawaiʻi grew at a rate of 9.96 percent from 1,580 to 1,730 employees. The most common job groups are office and administrative support, management, construction and extraction occupations, and sales. Compared to other places, Haleʻiwa has a high number of residents working in farming, fishing, and forestry, and life, physical, and social science occupations.

According to the EPA Environmental Justice Screening and Mapping Tool (https://ejscreen.epa.gov/mapper/), the resident population of historic Haleʻiwa Town is 68 percent people of color, low in comparison to the rest of Hawaiʻi but high for the U.S., and 20 percent low income, high in comparison to the rest of Hawaiʻi but low for the U.S. (Table 11).

Table 11: EJSCREEN Percentiles for the Town of Haleʻiwa

Indicator	% of Haleʻiwa's Population	Percentile in Hawaiʻi	Percentile in US
People of Color	68	25	76
Low Income	20	54	36

According to the CEQ Climate & Economic Justice Screening Tool online, the study area is divided into two separate census tracts, 15003010000 to the north and 15003009902 to the south. Neither tract that encompass the study area are identified as an economically-disadvantaged community (Figure 17).

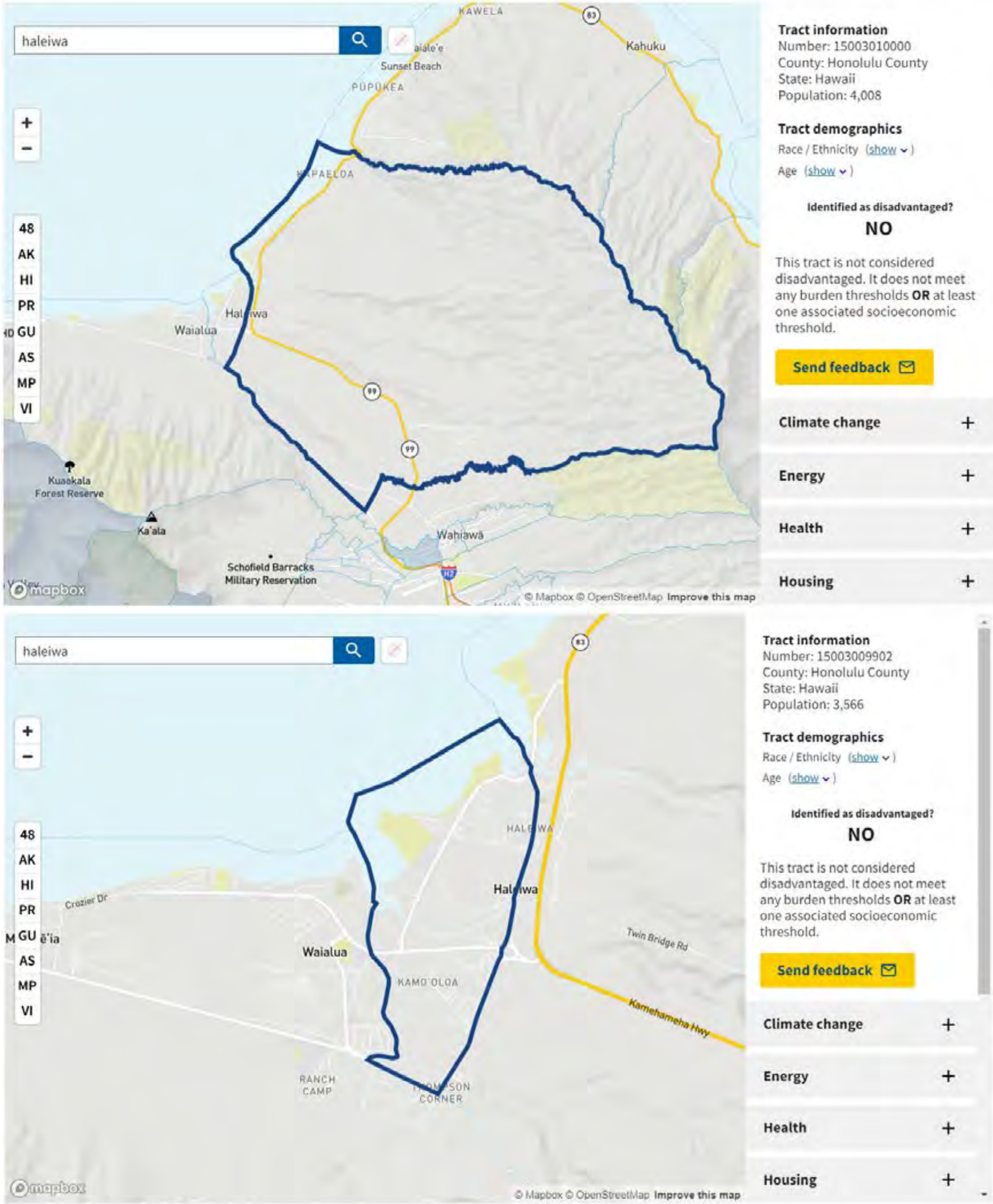

Figure 17 CEQ Climate & Economic Justice Screening Tool online results for the study area (screeningtool.geoplatform.gov)

2.3.5 Aesthetic Quality

Visual resources are defined as the natural and manufactured features that comprise the aesthetic qualities of an area. These features form the overall impressions that an observer receives of an area or its landscape character. Landforms, water surfaces, vegetation, and manufactured features are considered characteristic of an area if they are inherent to the structure and function of a landscape.

The greater study area and proximal surroundings are moderately urbanized and includes both residential and public lands. Areas to the immediate North and East of the study area consist of agricultural lands that provide a natural aesthetic. Development increases with proximity to the town of Hale‘iwa to the immediate South. The visual aesthetics of HBP are of high quality due to the scenic, ocean front setting and is a major draw for both tourists and residents for recreational use. Some of the many visual resources that comprise the landscape within the study area include the North O‘ahu segment of the Hawaiian Islands Humpback Whale National Marine Sanctuary to the northeast, the surrounding agricultural land use district, the historic recreational structures of HBP, the historic Rainbow Bridge over the Anahulu River, the Historic Hale‘iwa Town, the HBSPP and HSBH in Waialua Bay, the historic Loko Ea fishpond, the historic Waialua Sugar Mill Mount Ka‘ala and the Wai‘anae Mountain Range and the Anahulu River.

2.3.6 Noise

Noise, or unwanted sound in the study area is mainly generated by human activity, including vehicular traffic and agriculture with some recreational-related noise. Noise generation is most active during daylight hours and relatively subsides at night.

2.3.7 Hazardous, Toxic, and Radioactive Waste (HTRW)

To complete the Phase I hazardous, toxic, and radioactive waste (HTRW) survey, USACE reviewed existing environmental documentation and environmental regulatory databases. USACE contacted the DLNR and DOH’s Clean Water Branch and Office of Environmental Quality Control to obtain information about property history, environmental conditions, and any HTRW incidents, violations, or permit actions that may have occurred within the areas encompassing the final array of alternatives.

The Corps searched all publicly available Federal, state, and local agency environmental records and regulatory databases to identify the existence of any license or permit actions, violations, enforcements, and/or litigation against property owners, and to obtain general information about potential past incidents of HTRW releases. Results of the database searches include:

- No EPA National Priority List or Superfund sites are within a one-mile radius of the project alternative areas
- No Comprehensive Environmental Response, Compensation, and Liability Information System site is located within a 0.5-mile radius of the project alternative areas
- No Resource Conservation and Recovery Information System treatment, storage, or disposal facility is located within a 0.5-mile radius from the project alternative areas
- No Resource Conservation and Recovery Act Corrective Action Reports were identified within a one-mile radius of the project alternative areas
- No RCRA generators are located within the project alternative areas or adjacent properties
- One underground storage tank is located within a 0.25-mile radius of the project alternative areas

- No leaking underground storage tanks are located within a one-mile radius of the project alternative areas
- No active landfills are located within a 0.5-mile radius of the project alternative areas

Based on a review of publicly available information, there is no identified HTRW or sources of HTRW in the study area; accordingly, Corps does not anticipate HTRW within the study area.

HBP is a recreational area with low impact adjacent land uses (parkland, undeveloped); therefore, it is considered unlikely that any HTRW is present. The offshore sand borrow area deposit is an open water marine environment and is also considered unlikely to have any HTRW present. The proposed state breakwater settling basin is adjacent to the navigation channel and is considered to have chemical characteristics consistent with that of the navigation channel.

Prior sediment analysis of dredged material in HSBH is provided at Section 2.1.6.2. In summary, no HTRW has been identified in harbor sediments.

2.3.8 Historical and Archeological Resources

USACE defined the Area of Potential Effects (APE) of the study area to encompass both the terrestrial and marine portions of the undertaking. The terrestrial portion of the APE encompasses portions of HSBH (TMK 1-6-2-001:002 por.) and HBP (1-6-2-003:011 por.), located near the mouth of the Anahulu River and includes the 3.46-acre shoreline area fronting HBP, as well as two equipment staging areas: 1) a 1.0 acre area at HBP, and 2) a .21 acre area at HSBH. The total terrestrial APE thus encompasses 4.67 acres. The marine portion of the APE includes the total 4.55 acre area covered by the dredging activities, which include: 1) a 0.3 acre settling basin at HSBH, 2) a 2.0-acre portion of the federal entrance channel, 3) a 0.55 acre scow access area adjacent to the HBP southern groin, and 4) a 1.7-acre offshore sand deposit located 3,400 ft northwest of HBP. The barge activity area (i.e., shifting it to the north side of the groin) was redesigned so that the APE no longer includes Loko Ea, based on consultation with Malama Loko Ea Foundation.

Research was conducted at the SHPD library to determine the presence or absence of potential historic properties within or adjacent to the project area. Additionally, publicly available aerial photographs were examined to determine the potential for marine historic resources. One technical report was found that covers a portion of the direct APE, and two reports associated with work on nearby parcels had extensive background archaeology sections that provide regional context (O'Hare et. al., 2012 and Robins and Desilets, 2014). Based on a review of existing literary resources, the APE is absent of historic properties listed on either the National or State Registers of Historic Places. The discussion below describes historic properties that are present in the area surrounding the APE.

Current and recent historic aerial photographs available on Google Earth provide reasonably good visibility for the relatively shallow areas proposed for dredging. Special attention was given to the off-shore locale, since it is assumed that the routinely dredged HSBH channel is unlikely to contain marine historic properties. Aerial photos indicate clearly that the offshore dredge area consists entirely of sand deposits with no indication of anomalous features. Furthermore, the few literary resources available regarding shipwrecks in Hawaiʻi indicates no known historical wrecks within or near the project area (Rogers 1999, Van Tilburg 2003, Wikipedia Category: Shipwrecks of_ Hawaiʻi , Dec 2020). Background research indicates that no traditional Hawaiian historic properties are known to exist within the terrestrial portion of the project area. Portions of HBP were surveyed in 2003 and 2004 by Borthwick.

Furthermore, no Land Claim Awards are present in or near the project area. However, the region is archaeologically active, and several known cultural sites are nearby. There are two important cultural locales north of HBP, which include McAllister's Site 234 (Kahakakau Kanaka) and Site 235 (Curative Stone).

Hawaiian fishponds are unique and advanced forms of aquaculture found nowhere else in the world. The techniques of herding or trapping adult fish with rocks in shallow tidal areas is found elsewhere in the world but the loko iʻa kuapā or walled coastal ponds are unique to Hawaiʻi. East of HBP is Loko Ea Fishpond (Site 233), known to contain subsurface deposits along its perimeter. Loko Ea Fishpond is currently comprised of both original and reconstructed structural elements (e.g., walls and gates) and is actively managed by Malama Loko Ea Foundation for cultural and educational purposes. Loko Ea Fishpond is quite large, and only the westernmost perimeter of the fishpond is pertinent to the present undertaking. The project delivery team (PDT) coordinated with the Malama Loko Ea Foundation to address concerns regarding the effects on the Loko Ea Fishpond.

Loʻi deposits (State Inventory of Historic Places (SIHP) 50-80-04-7152) have been recorded just south of HSBH, apparently associated with a cluster of former Land Claim Award parcels. A potential pre-Contact cultural layer (SIHP 50-80-04-5916) was also recorded in this general area. Finally, Hawaiian skeletal remains (SIHP 50-10-04-7561) were recovered from the area of the former Haleʻiwa Hotel (current Haleʻiwa Joe's), adjacent to HSBH. Thus, the evidence indicates that although no traditional Hawaiian historic properties are known to exist in the area, there is a relatively high potential for such properties to exist in the general area in the form of subsurface deposits, to include traditional human burials.

For the portion of the project area along the immediate shoreline, it is important to note that this strand often consists of exposed beach-rock (limestone or sandstone). It is alternately exposed and re-covered with sand on an annual or semi-annual basis, weather depending. Historically, the sandy shoreline extended farther towards the sea than the current shoreline and the historical trend thus appears to be retrograde.

Architecturally speaking, the recreation support structures (e.g., comfort station) at HBP are contributing properties within a discontinuous "Art Deco Parks" historic district established on 9 June 1988 (SIHP No. 50-80-04-1388). Other properties within the discontinuous historic district include Ala Wai Park Clubhouse, Ala Moana Beach Park, Mother Waldron Playground, and Kawananakoa Playground. Importantly, the aforementioned architectural features of the Art Deco Parks historic district are not located within the APE and will not be affected by the work performed.

3.0 PLAN FORMULATION

This chapter provides information on the purpose and need for the proposed federal action and establishes that there is federal interest in taking part in this cost-shared project with the NFS.

3.1 Purpose and Need

The purpose of the pilot project is to place beach quality material from the USACE maintenance dredging of HSBH at the HBSPP to provide coastal storm damage reduction to upland infrastructure and provide recreational benefits to an area used heavily by the general public throughout the year.

This project is needed to restore the beach that is part of the federally authorized HBSPP to its original extent. This beach is part of a federal project, which provides a variety of benefits and services. Erosion of the beach has resulted in storm and wave driven erosion, impacting the beach and facilities of HBP. Beach erosion exposed existing infrastructure and facilities to potential damages from storms and scour. The existing seawall, which protects a comfort station and other park amenities, was undermined so severely that it needed to be rehabilitated by the local municipality in 2019 at a cost of approximately $2 million (Figure 18). Even with these repairs, damage to the seawall will likely continue because the beach and entire littoral cell is chronically eroding, and with SLR conditions will likely worsen. In addition, erosion of the beach resulted in decreases to the recreation uses of this beach. For example, over the last year beach widths have narrowed substantially in the central and northern portions of HBP making walking challenging during high tides.

The project is also needed to identify opportunities for BUDM taken from the HSBH. Dredging of the material in the federal channel is necessary for the O&M of the GNF in the harbor. The BUDM will help to counteract the impacts of erosion, protect the existing facilities and infrastructure, creating ancillary ecological opportunities, and improve recreational uses of HBP.

3.2 Problems

The following statements identify the key problems affecting the study area:

- The northern portion of the beach at the HBSPP is experiencing significant erosion that reduced its area from the original extent of the federally authorized HBSPP project.
- Without restoration of the federally authorized shore protection project, facilities, and infrastructure at HBP including the comfort station and historic monument are at risk of undermining and damage from storm events.
- Beach erosion at HBP impacted the suitability and availability of habitat for aquatic life.
- The availability of beach suitable material limits nourishment opportunities to maintain original design of HBSPP.
- The natural process of material transport is disrupted by constructed features of HSBH, causing shoaling and buildup of material, leading to increased maintenance costs.

Figure 18: Hale‘iwa Beach Park Erosion

3.3 Opportunities and Constraints

Opportunities are instances in which the implementation of a plan has the potential to positively address an issue or impact a resource. Constraints are restrictions that limit the planning process over and above those instituted specifically by laws, policies, and guidance.

3.3.1 Opportunities

The following are the identified opportunities over the 50-year period of analysis:

- Reduce coastal storm damages at Hale‘iwa Beach and HBP
- Restore habitat for aquatic life at Hale‘iwa Beach
- Enhance the value of recreational opportunities at Hale‘iwa Beach and HBP
- Expand beneficial use capabilities by dredging areas outside of the navigation channel
- Provide protection to culturally and historically significant structures including the comfort station and the World War II Memorial
- Partner with state, county, and local partners to carryout projects that beneficially use dredged materials

3.3.2 Constraints (Factors to avoid)

The following are the identified constraints:

- Borrow areas are constrained to those areas within the vicinity of Hale‘iwa Beach where material has similar characteristics for suitable placement on the Beach.

- Additional activities other than transportation and placement of dredged material shall be shared in accordance with the cost-sharing requirements of Section 204, WRDA of 1992, as amended.
- Material should not be placed in such a fashion as to create coastal storm damage measures such as dunes.
- Dredged material must be of suitable textural and chemical characteristics to be used for beach placement, in accordance with state law.

3.4 Objectives

Objectives identify planning outcomes that define a successful resolution of the problems and attainment of the opportunities listed in sections 4.2 and 4.3.1 respectively.

3.4.1 Federal Planning Objectives

The federal objective of water and related land resources planning is to contribute to NED consistent with protecting the nation’s environment, in accordance with national environmental statutes, applicable executive orders (EOs), and other federal planning requirements. The federal objective may be considered more of a national goal. Water and related land resources project plans shall be formulated to alleviate problems and take advantage of opportunities in ways that contribute to the study planning objectives and, consequently, to the federal objective. Contributions to NED outputs and increases in the net value of the national output of goods and services, expressed in monetary units, and are the direct net benefits that accrue in the planning area. Per WRDA 2016 Sec 1122 (b)(3), as amended, projects will be selected solely based upon: (a) the environmental, economic and social benefits of the projects, both non-monetary and monetary, and (b) the need for a diversity of project types and geographical project locations.

3.4.2 Specific Planning Objectives

The study-specific planning objectives are those that are specific to the problems and opportunities that exist within the study area. The study-specific planning objectives over the 50-year period of analysis, from 2021 to 2071 consist of the following:

- Evaluate the beneficial use of dredged material from HSBH to reduce the risk of coastal storm damage to existing public infrastructure and structures of HBP over the 50-year period of analysis.

3.5 Future Without Project Condition

The future without project condition would consist of continued operation and maintenance of the HSBH that consists of upland disposal. This future without- project conditions is the benchmark which alternative plans are evaluated against and are equivalent to the combined effects described in the No Action and O&M Base Plan Alternatives (Section 4.1.1 and 4.1.2, respectively). The period of analysis for this project is 50 years, from 2021 to 2071.

3.5.1 Navigation

Without the federal project for BUDM, the maintenance dredging for the federal GNF would be disposed of at the South O‘ahu ODMDS per the Base Plan established in the 2018 DMMP Preliminary Assessment. Material determined to be unsuitable of ocean disposal would be disposed of at an approved upland disposal site. (See description of the O&M Base Plan at Section 4.1.2). The beach suitable material would not be placed at HBSPP and the federally authorized project at HBSPP would remain unimproved. The navigation channel will accumulate sediment at an average rate of 238 cy/yr based on historical dredging records and hydrographic surveys. By 2024, it is anticipated that approximately 4,433 cy of shoaling will need to be dredged from the navigation channel to achieve design depths.

3.5.2 Hale‘iwa Beach Park

Under the Future Without Project Condition, HBP would continue to lose an average of 976 cy of beach volume due to erosion each year based on historical shoreline change and numerical modeling. This will continually reduce the recreational uses of HBP. The City and County of Honolulu will likely need to continue to repair damage that occurs to the seawall, comfort station, and monument. Recreational uses of parts of the beach will continue to be impacted as scour and sand loss expose reef rock.

When potential for future SLC is considered, the rate of erosion along Hale'iwa Beach (either with or without the project) will likely increase due to the inability of much of the shoreline to shift landward to reach an equilibrium with higher water levels. This is due to the backshore development such as the comfort station, parking areas, and highway, that are unlikely to be relocated or removed in the near future; as well as the lack of a backshore dune to allow natural landward migration of the shoreline and provide additional sediment to the shoreline under rising sea levels. The ability for larger waves to reach the shoreline under higher sea levels could also lead to greater erosion of the sand along the shoreline, under both the with and without project conditions. With only 1.0 foot of additional SLR (in approximately 2040 under the high scenario), overtopping of the existing backshore near the groin could begin to occur on an average annual basis. These impacts are not anticipated to threaten public health or life safety.

3.5.3 Biological Environment

As a result of continued beach erosion, the extent of beach habitat that could support sea turtles, Hawaiian Monk Seals, migratory shorebirds, and other aquatic life will continue to be limited over the next fifty years.

3.6 Formulation of Measures

A management measure is a feature or activity that can be implemented to address either single or multiple planning objectives. Measures are combined to form project alternatives. ER 1105-2-100-E-15 (d) states that “all dredged material management studies include an assessment of potential beneficial uses for environmental purposes including fish and wildlife habitat creation, ecosystem restoration and enhancement and/or hurricane and storm damage reduction.” The following measures were considered as part of plan formulation for this project.

3.6.1 Dredging, Transport, and Placement Methods

Preliminary analysis after consideration of 33 CFR 335.1 et seq, as well as EM 1110-2-5025, evaluated three of five transportation methods: truck haul, hydraulic pipeline, and barge (scow); rail haul and belt conveyor were not analyzed because they are not feasible measures in this project area. Table 5-4 of EM 1110-2-5025 outlines the steps utilized to identify the transport route. Dredged material transportation involves three major operations in transportation of dredged material - loading, transportation and unloading. Costs associated with these operations include site improvements. Examples of site improvements and access improvements are provided in chapter 4.10 of EM 1110-2-5025, and additional improvements specific to barge haul in chapter 5.9.2.3.

- **Hydraulic dredging** – This method of dredging would be an efficient way to dredge and transport material from the dredging locations (using a suction dredge and pipeline) to the placement locations in a sand/water slurry, without having to load the material onto trucks or barges.
- **Mechanical dredging –** This method of dredging is the typical method used for the navigation channel. It would require using a crane and clamshell or hydraulic excavator to dig the dredged material, and then barging and/or trucking the material to the placement location. A crane may be necessary to place the material at the placement location if barging is used.
- **Truck Hauling –** This method of dredged material transportation would involve loading dredged material onto trucks in HSBH for transport to HBSPP. In the event dredged material from HSBH is determined unsuitable for ocean disposal and requires upland disposal, truck hauling is the most efficient means of transport for upland disposal form HSBH to an approved upland disposal site.
- **Barge Haul via Scow –** This is the existing transportation means identified in the Base Plan to facilitate ocean disposal of dredged material suitable for ocean disposal at the South O‘ahu ODMDS. For beach nourishment purposes under Section 1122, this transportation means requires site access improvements (i.e., a barge access zone) and those costs are accounted for in project costs for economic evaluation. The navigational depth requirement is -10 MLLW for the barge to effectively place the material at the site without re-handling. The existing condition is approximately -3 MLLW. Consideration was given to light loading, and actively loading and unloading at high tide; however, it is more efficient and, therefore, more cost effective to make the site access improvements for the scow.

3.6.2 Beneficial Uses of Dredged Material

- **Beach Nourishment of HBSPP -** For this option, clean, sandy material would be placed on Hale‘iwa Beach in the area of greatest erosion, which is immediately in front of the seawall by the comfort station. Typical sand placement methods involve a single, concentrated placement site on the beach using a dump truck or large excavator. Smaller machinery (e.g., bobcat, small bulldozer, front-end loader, etc.) is staged atop the placement pile and is used to push the material from the placement pile further out into the water, as it progresses down the shoreline, to prevent use of heavy machinery in the marine environment. No in-water staging is necessary. A bulldozer will be used to grade the placed sand to a stable beach profile. Placement of this material would restore aquatic habitat as well as ecologically related beach habitat. Suitable sandy dredged material could be used to restore the HBSPP to provide a variety of benefits**.** The benefits would be in the form of improved habitat for sea turtles and Hawaiian Monk Seals, rehabilitation of recreational uses of the beach, and include improved protection of facilities from wave and storm damage. Only beach grade sand would be suitable for nourishment.

- **Wetland Habitat Creation –**Dredged material could be used to create and restore wetlands and other aquatic habitat in the vicinity of the project area. The dredged material would need to be placed in a suitable low energy environment or protected with an engineered structure to create conditions suitable for the establishment of aquatic and emergent vegetation.

3.6.3 Other Dredged Material Placement Options

- **Stockpiling -** Dredged material could be stockpiled at HBSPP. This material would be turned over to the City & County of Honolulu, which is responsible for the maintenance of the HBP and is interested in using the sand to address the erosion problem around the comfort station. This could be accomplished by working with the state to nourish the beach fronting the structures (using a combination of offshore sand and dredged material). For this option, the City & County of Honolulu would be responsible for all necessary environmental requirements related to the final placement of this material such as Hawai‘i Revised Statutes, Chapter 343 and demonstrating compliance with all applicable federal, state and county law and regulations.
- **Upland Placement -** Historically, dredged material from HSBH was moved to upland placement locations. PVT Landfill located in west O‘ahu is a potential location for upland placement. This landfill is active, permitted and the only landfill on O‘ahu that accepts construction and demolition material, including sediment. The dredged material could be used to cap sections of the landfill. The distance to the landfill is approximately 35 miles from the project site. This is a viable option, but does not achieve beneficial use goals; however, it is a viable option for any portion of the dredged material from HSBH that does not meet the requirements for beach nourishment or ocean disposal. Based on a cost estimate conducted in accordance with the development of the DMMP Preliminary Assessment, upland disposal costs at least three times more per cubic yard than ocean disposal (Appendix F).
- **South O‘ahu ODMDS -** Dredged material that does not meet State physical and chemical requirements for beach sand and that is determined to be suitable for ocean disposal in accordance with Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA) could be taken to the USEPA-designated South O‘ahu ODMDS. This site was designated in 1981 and is located 3 miles south of Pearl Harbor and 46 miles from HSBH, in water depths ranging from 1,230 to 1,560 ft. Ocean disposal of dredged material at the South O‘ahu ODMDS is identified in the HSBH DMMP Preliminary Assessment as the least cost dredged material disposal alternative i.e., the Base Plan.

3.6.4 Dredging Locations

Of the dredging locations proposed in this report, the Federal Navigation Channel within HSBH is the only location within a “federal or non-federal navigation channel.” The state breakwater settling basin and the offshore sand borrow area are both located outside traditional “navigation projects.”

- **HSBH –** O&M dredging of the federal navigation channel produces dredge material that must be transported and deposited as part of regular channel maintenance. Approximately 2,433 cy of material from this area is anticipated to meet the requirements for use as beach sand. The remaining 2,000 cy of material is anticipated to be finer grained sediment unsuitable for beach placement and will need to be disposed of at different locations.
- **State Breakwater Settling Basin –** This measure would involve dredging and beneficial use from a 0.3 ac area (State Breakwater Settling Basin) adjacent to the State of Hawai‘i breakwater within the HSBH, but outside of the federal navigation channel. This activity may reduce sedimentation rates in the navigation channel and HSBH and would produce 2,200 cy of beach suitable material. This shoaling was caused by sand that was transported over the state breakwater by wind and wave action. Dredging, transport, and placement of dredged material from this area would be considered “additional work” for the purposes of a PPA and would therefore be paid for entirely by the NFS.
- **Offshore Sand Borrow Area –** A 16.5 ac area, located 3,500 ft offshore of Hale‘iwa Beach, is estimated to have 200,000 cy of beach suitable sand. It is possible that economic efficiencies may be gained if this project is done together with the dredging of the federal navigation channel. The deposit appears to be an extension of a relict stream bed to the west of Ali‘i Beach Park and may be at the confluence of that streambed and one extending from Anahulu River, now used as an entrance channel for HSBH. Sediment grain size analysis indicates that it is similar to the beach sand currently at Hale‘iwa Beach. A portion of this area could be dredged to obtain the quantity of sand needed to fully restore HBP (20,000 cy). Dredging, transport, and placement of dredged material from this area would be considered “additional work” for the purposes of a PPA and would therefore be paid for entirely by the NFS.
- **Barge Access Zone –** An access zone would be excavated along the north side of the southern groin of the HBSPP to facilitate offloading of scows directly to the HBSPP (Figure 19). The access zone would be 50 ft wide, approximately 140 ft long, and would be dredged to a depth of -10 MLLW. The scow barge would travel from the harbor channel to the access zone along a direct path of approximately 450 ft, in an area with existing depths of -10 ft MLLW or greater. Sand within the Hale‘iwa Beach littoral cell naturally accumulates on the north side of the southern groin of the HBSPP therefore, excavation of this access zone is anticipated to produce approximately 1,300 cy of beach suitable dredged material. This construction improvement would eliminate the need to load dredged material on dump trucks for transportation to beach nourishment locations and is necessary as part of the least cost placement method as evaluated according to EM 1110-2-5025.

Though the dredging areas are in varying depths and wave exposure conditions, it is anticipated that a single barge mounted crane with a clamshell bucket could be used to excavate all areas. The sand would be dewatered during excavation using an environmental clamshell bucket, placed on a scow, and barged to the access channel where it would be mechanically placed on the beach. When sand is transported to the beach, it will be offloaded to a single location and spread across the beach using equipment such as bulldozers or bobcats. This spreading is considered part of placement and would be conducted under the federal dredging contract.

It is important to note that sediment sampling and analysis will occur in all dredge locations prior to dredging and determination of suitability for beach placement, ocean disposal or upland disposal. Sediment sampling and analysis is scheduled to occur after feasibility phase, in design phase and prior to implementation. Any material not suitable for beach placement in accordance with applicable state laws will undergo analysis to determine suitability at the South Oʻahu ODMDS or at an approved upland disposal site.

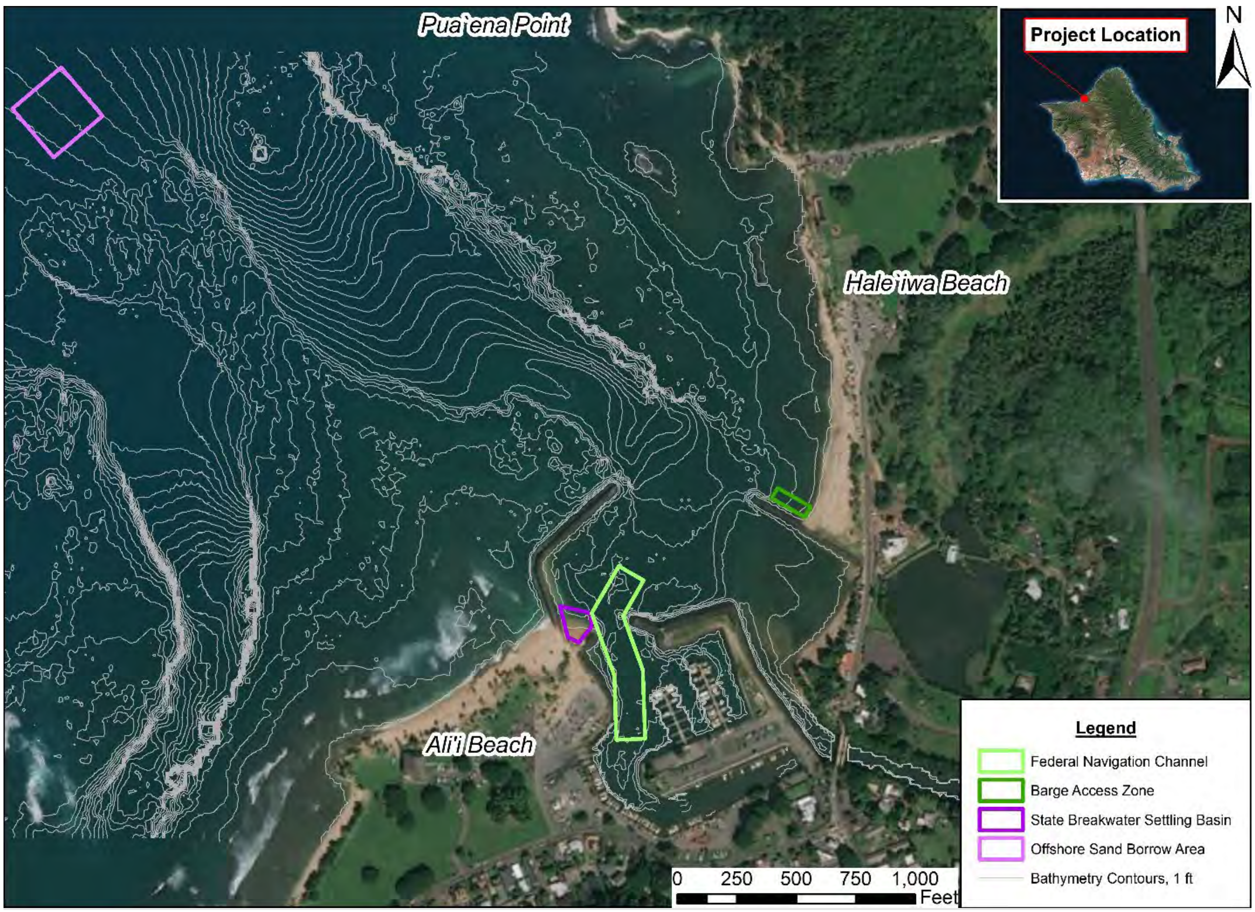

Figure 19. Dredging Locations

3.6.5 Preliminary Screening of Measures

The preliminary measures were evaluated and screened prior to the development of alternatives (Table 12). Completeness, effectiveness, efficiency, and acceptability (defined below) are the four evaluation criteria specified in the Council for

Environmental Quality Principles and Guidelines (ER 1105-2-100, Chapter 2, Section 2-3.c.2) in the evaluation and screening of alternative plans.

- Completeness is the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects.
- Effectiveness is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities.
- Efficiency is the extent to which an alternative plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the nation's environment.
- Acceptability is the workability and viability of an alternative plan with respect to acceptance by State and local entities, consulting parties, and the public and compatibility with existing laws, regulations, and public policies.

Alternatives considered in any planning study should meet minimum subjective standards of these criteria to qualify for further consideration and comparison with other plans.

Table 12. Preliminary Measures Considered

Measure	Preliminary Screening and Evaluation	Four Planning Criteria	Carried Forward
A) Dredged Method			
A1) Hydraulic dredge	Not Complete. This would be the least cost alternative if all the material being removed was suitable for beach placement; however, there are materials that require disposal at the South O‘ahu ODMDS. Due to the remaining need of disposal at the South O‘ahu ODMDS, a hydraulic pipeline is not by itself a complete disposal solution and would require a mechanical dredge plant in addition to re-handling operations and considerations, such as those in Par. 5.9.2.1 of EM 1110-2-5025	Completeness: No Effectiveness: Med Efficiency: High Acceptability: Yes	No
A2) Mechanical dredge	Acceptable. Mechanical dredging can be used to dredge all areas. Mechanical dredging will be used to fill scows with sediment and move it to appropriate locations	Completeness: Yes Effectiveness: Med Efficiency: Med Acceptability: Yes	Yes
A3) Truck hauling	Acceptable. This was determined to be the most expensive method for material transportation due to the double handling of material (offload from barge to dewatering area, and then transport using truck). The estimated cost of de-watering and transporting material via dump truck ($10-$13/cy); as well as the site improvements necessary for dewatering, site access roads, ramps, etc. further increase the costs of this alternative. Although this measure is acceptable, it is not as cost effective as the barge haul via scow measure and, therefore, was not carried forward.	Completeness: Yes Effectiveness: Med Efficiency: Low Acceptability: Yes	No
A4) Barge haul via scow	Acceptable. For beach nourishment purposes under Section 1122, this transportation method requires site access improvements (i.e., a barge access zone) and those costs are accounted for in project costs for economic evaluation. This was determined to be the most cost-effective method for dredged material transportation.	Completeness: Yes Effectiveness: Med Efficiency: High Acceptability: Yes	Yes
B) Beneficial Uses			
B1) Nourish beach at HBSPP	Acceptable. Only beach grade sand would be suitable for nourishment	Completeness: Yes Effectiveness: High Efficiency: High Acceptability: Yes	Yes
B2) Used to restore nearby wetland habitat	Not Complete. No suitable locations for wetland creation were identified and this measure was screened out.	Completeness: No Effectiveness: High Efficiency: High Acceptability: Yes	No

Measure	Preliminary Screening and Evaluation	Four Planning Criteria	Carried Forward
C) Other Disposal/Placement Options			
C1) Stockpiling	Not Complete or Acceptable This was not acceptable to the NFS as there is limited available real estate in the vicinity that could be used for this purpose, and the cost associated with dewatering the material and acquiring the necessary permits to meet environmental regulations make this a high-cost measure.	Completeness: No Effectiveness: High Efficiency: Low Acceptability: No	No
C2) Upland placement	Not Complete or Acceptable. This is a viable option but does not achieve beneficial use goals. However, no feasible opportunities for upland placement of material were identified during this study	Completeness: No Effectiveness: Med Efficiency: Med Acceptability: No	No
C3) Ocean Disposal at South O'ahu ODMDS	Not Complete. As the Base Plan, least cost disposal alternative, this is a viable option for routine dredged material placement per the DMMP Preliminary Assessment for HSBH. However, this disposal option is not complete because it does not achieve beneficial use goals.	Completeness: No Effectiveness: Low Efficiency: Low Acceptability: Yes	Yes
C4) Trucking to placement locations	Acceptable. This measure is for transporting dredged material to HBSPP. It would require unloading dredged material in the harbor, dewatering it, loading it onto trucks, and transporting it to HBSPP. This was determined to be more expensive than the option to excavate an access channel near HBSPP to allow direct unloading of sediments onto the beach.	Completeness: Yes Effectiveness: Low Efficiency: Low Acceptability: Yes	No
D) Dredging Locations			
D1) HSBH	Acceptable. This is a federal O&M requirement. Overdredge at this location can provide additional dredge material for beneficial use.	Completeness: Yes Effectiveness: High Efficiency: High Acceptability: Yes	Yes
D2) State breakwater settling basin	Acceptable. This area is not part of the federal navigation channel; however, this measure would reduce shoaling in HSBH and provide a source for beach quality sand.	Completeness: Yes Effectiveness: High Efficiency: High Acceptability: Yes	Yes
D3) Offshore sand borrow area	Acceptable. This area is not part of the federal navigation channel and as such, dredging and transportation costs for this material would be 100% non-federally funded. However, this area contains abundant beach suitable sand, and it is possible that economic efficiencies may be gained if this area is dredged together with the federal harbor	Completeness: Yes Effectiveness: High Efficiency: High Acceptability: Yes	Yes

3.6.6 Array of Alternatives Considered

The measures developed in the previous section and for which the PDT decided to carry forward ere combined to create a final array of five alternatives in addition to the No Action Alternative (Table 13).

Table 13. Final Array of Alternatives

Alternative	Description	CY of Dredged Material for Beneficial Use
Alternative 1: No Action Alternative	• No federal action within the study area	0
Alternative 1A: O&M Base Plan	• O&M dredging of the federal navigation channel would occur on its current cycle and sediment would be disposed of per the DMMP Preliminary Assessment, i.e., ocean disposal or other least cost disposal alternative, i.e., upland disposal • No BUDM	0
Alternative 2: Beneficial use from federal navigation channel dredged to -12 ft depth and excavation of barge access zone	• O&M dredging per the O&M Base Plan (Alternative 1A) • Dredged material suitable for beach placement transported to HBSPP for beach nourishment, i.e., BUDM • Excavation of Barge Access Zone to allow for direct placement onto Hale‘iwa Beach with beneficial use of excavated material	3,733
Alternative 2A: Beneficial use from federal navigation channel dredged to -13 ft depth and excavation of barge access zone	• All activities described in Alternative 2, and • One (1) ft of additional dredging in the parts of the Federal Navigation Channel with BUDM at Hale‘iwa Beach	5,438
Alternative 3: Beneficial use from federal navigation channel dredged to -13 ft, excavation of barge access zone and state breakwater settling basin	• All activities described in Alternative 2A, and • Additional mechanical dredging of state breakwater settling basin adjacent to Federal Navigation Channel with BUDM at Hale‘iwa Beach	7,638
Alternative 4: Beneficial use from federal navigation channel to -13 ft, excavation of barge access zone, state breakwater settling basin, and offshore sand borrow area	• All activities described in Alternative 3, and • Additional mechanical dredging of offshore sand borrow area with BUDM at Hale‘iwa Beach	22,638

4.0 COMPARISON OF ALTERNATIVES

4.1 Alternative Plan Descriptions

4.1.1 Alternative 1 – No Action Alternative

Alternative 1 is the No Action Alternative to which all other alternatives are compared and which establishes a benchmark. Under the No Action Alternative, USACE would undertake no federal action in the study area. Maintenance of the HSBPP would continue to be the responsibility of the NFS, the Hawaiʻi Department of Transportation. Haleʻiwa Beach would continue to erode and put landside infrastructure at risk of exposure and damage. Climate change, particularly SLR, is anticipated to escalate coastal erosion in the study area. Without federal intervention, the NFS would be responsible for fully funding any efforts to curtail erosion in the study area and protect landside infrastructure at HBP.

4.1.2 Alternative 1A – O&M Base Plan (No BUDM)

Alternative 1A (Figure 20) constitutes the Base Plan for O&M of HSBH involving maintenance dredging of the federal navigation channel down to -12 ft MLLW, yielding approximately 4,433 cy[1] of dredged material, with ocean disposal as described in the 2018 DMMP Preliminary Assessment. Under Alternative 1, no federal action for BUDM would be implemented using dredged material from HSBH, or other, and landside infrastructure at HBP would continue to be at risk of damage from coastal erosion. The HSBH, a federal project, would continue to operate and be maintained under the USACE O&M program. Due to relatively low shoaling rates, maintenance dredging of HSBH occurs on an as-needed basis, approximately every 10-15 years. The next maintenance dredging cycle is anticipated to occur in 2024.

The past two cycles of maintenance dredging occurred in 1999 and 2009, predating the findings of the 2018 DMMP Preliminary Assessment which identified the least cost disposal alternative, ocean disposal at the USEPA-designated South Oʻahu ODMDS. In prior years, dredged material was disposed in uplands, as it was understood to be the least coast disposal alternative at the time. Ocean disposal would be pursued in future dredge cycles, per the 2018 DMMP Preliminary Assessment, however, ocean disposal is ultimately contingent upon sediment sampling and analysis in accordance with the USEPA Ocean Testing Manual and a determination of suitability to ensure the dredged material is suitable for ocean disposal. Approval to use the South Oʻahu ODMDS is the responsibility of and requires concurrence by USEPA prior to disposal.

Alternatively, material determined unsuitable for ocean disposal would be disposed of at an approved upland disposal site. Upland disposal would require additional sampling and analysis pursuant to State law to determine a suitable upland disposal site. In 2022, dredged material removed from Honolulu Harbor determined to be unsuitable for ocean disposal was sampled and analyzed and accepted for upland disposal at the PVT

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[1] Note, the actual dredge volume per dredge cycle is determined by the volume of sediment that has accumulated since the prior dredge cycle, above the authorized depth, based on current bathymetric survey results.

Landfill in Waiʻanae, Hawaiʻi and may be a suitable upland disposal site for material dredged from HSBH.

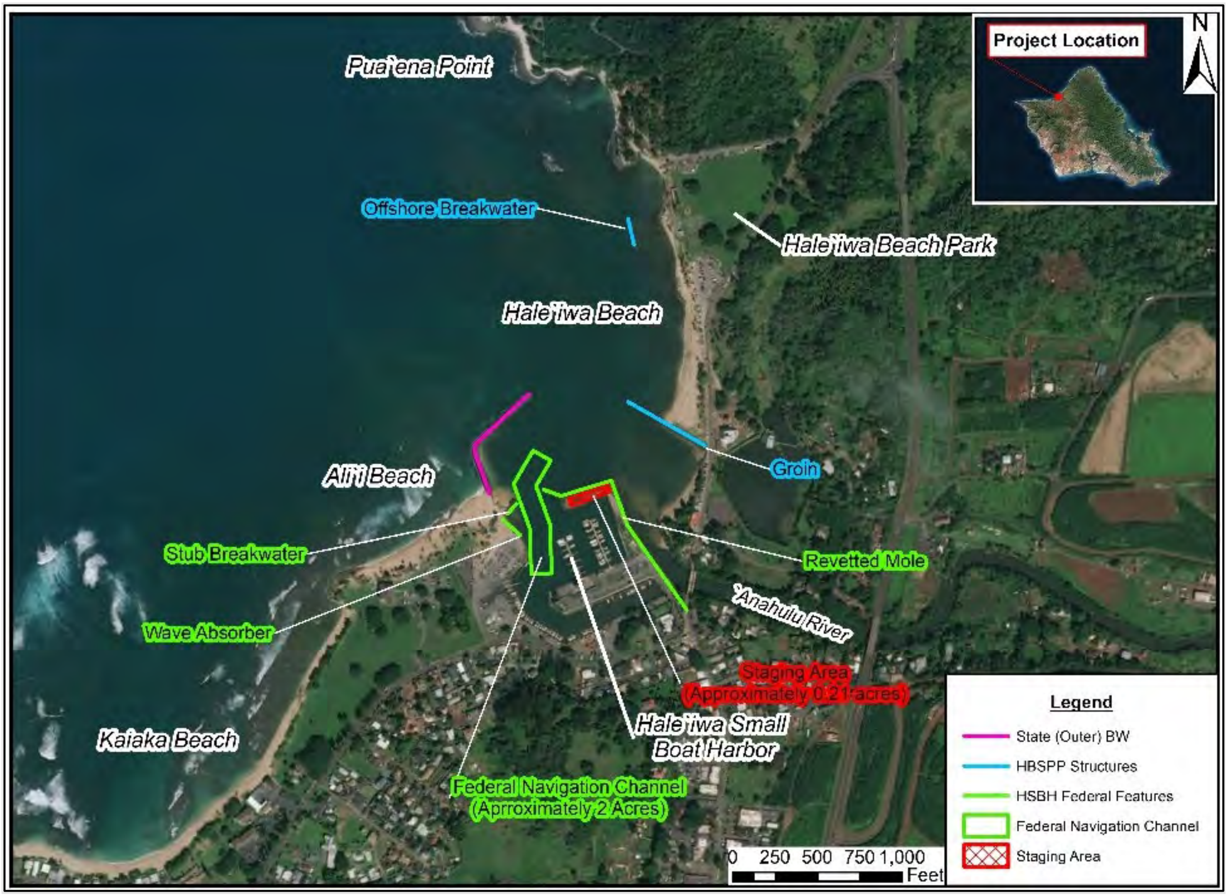

Figure 20. Alternative 1: No Action Alternative (Federal Navigation Channel Shown in Green)

4.1.3 Alternative 2 – BUDM from Federal Channel to -12 ft MLLW Depth

Alternative 2 consists of mechanically dredging the HSBH within the federal navigation channel to its authorized depth of -12 ft MLLW, and beneficially using the beach-suitable dredged material to partially restore the beach at the HBSPP (Figure 21).

Under this alternative, 4,433 cy of shoaling would be dredged from the federal navigation channel. An estimated 2,433 cy of the dredged material is anticipated to be coarse grain sand and suitable for beach placement (per the USACE 2008 sampling effort (MRC, 2008)). This beach-suitable dredged material would be transported from the HSBH to HBSPP (approximately 1,700 ft) for beach nourishment.

The remainder of silt or silty sand dredged from the inland reach of the federal navigation channel, approximately 2,000 cy, would be placed in a scow and taken to the South Oʻahu ODMDS per the DMMP Preliminary Assessment for HSBH or disposed of at an approved upland site if, in design phase, the dredged material is determined to be unsuitable for ocean disposal. Dredged material sampling and analysis compliant with the USEPA Ocean Testing Manual and State law as it relates to beach placement will be conducted in design phase and prior to implementation.

The most efficient method for transporting these sediments to the HBSPP for beneficial use involves excavating a barge access zone adjacent to the groin on the north end of the HBP southern groin, to a depth of -10 ft MLLW. This barge access zone will allow for scow offloading directly to the adjacent beach. Excavation of the barge access zone is anticipated to produce an additional 1,300 cy of beach suitable sand, resulting in a total of 3,733 cy of beach suitable sand (Table 14). The 3,733 cy of beach suitable sand will be used to restore 0.7 ac of beach south of the comfort station. This beach is part of the federally authorized project, and nourishment with dredged material will help restore the beach to its original extent.

This will primarily produce NED benefits in the form of storm damage reduction; secondary benefits include beach habitat for aquatic life and recreational benefits. This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated that the beach created under this alternative would persist for four years before returning to the existing condition. This project life assumes that no other measures are performed by other state or local agencies to maintain the restored beach or reduce scour.

Under Section 1122, the costs of beneficial use projects in excess of the Base Plan will be 100 percent federally funded.

Table 14. Alternative 2: Dredged Material Volume and Uses

Alt 2: Plan Components	**Dredged Material Placement Method**	
	Beach Suitable/ Beneficial Use (cy)	**Transport to ODMDS (cy)**
Federal navigation channel to -12 ft	2,433	2,000
Barge access zone	1,300	-
TOTAL	**3,733**	**2,000**

Figure 21. Alternative 2: BUDM at Hale‘iwa Beach Park

4.1.4 Alternative 2A - BUDM from Federal Channel to -13 ft MLLW Depth (blue polygon)

Alternative 2A consists of all the activities described in Alternative 2 (dredging and beneficial use from federal navigation channel to -12 ft MLLW, and excavation of a barge access zone with beneficial use of excavated sand), with one foot of additional mechanical dredging in parts of the federal navigation channel with sandy material to a total depth of -13 ft MLLW (Figure 22Figure 20). The purpose of this additional foot of dredging is to increase the volume of beach-suitable sandy material available for beach nourishment, and it is conducted solely for the purpose of the pilot project.

Under this alternative, the additional one foot of dredging is anticipated to produce an additional 1,705 cy of beach suitable sand material that will be used for nourishment of the HBSPP. This increases the total volume of dredged material available for beach nourishment to 5,438 cy (Table 15). The 5,438 cy of beach suitable sand will be used to restore 1.1 ac of beach south of the comfort station (Figure 23). This beach is part of the federally authorized project, and nourishment with dredged material will help restore the beach to its original extent.

This will primarily produce NED benefits in the form of storm damage reduction; secondary benefits include beach habitat for aquatic life and recreational benefits. This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated that the beach created under this alternative would persist for six years before returning to the existing condition. This project life assumes that no other measures are performed by other state or local agencies to maintain the restored beach or reduce scour.

The remainder of silt or silty sand dredged from the federal navigation channel, approximately 2,000 cy, would be placed in a scow and taken to the South O‘ahu ODMDS per the DMMP Preliminary Assessment for HSBH or disposed of in uplands if, in design phase, the dredged material is determined to be unsuitable for ocean disposal.

This additional dredging in the navigation channel is authorized by Section 1122 of WRDA of 2016, as amended. The January 2018 implementation guidance for Section 1122 (a)-(h) states:

> “*If additional material is dredged from a federal navigation project solely for the purposes of a pilot project, the costs associated with the additional dredging will be cost-shared with the non-federal sponsor of the pilot project in accordance with Section 204.”*

Therefore, the costs of the additional dredging of the Federal Navigation Channel *solely for the purpose of the pilot project* must be cost-shared with the NFS in accordance with the Section 204 authority (i.e., 65 percent federal/35 percent non-federal). All beneficial use components of the project, dredged from the federal channel, will be 100 percent federally funded in accordance with paragraph 8 of the Implementation Guidance for Section 1122(a)-(h) of WRDA 2016, BUDM.

Table 15. Alternative 2A: Dredged Material Volume and Uses

Alt 2A: Plan Components	**Dredged Material Placement Method**	
	Beach Suitable/ Beneficial Use (cy)	**Transport to ODMDS (cy)**
Federal navigation channel to -12 ft	2,433	2,000
Additional federal navigation channel to -13 ft	1,705	-
Barge access zone	1,300	-
TOTAL	**5,438**	**2,000**

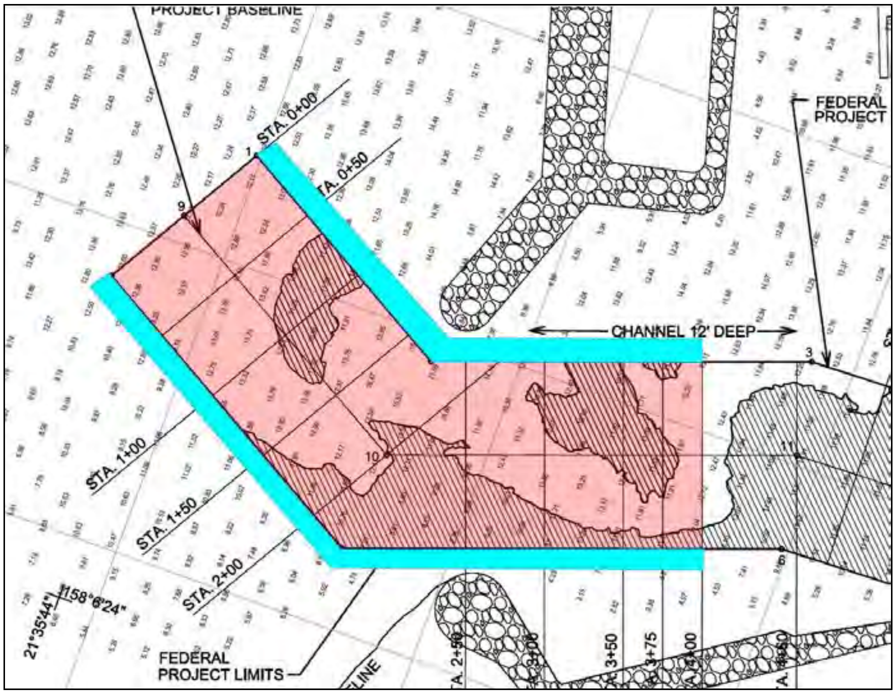

Figure 22. Alternative 2A: Additional Dredging Area to -13 ft (within red polygon)

Figure 23. Alternative 2A: BUDM at Haleʻiwa Beach Park (orange polygon)

4.1.5 Alternative 3– BUDM from Federal Channel to -13 ft MLLW and Settling Basin

Alternative 3 consists of all the activities described in Alternative 2A (dredging and beneficial use from federal navigation channel to -13ft MLLW, and excavation of a barge access zone with beneficial use of excavated sand), and the following additional work: mechanical dredging and beneficial use of dredged sediments from a 0.3 ac area (state breakwater settling basin) adjacent to the State of Hawai‘i breakwater within the HSBH, and outside of the federal navigation channel (Figure 24). Dredging, transport, and placement of dredged material from the state breakwater settling basin would be considered “additional work” for the purposes of a PPA.

Under this alternative, excavation of the 0.3 ac state breakwater settling basin is anticipated to produce an additional 2,200 cy of beach suitable sand that will be used for nourishment of the HBSPP. This increases the total volume of dredged material available for beach nourishment to 7,638 cy that will be used to restore 1.4 ac of beach south of the comfort station at HBP (Figure 24). This beach is part of the federally authorized project, and nourishment with dredged material will help restore the beach to its original extent. This will primarily produce NED benefits in the form of storm damage reduction; secondary benefits include beach habitat for aquatic life and recreational benefits. This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated that the beach created under this alternative would persist for eight years before returning to the existing condition. This project life assumes that no other measures are performed by other state or local agencies to protect and/or maintain the restored beach. As in alternative 2A, the remainder of silt or silty sand from the navigation channel dredging, approximately 2,000 cy, would be placed in a scow and taken to the South O‘ahu ODMDS or disposed of uplands if, in design phase, the dredged material is determined to be unsuitable for ocean disposal.

The 6,000 sq. ft proposed state breakwater settling basin would be excavated to a depth of -8 ft MLLW in a shoaled area west of the federal stub breakwater. Once created, this state breakwater settling basin will act as a sink for sand originating from Ali‘i beach, preventing it from migrating into the federal navigation channel. Creation of this state breakwater settling basin would reduce the rate of shoaling in the HSBH and federal navigation channel. Furthermore, the dredged material from this area is anticipated to be beach quality sand and, therefore, suitable for BUDM at the HBSPP.

The costs for dredging areas outside a non-federal navigation project will be 100 percent funded by the NFS in accordance with 33 USC 701h. The additional dredging of the navigation channel solely for the purpose of the pilot project, as described in Alternative 2A, must be cost-shared 65 percent federal/ 35 percent non-federal. All beneficial use components of the project, dredged from the federal channel, will be 100 percent federally funded in accordance with paragraph 8 of the implementation guidance for Section 1122(a)-(h) of WRDA 2016, BUDM.

Table 16 displays the amount of dredge material suitable for beneficial use or transport to ODMDS for each component of Alternative 3.

Table 16. Alternative 3: Dredged Material Volume and Uses

Alt 3: Plan Components	Dredged Material Placement Method	
	Beach Suitable/ Beneficial Use (cy)	Transport to ODMDS (cy)
Federal Navigation Channel to -12 ft	2,433	2,000
Additional Federal Navigation Channel to -13 ft	1,705	-
Barge Access Zone	1,300	-
State Breakwater Settling Basin	2,200	-
TOTAL	**7,638**	**2,000**

Figure 24. Alternative 3: Beneficial Use Beach Restoration Area (hot pink polygon)

4.1.6 Alternative 4: BUDM from Federal Channel to -13 ft MLLW, Settling Basin, and Offshore Sand Borrow Area

Alternative 4 consists of all the activities described in Alternative 3 (dredging and beneficial use from federal navigation channel to -13 ft MLLW, excavation of a barge access zone with beneficial use of excavated sand, mechanical dredging and BUDM from the state breakwater settling basin) and the following additional work: mechanical dredging and BUDM from an offshore sand deposit (offshore sand borrow area) located 3,400 ft offshore of HBSPP (Figure 25).

Under this alternative, excavation of the offshore sand borrow area is anticipated to produce an additional 15,000 cy of beach suitable sand that will be used for nourishment of the HBSPP. This measure increases the total volume of dredged material available for beach nourishment to 22,638 cy (Table 17) and allows for 4.2 ac of beach restoration south of the comfort station at HBP (Figure 25). This beach is part of the federally authorized project, and nourishment with dredged material will help restore the beach to its original extent. This will primarily produce NED benefits in the form of storm damage reduction; secondary benefits include beach habitat for aquatic life and recreational benefits. This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated that the beach created under this alternative would persist for 23 years before returning to the existing condition. This project life assumes that no other measures are performed by other state or local agencies to protect and/or maintain the restored beach.

As in Alternative 3, the remainder of silt or silty sand from the navigation channel dredging, approximately 2,000 cy, would be placed in a scow and taken to the South O‘ahu ODMDS in accordance with the DMMP Preliminary Assessment for HSBH or disposed in uplands if, in design phase, the dredged material is determined to be unsuitable for ocean disposal. The offshore sand borrow area is 16.5 ac in size, is located at a of depth of approximately 60 ft and is 3,400 ft offshore of HBSPP (Figure 25). This area will function as a borrow pit for the procurement of large quantities of beach suitable sand.

The costs associated with dredging the offshore sand borrow area and the state breakwater settling basin located outside of the federal navigation channel will be 100 percent non-federally funded in accordance with 33 USC 701h. The additional dredging of the navigation channel solely for the purpose of the pilot project, as described in Alternative 2A, must be cost-shared 65 percent federal/ 35 percent non-federal. All beneficial use components of the project, dredged from the federal channel, will be 100 percent federally funded in accordance with paragraph 8 of the implementation guidance for Section 1122(a)-(h) of WRDA 2016, BUDM. It is anticipated that this alternative will have the greatest economic benefits and would create significant cost efficiencies for federal and non-federal partners that would not be realized if the components of this project were implemented as individual projects.

Table 17 displays the amount of dredge material suitable for beneficial use or transport to ODMDS for each component of Alternative 4.

Table 17. Alternative 4: Dredged Material Volume and Uses

Alt 4: Plan Components	Dredged Material Placement Method: Beach Suitable/ Beneficial Use (cy)	Dredged Material Placement Method: Transport to ODMDS (cy)
Federal navigation channel to -12 ft	2,433	2,000
Additional federal navigation channel to -13 ft	1,705	-
Barge access zone	1,300	-
State breakwater settling basin	2,200	-
Offshore sand borrow area	15,000	-
TOTAL	**22,638**	**2,000**

Figure 25. Alternative 4: Beneficial Use Beach Restoration Area (yellow polygon)

4.2 Preliminary Screening of Alternative Plans

The alternatives noted above were also evaluated as separate alternatives in which the barge access zone (described in Alternative 2) measure was replaced with a measure in which dredged material was transported to the HBSPP using trucks. Under these alternatives, dredged sediment would need to be unloaded and dewatered at a dock within the federal harbor, reloaded onto trucks, and transported to the beach via existing roads. Preliminary cost analysis determined that these alternatives were more expensive and resulted in less beach nourishment and benefits, than those that

incorporated the barge access zone measure. Preliminary cost estimates for both hauling and excavation of the barge access zone are included in Section 3 of the Cost Engineering Appendix (Appendix D). For this reason, they were screened from further analysis.
Preliminary analysis after consideration of 33 CFR 335.1 et seq, as well as EM 1110-2-5025, evaluated three of five transportation methods: truck haul, hydraulic pipeline, and barge (scow); rail haul and belt conveyor were not analyzed. EM 1110-2-5025 outlines the steps the PDT utilized to identify its transport route. Dredged material transportation involves three major operations in transportation of dredged material - loading, transportation and unloading. Costs associated with these operations include site improvements. Examples of site improvements and access improvements are provided in chapter 4.10 of EM 1110-2-5025, and additional improvements specific to barge haul in chapter 5.1.1.

4.3 Preliminary Base Plan Costs

The Base Plan is the cost necessary to carry out the dredging and disposal for the O&M routine maintenance dredging of an authorized federal water resources project that is the source of the sediments in the most cost-effective way, consistent with economic, engineering, and environmental criteria (See HSBH DMMP Preliminary Assessment at Appendix F).

Under the Section 1122 authority, cost sharing requirements are generally carried out under the Section 204 Authority of WRDA 1992 (33 USC 2326). Under the Section 204 authority, the costs of beneficial use of sediment projects are limited solely to project costs that are in excess of the Base Plan. As a result, the costs used for evaluation and comparison purposes are the incremental first costs of the project construction over the first cost associated with disposing of the sediments as described in the Base Plan, i.e., ocean or upland disposal (Section 4.1.2)

The Base Plan dredging quantity is based on the anticipated O&M dredging requirements for the HSBH federal navigation channel at the next dredging cycle in 2024: 4,433 cy of material dredged from the federal navigation channel and transported to either the South Oʻahu ODMDS for ocean disposal or an approved upland disposal site. The Base Plan costs reported below represent the preliminary Base Plan cost developed with feasibility level cost assumptions and used for plan comparison and evaluation. It differs from the Base Plan costs associated with the Recommended Plan provided later in the report, which included a more detail level of cost estimation (Table 18).

Table 18. Base Plan Costs for All Alternatives

	Volume of Maintenance Dredging (cy)	Base Plan Costs
Base Plan	4,433	$2,108,000*

**Note: This represents the preliminary Base Plan cost developed with feasibility level cost assumptions and used for plan comparison and evaluation. This estimate is in FY21 dollars. It differs from the Base Plan costs associated with the Recommended Plan provided later in the report, which included a more detailed level of cost estimation.*

4.4 Costs of Alternatives

4.4.1 Alternative Costs

After determining the Base Plan cost for each alternative, the PDT determined the costs associated with using that material to construct each of the alternatives (Table 19). These cost estimates include contingency and are used for plan comparison and evaluation.

Table 19. Alternative Costs

Alternatives	Volume of Maintenance Dredging (cy)*	Base Plan Costs**	Total First Costs**	Incremental Cost
Alternative 1 No Action	0	$0	$0	$0
Alternative 1A O&M Base Plan (No BUDM)	4,433	$2,108,000	$2,108,000	$0
Alternative 2 BUDM from federal navigation channel to -12 ft	4,433	$2,108,000	$2,954,000	$846,000
Alternative 2A BUDM from federal navigation channel to -13 ft	4,433	$2,108,000	$3,155,000	$1,047,000
Alternative 3 BUDM from federal navigation channel and state breakwater settling basin	4,433	$2,108,000	$3,884,000	$1,776,000
Alternative 4 BUDM from federal navigation channel, state breakwater settling basin, and offshore sand borrow area	4,433	$2,108,000	$5,651,000	$3,543,000

**The volume of maintenance dredging is the same for all alternatives and represents the proposed quantity of dredged material that would be removed from the federal navigation channel under the Base Plan.*
***The Base Plan and first costs represent preliminary cost estimates developed with feasibility level cost assumptions and used for plan comparison and evaluation. These estimates were in FY21 dollars and may differ from the costs associated with the Recommended Plan provided later in the report, which included a more detailed level of cost estimation.*

4.5 Economic Benefits

The economic benefits were determined through the calculation of NED benefits of each alternative that were then compared against the incremental costs (i.e., costs in excess of the Base Plan) to calculate the benefit-cost ratio (BCR) for each alternative. NED benefits include benefits from navigation, recreation, and coastal storm reduction measures annualized across the 50-year study duration. NED costs include mobilization/demobilization and dredging costs for each alternative, as well as interest during construction and annual O&M costs associated with the project. Detailed information about the economics evaluation is included in Appendix C.

The navigation benefits are estimated to be consistent for between 10 and 26 years, depending on the alternative, after which point additional dredging would be required for continued navigation benefits (Section 2.1 of Appendix C).

The recreation benefits associated with Haleʻiwa Harbor were calculated based on current visitation to Haleʻiwa Beach Park and how the additional sand placed on the beach would affect this visitation with the assumption that the improvements to the sea turtle habitat from the additional sand will bring additional visitors to the beach. Average annual recreation benefits at Haleʻiwa Harbor were estimated based upon the annual use of HBP and the unit day value (UDV) of recreational activities offered at the beach. The primary recreational activities include surfing, paddle boarding, and turtle watching, thus the specialized recreation UDVs were used to calculate the recreational benefits of the beach. In the Base Plan, it is assumed that recreation continues to remain relatively constant as it has in prior years, producing recreation valued at approximately $360,000 annually (there are no additional recreation benefits resulting from the Base Plan. So, implementation of this plan effectively results in a $0 increase in recreational benefits annually). Recreational benefits are estimated to persist for up to 23.2 years in Alternative 4 (with an estimated increase in value of $940,000 over the Base Plan) at a decreasing annual value, as wave driven erosion and scour erode the additional beach material incrementally each year (Section 2.3 of Appendix C).

The coastal storm reduction measure benefits are estimated to be consistent for between five and 29 years, depending on the alternative, after which point the additional material helping to stabilize the seawall is anticipated to have fully eroded and the wall would be at risk of failure, requiring some form of repair to reacquire these benefits (Section 2.2 of Appendix C). The sum of these benefits was annualized over the 50-year period of analysis to estimate the average annual benefits (AAB), which were then compared against the average annual costs (AAC) to calculate net benefits and BCRs for each alternative.

Net NED benefits are calculated as AAB less AAC, while the BCR is the ratio of AAB to AAC. A BCR greater than one indicates a project is economically justified. The expected (most likely) AAB and AAC for each alternative are presented in Table 20. Since each alternative produces a BCR greater than one, all alternatives are economically justified. Alternative 4 is the plan that provides the greatest net benefits.

Table 20. Economic Benefits

Alternatives	**Total Direct Costs**	**Incremental Cost***	**Average Annual Costs**	**Net Economic Benefits**	**Average Annual Benefits**	**BCR (w/ recreation)**	**BCR (w/o recreation)**
Alternative 1 No Action	-	-	-	-	-	-	-
Alternative 1A O&M Base Plan	$2,108,000	-	$78,000	-$32,000	$46,000	0.6	0.6
Alternative 2 BUDM from federal navigation channel to -12 ft	$2,974,000	$846,000	$110,000	$84,000	$194,000	4.7	0.7
Alternative 2A BUDM from federal navigation channel to -13 ft	$3,175,000	$1,047,000	$118,000	$131,000	$249,000	5.2	1.2
Alternative 3 BUDM from federal navigation channel and state breakwater settling basin	$3,904,000	$1,776,000	$145,000	$157,000	$302,000	3.9	1.1
Alternative 4 BUDM from federal navigation channel, state breakwater settling basin, and offshore sand borrow area	$5,671,000	$3,543,000	$210,000	$303,000	$513,000	3.6	0.7

*The incremental cost is the project cost minus Base Plan cost. The average annual costs, net economic benefits, average annual economic benefits, and BCRs are derived using the incremental cost.
**Note: The costs and benefits as reported in this table were generated in FY21 and used as the basis for plan selection. The costs, benefits, and BCR for the Recommended Plan differs from what is reported elsewhere in this report, as the price level has changed since plan selection.

Due to the high value of recreation benefits associated with these alternatives additional BCRs were calculated for each alternative with recreation benefits removed from the calculation as shown in Table 20. According to Section 3.7 b (7) of the Planning Guidance Notebook, budget policy generally precludes using Civil Works resources to implement recreation-oriented projects in the Civil Works program. An exception is where a project is formulated for other primary purposes and average annual recreation benefits are less than 50 percent of the average annual benefits required for justification (i.e., the recreation benefits that are required for justification are less than an amount equal to 50 percent of project costs). Since each alternative produces a BCR greater than 0.51 without recreational benefits, all alternatives are compliant with budgeting policy and Alternative 4 remains the plan that provides the greatest NED benefits.

4.6 Ecological Opportunities

In addition to the economic benefits described above, the restoration of beach at HBSP will provide ancillary ecological opportunities. The restored beach habitat may provide haul-out and basking habitat for green sea turtles. It is unlikely to provide nesting habitat for this species because nesting beaches in the State of Hawaiʻi are mostly limited to the Northwestern Hawaiian Islands, not the Main Hawaiian Islands. In addition, turtles demonstrate honing tendencies, tending to return to nest at the beach where they were born, as opposed to a new or newly created beach. The beach may also provide foraging habitat for shorebirds and haul out areas for Hawaiian Monk Seals.

4.7 Evaluation of Alternatives

All USACE water resources development projects must be evaluated in terms of acceptability; completeness; effectiveness; and efficiency as defined in Section 3.6.5. Generally, projects must be formulated to reasonably maximize benefits to the national economy, to the environment, or to the sum of both. Each alternative plan shall be formulated in consideration of criteria described in the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G).

The project alternatives were compared based on the P&G criteria (Table 21). Alternatives 2 through 4 all fully achieve the completeness criteria and are considered efficient, because they have BCRs that exceed 1. All the alternatives are considered acceptable. Alternative 4 is most effective at delivering project outputs as it provides the greatest net economic benefits and, therefore, best achieves the project objectives.

Table 21. Alternative Comparison Criteria

Alternative	Completeness	Effectiveness	Efficiency*	Acceptability
Alternative 1 No Action	**No.** This alternative would not fully achieve the study objectives.	**Low.** There are no associated NED benefits	**Low.** This alternative has no calculated BCR	**No.** This alternative would not meet the USACE responsibility under the O&M Program Mission to maintain completed projects.
Alternative 1A O&M Base Plan	**No.** This alternative would not fully achieve the study objectives.	**Low.** The NED benefits are negative.	**Low.** This alternative has a BCR of 0.6	**Yes.** This alternative meets the USACE responsibility under the O&M Program Mission to maintain completed projects.
Alternative 2 BU from federal navigation channel to -12 ft	**Yes.** This alternative would fully achieve the study objectives	**Low.** This alternative provides NED benefits, but to a lesser extent than Alternative 4.	**Medium.** This alternative has a BCR of 4.7	**Yes.** This project is supported by the NFS and is anticipated to have public support. Furthermore, it will adhere to applicable laws, regulations, and public policies
Alternative 2A BU from federal navigation channel to -13 ft	**Yes.** This alternative would fully achieve the study objectives	**Low.** This alternative provides NED benefits, but to a lesser extent than Alternative 4	**High.** This alternative has a BCR of 5.2	**Yes.** This project is supported by the NFS and is anticipated to have public support. Furthermore, it will adhere to applicable laws, regulations, and public policies.
Alternative 3 BU from federal navigation channel and state breakwater settling basin	**Yes.** This alternative would fully achieve the project objectives	**Medium.** This alternative provides NED benefits, but to a lesser extent than Alternative 4.	**Medium.** This alternative has a BCR of 3.9.	**Yes.** This project is supported by the NFS and is anticipated to have public support. Furthermore, it will adhere to applicable laws, regulations, and public policies.
Alternative 4 BU from federal navigation channel, state breakwater settling basin, and offshore sand borrow area	**Yes.** This alternative would fully achieve goals for coastal storm damage reduction and beneficial use, maximizes beach restoration to historic extents, as well as ancillary ecological opportunities.	**High**. This alternative delivers the greatest NED benefits.	**Medium**. This alternative has a BCR of 3.6	**Yes.** This project is supported by the NFS and is anticipated to have public support. Furthermore, it will adhere to applicable laws, regulations, and public policies.

**Note: The BCRs as reported in this table were generated in FY21 and used as the basis for plan selection. The costs, benefits, and BCR for the Recommended Plan differ from what is reported elsewhere in this report, as the price level has changed since plan selection.*

4.8 Plan Selection

Based on the plan evaluation and comparison process detailed above, Alternative 4 was selected as the Recommended Plan as it maximized economic benefits, and it represents the NED plan.

5.0 RECOMMENDED PLAN

5.1 Plan Description

The Recommended Plan is Alternative 4 BUDM from the federal navigation channel to -13 ft, excavation of the barge access zone with beneficial use of excavated sand and the following additional work: dredging of the settling basin, and the offshore sand borrow area, with BUDM at Hale‘iwa Beach. This plan involves BUDM for the purposes of reducing storm damage to property and infrastructure with ancillary navigation, recreation benefits, and ecological opportunities.

Dredged material will be obtained from the HSBH federal navigation channel, the barge access zone, the state breakwater settling basin that is part of the HSBH, and an offshore sand borrow area (Figure 26). The beach suitable dredged material from these locations will be used to nourish the beach that is part of the federally authorized HBSPP. Dredging from these locations will yield approximately 22,638 cy of beach suitable sand and will be used to restore 4.2 ac of beach. This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated that the beach created under this alternative would persist for 23 years before returning to the existing condition. This project life assumes that no other measures are performed by other state or local agencies to protect and/or maintain the restored beach. This project represents a one-time event for dredging and dredged material placement. The 1122 authority only allows for pilot projects and, therefore, a long-term plan for beach re-nourishment as part of the HSBH DMMP Preliminary Assessment is beyond the scope of this study. However, a goal of this project is that it will demonstrate the benefits of the proposed measures and provide lessons learned that can be applied to future maintenance of this harbor.

5.1.1 Plan Components

The Recommended Plan contains six major components, which are listed below. A description of the cost share breakdown for each of the Recommended Plan components is provided in Section 7.6

O&M Federal Navigation Channel Dredging – Dredging of the Federal Navigation Channel to -12 ft depth below MLLW to meet O&M requirements. This dredging will produce approximately 4,433 cy of sediment. Approximately 2,433 cy is anticipated to be beach suitable and will be transported to the HBSPP for beach restoration. The remaining 2,000 cy will be either transported to the South O‘ahu ODMDS for ocean disposal in accordance with the HSBH DMMP Preliminary Assessment or disposed of in uplands if, during design, the material is determined unsuitable for ocean disposal.

Barge Access Zone – A barge access zone will be excavated to allow for efficient transport and unloading of dredged material to the HBSPP. The barge access zone will be excavated to a depth of -10 ft MLLW parallel to the southern groin of the HBSPP, along the north side. Scows will use this barge access zone to move adjacent to the HBSPP for unloading. Excavation of the barge access zone is anticipated to produce 1,300 cy of beach suitable sand that will be used for beach restoration at the HBSPP.

The barge access zone is necessary as part of the least cost placement method as evaluated per EM 1110-2-5025.

No adverse impacts to project performance are expected from dredging of the access channel. There is a potential for a minor and temporary increase to wave height in the area, but following construction, sediment will naturally fill the access channel via normal sediment transport processes.

Additional Federal Navigation Channel 1-ft Over-Dredge – The seaward portion of the federal navigation channel with sandy substrate will be dredged by an additional foot, to -13 ft MLLW. This will produce an additional 1,705 cy of beach suitable sand that will be used for beach restoration at the HBSPP.

State Breakwater Settling Basin – A 0.3 ac area adjacent to, but outside of, the Federal Navigation Channel will be excavated to a depth of -8ft MLLW to create the State Breakwater Settling Basin. Dredging of this area is anticipated to produce 2,200 cy of beach quality sand that will be used for beach restoration at the HBSPP. funded.

Offshore Sand Borrow Area – An offshore sand borrow area will be dredged to provide additional beach suitable sand for beach restoration. This 16.5 ac offshore sand borrow area is outside of HSBH and the Federal Navigation Channel; and is located 3,400 ft offshore at a depth of 60 ft. This area will function as a borrow area for the procurement of approximately 15,000 cy of beach suitable sand.

Beneficial-Use of Dredged Material – Beach suitable sand dredged from the federal navigation channel to -13 ft MLLW (4,138 cy), state breakwater settling basin (2,200 cy), the offshore sand borrow area (15,000 cy), and the barge access zone (1,300 cy) will be transported to the HBSPP for beach restoration. Beach restoration is anticipated to reduce storm damage to public property and infrastructure, promote recreation, and provide ancillary ecological opportunities.

All dredging will be completed by using a barge mounted crane and clamshell dredge to excavate material from the proposed areas and load scows for transportation to the HBSPP. The sand would be dewatered during excavation using an environmental clamshell bucket, placed on a scow, and barged to the barge access zone where it would be mechanically placed on the beach.

When sand dredged from the federal channel and all other areas is transported to the beach, it will be offloaded to a single location and spread across the beach using equipment such as bulldozers or bobcats, which is considered part of placement and would be conducted under a single federal dredging contract for all Recommended Plan components. For the purposes of estimating the coverage area of the placed sand, a typical placement template was assumed (Appendix A). The City and County of Honolulu have the equipment and labor necessary to complete shaping or spreading of the sand, as needed and could complete this using existing parks maintenance funding.

It is anticipated that this beneficial use project would be constructed in 2024. This coincides with the existing FY22 request for design funds to develop plans and specifications for maintenance dredging of the harbor, and the planned request for maintenance dredging construction funds in the FY23 budget. Section 1122 funds for the incremental costs of design and construction would need to be received on a concurrent FY22/FY23 schedule with maintenance dredging funds.

Figure 26. Recommended Plan Components

5.2 Base Plan Costs for the Recommended Plan

The Base Plan dredging quantity is based on the anticipated O&M dredging requirements for the HSBH federal navigation channel at the next dredging cycle 2024. Specifically, 4,433 cy of material dredged from the federal navigation channel and transported to the South Oʻahu ODMDS for ocean disposal. The Base Plan costs reported below were developed with detailed cost assumptions used in the cost estimation of the Recommended Plan (Table 22). For this reason, the cost may differ from the Base Plan cost provided earlier in the report.

Table 22. Base Plan Costs for the Recommended Plan

	Volume of Maintenance Dredging (cy)	Base Plan Costs ($1,000s)
Base Plan	4,433	$2,263*
**Note: This represents the Base Plan cost developed for the Recommended Plan. It differs from the Base Plan costs associated provided earlier in the report.*		

5.3 Detailed Cost Estimate of the Recommended Plan

Based on FY22 price levels, the estimated project first cost is $3,901,000 (Table 23). This represents the incremental cost over the Base Plan cost for implementation and includes construction; preconstruction, engineering, and design (PED); construction management, i.e., supervision and administration (S&A); lands, easements, rights-of-way, relocations, and disposals (LERRDs). The feasibility study costs-to-date of $485,000 are not included in this estimate of project first cost. The fully funded total project cost, including feasibility study costs-to-date and escalation to the estimated midpoint of construction (2024), is $4,502,000 at the FY22 price level (Table 23).

Table 23. Total Project Cost of the Recommended Plan

ITEM*	Project First Cost (FY22 Price Level, $1,000s)	Total Project Cost-Fully Funded ($1,000s)
Construction	$2,911	$3,004
Preconstruction Engineering and Design (PED)	$675**	$1,169
Construction Management (S&A)	$291	$305
LERRDs	$24	$24
Total Project Cost (1000s)	**$3,901***	**$4,502**
All costs represent the incremental cost (i.e., Total cost minus Base Plan cost of $2,263,000)* * PED first cost and total project first cost does NOT include feasibility study costs-to-date ($485K)*		

5.4 Economic Benefits of the Recommended Plan

The Recommended Plan will produce NED benefits in the form of navigation benefits, storm damage reduction benefits, and recreational benefits. The Recommended Plan is the NED Plan and provides an incremental average annual economic benefit of $430,000 with a BCR of 3.1 in FY22 price levels (Table 24). See Appendix C (Attachment 1) for additional detail.

Table 24. Economic Benefits of the Recommended Plan

	Base Plan	Recommended Plan
Total Average Annual Benefits (AAB)[1]	$43,000	$473,000
Total Average Annual Cost (AAC)[1]	$78,000	$215,000
Net Benefits	($35,000)	$258,000
Incremental AAB[1]	$0	$430,000
Incremental AAC[1]	$0	$137,000
Incremental Net Benefits	$0	$293,000
BCR[2]	0.0	3.1

[1] AAB and AAC were estimated using base year of 2025 (FY25), the FY22 FDR of 2.25%, and 50-year period of analysis.
[2] BCR is calculated as the incremental AAB divided by the incremental AAC.

5.5 Summary of Significance

5.5.1 Institutional Significance

Institutional significance represents the importance of the project outputs to federal, state, regional, local, and Tribal governments or private entities. Sources of institutional recognition include laws, EOs, rules and regulations, treaties, policy statements, ordinances, planning documents, resolutions and other policy statements of entities with jurisdiction in the study area.

The State of Hawai'i DLNR's 2013 Coastal Erosion Management Plan proposes several goals and recommendations that are consistent with the purpose of this project. This plan identifies the Coastal Lands Program at DLNR as the lead agency for coastal erosion management and beach conservation. The Coastal Lands Program supports restoration of beach and dune ecosystems and encourages landowners to consider beach restoration over hard shoreline armoring. A goal of the Coastal Lands Program, as stated in the Coastal Erosion Management Plan, is to implement beach and dune restoration with sand nourishment as a viable management option in Hawai'i and to streamline and coordinate the permitting necessary to achieve this goal and improve interagency coordination and cooperation. A recommendation of the Coastal Erosion Management Plan is to enhance interagency coordination to improve and standardize the permitting process for coastal restoration and to plan for beach nourishment as part of restoration solutions.

This project demonstrates institutional significance because it is consistent with the goals and recommendations for beach restoration and shoreline management as described in the Coastal Erosion Management Plan (2013) and pursued by the State of Hawai'i DLNR. Furthermore, HBP was a federally authorized beach restoration project and a historically important site that was added to the State Register of Historic Places on June 9, 1988.

5.5.2 Public Significance

Public significance represents the importance of the project to some segment of the general public. The north shore of Hawai'i is a popular location for tourism, attracting more than half of the State's seven million visitors annually (Hawaii.com, 2020). Local life and tourism are largely supported by the beaches located in this area. As described in the Coastal Erosion Management Plan (2013):

> "*Beach loss incurs costs to all aspects of Hawaiian life. The local populace of Hawaiʻi throngs to the beaches for the enjoyment of open access, socializing, exercise, being alone, and being together. The beaches are among the principal reasons many Hawaiians call these islands home. Tourism in the state is closely tied to the quality of Hawaiian beaches. As visitors find access difficult to shorelines lined by seawalls and crowded with development, they come to realize that our beaches are degraded, that coastal vistas are no longer pristine, and the fulfilling opportunities to experience the Hawaiian shore depicted by the visitor industry are rare. Beaches are critical component of the tourism infrastructure, like all infrastructure they must be maintained.*"

In 1997, the visitor economy provided 171,900 jobs in the state, accounted for $13 billion in tourism expenditures and supported a payroll of $3.5 billion (DLNR, 2013). However, beach loss can have serious impacts to the visitor economy of Hawaiʻi. Beach narrowing and loss, and shoreline hardening, severely restricts public access to State of Hawaiʻi conservation land and natural resources. Public access to beaches and the ocean is a right that is preserved by the State of Hawaiʻi constitution. Beach loss and narrowing, and coastal dune grading that accompanies coastal development causes environmental and ecological damage to natural resources and habitats. Coastal hardening can also produce coastal water quality impacts through increased turbulence and turbidity.

HBP supports recreational uses and provides access to the ocean. It is used by surfers, kayakers, sunbathers and for a variety of other aquatic recreational uses. In addition to beach access, HBP provides multiple amenities to visitors including play fields and a comfort station. The comfort station was closed in 2019 due to damages resulting from wave energy. The City and County of Honolulu completed repairs of this seawall in 2020 and have expressed interest and support for beach nourishment for HBP. The North Shore Sustainable Communities Plan (City and County of Honolulu, 2010) specifically recommends pursuing management actions consistent with the Recommended Plan and includes the following guideline for coastal land use:

> "*Place sand from channel, stream, and harbor mouth dredging projects on local beaches in accordance with Hawaiʻi Revised Statutes Chapter 205A.*"

HBP was a federally authorized beach restoration project. Additionally, HBP is an historically important site that was added to the State Register of Historic Places on June 9, 1988.

5.5.1 Technical Significance

Significance based on technical recognition means that the resource qualifies as significant based on its technical merits, which are based on scientific knowledge, judgment, or critical resource characteristics. Technical significance should be described in terms of one or more of the following criteria: scarcity, representativeness, status trends, connectivity, limiting habitat, and biodiversity.

Scarcity - The Hawaiian Islands are the most isolated archipelago in the world, situated in the middle of the Pacific Ocean more than 3,200 kilometers (2,000 miles) from the nearest continent. Due to its extreme isolation and climactic conditions, Hawaiʻi is characterized by high levels of endemism in both its native animals and plants, with over 10,000 species found nowhere else on earth (DLNR, 2010). Although comprising less than 0.2 percent of the land area of the U.S., the Hawaiian Islands hold more than 30 percent of the nation's federally listed species, including 317 taxa of plants and animals listed by the USFWS as endangered or threatened, 12 taxa proposed as endangered and 105 taxa as candidates for listing. Unique and varied habitats are also found across the islands. This project is anticipated to provide ancillary benefits green sea turtles and Hawaiian Monk Seals, federally listed species, by providing haul-out and basking habitat.

Status and Trends - The Hawaiʻi DLNR COEMAP (2013), describes impacts of beach loss across Hawaiʻi. Chronic coastal erosion resulting from shoreline hardening has caused 10.7 miles of beach narrowing and 6.4 miles of beach lost on Oʻahu. This equates to approximately 24 percent of Oʻahu's original sandy shoreline. This results in environmental and ecological impacts as beaches are important habitat for seabirds, turtles, seals, and other animals and plants.

The National Assessment of Shoreline Change – Historical Shoreline Change in the Hawaiian Islands (USGS, 2011) found that HBP had the highest rate of beach erosion on the North Shore of Oʻahu. Furthermore, SLR will reduce habitat for nesting seabirds, native passerines, Hawaiian Monk Seals, and sea turtles, and alter coastal habitats throughout Hawaiʻi (DLNR, 2016). Beach restoration, as proposed by the Recommended Plan, will help to mitigate these trends and replace habitat that was previously lost.

Connectivity – Oʻahu is part of an archipelago that makes up the Hawaiian Islands. As a series of separate land bodies, the Hawaiian Islands are inherently dependent on the connectivity between the habitats at these various islands.

Limiting Habitat – Beach habitat in the Hawaiian Islands is especially important to Hawaiian Monk Seals and green sea turtles. This type of habitat is at risk of alteration or loss as SLR-induced flooding becomes more frequent and beach erosion worsens.

Biodiversity - Mature islands, such as Oʻahu and Kauaʻi in the Main Hawaiian Islands and Nihoa and Necker in the Northwestern Hawaiian Islands are the most diverse, with habitat types ranging from estuaries and sandy beaches to rocky beaches and fringing and barrier reefs to lagoons with patch or pinnacle reefs. Although thousands of Hawaiian species have yet to be described, the estimated number of native species is thought to include more than 14,000 terrestrial, 100 freshwater, and 6,500 marine taxa. For more than 70 million years, the evolution of new species vastly exceeded losses to extinction.

Marine species in Hawaiʻi include over 1,200 species of fishes, with around 500 species adapted to live on coral reefs, and the rest adapted to the pelagic open surface waters, mesopelagic or bathypelagic zones (middle or deep waters), estuaries, or sandy bottoms. At the top of the food chain are the apex predators such as the many sharks and large predatory reef and pelagic fishes of Hawaiʻi. Over 5,000 marine invertebrates are known from Hawaiʻi and include over 100 species of hard, soft, and precious corals as well as hundreds of types of snails, crabs, shrimps and small numbers of worms, jellyfish, sponges, starfish, and tunicates. Five marine turtles occur in Hawaiʻi; two are common residents that nest on Hawaiʻi's beaches, and three others are more occasional visitors. All sea turtles are listed as threatened or endangered under the ESA. Approximately 26 species of marine mammals, mostly cetaceans, are considered resident or occasional visitors to Hawaiʻi. These include the humpback whale, which migrates during the winter months to Hawaiian waters to breed and give birth each year before returning to feed in Alaskan waters during spring and summer, false killer whale, and the spinner dolphin and bottlenose dolphin. Humpback whales, false killer whales, and Hawaiian Monk Seals are common marine mammals in Hawaiʻi and with the exception of the Humpback whale, are listed as endangered under the ESA. All marine mammals are protected by the MMPA.

5.6 Residual Risk

Implementation of the Recommended Plan will not eliminate beach erosion or risks associated with storm damage to infrastructure at HBP. It is anticipated that, based on projected erosion rates, the placed beach sand would persist for 23 years.

5.7 Integration of Environmental Operating Principles

The following environmental operating principles were integrated into the planning process:

Foster sustainability as a way of life throughout the organization: This project proposes a more sustainable alternative to off-site disposal of dredged material and contributes to a more sustainable coastal ecosystem.

Proactively consider environmental consequences of all USACE activities and act accordingly: Environmental consequences were considered throughout the planning process and every effort was made to modify the proposed action in such a manner so as to avoid, minimize, or otherwise mitigate anticipated adverse impacts. Construction of the Recommended Plan would improve the beach habitat of HBP. It is not anticipated that there will be impacts to historical/archeological resources.

Create mutually supporting economic and environmentally sustainable solutions: The Recommended Plan provides the maximum number of benefits to the nation and increases the net quality and quantity of desired ecosystems resources. The BUDM project is an environmentally sustainable alternative to off-site disposal of littoral sediments, requiring very little in maintenance, and avoids long-term environmental impacts wherever possible.

Continue to meet our corporate responsibility and accountability under the law for activities undertaken by USACE, which may impact human and natural environments: A full EA was conducted as required by the NEPA in addition to required coordination and consultation in accordance with applicable federal law and regulation. In addition, the principles of avoidance, minimization, and mitigation were enacted to the extent possible.

Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs: For this study, a systems approach was utilized to examine the interaction between coastal processes and the proposed BUDM for beach restoration.

Leverage scientific, economic and social knowledge to understand the environmental context and effects of USACE actions in a collaborative manner: The USACE worked closely with federal, state, and local agencies throughout this study to identify resources of concern, potential impacts and opportunities to avoid and/or minimize adverse impacts to the environment. In addition, USACE conducted a public meeting to garner public and stakeholder input on the project. The NFS has provided an abundance of institutional knowledge about the natural and human environment within and surrounding the study area.

Employ an open, transparent process that respects the views of individuals and groups interested in USACE activities: USACE has made every effort to be responsive to stakeholder concerns. Public input was solicited in writing and in person in response to the draft EA and was used for both environmental and economic analysis purposes. The draft IFR/EA has been made publicly available on the Honolulu District website. The Final EA and FONSI will also be posted to the Honolulu District website.

5.8 Summary of Accounts

5.8.1 National Economic Development

The Recommended Plan is the NED plan and provides the greatest amount of net annual benefits to the nation.

5.8.2 Regional Economic Development

Economic benefits that accrue to the region, but not necessarily the nation, include increased visitation and tourism to the beach and amenities at HBP. The expected increase in visitation resulting from the Recommended Plan would have positive effects on the region, thus providing additional regional economic development (RED) benefits, which may include increased spending at local business, new jobs and additional employment opportunities, increased wages for existing employees, and other recreation-related spending specific to the region.

5.8.3 Environmental Quality

The Recommended Plan provides ancillary ecological opportunities by creating beach habitat that supports aquatic life including haul-out and basking habitat for green sea turtles and Hawaiian Monk Seals.

5.8.4 Other Social Effects

The project contributes to the human environment by improving the beach at HBP, a publicly accessible area that is used for recreation. It provides a benefit to the local population as well as visitors to the area.

6.0 ENVIRONMENTAL IMPACTS

6.1 Background

This chapter provides an overview of anticipated environmental impacts. The environmental consequences of the various alternatives were evaluated in comparison to the No Action Alternative, as described in Section 4.1.1.

The following consequence analysis focuses only on comparison of the No Action Alternative, Alternative 1, against the O&M Base Plan, Alternative 1A and the Recommended Plan, Alternative 4. Alternatives 2, 2A and 3 are lesser derivatives in scope and constitute smaller components of the all-encompassing Alternative 4 or Recommended Plan. The Recommended Plan compiles all other alternatives into a single proposed action. Accordingly, the anticipated impacts of each Alternative 2, 2A and 3 are reasonably expected to be no more than identical to and likely less than the anticipated impacts of the Recommended Plan, unless otherwise noted.

The Recommended Plan estimates stability of the restored beach for 23 years and meets the study objective. All other alternatives estimate as little as 2 years to up to 8 years of stability and benefit and accordingly do not meet the study objective as effectively or efficiently as the Recommended Plan. The anticipated adverse environmental effects are lessened when weighed against the extended length of stability and consequential benefit to navigation, coastal storm risk reduction, recreation and ecological opportunities that the Recommended Plan provides.

6.2 Physical Resources

6.2.1 Terrestrial Habitat

6.2.1.1 No Action Alternative

The No Action Alternative proposes no federal action to curtail imminent shoreline erosion of landside infrastructure and terrestrial habitat. Without implementing a measure to address shoreline erosion, especially in anticipation of climate change and sea level rise, the shoreline would continue to erode resulting in the loss of the beach and adjacent uplands. Accordingly, the No Action Alternative has the potential to cause significant adverse impacts on terrestrial habitat.

6.2.1.2 O&M Base Plan

The O&M Base Plan involving ocean disposal would have no effect on the terrestrial habitat. O&M dredging within the federal channel with ocean disposal is an entirely waterborne activity and involves no work on land. Minimal ancillary upland activities would occur within the contractor’s staging area which was previously sited on State harbor property for prior dredge cycles, in previously disturbed areas void of terrestrial habitat.

Should sampling and analysis of the dredged material necessitate upland disposal, then impacts to terrestrial habitat must be considered. USACE would coordinate siting of an appropriate upland dewatering area for storage, handling, sampling and analysis and dewatering of the dredged material with the NFS. USACE would only approve an upland disposal site that complies with all applicable federal and state laws and regulations. For example, the recent maintenance dredging of the Honolulu Harbor necessitated obtaining a Section 401 National Pollutant Discharge Elimination System permit and Solid Waste Management Facility permit from the State Department of Health prior to disposal at an existing landfill. Similar permitting is anticipated to be required for the HSBH, if upland disposal is pursued. Accordingly, in ensuring environmental compliance, USACE would ensure terrestrial habitat is unaffected by the dewatering and disposal activities and would not approve an upland disposal site that caused adverse impacts to terrestrial habitat. Existing, active, permitted landfills are expected to be void of terrestrial habitat. Accordingly, the O&M Base Plan that involves upland disposal would have no effect on terrestrial habitat.

6.2.1.3 Recommended Plan

There will be a minor impact to some terrestrial habitat during construction of the project features. The impacts to terrestrial habitat will result from the placement of dredged material on the existing beach terrestrial habitat to increase the overall beach terrestrial habitat area at Haleʻiwa. The material being deposited will serve as additional beach acreage and will be utilized in the same fashion and support the same biota as the existing beach. The Recommended Plan is expected to have a beneficial effect on terrestrial habitat as it will increase available beach haul-out areas for sea turtles and Hawaiian Monk Seals. Accordingly, USACE anticipates insignificant impacts to terrestrial habitat by the Recommended Plan.

6.2.2 Aquatic Resources

6.2.2.1 No Action Alternative

The No Action Alternative proposes no federal action to address shoreline erosion in the study area. Erosion of the shoreline contributes terrigenous sediments and other pollutants to the nearshore marine environment which degrades water quality and negatively affects marine ecosystems. If no measure is implemented to curtail erosion and prevent damage to landside infrastructure, in particular the comfort station then erosive forces could act upon and rupture subsurface sewer lines that would convey untreated sewage into Waialua Bay leading to catastrophic consequences for marine life. Due to the imminent threat to landside infrastructure from shoreline erosion, the No Action Alternative has the potential to cause significant adverse impacts to aquatic resources.

6.2.2.2 O&M Base Plan

The O&M Base Plan involves in-water work consisting of maintenance dredging of HSBH with transport and disposal of dredged material at the South Oʻahu ODMDS. Such activities would temporarily impact WOTUS and associated aquatic resources, ecosystems and habitats. The impacts would be temporary and discrete and consistent with the continued maintenance of the harbor resulting in insignificant impacts to aquatic resources.

The South Oʻahu disposal site is in Māmala Bay. Approximately 4 nautical miles offshore, south of the Pearl Harbor entrance, at a depth of 1,230-1,560 ft. this site is the most frequently and heavily used of the five Hawaiʻi ODMDSs. A total of approximately

6.3 million cy of suitable dredged material (81% of all disposals at all Hawaiʻi sites combined) has been approved by USACE and USEPA for disposal at this site since it was designated in 1981. Most of this volume (over 4.4 million cy) was disposed prior to 2000 (USEPA, 2015). The USEPA designated the South Oʻahu ODMDS, manages the overall use of the site for all users through consultation with resource agencies and regular monitoring of the physical, chemical and biological conditions of the site, and approves each individual use of the site by users such as USACE to ensure the dredged material proposed for disposal complies with the Ocean Testing Manual and would be consistent with the existing conditions at the disposal site. In 2020, the USEPA completed ongoing programmatic consultation with NMFS and USFWS and concluded that USEPA's ocean disposal site selection in distant, deep waters previously identified as void of marine ecosystems, rigorous pre-disposal sediment testing, and site management measures help to ensure that adverse water column and seafloor effects to both listed species and EFH are avoided and minimized.

Consistent with the USEPA assessment of impacts and conclusions, USACE anticipates that the O&M Base Plan involving ocean disposal would have insignificant impacts on aquatic resources.

In the event that the material dredged from the HSBH is not suitable for ocean disposal, USACE will pursue upland disposal and conduct necessary dewatering, sampling and analysis to ensure compliance with state law concerning upland disposal. USACE would only approve an upland disposal site that complies with all applicable federal and state laws and regulations. Accordingly, in ensuring environmental compliance, USACE would ensure aquatic resources are unaffected by the dewatering and disposal activities and would not approve an upland disposal site that caused adverse impacts to aquatic resources. Existing, active, permitted landfills are expected to be void of aquatic resources. Accordingly, the O&M Base Plan that requires upland disposal would have no effect on aquatic resources.

6.2.2.3 Recommended Plan

The Recommended Plan would result in the placement of dredged material (i.e., beach quality sand) into approximately 4.2 acres of the Waialua Bay, a navigable water and WOTUS, for the purpose of beneficially using dredged material to nourish the eroding shoreline at the HBSPP fronting the HBP. The Recommended Plan does not propose any other fill activities in nearby WOTUS such as the Anahulu River or adjacent wetlands, including the Loko Ea Fishpond and Ukoa Pond. The Section 404(b)(1) evaluation for this project, can be found in Appendix B and concludes that the proposed action is consistent with the specified guidelines.

The Recommended Plan would result in the conversion of up to 4.2 acres of intertidal and subtidal shoreline WOTUS to uplands. This plan is consistent with the constructed beach at HBSPP in 1965 and 1969; accordingly, the Corps anticipates that natural wind and wave erosion will eventually erode the nourished beach proposed under the Recommended Plan back to existing conditions. In addition, the beach would be nourished using native sediments that are consistent with the existing beach i.e., compaction, grain size, color, etc. The impacts to aquatic resources would, in essence, be temporary and insignificant.

Discussion of compliance with Section 404 of the Clean Water Act is provided at Section 7.4.2. Discussion of compliance with Section 103 of the Marine Protection Research and Sanctuaries Act is provided at Section 7.4.6.

6.2.3 Water Quality

6.2.3.1 No Action Alternative

The No Action Alternative proposes no federal action to address shoreline erosion in the study area. Similar to the discussion regarding impacts to aquatic resources at Section 6.2.2.1, the No Action Alternative has the potential to cause significant adverse impacts to water quality of Waialua Bay.

6.2.3.2 O&M Base Plan

The O&M Base Plan involves in-water work activities resulting in temporary impacts to water quality, in particular, elevated turbidity during maintenance dredging activities. Turbidity generated from mechanical dredging will be abated through use of silt curtains of varying length and an environmental bucket when using a mid-depth silt curtain to isolate and contain the active dredge area. In addition, the contractor will be responsible for actively monitoring and maintaining the silt containment device to ensure water quality is not degraded beyond the active dredge area. The maintenance dredging would be covered under the existing Blanket Water Quality Certification (WQC 1092 issued by the State DOH on April 28, 2002) to ensure compliance with the State water quality standards. The impacts would be temporary and discrete and minimized to the greatest extent practicable through use of Best Management Practices (BMP) consistent with the continued maintenance of the harbor. Accordingly, the O&M Base Plan that involves ocean disposal would result in insignificant impact to water quality.

In the event material dredged from HSBH is not suitable for ocean disposal, as identified in the design phase, USACE would pursue upland disposal at an appropriate upland disposal site. Upland disposal requires dredged material handling, stockpiling, dewatering, sampling and analysis in uplands prior to disposal to ensure compliance with state law concerning upland disposal. USACE would only approve an upland dewatering and disposal site that complies with all applicable federal and state laws and regulations to ensure water quality is unaffected by the dewatering and disposal activities and would not approve an upland disposal site that either contained or caused adverse impacts to aquatic resources and water quality. Existing, active, permitted landfills are expected to be void of aquatic resources or other surface waters. Accordingly, the O&M Base Plan that requires upland disposal would have no effect on water quality.

6.2.3.3 Recommended Plan

The BUDM action of placing dredged material onto the shoreline and in the nearshore environment would generate elevated turbidity that could degrade water quality in the project vicinity. All construction activities would be conducted in accordance with BMPs developed by the USACE in consultation with various federal and state resource and regulatory agencies to monitor and minimize water quality degradation during construction. It is important to note that the sediment being placed along the shoreline and that would be the impetus of elevated turbidity level has been sourced from the surrounding seafloor in the same littoral cell. In addition, the sediments will be predominately coarse grain sand, absent of fine sediments, and accordingly would elevate turbidity levels momentarily, with expected immediate settling consistent with current settling rates for coarse-grain sand and given the wave climate fronting the HBSPP shoreline. For this reason, USACE anticipates compliance with State water quality standards.

Through compliance with Section 401 of the CWA (see Section 7.4.2), USACE will ensure the Recommended Plan is implemented in accordance with applicable state water quality standards at Hawaiʻi Administrative Rules Chapter 11-54. Any impacts to water quality are expected to be temporary, limited to the duration of construction, and less than significant. Accordingly, USACE anticipates insignificant impact to water quality from the Recommended Plan.

6.2.4 Air Quality

6.2.4.1 No Action Alternative

The No Action Alternative would have no effect on the air quality of the region. The region would continue to remain in attainment with EPA National Air Attainment Quality Standards.

6.2.4.2 O&M Base Plan

The O&M Base Plan involving maintenance dredging and either ocean or upland disposal would result in similar impacts. The use heavy machinery and equipment for maintenance dredging and either barge towing dredged material suitable for ocean disposal to the South Oʻahu ODMDS or trucking dredged material suitable for upland disposal to an approved disposal site would be comparatively similar. USACE expects heavy equipment and machinery to be used would meet industry standards to minimize air pollution. USACE anticipates any degraded air quality conditions that may be caused by the O&M Base Plan would be transient, highly localized, and expected to entirely dissipate at the end of the construction phase. Accordingly, USACE anticipates insignificant impact to air quality from the O&M Base Plan involving ocean or upland disposal.

6.2.4.3 Recommended Plan

The Recommended Plan does not propose construction of any new permanent air pollutant source. Air quality may be affected during the construction period as described in the preceding section due to resultant suspended particulates and emissions from heavy equipment and vehicular operation. Minimum equipment necessary to facilitate construction of the Recommended Plan includes a barge with mechanical excavator, a tug, and a bulldozer. The contractor must adhere to USACE standard construction contract specification requiring development of an air pollution control plan as part of the contractor's environmental protection plan. USACE anticipates the discrete construction activity proposed under the Recommended Plan would cause insignificant effects on air quality. Discussion of compliance with the Clean Air Act of 1963 is provided at Section 7.4.12.

6.2.5 Soils

6.2.5.1 No Action Alternative

Under the No Action Alternative, shoreline erosion would continue to occur unabated. The shoreline fronting the HBP and comprising the HBSPP would continue to erode resulting in loss of beach and shoreline. Erosion of the shoreline would expose terrigenous soils that comprise the HBP landside and deposit land-based sediments into the marine environment. Through loss of upland soils and sediments, the No Action Alternative would result in significant adverse impact to soils in the study area.

6.2.5.2 O&M Base Plan

The O&M Base Plan with ocean disposal involves only waterborne activities ad accordingly would have no effect on soils.

If upland disposal of dredged material is required, USACE would only approve an approved upland site that meets all applicable federal and state laws and regulations, i.e., an actively used, permitted landfill, that accepts dredged material. USACE expects that such an upland disposal site would be properly constructed to ensure no adverse effect to surrounding soils and has accounted for any impacted soils within the landfill itself. Accordingly, the O&M Base Plan that requires upland disposal would have no effect on soils.

6.2.5.3 Recommended Plan

The Recommended Plan would deposit beach grade sand along the existing shoreline of the HBSPP and fronting HBP. USACE would ensure that the sand is physically, chemically and biologically suitable for beneficial use of the dredged material prior to placement. The nourishment of the existing sandy beach would also prevent ongoing and slow down imminent further loss of shoreline sand and prevent exposure and discharge of terrigenous soils into nearshore waters. Due to the intended BUDM to nourish the sandy beach, USACE anticipates insignificant effects to soils in the study area by the Recommended Plan.

6.2.6 Benthic Substrate

6.2.6.1 No Action Alternative

Under the No Action Alternative, the shoreline fronting the HSBH would continue to erode as influenced by the current and projected forces of wave action and SLR on the shoreline. Erosion of landside sediments combined with SLR, over time, would extend the reach of the Waialua Bay landward. Terrigenous sediments that erode into Waialua Bay would add to the composition of benthic sediments in Waialua Bay, increasing fine and organic content and decreasing proportion of coarse grain sand. In addition to the volume of benthic substrate increasing locally, the physical, chemical and biological makeup of the benthic substrate sediments would change. Over time, the shoreline would reach an equilibrium and the introduced terrigenous sediments would reach an equilibrium. USACE anticipates that changes to benthic substrate by the No Action Alternative would be insignificant with the potential for significant impacts should erosion of uplands continue unabated.

6.2.6.2 O&M Base Plan

Benthic substrate in the HSBH navigation channel consists entirely of unconsolidated sediments as described at Section 2.1.6.2. Sediment of similar physical and chemical composition of existing harbors substrate, would continue to naturally accumulate via littoral drift of sand and gravel at the seaward end of the navigation channel and stream deposition of fine-grain sediments and organic material at the landward end of the navigation channel. Consequently, sediments that shoal within the federal navigation channel will be maintenance dredged to restore depths in the harbor down to the authorized dredge depth of -12 feet MLLW. The USACE responsibility to maintain the general navigation features of HSBH will continue to occur on an as-needed basis in perpetuity. Typical accumulation rates are less than 8,000 cy every 10-15 years. USACE anticipates that if no change to usage in the harbor and in the surrounding area, then the same type of benthic sediments will continue to accumulate at a similar rate. Disposal of the dredged material either at an ocean or upland disposal site, outside of the littoral cell would result in a perpetual loss of accumulated benthic substrate. The remaining benthic substrate in the harbor would not be affected as maintenance dredging would not disturb benthic substrate below -13'MLLW.

If determined suitable for ocean disposal, dredged material would be disposed at the South Oʻahu ODMDS. Based on the USEPA 2013 monitoring survey, the benthic substrate at the South Oʻahu ODMDS consists entirely of unconsolidated sediments, fine grain silts and clays, more gravel size sediments and 44% sand. Based on 2008 sediment characterization of HSBH, HSBH sediments consists of approximately 50% fine-grain sediments and would be substantially the same as the substrate at the SOODMDS. The survey also confirmed that after receiving a total of 6.2 million cy of dredged material since its designation, there have been no significant adverse impacts compared to 1980 baseline conditions; only minor physical effects, low concentrations of chemicals of concern and evidence of relatively rapid recolonization by infaunal and epifaunal communities after dredged material is deposited. Because the harbor sediments are similar in physical and chemical composition as the ocean disposal site and because the dredged material will undergo rigorous sampling and analysis in order to determine suitability for ocean disposal, as coordinated with USEPA, USACE anticipates that the O&M Base Plan with ocean disposal would result in insignificant impacts to benthic substrate at the South Oʻahu ODMDS.

As described at 7.2.2.2, any upland approved disposal site would be void of aquatic resources and likewise, have no effect on benthic substrate.

6.2.6.3 Recommended Plan

The Recommended Plan to dredge within the federal channel at the HSBH, the State breakwater settling basin, the offshore borrow area and the barge access zone would remove existing upper profile and deposit dredged material atop existing intertidal, nearshore benthos fronting the HBP. Placement of beach quality sand will convert up to 4.2 acres of intertidal and nearshore subtidal benthic substrate to uplands. Dredging will expose lower profile sediments that may be more compact and feature a higher proportion of fine-grained sediments that have accumulated and settled overtime. The immediate dredge footprints will be “fluffed” during dredging, so compaction would not prevent recolonization by benthic infaunal communities. The Recommended Plan would not introduce foreign benthic sediments, therefore a return to normal conditions is expected via natural hydrodynamics and accumulation rates. Sediments at the beach restoration site would be substantively similar with native sediments, by design, to comply with state water quality standards. The Corps characterizes the above impacts as minimally adverse. Accordingly, the Corps anticipates insignificant impacts to benthic substrate within the study area from the Recommended Plan.

6.3 Biological Resources

6.3.1 Fish and Wildlife Resources

6.3.1.1 No Action Alternative

Under the No Action Alternative fish and wildlife resources would not be directly impacted by any federal action. However, fish and wildlife resources fronting the HBSPP may be adversely affected by continued and chronic input of terrestrial pollutants into and degrading nearshore waters as the shoreline is eroded over time. The loss of beach would mean the loss of Hawaiian Monk Seal and sea turtle basking and resting area. Accordingly, the No Action Plan has the potential to cause significant adverse impact to fish and wildlife resources via unmitigated shoreline erosion into the marine environment.

6.3.1.2 O&M Base Plan

Resources occurring within and adjacent to the federal channel would be minimally impacted by routine O&M activities, as such resources have been previously impacted since the construction of the harbor and with every maintenance dredge event.

Impacts to fish and wildlife resources in transit to and at the ocean disposal site were contemplated by USACE and USEPA separately in consultation with the resource agencies and pursuant to Section 7 of the ESA and the EFH provisions of the MSA. The conclusions of both of those consultations by both agencies were that the transit and disposal of dredged material at the South Oʻahu ODMDS may affect but is not likely to adversely affect ESA listed marine species and may adversely affect, but does not have potential to cause substantial adverse effects to EFH. Additionally, and as described at Section 6.2.6.2, the biological community at the South Oʻahu ODMDS has been minimally impacted and suggests rapid recovery of existing benthic infauna after use of the site. Accordingly, USACE has determined that the O&M Base Plan that requires ocean disposal will have insignificant impacts to fish and wildlife resources in transit to and at the South Oʻahu ODMDS.

USACE anticipates that any approved upland disposal site would be void of fish and wildlife resources; fish and wildlife resources would be unaffected by the O&M Base Plan requiring upland disposal.

6.3.1.3 Recommended Plan

Under the Recommended Plan, fish and wildlife resources within the harbor and in transit to the South Oʻahu ODMDS would be minimally impacted through implementation of BMPs negotiated in consultation with federal and state resource and regulatory agencies (See Section 8.6.2). The Recommended Plan proposes conversion of intertidal hard and soft bottom habitats fronting the HBSPP shoreline with sandy beach habitat. While the Recommended Plan ultimately reconstructs the previously constructed beach of the authorized HBSPP, the existing conditions of the shoreline presently provide habitat for marine communities. However, USFWS broadly described the study area as low diversity of marine resources and low coral numbers relative to other places in Hawaiʻi. Accordingly and through implementation of BMPs, USACE anticipates impacts to fish and wildlife resources to be insignificant. Discussion of compliance with the FWCA is available at Section 7.4.4 below.

6.3.2 Marine Mammals

6.3.2.1 No Action Alternative

Under the No Action Alternative, no federal action would affect marine mammals. Marine mammals that may occur within the study area include the endangered Hawaiian monk seal. The continued erosion of the shoreline fronting the HSBPP would contribute terrigenous pollutants to and degrading the nearshore marine environment, as described in prior sections 7.2.2.1, 7.2.3.1, 7.3.1.1. The loss of the beach would result in the loss of shoreline available for haul out and resting by Hawaiian monk seal. Accordingly, the No Action Alternative has the potential to cause significant adverse impact to marine mammals via unmitigated shoreline erosion into the marine environment and loss of beach habitat for haul out and resting.

6.3.2.2 O&M Base Plan

Under the Recommended Plan, only Hawaiian monk seal are expected to occur in the nearshore area where dredging using heavy equipment is proposed. Potential impacts to marine mammals in the nearshore area range from dredging and equipment directly physically impacting Hawaiian Monk Seal or causing such marine mammals to temporarily move away from or avoid the active construction area during construction. The potential for physical impact and avoidance of the area would stop upon completion of the in-water work.

Potential impacts to marine mammals i.e., seals, dolphins and whales in the open ocean resulting from the dredged barge and scow transiting to the South Oʻahu ODMDS for dredged material disposal are higher than in the nearshore environment because marine mammals occur more commonly in deeper waters and due to limited visibility by vessel operators, are harder to see and avoid. Potential impacts would include vessel collision or direct physical impact during disposal activities. However, such impacts that would constitute “take” under the MMPA would be extremely unlikely i.e., “discountable” and in addition are avoided and/or minimized to the greatest extent practicable through implementation of the ESA BMPs such as species observers, slow starts, reduced vessel speed, etc., negotiated in consultation with NMFS through the Section 7 ESA consultation. Accordingly, USACE anticipates the O&M Base Plan involving maintenance dredging with ocean disposal would result in insignificant impacts to marine mammals. Further discussion regarding impacts to this endangered marine mammal and proposed BMPs to avoid and/or minimize impacts are provided at Section 6.3.3.2, and 8.6.2. Discussion regarding compliance with the ESA and MMPA are provided at Sections 7.4.3 and 7.4.6, respectively

Where upland disposal of dredged material is necessary, the upland disposal site will have no marine mammals and accordingly, the O&M Base Plan involving upland disposal will have no effect on marine mammals.

6.3.2.3 Recommended Plan

The Recommended Plan would involve additional in-water work using a barge-mounted excavator or similar to dredge areas outside of the HSBH federal navigation channel with offloading of the scow at the beach fronting HBSPP. Impacts to Hawaiian Monk Seal would be similar as expected with the maintenance dredging in the harbor and likewise would be temporary, only during construction activities. Shallow water and less prevalence of marine mammals in the nearshore area would decrease potential for impact in addition to implementation of ESA BMPs.

The Recommended Plan proposes to protect the shoreline fronting the HBSPP via beach nourishment. With the increase in sandy beach, the Recommended Plan would benefit Hawaiian Monk Seal by providing beach suitable for haul out and resting.

While temporal impacts to marine mammals may be adverse during construction and transport, permanent impacts from the Recommended Plan are expected to be beneficial to marine mammals. Accordingly, overall impacts to marine mammals from the Recommended Plan are expected to be insignificant.

6.3.3 Threatened and Endangered Species

6.3.3.1 No Action Alternative

Loss of shoreline due to unabated erosion would result in loss of terrestrial Hawaiian Monk Seal designated critical habitat as well as loss of suitable habitat for sea turtle haul out and basking. In addition, the shoreline will continue to erode due to wave action and terrestrial sediments and pollution will be released into the marine environment, degrading marine habitat for marine listed species. Accordingly, the No Action Alternative has the potential to cause significant adverse impact to threatened and endangered species if localized shoreline erosion is left unaddressed.

6.3.3.2 O&M Base Plan

Potential impacts to threatened and endangered species from the maintenance dredging of the HSBH with ocean disposal at the South O‘ahu ODMDS is documented, in accordance with Section 7 of the ESA, in the Biological Evaluation dated September 2021. USACE concluded that the Recommended Plan, inclusive of the maintenance dredging, ocean disposal and minimal upland access, stockpiling, staging and dewatering areas may affect, but is not likely to adversely affect ESA-listed species. Accordingly, USACE anticipates the O&M Base Plan involving ocean disposal would cause insignificant impacts to threatened and endangered species.

Should upland disposal be required, USACE anticipates that the approved upland disposal site will be an operating, permitted landfill that, by design, is absent of threatened and endangered species or habitat suitable for threatened and endangered species. Accordingly, upland disposal of dredged material would cause no additional impact on threatened and endangered species than is identified for the maintenance dredging of HSBH.

6.3.3.3 Recommended Plan

Completion of the Recommended Plan is intended to have a beneficial effect to listed species by increasing area of available suitable beach habitat for Hawaiian Monk Seals and sea turtles to haul out and bask. However, during construction, work involving heavy machinery in and near the marine environment and could affect listed species and possibly protected marine mammals via the following potential vectors for impact: 1) Collision with vessels; 2) Direct physical impact; 3) Disturbance from human activity and equipment operation; 4) Exposure to elevated noise levels; 5) Exposure to elevated turbidity and sedimentation; 6) Exposure to wastes and discharges; and 7) Loss of forage habitat. Potential adverse effects to listed species and critical habitat described at Section 2.2.3 within the action area would be avoided and minimized via implementation of BMPs before, during and after construction and any effects to listed species and critical habitat will be insignificant and discountable.

Accordingly, pursuant to Section 7(a)(2) of the ESA the USACE has determined the proposed project may affect, but is not likely to adversely affect the species listed at Section 2.2.3. USACE anticipates insignificant impacts to threatened and endangered species and designated critical habitat by the Recommended Plan.

The biological evaluation documenting the USACE full evaluation of effects to listed species is available for reference in Appendix B. Discussion of compliance with Section 7 of the ESA is provided at Section 7.4.3 below. Measures to avoid and minimize adverse impacts to listed species and protected marine mammals is provided at Section 8.6.2

6.3.4 Essential Fish Habitat

6.3.4.1 No Action Alternative

The No Action Alternative wherein the shoreline continues to erode will degrade quality of water column EFH as terrigenous sediments and associated pollutants discharge into the marine environment. In addition, erosion of the shoreline increases open water area in Waialua Bay, extending the shoreline inland, and would increase amount of designated EFH in the study area since the combined EFH designation for federally managed fisheries in the Hawai‘i archipelago begins at the shoreline. Accordingly, USACE anticipates insignificant impacts to EFH from the No Action Alternative.

6.3.4.2 O&M Base Plan

The O&M Base Plan involving in-water construction activities has the potential to reduce the quantity of substrate EFH consisting wholly of accumulated sediments within the HSBH navigational channel and reduce the quality of water column EFH during maintenance dredging activities within the active dredge area, with no anticipated long term adverse effects to EFH. Any upland disposal site would be absent of EFH and therefore upland disposal of dredged material would have no effect on EFH. The transport and disposal of dredged material at the South O‘ahu ODMDS may adversely affect EFH, but does not have the potential to cause substantial adverse effects to EFH, as described in the USACE EFH Assessment dated August 2021 (Appendix B). Accordingly, the O&M Base Plan will result in insignificant impacts to EFH.

6.3.4.3 Recommended Plan

The Recommended Plan involving in-water construction activities within and outside the HSBH federal navigation channel has the potential to temporarily reduce quality of water column EFH, i.e., elevated turbidity, during construction and have long-term reduction in quantity of water column, i.e., conversion of intertidal shoreline to beach, and long-term reduction in quantity of substrate EFH within the maintenance dredge and borrow areas. There are no anticipated permanent effects to EFH or federally managed fishery species with no measurable impact to the sustainability of the fishery. USACE anticipates the proposed action may adversely affect EFH, but does not have the potential to cause substantial adverse effect to EFH or any federally managed fishery. USACE anticipates insignificant impacts to EFH and federally managed fishery species by the Recommended Plan.

The EFH assessment documenting the USACE full evaluation of effects to EFH is available for reference in Appendix B. Discussion of compliance with the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act is provided at Section 7.4.5 below.

6.4 Socioeconomic Resources

6.4.1 Land Use

6.4.1.1 No Action Alternative

The continued loss of land along the shoreline of HBP would negatively impact existing land use plans by decreasing available land, possibility for implementation of existing plans, and availability of land for future plans. Accordingly, the No Action Alternative has the potential to cause significant adverse impacts to land use if erosion of the shoreline, i.e., loss of land continues with no resolution.

6.4.1.2 O&M Base Plan

The O&M Base Plan involving maintenance dredging within the HSBH, conducive to the continued operation of the harbor, as intended and designated would have no effect on land use. The disposal of dredged material at the South O‘ahu ODMDS is an entirely waterborne activity that would have no effect on land use. Upland disposal of dredged material is anticipated to occur in an existing, permitted landfill that will accept the HSBH dredged material, consistent with the land use designated at the upland disposal site. Accordingly, upland disposal of dredged material would have no effect on land use.

6.4.1.3 Recommended Plan

The Recommended Plan does not include any changes to existing land use designations. The resource would be unaffected by the Recommend Plan. Improved beach conditions along the HBP would result in beneficial impact to existing land use plans by increasing land available to implement existing plans.

6.4.2 Coastal Zone Management

6.4.2.1 No Action Alternative

Under the No Action Alternative, the beach will continue to erode and there will be potential negative effects on protection of infrastructure, public beach and shoreline access and recreation within the HBP. In addition, erosion of the shoreline and associated pollutants into the ocean would negatively affect coastal recreation and access as beach closures by local government could be reasonably expected to ensure public safety. These consequences would not meet the objectives of the State Coastal Zone Management Act (CZMA) plan. If not resolved, the continued erosion of the coast fronting the HBSPP has the potential to result in significant adverse impact to Coastal Zone Management.

6.4.2.2 O&M Base Plan

USACE has determined and the State CZM Office has concurred, that the maintenance dredging of the HSBH under the USACE O&M program is consistent to the greatest extent practicable with the enforceable policies and objectives of the State CZM Plan. Accordingly, the maintenance activity in coastal waters would have no effect on CZM.

The South Oʻahu ODMDS is located beyond state waters (3 nautical miles). Accordingly, ocean disposal of dredged material at the South Oʻahu ODMDS would have no effect on CZM.

Any dredged material determined to be unsuitable for ocean disposal would be disposed in uplands at an approved upland disposal site, i.e., landfill that accepts dredged material. The use of an existing, permitted landfill for its intended and authorized purpose, i.e., disposal of dredged material unsuitable for ocean disposal, would have no effect on CZM.

6.4.2.3 Recommended Plan

The Recommended Plan involving in-water construction activities and modification i.e., restoration, of the existing shoreline occurs in the State's coastal zone and accordingly has the potential to impact and must align with the State CZM plan. The Recommended Plan would temporarily disrupt public beach, ocean and shoreline access to facilitate construction activities, as is necessary to ensure public safety during construction. However, the intent of the Recommended Plan is to investigate BUDM such as beach restoration at HBP providing protection to landside infrastructure by abating shoreline erosion. Implementation of the Recommended Plan would, in the long-term, would improve recreation, public safety and public access to the beach and shoreline.

USACE has determined the Recommended Plan is consistent with the enforceable policies and objectives of the State CZM Plan and Hawaiʻi's Ocean Research

Management Plan, which seeks to address coastal challenges such as beach erosion and protection of infrastructure along the shoreline. Accordingly, the Corps anticipates CZM resources will be unaffected by the Recommended Plan. CZM correspondence documents are available for reference in Appendix B. Discussion of compliance with the CZMA is provided at Section 7.4.8 below.

6.4.3 Environmental Justice

6.4.3.1 No Action Alternative

The study area is absent of minority or economically-disadvantaged communities per USEPA and CEQ designation. Under the No Action Alternative, HBP will continue to erode, however, would have no direct effect on minority or economically-disadvantaged communities.

6.4.3.2 O&M Base Plan

The O&M Base Plan with ocean disposal is an entirely waterborne activity that will have no direct effect on minority or economically-disadvantaged communities. If upland disposal is necessary, any upland disposal site will be an existing, permitted site and the disposal will be consistent with the use and designation of that upland site so as to cause no effect to minority or economically-disadvantaged communities.

6.4.3.3 Recommended Plan

Under the Recommended Plan USACE proposes to restore the beach fronting HBP, intended to protect landside infrastructure and provide recreational opportunities for the public, some of whom may originate from minority or economically-disadvantaged communities. The study area is absent of minority or economically-disadvantaged communities, therefore, USACE has determined that this resource would be unaffected by the Recommended Plan. Discussion of socioeconomic resources is provided in Section 2.3.4 and documentation of compliance with EO 12898 is provided at Section 7.4.13 below.

6.4.4 Aesthetic Quality

6.4.4.1 No Action Alternative

The No Action Alternative will allow for continued erosion of the shoreline. This will undermine landside facilities and degrade the aesthetic quality of the beach and shoreline. In particular, access to the views of the north Oʻahu segment of the Hawaiian Islands Humpback Whale National Marine Sanctuary to the northeast, the surrounding agricultural land use district, the historic structures of HBP, historic Haleʻiwa Town, the HBSPP and HSBH in Waialua Bay, the Loko Ea fishpond, Mount Kaʻala and the Waiʻanae Mountain Range, and the Anahulu River from HBP will be limited by the loss of vantage points on the beach. Left unabated, shoreline loss from the No Action Alternative has the potential to cause significant impact to the aesthetic quality within and surrounding the study area.

6.4.4.2 O&M Base Plan

The O&M Base Plan involving maintenance dredging in HSBH with disposal of dredged material at existing ocean and upland disposal sites consistent with the disposal site designation, would have no effect on the aesthetic quality of the study area and surrounding area.

6.4.4.3 Recommended Plan

Aesthetic quality within the study area is expected to be improved after construction is complete. Most of the project will be located on recreational lands that are open to and accessible by the general public.

Under the Recommended Plan, aesthetic quality would be temporarily adversely impacted during construction as access to the shoreline will be limited either in full or in part by the construction activities to ensure public safety. Heavy equipment will be operating at HSBH and along the HBP shoreline to facilitate the dredge and beach restoration activities. Post construction, the changes in aesthetics for the general public will be immediately noticeable on Haleʻiwa Beach due to an increased width of the beach and will be visible to passersby.

The Recommended Plan is expected to have a positive effect on the aesthetics of the project due to the restoration of a previously constructed beach which is used for recreation and that has eroded by wave and tidal action. In particular access to views of the North Oʻahu segment of the Hawaiian Islands Humpback Whale National Marine Sanctuary to the northeast, the surrounding agricultural land use district, the historic structures of HBP, historic Haleʻiwa Town, the HBSPP and HSBH in Waialua Bay, the Loko Ea fishpond, Mount Kaʻala and the Waiʻanae Range and the Anahulu River from HBP will be increased with the increase in vantage points from the beach. USACE anticipates insignificant effects to aesthetic quality by the Recommended Plan.

6.4.5 Noise

6.4.5.1 No Action Alternative

The No Action Alternative will not generate noise greater than ambient levels and also will have no effect on noise in the study area.

6.4.5.2 O&M Base Plan

The O&M Base Plan requires use of heavy machinery that generates noise levels consistent with industry standard, that will operate in an existing harbor and in existing disposal sites that regularly feature heavy machinery, equipment and vehicles/watercraft that generate similar noise levels and constitute ambient noise in the study area. Accordingly, the O&M Base Plan may result in insignificant impacts to noise levels of the study area and surrounding area.

6.4.5.3 Recommended Plan

There is no expected permanent change in noise post-construction. The site will continue to be used as a beach post-construction and expected noise levels will not change from current noise levels. Construction will temporarily generate noise as a result of use of heavy machinery (e.g., a dredge barge with excavator, scow, tugboats, bulldozer or bobcat) and increase in worksite personnel presence and activity necessary to execute the Recommended Plan. The noise generated during construction will immediately cease at the completion of the project. HBP and the surrounding marine activity and landside commercial activity generates considerable sound during daylight hours, well above ambient, natural sounds. USACE anticipates construction activities with relatively few mobilized machinery and equipment would generate a relatively small increase to the baseline noise generated on a daily basis. The material to be dredged is soft sediments and would not generate anywhere near the noise levels expected of new dredging of hard substrate or pile driving. USACE has included as a condition of its construction contract that the contractor must comply with all applicable local regulations concerning noise generation and abatement. Due to the discrete nature of the work in soft sediments, the relatively small number of heavy machinery required and the ambient noise generated from high vehicle and pedestrian traffic in the area, USACE anticipates that any noise generated during construction would be insignificant and temporary.

6.4.6 HTRW

6.4.6.1 No Action Alternative

USACE conducted a review of publicly available reporting databases and has not identified any HTRW in the study area. Under the No Action Alternative, the eroding shoreline would receive no federal intervention. Left unabated, landside infrastructure at HBP would be at risk for imminent damage that could release anthropogenic waste such as raw sewage into the human environment. Accordingly, the No Action Alternative has the potential to result in significant impacts related to HTRW in the study area.

6.4.6.2 O&M Base Plan

The O&M Base Plan involving maintenance dredging of uncontaminated sediments in HSBH with disposal at existing ocean and upland disposal sites designated for such purpose, would have no effect related to HTRW in the study area.

6.4.6.3 Recommended Plan

The Recommended Plan proposes dredging of benthic sediments and no excavation or other ground-breaking activities in upland areas. BMPs identified in Section 8.6.2 such as development of a spill prevention and response plan to be implemented during construction would avoid and minimize potential for a release of HTRW into the environment. Because the study area is absent of HTRW and sources of HTRW and because the Recommended Plan would not intentionally or inadvertently introduce HTRW into the study area, the Corps has determined HTRW would be unaffected by the Recommended Plan.

6.4.7 Historical and Archaeological Resources

6.4.7.1 No Action Alternative

The No Action Alternative would result in unabated erosion of the shoreline in the study area, undermining landside facilities and potentially adversely affecting the nearby “Art Deco Parks” historic district. In addition, based on nearby archaeological findings, buried deposits may be present within the APE therefore, erosion of the shoreline in the study area could unearth unidentified subsurface historic properties. Accordingly, the No

Action Alternative has the potential to result in significant impacts on historic and archaeological resources in the study area.

6.4.7.2 O&M Base Plan

Based on an investigation of historic resources in the study area, the APE is absent of historic properties listed or eligible for listing on the National or Hawai ʻi Registers of Historic Places. The O&M Base Plan involving maintenance dredging in HSBH with disposal of dredged material at existing ocean and upland disposal sites consistent with the disposal site designation, would have no effect on historical and archaeological resources.

6.4.7.3 Recommended Plan

The Recommended Plan involves use of heavy machinery in the marine environment and along the adjacent shoreline that has the potential to impact unidentified subsurface historic properties during construction. In addition, the modification of the natural shoreline to restore the beach has the potential to impact historic properties. However, based on an investigation to identify historic and archaeological resources that could be impacted by this study, USACE identified no historic properties listed or eligible for listing on either the National or Hawaiʻi Registers of Historic Places within the APE for the study area. In addition, the Recommended Plan is limited in geographic and spatial scope and accordingly would not affect any surrounding historic properties located beyond the APE.

The following discussion concerns potential effects to historic and archaeological resources in the surrounding area and outside the APE. Based on nearby archaeological findings, buried deposits may be present within the APE. Since there will be no ground disturbance within the APE during this project, any potential undocumented subsurface historic properties will not be affected. Furthermore, restoration of the beaches likely to benefit for the protection of undocumented subsurface historic properties or burials along the shoreline within the APE that otherwise would be unearthed by natural erosion. Likewise, restoration of the beach would protect the shoreline by slowing erosion rates that place nearshore historic properties located beyond the APE, such as the "Art Deco Parks" historic district, at risk of damage.

Loko Ea Fishpond, a historic property located southeast of HBP, beyond the APE, and directly east of HSBH will not be directly or indirectly affected by project activities. The Recommended Plan was amended so that barge work will be restricted to the north side of the outlet groin to avoid potential effects to the fishpond.

USACE has determined that Historic and Archaeological Resources will be unaffected by the Recommended Plan. USACE documents and correspondence related to Section 106 is available for reference in Appendix B. Discussion of compliance with Section 106 is provided at Section 7.4.9 below.

6.5 Cumulative and Long-term Impacts

The CEQ regulations at 40 CFR 1508.1(g)(3) defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time."

NEPA guidance (40 CFR 1508.25) identifies resources that would be considered in a cumulative impacts analysis that should be evaluated in an Environmental Impact Statement or EA. For an action to have a cumulative effect on a resource, the action must have a direct or indirect effect on that resource, unless that resource is in a declining or significantly impaired condition.

NEPA guidance (40 CFR 1502.16) establishes procedural requirements, requiring that proposals for major federal actions significantly affecting the quality of the human environment consider the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and any irreversible and irretrievable commitments of resources that would be involved in the proposed action. Disposal of the dredged material would occur in any of the proposed alternatives; therefore, any irreversible and irretrievable commitments of resources are similar across all proposed plans.

The State of Hawaiʻi constructed the HSBH outer breakwater in 1955. The Haleʻiwa Harbor for light draft vessels was completed by USACE in November 1966. The harbor was improved by USACE in 1974 and dredged in 1999 and 2009. Based on the current 10 to 15 year interval between maintenance dredging of HSBH, the harbor would next require dredging in 2024, and then between 2034 and 2039, as needed. The NFS is responsible for maintaining the landside structures and facilities at the HSBH in perpetuity. The Recommended Plan under this Section 1122 pilot program aligns with and ensures the long-term productivity of the HSBH.

The HBSPP was built in 1965. USACE made emergency repairs in response to storm damage in 1969, 1975, and 1978. City and County of Honolulu repaired damage to the seawall along HBP in 2019 and has studied design alternatives for maintaining and repairing the park. There are plans to repair the comfort station at HBP and add a canoe hālau.

Per the 2021 City and County of Honolulu General Plan and the 2011 North Shore Sustainable Communities Plan, there are no plans for commercial development in the immediate vicinity of HBP and HSBH. Rather, the Hawaiʻi State Land Use Commission intends for the surrounding area to maintain an agricultural land use designation and retain its rural qualities.

The No Action Alternative proposes no federal intervention in the study area. The beach at HBP would continue to erode. Left unabated, continued shoreline erosion would comprise landside infrastructure, including the comfort station, parking lot, the historic World War II Memorial and the Art Deco Parks historic district within the park and perhaps, eventually, Kamehameha Highway at the east end of HBP. HBP and the adjacent shoreline are a main attraction along this span of the iconic Oʻahu's North

Shore for ocean recreation, beach access and commercial and recreational fishing. Continued loss of the shoreline will negatively impact recreational use of HBP.

When taken in conjunction with the City and County of Honolulu's current and likely future projects to maintain function and natural aesthetic of the park and the State DLNR DOBOR maintenance of the HSBH, the Recommended Plan would align with and have a cumulative beneficial effect on ocean recreation, commercial fishing, navigation, beach access, shoreline recreation and the natural, visual aesthetics of the study area. These projects would provide for a long-term, safer environment as the wider beach and reinforced wall would protect the area adjacent to the beach where visitors congregate and recreate. The Recommended Plan provides maintenance and ensures the long-term productivity of these federal and local government investments.

6.6 Summary of Mitigation Measures

6.6.1 No Action Alternative

Under the No Action Alternative, no federal action and likewise no federal mitigation measures would occur.

6.6.2 O&M Base Plan

The O&M Base Plan involving maintenance dredging of the HSBH with either ocean disposal of suitable dredged material at the South O ʻahu ODMDS or upland disposal at an approved disposal site requires implementation of the mitigative measures described at Section 8.6.2.

6.6.3 Recommended Plan

USACE has developed the Recommended Plan to incorporate mitigation measures intended to avoid and/or minimize adverse impacts to the greatest extent practicable. Mitigative measures proposed as an integral component of the Recommended Plan are provided at Section 8.6.2, Environmental Commitments. Through implementation of such mitigative measures, the Recommended Plan would not result in impacts warranting compensatory mitigation.

6.7 Plan Selection

After thorough consideration of the environmental and economic effects of both the No Action Alternative and all action alternatives, Alternative 4 (BUDM from Federal Channel to -13 ft MLLW, Barge Access Zone, Settling Basin, and Offshore Sand Borrow Area) was identified as the Recommended Plan. Any adverse effects resulting from implementation of the Recommended Plan will be temporary and less than significant. Adverse impacts would be avoided and or minimized through implementation of the BMPs described at Section 8.6.2. USACE has determined that the Recommended Plan would not result in impacts warranting compensatory mitigation.

7.0 PUBLIC AND AGENCY INVOLVEMENT

This chapter provides an overview of efforts to engage the public and agencies throughout the course of this study. The status of compliance with relevant laws and policies is shown Table 25.

7.1 Public Meetings

Public feedback was solicited throughout the study process. In accordance with the USACE NEPA Implementing Regulations at ER-200-2-2, Honolulu District released the Draft IFR/EA for a 30-day public review and comment period on December 8, 2020. Announcements were posted to social media and emailed to stakeholders (e.g., North Shore Neighborhood Board and state agency/partner coordination bodies such as the Hawaiʻi Ocean Research Management Plan Working Group and Hawaiʻi Shore and Beach Preservation Association) regarding the availability of the report. Hardcopy versions of the draft report were also made available for the public at the Waialua Public Library (67-068 Kealohanui Street, Waialua, Hawaiʻi) and Kahuku Public Library (56-490 Kamehameha Highway, Kahuku, Hawaiʻi).

Public information meetings were conducted with the NFS during the draft public review period via Webex on January 4, 2021 and January 5, 2021. USACE also met with representatives of the Malama Loko Ea Foundation on February 16, 2021 to tour the Native Hawaiian fishpond and discuss their concerns associated with the Recommended Plan. The NFS was invited to this meeting but declined to attend.

Public comment will be solicited on this second draft IFR/EA, in particular, as it relates to more robust discussion of environmental effects of the maintenance dredging and dredged material disposal alternatives. The public comment period will be 30 days starting in August 2023. USACE will host an on-site, in-person public meeting during the comment period to share information about the upcoming maintenance dredging and proposed offshore dredging and beach nourishment at HBP. Written and oral comments received during the comment period will be incorporated into any final IFR/EA.

7.2 Federal and State Agency Coordination

The project was presented to representatives of state and federal resource and regulatory agencies on June 19, 2019. The agencies included the Hawaiʻi State Department of Health, NMFS, USFWS, and USACE. The NFS was invited to this meeting but did not attend. During this day-long meeting, the project was introduced, known resources were identified, the potential physical and environmental effects and benefits of the project to those resources were discussed, and a conceptual model was mapped out. The main issue raised by the agencies was the concern for the adverse impact associated with loss of existing intertidal habitat and the anticipated longevity of the conversion to sandy beach. In essence, the longer the beach restoration would remain intact and provide ecological, navigational and recreational benefits, the lesser the adverse impact of the conversion of the intertidal habitat to a different habitat type would have in the greater context at HBP. USACE considered and incorporated this concern into the development of BUDM alternatives.

In addition, several potential models to evaluate ecological benefits of BUDM on sea turtles were discussed, but the Comer green sea turtle habitat suitability index model was the consensus with the most potential to effectively compare the alternatives (Comer, 2002). Since this meeting, it was determined that the project will not rely upon model outputs to justify the project through national ecosystem restoration benefits. Accordingly, no habitat modeling was conducted as part of the study.

7.2.1 Pre-Consultation Agency Coordination

USACE met with USFWS, State of Hawaiʻi DOH and State of Hawaiʻi CZMP on February 25, 2021 to present the initial scope of the study and solicit feedback from the resource and regulatory agencies on the approach to environmental compliance, in particular, the FWCA, CWA and CZMA. USACE discussed survey scope and framework with USFWS and plan for ensuring compliance in feasibility with DOH and CZMP.

7.3 Public and Agency Comments Received

Comments on the draft IFR/EA were received from several agencies, including: EPA, State of Hawaiʻi OCCL, State of Hawaiʻi Office of Planning, and OHA. Comments were also received from the Malama Loko Ea Foundation. Generally, the comments were minor in nature and suggested updates to the report, recommendations for additional coordination, or inclusion of additional information. The only comment that substantively affected the design of the alternatives and including the Recommended Plan, was submitted by the Malama Loko Ea Foundation. The project team met with Malama Loko Ea Foundation staff on February 16, 2021, to tour the historic Hawaiian fishpond and discuss their concerns. While Malama Loko Ea Foundation supported the dredging of the harbor and replenishment of Haleʻiwa Beach, they expressed concern with and identified potential negative impacts to the traditional fishpond and aquaculture in the vicinity of the barge access zone. In particular, the potential effect the barge access zone would have on the structural integrity of the fishpond walls upstream. As a result, the Recommended Plan was modified to relocate the barge access zone to the opposite side of the southern groin to avoid potentially undermining the Loko Ea perimeter wall (kuapā).

A summary of comments and responses can be found in Appendix G.

7.4 Status of Environmental Compliance

7.4.1 National Environmental Policy Act of 1969 (42 USC 4321 et seq.)

NEPA was established to ensures agencies consider the significant environmental consequences of their proposed actions and inform the public about their decision making. NEPA requires that environmental consequences and project alternatives be considered before a decision is made to implement a federal project. The NEPA established the requirements for preparation of an EIS for projects potentially having significant environmental impacts and an EA for projects with no significant environmental impacts. This EA was prepared to address impacts and propose avoidance and minimization steps for the proposed project, as discussed in the CEQ regulations on implementing NEPA (40 CFR 1500 et seq.).

In accordance with NEPA and USACE regulations and policies, the initial draft IFR/EA and unsigned FONSI were released for a 30-day public and agency review on December 8, 2020, and the EA was made available on the Honolulu District website to the interested public prior to the implementation of this proposed action. Comments made in response to the public notice and USACE responses are included in Appendix G.

This document is the second draft IFR/EA and FONSI incorporating and documenting agency, stakeholder and public input from the first draft and including a more robust discussion of environmental effects of the maintenance dredging and dredged material disposal alternatives. The second draft IFR/EA will be released for a 30-day comment period in August 2023. Comments received during this time will be acknowledged and consideration of comments incorporated into any final IFR/EA.

7.4.2 CWA of 1972 (33 USC 1251 et seq.)

The purpose of the CWA (33 USC 1251 et seq.) is to "restore and maintain the chemical, physical and biological integrity of the nation's waters." Section 404 of the CWA regulates the discharge of dredged or fill material into WOTUS, as defined at 33 CFR 328.3. Although USACE retains primary responsibility for implementing the permit program under Section 404 of the CWA, USACE does not issue itself a permit under regulatory authorities it administers, rather evaluates any proposed discharges into WOTUS in accordance with the environmental criteria set forth in the CWA Section 404(b)(1) guidelines (40 C.F.R. Part 230).

USACE considered various alternatives, lesser iterations of the Recommended Plan. The Recommended Plan provided the greatest economic benefit given the cost to construct. The lesser iterations, Alternatives 2, 2A and 3 proposed smaller fill footprints, however, the benefit to cost ratio was greatest under the Recommended Plan. The other alternatives may have had a lesser environmental effect, however none of the alternatives considered, including the Recommended Plan, would result in significant environmental impacts. The environmental effects across all alternatives would be substantively similar; the benefit of coastal storm risk reduction would decrease as the fill footprint decreases. Within this context, and as a result of the 404(b)(1) evaluation, the Recommended Plan is the Least Environmentally Damaging Practicable Alternative (LEDPA).

Under Section 401 of the CWA, applicants for a federal permit to conduct any activity that may result in a discharge of dredged or fill material into a WOTUS. must also obtain certification that any such discharge would comply with State water quality standards. DOH administers the Section 401 water quality certification (WQC) program, pursuant to HRS §342D. USACE met with DOH on February 25, 2021, to discuss the proposed BUDM activity resulting in discharges of dredged material into WOTUS. Both agencies concurred that USACE lacked project-specific information necessary to apply for and obtain a Section 401 WQC from DOH during feasibility. USACE received a letter of confirmation from the Hawaiʻi DOH dated April 19, 2021 confirming USACE coordination of the proposed discharge with DOH, stating that DOH has no preliminary issues with the USACE moving forward with further designs of this project and confirming USACE plan to obtain a WQC during the PED phase of this project and prior to construction when requisite project-, design- and site-specific information is available. The letter of confirmation from DOH may be found in Appendix B.

Section 402 of the CWA regulates discharges of pollutants and stormwater to surface waters through the National Pollutant Discharge and Elimination System (NPDES) program; the program is administered by EPA, who has delegated oversight authority to the Hawaiʻi DOH. Before construction, USACE or its contractors will obtain a NPDES construction activities permit from DOH, if required. Necessary information regarding the design and construction site plan is not currently available in feasibility.

7.4.3 Endangered Species Act of 1973 (16 USC 1531 et seq.)

ESA protects threatened and endangered species by requiring federal agencies, in consultation with the USFWS and/or the NMFS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife.

USACE determined that the proposed project may affect but is not likely adversely affect the green sea turtle (*Chelonia mydas*); hawksbill sea turtle (*Eretmochelys imbricate*); Hawaiian monk seal (*Monachus schauinslandi*), and its designated critical habitat. Hawaiian insular false killer whale (*Pseudorca crassidens*), and its designated critical habitat; giant manta ray (*Manta birostris*); and oceanic whitetip shark (*Carcharhinus longimanus*). The green sea turtles are under USFWS jurisdiction when located on terrestrial habitat. All of the aforementioned species are under NMFS jurisdiction when they are within the water. Consultation was initiated with USFWS and NMFS on September 3, 2021.

On November 1, 2021, the NMFS responded with a letter of concurrence agreeing with our determination of “may affect, not likely to adversely affect” listed marine mammals and sea turtles and Hawaiian Insular False Killer Whale and Hawaiian monk seal designated critical habitat within the ESA Action Area. On December 13, 2021, USFWS responded with a letter of concurrence agreeing with the USACE determination of “may affect, not likely to adversely affect” for listed sea turtles. On November 1, 2021, the NMFS responded with a letter of concurrence agreeing with our determination of “may affect, not likely to adversely affect” listed marine mammals and sea turtles and Hawaiian Insular False Killer Whale and Hawaiian monk seal designated critical habitat within the ESA Action Area. Supporting documentation regarding the ESA consultation may be found in Appendix B.

7.4.4 Fish and Wildlife Coordination Act (FWCA, 16 USC 661 et seq.)

FWCA requires federal agencies that are impounding, diverting, channelizing, controlling, or modifying the waters of any stream or other water body to consult with the USFWS and the appropriate state fish and game agency to ensure that wildlife conservation receives equal consideration in the development of such projects.

A charette and planning site visit were held on June 18-19, 2019 to introduce the project to the state and federal agencies. A formal request for FWCA consultation was submitted to the USFWS by the USACE on August 27, 2019. An initial draft CAR was provided to the USACE for review and comment on August 18, 2020, and a second draft was provided on September 30, 2020. The final FWCAR dated December 2020 concluding “the overall position of the Service is supportive of the project moving forward, while incorporating all appropriate minimization measures,” is provided in Appendix B. USACE responses to USFWS and DLNR Division of Aquatic Resources’ recommendations in the FWCAR are also provided in Appendix B, Section 2.4:

7.4.5 Magnuson-Stevens Fishery Conservation and Management Act Fishery Conservation Reauthorization Act of 2006, as amended, (16 USC 1801 et seq.)

The 1996 amendments to the MSA require regional fisheries management councils, with assistance from the NMFS, to delineate EFH in Fishery Management Plans for all managed species. EFH is defined as an area that consists of “waters and substrate necessary for spawning, breeding, feeding or growth to maturity” for certain fish species. Federal action agencies that carry out activities that may adversely impact EFH are required to consult with the NMFS regarding potential adverse effects of their actions on EFH and respond to NMFS recommendations.

Construction activities will occur in the marine environment designated as EFH for federally managed fisheries. USACE determined the project may adversely affect EFH and initiated consultation with NMFS on August 24, 2021, by submitting an EFH assessment evaluating the potential effects to EFH and providing measures for avoidance and minimization. On September 24,2021, USACE received eight (8) EFH conservation recommendations (CR) from NMFS. On November 19, 2021, USACE response was consistent with 3 of 8 CRs, partially consistent with 2 of 8 CRs and inconsistent with 3 of 8 CRs. A summary table of the EFH Conservation Recommendations received and subsequent responses are provided in Section 2.5 of Appendix B.

NMFS responded to USACE’ response to NMFS’ EFH CRs by letter dated December 6, 2021 acknowledging consistent responses and maintaining its position for responses inconsistent with EFH CRs. USACE acknowledged in writing February 7, 2022, receipt of NMFS’ response and concluding that in spite of USACE responses inconsistent with NMFS’ EFH CRs, the procedural and statutory requirements of the MSA had been satisfied and consultation has concluded. Documentation of the concluded EFH consultation is provided for reference in Appendix B.

7.4.6 Marine Mammal Protection Act of 1972, as amended (16 USC 1361 et seq.)

The MMPA provides protection to marine mammals in both state waters (within three nautical miles from the coastline) and the ocean waters beyond. As specified in the MMPA, the NMFS is responsible for the protection of marine mammals, such as Hawaiian Monk Seals, dolphins and whales present in the study area. Marine mammals anticipated to occur in the nearshore project areas where dredging and sand placement activities will occur include the Hawaiian Monk Seal. Several whale and dolphin species may occur in the open ocean from the harbor to the South Oʻahu ODMDS.

Potential impacts to marine mammals in the nearshore area range from dredging and equipment directly physically impacting Hawaiian Monk Seal or cause such marine mammals to temporarily move away from the active construction area. Potential impacts to marine mammals i.e., seals, dolphins and whales in the open ocean resulting from the dredged barge and scow transiting to the South Oʻahu ODMDS for dredged material disposal would include vessel collision or direct physical impact during disposal activities. However, such impacts that would constitute “take” under the MMPA would be extremely unlikely i.e., “discountable” and in addition are avoided and/or minimized to the greatest extent practicable through implementation of the ESA BMPs such as species observers, slow starts, reduced vessel speed, etc., negotiated in consultation with NMFS through the Section 7 ESA consultation.

Accordingly, USACE has determined the proposed action would not adversely affect or otherwise cause take of any marine mammals protected under the MMPA and would not trigger the need to obtain an Incidental Take Authorization from the NOAA Fisheries Office of Protected Resources prior to implementation of the Recommended Plan. The ESA biological evaluation documenting the USACE full evaluation of effects to listed species, including marine mammals protected under the MMPA, is available for reference in Appendix B.

7.4.7 Marine Protection, Research, and Sanctuaries Act (16 USC §1431 et seq. and 33 USC §1401 et seq.)

For projects involving transportation of dredged material through the territorial sea for the purpose of ocean disposal, or involving dredged material discharge within the territorial sea for the primary purpose of disposal, the discharge will be evaluated under Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA) and applicable environmental criteria of 40 CFR Part 227 relating to the effects of disposal, navigation, economic and industrial development, foreign and domestic commerce and availability of practicable alternatives to ocean disposal.

USACE conducted and to the greatest extent practicable completed a Section 103 evaluation of the proposed ocean disposal of dredged material through completion of a Tier 1 evaluation and coordination with USEPA. As directed by USEPA and concluded by the Tier 1 evaluation, USACE will develop a Tier 3 sampling and analysis plan that complies with the requirements of the USEPA Ocean Testing Manual, conducting the field sampling and analysis in accordance with an approved sampling and analysis plan, and developing a suitability determination to be coordinated with and seeking concurrence from USEPA prior to disposal.

Due to funding constraints of the feasibility study and to maximize contract efficiencies through coordination with the USACE O&M program for the maintenance dredging component of the Recommended Plan, USACE will defer development and implementation of the Tier 3 sampling and analysis plan to the Pre-Construction Engineering and Design (PED) Phase, following completion of this Feasibility Phase and prior to Implementation Phase. USACE understands that it cannot proceed with ocean disposal without completing the aforementioned tasks with final approval from USEPA for use of the South Oʻahu ODMDS and commits to full completion of the Section 103 evaluation and compliance with the MPRSA in PED phase.

7.4.8 Coastal Zone Management Act (CZMA, 16 USC 1451 et seq.)

In response to the increasing pressure of development on coastal resources, the U.S. Congress enacted the CZMA (16 U.S.C 1451-1464; CZMA) in 1972 and the Coastal Zone Act Reauthorization Amendments in 1990. These laws make federal financial assistance available to any coastal state or territory that is willing to develop and implement a comprehensive coastal management program.

Hawaiʻi's CZM program was approved as HRS Chapter 205A in 1977. In accordance with Hawaiʻi Revised Statutes (HRS) Chapter 205A, the Coastal Zone Management (CZM) law, all land areas of the state (extending seaward to 3 nautical miles) lie within Hawaiʻi's designated coastal zone. In accordance with Section 307 of the CZMA (the "federal consistency" provision), USACE submitted an application for CZM Federal Consistency Review and CZM Consistency Determination to the State of Hawaiʻi Office of Planning, the lead agency for Hawaiʻi's CZMP, summarizing the effects of the proposed action and concluding that the Recommended Plan is consistent, to the maximum extent practicable, with the enforceable provisions of the State CZMP. On June 30, 2022, USACE received conditional concurrence from the State Office of Planning and Sustainable Development on this determination. USACE will comply with all conditions prior to construction. Additional information and supporting documentation regarding the CZM conditional concurrence may be found in Appendix B.

7.4.9 National Historic Preservation Act of 1966, as amended (PL 89-665; 54 USC 300101 et seq.)

Federal agencies are required under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, to "take into account the effects of their undertakings on historic properties" and consider alternatives "to avoid, minimize, or mitigate the undertaking's adverse effects on historic properties" [(36 CFR 800.1(a-c)] in consultation with SHPD and other consulting parties, including Native Hawaiian Organizations (NHO).

In accordance with Section 106 of the NHPA, USACE consulted with the Hawaiʻi SHPD, and the following NHOs: the OHA, Malama Loko Ea Foundation, and the Waialua Hawaiian Civic Club, regarding potential effects to historic properties resulting from the project. Early coordination with Malama Loko Ea Foundation resulted in the identification of potential impacts to the western wall of Loko Ea Fishpond associated with barge activities. The concern centered on wave action potentially undermining the seaward wall of the historic fishpond. Based on the information and concerns expressed by Malama Loko Ea Foundation leadership, USACE relocated the barge access zone. Following redesign, the undertaking will not occur within or near Loko Ea, and the project has, therefore, eliminated the potential for direct or indirect effects stemming from wave action or turbulence near the outlet.

Following this change, and in light of the fact that the project will involve no ground disturbing terrestrial activities, USACE made a formal finding of “no historic properties affected”, as defined at 36 CFR 800.4(d)(1). Furthermore, due to the nature of the sand replenishment that is planned, the undertaking is likely to be beneficial for the protection of undocumented subsurface deposits or burials along the shoreline by slowing erosion rates.

USACE consulted with the SHPD and the aforementioned NHOs on this finding via letter August 11, 2021. SHPD concurred with the finding on September 23, 2021 that no historic properties would be affected by the project. NHOs did not object to the finding, thus closing out the Section 106 consultation process and meeting USACE’s NHPA responsibilities for the project. Additional information and supporting documentation on the Section 106 of the NHPA consultation may be found in Appendix B.

7.4.10 Migratory Bird Treaty Act of 1918, as amended (16 USC 703 et seq.)

The importance of migratory, non-game birds to the nation is embodied in numerous laws, EOs, and partnerships. The Migratory Bird Treaty Act (MBTA) demonstrates the federal commitment to conservation of non-game species. Amendments to the Act adopted in 1988 and 1989 direct the Secretary to undertake activities to research and conserve migratory non-game birds. EO 13186 directs federal agencies to promote the conservation of migratory bird populations, including restoring and enhancing habitat. Migratory Non-Game Birds of Management Concern is a list maintained by the USFWS. The list helps fulfill the primary goal of the USFWS to conserve avian diversity in North America. The USFWS Migratory Bird Plan is a draft strategic plan to strengthen and guide the agency’s Migratory Bird Program. The Recommended Plan would not adversely affect migratory birds and is in compliance with the applicable laws and policies.

7.4.11 EO 11988, Floodplain Management

EO 11988, enacted May 24, 1977, in furtherance of the NEPA of 1969, as amended (42 USC 4321 et seq.), the National Flood Insurance Act of 1968, as amended (42 USC 4001 et seq.), and the Flood Disaster Protection Act of 1973 (PL 93-234, 87 Star.975). The purpose of the EO 11988 was to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

These orders state that each agency shall provide and take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for: (1) acquiring, managing, and disposing of federal lands and facilities; (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. The Federal Emergency Management Agency Digital Flood Insurance Rate Map of the study area was analyzed to establish the locations of the 100-year flood zones. The Recommended Plan would not increase the risk of flood to the surrounding community. The proposed action would remain in compliance with EO 11988.

7.4.12 Clean Air Act of 1963, as amended (42 USC 85 et seq.)

Section 176(c) of the CAA requires Federal agencies to assure that their activities are in conformance with Federally-approved state implementation plans for areas designated as “non-attainment” and “maintenance.”. There are no non-attainment or maintenance areas in the State of Hawai‘i (EPA, 2020). Accordingly, the study area is in attainment for all air emissions and conformity analysis procedures do not apply to this project.

7.4.13 EO 12898 – Environmental Justice in Minority Populations and Low-Income Populations

EO 12898 states that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental impacts of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Northern Mariana Islands.” The study area is absent of minority or economically-disadvantaged communities per USEPA and CEQ designation. The Corps anticipates that the Recommended Plan would not impart disproportionately high and adverse effects on the health or environment of EJ communities within the study area. Accordingly, the Recommended Plan complies with EO 12898.

7.4.14 EO 13112, Invasive Species

EO 13112 recognizes the significant contribution native species make to the well-being of the nation’s natural environment and directs federal agencies to take preventative and responsive action to the threat of the invasion of non-native species. The EO establishes that federal agencies “will not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.” Construction activities will implement BMPs to ensure that carrying out the Recommended Plan would not cause or promote the introduction or spread of invasive species in or adjacent to the study area.

7.4.15 Summary of Primary Federal Laws and Regulations Applicable to the Recommended Plan.

Table 25 provides a summary of compliance with relevant laws and policies.

Table 25: Summary of Environmental Compliance

Legislative Title U.S. Code/Other	Compliance Status
NEPA (42 USC §§ 4321-4347)	In progress. Final IFR/EA forthcoming pending public review of second draft IFR/EA
CWA (33 USC § 1251 et seq.)	Compliant with USACE Policy and will obtain 401 WQC in PED Phase
ESA (16 USC §§ 1531 et seq.)	Compliant. Section 7 consultation completed November 1, 2021 with NMFS and December 13, 2021 with USFWS.
FWCA (16 USC § 661 et seq.)	Compliant. FWCAR received December 2020.
Magnuson-Stevens Fishery Conservation and Management Act	Compliant. Abbreviated EFH consultation completed February 7, 2022.
MMPA (16 USC §1)	Compliant. No Incidental Take Authorization required.
Marine Protection, Research and Sanctuaries Act (16 USC §1413)	Compliant with USACE Policy and will obtain suitability determination in PED Phase.
CZMA (16 USC § 1451-1464)	Compliant. Consistency Concurrence received June 30, 2022
National Historic Preservation Act of 1966, as amended (PL 89-665; 54 USC 300101 et seq.)	Compliant. Section 106 consultation completed September 23, 2021.
Migratory Bird Treaty Act of 1918, as amended (16 USC 703 et seq.)	Compliant. Recommended Plan would cause no adverse effect to migratory birds.
EO 11988, Protection of Floodplains, May 24, 1977	Compliant. Recommended Plan would cause no increase in flood risk.
Environmental Justice in Minority and Low-Income Populations (EO 12898)	Compliant. No minority or economically-disadvantaged communities disproportionately affected.
EO 13112, Invasive Species	Compliant. Recommended Plan would not introduce or cause spread of invasive species.

7.5 Views of the Non-Federal Sponsor

The NFS for this project is the State of Hawaiʻi as represented by DLNR, an active member of the study PDT. DLNR is supportive of the project and has provided feedback throughout the planning process, incorporated into the study plan formulation. USACE received a letter of support for the Recommended Plan from the DLNR Chairperson on April 29, 2022 (Appendix G – Public Involvement).

7.6 Cost Sharing

In general, Section 1122 provides that projects under this pilot program will be cost-shared in accordance with the cost sharing requirements for projects carried out under Section 204 of the Continuing Authority Program with some exceptions. Under Section 204, the incremental cost of design and implementation of a beneficial use project above the Base Plan will be cost-shared with the NFS at 65 percent federal cost/35 percent non-federal cost. Under this authority the feasibility phase is 100 percent federally funded. The specific exceptions to this under Section 1122 are provided in a "Memorandum for the Commanding General of the U.S. Army Corps of Engineers. Subject: Implementation Guidance for Section 1122(a)-(h) of WRDA 2016, Beneficial Use of Dredged Material", dated 3 January 2018 and are outlined below:

- For projects under the Section 1122 pilot program that utilize dredged material from Federal navigation projects, the authority provides that the incremental cost above the Base Plan for transporting and depositing such dredged material will be borne entirely by the Federal Government.
- If additional material is dredged from a federal navigation project solely for the purposes of a pilot project, the costs associated with the additional dredging will be cost-shared with the NFS of the pilot project in accordance with the requirements of Section 204.
- If a pilot project relies upon dredged material from a non-federal navigation project, or area outside a non-federal navigation project, the dredging and transportation costs will be 100 percent non-federal; all other costs associated with the pilot project will be cost-shared in accordance with Section 204.

Based upon this guidance, the project components would be cost-shared as followed:

- **Navigation Channel Dredging and Beneficial Use** – All incremental costs above the Base Plan associated with dredging of the federal navigation channel to -12 ft MLLW and beneficial use, including transport and placement of the dredged material to HBP, would be **100 percent federal cost**. This includes excavation of the barge access zone to allow for direct placement of dredged material onto the beach.
- **Additional Dredging for the Purpose of the Pilot Project** – The costs associated with dredging of the federal navigation channel to -13 ft MLLW will be cost shared **65 percent federal/35 percent non-federal**, because this is considered to be "additional material dredged from a Federal Navigation Channel solely for the purposes of the pilot project". The transport and placement of the additional dredging of the federal navigation channel for BUDM would be **100 percent federal cost**.The additional work of dredging, transportation, and placement of dredged material from the state breakwater settling basin and the offshore sand borrow area will be at **100 percent non-federal cost** (33 USC 701h). This includes all costs associated with that dredging to include environmental compliance, sediment sampling, hydrographic surveys, development of plans and specifications, S&A during construction, etc.

An estimate of total cost allocation is provided in Table 26.
The cost of beneficial use of sediment projects must be limited solely to construction

costs that are in excess of the Base Plan, referred to as an incremental cost. The total project first cost (Constant Dollar Cost at FY22 price levels) of the Recommended Plan is estimated at $3,901,000. This represents this incremental cost (Table 23) and does not include feasibility study costs-to-date. This cost was calculated by subtracting the Base Plan costs from total project cost of the entire project (Appendix D). The Base Plan for this project was based on the costs of maintenance dredging of the federal channel with ocean disposal of dredged material at the South Oʻahu ODMDS or upland disposal (for dredged material not suitable for ocean disposal). The non-federal share of the project components, calculated from the total project first cost, is estimated at $2,731,000 and will be funded by the local sponsor. The federal share of the project components is estimated at $1,170,000 (Table 26).

Table 26. Cost Share Allocation in 1000s

Item	Project First Cost	Federal Share	%	Non-Federal Share	%
Construction	**$2,911**	**$788**	-	**$2,123**	-
Incremental cost of navigation channel beneficial use*	$663	$663	100%	$0	0%
Navigation channel dredging to '-12' MLLW and beneficial use	$1,904	-	-	-	-
Base Plan cost	-$1,241	-	-	-	-
Additional navigation channel dredging to'-13' MLLW	$193	$125	65%	$68	35%
Settling basin and offshore sand deposit dredging and transport	$2,055	$0	0%	$2,055	100%
PED**	**$675**	**$289**	**-**	**$386**	**-**
Incremental cost of navigation channel beneficial use*	$280	$280	100%	$0	0%
Navigation channel dredging to'-12' MLLW and beneficial use	$1,177	-	-	-	-
Base Plan cost	-$897	-	-	-	-
Additional navigation channel dredging to'-13' MLLW	$14	$9	65%	$5	35%
Settling basin and offshore sand deposit dredging and transport	$381	$0	0%	$381	100%
Construction management (S&A)	**$291**	**$78**	**-**	**$213**	**-**
Incremental cost of navigation channel beneficial use*	$66	$66	100%	$0	0%
Navigation channel dredging to '12' MLLW and beneficial use	$191	-	-	-	-
Base Plan cost	-$125	-	-	-	-
Additional navigation channel dredging to'-13' MLLW	$19	$12	65%	$7	35%
Settling basin and offshore sand deposit dredging and Transport	$207	$0	0%	$207	100%
LERRDs***	$24	$16	65%	$8	35%
Total project cost-share(1000s)	**$3,901**	**$1,170**	**-**	**$2,731**	**-**
Feasibility study costs-to-date	$485				

**All costs represent the incremental cost (i.e., total cost minus Base Plan cost) related to BUDM*
*** PED costs do NOT include feasibility study costs-to-date (these are broken out as a separate line item and are not cost-shared)*

8.0 PLAN IMPLEMENTATION REQUIREMENTS

8.1 Non-Federal Responsibilities

The NFS for this project is the State of Hawaiʻi as represented by DLNR, OCCL and DOBOR. Federal implementation of the project for the BUDM includes, but is not limited to, the following required items of local cooperation to be undertaken by the NFS in accordance with applicable federal laws, regulations, and policies:

- Provide 35 percent of the costs that are in excess of the Base Plan costs associated with dredging the federal navigation channel for the authorized federal navigation project as further specified below:
    a. The incremental costs above the Base Plan for transporting (including depositing) dredged material from the federal navigation channel(s) for the authorized federal navigation project will be borne by the federal government
    b. Provide, during design, 35 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project.
    c. Provide all real property interests, including placement area improvements, and perform all relocations determined by the federal government to be required for the project.
    d. Provide, during construction, any additional contribution necessary to make its total contribution equal to at least 35 percent of costs that are in excess of the Base Plan costs associated with dredging the federal navigation channel for the authorized federal navigation project (Table 26)
- Provide funds sufficient to cover the costs of work related to the project that the Government will undertake on the NFS's behalf while the Government is carrying out the project, with the NFS responsible for all costs and any liabilities associated with such work.
- Operate, maintain, repair, rehabilitate, and replace the project or functional portion thereof at no cost to the federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable federal laws and regulations and any specific directions prescribed by the Federal Government.
- Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the NFS owns or controls for access to the project to inspect the project, and, if necessary, to undertake work necessary to the proper functioning of the project for its authorized purpose.
- Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the outputs produced by the project, hinder O&M of the project, or interfere with the proper function of the project.
- Hold and save the Government free from all damages arising from implementation (including design), operation, maintenance, repair, rehabilitation, and replacement of the project, except for damages due to the fault or negligence of the Government or its contractors.

- Perform, or ensure performance of, any investigations for HTRW that are determined necessary to identify the existence and extent of any HTRW regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, and any other applicable law, that may exist in, on, or under real property interests that the federal government determines to be necessary for construction, O&M of the project.
- Agree, as between the Federal Government and the NFS, to be solely responsible for the performance and costs of cleanup and response of any HTRW regulated under applicable law that are located in, on, or under real property interests required for construction, O&M of the project, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination, without reimbursement or credit by the Federal Government.
- Agree, as between the Federal Government and the NFS, that the NFS shall be considered the owner and operator of the project for the purpose of CERCLA liability or other applicable law, and to the maximum extent practicable shall carry out its responsibilities in a manner that will not cause HTRW liability to arise under applicable law.
- Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, PL 91-646, as amended, (42 USC 4630 and 4655) and the Uniform Regulations contained in 49 CFR Part 24, in acquiring real property interests necessary for construction, O&M of the project including those necessary for relocations, and placement area improvements; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

8.2 Federal Responsibilities

In order to implement the Recommended Plan, USACE will provide the federal share of the project cost. USACE will be responsible for providing the federal portion of design and construction funds as indicated in Table 26, as well as implementing all components of the project as described in the Recommended Plan. USACE will provide the following:

- Review and provide certification of Real Estate provisions
- Design and construction
- Contracting for project construction
- Construction management (S&A)

8.3 In-Kind Contributions

In-Kind Contribution is defined as work contributed by the NFS toward implementation of a project in lieu of payment of a portion of the sponsor's cash contributions toward implementation of the project. A NFS may receive credit toward its required cost share for the value of in-kind contributions it provides if those in-kind contributions are determined to be integral to the project. In-kind contributions are not anticipated toward the NFS share of implementation of the project.

8.4 Project Partnership Agreement

Upon approval of a final feasibility report, a PPA will be created. A PPA is a legally binding agreement between the Federal Government (USACE) and a NFS for the construction of the Project. The PPA will describe the project and responsibilities of the USACE and the NFS in the sharing of the costs and project execution.

8.5 Operations and Maintenance (O&M)

This federal action (implementation of a pilot project for BUDM and beach restoration) will not have an associated O&M requirement as Section 1122 of WRDA 2016 does not identify specific O&M requirements for the pilot project. As described in Section 5.0, Recommended Plan, dredged material will be placed at the HBSPP as a one-time event. However, if the pilot project is successfully implemented, the intention is to make BUDM an integrated part of the O&M dredging cycle (10 to 20 year interval).

This project will be inspected on a yearly basis through the USACE Inspection of Completed Works program. This monitoring will help determine how the placement is performing and what future placement interval would be optimal. This will be integrated into the long-term O&M plan for the HSBH. The recommended placement interval could change over time with SLC, and if the City and County of Honolulu sand tightens the groin. Evaluation on a 10-year cycle is a good estimation for planning purposes.

Based on historical erosion rates, it is anticipated that the placed material will be eroded from the cell over a period of approximately 23 years. This estimate does not take into consideration a major hurricane or tsunami. USACE anticipates impacts consistent or lesser than those described in this Draft IFR/EA to result from future O&M dredge and potentially BUDM activities at HSBH and HBSPP.

8.6 Mitigation & Environmental Commitments

8.6.1 Mitigation

Mitigation per 40 CFR §1508.20 includes measures to avoid the impact by not taking an action or parts of an action; minimize impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments. The appropriate application of mitigation is to formulate a project that first avoids adverse impacts, then minimizes adverse impacts, and lastly, compensates for unavoidable impacts.

The Honolulu District has avoided impacts to the greatest extent practicable and coordinated and considered the views of NHOs and State and Federal agencies during consultations. Section 8.6.2 describes the minimization of effects as agreed upon during consultations under applicable Federal laws. No impacts from the Recommended Plan have been identified that would require compensatory mitigation. This project does not impact any “special aquatic sites” as defined in 40 CFR§ Subpart E. Unavoidable impacts to rocky intertidal substrate and juvenile individual corals (mostly <5cm diameter) will occur from sand placement during construction. Any impacts to coral will occur within the footprint of the original HBSPP Federal project, i.e., previously impacted habitat. The Honolulu District determined the effects from these impacts are negligible and do not require compensatory mitigation.

The project will also provide ancillary habitat benefits by restoring a sandy beach that may be used by sea turtles and Hawaiian Monk Seals to haul-out and bask. The BUDM to recreate the sandy beach will also restore physical primary constituent elements of terrestrial designated Hawaiian Monk Seal critical habitat.

8.6.2 Environmental Commitments

Below is a list of the Environmental Commitments to minimize impacts from the project under each applicable consultation under Federal Law.

To minimize impacts to Essential Fish Habitat:

1. The construction contractor must develop a comprehensive plan to be submitted to the government for approval that describes how the following conditions will be met.
2. The contractor shall prepare, as a stand-alone document or part of the best management practices (BMP) plan, an anchor monitoring plan detailing measures to comply with the following conditions:
    a. Vessels, barges or other in-water structures must first attempt to tie-off to existing harbor structures.
    b. If anchoring on the seafloor is necessary, then anchors must be placed exclusively in soft sediments.
    c. Anchors and anchor components must cause no direct physical impact to corals beyond the federal limits.
    d. Anchor and anchor line footprints of all in-water equipment must be designed to occupy the smallest footprint necessary to achieve safe and effective anchorage.
    e. The anchor monitoring plan will be designed by the contractor and reviewed by USACE for approval and prior to implementation.
    f. As a matter of contingency, if there is an instance where anchor misplacement occurs, e.g., an anchor is placed within the restricted coral reef area, all work will stop, and the contractor will conduct an underwater survey to assess potential damages. If no damage is observed, work will resume.
3. During peak coral spawning (one week before and after the full moon in July and August), 1) dredging at night will be prohibited, and 2) any in-water sediment containment devices must not be left overnight.
4. While entering or exiting the harbor, all vessels, barges and scows must remain in the marked USCG ingress/egress channel until it passes the outer buoy.
5. Weather conditions must be considered to ensure the safety of equipment and personnel during in-water operations. Work must cease during unfavorable weather conditions such as storm surge, etc. that could compound impacts to surrounding resources.

6. Each vessel must have a written spill prevention plan on board that identifies the appropriate response and safety protocols and the contact information for appropriate authorities to be notified in the unlikely event of a spill.
7. The contractor must designate on-site personnel responsible for ensuring no inadvertent discharges of debris, petroleum, or other harmful materials into the water.
8. The contractor must submit a contingency plan detailing progressive, action-specific, risk-based responses to potential malfunctions of dredge equipment, barges, scows and in-water BMPs such as sediment containment devices.
9. All dredge vessels, barges and scows must be equipped with Dredging Quality Management (DQM) instrumentation systems, or similar, to allow near real-time monitoring of the scow’s status (e.g., GPS positioning, hull status (open or closed), heading (course and speed), volume (draft), displacement and bin ullage sounding) at all times to ensure performance, accuracy and accountability. The Contractor shall provide DQM tracking information to the Government upon request.
10. The Contractor must submit maintenance and inspection records, current to within six months or since its last use for whatever purpose, for any containment scow to be used to complete the proposed work, and a plan for the continued maintenance and inspection through the construction period.
11. Turbidity Curtains. In-water sediment containment devices must be used to contain project-generated turbidity and prevent spread beyond the active work area. At a minimum, the reach of the equipment is positioned inside the sediment containment device while the containment scow is positioned outside the sediment containment device, to minimize ingress/egress frequency. Sediment containment devices must be appropriately sized; the length adjusted as the dredge progresses and the area deepens. The size and position of the area enclosed by the sediment containment device must be strategically planned to reduce the number of times it must be repositioned. Prior to repositioning, sediment containment devices must remain in place until turbidity levels within the enclosure have returned to ambient levels per visual inspection.
    a. Full-length silt curtains will be required of the contractor during dredging for the entire project unless weather or water conditions will not allow for these to be properly employed or maintained.
    b. To minimize risk of silt curtain failure and maximize use of full-length silt curtains, the contractor shall monitor for heightened sea states or other conditions that may cause the silt curtain ballast to shift position and/or the silt curtain to move about excessively, and thereby increase the risk of abrasion or other damage to coral, or damage to the silt curtain causing failure of the enclosure. If there is an opportunity to wait until a calm sea state exists, that will be the first option that will be exercised.
    c. Where a full-length silt curtain is not practical given wave or current conditions, even under a calm sea state, a mid-length silt curtain may be used. Where a full-length silt curtain cannot be employed, an environmental bucket retrofitted with seals and valves to prevent leakage of dredge effluent must be used.

12. Containment scows must be adequately sized to prevent overflow/over-topping and must be equipped with functional seals to prevent leakage of dredged material.
13. Contractor must develop and submit to the Government a site-specific BMP plan to be reviewed and approved by the Government prior to start of work. The Site-Specific BMP Plan must contain turbidity to the active dredge area to the greatest extent practicable. The plan must include a visual and instrumented turbidity monitoring plan to ensure the efficacy of the sediment containment BMP in comparison to ambient levels, with minimum once-daily visual inspections and instrumented readings throughout the duration of construction. When reviewing the contractor's proposed BMP plan, USACE will only approve a plan that, at a minimum, includes the following or comparable alternative components:
    a. Visual inspection of sediment containment devices of sufficient frequency to minimize potential failure and to ensure proper use and installation;
    b. Instrumented or other monitoring that ensures compliance of the action with State Water Quality Standards;
    c. Establishment of a turbidity threshold (e.g., 10% above ambient) and corresponding progressive responses to exceedances beginning with taking a second reading to verify threshold exceedances, followed by inspecting the BMPs to identify the source of the plume, to replacing the BMPs, adjusting/doubling up BMPs and stopping work.
14. Reinitiation Notice: USACE must reinitiate consultation with NMFS if USACE substantially revises its plans for an action in a manner that may adversely affect EFH or if new information becomes available that affects the basis for NMFS EFH Conservation Recommendations.

To minimize impacts to threatened or endangered species under NMFS jurisdiction and marine mammals:

1. A competent observer shall be designated to survey the marine areas adjacent during construction to the proposed action for ESA-listed marine species, including but not limited to the green sea turtle, hawksbill sea turtle, and Hawaiian monk seal.
2. All on-site project personnel shall be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal laws.
3. Visual surveys for ESA-listed marine species 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, to ensure that no protected species are in the area (within 50 yards of the proposed work).
4. If a basking monk seal is found within the project area, cease all mechanical or construction activities within 100 ft until the animal voluntarily leaves the area. If you resume work from a distance greater than 100 ft and the monk seal appears agitated or otherwise modifies its behavior in response to your nearby work, distance yourself further until either the monk seal is not affected by your nearby work or cease work until the animal voluntarily leaves the area.

5. No attempt will be made to feed, touch, ride, or otherwise intentionally interact with any ESA listed marine species.
6. Work shall be postponed or halted when ESA-listed marine species are within 50 yards of the proposed work and shall only resume after the animals have voluntarily departed the area.
7. Before any equipment, anchors(s), or material enters the water, a responsible party shall verify that no ESA-listed species are in the area where the equipment, anchor(s), or materials are expected to contact the substrate. If practicable, the use of divers to visually confirm that the area is clear is preferred.
8. Equipment operators shall employ “soft starts” when initiating work that directly impacts the bottom. Buckets and other equipment shall be sent to the bottom in a slow and controlled manner for the first several cycles before achieving full operational impact strength or tempo.
9. All objects lowered to the bottom shall be lowered in a controlled manner. This can be achieved by 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 decent.
10. Equipment, anchor(s), or material shall not be deployed in areas containing live corals, sea grass beds, or other significant resources.
11. For any equipment used in undertaking the authorized work, the 160 dB and 120 dB isopleths shall not exceed the 50-yard shut-down range for impulsive and continuous sound sources, respectively.
12. Vessel operators shall alter course to remain at least 100 yards away from whales, and at least 50 yards from other marine mammals and sea turtles.
13. Vessel operators shall reduce vessel speed to 10 knots or less when piloting vessels in the proximity of marine mammals, and to 5 knots or less when piloting vessels in areas of observed turtle activity. If approached by a marine mammal or turtle, the vessel operator shall put the engine in neutral and allow the animal to pass.
14. Vessel operators shall not encircle or trap marine mammals or sea turtles between multiple vessels or between vessels and the shore.
15. The contractor shall keep a record of all protected species sightings, incidents, disturbance, and injuries, and shall provide a weekly report to the Honolulu District, USFWS’ Ecological Services office, and the NMFS’ Protected Resource Division.
16. Immediately report any incidental take of protected species, including incidents of harassment, disturbance, or injury, and must include the name and phone number of a point of contact, location of the incident, and nature of the take and/or injury.
    a. The incident must be reported immediately to the construction representative for the USACE.
    b. For Hawaiian Monk Seals contact shall be made with the Marine Mammal Response Coordinator, David Schofield at NMFS, at 808-944-2269, as well as the monk seal hotline at 1-888-256-9840.
    c. For turtles, contact shall be made with NOAA turtle hotline at 800-853-1964. The incident shall also be reported to the Pacific Island Protected

Species Program Manager, Southwest Region (Tel: 808-973-2987, fax: 808-973-2941).

17. Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary.
18. Install automatic motion sensor switches and timer controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
19. Avoid nighttime construction during the seabird fledging period, 15 September through 15 December.
20. To avoid and minimize project impacts to sea turtles and their nests we recommend you incorporate the following applicable measures into your project plan:
21. If a basking sea turtle is found within the project area, cease all mechanical or construction activities within 100 ft until the animal voluntarily leaves the area.
22. Cease all activities between the basking turtle and the ocean.
23. Remove any project-related debris, trash, or equipment from the beach or dune if not actively being used.
24. Do not stockpile project-related materials in the intertidal zone, reef flats, or stream channels.
25. Reinitiation Notice: ESA Consultation must be reinitiated if:
    a. 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;
    b. 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;
    c. the identified action is subsequently modified in a manner causing effects to ESA-listed species or designated critical habitat not previously considered; or
    d. a new species is listed, or critical habitat designated that may be affected by the action.

To minimize impacts to threatened and endangered species under USFWS jurisdiction:

1. A biologist familiar with sea turtles will conduct a visual survey of the project site to ensure no basking or nesting turtles or nests are present.
   During construction and prior to the start of any scheduled beach work, an early morning daily survey along the shoreline will be conducted for the presence of basking sea turtles and sea turtle nests.
    a. If a basking sea turtle is observed within or adjacent to the project footprint, the contractor will cease all mechanical or construction activities within 100 feet, until the animal voluntarily leaves the area and will cease all activities between the basing turtle and the ocean. The 100 ft radius will be demarcated with stakes and flagging, but not to impede access to the ocean.
    b. If sea turtle nests are found within or adjacent to the project footprint, the

contractor will stop all beach/dune environment work immediately and report to USACE. USACE will confer with the USFWS prior to restarting work.

2. Native dune vegetation will not be removed.
3. Applicable BMPs regarding work in aquatic environments will be incorporated into the project design.
4. Project-related debris, trash, or equipment from the beach or dune if not actively being used will be removed.
5. Project-related materials will not be stockpiled in the intertidal zone, reef flats, sandy beach and adjacent vegetated areas, or stream channels.
6. Nighttime work will be avoided during the nesting and hatching season (May to December).
7. The use of lighting on or near beaches will be minimized and all project-related lights will be shielded so the light is not visible from any beach.
    a. If lights can't be fully shielded or if headlights must be used, the light source will be fully enclosed with light filtering tape or filters.

CZM Federal Consistency Concurrence Conditions:

1. The proposed activity shall be carried out as represented in the CZMA federal consistency determination and all supporting materials and information provided to the Hawai‘i CZM Program. Any changes to the proposed activity shall be submitted to the Hawai‘i CZM Program for review and approval. Changes to the proposed activity may require a full CZM federal consistency review, including publication of a public notice and provision for public review and comment. This condition is necessary to ensure that the proposed activity is implemented as reviewed for consistency with the enforceable policies of the Hawai‘i CZM Program. Hawai‘i Revised Statutes (HRS) Chapter 205A Coastal Zone Management, is the federally approved enforceable policy of the Hawai‘i CZM Program that applies to this condition.
2. To mitigate potential adverse effects to water quality and State of Hawai‘i protected species, best management practices (BMPs) shall be implemented during construction as represented in the CZMA consistency determination and supporting information: Attachment 7 - Proposed BMPs (received August 25, 2021); Essential Fish Habitat Assessment, August 2021; and the Draft Integrated Feasibility Report and Environmental Assessment, November 2020. This condition is necessary to ensure consistency with Hawai‘i CZM Program federally approved enforceable policies: HRS Chapter 205A Coastal Zone Management, Section 205A-2 Coastal Ecosystems; HRS Chapter 342D Water Pollution; and HRS Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants.
3. The proposed activity shall be conducted in compliance with State of Hawai‘i water quality standards and requirements as specified in Hawai‘i Administrative Rules (HAR) Chapter 11-54 Water Quality Standards, including obtaining a Section 401 Water Quality Certification (WQC) from the State Department of Health (DOH). The commitment to obtain a WQC was represented in the U.S. Army Corps of Engineers letter to DOH on April 1, 2021 and confirmed by DOH by letter dated April 19, 2021 that a WQC is required. This condition is necessary

to ensure consistency with Hawaiʻi CZM Program federally approved enforceable policies HRS Chapter 342D Water Pollution, and HAR Chapter 11-54.

4. HRS Chapter 6E Historic Preservation and Section 106 of the NHPA consultation was initiated with the SHPD by letter dated August 17, 2021. The proposed activity shall be conducted in compliance with the SHPD requirements resulting from the Section 106 NHPA and HRS Chapter 6E Historic Preservation consultation. This condition is necessary to ensure consistency with Hawaiʻi CZM Program federally approved enforceable policy HRS Chapter 6E.

Section 401 WQC Letter of Confirmation Conditions:

1. A Section 401 WQC must be obtained prior to construction.

Section 103 MPRSA Conditions:

1. A Section 103 Suitability Determination must be made and concurred upon by USEPA prior to ocean disposal.

8.7 Implementation Schedule

The schedule shown in Table 27 details major activities to be accomplished during the design and implementation phase and assumes funding and resource availability. A lack of either funding or resources may cause significant changes to this schedule.

Table 27. Planning and Implementation Schedule

Phase/Task	Duration (months)	Anticipated Start	Anticipated Finish
Decision document approval	3	Oct 2023	Jan 2024
Execute PPA/FCSA	3	Dec 2023	Mar 2024
Receive PED funds	2	Mar 2024	Apr 2024
PED phase	14	Apr 2024	Jun 2025
Contract award	2	Jun 2025	Oct 2025
Pre-construction submittals/ mobilization	5	Nov 2025	Apr 2026
Dredging work [1]	3	Apr 2026	Jun 2026
Beach placement work [1]	4	May 2026	Aug 2026
Post-construction survey/cleanup	3	Aug 2026	Oct 2026
Construction complete/ demobilization	1	Oct 2026	Oct 2026

[1]Construction Windows. Project schedule will be affected by the following construction windows:
Optimal dredging/placement based on waves/weather: April to September
Environmental windows: July/August (no night dredging/placement during peak coral spawning i.e., one week prior to and after the full moon during the months of July and August)

8.8 Real Estate Considerations

The NFS, the State of Hawaiʻi as represented by the DLNR, is responsible for all LERRDs required to implement project construction. The estimated real estate cost associated with the Recommended Plan is approximately $24,100, including all LERRDs, administrative costs to be carried out by the NFS, and Government costs for LERRDs monitoring and certification. Minimal real estate action is needed for project implementation. Based on the findings of the Real Estate Plan (Appendix E), the NFS must acquire a temporary work area easement from the City and County of Honolulu. The City and County of Honolulu owns HBP, which includes the anticipated staging area as well as a portion of the beach above the high-water mark required for beach restoration. The temporary work area easement is estimated at 1.9 acres and is anticipated to be required for one year during project construction. Easement boundaries will be refined during the PED phase.

The NFS maintains current ownership of the barge access zone, state breakwater settling basin, sand borrow area, a portion of the submerged beach area below the high-water mark for BUDM, and the revetted mole, which total approximately 5.9 acres. The federal navigation channel within HSBH qualifies under the navigation servitude, which is the Government's constitutional right to use, control, and regulate U.S. navigable waters for commerce-related purposes. Therefore, the channel dredging project features totaling approximately 3.1 acres in the HSBH federal channel are not to be acquired nor eligible for LERRDs credit.

8.9 Risk and Uncertainty

In any planning decision, it is important to account for the risk and uncertainty that is invariably present. For this study, there are several risk and uncertainty categories that were identified and evaluated during the planning process including, but not limited to: coastal storm damages, material prices and recreational usage. Further information on these calculations can be found in the Appendix A and Appendix C.

The following project risks were considered that may affect the design and implementation of the Recommended Plan:

1. **Beach suitability of dredged sand:** Low Risk. The suitability of sediments for beach nourishment will not be confirmed until additional sampling and analysis compliant with federal and state law is completed during the design phase, although the proposed areas are considered very likely to contain suitable beach quality sand based on prior sampling efforts in the harbor by USACE and by the State in the offshore borrow area.

   Consequence: Low Consequence. The results of the sampling and analysis of the borrow areas will range from all unsuitable, to areas that are suitable and areas that are not suitable, to all suitable for beach nourishment. In the unlikely event that all the sampled material in the offshore borrow area and State breakwater settling basin is unsuitable for beach nourishment, then those areas will not be dredged. In the more likely event that some of the sediments within the offshore borrow area and State breakwater settling basin are not suitable, then only those areas where the sediment will be beneficially used will be dredged. The volume of sand suitable for beach nourishment may decrease resulting in a decrease in the acreage of beach restoration and consequent reduction in the stability and longevity of the nourished beach against wave action and SLR. This is not anticipated to significantly, adversely affect the anticipated benefits to NED or NER.

With respect to the federal navigation channel of the HSBH, if, after sediment sampling and analysis, we understand that the additional 1-ft of dredging proposed under the Recommended Plan is unsuitable for beach nourishment, it will not be dredged. If after sediment sampling and analysis of the federal navigation channel the material to be dredged down to the authorized depth including 1ft of over-dredge, is determined unsuitable for beach nourishment, then USACE would proceed with determining suitability for ocean disposal followed by suitability for an acceptable upland disposal site. The volume for which USACE would evaluate suitable disposal alternatives, i.e., less than 5,000 cy is relatively minor in comparison to other O&M dredging projects on Oʻahu. USACE does not anticipate difficulty in identifying a suitable disposal site for the O&M dredged material from HSBH.

2. **Bedrock in Barge Access Zone:** Medium Risk. Bedrock or other debris may be encountered during dredging of the barge access zone.

   Consequence: Medium Consequence. The feasibility of dredging the Barge Access Zone could be in question if materials other than sand are encountered. If hard material is unable to be avoided to obtain adequate barge access depths, a land-based option for dredged material transport would be considered. This may result in increases to the project cost by approximately 23 percent.

3. **Project schedule.** Low Risk. Environmental windows related to shorebirds and other biological resources may constrain construction period; however, actual dredging and placement should be able to be completed during the summer months (April to September). Dredging outside of these months is difficult due to wave and weather conditions.

   Consequence: Medium Consequence. If contract award is delayed beyond November, the optimal construction window will be missed, and construction will be delayed for another year.

Additionally, SLC presents significant uncertainty and risk related to the long-term functioning and performance of the project. When potential for future SLC is considered, the rate of erosion along Hale'iwa Beach (either with or without the project) will likely increase due the inability of much of the shoreline to shift landward to reach an equilibrium with higher water levels. This is due to the backshore development such as the comfort station, the parking areas, and the highway, that are unlikely to be relocated or removed in the near future; as well as the lack of a backshore dune to allow natural landward migration of the shoreline and provide additional sediment to the shoreline under rising sea levels. The ability for larger waves to reach the shoreline under higher sea levels could also lead to greater erosion of the sand along the shoreline, under both the with and without project conditions. With only 1.4 feet of additional SLR (in approximately 2050 under the high scenario), overtopping of the beach fill crest and backshore areas will begin to occur on an average annual basis. Though future SLC will reduce the longevity of any beach fill completed, this also highlights the fact that any addition of sand to the chronically eroding shoreline will delay the impacts of SLC to the infrastructure in an around HBP.

The alternatives for this project were formulated with fill volumes based on the availability of sand, rather than specific dimensions of the proposed beach fill. However, this cursory evaluation of SLC and its future impacts illustrates that the larger the volume of sand placed (up to the limit that the littoral cell can hold), the longer the backshore infrastructure will be protected from SLC and storm damage impacts, including increased frequency of overtopping and increased erosion.

8.10 Local Betterments

The project does not include any local betterments.

8.11 Compliance with CAP Section 204 Policies

Generally, the Recommended Plan is consistent with the policies of Section 204 of the Continuing Authorities Program. However, the district obtained a policy exemption from the Assistant Secretary of the Army for Civil Works (ASA(CW)) relating to the nourishment of the beach at HBP, that is part of HBSPP, a previously completed federal shore protection project. Engineer Pamphlet (EP) 1105-2-58, March 2, 2019 states that "The authority of Section 204 will not be used to re-nourish authorized federal shore protection projects". A policy exemption was requested on July 20, 2021 and was granted by the ASA(CW) on August 9, 2021 (Appendix G).

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

The proposed construction of the Recommended Plan would provide the greatest NED benefits in the most cost effective manner within the constraints of the Section 1122 authority. The project would result in the restoration of approximately 4.3 acres of beach habitat at HBP with minimal adverse impacts.

9.2 Recommendations

My recommendation is subject to cost sharing and other applicable requirements of federal laws, regulations, and policies. Federal implementation of the project for beneficial use of dredged material includes, but is not limited to, the following required items of local cooperation to be undertaken by the non-federal sponsor in accordance with applicable federal laws, regulations, and policies:

a. Provide the non-federal share of construction costs of the authorized project, as further specified below:

1. Provide all real property interests, including placement areas, and perform all relocations determined by the federal government to be required for the project;

2. Provide, during construction, any additional contribution necessary to make its total contribution equal to at least 35 percent of costs that are in excess of the Base Plan costs associated with dredging the federal navigation channel for the authorized federal navigation project, excluding the additional incremental costs for transporting (including depositing) dredged material from the federal navigation channel(s);

b. Provide funds sufficient to cover the costs of additional work related to the project that the federal government will undertake on the non-federal sponsor's behalf while the government is carrying out the Project, with the non-federal sponsor responsible for all costs and any liabilities associated with such additional work;

c. Operate, maintain, repair, rehabilitate, and replace the project or functional portion thereof at no cost to the federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable federal laws and regulations and any specific directions prescribed by the federal government;

d. Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor owns or controls for access to the project to inspect the project, and, if necessary, to undertake work necessary to the proper functioning of the project for its authorized purpose;

e. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the outputs produced by the project, hinder operation and maintenance of the project, or interfere with the proper function of the project;

f. Hold and save the Government free from all damages arising from implementation (including design), operation, maintenance, repair, rehabilitation, and replacement of the Project, except for damages due to the fault or negligence of the Government or its contractors;

g. Perform, or ensure performance of, any investigations for hazardous, toxic, and radioactive wastes (HTRW) that are determined necessary to identify the existence and extent of any HTRW regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, and any other applicable law, that may exist in, on, or under real property interests that the federal government determines to be necessary for construction, operation and maintenance of the project;

h. Agree, as between the federal government and the non-federal sponsor, that the non-Federal sponsor shall be solely responsible for the performance and costs of cleanup and response of any HTRW regulated under applicable law that are located in, on, or under real property interests required for construction, operation, and maintenance of the project, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination, without reimbursement or credit by the federal government;

i. Agree, as between the federal government and the non-federal sponsor, that the non-Federal sponsor shall be considered the owner and operator of the project for the purpose of CERCLA liability or other applicable law, and to the maximum extent practicable shall carry out its responsibilities in a manner that will not cause HTRW liability to arise under applicable law; and

j. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended, (42 U.S.C. 4630 and 4655) and the Uniform Regulations contained in 49 C.F.R Part 24, in acquiring real property interests necessary for construction, operation, and maintenance of the project including those necessary for relocations, and placement area improvements; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

I have given consideration to all significant aspects in the overall public interest, including environmental, social, and economic effects and engineering feasibility; and any other elements bearing on the decision. I therefore recommend that the Recommended Plan, Alternative 4: BUDM from the federal navigation channel to -13 ft, excavation of the barge access zone with beneficial use of excavated sand and the following additional work: dredging of the settling basin, and the offshore sand borrow area, with BUDM at Hale‘iwa Beach be constructed generally in accordance with the plan described in Section 5.0, and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable at an estimated total federal cost of $1.170 million and $0 annually for federal maintenance.

Date:________________________

Christopher Ryan Pevey
Lieutenant Colonel, U.S. Army
District Engineer

10.0 LIST OF PREPARERS

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Appendix A: Engineering Analysis

Hale‘iwa Small Boat Harbor Maintenance Dredging and
Beach Restoration Project

Hale’iwa, Island of O’ahu, Hawai’i

SECTION 1122
WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 2016

August 2023

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Contents

Figures

Tables

1.0 Introduction

This appendix summarizes the engineering design elements of the Section 1122 Haleʻiwa Boat Harbor Maintenance Dredging and Beach Restoration study. It describes the process and analysis used for feasibility-level design of the Beneficial Use of Dredged material, including natural forces, existing conditions, alternatives considered and construction methods. Haleʻiwa is located on the central north coast of the island of Oʻahu, Hawaiʻi, approximately 30 miles northwest of Honolulu. The project location is shown below in **Error! Reference source not found.** A1. The non-federal partners for the feasibility study are the D epartment of Land and Natural Resources, Division of Boating and Ocean Recreation and the Office of Conservation of Coastal Lands.

1.1 Project Background and Authority

Haleʻiwa Small Boat Harbor (HSBH) is the center for recreational boating activities on the north shore of Oʻahu. The original federal navigation project which was completed in November 1966 consisted of the entrance channel and revetted mole. The stub breakwater and wave absorber were added in 1975. Non-federal project features include 64 berths, 26 moorings, 2 loading docks, and 3 ramps. Shore side facilities include a harbor office, vessel wash down area, dry land storage, and a fish hoist. Several commercial operations operate out of the harbor, including fishing charters, shark encounters, diving charters, whale watching tours, snorkeling tours, sailing cruises, and other boat tours. The beaches surrounding the harbor are frequented by swimmers, surfers, stand-up paddle boarders, and other recreational ocean users. In the winter, several surf contests are held in this area due to the large surf.

This feasibility study is being conducted under authority granted by Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law 114-322), as amended. Section 1122 of WRDA 2016 requires USACE establish a pilot program to carry out 10 projects for the beneficial use of dredged material, including projects for the purposes of— (1) Reducing storm damage to property and infrastructure; (2) promoting public safety; (3) protecting, restoring, and creating aquatic ecosystem habitats; (4) stabilizing stream systems and enhancing shorelines; (5) promoting recreation; (6) supporting risk management adaptation strategies; and (7) reducing the costs of dredging and dredged material placement or disposal.

1.2 Existing Federal Projects

The current general navigation features at HSBH consist of (a) an entrance channel (740 feet (ft) long, 100–120 ft wide, 12 ft deep), (b) a revetted mole (1,310 ft long), (c) a stub breakwater (80 ft long), and (d) a wave absorber (140 ft long). The outer breakwater, approximately 840 ft long, was constructed by the State of Hawaiʻi. The non-federal sponsor for the harbor is the State of Hawaiʻi, Department of Land and Natural Resources, Division of Boating and Ocean Recreation.

The Haleʻiwa Shore Protection Project (HBSPP) consists of (a) a sand beach (1,600 ft long and 140–265 ft wide), (b) an offshore breakwater (160 ft long), and (c) a groin (500 ft long) which defines the southern limit of the beach improvements. The non-federal sponsor for the beach restoration project is the State of Hawaiʻi, Department of Transportation, and the project fronts Haleʻiwa Beach Park (HBP), which is the responsibility of the City and County of Honolulu. Construction of the beach restoration project was completed in April 1965 and repaired under the authority of Public Law 84-99 in 1978. Approximately 50,000 cu yd of sand were placed within the project limits as part of initial construction and the emergency repair. The project authorization states that the non-federal sponsor is responsible for ongoing maintenance of the project and that USACE may conduct emergency repairs to the project in accordance with Public Law 84-99. Features of the federal navigation project and shore protection project are shown in Figure A1.

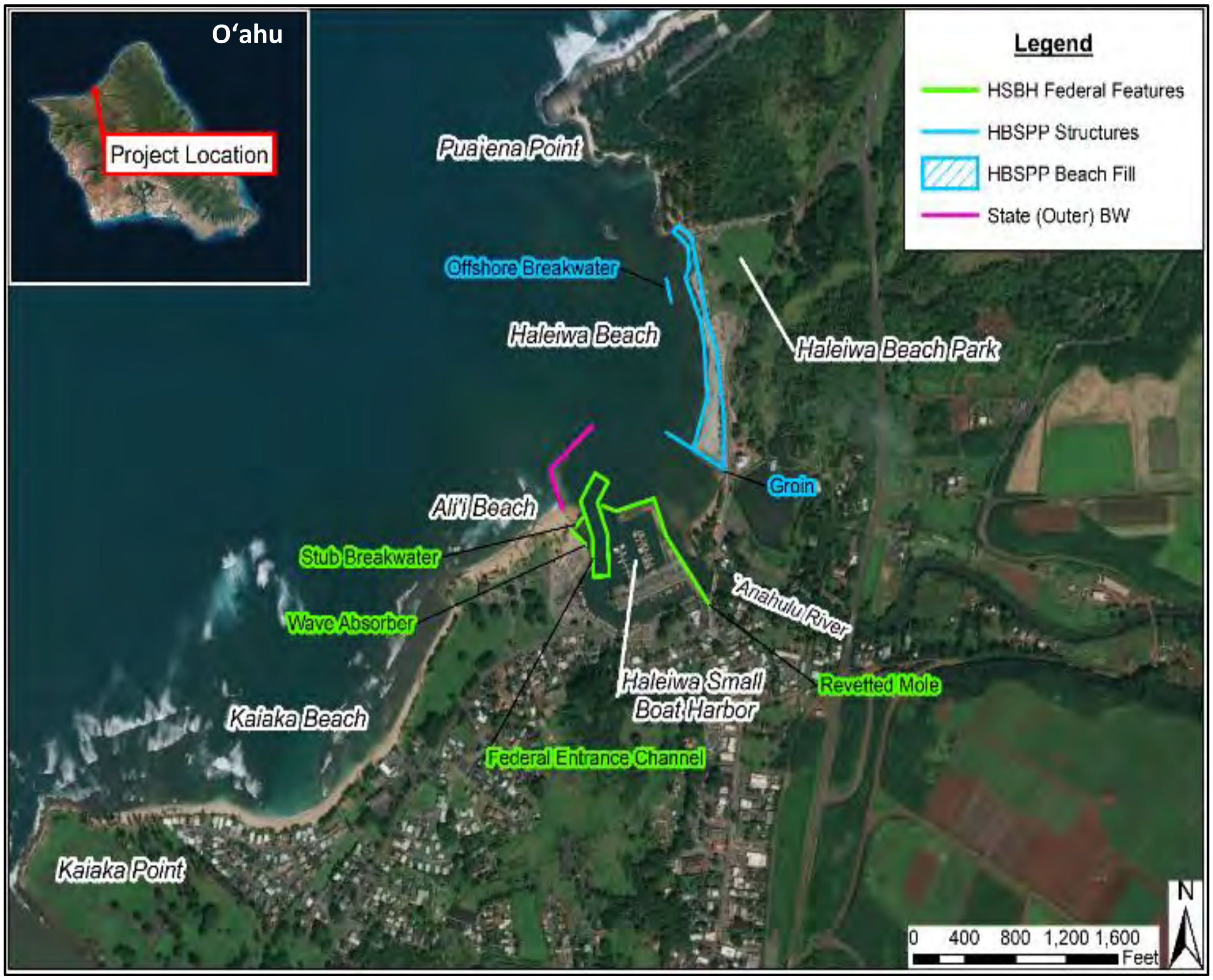

Figure A1. Project Location and study area for HSBH and HBSPP

2.0 Previous Studies and Investigations

2.1 Regional Sediment Management Investigations

Regional Sediment Management (RSM) refers to the effective use of littoral, estuarine, and riverine sediment resources in an environmentally sensitive and economical efficient manner. RSM changes the focus of engineering activities from the local or project-specific scale to a broader scale that is defined by natural sediment processes. A prime motivator for the implementation of RSM principles and practices is the potential for reducing construction, maintenance, and operation costs of federally authorized projects. Implementing RSM principles also has the potential to positively impact multiple projects in their ability to realize authorized purposes.

A Coastal and Hydraulics Engineering Technical Note, ERDC/CHL CHETN-XIV-38 (Podoski, 2014), reviews the development of conceptual regional sediment budgets (RSB) for the Haleʻiwa region as part of the Hawaiʻi RSM Program. The CHETN document discusses the methodology used for determining volume change rates as well as numerical models utilized, including the Particle Tracking Model (PTM), in support of identifying sediment pathways in the region. The results of these investigations were used to create the pre- (1922–1948) and post-Haleʻiwa Harbor (1988–2006) sediment budgets for the Haleʻiwa Region using the Sediment Budget Analysis System (SBAS) software. The post-Haleʻiwa Harbor sediment budget is provided later in this document in the section “Currents and Littoral Sediment Transport”.

An RSM Technical Note, ERDC/TN RSM-18-9 (Molina, 2018), documents information to prepare for the next maintenance dredging event at HSBH. The RSM-TN reviews previous work in the region including maintenance dredging and sediment budgets, evaluates sediment quality data, and projects future sediment volumes and shoaling rates. Additionally, this RSM-TN identifies environmental coordination requirements and permits and documents discussions with the non-federal sponsors and other stakeholders to identify stockpile, beneficial reuse, and disposal options. This TN was also used to inform the current study and is referenced in this appendix.

2.2 City and County of Honolulu Conceptual Design Study

In August 2019, the City and County of Honolulu Department of Design and Construction finalized a report titled, *Concept Designs for Selected Beach Parks, Volume 1 – Haleʻiwa Beach Park* (Sea Engineering, Inc., 2019). The study was completed as part of a larger program to address erosion problems at City and County beach parks on Oʻahu, with Haleʻiwa Beach Park identified as one of a few parks in a higher priority category that moved forward for a conceptual design phase.

The objective of the study, completed by Sea Engineering, Inc., was to conduct a more in-depth site investigation at Haleʻiwa Beach Park and develop concept designs to address the priority problem at the beach park. The conceptual report design objectives for Haleʻiwa Beach Park are two-fold: protect the backshore facilities and improve the recreational beach. The report documents the results of the study and
includes sections on existing conditions, historical shoreline trends, oceanographic design criteria, and discussions of the concept design alternatives.

As noted in the study, “The backshore in this area is protected from erosion by a vertical wall that was built in the 1950s as part of the park development. The vertical wall extends along approximately 550 ft of shoreline… The severe loss of sand fronting the wall, however, has resulted in the undermining of the wall, and the wall shows signs of settling, spalling, and cracking.” A photo from the report showing the damaged seawall is shown in Figure A2.

Figure 2-17 Damaged north end of wall (2008)

Figure A2. Photo of damaged seawall at Haleʻiwa Beach Park (Sea Engineering, Inc., 2019)

The study also identified a sand deposit approximately 3,400 ft offshore of Haleʻiwa Beach Park. Scuba divers performed a reconnaissance-level investigation of the sand deposit. Jet probing was conducted to determine the thickness of sediments overlying consolidated or hard bottom substrate within an area covering approximately 80,000 square yards, or about 16.5 acres. The preliminary investigations in this area indicate that the sand deposit contains in excess of 200,000 cubic yards (cy) of sand in the area identified. The depth of the area investigated varies from 35 to 54 feet.

Finally, the study presented five alternative designs that include varying measures such as: replacing/repairing the vertical seawall, attaching the existing detached federal breakwater to land by a rubble mound groin, adding a new T-head groin structure, various volumes of beach fill, and sand tightening the existing federal groin. The City and County of Honolulu considers Haleʻiwa Beach Park a high priority and has initiated the planning phase of an improvement project in 2020.

3.0 Existing Conditions

3.1 Water Levels, Tides, and Sea Level Change

Tides

Tides in Hawai‘i are semi diurnal with pronounced diurnal inequalities (i.e., two high and low tides each 24-hour period with different elevations). Water level data established for a temporary HSBH tidal station is show below.

Table A1. Water level data for Hale‘iwa Harbor

Datum	Elevation (MLLW)	Elevation (MSL)
Mean Higher High Water	1.9 ft	1.0 ft
Mean High Water	1.6 ft	0.7 ft
Mean Sea Level	0.9 ft	0.0 ft
Mean Low Water	0.3 ft	-0.6 ft
Mean Lower Low Water	0.0 ft	-0.9 ft

Hawai‘i is subject to periodic extreme tidal levels due to large scale oceanic eddies that propagate through the islands. These eddies produced tide levels up to 0.5 to 1 ft higher than normal for periods of up to several weeks.

Water Levels

Water level plays a critical role in design of coastal projects, particularly in those locations where waves are depth limited. The super-elevation of water level near the coast can be a controlling factor in determining the amount of wave energy affecting the harbor and shorelines. It can significantly affect coastal processes such as harbor seiching, wave breaking, wave generated currents, wave runup and inundation, and sediment transport. In addition, sea level change will increase the magnitude and frequency of the loading at a project as it increases the water level over time.

Water level is a combination of many factors that can occur over different temporal and spatial scales. Longer-term water level increases may be due to sea level changes, and/or annual or decadal anomalies such as El Niño/La Niña or the Pacific Decadal Oscillation. These phenomena will be discussed in the next section. Shorter-term effects on nearshore still water level are astronomic tide (presented above), storm surge (which includes wind setup and localized increase due to low pressure), and wave setup. Wave runup can be added to the still water level in areas where inundation along the shoreline or overtopping of a structure is a concern.

Extreme water levels calculated at the Honolulu Harbor tide gauge (shown in Figure A3) can be viewed as a generalized representation of still water level conditions at HSBH. However, since wave and storm exposure can vary dramatically on different coasts of O‘ahu, actual still water level probabilities at HSBH are likely different than those shown below. Figure A3 shows that the 1 percent annual exceedance probability still water level is 2.5 feet (0.76m) above Mean Sea Level for the period between 1983 -2001. This type of short-term water surface elevation in combination with longer-term increases such as sea level rise will cause increasing erosion, wave runup, and threats to habitat, recreation, and coastal infrastructure at Hale‘iwa Beach Park.

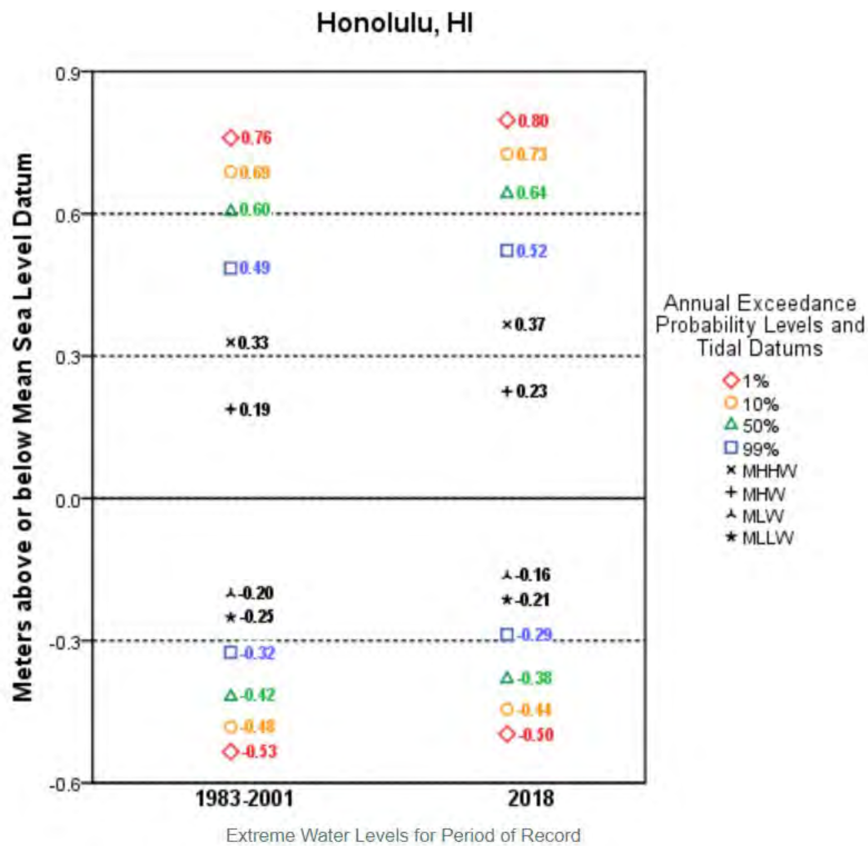

Figure A3. Extreme water levels at Honolulu Harbor, Oʻahu

Sea Level Change

Relative sea level change (SLC) is the local change in sea level relative to the elevation of the land at a specific point on the coast, including the lowering or rising of land through geologic processes such as subsidence and glacial rebound. Relative SLC is a combination of both global and local SLC caused by changes in estuarine and shelf hydrodynamics, regional oceanographic circulation patterns (often caused by changes in regional atmospheric patterns), hydrologic cycles (river flow), and local and/or regional vertical land motion (subsidence or uplift). Thus, relative SLC is variable along the coast.

At Honolulu Harbor (on the south coast of Oʻahu), relative sea level has risen at an average rate of 0.0049 ft/year (1.51mm/yr) over the 114-year period of record for the long-term NOAA tide station at this location. This is equivalent to an increase of 0.50 feet over the past century (Figure A4). This long-term trend of relative sea level rise exacerbates hazards such a coastal erosion, impacts from seasonal high waves, and coastal inundation due to storm surge and tsunamis. It has also increased the impact of short-term fluctuations such as extreme tides along coastlines of Oʻahu.

Yang and Francis (2019) notes that the VLMR (vertical land-motion rate) results at both Honolulu and Mokuoloe Island provide support towards Oahʻu being vertically ʻstableʼ (i.e., near-zero vertical land movement within uncertainties). Thus, the data point towards the conclusion that the relative sea level change on Oahʻu is dominated by the absolute sea level change, rather than the vertical land movement. This also provides confidence in the use of the Honolulu Harbor tide station to represent Haleʻiwa Harbor.

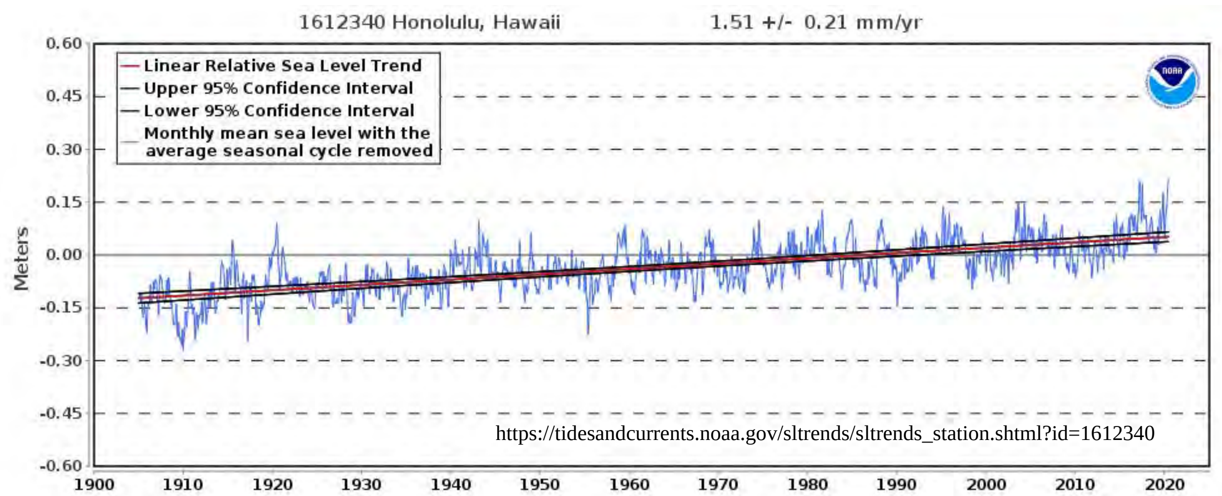

Figure A4. Sea level trend for Honolulu, Hawai'i.

Multi-decadal trade wind shifts in the Pacific (1950-1990 had weak trade winds, while 1990-present have shown strong trade winds) are likely related to the Pacific Decadal Oscillation (Merrifield et al., 2012), a recurring pattern of ocean-atmosphere climate variability centered over the mid-latitude Pacific basin. These low frequency trade wind changes can contribute on the order of 1 cm variations in sea level in the tropical Pacific. Multi-decadal variations such as these can lead to linear trend changes over 20-year time scales that are as large as the global SLC rate, and even higher at individual tide gauges, such as Honolulu, Hawai'i (Merrifield, 2011 and Merrifield et al., 2012).

In addition, higher frequency interannual variations in Pacific water levels can be caused by the effect of the El Niño Southern Oscillation (ENSO); the climate phenomenon in the Pacific evidenced by alternating periods of ocean warming and high air pressure in the western Pacific (El Niño) and cooler sea temperatures accompanied by lower air pressure in the western Pacific (La Niña). In fact, it is the largest interannual variability of sea level around the globe occurs in the tropical Pacific, due to these climate patterns (Widlansky et al., 2015). Additionally, and throughout the tropical Pacific, prolonged interannual sea level inundations are also found to become more likely with greenhouse warming and increased frequency of extreme La Niña events, thus exacerbating the coastal impacts of the projected global mean sea level rise (Widlansky et al., 2015).

These phenomena are documented here to emphasize the large variability in sea level that is experienced in the tropical Pacific, and to indicate that sea level trends reported by the nearest NOAA tide gage at Honolulu, Hawai'i are affected by this variability. Figure A5 shows the interannual variation of monthly mean sea level at Honolulu Harbor and the 5-month running average, with average seasonal cycle and linear sea level trend have been removed. Variability of up to +/- 0.5 feet (+/- 0.15 m) in the trend is comparable to the relative SLC over the past century.

Interannual Variation
1612340 Honolulu, Hawaii

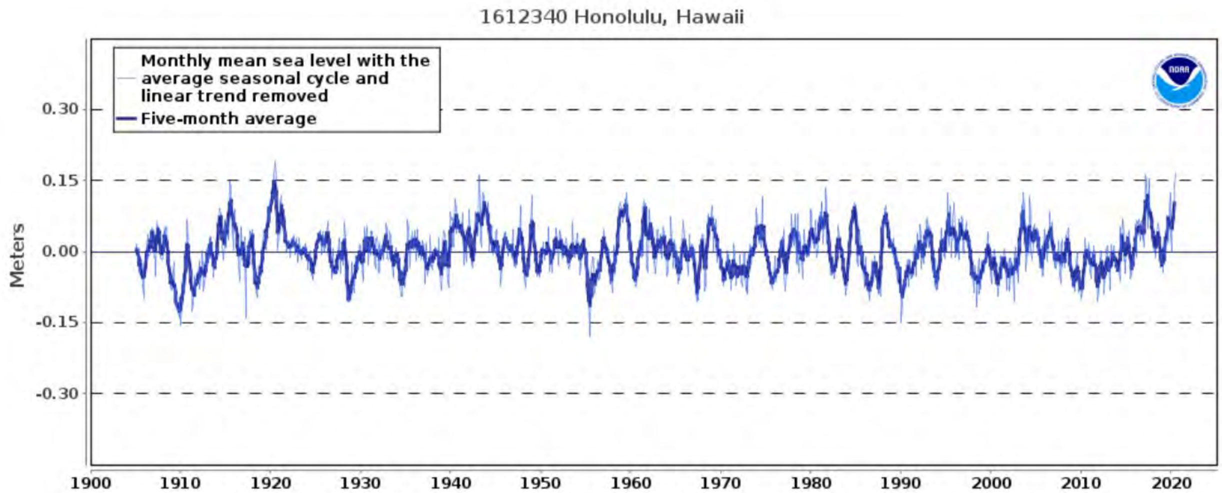

Figure A5. Interannual variation at Honolulu Harbor NOAA tide station

To incorporate the direct and indirect physical effects of projected future sea level change on design, construction, operation, and maintenance of coastal projects, USACE has provided guidance in the form of Engineering Regulation, ER 1110-2-8162 (USACE, 2019). ER 1100-2-8162 provides both a methodology and a procedure for determining a range of sea level change estimates based on global sea level change rates, the local historic sea level change rate, the construction (base) year of the project, and the design life of the project. Three estimates are required by the guidance, a Baseline (or “Low”) estimate, which is based on historic sea level change and represents the minimum expected sea level change, an Intermediate estimate (NRC Curve I), and a High estimate (NRC Curve III) representing the maximum expected sea level change. These projections are shown in Figure A6, with annotations for year 2023 (project start year), 2073 (50-year planning horizon) and 2123 (100-year adaptation horizon), and their impacts on the project alternatives are discussed later in this appendix.

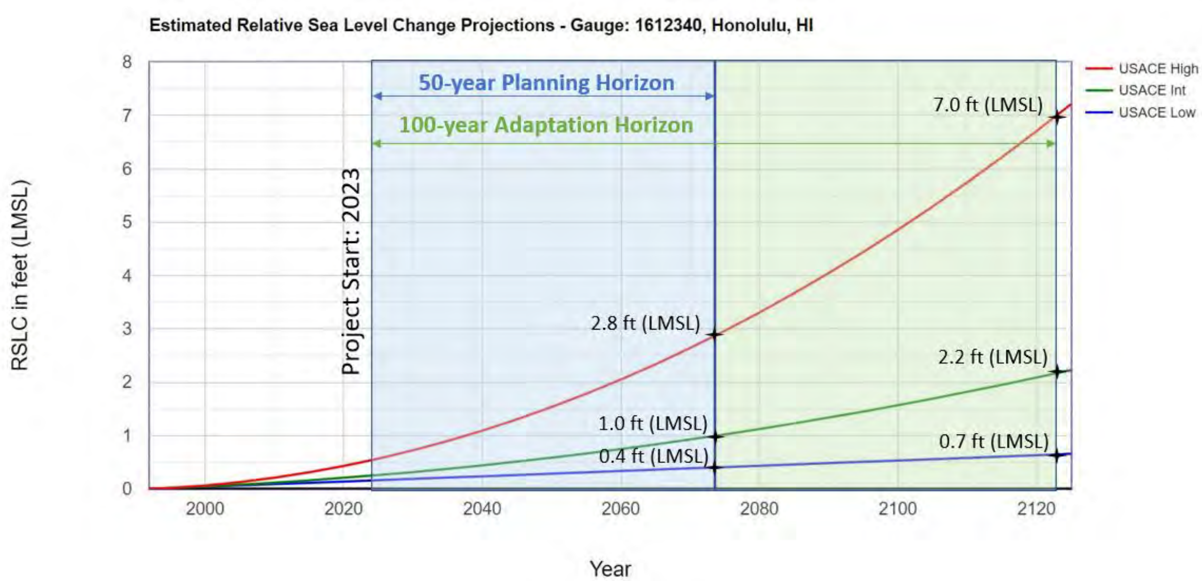

Figure A6. Relative Sea Level Change curves at Honolulu Harbor NOAA tide station

3.2 Wind and Wave Climate

Winds

The prevailing wind direction in the Hawaiian Islands is the northeasterly trade wind. During the summer period (May through September) the trades are prevalent 80 to 95 percent of the time. During winter/spring months (October through April), the trade wind frequency is 50 to 80 percent in terms of average monthly values. Locally generated low-pressure systems known as Kona lows situated to the west of the island chain can generate winds from a southerly to southwesterly direction, but this condition is relatively infrequent.

Figure A7 shows a wind rose diagram from a Wave Information Study (WIS) Hindcast station located off the north shore of O‘ahu.

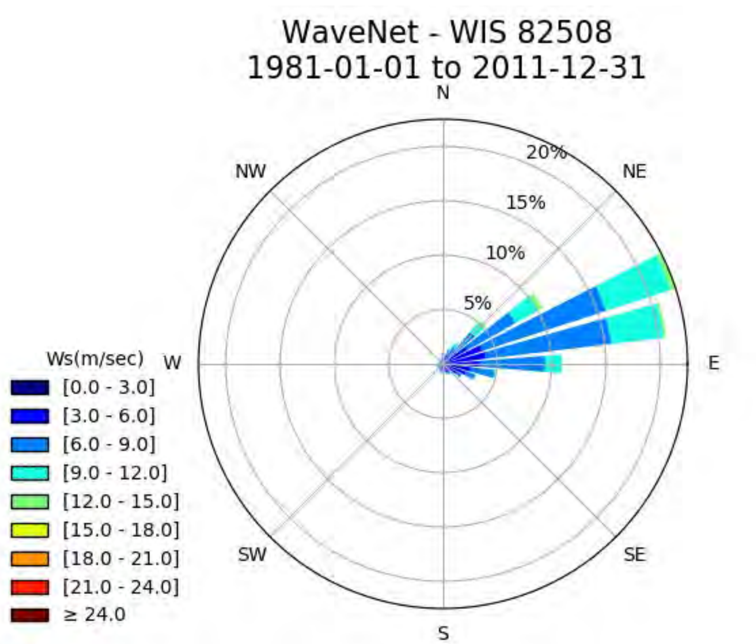

Figure A7. Wind Rose from WIS Station 82508

Waves

The Hawaiian Island chain is subject to a wide variety of incident wave conditions. Consistent trade winds generate local wind waves while distant storms in the North and South Pacific Ocean generate significant swell energy that travels thousands of miles before reaching Hawai‘i's coastline. Nearshore exposure to these wave conditions is highly dependent on location as well as shoreline orientation, due to the significant wave sheltering by adjacent islands and land features such as peninsulas and headlands. Refraction due to wave propagation over rapid changes in bathymetry also greatly affects wave climate in the islands.

Hale‘iwa SBH and Hale‘iwa Beach are exposed to north swell during the winter months and refracted trade wind waves year-round. Measured directional wave data is available for Buoy 106 of the Coastal Data Information Program (CDIP), which is located about five miles north of Hale‘iwa. A wave rose plot from this buoy data is shown in Figure A8, and a wave period rose plot is shown in Figure A9. These plots show that longer period swell arrives from the west-northwest to north directions, while trade wind generated shorter-period seas arrive from north-northeast through northeast.

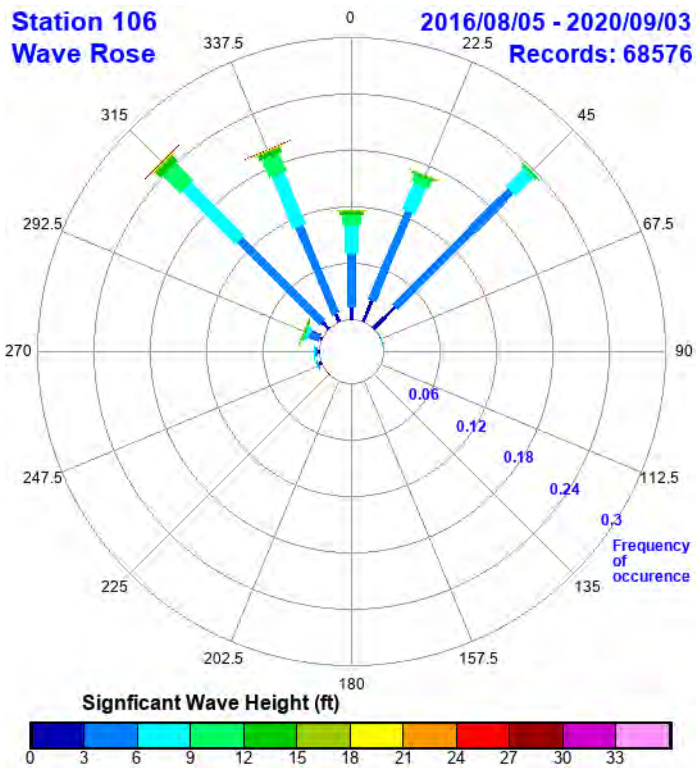

Figure A8. Wave height rose from CDIP buoy 106

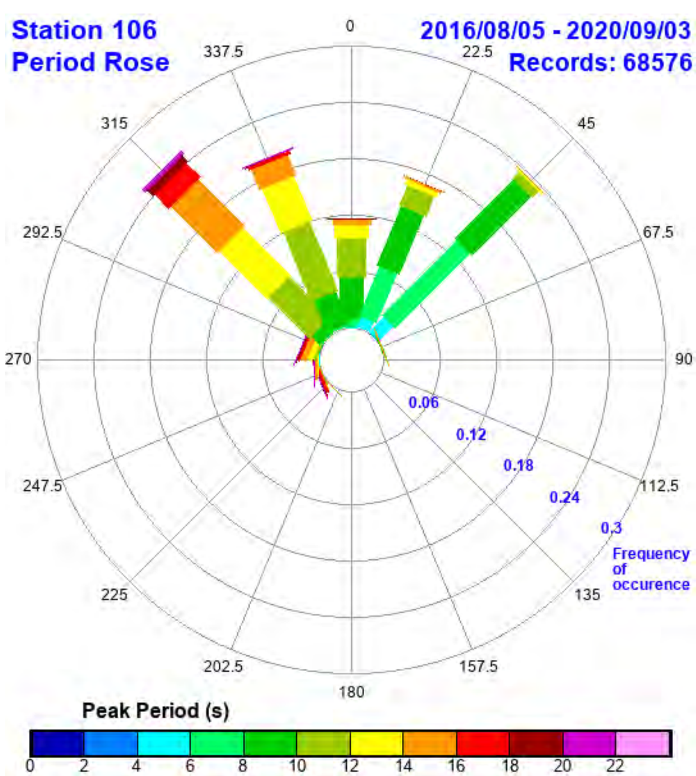

Figure A9. Wave period from CDIP buoy 106

3.3 Currents and Littoral Sediment Transport

The general circulation patterns in the Haleʻiwa region are dictated by the presence of the relic stream channels offshore of Kaiaka Beach and HSBH. An example of the dominant current regime, determined by circulation modeling presented in CHETN-XIV-38, is shown in Figure A10. The small black arrows in the figure indicate the direction of flow while current velocities are color coded in accordance with the legend in the top left corner of the figure (ranging from 0 m/sec in blue to 2 m/sec in red). The large black arrows represent the generalized current patterns of the region. Interpretation of the modeling results suggest that flow enters the Kaiaka Beach channel from both the reef and the nearshore waters. Flow also enters the adjacent channel offshore of HSBH from the reef fronting Aliʻi Beach and from the Haleʻiwa Beach Park shoreline. A strong, shore-parallel current from southwest to northeast is evident in the vicinity of the outer state breakwater, emptying into the harbor channel.

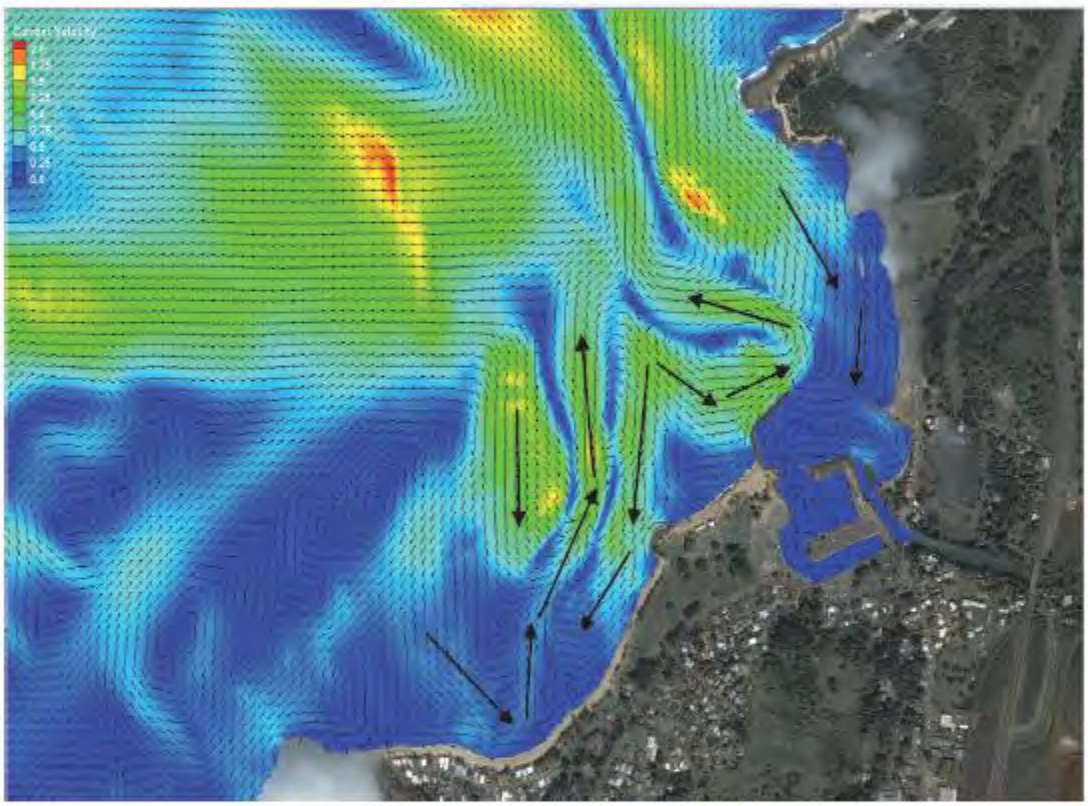

Figure A10. Regional circulation patterns in project area (Podoski, 2014)

The wave and circulation modeling completed was used with the Particle Tracking Model to visualize sediment transport pathways, and this in combination with shoreline change analysis and dredging records were used to develop a regional sediment budget, shown in Figure A11. The sediment budget is a tool to visualize and summarize the balance of sediment inputs and outputs over a given period, usually annually. This sediment budget uses pink to indicate erosive littoral cells, green to indicate accretive cells, blue to indicate stable cells, and arrows with average annual sediment transport rates in cy/year to indicate magnitude and the direction of dominant movement of sediment between cells. Stronger transport directions are indicated by larger magnitude transport rates.

The post-harbor construction sediment budget presented in this CHETN indicates that the Puaʻena Point, Haleʻiwa Beach, and Aliʻi Beach littoral cells are historically negative (or erosive). The Haleʻiwa Harbor cell is positive (accretive), being fed by sand transported from Aliʻi Beach over the harbor breakwater root and from Hale‘iwa Beach through both the harbor channel and the permeable groin along this cell boundary. There is also a small, assumed transport from the `Anahulu River since terrestrial sediments have been observed in dredged material. The harbor cell volume change is positive (+200 cu yd/yr), which is in general agreement with the shoaling rate presented in the next section.

Figure A11. Sediment budget for the Hale‘iwa region (Podoski, 2014)

The Ali‘i Beach cell is losing sand over the breakwater and into the harbor as well as along the outside of the breakwater and into the harbor entrance channel. A structural improvement at the root of the breakwater could reduce some of the erosion in this cell as well as reducing maintenance dredging requirements in the harbor channel; however, this action would be required by the State of Hawai‘i.

A portion of the sand from Ali‘i Beach and Hale‘iwa Beach is being directed offshore into the channel at the harbor entrance, a phenomenon that may have been caused or amplified by the construction of Hale‘iwa Harbor. Some of this sand may be staying within the littoral system, but based on increased erosion rates in recent years, it is likely that some of this sand is being moved into deep water by the offshore current in the channel and is being lost from the system. This observation is in agreement with the large sand field in 35 to 54 feet of water that was identified in the 2019 City and County of Honolulu Conceptual Design Study conducted by Sea Engineering, Inc. Sea level rise in combination with episodic high water levels and limited sediment supply are also thought to be contributing factors to recent erosion, and it is anticipated that erosion and offshore transport will increase in the future with continued sea level rise and temporary high water levels, due to increasing nearshore wave heights and current magnitudes. The ongoing offshore sediment loss may be altered by the addition of structures as proposed by the City and County but will not be completely eliminated.

In the Hale‘iwa Beach cell, there is strong transport from north to south, as evidenced by the wide beach at the terminal groin (which allows some sand to leak through). This also leaves the section in front of the comfort station severely eroded. Sand leaving the Hale‘iwa Beach cell but not moving offshore is ending up in the harbor channel in the lee of the State breakwater and nearby areas. This is adding to the maintenance dredging requirement in the channel. In addition, terrestrial sediment enters the back of the harbor from `Anahulu Stream. This explanation of regional processes correlates with the sediment analysis described in the next section, which identified fine grained terrestrial sediment in the back of the harbor and coarse-grained sand in the outer harbor.

Tightening the permeable groin at the south end of Hale‘iwa Beach and/or determining whether beach-quality sand can be recovered from areas adjacent to the harbor (near `Anahulu Stream mouth) may be viable ways of reducing maintenance requirements and keeping sand within the littoral system. Another method to address channel maintenance is the establishment of a settling basin between Ali‘i Beach and the federal channel, that would be dredged periodically in order to intercept sand before it migrates into the channel. These methods are discussed later in the Alternatives section of this appendix.

3.4 Historical Dredging, Shoaling Rates, and Sediment Characterization

Hale‘iwa Harbor has been dredged twice since initial construction: (1) 7,214 cy in 1999 and (2) approximately 4,556 cy in 2009. Both times, the material was disposed of upland. Some of the clean, sandy material from the 2009 dredging was used at the HBP for repair work, and some was made into concrete. At the time, placing suitable dredged material on Hale‘iwa Beach was identified as a potential beneficial reuse option. The necessary environmental permits were not in place, however, and the maintenance dredging schedule and budget did not allow for them to be acquired at that time. At the time, it was noted that some of the material dredged from portions of the navigation channel could be suitable for direct beach placement, however the quantity of material available per dredging cycle would not be enough to provide long-term stability to the region’s beaches.

By evaluating past dredging events and survey data, shoaling rates can be calculated, and future dredging requirements can be projected. See Table A2 for a summary of past dredging events and surveys from the past 20 years. The volume is the amount of material that shoaled above the authorized depth of 12 feet (identified by hydrosurvey), or the amount that was dredged during maintenance dredging. The shoaling rate is calculated as the difference in volume from the previous survey/dredge, divided by the number of years since that event. The high shoaling rate between 1999 and 2009 suggests that the harbor may fill in episodically, such as during storm events, rather than steadily over many years. In addition, high shoaling between 1999-2009 could be due to the initiation of sand moving around the breakwater spur due to high wave events. The average shoaling rates show that over the long term, the harbor shoals at a rate of about 238 cy/yr.

Table A2. Dredging and hydrosurvey volumes, and calculated shoaling rates

Shoaling rate based on dredging and hydrosurvey history			
YEAR	TYPE OF WORK	VOLUME (CY)	SHOALING RATE (CY/YR)
1999	Maintenance Dredging	7,214	219
2009	Maintenance Dredging	4,556	455
2011	Hydrosurvey	311	155
2014	Hydrosurvey	800	160
2018	Hydrosurvey	1600	200

Prior to the 2009 maintenance dredging, shoaled areas were sampled for both grain size and chemicals of concern by Marine Research Consultants, Inc. (MRCI, 2008). MRCI conducted two rounds of sampling: the first for grain size analysis (Samples H1-H6) and the second for chemicals of concern (Samples H1-H5, and H7). Composite Sample H123 was in the interior non-federal berthing area, which is the state’s dredging responsibility. Composite Sample H45 and discrete Sample H6 are in the federal channel as shown in Figure A12. Table A3 shows the grain size results.

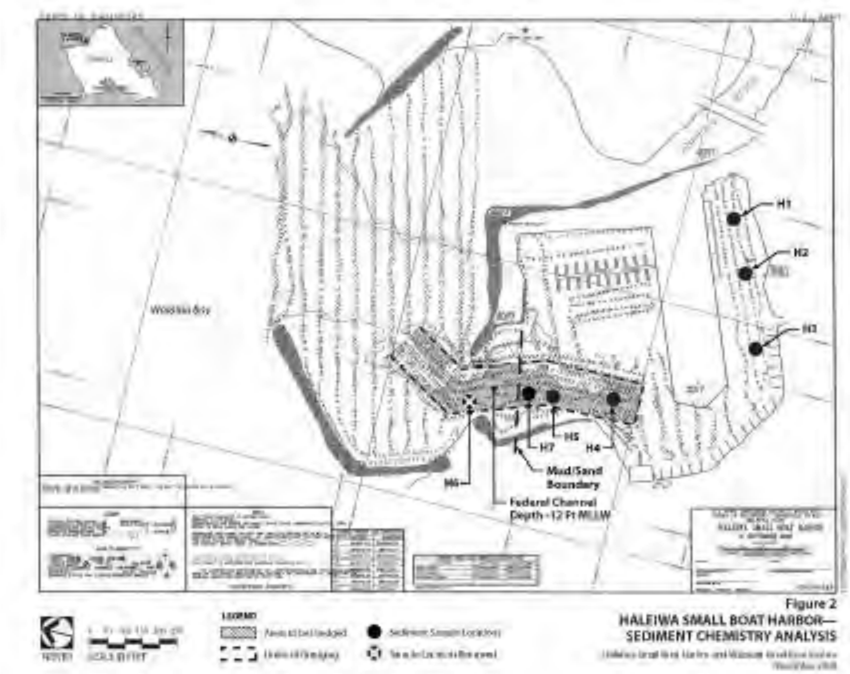

Figure A12. Haleʻiwa Harbor with sediment sampling locations and estimated sand/silt boundary (MRCI, 2008).

Table A3. Particle size distribution of Haleʻiwa Harbor sediment samples

Sample	H123 (%)	H45 (%)	H6 (%)
Gravel (>2 mm)	1.63	1.74	7.29
Sand (>63 µm)	8.11	43.67	92.35
Silt/Clay (<63 µm)	91.89	54.59	0.37

These data show the gradation from very fine-grained material in the berthing area (Sample H123), to clean, well-sorted coarse-grained sand in the outer channel (Sample H6). Based on these results, Figure A12 shows the approximate boundary between the sand/silt areas in the entrance channel (dashed line). Since Sample H6 was found to be less than one percent fines (silt/clay), it was not used for the second round of testing, which was a chemical analysis on material with greater than 15 percent fines. Instead, another sample location (Sample H7) was added to create composite Sample H457 as shown in Figure A12.

Although chemical concentrations were detected in Sample H457, they were determined to be below the Department of Health Environmental Action Limits for unrestricted uses. They were also below the maximum limits for landfill acceptance. Thus, contaminates did not restrict disposal options in 2009. Though the amount of dredged material suitable for beach placement was not quantified in 2009, based on the sample data and observations during dewatering, an assumption was made that approximately 60 percent (3,900 cy) of the material dredged from this section of the federal channel (dashed box in Figure A12) was sand similar to that found in Sample H6. Figure A13 is a photo of the sediment removed by mechanical dredging in 2009, placed in two distinct piles – on the left is silty/fine material dredged from the interior of the harbor, and on the right is material dredged from the outer harbor near the entrance, which is overwhelmingly coarse-grained sand.

Figure A13. Sediment dredged from Haleʻiwa Harbor 2009 maintenance dredging

More recent sediment sampling and analysis has not been conducted, as this is typically done in the design and permitting stage just prior to maintenance dredging. If maintenance dredging funds are received for Haleʻiwa Harbor as part of the requested FY22 budget package, sampling and analysis will be completed to determine the suitability of dredged material for beach placement, placement at an Ocean Dredged Material Disposal Site (ODMDS), or other disposal options during construction in FY23. For the purposes of this feasibility study, it is assumed that the dredged material will be of similar grain size and chemical makeup as the 2009 dredged material. Based on an average shoaling rate of 238 cy/year derived from the data in Table A2, it is anticipated that the volume of material above project depth by the time of construction (early calendar year 2024) will be approximately 3,332 cy. Addition of the estimated volume of material due to sloughing of side slope material and allowable overdepth dredging increases the total estimated dredging volume to 4,433 cy. Based on the previous boundary between sand and silt/fines found in 2009 and shown in Figure A12 (dashed line), it is assumed that approximately 2,433 cy of the dredged material will be coarse grained sand, suitable for beach placement. The remaining 2,000 cy dredged from the interior of the harbor is assumed to be fine/silty material that will not be suitable for beach placement and would have to be disposed of in the South Oʻahu ODMDS or upland, depending on the results of chemical analysis.

3.5 DMMP and Federal Standard for Maintenance Dredging

Many of Hawaiʻi's small boat harbors (including Haleʻiwa Harbor) are dredged relatively infrequently (10-to-15-year interval) due to low shoaling rates, high mobilization and construction costs for small projects, and limited impacts of shoaling on small boat navigation. Haleʻiwa has been dredged mechanically with a barge mounted excavator, due to the small footprint of the channel and relatively small dredge volumes. Historically, maintenance material dredged from HSBH was required to be disposed of by contractors in adherence with all applicable local, state, and federal laws and regulations. Most of the material has been relegated to upland disposal sites with occasional beneficial reuse which takes material out of the system (e.g., landfill cover and road construction), and, in combination with high costs of mobilization and relatively low dredge volume, has resulted in high costs per cubic yard as indicated in Table A4. The dredge material was placed upland in 1999 and 2009 because at that time this was the least cost option. Further analysis and development of a DMMP in 2018 showed that offshore disposal (50+ mile haul distance) is now the least cost option.

Table A4. Maintenance dredging historical volumes and costs

Year	Type of Work	Type of Disposal	Volume (cy)	Total Cost	Unit Cost ($/cy)*

1999	maintenance	upland	7,214	$208,000	$29.00
2009	maintenance	upland	4,556	$1,150,000	$219.00

*(Mob/Demob costs removed from Total Cost for unit cost calculation when known – 2009 known, 1999 unknown)

Until recently, all Honolulu District dredging contracts were solicited as lump sum contracts, so the unit prices shown are inferred from lump sum price, which introduces some uncertainty in the average costs. The 2009 dredging contract was a small business set aside, where the awarded contract line items indicated mob/demob as $150k and dredging as $1M, which is likely unbalanced, causing an inflated unit price. The actual unit price is likely closer to $100/cy as shown in cost estimates in Table A5. This increase in unit price over time also reflects the continuously high cost of construction in remote locations, and the limited availability of dredging contractors reducing competition.

In September 2018, a Dredged Material Management Plan (DMMP) Preliminary Assessment (USACE, 2018) was completed in accordance with ER 1105-2-100 (USACE, 2000). A DMMP is a comprehensive, long-term plan for management of dredged material removed from channels and berths to provide safe navigation. The DMMP is included as Appendix F of this document, for reference.

The Federal Standard is defined in USACE regulations as the least costly dredged material disposal or placement alternative identified by USACE that is consistent with sound engineering practices and meets all federal environmental requirements. It is also USACE policy to fully consider all aspects of the dredging and placement operations while maximizing benefits to the public. Beneficial use options for the dredged material should be given full and equal consideration with other alternatives.

A rough order of magnitude cost estimate completed as part of the DMMP is presented in Table A5 to compare the different disposal options. For each option, it is assumed that the channel will be dredged to authorized depth using mechanical means and that all material will be disposed of with a single disposal method (i.e., stockpile, beach placement, landfill, or ODMDS). The estimate showed that disposing of the material at the ODMDS is the least costly option, at $33/cy (based on an assumed 6,500 cy of dredged material). When an economy of scale is considered, this reasonably compares to a unit cost of $60 - $76/cy for offshore disposal for costs presented in this report (which assume 2,000 to 4,433 cy of dredged material, depending on the alternative). Taking the material to the ODMDS eliminates the need for landside equipment and dewatering and trucking the material.

Stockpiling and beach placement are very similar in unit cost ($91 - $96/cy), indicating that for construction cost there is not much difference with placing the material at HBP in stockpile vs. placing it on the beach. These DMMP estimated costs also compare very well with the average unit cost of $100/cy estimated in this report (which assume 3,733 to 7,638 cy of dredged material, depending on the alternative). Trucking the material to the landfill is the most expensive option, about double the stockpile/beach placement options (i.e., $188/cy vs. $91-96/cy). This ROM cost estimate for upland placement is in general agreement with the unit cost for the 2009 maintenance dredging shown above ($188/cy vs. $219/cy). The Federal Standard (or Base Plan) for management of material dredged from Haleʻiwa Harbor determined by the 2018 DMMP is the use of the existing EPA designated South Oʻahu ODMDS for all suitable dredged material. It is not expected that any material will have contaminates of concern above EPA's limits, nor that it will exceed the ODMDS grain size requirements.

Table A5. Cost Estimates for Various Disposal Options from DMMP

Disposal Method	Mob/ Demob	Dredging Project Costs	Total Project Costs	Dredging Unit Costs ($/cy)
Stockpile	$501,121	$593,948	$1,095,069	$91
Beach Placement	$501,121	$621,450	$1,122,571	$96
Landfill	$501,121	$1,220,902	$1,722,023	$188
South Oahu ODMDS	$626,888	$212,880	$839,768	$33

Beneficial use project costs exceeding the cost of the Federal Standard (or “base plan”) option become either a shared federal and non-federal responsibility, or entirely a non-federal responsibility, depending on the type of beneficial use. Section 145 of WRDA 1976, as amended by Section 933 of WRDA 1986, Section 207 of WRDA 1992, and Section 217 of WRDA 1999, authorizes USACE to place suitable dredged material on local beaches if a state or local government requests it. Although placement for restoration purposes may be authorized under it, this provision is primarily used for storm damage control purposes. Typically, the incremental costs of beach nourishment are shared on a 65 percent federal and 35 percent non-federal basis. Under Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law 114-322), as amended, the costs of beneficial use projects in excess of the Base Plan will be 100 percent federally funded.

4.0 Measures and Methods Considered for Beneficial Use

4.1 Dredging Locations and Sediment Volumes

This section describes the various locations proposed for dredging as part of the Section 1122 Beneficial Use of Dredged Material project. Approximate dimensions and volumes of each area are outlined. Beneficial reuse of material from any of these areas is contingent upon sediment sampling an analysis to confirm that material meets the requirements of the State of Hawaiʻi for beach placement. These requirements are, in general: no more than 6 percent fine sediment, no more than 10 percent coarse sediment, grain size compatibility within 20 percent of the existing beach sand, no more than 50 percent of material as fine sand, a composition of naturally occurring carbonate, and free of contaminants such as organic matter. This sampling and analysis will be conducted during the design phase of this project, if authorized.

Federal Navigation Channel

This is the primary source of dredged material and is a federal channel with regular O&M requirements. As noted in the previous chapter, it is anticipated that the volume of material above project depth (-12 ft MLLW) by the time of construction (early calendar year 2024) will be approximately 3,332 cy. Addition of the estimated volume of material due to sloughing of side slope material and allowable overdepth dredging increases the total estimated dredging volume to 4,433 cy. It is assumed that approximately 2,433 cy of the dredged material will be coarse grained sand, suitable for beach placement. The remaining 2,000 cy dredged from the interior of the harbor is assumed to be fine/silty material that will not be suitable for beach placement and would have to be disposed of in the South Oʻahu ODMDS or upland, depending on the results of chemical analysis.

Dredging beyond the authorized depth is permitted (if done solely for the purpose of the pilot project and not for the purposes of advanced maintenance) under Section 204 of the Continuing Authorities Program. If sampling and analysis of channel sediments done as part of the design phase of the O&M dredging project show that sandy sediment exists below the authorized channel depth (as is expected), one foot of additional dredging (to a depth of -13 ft MLLW) could be conducted in the outer harbor (between Sta 0+00 and Sta 4+00), in the area shown in Figure A14. This would result in an additional volume of approximately 1,705 cy and would be placed on Haleʻiwa Beach Park with the additional suitable dredged material. Based on the estimated channel shoaling rate of 238 cy/year, this would delay the requirement for future dredging by about 7 years. The additional cost of this dredging would be cost shared between the federal government and the Hawaiʻi Department of Land and Natural Resources, Division of Boating and Ocean Recreation (DLNR/DOBOR).

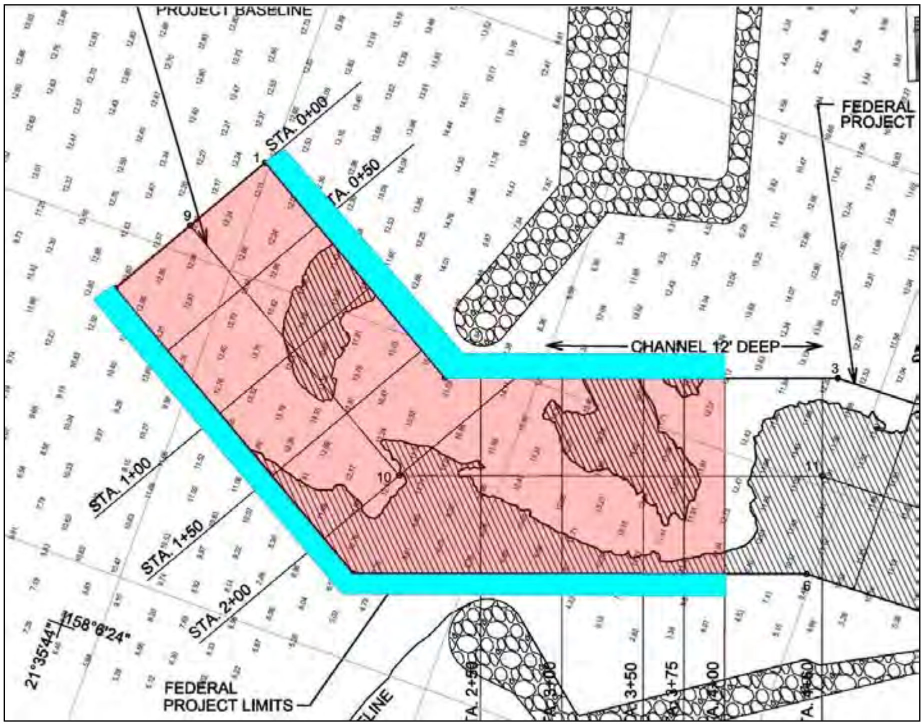

Figure A14. Area of additional dredging to -13 ft MLLW

State Breakwater Settling Basin

Previous RSM efforts (Podoski, 2014 and Molina, 2018) identified sediment shoaling between the federal stub breakwater and the State of Hawai‘i owned outer breakwater, as indicated in Figure A15. Sand is transported by wind and high waves from Ali‘i Beach over the root of the outer breakwater and is deposited on the harborside of the breakwater.

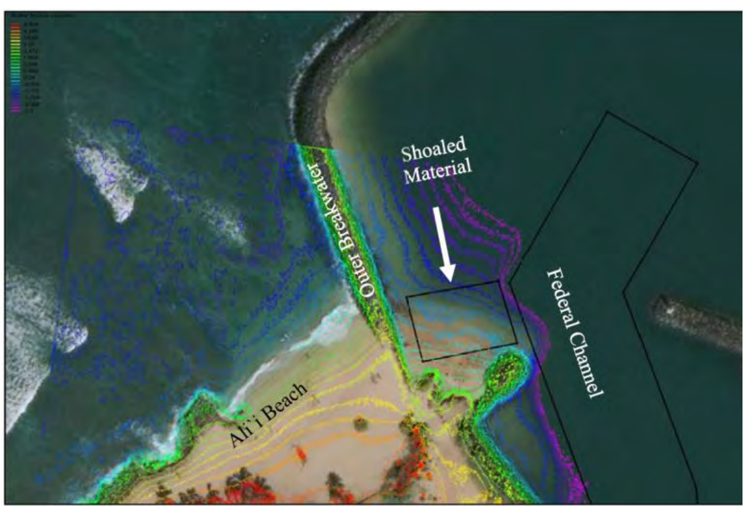

Figure A15. Sediment from Ali‘i Beach overtopping State breakwater

A 2018 multibeam hydrosurvey of the harbor shown in Figure A16 (depths shown in feet relative to MLLW) indicates that a significant portion of this material is ultimately transported around the stub breakwater and into the federal channel (shown as gray lines in the figure). A cross-section of survey data (location indicated by red line in Figure A16) in the area between the stub breakwater and revetted mole shows that the incoming material is causing over half of the 120 ft-wide channel to shoal above the -12 ft

MLLW authorized project depth (Figure A16 inset). Also evident in the figure is that depth in the other half of the channel is significantly greater than authorized depth, up to -23 ft MLLW. This "scour hole" is being created by the narrowing of the cross-sectional channel area between the shoaled material and the revetted mole on the other side, resulting in high current velocities through this constricted area. There is also concern that this scouring process may begin to threaten the stability of the revetted mole by undermining its foundation if the scour hole continues to deepen and/or migrate toward the structure. For the purposes of navigation safety, navigation structure stability, and reducing channel maintenance costs, this influx of sand to the federal channel is a problem that must be addressed.

RSM program funds were used in FY19 to investigate the feasibility of seeking authorization to establish a settling basin in the shoaled area updrift of the channel. The intent would be to allow federal dredging of the area outside the currently authorized project, in order to intercept the sediment before it reaches the federal channel, and beneficially reuse the material (if suitable) at Hale‘iwa Beach Park. The RSM investigation determined that establishing the settling basin and removing sand between maintenance dredge events would reduce O&M life cycle costs by extending the required interval between maintenance dredging from approximately 10 years to 17 years.

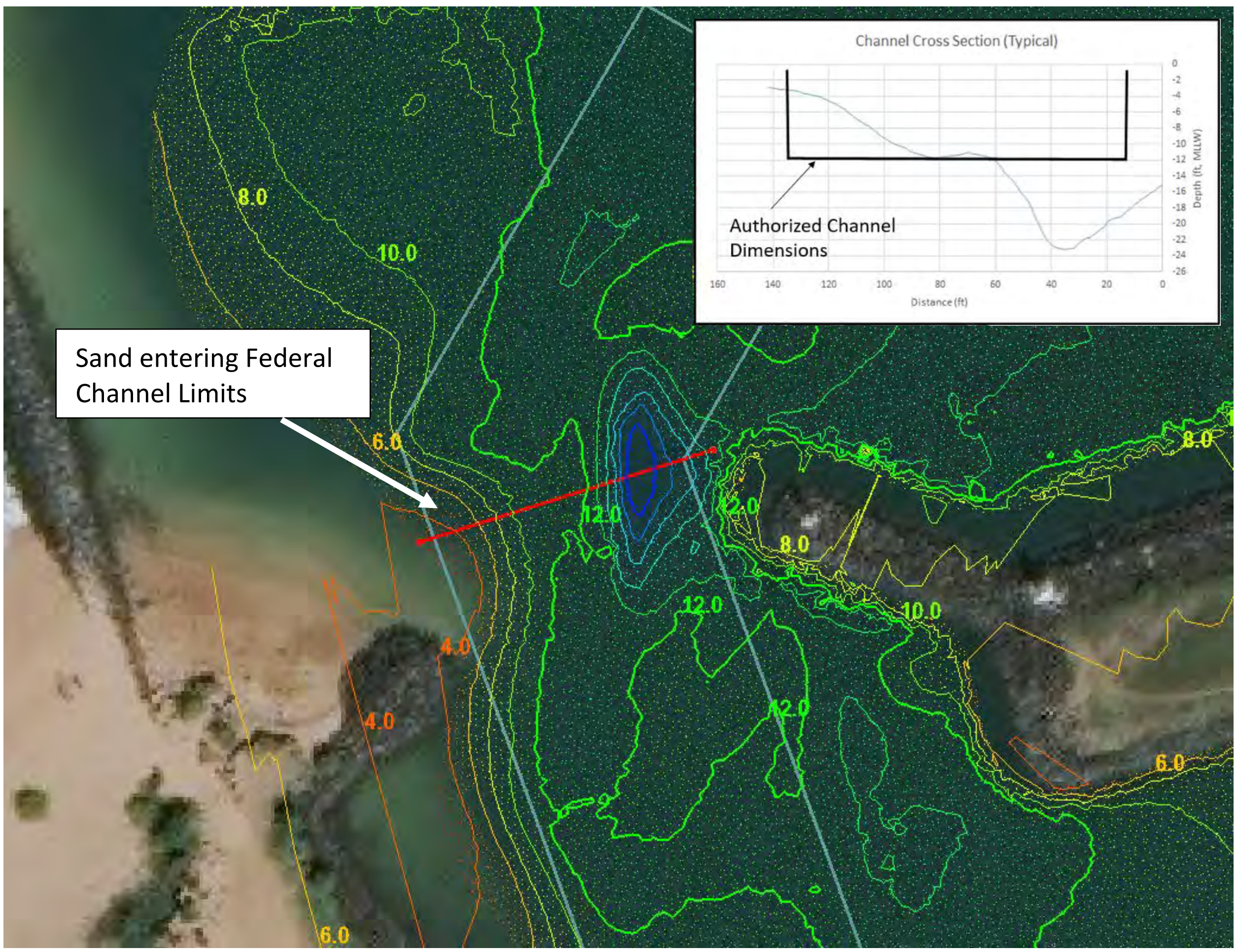

Figure A16. 2018 survey data indicating channel shoaling and channel cross-section (Inset)

The authorization could occur in accordance with ER 1130-2-520, paragraph 8-2.a. (7) Navigation and Dredging Operations and Maintenance Policies, 29 Nov 1996 which states that,

> *Advance maintenance dredging, to a specified depth and/or width, may be performed in critical and/or fast-shoaling areas to avoid frequent dredging and ensure the least overall cost of maintaining the project. MSC*

> *commanders are authorized to approve advance maintenance dredging for new work dredging and maintenance dredging of the project.*

The proposed State Breakwater Settling Basin footprint would be a polygon of approximately 140 feet by 110 feet, or 13,000 square feet (0.3 acre) in area, as shown in Figure A17. The basin would be dredged to a depth of approximately -8 ft MLLW, with side slopes of 1V:2H (based on coarse sand angle of repose), yielding approximately 2,200 cy of sediment. Based on the sediment budget in Figure A11 showing approximately 131 cy/year coming over the breakwater and into the channel, and the existing total shoaling rate of 238 cy/year, it can be concluded that dredging the settling basin would reduce the shoaling rate to 107 cy/year (reduction of 55 percent) over the next 17 years, until the settling basin fills up again. The sediment would need to be sampled and analyzed for grain size to determine it suitability for beach placement. In addition, during design phase, geotechnical surveys would be required to determine the location of the toe of the state breakwater (As-Built drawings are not available), to ensure that any dredging of the settling basin would not impact the stability of this structure's foundation.

Ultimately, the authorization of a State Breakwater Settling Basin in this location was not supported by the Major Subordinate Command (MSC), which for Honolulu District is the Pacific Ocean Division, because Haleʻiwa Harbor is not considered a "fast-shoaling area", due to its relatively infrequent maintenance dredging cycle of approximately 10 years. For this reason, the State Breakwater Settling Basin is being included as a measure in this feasibility study as a 100 percent non-federal feature, to be completed during maintenance dredging of the federal channel but paid for by DLNR/DOBOR. This agency, as non-federal sponsor of HSBH, is supportive of the Section 1122 project and beneficial use of dredged material at Haleʻiwa Beach Park to the maximum extent practicable.

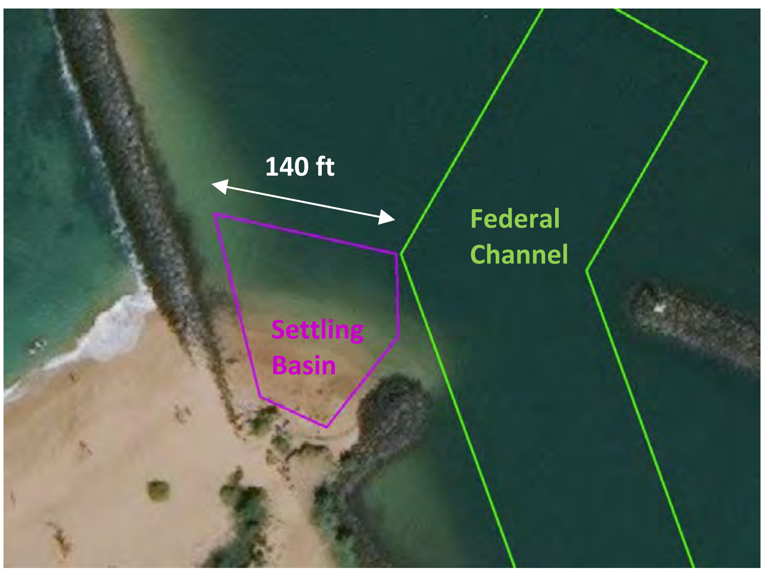

Figure A17. State Breakwater Settling Basin limits

Offshore Sand Borrow Area

The 2019 City and County of Honolulu Conceptual Design Study (Sea Engineering, Inc., 2019) identified a sand deposit approximately 3,400 ft offshore of Haleʻiwa Beach Park. Scuba divers performed a reconnaissance-level investigation of the sand deposit. Jet probing was conducted to determine the thickness of sediments overlying consolidated or hard bottom substrate within an area covering approximately 80,000 square yards, or about 16.5 acres. The preliminary investigations in this area, including reconnaissance-level cores of approximately 3 to 4 feet depth, indicate that the sand deposit contains in excess of 200,000 cy of sand in the area identified. Grain size distributions from these core samples are shown in Figure A18, indicating a composite mean grain size diameter (D_{50}) of 0.4mm (thick blue line in figure), which would be considered compatible with the composite mean grain size diameter of sand on the beach at 0.6mm (thick black line in figure). The depth of the area investigated varies from 35 to 54 feet. A portion of this identified area could be used as an offshore sand borrow area, in order to supplement the volume obtained from the federal channel and the settling basin. It is anticipated that approximately 15,000 cy of material from this offshore site would be sufficient to fully restore Haleʻiwa Beach, contingent upon sediment sampling to confirm its suitability for beach placement.

The dredging of sand from this area and placement at HBSPP would require the use of a barge mounted crane and clamshell dredge. The sand would be dewatered during excavation using an environmental clamshell bucket, placed on a scow, and barged to the access channel where it would be mechanically placed on the beach. This dredging and placement would be completed during maintenance dredging of the federal channel, but would be paid for by DLNR/OCCL. This agency, as non-federal sponsor of the Hawaiʻi Regional Sediment Management Program, is supportive of the Section 1122 project and beneficial use of dredged material at Haleʻiwa Beach park to the maximum extent practicable.

Figure A18. Offshore Sand Borrow Area (SEI, 2019)

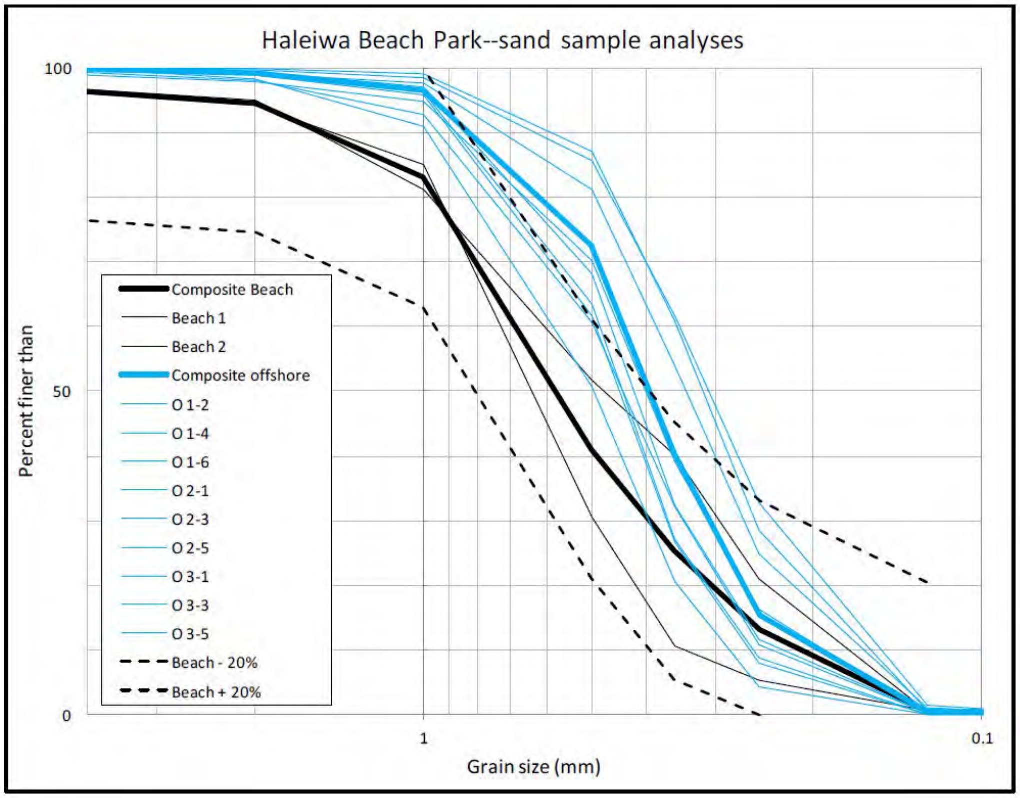

Figure A19. Grain size distribution, Hale‘iwa Beach and Offshore Sand Borrow Area (Sea Engineering, Inc., 2019)

Barge Access Zone

As noted in the following section, the most efficient method for transporting dredged material to HBSPP for beneficial use involves excavating a barge access zone adjacent to the groin on the south end of Hale‘iwa Beach Park, to a depth of -10 ft MLLW (Mean Lower Low Water). This barge access zone will allow for scow unloading (via long reach excavator) directly to the beach. This was determined to be a more cost-effective method of transport and placement compared to trucking via roads. Excavation of the barge access zone is anticipated to produce an additional 1,300 cy of beach suitable sand based on visual observations. Suitability of the material will be confirmed by sediment sampling conducted in the design phase. The navigational depth requirement is -10 ft MLLW for the barge to effectively place the material at the site without re-handling. The existing condition is approximately -3 ft MLLW. No adverse impacts to project performance are expected from dredging of the access zone. There is a potential for a minor and temporary increase to wave height in the area, but following construction, sediment will fill the access channel due to normal sediment transport processes. Consideration was given to light loading of the scow, and actively loading and unloading at high tide; however, it is more efficient and therefore more cost effective to make the site access improvements for the scow.

4.2 Dredging and Placement Methods Considered

- **Hydraulic dredging** – This method of dredging would be an efficient way to dredge and transport material from the dredging locations (using a suction dredge and pipeline) to the beach placement location in a sand/water slurry, without having to dewater sediment, or load the material onto trucks or barges. It is not an efficient way to dredge material that will go to an ODMDS, due to the excess water that would have to be removed from the dredged material to ensure efficient transport offshore.

Mechanical dredging – This method of dredging is the typical method used for the Haleʻiwa Small Boat Harbor navigation channel. It would require using a barge mounted crane and clamshell or hydraulic excavator to dig the dredged material and place into a scow barge (see Figure A20), and then barging and/or trucking the material to the placement location. Though the dredging areas are in varying depths and wave exposure conditions, it is anticipated that a single barge mounted crane with a clamshell bucket could be used to excavate all areas.

- **Truck Hauling –** This method of dredged material transportation would involve dewatering sediment in a basin, then loading dredged material onto trucks in HSBH for transport to HBSPP.

- **Barge Haul via Scow –** This is the existing transportation means for the Federal Standard, with disposal at the South Oʻahu ODMDS. For beach nourishment purposes under Section 1122, this transportation means requires site access improvements (i.e., a barge access zone) and those costs are accounted for in project costs for economic evaluation. The navigational depth requirement is -10 ft MLLW for the barge to effectively place the material at the site without re-handling. The existing condition is approximately -3 ft MLLW. As-Built drawings of the groin at the south end of Haleʻiwa Beach Park indicate the toe of groin lies at elevation of approximately -6.5 to -7.5 ft MLLW. The final location of the barge access zone will be offset from the structure to ensure that undermining of toe stones does not occur. This location will be determined during design phase and placed in contract documents.

Figure A20. Typical method of mechanical dredging at Haleʻiwa Harbor (from 2009 construction)

Placement of dredged material at Haleʻiwa Beach, whether by offloading from a scow barge or trucked from Haleʻiwa SBH, will require that the sand is dewatered prior to placement, such that minimal runoff of water will return to the ocean. This requirement exists to remain in compliance with the Section 401 Water Quality Certification for the State of Hawaiʻi. If a barge is used, dewatering will occur during placement from the excavator or crane to the scow using an environmental bucket, which minimizes the uptake of water during the dredging process. If trucking is used, and environmental bucket may be used, in addition to a bermed dewatering area if needed. When sand is transported to the beach, it will be offloaded to a single location (dependent on the method of transport) and spread across the beach using equipment such as bulldozers or bobcats, which is considered part of placement and would be conducted under the federal dredging contract. The Section 1122 authority does not allow for the “shaping” of beach features such as dunes or berms, but for the purposes of estimating the coverage area of the placed sand, a typical placement template was assumed, and is presented in the following section. The City and County of Honolulu has indicated that it has the equipment and labor necessary to complete further shaping or spreading of the sand as needed and could complete this using existing parks maintenance funding.

4.3 Typical Beach Placement Cross-Sections

The various locations of potential dredging outlined in Section 4.1 are anticipated to yield varying quantities of sand suitable for beach placement. Depending on the final quantity that is dredged, the area of beach to be restored can be estimated using a simple calculation of approximate volume per linear foot of beach. A baseline and stationing were established for the southern portion of Haleʻiwa Beach Park (Figure A21). Erosion exists along the entire comfort station seawall along the northern 1/3 of shoreline and has recently progressed southward now affecting war memorial in middle of the shoreline. For the purposes of the feasibility study, it was assumed that any placement, regardless of the quantity, would be centered at Station 3+00, in front of the war memorial at the beach park. This is an area of continued erosion, and any material placed in this location would spread to the north and south by adjusting to an equilibrium due to wave action in the short-term. In the longer-term, placed sand would move to the south in accordance with the direction of dominant longshore transport along this beach. Placement locations will be refined/finalized during design phase.

Figure A21. Primary stationing for beach placement

Typical cross-sections for beach placement were designed using a berm crest elevation of +9 ft MLLW (+8.1 ft MSL), a berm width of 35 to 50 feet, and a slope of 1V:8H (Figures A22a through A22d). These parameters were based on the original beach placement template used for the HBSPP, as well as the existing features of the area, including the backshore elevation and existing beach slope. Data from a 2013 USACE LiDAR survey of Oʻahu shorelines was the most recent topography available to represent the existing beach. A new topographic survey should be conducted during the design phase of the project to evaluate and revise the beach placement template and fill volume calculations.

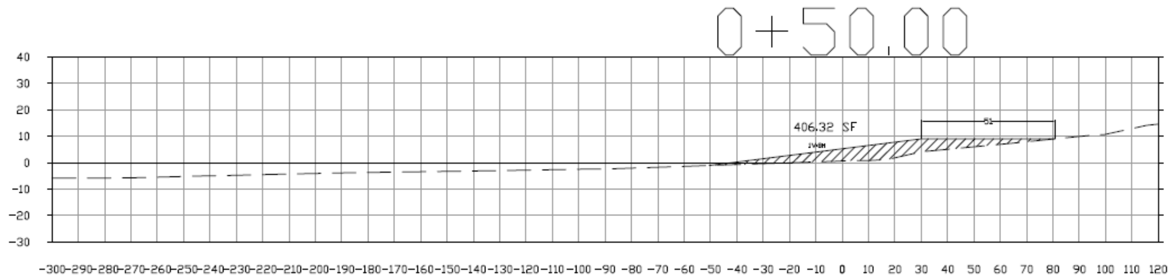

Figure A22 (a). Typical beach fill cross-section at Sta 0+50

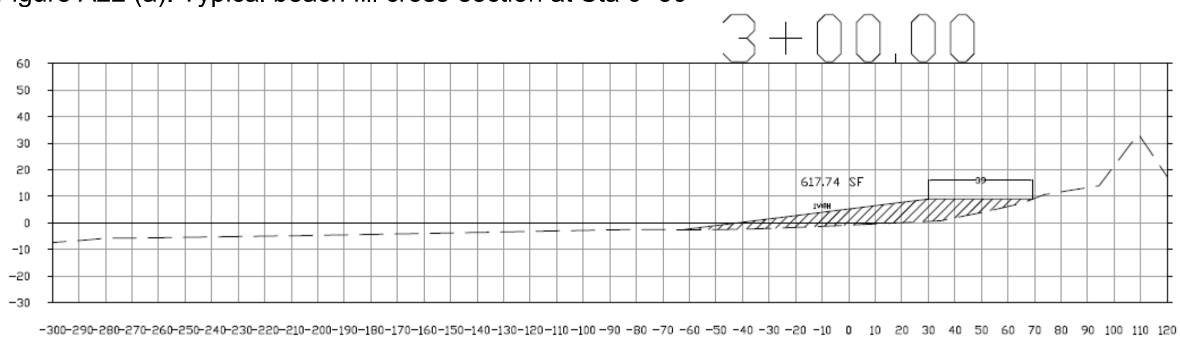

Figure A22 (b). Typical beach fill cross-section at Sta 3+00

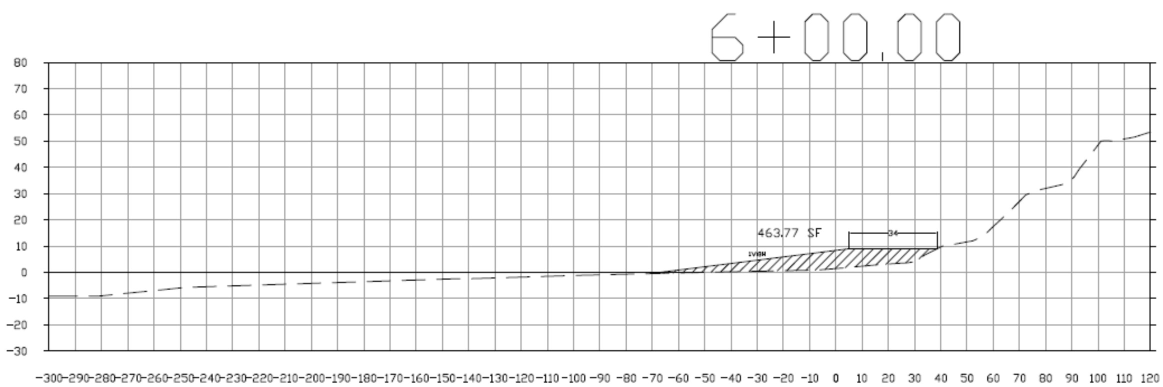

Figure A22 (c). Typical beach fill cross-section at Sta 6+00

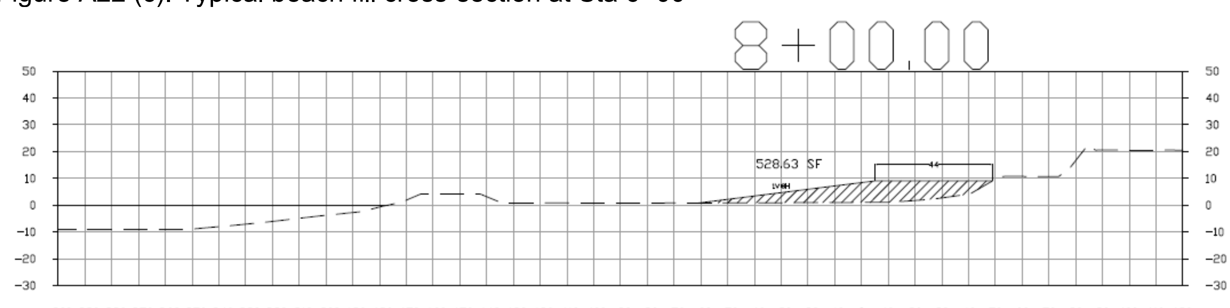

Figure A22 (d). Typical beach fill cross-section at Sta 8+00

5.0 Alternative Plans

5.1 Alternative 1 – No Action Alternative

Maintenance of the HSBH would continue to be the responsibility of the NFS, the Hawai'i Department of Transportation. USACE would undertake no action in the study area. Under this No Action Alternative, conditions in the project area are anticipated to develop as described in the Future Without Project Condition (Section **Error! Reference source not found.**). Specifically, no beneficial use of dredged m aterial for beach restoration would occur leading to continued beach erosion at Hale'iwa Beach Park and likely increases in storm damage to the public infrastructure located there. The No Action Alternative serves as the basis against which the project alternatives are compared.

5.2 Alternative 1A- No Action Alternative

O&M dredging of the navigation channel (Figure A23) would occur on its current cycle and sediment would be disposed of per the Federal Standard. The Federal Standard for sediment is open water placement at the South O'ahu ODMDS.

Under this No Action Alternative, conditions in the project area are anticipated to develop as described in the Future Without Project Condition (Section **Error! Reference source not found.**). Specifically, no b eneficial use of dredged material for beach restoration would occur leading to continued beach erosion at Hale'iwa Beach Park and likely increases in storm damage to the public infrastructure located there. The No Action Alternative serves as the basis against which the project alternatives are compared.

Alternative 1A also serves as the Base Plan for operation and maintenance of HSBH. Under the Base Plan, O&M dredging of the Federal Navigation Channel would occur, and sediments would be disposed of per the Federal Standard. The next dredging maintenance cycle is anticipated for FY23. Under the Base Plan, approximately 4,433 cy will be dredged from the Federal Navigation Channel and taken offshore to the South O'ahu ODMDS.

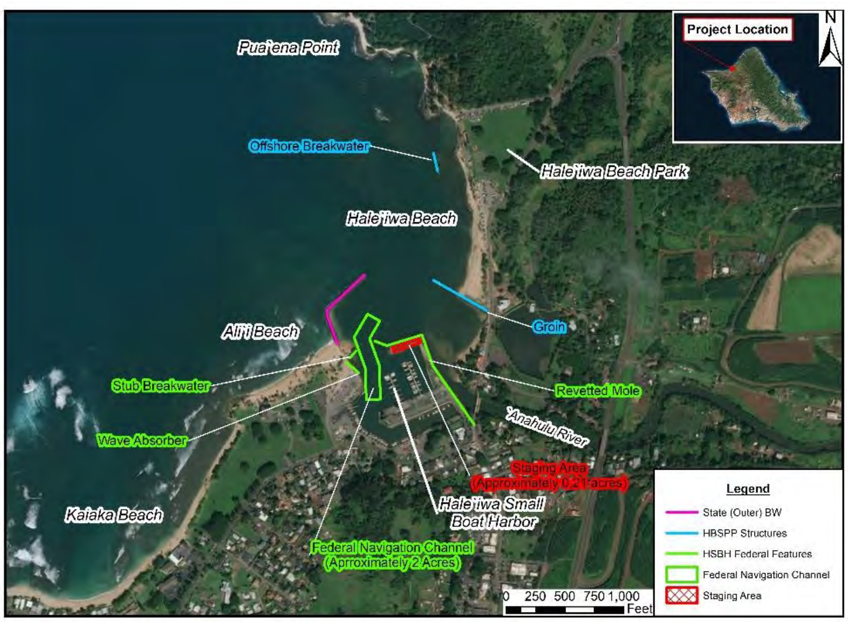

Figure A23. Alternative 1A: No Action Alternative. Federal Navigation Channel shown in green.

5.3 Alternative 2 – Beneficial Use of Dredged Material from Federal Navigation Channel to 12' Depth

Alternative 2 consists of mechanically dredging the HSBH within the Federal Navigation Channel to its authorized depth of 12', and beneficially using the beach-suitable dredged material to partially restore the beach in front of HBP (Figure A24).

Under this alternative 4,433 cy of shoaling would be dredged from the Federal Navigation Channel. An estimated 2,433 cy of the dredged material is anticipated to be sand, and suitable for beach placement. This beach-suitable dredged material would be transported from the HSBH to HBSPP (a distance of approximately 1700 ft) for beach nourishment.

The most efficient method for transporting these sediments to HBSPP for beneficial use involves excavating a barge access zone adjacent to the groin on the south end of HBP, to a depth of -10 ft MLLW (Mean Lower Low Water). This Barge Access Zone will allow for scow unloading directly to the beach. This was determined to be a more cost-effective method of transport and placement compared to trucking via roads. Excavation of the Barge Access Zone is anticipated to produce an additional 1,300 cy of beach suitable sand, resulting in a total of 3,733 cy of beach suitable sand (Table A6A6). The 3,733 cy of beach suitable sand will be used to restore 0.7 acres of beach south of the comfort station. This beach is part of the federally authorized project, and nourishment with dredged material will help restore the beach to part of its original extent. The remainder of silt or silty sand dredged from the navigation channel, approximately 2,000 cy, would be placed in a scow and taken to the ODMDS.

Table A6. Alternative 2 dredged material volume and uses

Alt 2: Plan Components	Dredged Material Placement	
	Beach Suitable/ Beneficial Use (CY)	Fed Standard ODMDS (CY)
Fed Channel to 12'	2,433	2,000
Barge Access Zone	1,300	-
TOTAL	**3,733**	**2,000**

Figure A24. Alternative 2: beneficial use of dredged material beach restoration area

5.4 Alternative 2a- Beneficial Use of Dredged Material from Federal Navigation Channel to 13' Depth

Alternative 2a consists of all the activities described in Alternative 2 (dredging and beneficial use from Federal Navigation Channel to 12'), with 1 foot of additional mechanical dredging in parts of the navigation channel with sandy material to a total depth of 13' (Figure A25). The purpose of this additional foot of dredging is to increase the volume of beach-suitable sandy material available for beach nourishment, and it is conducted solely for the purpose of the pilot project.

Under this alternative, the additional one foot of dredging is anticipated to produce an additional 1,705 cy of beach suitable sand material that will be used for nourishment of HBSPP. This increases the total volume of dredged material available for beach nourishment to 5,438 cy (Table A7). The 5,438 cy of beach suitable sand will be used to restore 1.1 acres of beach south of the comfort station (Figure A26). This beach is part of the federal authorized project, and nourishment with dredged material will help restore the beach to part of its original extent. The remainder of silt or silty sand dredged from the navigation channel, approximately 2,000 cy, would be placed in a scow and taken to the ODMDS.

Table A7. Alternative 2a dredged material volume and uses

Alt 2A: Plan Components	Dredged Material Placement	
	Beach Suitable/ Beneficial Use (CY)	Fed Standard ODMDS (CY)
Fed Channel to 12'	2,433	2,000
Additional Fed Channel to 13'	1,705	-
Barge Access Zone	1,300	-
TOTAL	**5,438**	**2,000**

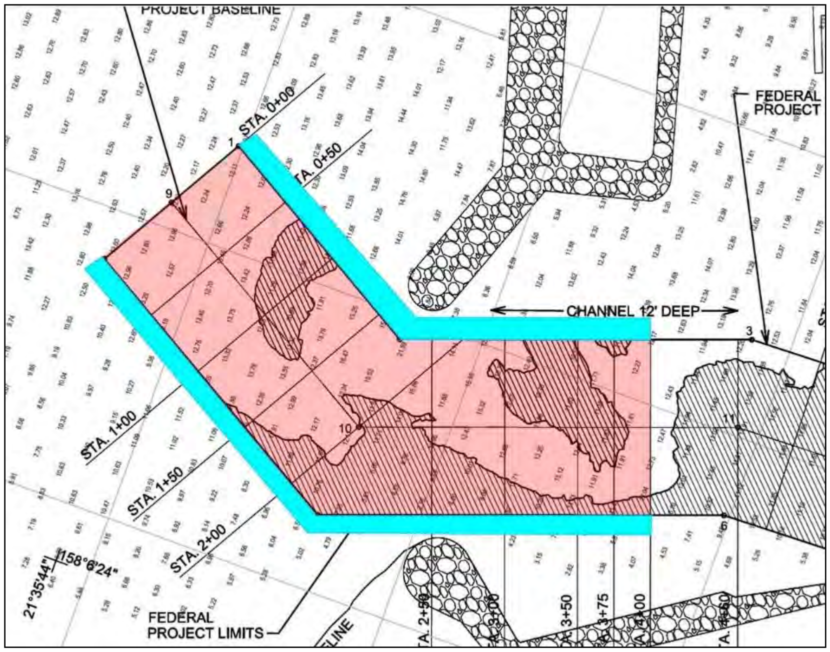

Figure A25. Alternative 2a: additional dredging area to 13'

Figure A26. Alternative 2a: beneficial use of dredged material beach restoration area

5.5 Alternative 3– Beneficial Use of Dredged Material from Federal Channel to 13’ and Settling Basin

Alternative 3 consists of all the activities described in Alternative 2a (dredging and beneficial use from Federal Navigation Channel to 13’), with additional mechanical dredging and beneficial use of dredged sediments from a 0.3-acre area (State Breakwater Settling Basin) adjacent to the State of Hawaiʻi breakwater within the Haleʻiwa Small Boat Harbor, but outside of the Federal Navigation Channel (Figure A27).

Under this alternative, excavation of the 0.3-acre State Breakwater Settling Basin is anticipated to produce an additional 2,200 cy of beach suitable sand that will be used for nourishment of HBSPP. This increases the total volume of dredged material available for beach nourishment to 7,638 cy (Table A8) that will be used to restore 1.4 acres of beach south of the comfort station at HBSPP (**Error! Reference source not found.**A27). This beach is part of the federal authorized project, and nourishment with dredged material will help restore the beach to its original extent. As in alternative 2a, the remainder of silt or silty sand from the Federal Navigation Channel dredging, approximately 2,000 cy, would be placed in a scow and taken to the ODMDS.

The 6000 sq. ft proposed settling basin would be excavated to a depth of 10 feet below mean low water in a shoaled area west of the federal stub breakwater. Once created, this State Breakwater settling basin will act a sink for sand originating from Ali‘i beach, preventing it from migrating into the Federal Navigation Channel, and ultimately reduce the rate of shoaling in the HSBH and Federal Navigation Channel. Furthermore, the dredged material from this area is anticipated to be beach quality sand and therefore would be beneficially used at HBSPP.

Table A8. Alternative 3 dredged material volume and uses

Alt 3: Plan Components	Dredged Material Placement	
	Beach Suitable/ Beneficial Use (CY)	Fed Standard ODMDS (CY)
Fed Channel to 12'	2,433	2,000
Additional Fed Channel to 13'	1,705	-
Barge Access Zone	1,300	-
Settling Basin	2,200	-
TOTAL	**7,638**	**2,000**

Figure A27. Alternative 3: beneficial use of dredged material beach restoration area

5.6 Alternative 4: Beneficial Use of Dredged Material from Federal Channel to 13', State Breakwater Settling Basin, and Offshore Sand Borrow Area

Alternative 4 consists of all the activities described in Alternative 3 (dredging and beneficial use from Federal Navigation Channel to 13' and State Breakwater Settling Basin), with additional mechanical dredging and beneficial use of dredged sediments from an Offshore Sand Borrow Area located 3,400 feet offshore of HBSPP (Figure A28).

Under this alternative, excavation of the Offshore Sand Borrow Area is anticipated to produce an additional 15,000 cy of beach suitable sand that will be used for nourishment of HBSPP. This measure increases the total volume of dredged material available for beach nourishment to 22,638 cy (Table A9) and allows for 4.2 acres of beach restoration south of the comfort station at HBSPP (Figure A28). This beach is part of the federal authorized project, and nourishment with dredged material will help restore the beach to its full original extent. As in alternative 3, the remainder of silt or silty sand from the navigation channel dredging, approximately 2,000 cy, would be placed in a scow and taken to the ODMDS.

The Offshore Sand Borrow Area is 16.5 acres in size, is located at a depth of approximately 55 ft, and is 3,400 feet offshore of HBSPP (FigureA28). This area will function as a borrow area for the procurement of large quantities of beach suitable sand. The dredging of sand from this area and placement at HBSPP would require the use of a barge mounted crane and clamshell dredge. The sand would be dewatered during excavation using an environmental clamshell bucket, placed on a scow, and barged to the access channel where it would be mechanically placed on the beach.

Table A9. Alternative 4 dredged material volume and uses

Alt 4: Plan Components	Dredged Material Placement	
	Beach Suitable/ Beneficial Use (CY)	Fed Standard ODMDS (CY)

Fed Channel to 12'	2,433	2,000
Additional Fed Channel to 13'	1,705	-
Barge Access Zone	1,300	-
Settling Basin	2,200	-
Offshore Sand Borrow Area	15,000	-
TOTAL	**22,638**	**2,000**

Figure A28. Alternative 4: beneficial use of dredged material beach restoration area

5.7 Beach Length and Area Calculations

Using the volumes per linear foot for each typical cross-section (ft^3/ft) and multiplying by the length of fill over which this cross-section applies provides a total volume that can be placed in that area. The volumes per linear foot for each typical section shown in Figures A22a through A22d were interpolated at 50 foot intervals and incremental volumes in each 50 foot section were calculated using the average end area method. The volumes of material available for each alternative were multiplied by a bulking factor of 1.3 (since dredge volumes are in-situ) and were applied over the maximum length of beach possible. It was also assumed that the fill would be tapered back to the existing shoreline over 50 feet on either end of the placement.

It was assumed that since the majority of the material placed would be above MLLW, the area of beach created for each alternative would be the alongshore length of beach placement, multiplied by the full cross-shore width of the beach placement template. Based on these assumptions, the following table presents the conversions from dredged volume to alongshore beach length and beach area. These areas were used to calculate environmental and recreational benefits.

Table A10. Placement Volumes and Calculation of Beach Length and Area

Volume of sand (cy) (in situ)	Bulk Volume (cy) (in place)	Length of Fill (ft)	Station Limits	Beach Area (acre)
3,733	4,853	300	3+50 to 6+50	0.7
5,438	7,069	400	2+50 to 6+50	1.1
7,638	9,929	500	2+00 to 7+00	1.4
22,638	29,429	1600	-3+50 to 12+50	4.2

5.8 Estimated Duration of Beach Fill at HBSPP and Sea Level Change Impacts

The sediment budget for the Haleʻiwa region (Figure A11) estimates that the Haleʻiwa Beach littoral cell erodes at a rate of approximately 976 cy/year. In order to estimate how long a volume of placed sand is expected to remain, the total volume of beach fill (cy) can be divided by 976 cy/year. With the assumption that this erosion rate remains consistent, and no changes to the area (such as sand tightening of the terminal groin or additional beach fill) are made, Alternative 2 fill of 3,733 cy would be slowly be reduced over 4 years, before returning to the existing conditions. Similarly, Alternative 2a fill (5,438 cy) would be eroded over approximately 6 years, Alternative 3 fill (7,638 cy) would erode gradually over approximately 8 years, and Alternative 4 (22,638 cy) would be reduced over approximately 23 years.

When potential for future sea level change is considered, the rate of erosion along Haleʻiwa Beach (either with or without the project) will likely increase due the inability of much of the shoreline to shift landward to reach an equilibrium with higher water levels. This is due to the backshore development such as the comfort station, the parking areas, and the highway, that are unlikely to be relocated or removed in the near future; as well as the lack of a backshore dune to allow natural landward migration of the shoreline and provide additional sediment to the shoreline under rising sea levels. The ability for larger waves to reach the shoreline under higher sea levels would also lead to greater erosion of the sand along the shoreline. With future SLC and a higher erosion rate, the estimated duration of all the beach fill alternatives stated above would be reduced, making each an upper-bound estimate. Though future SLC will reduce the longevity of any beach fill completed, this also highlights the fact that any addition of sand to the chronically eroding shoreline will delay the impacts of SLC to the infrastructure in and around HBP.

As shown in Figure A6, the estimated SLC under low, intermediate, and high scenarios is 0.4 ft, 1.0 ft, and 2.8 ft above local MSL in 2073 (50-years post-construction). This typical planning horizon is well outside the estimated duration of even the greatest volume of beach fill under the proposed alternatives based on existing conditions (Alternative 4 – 22,638 cy and 23 years). It is useful, however, to evaluate the effects of future SLC on the with and without project conditions, including potential elevation thresholds.

Existing backshore elevations at the beach park are between +6 and +11 ft MLLW (+5 to +10 ft MSL) and the proposed crest elevation of the beach fill is of +9 ft MLLW (+8 ft MSL). Based on the estimated SLC at Honolulu Harbor, the mean sea level water elevation under non-storm conditions would not reach this threshold until after 2123, and only under the highest SLC scenario. However, when the effect of increased water levels under storm conditions are considered (e.g. - wave setup and wave runup), as well as the annual to decadal-scale variability of water levels in the Hawaiian Islands and astronomical tides (as discussed in paragraph 3.1 of this appendix), the impacts of sea level change may reach this elevation threshold much sooner. The SEI 2019 report estimated an annual still water level (99 percent annual exceedance probability) at HBP as 1.7ft MSL (0.7 ft tide + 0.5 ft water level variability + 0.5 ft wave setup). Adding a typical wave runup value of approximately 5 feet would result in a total water level of around 6.7 ft MSL for an annual wave event. With only a 1.4 feet of additional sea level rise (in approximately 2050 under the high scenario), overtopping of the beach fill crest and backshore areas will begin to occur on an average annual basis.

The alternatives for this project were formulated with fill volumes based on the availability of sand, rather than specific dimensions of the proposed beach fill. However, this cursory evaluation of SLC and its future impacts illustrates that the larger the volume of sand placed (up to the limit that the littoral cell can hold), the longer the backshore infrastructure will be protected from SLC and storm damage impacts, including increased frequency of overtopping and increased erosion.

5.9 Operations and Maintenance

Since Section 1122 is an authority for only a pilot project, the placement considered in this study is currently considered a one-time action. However, if the pilot project is successfully implemented, the intention is to make beneficial use an integrated part of the O&M dredging cycle (10-to-20-year interval). The dredge material placement interval is dictated by the O&M dredging schedule, which has averaged 10+ years in the past. Continuous post-placement monitoring of Haleʻiwa Beach Park (Unmanned Aerial System survey, GPS of shoreline, photos) will be conducted as part of state permitting requirements (for 1 year) and thereafter as part of the Inspection of Completed Works program. This monitoring will assist with determination of beach fill performance and what placement interval would be optimal. This will be integrated into the long-term O&M plan and DMMU plan for Haleʻiwa Harbor. The recommended placement interval could change over time with SLC, and if the City and County of Honolulu sand tightens the groin and constructs additional retention structures. Evaluation of performance on a 5-year cycle is a reasonable estimation for planning purposes.

6.0 References

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Appendix B: Environmental
Hale‘iwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project
Hale‘iwa, Island of O‘ahu, Hawai‘i

SECTION 1122
WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 2016

August 2023

Table of Contents

1 Introduction

The purpose of this appendix is to provide supporting information and document compliance with applicable Federal environmental laws and regulations as discussed within the Haleiwa Section 1122 Integrated Feasibility Report/Environmental Assessment (IFR/EA).

2 Compliance with Federal Laws and Regulations

Actions authorized, funded or otherwise undertaken by federal agencies i.e. federal actions, must comply with applicable Federal environmental laws, regulations, policies, rules, and guidance. Extensive coordination with local, state, and federal resource and regulatory agencies has occurred since the beginning of the feasibility study in July 2020. In implementing the Recommended Plan, USACE would follow provisions of all applicable laws, regulations, and policies related to the proposed actions. The following sections present summaries of compliance with applicable federal environmental laws, regulations, and coordination requirements for this federal action.

2.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals (42 United States Code [U.S.C.] 4321 et seq.). NEPA requires federal agencies to incorporate environmental considerations in their planning and decision-making process through a systematic interdisciplinary approach. Specifically, it requires full disclosure of the environmental effects, alternatives, potential mitigation, and environmental compliance procedures of the proposed action.

This draft Feasibility Study Report with integrated Environmental Assessment (FR/EA) has been prepared in compliance with NEPA and its 1978 implementing regulations (40 CFR Part 1500 through 1508) because this FR/EA was initiated in July of 2020 and therefore not subject to the 14 September 2020 updated regulations, per 40 CFR 1506.13. Pursuant to these regulations, the document describes the existing environmental conditions within the study area, the proposed action and alternatives, potential environmental impacts of the Recommended Plan, and measures to avoid, minimize, and mitigate environmental impacts. Full compliance will be achieved when the Final Finding of No Significant Impact is approved by USACE.

This project was initiated in July of 2020, prior to the publication of updated NEPA regulations on September 14, 2020. Per 40 CFR 1506.13 and current USACE policy, this project will continue to follow the prior NEPA regulations. See Attachment 1 for relevant documentation.

2.2 Clean Water Act

To demonstrate compliance of this feasibility study with Sections 404 and 401 of the Clean Water Act, the 404(b)(1) analysis and letter of confirmation from the State of Hawaii Department of Health, Clean Water Branch is provided at Attachment 2.

2.3 Endangered Species Act

To demonstrate compliance with Section 7 of the Endangered Species Act, the Corps' request to initiate consultation, including Biological Evaluation, and the National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS) letters of concurrence are provided at Attachment 3.

2.4 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires federal agencies that are impounding, diverting, channelizing, controlling, or modifying the waters of any stream or other water body to consult with the USFWS and appropriate state fish and game agency to ensure that wildlife conservation receives equal consideration in the development of such projects.

USACE requested a marine survey of resources that may be affected from the alternatives from USFWS under the FWCA. Based on information provided by USFWS within the Coordination Act Report (CAR) dated December 2020, the potential impacts associated with this project are relatively small, and include possible impacts to corals, particularly *Psammocora stellata* in the northern portion of the beach park area. The most notable impact includes the loss of the majority of the Rocky Shoreline Intertidal habitat from sand placement under Alternative 5. The U.S. Fish and Wildlife Service recommends steps to minimize the impact to these two areas by avoiding sand placement in the northern section or across the Rocky Shoreline Intertidal habitat. USFW's position is supportive of this project with consideration of USACE avoiding and minimizing these impacts. The FWCA CAR can be found in Attachment 3.

The USFWS recommendations in the FWCAR and the USACE response to such recommendations are provided below:

USFWS Recommendation 1) The Service recommends that measures be taken to minimize water from discharging back into the coastal area that could create a sediment plume. It is possible that placement of sand may occur directly from the water to the beach area. Minimization measures such as sand berms should be used to slow and pool water on the beach. In addition, silt curtains should be used to minimize sediment generated from the dewatering of dredged sediment.

> USACE Response: Concur. At a minimum, industry-standard best management practices such as water quality monitoring and sediment containment devices will be utilized during construction to minimize spread of construction-generated turbidity beyond the active construction area. Additionally, USACE will obtain a

Section 401 WQC from the State DOH prior to construction to ensure consistency with State water quality standards and compliance with the CWA.

USFWS Recommendation 2) and 3) combined: 2) The Service recommends avoiding placing sand in the Shoreline Intertidal – Rocky stratum given the unique intertidal community documented. Sand placement should avoid the northern section of the project area based on the amount of Shoreline Intertidal community impacted, and specifically a higher density of corals in the northern Pavement stratum. While the number of corals is generally low, more sand placement in this section may have increased impacts to the limited coral community. 3) The Service recommends that the amount of sand placed in the northern section and in the Shoreline Intertidal – Rocky stratum should be limited, or only nourished to the extent that is needed to protect the shore-side structures. Alternatives to sand should also be explored to protect the structures, but also maintain the integrity of the intertidal community.

USACE combined response: Sand placement in the northern section and in the Shoreline Intertidal – Rocky stratum will be limited to the amount necessary to protect shore side structure and to meet project objectives. However, modifying the design to eliminate placement of sand in this area will reduce the stability of the shoreline and result in a significantly shortened life post-construction. Sediment transport in this area is dominated by the north to south direction of ocean currents and circulation along the shoreline. The Recommend Plan proposes filling the littoral cell, physically bounded to the north by the natural shoreline and to the south by the Southern Groin, to max capacity necessary to address SLC and to ensure longevity. Reducing the footprint to the north to any extent shy of the natural shoreline introduce vulnerability of the nourished beach to erosive wave action, destabilize the shoreline and reduce expected storm risk reduction benefits.

When considering the potential benefits of shoreline stabilization i.e., erosion abatement and improvement to water quality in the bay, the loss of Rocky-Intertidal Shoreline habitat within the study area is not significant. This habitat was likely present prior to construction of the HBSPP and constitutes the current baseline since erosion of the HBSPP nourished beach. Accordingly, USACE expects the Rocky-Intertidal Shoreline habitat will naturally restore upon erosion of the nourished beach i.e., Recommended Plan.

USFWS indicated use of the hardbottom shoreline for nursery and grazing of the Convict Tang (*Acanthurus triostegus*), the loss of which would significantly impact the Convict Tang fish. However, the convict tang is plentiful in Hawaiian waters as the most abundant fish species observed by USFWS in 2020, the most abundant surgeonfish species in Hawaiʻi, recently listed on The IUCN Red List of Threatened Species in 2010 as “Least Concern,” and is not a federally managed fishery species (McIlwain, 2012). Loss of such habitat within the project area would not measurably affect viability of this fish population due to the pervasive presence of the fish throughout the Hawaiian Islands in comparison to the relatively miniscule Rocky-Intertidal Shoreline stratum habitat area within the project footprint.

USFWS Also indicated the potential loss of 477 coral colonies (304 colonies of *Psammocora stellata*, 87 colonies of *Leptastrea purpurea*, and 87 colonies of *Pocillopora damicornis*) within the project footprint, of which, approximately 90% of the colonies are less than 5 cm, and 10% are between 6 and 10 cm in size. The small stature of these coral colonies is likely due to the shallow, intertidal depths with exposure to open air during low tide that limits growth of the coral in this habitat stratum. Corals of such small size provide significantly less ecosystem functions and services than their larger, sexually mature counterparts, e.g., >40cm, such as no coastal storm risk reduction and no reproductive capabilities, etc.

USACE will design the shoreline to meet the following objective: reduce the risk of coastal storm damage to existing public infrastructure and structures of HBP over the 50 year period of analysis. USACE will consider USFWS' recommendation to minimize placement in this area, but not at the expense of reduced shore protection benefits because the impacts of loss of the Shoreline Intertidal – Rocky stratum would be temporal with natural restoration upon erosion of the nourished beach, is a common habitat type beyond the study area, would have an immeasurable impact on the highly abundant A. triostegus and is minimally diverse ecologically. Accordingly, USACE anticipates minimal impacts to fish and wildlife resources resulting from the loss of Shoreline Intertidal – Rocky stratum in the study area that does not warrant the modification recommend by USFWS that would have significant consequence to the desired coastal storm risk management benefits anticipated from construction of the Recommended Plan.

USFWS Recommendation 4) The Service also recommends that annual quantitative surveys be conducted for a minimum of five years post sand placement in order to document the changes to the marine communities. This effort can also show any effects of movement of sand across the area and help determine if future re-nourishment initiatives will have continuing impacts.

USACE response:

Under the Section 1122 pilot program, maintenance of the BUDM project is not authorized. However, consistent with constructed federal works, maintenance and upkeep of the beach will be the responsibility of the NFS. Observations of sand movement will be carried out to ensure that project benefits are being maintained and that further intervention is not necessary.

USFWS Recommendation 5) During all dredging operations, sufficient sediment control measures must be taken. The proposed dredge areas are known for low water clarity, but sediment curtains and turbidity monitoring should be incorporated to minimize impacts to resources. We further recommend that some baseline turbidity monitoring be *conducted in the area during various weather cycles in order to develop appropriate turbidity thresholds to be used during dredging operations.*

USACE response:

Water quality monitoring during construction will be conducted to ensure compliance with state water quality standards. BMPs such as conducting work during calm seas state and utilizing silt curtains to encircle the active dredge area will be employed to minimize release of suspended sediments beyond the project area. See BMPs at Section 8.7.2.

USFWS Recommendation 6) Extra measures must be taken to avoid impacts to large coral colonies adjacent to the small boat harbor federal channel shown in Appendix F – Figure F13. This small area should be delineated daily by small buoys if the barge is required to be anchored or will routinely move around the area.

USACE response:

The location of known, large corals adjacent to the harbor can be provided to the construction contractor for input into plan documents, flagged for avoidance. The contractor is prohibited from causing direct physical impact to corals located outside the federal channel and must devise a BMP plan that describes how the contractor will meet this condition. BMPs associated with coral avoidance is provided in Section 8.7.2.

USFWS Recommendation 7) The groin that is on the southern boundary of Haleʻiwa Beach Park should be grouted to minimize sand leaking through the boulders. This will help to retain the beach with less maintenance required.

USACE response:

The Section 1122 study authority limits the scope of study alternatives to BUDM stabilization measures. Consideration of additional stabilization measures beyond BUDM is outside of the Section 1122 study authority.

USFWS Recommendation 8) All of the potential sand source areas should undergo extensive sediment and coring analysis. The surface sediment observed in the barge access area and the federal channel seem to consist mostly of mud and does not appear to be of suitable quality for a beach. Excess material that is not suitable for deposition on the beach will need to be disposed of in another manner and this will likely increase costs associated with the project.

USACE response:

All borrow areas will be sampled and analyzed prior to dredging and to determine suitable disposition i.e., beach placement vs. ocean disposal vs. upland disposal.

USFWS Recommendation 9) DAR recommends the following:

a. *Make a formal determination of the areas that can be avoided, or not, and work with them to determine if a Special Activity permit can be issued or will be required;*
b. *Provide more information on the potential increased turbidity in the area and the potential movement of such turbidity;*

c. *Initiate a public outreach and education effort to effectively document and attempt to mitigate any on-going concerns brought forward from the community or local fisherman;*
d. *Provide more details of the project delineation and the footprints of these areas as the project moves from the Feasibility Study to the Design Phase; and*
e. *Provide BMPs which will minimize sedimentation and turbidity during the nourishment activities.*

USACE responses:

a. All applicable permits will be acquired prior to the start of construction on this project.
b. Temporary impacts to water quality will be expected from the construction of the proposed project due to turbidity resulting from dredging and placement activities. All dredging activities will be encircled by silt curtains to prevent spread of suspended sediments beyond the active dredge area. BUDM placement will be conducted unabated, however, only beach quality sand will be placed on the shoreline fronting the HBP. Sand is coarse grain sediment that settles out of the water column relatively quickly (sand settles at approximately 1 meter per second according to Stoke's Law) in a matter of minutes to hours. Turbidity generated by the sand placement will subside at the completion of the in-water work. Sand will be agitated by wave action, but no more than currently occurs at HBP because only sand that is of a similar physical composition as the native sand will be beneficially used. Sand in suspension is expected to move consistent with longshore sediment transport within the local littoral cell, in a north to south direction and is expected to erode at a rate of approximately 1,000 cy annually. USACE expects the turbidity effects to be temporary, limited to the duration of construction, and less than significant.
c. The study included two public comment periods: 1) release of the draft EA for public comment in December 2020 and 2) public notice of the CZM Federal Consistency review in September 2021. No public concern was raised during either of these comment periods. However, due to the high recreational use of the HSBH and HBP, USACE will consider informing the public in the PED phase when more information is available regarding the construction schedule. Examples may include electronic public notice, news release, mailers, and posting paper notices at HBP and HSBH prior to construction will have an opportunity to review and comment on the project's NEPA documents.
d. Additional project details can be made available in future phases.
e. See response above at b). BMPs provided in Section 8.6.2 of the IFR/EA

See Attachment 4 for relevant documentation.

2.5 Magnuson-Stevens Fishery Conservation and Management Act

On September 24, 2021, NMFS provided EFH Conservation Recommendations (CRs) to the USACE. On November 19, 2021, USACE provided a detailed response to NMFS providing which CRs would be adopted by the USACE and providing an explanation, including the scientific justification for those CRs that would not be followed. The CRs received and USACE’s consideration and response to each is provided in the table below:

EFH CRs and Responses

NMFS EFH Conservation Recommendation	USACE Response
1. USACE should describe and share with NMFS the characterization of sediments in Hale'iwa Harbor.	Consistent. USACE included in its November 19, 2021 response to NMFS a copy of the 2008 Sampling and Analysis Report used to inform planning assumptions.
2. To the extent possible, the USACE should avoid placing dredged sand directly on intertidal habitat, especially in areas of higher coral density in the north end of the beach park. Throughout the sand placement area, dredged sand should be spread away from the ocean where placement could smother rocky habitat and/or cause sedimentation.	Consistent. USACE will avoid placing dredged material directly on intertidal rocky habitat to the greatest extent possible; however, it should be noted that impacts to intertidal habitat cannot be completely avoided given that the purpose of the project is to beneficially use dredged material for the purposes of beach restoration and reduce storm damage to public property and infrastructure.
3. USACE should ensure that full-length curtains are used at all times nearest perimeter areas with high coral cover and only dredge near these areas during calm sea states.	Inconsistent. USACE will use full-length silt curtains during dredging for the entire project unless weather or water conditions will not allow for these to be properly employed or maintained and creating a risk for damage to or failure of the silt curtain. To minimize risk of failure and maximize use of full length silt curtains, USACE will 1) monitor for heightened sea states, 2) if there is an opportunity to wait for a calm sea state, then the contractor will wait, 3) if full-length curtains are not sustainable even in a calm sea state, then a mid-length silt curtain may be used to reduce spread of suspended sediments only in combination with use of an environmental dredge bucket.
4. USACE should reduce the size of silt-curtained dredge areas to further minimize potential sedimentation and turbidity.	Consistent. USACE will appropriately and commensurately scale the active, enclosed dredge area
5. Ensure that barge and dredge anchor systems (e.g., anchors, chains, moorings, etc.) are properly installed and only in the Federal channel. Systems should be inspected daily and monitored over time.	Consistent. USACE will ensure that barge and dredge anchor systems are properly installed while dredging in the harbor to avoid damaging corals outside the Federal channel. Systems will be inspected daily and monitored over time to assess integrity and potential damages. Inconsistent. When working beyond the harbor at the offshore borrow site and fronting the HBSPP, the barge and anchor system will be positioned outside the harbor. To address NMFS’ concerns, the contractor will develop an anchor monitoring plan detailing measures to control and monitor the positions of all anchors and anchor cables, sufficient to avoid damage to corals beyond the Federal channel.
6. USACE should require post-dredging reconnaissance surveys to fully quantify any substantial unavoidable and/or unintended	Inconsistent. USACE will not conduct post-dredge reconnaissance surveys of in-water work areas. However, if there is anchor misplacement (as detected through implementation of the anchor monitoring plan) with a potential to damage adjacent

NMFS EFH Conservation Recommendation	USACE Response
degradation in condition and/or mortality in areas outside of the dredge footprints.	coral resources, then USACE will, as a contingency, conduct underwater impact assessment surveys.
7. USACE should propose offset for the unavoidable loss of 477 coral colonies and their ecological services and functions.	Inconsistent. USACE will not offset for the unavoidable loss of 477 coral colonies and their ecological services and functions. USACE assessed impacts to the corals identified in the USFWS survey and determined impacts to corals will be minimal across the project footprint. Based on an evaluation of the minimal coral impacts relative to the Fishery Ecosystem Plans, loss of small corals in depths less than 3 m would have negligible impact to ecosystem functions or services for each MUS therefore, EFH offset is not warranted.
8. If substantial unavoidable and/or unintended degradation is observed due to the USACE's contracted dredging and nourishment operations, USACE should immediately notify NMFS, re-initiate EFH consultation and develop, in coordination with NMFS, equitable compensation to offset the loss of ecosystem services and function.	Consistent. USACE will immediately notify NMFS if unavoidable and/or unintended degradation occur(s) to EFH as a result of contractor operations. Inconsistent. USACE will re-initiate EFH consultation with NMFS in accordance with 50 CFR 600.920(1). At that time, it will be determined if EFH offset is warranted.

On December 6, 2021, NMFS responded to USACE notifying that they did not agree with USACE perspective regarding not adopting specific conservation recommendations. Upon consideration of NMFS; concerns, USACE responded to NMFS, On February 7, 2022 stating that USACE has complied with the procedural and statutory requirements of the EFH provisions of the MSA and has determined consultation is concluded. Relevant consultation documents documenting compliance with the EFH Provisions of the Magnuson Stevens Act can be found in Attachment 5.

2.6 Marine Mammal Protection Act (MMPA)

USACE and NMFS have determined that an MMPA incidental take authorization is not required for this project. Supporting documentation is located at Attachment 6.

2.7 Coastal Zone Management (CZM) Act

USACE has determined that the Recommend Plan is consistent to the maximum extent practicable with the Hawaii CZM Program enforceable policies and objectives. To demonstrate compliance with the Coastal Zone Management Act, the CZM application, assessment form, and conditional concurrence can be found in Attachment 7.

2.8 National Historic Preservation Act of 1966

Supporting documentation regarding the Section 106 consultation with the State Historic Preservation Division and Native Hawaiian Organizations may be found in Attachment 8.

2.9 Marine Protection, Research and Sanctuaries Act

Consistent with USACE policy, USACE conducted and to the greatest extent practicable completed a Section 103 evaluation of the proposed ocean disposal of dredged material through completion of a Tier 1 evaluation coordinated with USEPA. As directed by USEPA and concluded by the Tier 1 evaluation, USACE will develop a Tier 3 sampling and analysis plan that complies with the requirements of the USEPA Ocean Testing Manual, conducting the field sampling and analysis in accordance with an approved sampling and analysis plan, and developing a suitability determination to be coordinated with and seeking concurrence from USEPA in pre-construction, engineering and design phase and prior to disposal. See Attachment 9 for relevant documentation.

Attachment 1 – National Environmental Policy Act (NEPA) DRAFT Finding of No Significant Impact (FONSI) (*unsigned*)

(DRAFT) FINDING OF NO SIGNIFICANT IMPACT

HALEʻIWA SMALL BOAT HARBOR MAINTENANCE DREDGING AND BEACH RESTORATION PROJECT
HALEʻIWA, ISLAND OF OʻAHU, HAWAIʻI

The U.S. Army Corps of Engineers, Honolulu District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. This second draft Integrated Feasibility Report and Environmental Assessment (IFR/EA) dated August 2023, for the Haleʻiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project addresses maintenance dredging of the Haleʻiwa Small Boat Harbor (HSBH) and evaluates the feasibility of beneficial use of dredged material at Haleʻiwa Beach, Haleʻiwa, Island of Oʻahu, Hawaiʻi. The final recommendation will be contained in the final IFR/EA.

The second Draft IFR/EA, incorporated herein by reference, augmented evaluation of the maintenance dredging of the HSBH and dredged disposal alternatives in addition to alternatives that would beneficially use dredged materials in the study area. The recommended plan is the National Economic Development Plan and includes:

- Beneficial use of 22,638 cubic yards of dredged material from the federal Haleʻiwa Small Boat Harbor, the state breakwater settling basin, an offshore sand borrow area, and a barge access zone to restore 4.2 acres of beach at Haleʻiwa Beach Park

In addition to a “no action” plan (Alternative 1), the following five alternatives were evaluated and are included in Section 5.0 of the IFR/EA.

- Alternative 1A: Operations and Maintenance Base Plan involving maintenance dredging of the federal navigation channel dredged to the Congressionally Authorized -12 feet (ft) MLLW depth with either ocean disposal at the South Oʻahu Ocean Dredged Material Disposal Site or upland disposal at an approved upland disposal site
- Alternative 2: Beneficial use of dredged material (BUDM) from the federal navigation channel dredged to -12 ft MLLW depth and excavation of barge access zone
- Alternative 2a: BUDM from the federal navigation channel dredged to -13 ft MLLW depth and excavation of barge access zone
- Alternative 3: BUDM from the federal navigation channel dredged to -13 ft MLLW depth, excavation of barge access zone and state breakwater settling basin
- Alternative 4: BUDM from the federal navigation channel dredged to -13 ft MLLW depth, excavation of barge access zone, state breakwater settling basin, and offshore sand borrow area

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1, below.

FONSI Table 1. Summary of Potential Effects of the Recommended Plan

Resource	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action	IFR/EA Reference Section
Terrestrial Habitat	☒	☐	☐	6.2.1
Aquatic Resources	☒	☐	☐	6.2.2
Water Quality	☒	☐	☐	6.2.3
Air quality	☒	☐	☐	6.2.4
Soils	☒	☐	☐	6.2.5
Benthic Substrate	☒	☐	☐	6.2.6
Fish and Wildlife Resources	☒	☐	☐	6.3.1
Marine Mammals	☒	☐	☐	6.3.2
Threatened/endangered species/critical habitat	☒	☐	☐	6.3.3
Essential Fish Habitat	☒	☐	☐	6.3.4
Land use	☐	☐	☒	6.4.1
Coastal Zone	☐	☐	☒	6.4.2
Environmental justice	☐	☐	☒	6.4.3
Aesthetics	☒	☐	☐	6.4.4
Noise levels	☒	☐	☐	6.4.5
Hazardous, toxic and radioactive waste	☐	☐	☒	6.4.6
Historic properties	☐	☐	☒	6.4.7

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the IFR/EA will be implemented, if appropriate, to minimize impacts. All environmental commitments the Corps will implement as part of the Recommended Plan are listed at Section 8.6.2 of the IFR/EA, organized per protected resource and reflecting coordination and/or consultation with appropriate federal and state resource and regulatory agencies. No compensatory mitigation is required as part of the recommended plan.

Public review of the initial draft IFR/EA and Finding of No Significant Impact (FONSI) was completed on January 9, 2021. All comments submitted during the public review period were acknowledged and documented in this second draft IFR/EA dated August 2023. The Corps determined the need to release a second draft IFR/EA to incorporate a more comprehensive evaluation of potential environmental effects from the maintenance dredging and dredged material disposal alternatives to beneficial use. responded to in the Final IFR/EA and FONSI dated June 2022 (See Appendix H). All comments received during the public review period will be responded to in the Final IFR/EA.

Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, USACE determined that the recommended plan may affect, but is not likely to adversely affect, the following federally listed species or their designated critical habitat: endangered Main Hawaiian insular false killer whale (*Pseudorca crassidens*) and critical habitat, endangered Hawaiian monk seal (*Monachus schauinslandi*) and critical habitat; threatened green sea turtle, Central North Pacific Distinct Population Segment (*Chelonia mydas*), endangered hawksbill sea turtle (*Eretmochelys imbricate*); threatened oceanic whitetip shark (*Carcharhinus longimanus*) and threatened giant manta ray (*Manta birostris*). The National Marine Fisheries Service (NMFS) received our written request on September 3, 2021 and concurred with the USACE determination on November 1, 2021. In addition, USACE determined that the recommended plan may affect, but is not likely to adversely affect, the threatened green sea turtle, Central North Pacific Distinct Population Segment (*Chelonia mydas*) and endangered hawksbill sea turtle (*Eretmochelys imbricate*), while on land. The U.S Fish and Wildlife Service received our written request on September 2, 2021, and on concurred with the USACE determination on December 13, 2021.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the USACE determined that the recommended plan has no effect on historic properties.

Pursuant to the Clean Water Act (CWA) of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with Section 404(b)(1) Guidelines (40 CFR 230). The CWA Section 404(b)(1) Guidelines' evaluation is found in Appendix B of the IFR/EA.

A water quality certification (WQC) pursuant to Section 401 of the CWA will be obtained from the Hawaiʻi State Department of Health (DOH) prior to construction. In a letter dated April 19, 2021, the Hawaiʻi State DOH stated that the recommended plan appears to meet the requirements of the water quality certification, pending confirmation based on information to be developed during the pre-construction engineering and design phase. All conditions of the water quality certification will be implemented in order to minimize adverse impacts to water quality.

A determination of consistency with the Hawaiʻi Coastal Zone Management program pursuant to the Coastal Zone Management Act of 1972 was obtained from the Hawaiʻi State Office of Planning and Sustainable Development. All conditions of the consistency determination dated July 1, 2022 shall be implemented in order to minimize adverse impacts to the coastal zone.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed (see Section 7 and 8 of the

IFR/EA). A brief discussion of issues raised relative to other environmental laws is as follows:

Pursuant to Section 305(b)(2) of the Magnuson Stevens Fishery Conservation and Management Act, the USACE has determined that the recommended plan may adversely affect Essential Fish Habitat (EFH) for Crustacean, Bottomfish and Pelagic fisheries. The NMFS responded to the USACE EFH Assessment dated with Conservation Recommendations that are incorporated into the project Environmental Commitments.

Pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act, USACE has committed to conducting sediment sampling and analysis of the dredged material to determine suitability for ocean disposal. USACE will coordinate any ocean disposal activities with the U.S. Environmental Protection Agency prior to construction.

Technical, environmental, and economic criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other federal, state and local agencies, Native Hawaiian Organizations, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____/UNSIGNED/____________
Date
Christopher Ryan Pevey
Lieutenant Colonel, U.S. Army
District Engineer

Attachment 2 – Clean Water Act (CWA) Compliance

SECTION 404(B)(1) CLEAN WATER ACT 40 CFR PART 230 EVALUATION

Haleʻiwa Small Boat Harbor Maintenance Dredging and Beach Restoration

Haleʻiwa, Island of Oʻahu, Hawaiʻi

US Army Corps of Engineers
Honolulu District

July 2023

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Contents

EVALUATION UNDER
SECTION 404(b)(1) CLEAN WATER ACT 40 CFR PART 230
Hale‘iwa Small Boat Harbor Maintenance Dredging and Beach Restoration
Hale‘iwa, Island of O‘ahu, Hawai‘i

1. PROJECT DESCRIPTION

The proposed project involves beneficial use of dredged material (BUDM) for the purposes of reducing coastal storm damage to property and infrastructure.

The project is located on the north shore of the island of O‘ahu, approximately 30 miles north of Honolulu, Hawai‘i (Figure 1). The study area (Figure 3) encompasses the federally authorized Hale‘iwa Small Boat Harbor (HSBH) and Hale‘iwa Beach Shore Protection Project (HBSPP), and the Hale‘iwa Beach Park (HBP). It is located near the mouth of the Anahulu River (21° 35’ 49.24” N, 158° 05’ 47.50 W”). The study area also includes a 0.3 acres (ac) shoaling deposit caused by state owned breakwater (State Breakwater Settling Basin) located immediately to the east of the state breakwater on Ali‘i Beach, a 1.7 ac offshore sand deposit (Offshore Sand Borrow Area) located 3,400 feet (ft) northwest of HBP in Waialua Bay and a barge access zone to be excavated along the north side of the southern groin.

USACE defines waters of the U.S. (WOUS) subject to regulatory jurisdiction under the CWA at 33 CFR 328.3. WOUS within the project area include the Waialua Bay of the Pacific Ocean (including the HSBH), the Anahulu River, Loko Ea Fishpond and Ukoa Pond. Waialua Bay is a water subject to the ebb and flow of the tide, the Anahulu River is a perennial tributary with end terminus in Waialua Bay, and Loko Ea Fishpond and Ukoa Pond are adjacent wetlands. Note that the boundaries of the adjacent wetlands have not been formally delineated by USACE.

Figure 1 - Project Location

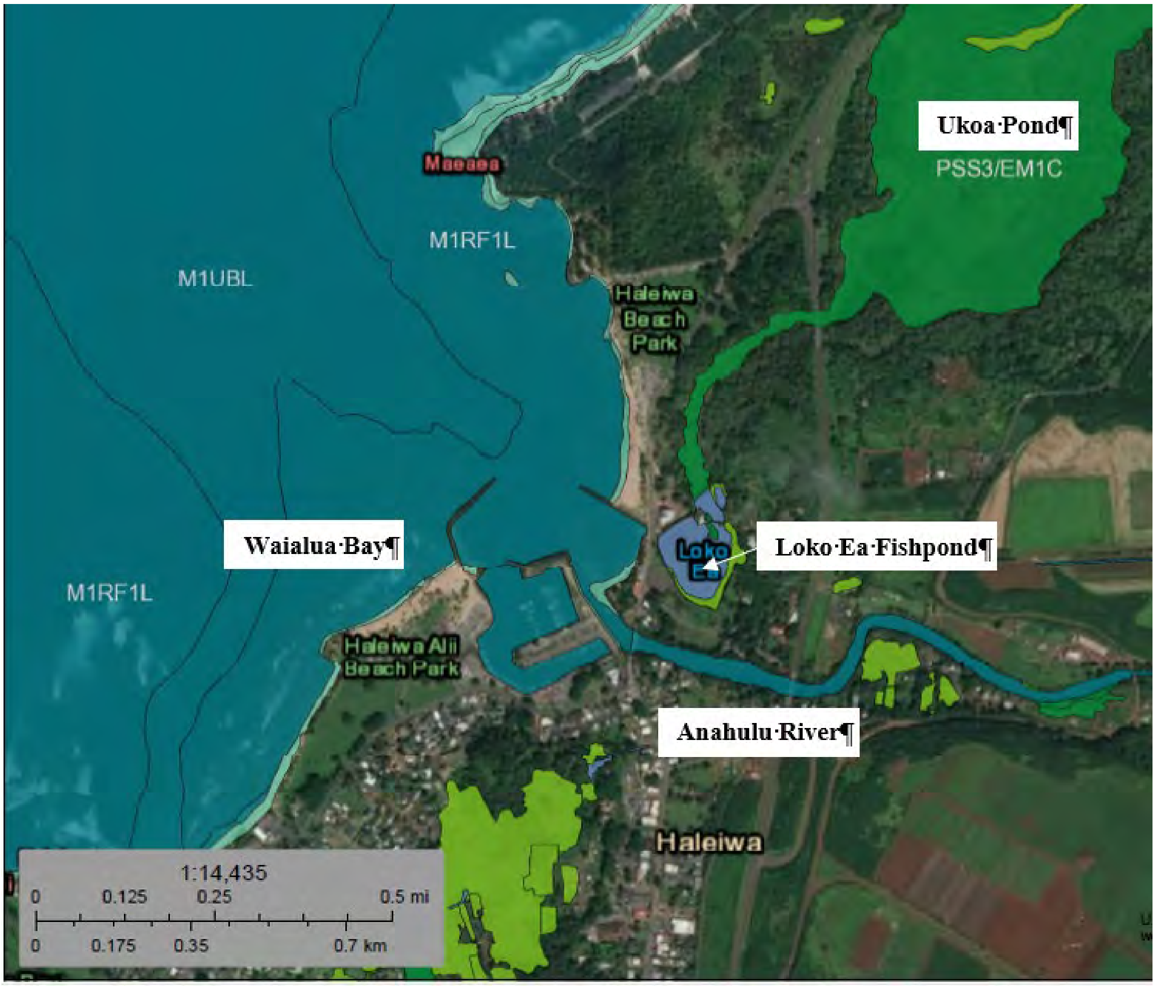

Figure 2 Waters of the United States within the Study Area. WOUS are labelled in white.

The project will be constructed by the U.S. Army Corps of Engineers (USACE), Honolulu District. The non-federal sponsor for this project is the State of Hawaii as represented by Department of Land and Natural Resources (DLNR). Both DOBOR and OCCL are branches of DLNR, and have stated their intention to serve as cost-share sponsors for the BUDM project at Hale‘iwa Beach. This partnership of federal and non-federal interests in BUDM helps ensure that the selected plan will effectively serve both local and national needs.

The proposed project contains six major components, which are listed below:

Operation and Maintenance (O&M) Navigation Channel Dredging – Dredging of the Federal Navigation Channel to twelve ft (-12 ft) depth below mean lower low water (MLLW) to meet O&M requirements. This dredging will produce approximately 4,433 cy of sediment. Approximately 2,433 cy is anticipated to be beach suitable and will be transported to the Hale‘iwa Beach shore protection project (HBSPP) for beach restoration. The remaining 2,000 cy is anticipated to be not suitable for beneficial reuse due to having a higher percentage of silt/clay material and will be either transported to the South Oʻahu Ocean Dredged Material Disposal Site (ODMDS) for open-water placement or transported to an approved upland disposal site. This site was analyzed as part of the 2018 Haleiwa Dredged Material Management Plan (DMMP) Preliminary Assessment.

This project component does not result in the discharge of dredged material in a WOUS.

Barge Access Zone – A Barge Access Zone will be excavated near the southern groin at the HBSPP to allow for efficient transport and unloading of dredged material to the HBSPP. The Barge Access Zone will be excavated to a depth of minus ten ft (-10') MLLW parallel to the south groin of the HBSPP. Scows will use this Barge Access Zone to move adjacent to the HBSPP for unloading. Excavation of the Barge Access Zone is anticipated to produce 1,300 cy of beach suitable sand that will be used for beach restoration at the HBSPP. The Barge Access Zone is necessary as part of the least cost placement method as evaluated according to EM 1110-2-5025.

This project component does not result in the discharge of dredged material in a WOUS.

Additional Navigation Channel Deepening – The seaward portion of the Federal Navigation Channel with sandy substrate will be dredged by an additional foot, to thirteen feet below MLLW. This will produce an additional 1,705 cy of beach suitable sand that will be used for beach restoration at the HBSPP.

This project component does not result in the discharge of dredged material in a WOUS.

State Breakwater Settling Basin – A 0.3 ac area adjacent to, but outside of, the Federal Navigation Channel will be excavated to a depth of eight ft (8') below MLLW to create the State Breakwater Settling Basin. This activity may reduce sedimentation rates in the navigation channel and HSBH and would produce 2,200 cy of beach suitable material. This shoaling has been caused by sand that has been transported over the state breakwater by wind and wave action. Dredging, transport, and placement of dredged material from this area would be considered "additional work" for the purposes of a project partnership agreement (PPA).

This project component does not result in the discharge of dredged material in a WOUS.

Offshore Sand Borrow Area – An Offshore Sand Borrow Area will be dredged to provide additional beach suitable sand for beach restoration. This 16.5 ac Offshore Sand Borrow area is outside of HSBH and the Federal Navigation Channel; and is located 3,400 ft offshore at a depth of 60 ft. This area will function as a borrow area for the procurement of approximately 20,000 cy of beach suitable sand. The dredging of sand from this area and placement at the HBSPP would require the use of a barge-mounted crane and clamshell dredge. The sand would be dewatered during excavation using an environmental clamshell bucket, placed on a scow, and barged to the access channel where it would be mechanically placed on the beach.

This project component does not result in the discharge of dredged material in a WOUS.

Beneficial Use of Dredged Material – Beach suitable sand dredged from the Federal Navigation Channel, and State Breakwater Settling Basin, will be transported to the HBSPP for beach restoration. Beach restoration is anticipated to restore an aquatic ecosystem, reduce storm damage to public property and infrastructure, and also promote recreation. When sand is transported to the beach, it will be offloaded to a single location (dependent on the method of transport) and spread across the beach using equipment such as bulldozers or bobcats, which is considered part of placement and would be conducted under the federal dredging contract.

This project component results in the discharge of dredged material in a WOUS.

The various project components are shown on Figure 3.

Figure 3 - Project Components

1.1 Authority

This feasibility study is being conducted under authority granted by Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law (PL) 114-322), as amended.

Section 1122 of WRDA 2016 requires U.S. Army Corps of Engineers (USACE) establish a pilot program to carry out 10 projects for the beneficial use of dredged material, including projects for the purposes of— (1) Reducing storm damage to property and infrastructure; (2) promoting public safety; (3) protecting, restoring, and creating aquatic ecosystem habitats; (4) stabilizing stream systems and enhancing shorelines; (5) promoting recreation; (6) supporting risk management adaptation strategies; and (7) reducing the costs of dredging and dredged material placement or disposal.

1.2 General Description of Dredged or Fill Material

The primary discharges to waters of the U.S. would be:

- Placement of dredged material along the shoreline fronting HBP in Waialua Bay for the purpose of beach restoration.

Dredged material will be obtained from the HSBH Federal Navigation Channel, the State Breakwater Settling Basin that is part of the HSBH, an Offshore Sand Borrow Area and the Barge Access Zone. The beach suitable dredged material from these locations will be used to nourish the beach that is part of the federally authorized HBSPP. Dredging from these locations will yield approximately 22,638 cy of beach suitable sand and will be used to restore 4.2 ac of beach. This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated that the beach created under this alternative would persist for twenty-six years before returning to the existing condition. This project life assumes that no other measures are performed by other state or local agencies to protect the beach or reduce scour.

Particle sizes of the material to be dredged from the HSBH federal navigation channel is predominantly sand (>63 µm) and silt/clay (<63 µm), with smaller amounts of gravel (>2 mm). The outer harbor and approach channel is predominantly sandy material, while the silt/clay makes up a majority of the material in the channel closest to the inner harbor

The fine-grained dredged material from the Federal Navigation Channel that is not suitable for beach restoration, approximately 2,000 cy, will either be transported by scow and taken to the south Oʻahu ODMDS or disposed of at an approved upland disposal site. This action was previously analyzed in the 2018 Haleiwa Dredged Material Management Plan Preliminary Assessment.

Total dredged volume quantities per dredge location and the dredged material placement method for the Recommended Plan is provided in the table below:

+	Dredged Material Placement Method	
	Beach Suitable/ Beneficial Use (cy)	**Ocean or Upland Disposal (cy)**
Federal navigation channel to -12 ft	2,433	2,000
additional federal navigation channel to -13 ft	1,705	-
Barge access zone	1,300	-
State breakwater settling basin	2,200	-
Offshore sand borrow area	15,000	-
TOTAL	**22,638**	**2,000**

Table 1 – Dredged Volume per Dredge Location

1.3 Descriptions of the Proposed Discharge Sites

HBP is a 15.7- ac park located in the town of Haleʻiwa. It is adjacent to 2,500 ft of beach shoreline between HSBH and Puaʻena Point. The backshore facilities at HBP are protected by a 550 ft long vertical wall, and include a comfort station, World War II monument, pavilion, promenade, and a playground. A 160 ft long rubble mound breakwater, part of the HBSPP, is located offshore of the wall.

The northern portion of the park has experienced significant erosion and the vertical wall has become undermined, leading to sinkhole formation on the landward side. The wall and sinkholes were repaired; however, the risks of undermining and collapse still remain. The erosion has greatly reduced the recreation value of the beach. A report by Sea Engineering, Inc. (2019) gave Haleʻiwa Beach a High Erosion Hazard Priority Rating, compared with other beaches of Oʻahu.

The federally authorized HBSPP is adjacent to HBP, and is less than one mile from HSBH (Figure 2). The HBSPP was authorized by the River and Harbor Act of 1965 (Public Law 89-298) and was constructed in 1965 for the purpose of restoring the eroded public beach at HBP. The shoreline protection project consists of a sand beach (1,600 ft long and 140-265 ft wide), an offshore breakwater (160 ft long), and a terminal groin (500 ft long) at the southern end Haleʻiwa Beach.

Habitat in the placement areas for dredged material is predominantly open beach, shoreline intertidal, and scattered coral rock in unconsolidated sediment (USFWS 2020). BUDM beach restoration at HBSPP is expected to take place following the next maintenance dredge cycle in 2024 and take approximately 9 to 12 months to complete.

Figure 4 - Proposed Discharge Site Map. Fill footprint is depicted in yellow.

1.4 Descriptions of Discharge Methods

The most efficient method for transporting these sediments to the HBSPP for beneficial use involves excavating a Barge Access Zone adjacent to the groin on the south end of HBP, to a depth of -10 ft MLLW. This Barge Access Zone will allow for scow unloading directly to the beach. This was determined to be a more cost-effective method of transport and placement compared to trucking via roads. Typical sand placement methods involve a single, concentrated placement site on the beach using a dump truck or large excavator. Smaller machinery e.g. bobcat, small bulldozer, front-end loader, etc. are staged atop the placement pile and are used to push the material from the placement pile further out into the water, as it progresses down the shoreline, to prevent use of heavy machinery in the marine environment. No in-water staging is necessary. A bulldozer will be used to grade the placed sand to a stable beach profile.

2. FACTUAL DETERMINATIONS

2.1 Physical Substrate Determinations

2.1.1 Substrate Elevation and Slope

The geomorphology of the deposition area at HBP is flat to slightly sloped towards the ocean. The nearshore bathymetry and topography of Hale'iwa Beach backshore includes the highway, seawalls and the comfort station, and has typical elevations of between +6 ft and +11 ft MLLW, while sea floor elevations vary from -2 ft to -7 ft MLLW in the area between 100 and 200 ft from the shoreline.

2.1.2 Sediment Type

Substrate within HSBH and the navigation channel vary from sand to silts. Based on the 2008 Sampling and Analysis Report for Maintenance Dredging (MRC, 2008), sediment samples from the northern part of the navigation channel were the only samples with a least 85% sand or larger material and considered suitable for beach use. Samples from this area had nearly 100% sand and gravel fractions. Samples from other areas indicated much lower sand fractions. Chemical analysis indicated that all sediments from HSBH would have no restrictions on placement.

With respect to Haleiwa SBH, there is a very distinct boundary between mud in the inner harbor that is outside the federal channel and marine carbonate sand within the federal channel. Fine-grained black mud of terrigenous origin is likely deposited in the innermost reaches of the harbor from the Anahulu River. The sediments at the seaward end of the federal navigation channel are extremely clean, well-sorted coarse-grained sand of marine origin with less than 1% fines. The sediments at the inland end of the federal navigation channel, furthest from the open ocean, is 45% sand and gravel and 55% fines. Only material with less than 1% fines will be placed on the beach.

A complete analysis of the 2008 sediment sampling and analysis in support of at Tier 1 Section 103 evaluation is provided in Appendix B of the Feasibility Report.

2.1.3 Fill Material Movement

Sand deposited on the beach is expected to move into nearby offshore areas through wave action. The local littoral cell bounded to the north by rock outcrop and to the south by the Southern Groin transports sediment longshore in a north to south direction.

2.1.4 Physical Effects on Benthos

Conversion of intertidal rocky stratum to sandy beach and burial of immobile invertebrates and other sessile organisms is expected to occur as result of this action.

2.1.5 Effects Determination

The nature of effects is burying the existing benthos with sand. This impact would impact extant benthic organisms; however the new substrate would be colonized by new organisms.

2.1.6 Actions Taken to Minimize Impacts

Best Management Practices – Soil erosion and sediment control measures designed to minimize spread of suspended sediments beyond the BUDM beach restoration area will be incorporated into the alternative during design phase and will comply with state and federal environmental requirements. The minimum measures required at the project site may include:

- In-water sediment containment devices
- Water quality monitoring
- Monitoring of sea state to inform construction schedule

2.2 Water Circulation, Fluctuations, and Salinity Determinations

The placement of dredged material is not expected to cause discernable changes to water circulation, fluctuations, or salinity. Material placed on the beach will experience wave driven erosion and scour immediately following placement at an estimated annual erosion rate of 1,000 cy.

Water Chemistry – Effects to water chemistries of the project area are not anticipated from any of the proposed alternatives. The sand will be sampled and analyzed prior to placement to ensure compatibility with native sands at HBSPP.

a) Clarity – No effects are expected.
b) Color – No effects are expected.
c) Odor – No effects are expected.
d) Taste – No effects are expected.
e) Dissolved Gas Levels – No effects are expected.
f) Nutrients – No effects are expected.
g) Eutrophication – No effects are expected.
h) Other – NA

2.3 Suspended Particulate/Turbidity Determinations

Temporary impacts to water quality will be expected from the construction of the proposed project due to turbidity resulting from dredging and placement activities. The turbidity effects are expected to be minimal, through implementation of water quality monitoring and silt curtains, and temporary, because coarse-grain sand material used for BUDM beach restoration activities will settle out of the water column relatively quickly (approximately 1 meter per second according to Stoke's Law). This impact is expected to be limited to the duration of construction, and less than significant. The dredging is expected to be performed with a mechanical clamshell dredge or excavator operated from a crane stationed on a barge and depositing the dredged material into an adjacent scow. In mechanical dredging, the sediment becomes suspended into the water by:

- the impact of the dredge with the seafloor;

- the fallback of sediment as the dredge is raised to the surface;
- dewatering of the sediment as it is stockpiled on the scow; and
- discharge of the sediment from the scow at the placement site.

2.3.1 Effects on Chemical and Physical Properties of the Water Column

a) Light Penetration – Temporary impacts to light penetration is expected from construction generated suspended sediments.
b) Dissolved Oxygen – No effects are expected. Sediments will settle out of suspension relatively quickly and have no long term effects that would result in a change in dissolved oxygen, such as from an algal bloom.
c) Toxic Metals and Organics – No effects are expected. Per state water quality standards, only clean, beach quality sand free of inorganic and organic contaminants is permitted for beach restoration.
d) Pathogens – No effects are expected. Per state quarter quality standards, only clean, beach quality sand is permitted for beach restoration.
e) Aesthetics – No effects are expected. Sediments in suspension during and immediately after beach nourishment are expected to settle out of suspension relatively quickly and will not have residual effects on water column aesthetics. Wave action may naturally re-suspend beach sands, consistent with the status quo.
f) Other - NA

2.3.2 Effects on Biota

a) Primary Production, Photosynthesis – No effects are anticipated. Sediments will settle out of suspension relatively quickly and have no long term effects that would result in a change in phytosynthetically active radiation in the water column.
b) Suspension/Filter Feeders – Minor and temporary impacts are expected on suspension/filter feeders due to increased turbidity.
c) Sight Feeders – Minor and temporary impacts are expected on suspension/filter feeders due to increased turbidity.
d) <u>Actions Taken to Minimize Impacts</u>

Best Management Practices – Soil erosion and sediment control measures will be incorporated into the alternative during design phase and will comply with state and federal environmental requirements. The minimum measures required at the project site may include:

- In-water sediment containment devices
- Water quality monitoring
- Monitoring of sea state to inform construction schedule

2.4 Contaminant Determinations

Hazardous, toxic and radioactive waste (HTRW) are not anticipated in the study area. Sediments within the dredged navigation channel were chemically analyzed for pH, percent solids, ignitability, total organic carbon (TOC), total and water soluble sulfides, oil and grease, total recoverable petroleum hydrocarbons (TRPH), cyanides, toxicity characteristic leaching procedure (TCLP), metals, pesticides, polycholorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), semi-volatile and halogenated volatile organic compounds (SVOCs and HVOCS), total petroleum hydrocarbons (TPH); and benzene, toluene, ethylbenzene, and xylene (BTEX). The most recent chemical analysis occurred in November 2008 and determined that there would be no restrictions on use placed on dredged material from HSBH. A complete HTRW evaluation is provided in Section 2.6 of the Feasibility Report.

2.5 Aquatic Ecosystems and Organism Determinations

The USFWS characterized marine habitat at HBP (USFWS 2020) and a summary of their findings follows: "Overall, the diversity of marine resources within this area was low and coral numbers were low compared to other areas in Hawaii. Within this area, the majority of corals were found in the northern section and represent an area where avoidance and minimization measures should be undertaken. The Service further documented the intertidal community across the area and notes that sand placement will have a significant impact to the Shoreline Intertidal – Rocky habitat."

The primary impacts from this project include the direct impact to benthic habitat and associated resources from the placement of sand along the coastline, as well as the indirect effects from sand shifting and migration after initial placement of sand. The direct impacts are straightforward, as the sand placement will cover portions of the project area. Impacts to corals are anticipated to be minimal across the project area. Overall impacts from other project components are expected to be minimal.

a) Effects on Plankton - Minor and temporary impacts to plankton are expected due to turbidity and disturbance from construction.

b) Effects on Benthos - Effects to benthos are expected. The BUDM beach restoration would result in the placement of 22,638 cy of sand along 4.2 acres of beach and waters of the U.S. converting various nearshore habitat types to sandy beach. The various habitat types, pavement, scattered coral rock in unconsolidated sediment, shoreline intertidal rocky and sandy stratums and sand all include various benthic and intertidal marine species that will be affected by the BUDM beach restoration. Motile species such as fish will likely vacate the construction area while sessile species such as sea urchins will be buried in place. Some of those buried benthic organisms may survive the additional sand, while others will not.

c) Effects on Nekton - Minor effects to nekton are expected. Turbidity may impact foraging or navigation for these species, however the vastness of the surrounding ocean should provide ample refuge and suitable replacement habitat for motile species.

d) Effects on Aquatic Food Web - Effects not expected.

e) Effects on Special Aquatic Sites - Effects not expected. These natural areas are not present within the affected area.

f) Wetlands – No impacts are expected.

g) Threatened and Endangered Species – In consultation with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) and it was determined that this project may affect but is unlikely to adversely affect Threatened or Endangered Species under the Endangered Species Act (ESA) and their designated critical habitat. USACE negotiated many BMPs intended to avoid and minimize adverse effects to listed species. Documentation of this consultation can be found in Appendix B.

h) oral Reefs – No coral reefs are present in the components of the project. Coral reefs are present beyond the components, however, these reefs will not be directly impacted and implementation of BMPs will ensure adjacent coral reefs will not be indirectly impacted.

i) Other Wildlife - No wildlife effects are anticipated.

j) ctions to Minimize Impacts - Environmental commitments have been made in consultation with the National Marine Fisheries Service and U.S. Fish and Wildlife Service and are detailed in Section 8.7.1 of the Feasibility Report.

2.6 Proposed Discharge Site Determinations

a) Mixing Zone Determination – This material will be placed on the beach and no mixing zone is anticipated. Beach deposited dredged material would be subject to disturbance and dispersion from wave dispersion, storm surge, and other natural processes and be redistributed beyond the initial placement area.

b) Determination of Compliance with Applicable Water Quality Standards - The proposed activity would not cause significant or long-term degradation of water quality within the project area or surrounding environment and would comply with all applicable water quality standards.

c) Potential Effects on Human use Characteristics
    i. Municipal and Private Water Supply – No effects expected.
    ii. Recreational and Commercial Fisheries – No effects expected.
    iii. Water Related Recreation – No effects expected.
    iv. Aesthetics – No effects expected.
    v. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves – NA

2.7 Determination of Cumulative, Secondary Effects on the Aquatic Ecosystem

Natural processes would gradually disperse dredged material placed at the disposal site, and no permanent long-term effects are anticipated.

This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated the beach created under this alternative would persist for twenty-six years before returning to the existing condition. This project life assumes no other measures are performed by other state or local agencies to protect the beach or reduce scour.

For an action to have a cumulative action on a resource, the action must have a direct or indirect effect on that resource, unless that resource is in declining or in a significantly impaired condition. Only one other project was found to be in effect in the project area that should be considered under the cumulative impact analysis. The City and County of Honolulu repaired the seawall along the beach in 2020 and there are plans to repair the comfort station at Haleʻiwa Beach.

When taken in conjunction with the City and County of Honolulu's project, the proposed project would have a beneficial effect on recreation and the visual aesthetics of the project area. These two projects would provide for a long-term safer environment as the wider beach and reinforced wall would protect the area adjacent to the beach where visitors congregate and park. There are no anticipated long term impacts to the aquatic ecosystem from these actions.

3. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

3.1 Adaptation of Section 404 (b)(1) Guidelines to this Evaluation

The proposed project complies with the requirements outlined in the Environmental Protection Agency's Guidelines for Specification of Disposal Sites for Dredged or Fill Material.

3.2 Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem

Open water disposal at the south Oʻahu ODMDS has been identified as the Federal Standard (USACE 2018). USACE does not consider placement/disposal of the dredged material on land as practical or desirable, due to the lack of upland storage areas and the impacts and cost of transporting the dredged material inland by truck through the community on its limited road system. Additionally, beach sand is a scarce resource in some areas across the state. The state desires to retain beach sand within the littoral cell, rather than to lose the sand to uplands or offshore.

3.3 Compliance with Applicable State Water Quality Standards

A water quality certification (WQC) pursuant to Section 401 of the CWA will be obtained from the Hawaiʻi State Department of Health (DOH) prior to construction. USACE has coordinated the proposed placement of dredged material into waters of the U.S. with the Hawaiʻi State DOH and has obtained a letter of confirmation from the Hawaiʻi State DOH dated April 19, 2021, stating that DOH acknowledges that USACE lacks the details necessary to apply for and obtain a Section 401 WQC during feasibility, that DOH has no preliminary issues with the USACE moving forward with further designs of this project and that USACE will seek a Section 401 WQC from DOH-CWB when sufficient detail is available, underscoring the need to obtain a Section 401 WQC prior to construction. All conditions of the water quality certification, once obtained, will be implemented to minimize adverse impacts to water quality and ensure compliance with the State Water Quality Standards. USACE has satisfied the statutory requirements of Section 401 WQC at the feasibility phase and in accordance with Engineering Regulation 1105-2-100, Appendix C.Compliance with Applicable Toxic Effluent Standards or Prohibition under Section 307 of the Clean Water Act.

No toxic effluents that would affect water quality parameters are associated with the proposed project. Therefore, the project complies with toxic effluent standards of Section 307 of the Clean Water Act.

3.4 Compliance with Endangered Species Act of 1973

Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, USACE determined that the recommended plan may affect, but is not likely to adversely affect, the federally listed species or their designated critical habitat. National Marine Fisheries Service (NMFS) received our written request on 3 September 20201 and concurred with the USACE determination on 1 November 2021 that the proposed action may affect, but is not likely to adversely affect the following ESA-listed species: endangered Main Hawaiian insular false killer whales (*Pseudora crassidens*), endangered Hawaiian monk seals (*Monachus schauinslandi*); threatened Central North Pacific green sea turtles (*Chelonia mydas*), endangered hawksbill sea turtles (*Eretmochelys imbricate*); threatened oceanic whitetip sharks (*Carcharhinus longimanus*) and threatened giant manta rays (*Manta birostris*). In addition, National Marine Fisheries Service (NMFS) also concurred that the proposed action is not likely to adversely affect the designated critical habitat of Main Hawaiian Island insular false killer whales (*Pseudora crassidens*) and Hawaiian monk seals (*Monachus schauinslandi*). On 2 September 2021, U.S Fish and Wildlife Service (USFWS) received our letter and on 13 December 2021, they concurred that the proposed action may affect, but is not likely to adversely affect the green sea turtle (*Chelonia mydas*) and hawksbill sea turtle (*Eretmochelys imbricate*). USACE has satisfied the statutory requirements of Section 7 of the ESA.

3.5 Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection. Research, and Sanctuaries Act of 1972:

N/A. No marine sanctuaries are located within the project area.

3.6 Evaluation of the Extent of Degradation of the Waters of the United States

The proposed BUDM beach restoration activities would result in minimal adverse effects to the aquatic ecosystem, primarily concentrated during construction, and substantially subsiding upon completion of the in-water work. The proposed discharge would not cause or contribute to significant degradation of water of the U.S.

3.7 Finding of Compliance

a) No adaptation of the Section 404(b)(1) guidelines was made for this evaluation.
b) No practical alternatives are available that produce fewer adverse aquatic impacts than the proposed plan.
c) The proposed project would comply with applicable water quality standards.
d) The project follows applicable Toxic Effluent Standards under Section 307 of the Clean Water Act; with the Endangered Species Act of 1973; and with the Marine Protection, Research, and Sanctuaries Act of 1972.
e) The proposed fill activity would have no significant adverse impact on human health or welfare, including municipal and private water supplies, recreational and commercial fisheries, plankton, fish, shellfish, or wildlife communities (including community diversity, productivity, and stability), special aquatic sites, or recreational, aesthetic, and economic values.
f) Typical erosion control measures would be taken to minimize construction impacts other than selection of the least environmentally damaging construction alternative.
g) On the basis of the Guidelines, the proposed site for the discharge of fill material is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse impacts to the aquatic ecosystem.

4. CONCLUSION

USACE considered various alternatives, lesser iterations of the Recommended Plan. The Recommended Plan provided the greatest economic benefit given the cost to construct. The leser iterations, Alternatives 2-4, proposed smaller fill footprints, however, the benefit to cost ratio was greatest under the Recommended Plan. The other alternatives may have had a lesser environmental effect, however none of the alternatives considered, including the Recommended Plan, would result in significant environmental impacts. The environmental effects across all alternatives would be substantively similar; the benefit of coastal storm risk reduction would decrease as the fill footprint decreases. Within this context, and as a result of the 404(b)(1) evaluation, the Recommended Plan is the Least Environmentally Damaging Practicable Alternative.

5. REFERENCES

Marine Research Consultants, Inc. (MRC). 2008. Sampling and Analysis Report for Maintenance Dredging of Haleʻiwa and Waianae Small Boat Harbors.

U.S. Army Corps of Engineers Honolulu District (USACE). 2018. Haleiwa Harbor, Oahu, Hawaii Dredged Material Management Plan Preliminary Assessment

U.S. Fish and Wildlife Service (USFWS). 2020. Phase 1 & 2 Marine Habitat Characterization Haleiwa Beach Park, Oahu, Hawaii Beach Renourishment Fish & Wildlife Coordination Act Report

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

April 1, 2021

Civil and Public Works Branch
Programs and Project Management Division

Mr. Alec Wong
Clean Water Branch
Environmental Management Division
State Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Mr. Wong:

The Honolulu District, U.S. Army Corps of Engineers (Corps) has initiated a pilot study to evaluate opportunities to beneficially reuse material dredged from the Haleiwa Small Boat Harbor located in Haleiwa, Island of Oahu, Hawaii. The Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Study is authorized under Section 1122 of Water Resources Development Act of 2016, as amended. Section 1122 established the pilot program under which this study proposes to dredge suitable materials from Haleiwa Small Boat Harbor (HSBH) and other suitable areas in the vicinity for placement at the Haleiwa Beach Shore Protection Project that is adjacent to Haleiwa Beach Park. The non-federal sponsor is the State of Hawaii, represented by the Department of Land and Natural Resources.

The Corps met with your agency on February 25, 2021, to present the project details and to discuss potential discharges into waters of the U.S. subject to Clean Water Act regulation. In accordance with Section 401 of the Clean Water Act (33 USC § 1341), the Corps must obtain certification from the State of Hawaii Department of Health (DOH), Clean Water Branch that any proposed discharges will comply with the applicable provisions of the Clean Water Act. However, as discussed at our meeting, the details of the feasibility level of conceptual design is inadequate to identify and describe all proposed discharges with sufficient detail to apply for and obtain a Section 401 Water Quality Certification from the DOH. The Corps will seek water quality certification from your agency when sufficient detail is available, during the environmental permitting process of the Design and Construction Phase. The Corps seeks written confirmation acknowledging the Corps' coordination on this project with your agency, your agency's potential preliminary findings, if available, and acknowledgement of the Corps' plans to obtain a water quality certification at a later date, prior to implementation of the project.

We request your written confirmation within 30 days of the date of this letter. As this study progresses, we will continue to keep your agency apprised of any changes, as appropriate. Should you have any questions or comments, please contact the study project manager, Mr. Benjamin Reder of my Civil and Public Works Branch, at (808) 835-4023 or via email at Benjamin.E.Reder@usace.army.mil. Thank you for your cooperation.

Sincerely,

Jennifer Moore, PMP
Deputy District Engineer for
Programs and Project Management

DAVID Y. IGE
GOVERNOR OF HAWAII

ELIZABETH A. CHAR, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

04019PDCL.21

April 19, 2021

Ms. Jennifer Moore, PMP
Deputy District Engineer for Programs and Project Management
Department of the Army
U.S. Army Corps of Engineers, Honolulu District
Fort Shafter, Hawaii 96858-5440

Dear Ms. Moore:

Subject: Haleiwa Small Boat Harbor
Maintenance Dredging and Beach Restoration Study
February 25, 2021 Coordination Meeting

Reference is made to your letter of April 1, 2021. The Department of Health (DOH), Clean Water Branch (CWB) confirms attending the subject coordination meeting with the U.S. Army Corps of Engineers (USACE), Civil and Public Works Branch.

Pursuant to Clean Water Act (CWA), Section 401 (33 USC § 1341), the USACE must obtain a Section 401 Water Quality Certification (WQC) from the DOH-CWB for the proposed discharge. The DOH-CWB acknowledges that the details of the feasibility level of conceptual design are inadequate to identify and describe the proposed discharges with sufficient detail to apply for and obtain a Section 401 WQC from the DOH-CWB. Although insufficient detail exists at the feasibility stage for USACE to apply and obtain a Section 401 WQC from DOH-CWB, DOH-CWB has no preliminary issues, based on information available at this time, with the USACE moving forward with further designs of this project. We acknowledge that USACE will seek a Section 401 WQC from DOH-CWB when sufficient detail is available. A Section 401 WQC must be obtained prior to construction

If you have any questions, please contact Mr. Darryl Lum of the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

DCL:na

c: Mr. Jeffrey Herzog, USACE [via e-mail Jeffrey.a.herzog@usace.army.mil only]
Ms. Jessie Paahana, USACE [via e-mail Jessie.K.Paahana@usace.army.mil only]
Mr. Benjamin Reder, USACE [via e-mail Benjamin.e.reder@usace.army.mil only]

Attachment 3 – Endangered Species Act (ESA) Consultation

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

September 2, 2021

Civil Works Branch
Programs and Project Management Division

Michelle D. Bogardus
Assistant Field Supervisor
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service
300 Ala Moana Blvd., Room 3-122
Honolulu, Hawaiʻi 96850

Dear Ms. Bogardus:

The purpose of this letter and enclosure is to present the Honolulu District, U.S. Army Corps of Engineers' (Corps) evaluation of potential effects of our proposed actions on species protected under the Endangered Species Act (ESA) and to request informal consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Services (NMFS) on our determination of effect.

The Corps is assessing the beneficial use of dredged material on Haleiwa Beach Park (HBP), Island of Oahu, Hawaii. The proposed plan entails dredging the Haleiwa Small Boat Harbor Channel to a depth of 13' MLLW, dredging material from the Ali'i settling basin, and dredging additional material from an offshore sand deposit. Additionally, approximately 22,638 cy of beach quality sand would be placed on Haleiwa Beach over an area of approximately 4.2 acres. Any material determined not suitable for beach restoration will be transported by scow and taken to the U.S. Environmental Protection Agency South Oahu Ocean Dredge Material Disposal Site. The Corps intends to award a construction contract for the proposed work in Fiscal Year 2023 (Calendar Year 2024) with completion of in-water work within one year.

The Corps has identified the following species listed under the ESA that may occur within the ESA action area:

- Green Sea Turtle (*Chelonia mydas*) Central North Pacific DPS – Hawaii, threatened
- Hawksbill Sea Turtle (*Eretmochelys imbricate*), endangered
- Hawaiian Monk Seal (*Monachus schauinslandi*), endangered
- Hawaiian Insular false killer whale (*Pseudora crassidens*), endangered

- Giant manta ray (*Manta birostris*), proposed threatened
- Oceanic Whitetip shark (*Carcharhinus longimanus*), proposed threatened

The ESA action area contains designated critical habitat for Hawaii Monk Seal and Hawaiian Insular false killer whale.

The enclosed Biological Evaluation describes the proposed actions and action areas, potential impacts to listed species, and proposed avoidance and minimization measures in detail. Based on this information, the Corps determines that its proposed action may affect, but are not likely to adversely affect, the above listed species and will not adversely modify designated critical habitat. Through informal consultation, the Corps seeks written concurrence from USFWS and NMFS on this determination.

Should you have any questions or require additional information on these projects, please contact Ms. Kate Bliss at 808-835-4626, or via e-mail at kate.m.bliss@usace.army.mil, or Mr. Ben Reder, at (808) 835-4203, or via e-mail at benjamin.e.reder@usace.army.mil.

Sincerely,

R.Kucharski

Rhiannon Kucharski
Chief, Civil and Public Works Branch

Enclosure

BIOLOGICAL EVALUATION

HALEIWA SMALL BOAT HARBOR MAINTENANCE DREDGING AND BEACH RESTORATION
HALEIWA, ISLAND OF OAHU, HAWAII

Prepared for:NOAA, National Marine Fisheries ServiceProtected Resources Division
Pacific Islands Regional Office
Honolulu, Hawaii

And

U.S. Fish and Wildlife Service
Ecological Services
Pacific Islands Fish and Wildlife Office
Honolulu, Hawaii

Prepared by:
U.S. Army Corps of Engineers, Honolulu District

September 2021

1.0 BACKGROUND

1.1 Authority

The U.S. Army Corps of Engineers' (Corps) is examining the feasibility and environmental effects of implementing beneficial use of dredged material (BUDM) from Haleiwa Small Boat Harbor (HSBH) at Haleiwa Beach Park (HBP) located in Haleiwa, Oahu, Hawaii under authority granted by Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law (PL) 114-322), as amended. The Corps' feasibility study is a federal action subject to the statutory requirements of Section 7 of the Endangered Species Act of 1973, as amended. The purpose of this biological evaluation (BE) is to document the Corps' assessment of anticipated direct and indirect effects of the proposed action on species listed or proposed for listing as threatened or endangered and their designated critical habitat pursuant to the Endangered Species Act (ESA) of 1973, as amended. Section 7 of the ESA requires any federal action agency to consult the Services on any federal action that may affect ESA-listed species or designated critical habitat. This BE was prepared In accordance with 50CFR Part 402.14(c) and is based upon the best available scientific and commercial information.

1.2 Pre-Consultation History

The Corps invited federal and state resource agency partners to a pre-consultation meeting to present the proposed action and solicit feedback from each agency representative. The meeting was held on June 19, 2019 at the U.S. Fish and Wild Service (UWFWS) Pacific Island Fish and Wildlife Office and was attended by representatives from the USFWS, National Marine Fisheries Service (NMFS), State of Hawaii Department of Health, Clean Water Branch and State of Hawaii Department of Business, Economic Development and Tourism, Coastal Zone Management Office. The major takeaway from this meeting was the need to ensure that the beach restoration design would provide long-term beneficial impacts that outweigh the adverse effects to fish and wildlife resources resulting from loss of intertidal habitat for conversion to sandy beach.

Additionally, pursuant to the Fish and Wildlife Coordination Act (FWCA) of 1934 [16 U.S.C. 661 et seq.; 48 Stat. 401], as amended, the Corps consulted USFWS, requesting technical assistance to inform the Corps' feasibility study. Accordingly, USFWS conducted a FWCA investigation to document the resources within the project area and analyze the potential impacts to marine resources. USFWS documented its findings, recommendations and support for this project in a FWCA Report dated December 2020. The FWCA Report indicates that potential impacts associated with this project are relatively small and recommends steps to minimize the impact which includes possible impacts to corals and loss of the majority of the Rocky Shoreline Intertidal habitat from sand placement.

1.3 Project Location

The project is located on the North Shore of the island of Oahu, approximately 30 miles north of Honolulu, Hawaii (Figure 1). The study area (Figure 2) encompasses the federally authorized Haleiwa Small Boat Harbor (HSBH), Haleiwa Beach Shore Protection Project (HBSPP), and the Haleiwa Beach Park (HBP). It is located near the mouth of the Anahulu River (21° 35' 49.24" N, 158° 05' 47.50 W"). The study area also includes a 0.3 acres (ac) shoaling deposit caused by and located immediately to the east the State-owned breakwater on Alii Beach (State Breakwater Settling Basin), and a 16.5 ac offshore sand deposit (Offshore Sand Borrow Area) located approximately 3,500 feet (ft) northwest of HBP (Figure 3).

Figure 1 Project Location

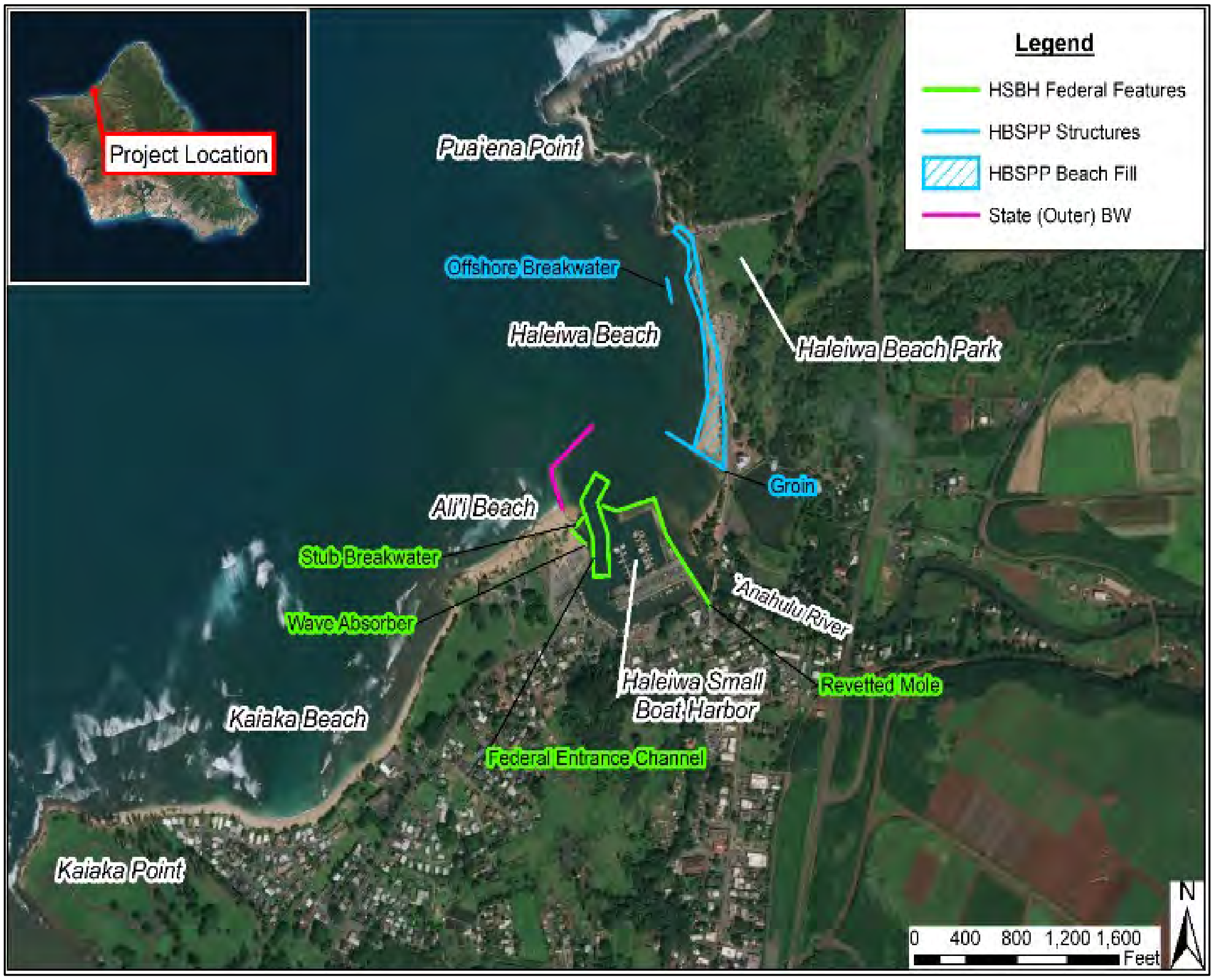

Figure 2 Study Area

1.4 Purpose & Need

The HBSPP was authorized by the Rivers and Harbors Act of 1965 and was constructed in 1965. The project consists of a 160 foot (ft) long offshore breakwater, a 520 ft long terminal groin at the southern end of Haleiwa beach, and a 1,600 ft long, 140 to 265 ft wide beach fill.

In the 1970s, the HBSPP was repaired several times due to storm damages. In December 1969, the Corps conducted emergency repairs on the groin and offshore breakwater in response to damages caused by severe storms and placed approximately 12,000 cy of sand on the beach. Storms in January 1974 and November 1976 again caused damages requiring emergency repairs for the project, in 1975 and 1978, respectively.

The project authorization states that the non-federal sponsor is responsible for ongoing maintenance of the project and that the Corps may conduct emergency repairs to the project in accordance with Public Law (PL) 84-99. The non- federal sponsor for the Haleiwa Beach Shore Protection Project is the State of Hawaii, Department of Transportation.

Regular maintenance of the HBSPP has been limited; Haleiwa beach is known to be erosive with current rates of erosion at an average of 2.2 ft. per year (University Hawaii, 2010). Recent erosion has exposed underlying beach rock, contributed terrigenous sediment and other materials into the marine environment and undermined the retaining wall fronting the HBP comfort station and associated infrastructure.

The Corps proposes to beneficially use material dredged from a federally navigation project and an offshore sand deposit to restore the beach fill to its original extent and restore several benefits and services such as storm damage reduction, resting habitat creation for listed sea turtles and promotion of beach recreation. Historically, all sediments dredged from HSBH are removed from the local system and taken to the South Oahu Ocean Dredged Material Disposal Site (ODMDS) or taken to a landfill.

2.0 PROPOSED ACTION

2.1 Project Description

The proposed action involves BUDM for the purposes of reducing storm damage to property and infrastructure. The BUDM will help to counteract the impacts of erosion, protect the existing facilities and infrastructure, and improve recreational uses of the HBP. A secondary benefit of the project may also be creation of resting habitat for green sea turtles fronting the HBP.

Dredged material will be obtained from the HSBH Federal Navigation Channel, the State Breakwater Settling Basin that is part of the HSBH, and an Offshore Sand Borrow Area. The beach-suitable dredged material i.e., sand, from these locations will be used to nourish the beach that is part of the federally authorized HBSPP and fronting the HBP. Dredging from these locations will yield approximately 22,638 cubic yards (cy) of beach-suitable sand and will be used to restore 4.2 ac of beach.

The fine-grained dredged material from the Federal Navigation Channel that is not suitable for beach restoration, approximately 2,000 cy, will be transported by scow and taken to the SOODMDS. The Corps will pursue a suitability determination in coordination with the U.S. Environmental Protection Agency pursuant to Sections 102 and 103 of the Marine Protection, Research and Sanctuaries Act of 1972 during the design phase.

This beach is part of the federally authorized project, and nourishment with dredged material will help restore the beach to its original extent. This will produce benefits in the form of restored resting habitat for the green sea turtle, recreational benefits, and storm damage reduction benefits.

All dredging will be completed by using a clam shell dredge to excavate material from the proposed areas and load scows for transportation to the Haleiwa Beach Shore Protection Project (HBSPP). The scows will be unloaded directly to the beach at the HBSPP. Scows will use a barge access zone, excavated as part of this project, to move adjacent to the HBSPP for unloading. The dredged material will be unloaded directly onto the beach and is not anticipated to require dewatering. The beach sand would be graded to a typical cross section.

2.2 Proposed Avoidance & Minimization Measures Included as part of the Proposed Action

To avoid and minimize impacts to listed species, the Corps proposes the following measures that would be implemented to reduce adverse effects of the proposed action on the environment. The Corps considers the following measures a component of the proposed action. In consultation with the Services, agreed upon avoidance and minimization measures will be incorporated into any future contract for implementation by the construction contractor.

Specific to federally-listed marine species under NMFS' purview, the Corps has committed to the following BMPs:

- A competent observer shall be designated to survey the marine areas adjacent during construction to the proposed action for ESA-listed marine species, including but not limited to the green sea turtle, hawksbill sea turtle, and Hawaiian monk seal.

- All on-site project personnel shall be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal laws.
- Visual surveys for ESA-listed marine species 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, to ensure that no protected species are in the area (within 50 yards of the proposed work).
- If a basking monk seal is found within the project area, cease all mechanical or construction activities within 100 feet until the animal voluntarily leaves the area. If you resume work from a distance greater than 100 feet and the monk seal appears agitated or otherwise modifies its behavior in response to your nearby work, distance yourself further until either the monk seal is not affected by your nearby work or cease work until the animal voluntarily leaves the area.
- No attempt will be made to feed, touch, ride, or otherwise intentionally interact with any ESA listed marine species.
- Work shall be postponed or halted when ESA-listed marine species are within 50 yards of the proposed work and shall only resume after the animals have voluntarily departed the area.
- Before any equipment, anchors(s), or material enters the water, a responsible party shall verify that no ESA-listed species are in the area where the equipment, anchor(s), or materials are expected to contact the substrate. If practicable, the use of divers to visually confirm that the area is clear is preferred.
- Equipment operators shall employ “soft starts” when initiating work that directly impacts the bottom. Buckets and other equipment shall be sent to the bottom in a slow and controlled manner for the first several cycles before achieving full operational impact strength or tempo.
- All objects lowered to the bottom shall be lowered in a controlled manner. This can be achieved by 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 decent.
- Equipment, anchor(s), or material shall not be deployed in areas containing live corals, sea grass beds, or other significant resources.
- For any equipment used in undertaking the authorized work, the 160 dB and 120 dB isopleths shall not exceed the 50-yard shut-down range for impulsive and continuous sound sources, respectively.
- Vessel operators shall alter course to remain at least 100 yards away from whales, and at least 50 yards from other marine mammals and sea turtles.
- Vessel operators shall reduce vessel speed to 10 knots or less when piloting vessels in the proximity of marine mammals, and to 5 knots or less when piloting vessels in areas of observed turtle activity. If approached by a marine mammal or turtle, the vessel operator shall put the engine in neutral and allow the animal to pass.
- Vessel operators shall not encircle or trap marine mammals or sea turtles between multiple vessels or between vessels and the shore.
- The contractor shall keep a record of all protected species sightings, incidents,

disturbance, and injuries, and shall provide a weekly report to the Honolulu District , USFWS' Ecological Services office, and the NMFS' Protected Resource Division.

- Immediately report any incidental take of protected species, including incidents of harassment, disturbance or injury, and must include the name and phone number of a point of contact, location of the incident, and nature of the take and/or injury.
  - The incident must be reported immediately to the construction representative for the Corps.
  - For monk seals contact shall be made with the Marine Mammal Response Coordinator, David Schofield at NMFS, at 808-944-2269, as well as the monk seal hotline at 1-888-256-9840.
  - For turtles, contact shall be made with NOAA turtle hotline at 800-853-1964. The incident shall also be reported to the Pacific Island Protected Species Program Manager, Southwest Region (Tel: 808-973-2987, fax: 808-973-2941).

Specific to federally-listed terrestrial species under USFWS' purview, the Corps has committed to the following BMPs:

- To avoid and minimize potential project impacts to seabirds:
  - Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary.
  - Install automatic motion sensor switches and timer controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
  - Avoid nighttime construction during the seabird fledging period, September 15 through December 15.
- To avoid and minimize project impacts to sea turtles and their nests we recommend you incorporate the following applicable measures into your project plan:
  - If a basking sea turtle is found within the project area, cease all mechanical or construction activities within 100 feet until the animal voluntarily leaves the area.
  - Cease all activities between the basking turtle and the ocean.
  - Remove any project-related debris, trash, or equipment from the beach or dune if not actively being used.
  - Do not stockpile project-related materials in the intertidal zone, reef flats, or stream channels.

2.3 Action Area

As defined under the ESA, the Action Area encompasses all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). The Corps' defines the action area (Figure 3) for the proposed action as the footprint of in-water and nearshore construction, which encompasses dredge areas in the HSBH, the offshore sand borrow area, and the beach restoration area, associated upland staging and access areas, in-water access areas, and anticipated open waters to be transited by support vessels necessary to complete the proposed action. Additionally, not shown on the figure below, the action area extends to the transit corridor to the SOODMDS; the Corps anticipates its construction contractor will follow the shortest open ocean route to the SOODMDS typical of any mariner. The action area boundary was delineated to include the estimated sphere of influence for indirect effects associated with potential increased turbidity and ambient noise levels during certain construction activities.

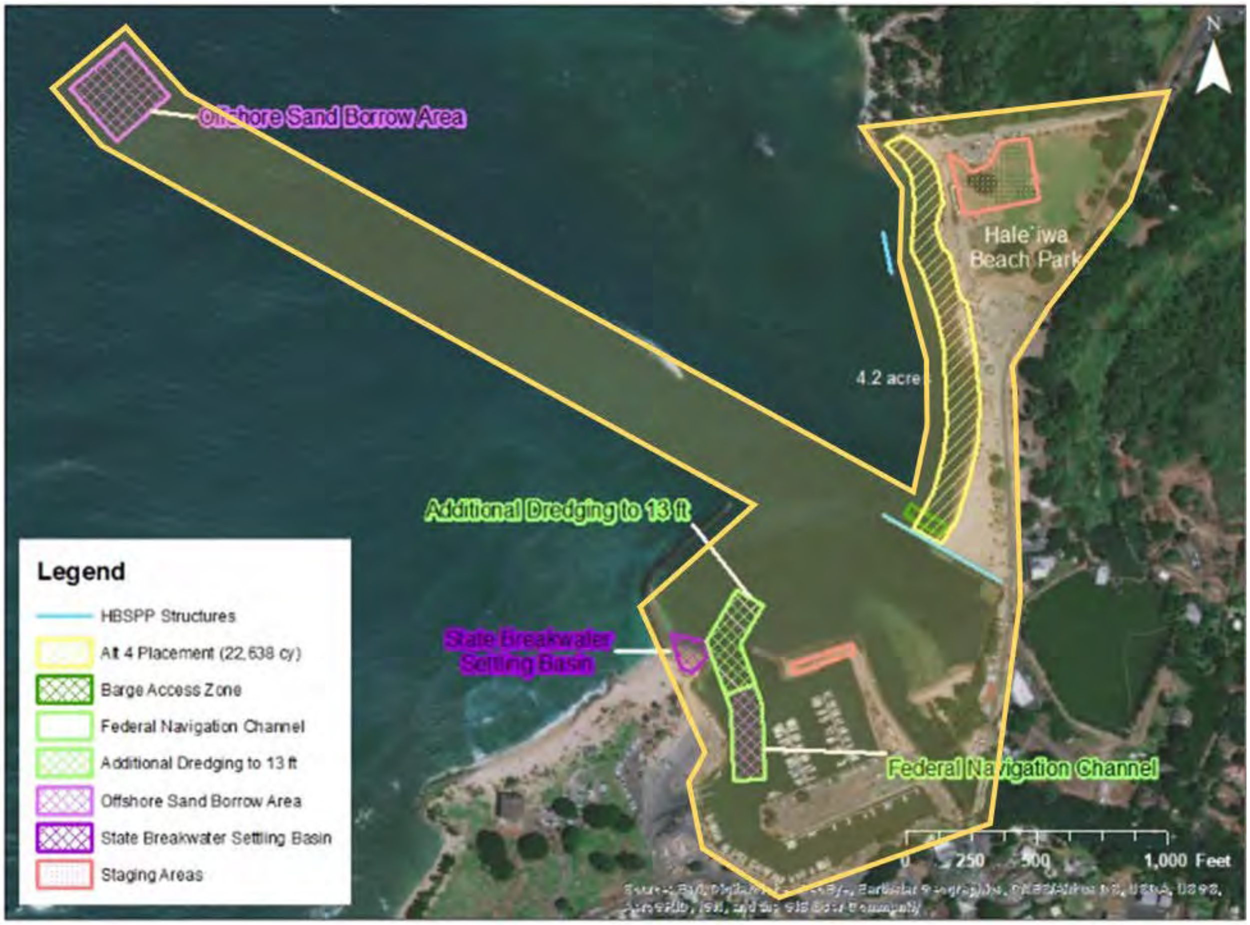

Figure 3 ESA Action Area

2.4 General Description of the Action Area and Environmental Baseline

The northwest coast of Oahu extends from Kahuku Point to Haleiwa, and is characterized by massive winter surf, long sandy beaches, rocky points, and patches of exposed beach rock. The beach rock is particularly exposed in the winter, when foreshore slopes steepened, and large quantities of sand are moved by high surf from the water's edge toward the back of the beach. During relatively calm summer conditions, the beaches are flat and wide. Sand at the shoreline is mostly coarse grained and calcareous, a signature of the high energy waves that impact this coast in the winter. A fringing reef of variable width and depth is present offshore. The coastal plain is variable in width and is composed largely of fossiliferous limestone and unconsolidated sand.

Substrate within HSBH and the navigation channel vary from sand to silts. Sediment samples from the northern part of the navigation channel were the only samples with a least 85% sand or larger material and considered suitable for beach use. Samples from this area had nearly 100% sand and gravel fractions. Samples from other areas indicated much lower sand fractions. Chemical analysis indicated that all sediments from HSBH would have no restrictions on placement.

U.S. Fish and Wildlife Service (USFWS) completed a biologic survey (USFWS 2020) of the nearshore waters within the project area. The FWCA Report (December 2020) characterizes the coral reef habitat, adjacent to HBP, as “Resource Category 3”. The draft report notes “this coral reef area should be considered medium to high value due to the marine resources documented in this survey. However, this reef has been classified as Category 3…while most Hawaiian coral reefs are rated at Category 2.” Coral reefs are also designated as Special Aquatic Sites under the Clean Water Act (CWA). Special Aquatic Sites are defined by 40 CFR 203.03 (m) as “geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region.”

3.0 LISTED SPECIES IN THE ACTION AREA

The Corps has reviewed the project components within this geographic region and determined the following species have the potential to occur (co-locate in time and/or space) in the action area and may be affected by the proposed action:

- Green Sea Turtle (*Chelonia mydas*) Central North Pacific DPS – Hawaii, threatened
- Hawksbill Sea Turtle (*Eretmochelys imbricate*), endangered
- Hawaiian Monk Seal (*Monachus schauinslandi*), endangered; and designated critical habitat
- Hawaiian Insular false killer whale (*Pseudora crassidens*), endangered; and designated critical habitat
- Giant manta ray (*Manta birostris*), proposed threatened
- Oceanic Whitetip shark (*Carcharhinus longimanus*), proposed threatened

All of the species listed above are NMFS trust resources. When on land, the above listed sea turtles are USFWS trust resources.

The action area includes designated terrestrial and marine critical habitat for the Hawaiian Monk Seal and also provides suitable habitat for resting and haul out.

3.1 Green Sea Turtle (Chelonia *mydas*)

The green sea turtle was listed as threatened on July 28, 1978, except for breeding populations found in Florida and the Pacific coast of Mexico, which were listed as endangered. These turtles are globally distributed, typically along continental coasts and islands in tropical and subtropical waters between 30° N and 30° S. They are highly migratory and use a wide range of broadly separated habitats throughout their lives. Post-hatchling and juvenile green sea turtles are believed to drift along major current systems for several years, where they are assumed to forage at, or near, the surface where currents converge. Their diet appears to be primarily carnivorous and includes invertebrates and fish eggs. Upon reaching a carapace length of about 35 centimeters, juveniles recruit to near shore habitats. Most adult green turtles appear tohave a nearly exclusive herbivorous diet, consisting primarily of marine algae and sea grasses. However, greens from the eastern Pacific coast appear to have a more carnivorous diet. Every few years after reaching sexual maturity, green sea turtles make breeding migrations that may span thousands of kilometers between resident foraging grounds and their natal nesting areas. green sea turtles in Hawaii are genetically distinct and geographically isolated, which is uncharacteristic of other regional sea turtle populations. Detailed information about the biology, habitat, and conservation status of this species is described in the recovery plan (NMFS and USFWS 1998a) and the 5-year status review (NMFS and USFWS 2007a).

Globally, most of the important green sea turtle nesting populations declined substantially during the 20th century. Conservation efforts over the past 25 years or more appear to have had some positive results. Chaloupka, et al. (2007) reports that four green sea turtle index rookeries in the Pacific have shown significant increases in nester or nest abundance. However, threats and impacts persist for a number of Pacificsea turtle populations.

Foraging adult and juvenile green sea turtles occur in the nearshore waters around all of the island archipelagos, including the action area considered in this BE. Green sea turtles are very common in the main Hawaiian Islands (MHI), and the population is increasing (Chaloupka, et al. 2007). Nesting is known to occur throughout the Hawaiian Archipelago, with about 90% taking place in the Northwestern Hawaiian Islands (NWHI). Limited nesting also occurs in the Marianas, as well as Rose Atoll in the American Samoa Archipelago. Little is known about nesting in the PRIA, but some nesting is assumed to occur there.

Green sea turtle populations have declined dramatically throughout the Pacific and continue to decline, with the exception of populations in the Hawaiian Islands and possibly Australia. Continued harvest by humans is considered a serious threat to green sea turtle recovery, and the turtles are vulnerable at both ends of their migratory routes. Adults and eggs are vulnerable to hunters who take them from nesting beaches in one location, and those same adults are again hunted at their nearshore feeding areas. Illegal harvest of turtles and eggs continues with regularity in American Samoa and the Mariana Islands, and low level poaching also likely occurs in Hawaii. Habitat degradation and loss from coastal development, pollution, and global climate change are also serious threats to green sea turtles. Disease is also a significant threat to many green sea turtle populations. An often fatal tumor affliction, fibropapillomatosis, is increasing in scope and magnitude among many populations. Fisheries interactions and vessel collisions are also threats in some areas (NMFS and USFWS 1998a).

3.2 Hawksbill sea turtle (*Eretmochelys* imbricata)

The hawksbill sea turtle was listed as endangered on June 2, 1970. These turtles are distributed globally in tropical and subtropical waters between 30° N and 30° S. They are highly migratory, use different habitats at different stages of their life cycle, and are most commonly associated with healthy coral reefs. Post-hatchlings and oceanic stage juveniles are believed to occupy the pelagic environment for several years where they probably drift along major current systems and feed primarily at the surface. At about 35 centimeters carapace length, juveniles recruit to nearshore foraging areas where they begin feeding on benthic sponges, other invertebrates, and algae. Every few years, adult hawksbill sea turtles make breeding migrations that may span thousands ofkilometers between their foraging and nesting areas. Detailed information about the biology, habitat, and conservation status of this species is described in the recovery plan (NMFS and USFWS 1998b) and the 5-year status review (NMFS and USFWS 2007b). Globally, hawksbill sea turtle nesting populations declined substantially during the 20th century, and population declines appear to continue (NMFS and USFWS 2007b).

Foraging hawksbill sea turtles occur in the waters around the main Hawaiian Islands, Guam, and Tutuila in American Samoa. They also likely occur in the southern islands of the CNMI, and probably occur around at least some of the islands in the PRIA. Hawksbills are uncommon, occurring in much lower numbers than green sea turtles, but individuals are occasionally sighted foraging in nearshore waters around all of the island groups, particularly along the west side of the island of Hawaii and around Tutuila.

Limited nesting is known to occur on the islands of Hawaii and Maui, on Guam, and on Tutuila. Little is known about nesting in the PRIA.

3.3 Hawaiian Monk Seal (*Monachus schauinslandi*)

The Hawaiian monk seal was listed as endangered on November 23, 1976 (41 FR 51611). They are among the most evolutionarily-primitive genera of seals, and are critically endangered, numbering approximately 1,100-1,200 animals, and the majority of the population in the NWHI is decreasing by about 3% annually (Caretta et al., 2014). They are endemic to the Hawaiian Archipelago, and are the only endangered marine mammal that exists wholly within the jurisdiction of the U.S.A. Although they have been reported at Johnston Atoll, in the PRIA, none have been observed since December 2003. To our current knowledge the range of the Hawaiian monk seal is limited to the Hawaiian Islands chain. The overwhelming majority of the population resides in the NWHI, but they are increasingly found in the MHI, where pupping is becoming more common and survival of young seals is very high. Monk seals spend about one third of their time on land and about two thirds in the water. They are non-migratory, but their home ranges are extensive, and inter-island movement is common. They are capable of dives of more than 1,600 ft while foraging, and appear to be opportunistic feeders preying on fish, eels, mollusks, and crustaceans. Hawaiian monk seals are thought to live up to 30 years. Females reach sexual maturity at about five to ten years of age. They give birth on land, bearing single pups, most commonly between February and August, but pupping has been documented during all times of the year. The most current information to describe the biology, habitat, and conservation status of this species can be found in NMFS' 12-month finding for revision of monk seal critical habitat (74 FR 27988), published on June 12, 2009, and in the recovery plan (NMFS, 2007).

Critical habitat was originally designated under the ESA for the Hawaiian monk seal on May 26, 1988 (53 FR 18988). NMFS announced proposed rulemaking to revise the currently designated critical habitat for the Hawaiian monk seals (76 FR 32026) on June 2, 2011. A final rule to revise this critical habitat for the Hawaiian monk seal was published in the Federal Register on August 21, 2015 (80 FR 50925).

Critical Habitat in the revised designation includes sixteen occupied areas within the range of the species: 10 areas in the NWHI and 6 in the MHI. Specific areas in the NWHI include all beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and including marine habitat through the water's edge, including the seafloor and all subsurface waters and marine habitat within 10 meters (m) of the seafloor, out to the 200-m depth contour line (relative to mean lower low water) around the following 10 areas: Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, Maro Reef, Gardner Pinnacles, French Frigate Shoals, Necker Island, and Nihoa Island. Specific areas in the MHI include the marine habitat from the 200-m depth contour line, including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor, through the water's edge 5 m into the terrestrial environment from the shoreline between identified boundary points around the islands of: Kaula, Niihau, Kauai, Oahu, Maui Nui (including Kahoolawe, Lanai, Maui, and Molokai), and Hawaii.

Detailed information on Hawaiian monk seal critical habitat can be found at https://www.fisheries.noaa.gov/species/hawaiian-monk-seal#conservation-management. The specific areas within the designation, with their physical and biological features are:

1. Terrestrial areas preferred by monk seals for pupping and nursing with adjacent shallow, sheltered aquatic areas;
2. Marine areas from 0 to 200 m in depth that with water quality and sediment characteristics that support adequate prey quality and quantity for juvenile and adult monk seal foraging; and
3. Significant areas used by monk seals for hauling out, resting or molting.

3.4 Hawaiian Insular False Killer Whale (Pseudorca crassidens)

The Hawaiian Insular false killer whale (*Pseudorca crassidens*) was listed as an endangered species under the ESA on November 28, 2012 (77 FR 70915). The Status Review report produced by the Biological Review Team (BRT) (Oleson et al. 2010) found that Hawaiian insular false killer whales are a Distinct Population Segment (DPS) of the global false killer whale taxon. Note that the main Hawaiian Islands insular false killer whale is separate from both the Northwestern Hawaiian Islands false killer whale and the Hawaii pelagic false killer whale neither of which are listed under the ESA.

The MHI insular stock false killer whales appears to have declined during the past two decades (Oleson et al. 2010, Reeves et al. 2009; Baird 2009). Of the 29 identified threats to the population, the BRT considered the effects of small population size, including inbreeding depression and Allee effects, exposure to environmental contaminants (Ylitalo et al 2009), competition for food with commercial fisheries (Boggs and Ito, 1993, Reeves et al 2009), and hooking, entanglement, or intentional harm by fishers to be the most substantial threats to the population.

The insular Hawaiian population of the false killer whale is typically found in both shallow (<200 m) and deeper (>2000 m) waters and has been observed to move extensively between the main Hawaiian Islands. False killer whales are large members of the dolphin family. Females reach lengths of 15 feet (4.5 m), while males are almost 20 feet (6 m). In adulthood, false killer whales can weigh approximately 1,500 pounds (700 kg). They have a small conical head without a beak. Their dorsal fin is tall and their flippers (pectoral fins) have a distinctive hump or bulge in the middle of the front edge. False killer whales have dark coloration except for some lighter patches near the throat and middle chest. Their body shape is more slender than other large delphinids.

False killer whales' breeding season lasts several months. Gestation periods range from 14 to 16 months and lactation occurs for one and a half to two years. False killer whales have low reproduction rates with calving intervals of approximately seven years. Maturity occurs at around 12 years of age and maximum longevity is 63 years. These whales are gregarious and form strong social bonds. They are usually found in groups of ten to twenty that belong to much larger groups of up to 40 individuals in Hawai'i and 100 individuals elsewhere. They are known to "strand" in large groups as well. False killer whales are also found with other cetaceans, most notably bottlenose dolphins.

To increase success of finding prey, these whales travel in a broad band that can be up to several miles wide. Food sharing has been documented between individual false killer whales. They feed during the day and at night on fishes and cephalopods, and they are known to attack smaller dolphins that are involved in the tuna purse-seine fishery in the Pacific Ocean. The species feeds primarily on fish and cephalopods, with observational studies suggesting the diet of the Hawaii insular population consists mainly of large game fish (e.g., yellowfin tuna, mahi mahi, skipjack tuna, broadbill swordfish, etc.). The greatest threat in Hawaii to this species is incidental mortality and injury due to interactions with the longline fisheries (Fallon, 2009).

A final rule designating critical habitat under the ESA for the False Insular Killer Whale was published in the Federal Register on July 24, 2018 (83 FR 35062). Critical Habitat includes waters from the 45-m depth contour to the 3,200-m depth contour around the MHI from Niihau east to Hawaii, with some exclusions: the Kaulakahi Channel and Warning Area 188 A and B and PMRF Offshore Areas between Kauai and Niihau; FORACs and SESEF off the west coast of Oahu; Ewa Training Minefield, NDSA, Warning Areas 196, 191, 193, and 194 south of the south coast of Oahu; an area north and offshore of Molokai; Kahoolawe Training Minefield and Hawaii Area Tracking System southwest of Maui; and the Alenuihaha Channel between Maui and Hawaii.

Critical habitat for the main Hawaiian Islands insular false killer whale consists of one essential feature comprised of four characteristics:

1. Space for movement and use within shelf and slope habitat
2. Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth;
3. Waters free of pollutants of a type and amount harmful to Hawaiian False Insular Killer Whales; and
4. Sound levels that would not significantly impair Hawaiian False Insular Killer Whales' use or occupancy.

Detailed information on Main Hawaiian Islands insular false killer whale critical habitat can be found at: https://www.fisheries.noaa.gov/species/false-killer-whale#conservation-management.

3.5 Giant Manta Ray (*Manta birostris*)

The giant manta ray (*Manta birostris*) was listed as threatened under the Endangered Species Act on January 22, 2018 (83 FR 2916). The giant manta ray can be found in all ocean basins. In terms of range, within the Northern Hemisphere, the species has been documented as far north as southern California and New Jersey on the United States west and east coasts, respectively, and Mutsu Bay, Aomori, Japan, the Sinai Peninsula and Arabian Sea, Egypt, and the Azores Islands (Gudger 1922; Kashiwagi et al. 2010; Moore 2012; CITES 2013). In the Southern Hemisphere, the species occurs as far south as Peru, Uruguay, South Africa, New Zealand and French Polynesia (Mourier 2012; CITES 2013). The giant manta ray inhabits tropical, subtropical, and temperate bodies of water and is commonly found offshore, in oceanic waters, and near productive coastlines. It occurs over a broad geographic range and is found in all ocean basins. Since NMFS found that the giant manta ray is at a moderate risk of extinction within a significant portion of its range and did not find that the significant portion meets the criteria of a DPS, the giant manta ray is listed as threatened under the ESA throughout its range. Critical habitat for this species was not defined at the time of listing.

Manta rays are large bodied, planktivorous rays, considered part of the Mobulidae subfamily that appears to have diverged from Rhinoptera around 30 million years ago (Poortvliet et al. 2015). The current net productivity of M. birostris is unknown due to the imprecision or lack of available abundance estimates or indices. Fecundity, however, is extremely low, with one pup per litter and a reproductive periodicity of 1–2 years. According to the Final Rule, the primary factor responsible for the decline of the giant manta ray is overutilization for commercial purposes.

Giant manta rays are both targeted and caught as bycatch in a number of global fisheries throughout their range. Estimated take of giant manta rays, particularly in many portions of the Indo-Pacific, frequently exceeds numbers of observed individuals in those areas, and is accompanied by observed declines in sightings and landings of the species. Efforts to address overutilization of the species through regulatory measures appear inadequate, with evidence of targeted fishing of the species despite prohibitions (Indo-Pacific; Eastern Pacific) and only one regional measure to address bycatch issues, with uncertain effectiveness (Eastern Pacific). Additionally, given the migratory and pelagic behavior, national protections for the species are less likely to adequately protect the species from fisheries-related mortality. Giant manta rays are not confined by national boundaries and may, for example, lose certain protections as they conduct seasonal migrations or even as they move around to feed if they cross particular national jurisdictional boundaries (e.g., between the Maldives and Sri Lanka or India), move outside of established Marine Protected Areas, or enter into high seas. While the species recently has been added to CITES Appendix II (added in March 2013 with a delayed effectiveness of September 2014), which may curb targeted fishing as countries must ensure that manta ray products are legally obtained and trade is sustainable, the species is still likely to be caught as bycatch in the industrial fisheries and targeted by artisanal fisheries for domestic consumption.

Other threats to the giant manta ray that potentially contribute to long-term risk of the species include (micro) plastic ingestion rates, increased parasitic loads as a result of climate change effects, and potential disruption of important life history functions as a result of increased tourism; however, due to the significant data gaps, the likelihood and impact of these threats on the status of the species is highly uncertain.

3.6 Oceanic Whitetip Shark (*Carcharhinus longimanus*)

The oceanic whitetip shark (*Carcharhinus longimanus*) was listed as threatened under the Endangered Species Act on January 30, 2018 (83 FR 4153). NMFS determined that because oceanic whitetip sharks can be found worldwide, with no present indication of a range contraction, the ESA listing would apply to the global oceanic whitetip shark population. The oceanic whitetip shark is distributed worldwide in epipelagic tropical and subtropical waters between 30˚ North latitude and 35˚ South latitude (Baum et al., 2006). Oceanic whitetips also occur throughout the Western and Central Pacific Ocean, including China, Taiwan, the Philippines, New Caledonia, Australia (southern Australian coast), Hawaiian Islands south to Samoa Islands, Tahiti and Tuamotu Archipelago and west to the Galapagos Islands (Compagno 1984). The oceanic whitetip shark is a highly migratory species of shark that is usually found offshore in the open ocean, on the outer continental shelf, or around oceanic islands in deep water, occurring from the surface to at least 152 meters (m) depth. Although the oceanic whitetip can be found in decreasing numbers out to latitudes of 30˚ N and 35˚ S, with abundance decreasing with greater proximity to continental shelves, it has a clear preference for open ocean waters between 10˚ S and 10˚ N (Backus et al., 1956; Strasburg 1958; Compagno 1984; Bonfil et al., 2008). The species can be found in waters between 15˚C and 28 C, but it exhibits a strong preference for the surface mixed layer in water with temperatures above 20 ˚C, and is considered a surface-dwelling shark.

Oceanic whitetip sharks are high trophic-level predators in open ocean ecosystems feeding mainly on teleosts and cephalopods (Backus et al., 1956; Bonfil et al., 2008), but studies have also reported that they consume sea birds, marine mammals, other sharks and rays, molluscs, crustaceans, and even garbage (Compagno 1984; Corte´s 1999). The reproductive cycle is thought to be biennial, giving birth on alternate years, after a lengthy 10–12 month gestation period. The number of pups in a litter ranges from 1 to 14 (6 pups on average), and a positive correlation between female size and number of pups per litter has been observed, with larger sharks producing more offspring (Compagno 1984; Seki et al., 1998; Bonfil et al., 2008; IOTC 2015a). Age and length of maturity estimates are slightly different depending on geographic location. In the North Pacific, there are two different estimates for age and length of maturity. Seki et al., (1998) estimated that females reach sexual maturity at approximately 168–196 cm total length (TL), and males at 175–189 cm TL, which corresponds to ages of 4 and 5 years, respectively (Seki et al., 1998). However, more recently Joung et al. (2016) determined a later age of maturity in the North Pacific, with females reaching maturity at 190 cm TL (approximately 8.5–8.8 years) and males reaching maturity at 172 cm TL (approximately 6.8–8.9 years old).

The most significant threat to the continued existence of the oceanic whitetip shark in the foreseeable future is ongoing and significantly high rates of fishing mortality driven by demands of the international trade in shark fins and meat, as well as impacts related to incidental bycatch and illegal, unreported, and unregulated fishing. In addition to declines in oceanic whitetip catches throughout its range, there is also evidence of declining average size over time in some areas, which is particularly concerning given evidence that litter size is potentially correlated with maternal length. With such extensive declines in the species' global abundance and the ongoing threat of overutilization, the species' slow growth and relatively low fecundity may limit its ability for compensation. Related to this, the low genetic diversity of oceanic whitetip is also cause for concern and a viable risk over the foreseeable future for this species.

3.7 Current Species Baseline, Trends

Green sea turtle populations have declined dramatically throughout the Pacific and continue to decline, with the exception of populations in the Hawaiian Islands. Harvest of green sea turtles for their meat, shells, and eggs has been a major factor in past declines of green turtles, and continues to be a major threat globally (Humber et al. 2014). Despite increasing levels of protection low level poaching likely occurs in Hawaii. Habitat degradation and loss from coastal development, pollution, and global climate change are also serious threats to green sea turtles. Disease is also a significant threat to many green sea turtle populations. An often fatal tumor affliction, fibropapillomatosis, persists in the Hawaiian green turtle population. Fisheries interactions and vessel collisions are also important threats in some areas (NMFS and USFWS 1998a; NMFS and USFWS 2015).

Green sea turtles primarily nest in the Northwestern Hawaiian Islands. Basking Green Sea Turtles are a regular occurrence on beaches and shorelines of Oahu's North Shore.

Hawksbill sea turtle populations have also declined dramatically throughout the Pacific and almost all nesting populations continue to decline. As with the green sea turtle, continued harvest by humans is considered a serious threat to their recovery. Adults and eggs are vulnerable to hunters who take them from nesting beaches in one location, and those same adults are again hunted at their nearshore feeding areas. Whereas greens are taken primarily for food, adult hawksbills are taken primarily for their shells. Hawksbills are not regularly eaten, probably due to their occasional toxicity and poor taste. However their eggs are readily consumed. Habitat degradation and loss from coastal development, nest predation, pollution, and global climate change are also serious threats to hawksbill sea turtles. Fisheries interactions and vessel collisions are also important threats in some areas (NMFS and USFWS 1998b; NMFS and USFWS 2013).

Hawaiian monk seal beach counts of juveniles, sub-adults, and adults estimate a decline of 66% between the years 1958 and 2006. The 2014 estimate of the total population size was 1153 (Caretta et al., 2014). Due to low juvenile survival and an aging breeding female population, insufficient replacement of breeding females is expected to lead to declining birth rates over time. Significant threats that face this species include: 1) Very low survival of juveniles and sub- adults in the NWHI due to starvation; 2) mortality due to entanglement in marine debris; 3) predation of juveniles by sharks; 4) loss of haul-out and pupping beaches due to erosion in the NWHI; and 5) limited available habitat in the MHI that might support relocation away from the deteriorating habitats of the NWHI, primarily due to development and human interactions, which include recreational fishery interactions, mother-pup disturbance on popular beaches, and exposure to disease (NMFS 2007).

Hawaiian false killer whales insular population surveys estimate about 120 individuals. Further evidence suggests that this population has declined in size over the past 10-20 years. While the exact causes for the decline are not specifically known, multiple factors threaten the population. Although the insular population of Hawaiian false killer whales is found primarily in waters that are excluded from longline fisheries (less than 75 km from the shores of the main islands), fin disfigurements suggest that some members have experienced interactions with the longline fisheries. The population is also subject to unregulated near-shore and "short" longline fisheries, and recent anecdotal information suggests that they may experience deliberate shootings from local fisherman. These and other fisheries are also likely contributing to a decline in the size or number of the primary prey species for false killer whales, which are large pelagic fishes including mahi mahi, yellowfin tuna and bigeye tuna. Hawaiian false killer whales may be further threatened by ocean acidification and acoustic impacts. Recent toxicological research has documented the presence of persistent organic pollutants in each of 9 tissue samples tested from the insular Hawaiian population of false killer whales. One third of these samples showed high enough concentrations to suggest that these individuals may suffer from health effects due to the level of pollutants. Finally, small populations are inherently at risk for extinction from environmentally stochastic events. The cumulative effects of these risks combined with the population's small size and declining numbers qualifies the insular population of Hawaiian false killer whales as an endangered species under the U. S. Endangered

Species Act (Fallon, 2009). Beaches and shorelines along Oahu's North Shore is a common resting and haul out spot for Hawaiian Monk Seals.

Giant manta ray abundance is uncertain throughout its range, the best available information indicates that the species has experienced population declines of potentially significant magnitude within areas of the Indo-Pacific and eastern Pacific portions of its range, primarily due to fisheries-related mortality.

Oceanic whitetip sharks are not generally targeted, but are frequently caught as bycatch in many global fisheries, including pelagic longline (PLL) fisheries targeting tuna and swordfish, purse seine, gillnet, and artisanal fisheries. Oceanic whitetip sharks are also a preferred species for their large, morphologically distinct fins, as they obtain a high price in the Asian fin market, and thus they are valuable as incidental catch for the international shark fin trade. Across the Pacific Ocean, several lines of evidence indicate significant and ongoing population declines of the oceanic whitetip shark. The median estimate of oceanic whitetip biomass in the Western Central Pacific as of 2010 was 7,295 tons (Rice and Harley 2012), which would be equivalent to a population of roughly 200,000 individuals (FAO 2012).

4.0 EFFECTS OF THE ACTION

The primary impacts from this project include potential direct effects to marine and terrestrial listed species via in-water and nearshore construction using heavy equipment and increasing human presence and indirect effects from noise and turbidity.

Potential vectors of impact include:

- Collision with vessels;
- Direct physical impact;
- Disturbance from human activity and equipment operation;
- Exposure to elevated noise levels;
- Exposure to elevated turbidity and sedimentation;
- Exposure to wastes and discharges; and
- Loss of forage habitat.

A discussion of each of these vectors of impact is described below in relation to the temporal nature of the effect to listed species.

4.1 Short-Term (Temporary) Effects to Listed Species

The Haleiwa small boat harbor maintenance dredging and beach restoration project has the potential to impact green sea turtle, hawksbill sea turtle, and Hawaiian monk seal within the project's action area by temporarily decreasing water quality as a result of the suspension of sediments and increased turbidity associated with the dredging and beach restoration activities. In most cases, however, the species are likely to avoid the construction activities and the turbid waters. Furthermore, the HSBH is a highly trafficked and routinely used harbor for commercial and private use that exposes marine species to several manmade perturbations, including prop-wash from motorized vessels. As a result of these existing (without-project) conditions, many of the species that utilize HSBH are believed to have acclimated to such perturbations or simply avoid the harbor area.

Other likely short-term impacts would include temporary modifications to the water column and temporary physical disturbances to the submerged lands in the immediate areas where the work would take place. However, based on the nature of the proposed work and the proposed BMPs, no substantial changes in water depths, salinity and temperature changes to the water column would be expected post-construction. There would also be short-term effects related to elevated ambient noise levels during certain construction activities, particularly those associated with the use of heavy construction equipment. The acoustic effects are discussed in further detail below.

The following sub-sections consider and evaluate the potential direct and indirect impacts of the proposed project on green sea turtle, hawksbill sea turtle, and Hawaiian monk seal that may periodically utilize the marine waters within the action area for one or more of their life requisites. Each sub-section addresses the individual stressors or potential vectors of impact based on the proposed construction methods, proposed avoidance and minimization measures, the biology and life history of the species, and the interaction between the habitats used by these species and the action area. Some or all of the components of the proposed construction could reasonably be expected to have the potential to directly or indirectly affect green sea turtle, hawksbill sea turtle, and Hawaiian monk seal through the following potential impacts:

- Disturbance from human activity and equipment operation, including construction-related noise;
- Exposure to elevated turbidity; and
- Exposure to wastes and discharges

4.1.2 Disturbance from human activity and equipment operation, including construction-related noise

Elevated Ambient Noise Levels

While the majority of their life cycle is spent in marine waters, Hawaiian monk seals breed, nurse and frequently haul-out along sandy and rocky shorelines. Similarly, greensea turtles and hawksbill sea turtles nest on sandy beaches, with juveniles returning as adults to nest on the same beaches where they hatched. Sea turtles also forage nearshore. Because the proposed action would involve the use of dredging equipment, the temporary increase in ambient noise levels in and around the action area may place sea turtles and Hawaiian monk seals at risk of stress caused by construction noise.

The effects of exposure to sound vary with the frequency, intensity, and duration ofthe sound source, and the hearing characteristics of the affected animal. Effects may include: (1) physical injury and/or permanent hearing damage, also referred to as permanent threshold shift (PTS); and (2) behavioral impacts through temporarily reduced sensitivity also referred to as temporary threshold shifts (TTS), temporarily masked communications or acoustic environmental cues, and modified behavior suchas attraction and areal avoidance.

The effects thresholds currently used by NMFS are marine mammal specific and based on levels of harassment as defined by the Marine Mammal Protection Act (MMPA). For exposure to sounds in water, ≥ 180 dB and ≥ 190 dB are the thresholds for Level A harassment (i.e. injury and/or PTS) for cetaceans and pinnipeds, respectively. The thresholds for Level B harassment for on all marine mammals in theform of TTS and other behavioral impacts are ≥ 160 dB for impulsive noises and ≥ 120dB for continuous noises.

Sound can be measured and quantified in several ways, but the logarithmic decibel (dB) is the most commonly used unit of measure, and sound pressure level (SPL) is a common and convenient term used to describe intensity. In water, sound pressure is typically referenced to a baseline of 1 micropascal (re 1 µPa), vice the 20 µPa baseline used for in-air measurements. Consequently, 26 dB must be added to an in-air measurement to convert to an appropriate in-water value for an identical acoustic source (Bradley and Stern 2008). To assess the potential impact of a sound on marine resources, NMFS often assesses impacts based on the root-mean-square (dB_{rms}) of anacoustic pulse. This is the portion of a pulse that contains 90% of the sound pressure. For brevity, all further references to SPL assume dB_{rms} re 1 µPa, unless specified differently.

Transmission loss (attenuation of sound intensity over distance) varies according to several factors in water, such as water depth, bottom type, sea surface condition, salinity, and the amount of suspended solids in the water. Sound energy dissipates through mechanisms such as spreading, scattering, and absorption (Bradley and Stern 2008). Spreading refers to the apparent decrease in sound energy at any given point on the wave front because the sound energy is spread across an increasing area as the wave front radiates outward from the source. In unbounded homogenous water, sound spreads out spherically, losing as much as 7 dB with each doubling of range. Toward the other end of the spectrum, sound expands cylindrically when vertically bounded such as by the surface and substrate, losing only about 3 dB with each doubling of range. Scattering refers to the sound energy that leaves the wave front when it “bounces” off of a surface or particles in the water. Absorption refers to the energy that is lost through conversion to heat due to fiction. Irregular substrates, rough surface waters, and particulates in the water column increase scattering loss, while soft substrates, such as mud and silt increase absorption loss. Sound typically dissipates more rapidly in shallow, turbid waters over soft substrates.

Accurately predicting received noise levels at a given range (isopleth) requires complex equations and detailed information that is rarely available. Typically, predictions are made by estimating spreading loss based on the equations RL = SL – 20LogR, for spherical spreading, and RL = SL – 10LogR for cylindrical spreading (RL =received level; SL = source level; and R = range in meters). Actual spreading loss is thought to be somewhere between the two, with absorption and scattering increasing the loss. In the absence of site specific transmission loss data, RL = SL – 15LogR is often used to estimate the RLs for actions in the relatively shallow nearshore marine environments. Based on the expected source level of 190 dB and 20LogR equation, the 160 dB isopleth is expected to occur at 32 meters from the source.

Dredging and sand placement would involve work using heavy construction equipment. However, green sea turtles and many other marine mammals typically avoid human activity. Thus, the most likely effect of this interaction would be moderate level stress with a moderate to high energy avoidance behavior leading to the animal rapidly vacating the project action area without injury. The avoidance and minimization measures listed in Section 2.3 of this BE require the contractor to conduct visual surveys for the presence of federally-protected marine species before commencing work and to postpone or halt operations if a species is observed within or near the project action area. These measures would considerably reduce the likelihood of this negative interaction ever occurring.

For these reasons, the Corps has determined that human-induced noise disturbances associated with the proposed construction activities would be infrequent and non-injurious, resulting in insignificant and discountable effects on the Hawaiian monk seal, hawksbill sea turtle, and green sea turtle.

Direct Physical Impact

Operation of heavy equipment in the harbor area has the potential to impact sea turtles and Hawaiian monk seals through direct collision or physical impact with the animal. To minimize the potential for this impact, it is proposed to have a competent individual conduct surveys throughout the project area each day before the start of any scheduled beach work for the presence of sea turtles and/or Hawaiian monk seals within the potential area of impact. If any protected species are observed within the work area, no work may start (or if work has already started, immediately cease all operations) within 50 yards of the species. Work could not resume until the observed species has left the work area on its own accord.

In consideration of the proposed avoidance and minimization measures, the Corpshas determined any direct physical impact to the species would be avoided and that other potential human-induced indirect disturbances resulting from the proposed construction activities would be infrequent and non-injurious, resulting in discountable effects to green sea turtle, hawksbill sea turtle, and Hawaiian monk seal.

4.1.2 Exposure to elevated turbidity

Given that sea turtles and marine mammals breathe air instead of water, increased turbidity should not adversely affect their respiration or other biological functions. Although these animals may be found in turbid waters, it is likely that they may avoid dense turbidity plumes in favor of clearer water. However, the quantity and/or quality of some prey species that sea turtles and monk seals forage upon could be adversely affected by turbidity and other pollutants introduced to the water column.

Based on the information above, it is expected the likelihood for impacts due to turbidity plumes would be low and therefore, the risk from exposure to elevated levels of suspended sediments in the water column would be correspondingly low. The Corps has determined this potential effect would be non-injurious and would result in an insignificant effect on the marine species of concern.

4.1.3 Exposure to wastes and discharges

The action area includes a stretch of beachfront and nearby in-water areas. Therefore, it is reasonable to expect an increase in the potential for debris (such as plastic bags, bottles, trash) and pollutants (such as oil) to enter the marine environment and possibly be ingested by Hawaiian monk seals, hawksbill sea turtles, and green sea turtles, or if large enough, entangle the species. If unintentional discharges of waste were to occur and the species were to ingest or otherwise be exposed to the debris, the likely result would be digestive blockage, suffocation or exposure of harmful pollutants by the species of concern and/or by prey species that the sea turtles and monk seals depend on for foraging. Depending on the chemicals and their concentration, exposure to certain wastes (e.g., fuel oils, gasoline, lubricants, hydraulic fluids) could result in a range of effects, from avoidance of an area to fatality. However, it is anticipated that the appropriate water quality BMPs would avoid and/or minimize construction-related debris and uncontrolled spills of harmful hydrocarbon-based chemicals from entering the nearshore tidal waters that could harm the protected species. Furthermore, Federal and state regulations prohibit the intentional discharge of toxic wastes and plastics into the marine environment, which further lessens the potential for direct exposure to harmful wastes.

Based on the information above, including the proposed BMPs, it is anticipated that discharges of waste and hazardous spills are unlikely to occur, but if they were to occur they would be incidental, small in scale, and quickly contained and cleaned up. In addition, prior to work commencing, the contractor would be required to survey the area to determine whether one or more of the species of concern is present. If a species is present, then work would not commence until the species vacates the area on its own accord. Therefore, the Corps has determined that exposure to construction wastes and discharges that may result from this proposed action would result in an insignificant and discountable effect on Hawaiian monk seal, hawksbill sea turtle, and green sea turtle.

4.2 Long-Term (Permanent) Effects to Listed Species

The proposed action would create additional beach habitat suitable for resting, haul out or basking, providing beneficial long-term effects to sea turtles and monk seals. Green Sea Turtles are regularly observed in the nearshore environment, swimming and foraging, and less regularly on the rocky intertidal shoreline. Hawaiian Monk Seals are a common occurrence hauled out on Oahu's North Shore beaches.

The creation of 4.2 acres of sandy beach that is expected to last approximately 26 years would provide long term benefit to listed species. However, the Corps acknowledges that resting sea turtles and monk seals are likely to attract and intrigue human observers. Creating terrestrial habitat to be used by listed species could increase potential for human interaction, including take. The Corps understands that the Services do everything they can to reduce this risk, in particular, by maintaining active volunteer and response teams that readily respond to hauled out turtles and seals to create a safe barrier and educate onlookers.

The Corps anticipates the potential for interaction at the restored beach fronting HBP within the action area would be consistent with interactions that occur at other North Shore Oahu beaches. Accordingly, the long-term benefit of restoring sandy beach habitat and preventing erosion of terrigenous sediments into the marine environment are expected to outweigh the potential for adverse human interaction, given predominate common knowledge to avoid interaction with listed species in the water and on land. Any long-term adverse impacts to green sea turtle, hawksbill sea turtle, and Hawaiian monk seal would be insignificant and discountable.

4.3 Effects on Designated Critical Habitat for Hawaiian Monk Seal

Marine waters within the action area that support adequate prey quality and quantity for juvenile and adult monk seal foraging could be adversely affected by the proposed action. Inshore, benthic and offshore teleosts, cephalopods, and crustaceans are commonly described as monk seal prey items. Habitat types that are regularly used by monk seals for foraging include the sand terraces, talus slopes, submerged reefs and banks, nearby seamounts, barrier reefs, and slopes of reefs and islands; such habitat types do not occur within the action area. Monk seals focus foraging in bottom habitats on bottom-associated prey species, with most foraging occurring in waters between 0 to 200 meters in depth. Water quality, substrate composition and available habitat are elements that are considered in determining whether an area might support growth and recruitment of bottom-associated prey species to an extent that monk seal populations are able to successfully forage.

The ESA action area encompasses an active marina and multiple recreational beaches. It is expected that monk seals and other wildlife would typically avoid these areas. Minimal impacts are expected to the marine environment as a result of dredging and beach restoration activities. Based on the existing project conditions, the minor area of physical impact to critical habitat, and the absence of constituent elements necessary for juvenile and adult monk seal foraging habitat within the action area, the Corps has determined the direct impacts to monk seal critical habitat would not diminish the value of critical habitat for both the survival and recovery of listed species. Additionally, the construction of 4.2 acres of sandy beach would create habitat suitable for use by Hawaiian Monk Seal for resting and haul out.

4.4 Effects on Designated Habitat for False Insular Killer Whale

The proposed action involves transport of dredged material for the purpose of disposal at the USEPA-designated SOODMDS. This portion of the action area intersects False Insular Killer Whale critical Habitat i.e. waters from the 45-m depth contour to the 3,200-m depth contour around the MHI.

Designated critical habitat for the False Insular Killer Whale will not be adversely modified by the proposed action involving normal vessel maneuvering and transit in open ocean waters. Vessel traffic through this area resulting from the proposed action will be negligibly add to current vessel traffic and will be limited to only during the construction period with no long-term or permanent impacts. It is anticipated that the proposed action will not reduce space for free movement by this species and vessel strikes are unlikely given the slow speed for transit. Additionally the Corps does not anticipate the proposed action involving vessel transit to the ODMDS will noticeably impact prey species, water quality, or sound levels within the critical habitat during construction.

5.0 CONCLUSIONS

5.1 Determinations of Effect Under Section 7 of the ESA

While there is potential for the species listed below occur within the action area, based on the proposed avoidance and minimization measures that have been incorporated into the proposed project, the Corps has determined that the effects to the species and critical habitat will be insignificant and discountable. Additionally the proposed action would not alter or otherwise diminish the value of critical habitat for both the survival and recovery of a listed species. Accordingly, pursuant to Section 7(a)(2) of the ESA the Corps has determined the proposed project may affect, but would not likely adversely affect:

- Green Sea Turtle (*Chelonia mydas*) Central North Pacific DPS – Hawaii, threatened
- Hawksbill Sea Turtle (*Eretmochelys imbricate*), endangered
- Hawaiian Monk Seal (*Monachus schauinslandi*), endangered; and designated critical habitat
- Hawaiian Insular False Killer Whale (*Pseudora crassidens*), endangered; and designated critical habitat
- Giant Manta Ray (*Manta birostris*), proposed threatened
- Oceanic Whitetip shark (*Carcharhinus longimanus*), proposed threatened

And would not destroy or otherwise adversely modify designated critical habitat for the Hawaiian Monk Seal and Hawaiian Insular False Killer Whale.

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November 1, 2021

Ms. Rhiannon Kucharski
Chief, Civil and Public Works Branch
U.S. Army Corps of Engineers
Honolulu District
Fort Shafter, Hawaii, 96858-5440

RE: Request for Informal ESA Consultation on the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration, at Haleiwa, Oahu, Hawaii (Consultation Number, PIRO-2021- 02663)

Dear Ms. Kucharski:

On September 3, 2021, NOAA's National Marine Fisheries Service (NMFS) received your written request for informal consultation on the U.S. Army Corps of Engineers' (Corps) proposed action to conduct maintenance dredging at the Haleiwa Boat Harbor, and place some of the dredge spoils onto nearshore areas nearby to replenish the beach, which has been depleted over several decades. The proposed action affects the endangered or threatened species under our jurisdiction, as identified below in Table 1. We reviewed your written request and information in your September 30 email, and initiated consultation on September 3, 2021.

This response to your request was prepared by us 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 also 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. A complete record of this consultation is on file at the Pacific Island Regional Office, Honolulu, Hawaii.

Proposed Action

The purpose of the action is to maintain a passable navigable channel at the boat harbor, and to examine the feasibility and environmental effects of implementing Beneficial Use of Dredged Material by placing dredged material onto eroded beaches. The Corps proposes to dredge up to 24,638 cubic yards of sediments from the Haleiwa Small Boat Harbor. The Corps will transport most of it to a beach 800-2000 feet north of the boat harbor to construct the Haleiwa Beach Shore Protection Project (HBSPP). Approximately 2,000 cubic yards of sediment is unsuitable for beach nourishment and will be deposited at the South Oahu Ocean Dredge Material Disposal Site in compliance with our letter of concurrence that it is not likely to adversely affect 15 species and two critical habitats (NMFS Number PIRO-2020-02769, 27 Nov 2020). The proposed action is authorized and funded through the Public Law 84-99 program.

The Corps will use a clam shell to excavate material from the proposed areas and load scows for transportation. The Corps will unload the dredge spoils directly to the beach at the HBSPP, where they will grade them to a typical cross section by an excavator. To transport the material to shallow areas adjacent to the HBSPP, the Corps will build a temporary barge access zone.

To avoid and minimize impacts to listed species, the Corps listed measures in their BE to reduce the proposed action's exposure and severity to species and environment. These measures include but are not limited to reduced vessel speeds, observers and 'shut down' procedures, and hazardous waste management. We discuss how these best management practices (BMPs) avoid or minimize exposure to or the severity of effects to listed species in the Analysis of Effects section of this letter. The Corps will only work during daylight hours and estimates the action will take up to a year to complete.

Action Area

The action area is defined by regulation as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). The action area includes all other areas potentially affected by the action physically, chemically, or biologically. Therefore, we determine the action area by vessel traffic, turbidity plumes from dredging or sand placement, noise, and other general construction disturbance. It also includes transit routes to the South Oahu Ocean Dredged Material Disposal Site (ODMDS).

For this action, the most appropriate measure of the full extent relies on the distance noise is propagated by construction activities. We estimate noise from dredging extends to 933.3 meters away from every location including the harbor, the HBSPP, and the temporary barge access zone adjacent to the HBSPP. We estimate the noise from the scow will extend 1,000 meters. Thus, the action area also includes the locations and paths of the scow extending 1,000 meters during the action and transport between the harbor and HBSPP, and while transporting dredge materials from Haleiwa to the South Oahu ODMDS.

Listed Species in the Action Area

The ESA-listed species under our 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 NOAA Fisheries' web site (https://www.fisheries.noaa.gov/species-directory/threatened-endangered).

Table 1. Common name, scientific name, ESA status, effective listing date, critical habitat designation, and recovery plans, with Federal Register reference for ESA-listed species considered in this consultation.

Species/ common name	ESA Status	Effective Listing Date/ FR Notice	Critical Habitat	Recovery Plan
Chelonia mydas Central North Pacific Green Sea Turtle	Threatened	05/06/2016 81 FR 20057		
Eretmochelys imbricata Hawksbill Sea Turtle	Endangered	06/03/1970 35 FR 8491		5/22/98 63 FR 28359
Neomonachus schauinslandi Hawaiian Monk Seal	Endangered	11/23/1976 41 FR 51612	9/21/2015 (revised) 80 FR 50925	8/22/07 72 FR 46966
Pseudorca crassidens False Killer Whale Main Hawaiian Island Insular[2]	Endangered	12/28/2012 77 FR 70915	8/23/2018 83 FR 35062	
Carcharhinus longimanus Oceanic Whitetip Shark	Threatened	03/01/2018 83 FR 4153		
Manta birostris Giant Manta Ray	Threatened	02/21/2018 83 FR 2916		

Critical Habitat in the Action Area

In designated areas of the Main Hawaiian Islands (MHI), critical habitat for monk seals includes the marine environment with a seaward boundary that extends from the 200-m depth contour line (relative to mean lower low water), including the seafloor and all subsurface waters and marine habitat within 10-m of the seafloor, through the water's edge 5-m into the terrestrial environment. Detailed information on Hawaiian monk seal critical habitat can be found at https://www.fisheries.noaa.gov/action/critical-habitat-hawaiian-monk-seals.

The essential features for the conservation of the Hawaiian monk seal with their physical and biological features are the following:

1. Terrestrial areas preferred by monk seals for pupping and nursing, with adjacent shallow, sheltered aquatic areas;
2. Marine areas from 0 to 200 m in depth with water quality and substrate that support adequate prey quality and quantity for juvenile and adult monk seal foraging; and
3. Significant areas used by monk seals for hauling out, resting or molting.

Critical habitat for MHI insular false killer whales (IFKW) includes the geographic area of the 45-m depth contour to the 3200-m depth contour in waters that surround the MHI from Niihau east to the Island of Hawaii. Critical habitat for the MHI IFKW consists of one essential feature comprised of four characteristics:

1. Space for movement and use within shelf and slope habitat
2. Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth;
3. Waters free of pollutants of a type and amount harmful to MHI IFKWs; and
4. Sound levels that would not significantly impair false killer whales' use or occupancy.

Detailed information on MHI IFKW critical habitat can be found at http://www.nmfs.noaa.gov/pr/species/mammals/whales/false-killer-whale.html.

Analysis of Effects/Exposure and Response

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat caused by the proposed action, including the consequences of other activities caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02).

In order to determine that a proposed action is not likely to adversely affect ESA-listed species, we must find that the effects of the proposed action are expected to be discountable, insignificant, or completely beneficial. As defined in the joint USFWS-NMFS Endangered Species Consultation Handbook (USFWS and NMFS 1998), beneficial effects are contemporaneous positive effects without any adverse effects to the species. Discountable effects are those extremely unlikely to occur. When the terms "discountable" or "discountable effects" appear in this document, they refer to potential effects that are found to support a "not likely to adversely affect" conclusion because they are extremely unlikely to occur. The use of these terms should not be interpreted as having any meaning inconsistent with our regulatory definition of "effects of the action."

Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. "Take" is defined by the ESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. 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" (Wieting 2016). 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 we have issued regulations prohibiting take under section 4(d) of the ESA.

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 biological evaluation. Only activities that have the potential to adversely affect ESA-listed species are discussed here.

Despite the Corps' use of BMPs, we identified the following stressors remain, and have the potential to affect listed marine species:

- Direct physical contact
- Collision with vessels
- Hazardous chemicals
- Disturbance
- Elevated sound levels
- Elevated turbidity and sedimentation
- Loss of forage habitat

Effects are discountable if exposure is extremely unlikely to occur. For this reason, we first determine if stressors will, or will not be expected to co-occur with individuals from the listed species. For stressors where exposure is not discountable, we discuss the significance of the species' response.

<u>Species Exposure</u>

Direct physical contact

The potential for any harm to ESA-listed individuals from contact with clam shell buckets, excavators, or other equipment is remote. The Corps will monitor for individuals, shut down work if any approach the work zone, and implement other best management practices to ensure large marine animals, including the ones listed in Table 1 are not in the area during construction. The Corps will monitor the area prior to dredging and shut down work if they observe sea turtles with 50 feet of the activities, or if they observe Hawaiian monk seals within 100 feet. Because this will avoid exposure, we are reasonably certain the probability of direct contact to ESA-listed individuals is extremely unlikely and therefore discountable.

Collision with vessels

<u>Sea turtles</u>: Kelly (2020) documented vessel collisions with sea turtles resulting in lethal and sub-lethal injuries. Sea turtles may be in the action area, and could potentially be struck by transiting vessels during the proposed activities. NMFS (2008) estimated 37.5 vessel strikes of sea turtles per year from an estimated 577,872 trips per year from vessels of all sizes in Hawaii. More recently, we estimated as many as 200 green sea turtle strikes annually in Hawaii (Kelly 2020). If these turtle strikes are evenly distributed around the islands, the probability of a green sea turtle strike from any one vessel trip is extremely low (on average 0.035%, calculated by dividing the most recent strike estimate of 200 per year by the best estimate of all vessel transits of 577,872 per year). However, green sea turtle strikes are not evenly distributed throughout the islands. They are concentrated in areas with high sea turtle density and high small vessel activity (e.g., near small boat harbors and boat launches), such as Kāneʻohe Bay and Pearl Harbor on Oʻahu (Kelly 2020).

Green sea turtles are most vulnerable to small vessels (<15 m), travelling at fast rates (>10 knots) (Kelly 2020). Increased vessel speed decreases the ability of sea turtles to recognize a moving vessel in time to dive and escape being hit, as well as the vessel operator's ability to recognize the turtle in time to avoid it. The action area is not in a location identified by Kelly (2020) as a hot spot for green sea turtle strikes, but it is an area with significant overlap of high density boating activity and sea turtle habitat. However, the Corps will be using larger and slower vessels than those known to cause turtle strikes (restricted to 5 knots in the harbor area but will often be moving much slower). Furthermore, vessels in the proposed action will be using other BMPs to reduce vessel strike probability of ESA-listed species, including the use of observers and shut down when listed species are observed. Therefore, the probability of a green sea turtle strike is likely less than the overall rate calculated above. Thus, we are reasonably certain the probability of exposure of any green sea turtle to vessel strikes from this action is extremely unlikely, and therefore discountable.

Hawksbill sea turtles likely have a much lower rate of striking than green sea turtles. This is likely mostly due to their low abundance numbers. The rate is also likely lower due to hawksbill sea turtle's preference for deeper offshore waters (Kelly 2020), although they have been documented in shallow coral reef habitats and in harbors (HHTN 2018). There were only four documented vessel strikes of hawksbill sea turtles between 1984 and 2020 in Hawaii (Kelly 2020). Because the probability of a project-related vessel striking a hawksbill sea turtle is even lower than that of a green sea turtle, and because of the BMPs included in this proposed action, we are reasonably certain the probability of exposure of any individual is extremely unlikely, and therefore discountable.

Seals: Hawaiian Monk Seals are highly agile and vessel strikes with monk seals are infrequent (Carretta et al. 2019). According to PIFSC's database there have been only four verified vessel strikes of Hawaiian monk seals between 1981 and 2016 (John Henderson, PIFSC 5/4/17). Considering the BMPs included with this action (such as a dedicated observer and speed restrictions), the rarity of documented vessel strikes, and the low abundance and widely scattered nature of monk seals in the action area; we are reasonably certain the likelihood of exposure of any monk seal to vessel strikes from this proposed action is extremely unlikely, and therefore discountable.

<u>Whales</u>: Whales surface to breathe, with calves surfacing more regularly than adults. While at the surface, a whale is at risk of being struck by a vessel. In a study by Lammers et al. (2003), 22 whale/vessel incidents were recorded between 1975-2003, with 14 of those occurring during the years from 1994-2003. The vast majority (17) of the vessel strikes were from vessels traveling at speeds in excess of 15 knots, and nearly all of them occurred in close proximity to the coastline of the main four Hawaiian Islands Lammers et al. (2003). Vessels used for the proposed action will be traveling at speeds less than 10 knots when near marine mammals, they will use dedicated lookouts, limiting the already extremely low probability of a strike. Based on adherence to BMPs, the collision risks from the references cited above, and the low abundance and widely scattered nature of whales in the action area; the likelihood of an individual from the whale species listed in Table 1 being struck during the proposed action is extremely unlikely, and therefore discountable.

False killer whales commonly travel in pods and are known to approach vessels and ride the bows of vessels. We have little to no data on vessel strikes on false killer whales, but false killer whales are much more agile than baleen whales and few vessel strikes on false killer whales have been reported. We expect the probability of vessel strikes of false killer whales to be lower than reported in Lammers et al. (2013) for other whale species. False killer whales typically prefer waters deeper than 1,005 meters (3,300 feet). Therefore, only the vessel trips to the South Oahu ODMDS spatially overlap with false killer whales. Considering the low probability of vessel strikes, the rarity of listed individuals in action areas, and that most project activity occurs close to shore, we are reasonably certain that the probability of insular false killer whales being struck by vessels associated with the proposed actions is extremely unlikely and therefore discountable.

Elasmobranchs: Because they spend little to no time near the surface, vessel collisions are not a threat to oceanic whitetip sharks or giant manta rays in the Hawaiian Islands. Therefore, we are reasonably certain the likelihood of a vessel strike on ESA-listed sharks and rays is extremely unlikely, and discountable.

Hazardous chemicals

The project may expose listed species to waste and discharge associated with heavy machinery and equipment nearshore for dredging and other activities. However, the Corps will used well-maintained equipment, which they will inspect prior to each day's activities to minimize accidental spills. The likelihood of a spill from a vessel or equipment during the duration of the action is extremely unlikely. In addition, the applicant will strictly adhere to the BMPs listed in the Corps' consultation request, including a spill contingency plan and conservation measures which include BMPs for fueling sites, hazardous waste management and disposal, spill kits and absorption pads on site, and recovery of spilled materials. This reduces the amount of contamination if a spill occurs by ensuring prompt containment and cleanup activities. Based on properly maintaining all vessels and equipment, and adherence to proposed BMPs, we are reasonably certain exposure to waste or discharge from the project activities on ESA-listed species is extremely unlikely and therefore discountable.

Species Response

Disturbance

The Corps could disturb listed species during any phase of the action where they could disturb listed animals in the nearshore or open ocean area. The species in Table 1 in the action area during construction may encounter humans or equipment during in-water dredging or other related activity. The Haleiwa Small Boat Harbor is a busy area with daily heavy vessel traffic. While dredging is not common in the harbor, any sea turtles or other animals present are likely habituated to anthropogenic activity, making them less sensitive to activities such as those proposed by the Corps. The Corps will survey the area for large animals, including all of the ESA-listed species prior to work, and will continually monitor the area during construction. Halting work when animals are within ranges describe in previous sections will minimize exposure and the severity of their response. Because of the Corps' BMPs, we are reasonably certain responses from disturbance will not reach the scale where harm or harassment occurs, and are therefore insignificant to listed species in Table 1.

Elevated sound levels

The proposed actions will introduce noise into the habitat of the listed species for a period of three months. Anthropogenic noise can affect listed species three ways: non-auditory damage (barotrauma) to gas-filled organs, hearing loss expressed in permanent threshold shift (PTS) or temporary threshold shift (TTS), and behavioral responses or changes. Noises generated from underwater construction will be too low to cause barotrauma or non-auditory injury. The sound generated from dredging, vessel engines, and other activities will be below the peak threshold for temporary threshold shift (181 dB_{SEL} or higher for all species in Table 1) and barotrauma/non-auditory injury (237 dB_{peak}). Some action-generated noises may be above the cumulative sound level thresholds for PTS and TTS. However, hearing loss could only occur if an individual is at a close distance for a long duration. Adherence to the BMPs for observing and shutting down will ensure such proximate exposure and duration of exposure will not occur.

All noises could elicit a behavioral response from Hawaiian monk seals and sea turtles. NMFS has suggested behavior response thresholds of 120 dB_{RMS} for continuous sounds and 160 dB_{RMS} for impulsive sounds for marine mammals, and 160 dB_{RMS} for all types of sounds for sea turtles (NMFS 2018). Noises generated from vessels could be louder than those respective thresholds, which could affect ESA-listed species in their zone of influence. According to the practical spreading model, the zone of influence could extend far from the source. However, the action area is within and near the Haleiwa Small Boat Harbor, which commonly has heavy vessel traffic by recreational and commercial vessels. Noise and disturbance is common in the action area and animals are less likely to respond to it if they have become habituated.

Reine et al. (2014) compiled data from several different types of sounds generated during dredging, including barge activities, and different types of dredging. Reine et al. (2014) presented data of mechanical backhoe sounds from engines that were recorded at 167 dB_{RMS} at 1m. Rock breaking from mechanical dredging is not anticipated during this action but would represent the loudest noises from this kind of dredging. Those sounds were recorded at 179.4 dB_{RMS} at 1m and 148.4 dB_{RMS} at 60m. We estimate the noise generated by dredging using measurements compiled in Reine et al. (2014) and estimated using our publically available sound calculator (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance, accessed 10/25/2021). Based on Reine et al. (2014), we estimate clam shell dredging to generate sounds as loud as 179.4 dB_{RMS} re: 1 μPa. The spreading model estimates dredging noise will attenuate to 120 dB (assumed ambient sound level) 933.3 meters away from the source. Vessels as large as scows are expected to generate sounds approximately 180 dB which results in a calculated action area that extends 1,000 meters from the scow during the action, and during transport of dredge materials from Haleiwa to the South Oahu ODMDS.

Although the NOAA acoustic threshold exists for behavioral responses, it is less understood or studied than hearing loss and non-acoustic injury. The sounds generated from project-related activities could be above thresholds for behavioral disturbance for all marine mammals (≥ 120 dB re 1 μPa) and sea turtles (≥ 160 dB re 1 μPa) for exposure to non-impulsive continuous in-water sounds (NMFS 2018). All species in Table 1 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. All species in Table 1are large and agile, and capable of swimming away safely from any disturbance that would harm them. Attraction to sounds are unusual but sometimes happen. With the BMPs in place, the Corps will avoid effects associated with attraction by halting work when any ESA-listed individual is observed respectively within 50 feet (turtles) and 100 feet (mammals) of the work area and will not restart until the animal is no longer observed. We expect behavioral changes in individuals exposed to sounds generated during construction will not subsequently reduce nutrition, growth, fitness, reproductive success or survival. Therefore, we are reasonably certain behavior responses from elevated sound exposure will not reach the scale where harm or harassment occur, and therefore are insignificant to listed species in Table 1.

Elevated turbidity and suspended sediments

The proposed action will cause elevated turbidity or sedimentation during dredging, creation and use of the barge access, sediment placement, and other construction activities. The Corps is proposing to use turbidity curtains during dredging which will minimize the amount of suspended sediments leaving the immediate work area and isolate it from ESA-listed individuals. Outside of the turbidity curtain, the area affected by turbid conditions is likely to be small, and the intensity of turbidity added to the ambient condition is likely to be low. However, turbid conditions are likely over the entire year during construction period. Being situated at the mouth of ‘Anahulu River, the action area is naturally turbid and extremely turbid after most rainfall events. Green sea turtle density is high in the action area as well, which could imply that the sea turtles in the action area appear unharmed or at least habituated to suspended sediments.

Hawaiian monk seals and sea turtles are the only ESA-listed species reasonably certain to be present near the turbidity-generating activities. They are highly mobile and capable of avoiding turbid areas, thus unlikely to be exposed to highly turbid water. Additionally, observers will alert work crews to halt work if listed animals are observed within 50 feet for sea turtles and 100 feet for Hawaiian monk seals of the construction area. While the likelihood of increased turbidity is high, the potential exposure of turtles and monk seals is low, and if exposed, the response of the sea turtles and monk seals will be within the range of normal behaviors (avoidance) and is not expected to limit feeding or resting behavior over the duration of the action. As such, the avoidance will not alter their fitness, or ability to grow and reproduce. Therefore, we are reasonably certain the response to turbidity from the project activities will not reach the scale where harm or harassment occur to ESA-listed species, and thus is insignificant.

Loss of forage habitat

The Corps is proposing to dredge up to 2.5 acres of shallow subtidal habitat (corresponding to 24,638 cubic yards) in the Haleiwa Small Boat Harbor. The Corps will also deepen up to five acres of subtidal habitat near the HBSPP to create the barge access channel. This could kill or disrupt any vegetation or infauna in the sand. While some of the vegetation could provide forage for green sea turtles, algae are plentiful in the general area. The Corps will avoid all hard substrates, coral and other unique or high quality habitat. The proposed dredge footprint and barge access areas are not considered high quality or irreplaceable foraging area and we expect all forage will recolonize the dredged or disrupted areas. The nourishment of beach areas will change the profile of the beach, raising it several inches, but will not prevent Hawaiian monk seals from accessing it for any important activities and is not likely to harm them. The changes to the action area is expected to temporarily diminish sea turtle or monk seal foraging habitat although in a very small amount relative to available habitat in the action area. This small and temporary loss does not constitute a habitat modification significantly impairing essential behavioral patterns. Thus, the effects from loss of forage are insignificant to species listed in Table 1.

Critical Habitat

The action area includes critical habitat for Hawaiian monk seals and MHI IFKW. The Corps will implement BMPs to avoid and minimize vessel/mammal interactions, including the use of observers and work shut down zones. Nourishment activities at the beach will not change access or the quality of upland habitat for Hawaiian monk seals, nor prevent them from resting, molting, or pupping. In the species analysis above, we were reasonably certain probabilities of direct physical contact, collision with vessels, and hazardous chemicals on ESA-listed species are discountable. We were also reasonably certain the effects from disturbance, elevated sound levels, elevated turbidity and sedimentation, and loss of forage habitat are insignificant. Those conclusions also apply to Hawaiian monk seal and MHI IFKW critical habitat.

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, all effects of the proposed action are either discountable, or insignificant. Accordingly, we concur with your determination that the proposed action is not likely to adversely affect the following ESA-listed species: endangered Main Hawaiian Island insular false killer whales; endangered Hawaiian monk seals; threatened Central North Pacific green sea turtles, endangered hawksbill sea turtles; threatened oceanic whitetip sharks; and threatened giant manta rays. We also concur with your determination that the proposed action is not likely to adversely affect the designated critical habitat of Main Hawaiian Island insular false killer whales and Hawaiian monk seals.

This concludes the informal consultation under section 7 of the ESA for species under NMFS's jurisdiction. Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect essential fish habitat (EFH). If necessary, it is your responsibility to request EFH consultation for this action with NMFS' Habitat Conservation Division.

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; 3) the identified action is subsequently modified in a manner causing effects to ESA-listed species or designated critical habitat not previously considered; or 4) a new species is listed or critical habitat designated that may be affected by the action.

If you have further questions, please contact Joel Moribe at (808) 725-5142 or joel.moribe@noaa.gov. Thank you for working with us to protect our nation's living marine resources.

Sincerely,

GARRETT.ANN.M.1365883323 Digitally signed by GARRETT.ANN.M.1365883323 Date: 2021.11.01 12:47:31

Ann M. Garrett
Assistant Regional Administrator
Protected Resources Division

NMFS File No.: PIRO-2021-0 02663
PIRO Reference No.: I-PI-21-1967-AG

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In Reply Refer To:
01EPIF00-2021-I-0470

December 13, 2021

Ms. Rhiannon Kucharski
Chief, Civil & Public Works Branch
c/o Ms. Jessie K. Paahana
U.S. Army Corps of Engineers
Building 230
Fort Shafter, Hawai'i 96858

Subject: Informal Consultation for the Proposed Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Rehabilitation Project, O'ahu

Dear Ms. Kucharski:

The U.S. Fish and Wildlife Service (Service) received your letter on September 3, 2021, requesting our concurrence with your determination that the proposed Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Rehabilitation Project, located on the island of O'ahu, may affect, but is not likely to adversely affect the endangered hawksbill sea turtle (*Eretmochelys imbricata*) and the threatened Central North Pacific distinct population segment (DPS) of the green sea turtle (*Chelonia mydas*).

Our findings and recommendations in this consultation are based on the following: 1) your letter dated September 2, 2021, and 2) other information available to us. 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 entails dredging the Hale'iwa Small Boat Harbor Channel to a depth of 13' Mean Lower Low Water, dredging material from the Ali'i settling basin, and dredging additional material from an offshore sand deposit. Additionally, approximately 22,638 cubic yards of beach quality sand would be placed on Hale'iwa Beach over an area of approximately 4.2 acres. Any material determined not suitable for beach restoration will be transported by scow and taken to the U.S. Environmental Protection Agency South O'ahu Ocean Dredge Material Disposal Site.

The U.S. Army Corps of Engineers (USACE) intends to award a construction contract for the proposed work in Fiscal Year 2023 (Calendar Year 2024) with completion of in-water work within one year.

Green Sea Turtle and _Hawksbill Sea Turtle_
Green sea turtles may nest and bask on any sandy beach and bask on sandy beaches and rocky shoreline area in the Pacific Islands. Basking may occur during the day or at night throughout the year. Hawksbill sea turtles exhibit a wide tolerance for nesting substrate (ranging from sandy beach to crushed coral) with nests typically placed under vegetation. Although hawksbill hatchlings have been observed on O'ahu, no nests have been documented. Both species 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, barriers that restrict their nesting movements, 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 turtle adults, hatchling, or nests, and also contributes to habitat degradation through erosion and compaction.

To avoid and minimize project impacts to sea turtles and their nests the following measures will be incorporated into the project description:

- A biologist familiar with sea turtles will conduct a visual survey of the project site to ensure no basking or nesting turtles or nests are present.
    - During construction and prior to the start of any scheduled beach work, an early morning daily survey along the shoreline will be conducted for the presence of basking sea turtles and sea turtle nests.
    - If a basking sea turtle is observed within or adjacent to the project footprint, the contractor will cease all mechanical or construction activities within 100 feet, until the animal voluntarily leaves the area and will cease all activities between the basing turtle and the ocean. The 100 foot radius will be demarcated with stakes and flagging, but not to impede access to the ocean.
    - If sea turtle nests are found within or adjacent to the project footprint, the contractor will stop all beach/dune environment work immediately and report to USACE. USACE will confer with the Service prior to restarting work.
- Native dune vegetation will not be removed.
- Applicable best management practices regarding work in aquatic environments will be incorporated into the project design.
- Project-related debris, trash, or equipment from the beach or dune if not actively being used will be removed.
- Project-related materials will not be stockpiled in the intertidal zone, reef flats, sandy beach and adjacent vegetated areas, or stream channels.

- Nighttime work will be avoided during the nesting and hatching season (May to December).
- The use of lighting on or near beaches will be minimized and all project-related lights will be shielded so the light is not visible from any beach.
    - If lights can't be fully shielded or if headlights must be used, the light source will be fully enclosed with light filtering tape or filters.

Consequences of the proposed action on the green sea turtle and *hawksbill sea turtle*
By implementing surveys prior to and during the proposed work, it is not probable that there will be interactions with basking adults or nests. Also, by implementing surveys prior to and during the proposed work, it is not probable that construction equipment or other physical barriers will be stock piled in areas that may restrict hatchlings emerging from their nest and navigating to their ocean habitat; and not probable that construction equipment or vehicle activity will crush hatchlings or nests, erode or expose nests, or destroy nest as a result of sand compaction. Because there will be no vegetation removed, it is not probable that there will be erosion that will expose nests. By implementing best management practices to minimize impacts to aquatic environments, it is not likely that contaminants or runoff will impact nests. Lastly, because there is no proposed night work, it is not probable that nesting females will be disoriented from nesting in inappropriate locations or emerging hatchlings be disoriented from their ocean habitat. Because the threats for sea turtles are not probable by implementing the proposed project, impacts are discountable.

Summary
Based on the project description that you provided along with the proposed avoidance and minimization measures that will be implemented, effects from the actions are discountable. Because actions from the proposed project are discountable, we concur with your determination that the proposed action may affect, but is not likely to adversely affect the green sea turtle and hawksbill sea turtle. This concludes section 7 consultation on the Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Rehabilitation Project.

Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

1) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
2) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the written concurrence; or,
3) If a new species is listed or critical habitat designated that may be affected by the identified action.

We appreciate your efforts to conserve protected species. If you have questions regarding this letter, please contact Joy Browning, Fish and Wildlife Biologist (phone: 808-792-9400, email:

Joy_Browning@fws.gov). When referring to this project, please include this reference number: 01EPIF00-2021-I-0470.

Sincerely,

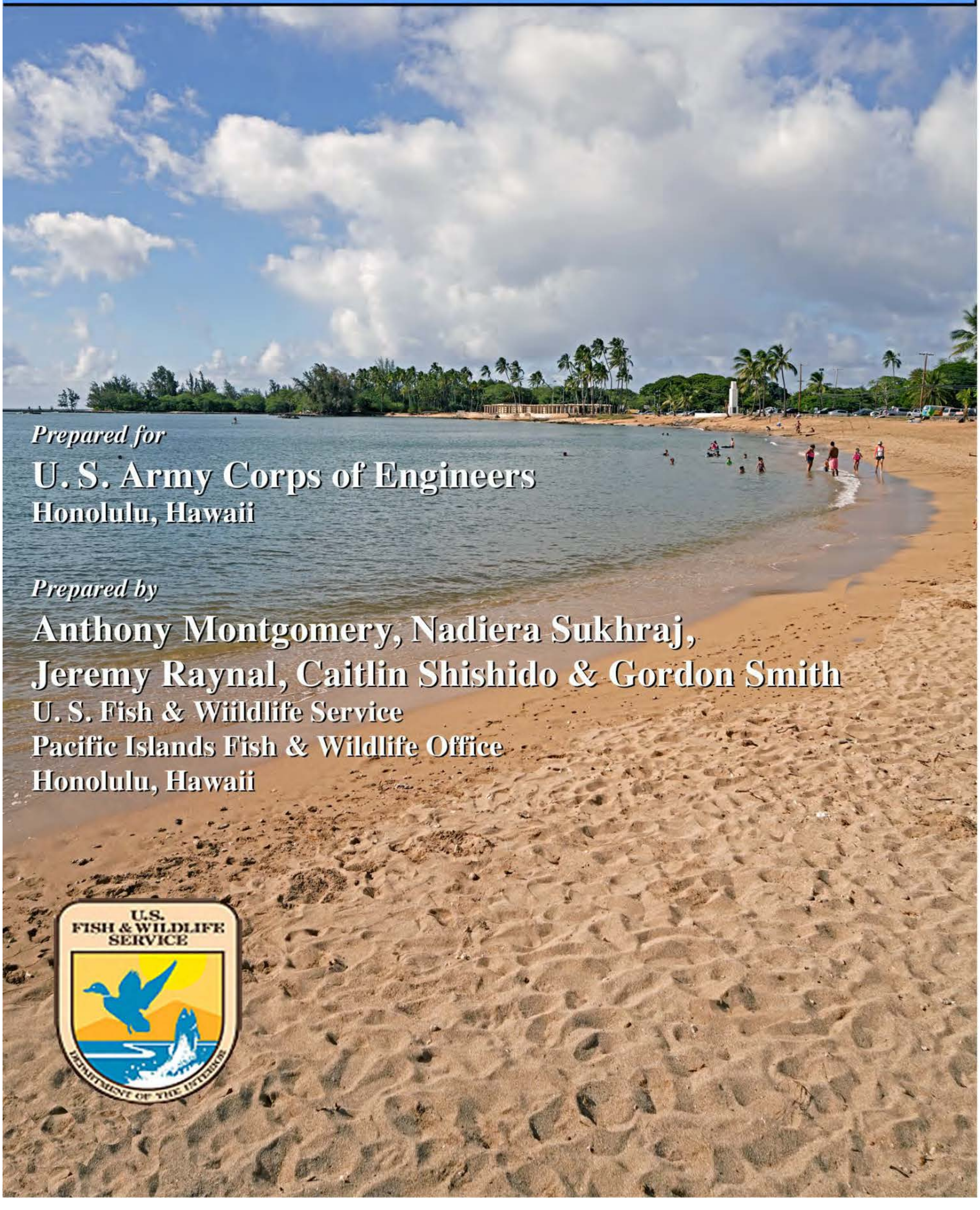
JINY KIM Digitally signed by JINY KIM
Date: 2021.12.13
19:21:28 -10'00'

Acting Island Team Manager
O'ahu, Kaua'i, Northwestern Hawaiian Islands, and American Sāmoa

Attachment 4 - Fish and Wildlife Coordination Act (FWCA)

Phase 1 & 2 Marine Habitat Characterization
Haleiwa Beach Park, Oahu, Hawaii
Beach Renourishment
Fish & Wildlife Coordination Act Report

FINAL REPORT **December 2020**



Prepared for

U. S. Army Corps of Engineers
Honolulu, Hawaii

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U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

FINAL

FISH AND WILDLIFE COORDINATION ACT REPORT

PHASE I AND II MARINE HABITAT CHARACTERIZATION HALEIWA BEACH PARK BEACH RE-NOURISHMENT

OAHU, HAWAII

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Prepared for

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Honolulu District, Civil and Public Works Branch

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EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers, Honolulu District's Civil Works Branch is proposing a pilot project under Section 1122 of the Water Resources Development Act of 2016 to place sand at Haleiwa Beach Park, Oahu, Hawaii. This project would beneficially reuse dredged material from the Haleiwa Small Boat Harbor as well as a sand deposition area adjacent to the harbor, a nearby offshore location, and an adjacent area south of the beach. This proposed action will provide services such as coastal protection and enhanced recreational and commercial opportunities for residents and tourists utilizing the beach area.

The U.S Fish and Wildlife Service has conducted a Fish and Wildlife Coordination Act investigation to assess the marine resources within the project area and the potential impacts associated with the proposed action. In order to complete a biological characterization of the project area, surveys were conducted to map the marine habitat and its resources at each of the project component sites. Based on that data, we divided the Haleiwa Beach Park area into five strata in order to develop a stratified, random sampling design for quantitative surveys. Quantitative surveys were then conducted at 29 sites across Sand, Pavement, Scattered Coral/Rock in Unconsolidated Sediment, Rocky Shoreline Intertidal, and Sandy Shoreline Intertidal strata. The quantitative data collected included species, size, and number of coral colonies and fishes, species and number of macroinvertebrates, estimate of benthic cover (substrate, algae, and invertebrate percent cover), and habitat rugosity.

The uncolonized bottom across all strata was high, being 100% of the Shoreline Intertidal – Sandy stratum, 99.1% of the Sand stratum, 81.9% of the Rocky Shoreline Intertidal stratum, 79.9% of the Scattered Coral/Rock in Unconsolidated Sediment stratum, and 66.7% of the Pavement stratum. This study documented a relatively low diversity of marine species, with 10 species of corals, 7 species of algae, 13 species of fishes, and 60 species of invertebrates across all 29 sites. Coral density was low across all sites, but was the most dominant in the Pavement and Scattered Coral/Rock in Unconsolidated Sediment strata, with the most abundant species being *Psammocora stellata* (0.48 colonies/m^2) in the Pavement stratum. The density and biomass of fishes were low across all sites, with the highest density in the Rocky Shoreline Intertidal stratum and highest biomass in the Pavement stratum. The most abundant fish species was *Acanthurus triostegus* (0.08/m^2), while *Acanthurus nigrofuscus* had the highest biomass (0.03 tonnes/ hectare). The highest invertebrate density was in the Rocky Shoreline Intertidal stratum, while the Pavement stratum had the highest invertebrate density for subtidal habitats. The most abundant invertebrates were *Nerita picea* (10.24/m^2) in the intertidal habitat and *Echinometra mathaei* (1.75/m^2) among subtidal habitats. An invasive alga, *Acanthophora spicifera*, made up the highest benthic biological cover in subtidal habitats (13.3% in Pavement stratum and 12.7% in Scattered Coral/Rock in Unconsolidated Sediment stratum).

The potential impacts associated with this project are relatively small, but include possible impacts to corals, particularly *Psammocora stellata* in the northern portion of the beach park area. The most significant impact includes the loss of the majority of the Rocky Shoreline Intertidal habitat from sand placement under Alternative 5. The U.S. Fish and Wildlife Service recommends steps to minimize the impact to these two areas by avoiding sand placement in the northern section or across the Rocky Shoreline Intertidal habitat. Our position is supportive of this project with consideration of avoiding and minimizing these impacts.

TABLE OF CONTENTS

INTRODUCTION

Authority, Purpose and Scope

The U.S. Army Corps of Engineers (USACE) Civil Works Branch is proposing to place sand at Haleiwa Beach Park, Oahu, Hawaii as part of a beneficial reuse of dredged material from the Haleiwa Small Boat Harbor and nearby offshore sand sources. The USACE received funding under Section 1122 of the Water Resources Development Act of 2016 as a pilot project. The scope of this project requires consultation under the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq*.; 48 Stat. 401], as amended (FWCA). This report, in the form of a Fish and Wildlife Coordination Act Report (FWCAR), has been prepared under the authority of and in accordance with provisions of the FWCA (Section 2b); the Clean Water Act of 1977 [33 USC 1251 *et seq*.; 91 Stat. 1566], as amended (CWA); the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq*.; 87 Stat. 884], as amended (ESA); and other authorities that authorize the Service to provide technical assistance to conserve trust resources.

The FWCA provides the basic authority for the Secretary of the Interior, Secretary of Commerce, and the appropriate State fish and game agency to assist and cooperate with Federal, State and public or private agencies and organizations in the conservation and rehabilitation of aquatic wildlife. This authority provided to the Secretary of the Interior is through the U.S. Fish and Wildlife Service (and subsequently delegated to Ecological Services Program), for the Secretary of Commerce through the National Marine Fisheries Service (NMFS) via Reorganization Plan No. 4, and to the State of Hawaii through Department of Land and Natural Resources, Division of Aquatic Resources (DAR).

The Pacific Islands Fish and Wildlife Office (PIFWO) conducted this FWCA investigation to document the resources within the project area and analyze the potential impacts to marine resources, and as the lead agency has the responsibility of ensuring that concerns and recommendations of the other resource agencies are considered fully in FWCA reviews. The NMFS and DAR were invited to take part in the fieldwork, but were unable to participate. The draft report (August 2020) was sent to NMFS, the Environmental Protection Agency (EPA), and DAR. NMFS and EPA notified the Service they had no comments while DAR has provided comments (Appendix G). Those comments have been incorporated into this report. A second draft was sent to the USACE for additional comments based on the feedback from DAR and the USACE provided no additional comments. This report was prepared using the guidance described in Smalley (2004).

Description of Project Area and Proposed Action

The Haleiwa Beach Park is located on the island of Oahu, Hawaii, in the tropical north Pacific (Figures 1 & 2). The site lies along the northern coast of Oahu at Waialua Bay. The depths in this area range from 0 to 3 meters (m) (0 to 10 feet). The Haleiwa Beach Park is at the mouth of the Anahulu River and northeast of the Haleiwa Small Boat Harbor. The Beach Park is operated and maintained by City and County of Honolulu (CCH).

The Haleiwa Beach Shore Protection Project was authorized by the River and Harbors Act of 1965 and constructed in the same year. The project consisted of an offshore breakwater (160 feet by 520 feet), terminal groin on the southern edge of the beach, and beach fill 1,600 feet long and 140–265 feet wide. The USACE undertook emergency repairs of the project in the 1970s, consisting of repairs to the groin and offshore breakwater, as well as placing approximately 12,000 cubic yards of sand. The project authorization allows the USACE to undertake emergency repairs as needed, but the non-federal sponsor (State of Hawaii's Department of Transportation) is responsible for maintenance (USACE 2018).

The Haleiwa Small Boat Harbor was constructed in 1966 and modified in 1975 with the addition of the stub breakwater and wave absorber. It was dredged in 1999, with 7,214 cubic yards of material removed, and again in 2009 with 6,500 cubic yards removed. The material was disposed in an upland area, except for a small amount in 2009, which was used at Haleiwa Beach Park for repairs.

This proposed project aims to place beach quality sand within the existing beach and nearshore marine waters of Haleiwa Beach Park. The placement of additional sand will provide services such as coastal protection, as well as enhanced recreational and commercial opportunities for residents and tourists utilizing the beach area. Coastal erosion of this area has been severe, and most pronounced in front of the CCH comfort station. In 2019, the CCH repaired the wall of the comfort station due to concern of imminent collapse, but this wall will be subject to further erosion without additional protection. The USACE proposal for project funding reports that the area in front of the comfort station would receive sand first, as this is the most critical portion of the beach (USACE 2018). Please see below (section DESCRIPTION OF ALTERNATIVES UNDER CONSIDERATION) for the description of the five proposed alternatives.

Proposed sources of sand for the beach re-nourishment include an offshore sand area, the outer portion of the small boat harbor federal channel, a small sand deposition area adjacent to the channel, and a dredged access channel adjacent to the groin at the southern end of Haleiwa Beach Park. Dredging of the offshore sand area would remove 15,000 cubic yards of beach suitable sand. Routine Operations and Maintenance of the federal channel would dredge the channel to 13 feet below Mean Lower Low Waterline (MLLW) by removing an estimated 2,433 cubic yards beach suitable sand and 2,000 cubic yards of non-suitable material. Dredging of the sand deposition area adjacent the channel would remove 2,200 cubic yards beach quality sand to 8 feet below MLLW. In order to offload the sand, a dredged channel south of the southern beach groin will be dredged to 10 feet below MLLW by removing 4,733 cubic yards of material. The proposed dredging activities will be conducted with a barge-mounted crane and environmental clamshell bucket dredge, placed on a scow, and barged to the access channel to be mechanically placed on the beach. Material not suitable for the beach will be disposed at the South Oahu Ocean Dredged Material Disposal Site located 3 miles south of Pearl Harbor and 46 miles from Haleiwa Small Boat Harbor at depths of 1,300 to 1,650 feet.

Prior Fish and Wildlife Service Studies and Reports

The Service completed a Phase I habitat-mapping survey for Haleiwa Small Boat Harbor in August – September 2012 and sent a report to the USACE on September 14, 2012 (2012-CPA-0003). The report included a qualitative description of the resources within the federal channel and data on coral colonies growing on the rock revetment.

Prior Studies and Reports from other agencies

The Service is unaware of any other studies or resource investigations within the area.

Coordination with Federal and State Resource Agencies

USACE charrette planning site visit – June 18, 2019

USACE charrette planning meeting – June 19, 2019

USACE request for FWCA consultation – August 27, 2019

USFWS coordination with NMFS – August 28 – September 24, 2019

USFWS Scope of Work and Budget – October 2, 2019

USFWS Revised Scope of Work and Budget – January 29, 2020

Receipt of the Military Inter-department Purchase Request – February 25, 2020

Invitation to State of Hawaii, Division of Aquatic Resources to participate – March 11, 2020

Fieldwork conducted – May 30 and June 23–26, 2020

Draft data graphs to USACE – July 13, 2020

Draft report sent to NMFS – August 18, 2020

Draft report sent to DAR – August 18, 2020

Draft report sent to Environmental Protection Agency – August 18, 2020

Draft report sent to USACE – August 19, 2020

Comments on draft report from USACE – August 25, 2020

Comments on draft report from NMFS – August 26, 2020

Comments on draft report from EPA – September 8, 2020

Comments on draft report from DAR – September 22, 2020

Draft 2 report sent to USACE – September 29, 2020

Comments on draft report from USACE – November 24, 2020

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES

U.S. Fish and Wildlife Service Planning Objectives

The mission of the Service consists of working with partners to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. In 2016, the Service updated its 1981 mitigation policy to better meet this mission (USFWS, 2016), but has since rescinded the revised 2016 mitigation policy (USFWS, 2018) leaving the 1981 policy in effect. The Service's 1981 Mitigation Policy (USFWS, 1981) outlines internal guidance for evaluating project impacts affecting fish and wildlife resources. The Mitigation Policy complements the Service's participation under NEPA and the FWCA. The Service's Mitigation Policy was formulated with the intent of protecting and conserving the most important fish and wildlife resources while facilitating balanced development of this nation's natural resources. The policy focuses primarily on habitat values and identifies four resource categories and mitigation guidelines. The resource categories are shown in Table 1.

The Haleiwa Beach area is considered a coral reef and meets the description of Resource Category 3. This coral reef area should be considered medium to high value due to the marine resources documented in this survey. However, this reef has been classified as Category 3, based on its current condition described below, while most Hawaiian coral reefs are rated at Category 2. In general, coral reefs are considered scarce based on their local, national, and global decline (Williams et al., 2009; Walsh et al., 2010; Waddell (ed.), 2005; Waddell and Clarke (eds.), 2008; Wilkinson (ed), 1998; Wilkinson (ed), 2000; Wilkinson (ed), 2004; Wilkinson (ed), 2008) and their geographical constraints within the United States. Coral reefs have also been designated as Special Aquatic Sites under the Clean Water Act (CWA). Special Aquatic Sites are defined as “geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values.” They are further described as “significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region” (40 CFR Part 230 §230.44/FR v.45n.249).

Table 1: Resource categories. Resource categories and mitigation planning goals.

Resource Category	Designation Criteria	Mitigation Planning Goal
1	High value for evaluation species and unique and irreplaceable.	No loss of existing habitat value.
2	High value for evaluation species and scarce or becoming scarce.	No net loss of in-kind habitat value.
3	High to medium value for evaluation species and abundant.	No net loss of habitat value while minimizing loss of in-kind habitat value.
4	Medium to low value for evaluation species.	Minimize loss of habitat value.

These designations of Resource Category 3 and Special Aquatic Site require the Service to recommend ways for the action agency to mitigate losses, through measures to avoid or minimize significant adverse impacts. In the event losses are unavoidable, measures to rectify immediately, reduce, or eliminate losses commensurate with project permitting or implementation will be recommended under the FWCA. Recommendations will focus on compensation for the replacement of in-kind habitat values and ecological functions. An effective and verifiable mitigation program planned and executed by the project proponent is required under NEPA and the CWA.

To this end, it is the policy of the Service to provide federal leadership for the conservation, protection, and enhancement of fish, wildlife, and their habitats by seeking to mitigate their losses with a facilitated, balanced approach to proposed water development actions. The Service's 1981 mitigation planning policies achieve this by the following: 1) State-Federal Partnership, 2) Resource Category Determinations, 3) Impact Assessment Principles, 4) Mitigation Recommendations, 5) Mitigation means and Measures, and 6) Follow-up.

Within these planning policies, *evaluation species* is a key term to describe the fish and wildlife resources selected for impact analysis. There are two basic approaches to the implementation of evaluation species: 1) selection of species with high public interest, economic value, or both, and 2) selection of species to provide a broad ecological perspective of an area. While some species may be appropriate for both approaches, we emphasize using species that provide a broad ecological perspective.

The evaluation species typically used for tropical Pacific marine ecosystems include stony corals, seagrasses, and certain benthic algal groups (*Halimeda* meadows or unique coralline algal communities). Some situations may dictate the use of additional species, and the Phase 1 protocols that the Service uses capture the key benthic resources that are of interest. Other situations may warrant considering key fish species as important evaluation species.

These evaluation species are important as they also relate to other federal agency policies. Coral reefs in general are considered high value habitat and have been defined in the CWA Section 404(b)(1) guidelines as "skeletal deposits, usually of calcareous or silicaceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of the reef." Stony corals are a foundation species to the development of coral reefs and hence are often the central focus of mitigation within the Pacific Island region. Coral reefs are further considered to be Special Aquatic Sites under the CWA 404(b)(1) guidelines. Finally, the 404(b)(1) guidelines also consider vegetated shallows to be Special Aquatic Sites. Within the Pacific Islands, the Service considers *Halimeda* meadows and seagrass communities to be vegetated shallows. Such Special Aquatic Sites are areas that possess special ecological characteristics and contribute to the overall benefit of the ecosystem.

This report is a Phase I and II investigation that addresses the Service's mitigation framework to the extent that the data are sufficient. A Phase I report aims to provide broad information for avoidance and minimization of negative environmental impacts, but does not include information necessary for scaling and planning a compensatory mitigation package. A Phase II investigation addresses the remaining components of the Service's mitigation framework and can also provide information for scaling and planning a compensatory mitigation package, if necessary.

Resource Concerns

The primary concerns associated with the proposed project include the direct impacts associated with the placement of sand on existing marine habitat, particularly the Shoreline Intertidal community. The proposed Alternative 5 would cover a significant amount of Shoreline Intertidal area as well as some portions of the Pavement and Scattered Coral/Rock in Unconsolidated Sediment habitats, although the latter is a much smaller portion of the total area. The specific planning objective is to provide technical assistance and recommendations to USACE to allow equal weight to be given to both project benefits and natural resources in decision-making. To achieve this goal, we provide the following: 1) biological and habitat data for the Haleiwa Beach Park area; 2) analysis of potential impacts of the proposed project to fish and wildlife resources and their habitats; and 3) recommendations for minimization and avoidance measures.

EVALUATION METHODOLOGY

Phase I Habitat Mapping

A team of two biologists using snorkel collected information on the habitats and biological communities within and adjacent to the project footprint. The survey team was equipped with digital cameras, dive watches, floated GPS units, and datasheets attached to a clipboard to record data. The time on the digital camera was synchronized with the GPS units by photographing the time of the GPS unit before entering the water. In addition, the time difference between the dive watch and GPS unit was recorded on the datasheet. The team was familiar with the proposed project area and had pre-determined starting points and areas for the initial survey. The number of survey transects was determined based on the time available and an estimated area covered.

A survey transect consisted of the team collecting habitat and biological information as described below along a swim path while towing a pair of floated GPS units. The floated GPS units were always maintained/aligned near the team to minimize spatial error between the biologists and the GPS. All survey transects were marked by a starting waypoint and an ending waypoint. GPS units were set to the local time and set to record a track log automatically at 5-second intervals.

The biologists on the survey team consisted of a habitat/coral surveyor and an algal/invertebrate surveyor. All biologists collected data on observed habitat zones, debris observations, and protected species as well as their respective biological groups. The visual observation area that was qualitatively evaluated was estimated by each biologist and recorded in meters. The estimation distance was influenced by water clarity, rugosity of habitat, complexity of habitat, water depth, and other environmental conditions that limit visual distance. One biologist was assigned as the navigator; this person followed a pre-determined compass bearing, depth contour, habitat boundary or other criteria that determined the survey transect path. Each biologist carried an underwater camera to document species and habitat types observed.

Habitat Terminology and Characterization

Habitat terminology used was modified from Battista et al. (2007) and detailed definitions ae available from the Pacific Islands Fish and Wildlife Office upon request. Although the classification of Battista et al. (2007) was not developed specifically for impact assessments, the terminology and characterization framework were deemed generally appropriate for the purposes of characterizing habitats for this Phase I survey. The framework described in Battista et al. (2007) included three data layers of habitat information, consisting of a classification of geographic zones, geomorphological structures, and biological cover. The terms for geographic zones, geomorphological structures, and major geomorphological structures are used here with slight modification. The "geographic zones" are subsequently called "habitat zones," the "geomorphological structures" are subsequently called "habitat structures," and the "major geomorphological structures" are subsequently called "major habitat structures." By contrast, the biological cover classification scheme of Battista et al. (2007) is not used. Instead, the biological cover classification scheme used here is modified and expanded substantially from Battista et al. (2007), as described below.

Habitat zones were generally determined prior to entering the water or after exiting from the water and were recorded by the habitat/coral and algae/invertebrate surveyors. Habitat structures were determined in the water to the best ability of the habitat/coral surveyor. Water clarity and conditions could impact the diver's ability to determine the specific habitat structure, but it was generally determined while in the water. Biologists, particularly the navigator, followed along a habitat structure boundary when appropriate in order to assist with further delineation between habitat structures. Care was taken when conducting the biological characterization along these boundaries. The biological characterization was focused on one side of the observed boundary so that it was applied appropriately to each particular habitat structure involved. This aspect was coordinated by the observers and noted on the datasheet. The boundaries between habitat structures were evaluated or refined during the data processing phase (see Habitat Map Production methods). The types of unconsolidated sediments observed were also recorded, being scored as present or absent. These included sand, mud, rubble, and cobble as described below.

In addition to characterizing the habitat structures, the habitat/coral surveyor also characterized habitat complexity. The categories of habitat complexity are the same as used by NOAA's Pacific Islands Fishery Science Center (Brainard et al. 2008; Brainard et al. 2012). As stated in Brainard et al. 2008, "Estimates of habitat complexity were subjective assessments of topographical diversity and complexity of the benthic habitat and were classified according to one of six categories: low, medium-low, medium, medium-high, high, and very high (Fig. 2.4.2b). As examples, low habitat complexity is often associated with flat sand plains or rubble habitats; medium habitat complexity is often associated with small to moderate spur and groove, coral or boulder habitats; and high or very high habitat complexity are often observed as high or extreme vertical relief associated with steep spur-and-groove canyons, pinnacles, and walls." These six categories were recorded on a 0-5 scale with 0 for low, 1 for medium-low, 2 for medium, 3 for medium-high, 4 for high, and 5 for very high.

Biotic Characterization

The biologists collected information on various biological groups/categories and species inventoried along the survey transect. The information on the various biological groups/categories (as described below) was recorded at a frequency of every 15 to 60 seconds depending on the habitat area and speed of swimming, but varied under different circumstances. The area that could be reasonably visually assessed was recorded at each point and varied based on water depth, water visibly, or other environmental factors. The biotic characterization included three main survey components (habitat/coral, algae/invertebrate, and ESA corals) and each main component had multiple data collection components.

Habitat/Coral Characterization

The habitat/coral surveyor (Tony Montgomery) collected information on habitat as described above, as well as six different components of the coral population within an area. These components included the relative abundance of stony coral, stony coral growth forms observed, estimated stony coral sizes present, and presence of non-stony corals. Details for each component are given below. Each observation was collected with the specific time (hh:mm:ss) that was later converted to a GPS coordinate by the closest GPS track log coordinate within a five second window. This conversion was completed in a Microsoft Access© database. The area that could be visually assessed reasonably for coral abundance was estimated as a visual distance in meters (in terms of a radius) and recorded on the datasheet. The observer also carried an underwater camera to take photographs of representative habitats, representative coral communities, coral colonies for species identification, or any other notable feature of interest.

Component 1 – Habitat structure and sediment were classified on a continual basis and with the same frequency as other data. Habitat zone was classified at the start of the dive or when a change of zone was found.

Component 2 – Relative abundance of coral was recorded utilizing a modified DACOR method. DACOR stands for dominant (5), abundant (4), common (3), occasional (2), or rare (1), and categories were recorded on a 1-5 scale with 1 being Rare and 5 being Dominant. Zero was used for coral absence. Each category was approximated to represent a broad range of percent coral cover such as 1 – <1% (scattered corals), 2 – <10%, 3 – 10-50%, 4 – 50-80%, and 5 – >80%.

Component 3 – The stony coral growth forms included: 1) lobate/massive, 2) conical, 3) small-branching, 4) medium-branching, 5) large-branching, 6) digitate, 7) columnar, 8) table, 9) plate, 10) foliaceous, 11) encrusting, 12) free-living, and 13) mixed. Possible mixed growth forms included forms like plates-and-column and plates-and-branched, but if other combinations existed, they were recorded. The distinction between small and medium branching colonies were made by using the approximate diameter of a pencil (< 1 cm) while the distinction between medium and large branching colonies were made by using the approximate diameter of a small wrist (< 5 cm). For data analysis, these growth forms were lumped into fewer categories including: 1) lobate, microatoll, branching, encrusting, plate-like, and free-living.

Component 4 – For each growth form observed, the sizes observed were recorded into broad size categories, including: 1) small included colonies estimated less than 50 cm, 2) large included colonies greater than 50 cm, 3) mixed included colonies of both small and large, and 4) extra-large included colonies greater than 2 m.

Component 5 – Non-stony coral groups were recorded as present or absent. The groups included: 1) soft corals, 2) zoanthids, 3) gorgonians or sea fans, and 4) black or wire corals.

Component 6 – If coral disease or bleaching were observed, it was noted in the comments section of the datasheet and recorded in the Access database. It was recorded as present or absent as coral stress, and then logged as disease, pale bleached, partial bleached, or complete bleached.

Algae/Non-Coral Invertebrate Characterization

The algal/invertebrate observer (Dr. Nadiera Sukhraj) collected information on up to eight different components. These components included relative abundances for seagrass, turf algae, coralline algae, filamentous algae, macroalgae, and several invertebrate groups. The observer also recorded observations of debris. Additionally, the observer developed an overall species list for algae and non-coral invertebrates. The details for each component are listed below. Each observation was collected with the specific time (hh:mm:ss) that was later converted to a GPS coordinate by the closest GPS track log coordinate within a five second window. This conversion was completed in a Microsoft Access© database. The area that could be reasonably assessed for algal/invertebrate abundance was estimated as a visual distance in meters (in terms of a radius) and recorded on the datasheet. The observer also carried an underwater camera to take photographs of representative habitats, representative algal and invertebrate communities, algae and invertebrates for species identification, or any other notable feature of interest.

Component 1 – Relative abundance for seagrass was recorded on a scale of 0–3. Zero was used for seagrass absence. Category 1 represented seagrass abundance that consisted of isolated patches and did not have continuous coverage within an area. Category 2 represented seagrass that had a semi-continuous or continuous coverage, but had a low density of blades. Category 3 represented seagrass with a continuous coverage and had a high density of blades or a tall canopy height. The species of seagrass was recorded.

Component 2 – Relative abundance for turf algae was recorded on a scale of 0–3. Zero was used for turf algae absence. Category 1 represented turf algae that had sparse or patchy coverage and/or low density of turf algae. Category 2 represented a moderate, semi-continuous coverage and a low to moderate density of turf algae. Category 3 represented a continuous coverage and a high density of turf algae. Turf algae for the purpose of this assessment were sparse to thick multi-specific assemblage of diminutive and juvenile algae less than 2–3 cm in canopy height.

Component 3 – Relative abundance for coralline algae was recorded on a scale of 0–3. Zero was used for coralline algae absence. Category 1 represented a sparse or patchy coverage of coralline algae. Category 2 represented a moderate or semi-continuous coverage of coralline algae. Category 3 represented a continuous coverage of coralline algae. Coralline algae were assessed for readily visible corallines mostly that are red or pink on the reef surface. The observer did not look in holes or under rocks to assess the coralline algae abundance.

Component 4 – Relative abundance of filamentous algae and cyanobacteria was recorded on a scale of 0–3. Zero was used for absence of filamentous algae or cyanobacteria. Category 1 represented a sparse or patchy coverage of filamentous algae or cyanobacteria. Category 2 represented a moderate or semi-continuous coverage of filamentous algae or cyanobacteria. Category 3 represented a continuous coverage and a high density of filamentous algae or cyanobacteria. Filamentous algae for the purposes of this assessment was defined as hair-like plants that do not form a substantial thallus or a coherent tissue (definition modified from Huisman et al. 2007, page 254). Common filamentous algae that are representative of this group include *Cladophora* spp. or *Bryopsis hypnoides* (not *Bryopsis pennata*). Common cyanobacteria that are representative of this category include *Lyngbya* spp. and *Hormothamnion* sp.

Component 5 – Relative abundance of macroalgae was recorded on a scale of 0–3. Zero was used for macroalgae absence. Category one classification represented sparse or patchy (even individual plants) and a low density of macroalgae. Category two classification represented moderate, semi-continuous coverage and a low to moderate density of macroalgae. Category 3 represented a continuous coverage with a high density of macroalgae. In addition to recording the relative abundance, four forms of macroalgae were recorded as being present or absent and included short frondose, tall frondose, *Halimeda* algae, or invasive macroalgae. Short frondose macroalgae was defined as having a maximum canopy height of 20 cm and tall frondose macroalgae was defined as a canopy minimum canopy height of 20 cm.

Component 6 – Relative abundance for all non-coral invertebrates was recorded on a scale of 0–3. Zero was used for invertebrate absence. Category one classification represented an observation of 1–2 individuals. Category two classification represented the observation of 3–10 individuals. Category 3 represented the observation of more than 10 individuals. If an aggregation of significantly more than 10 individuals was observed, this was recorded in the comments section. The invertebrate groups included grazing sea urchins, rock boring sea urchins, crown-of-thorns starfish, lobsters, *Pinctada margaritifera*, giant clams, anemones, sea cucumbers, mollusks (strombids, top or turbin shells, Triton's Trumpet, helmet shells, etc.), octopus, seastars (*Linckia* sp., *Culcita* sp., or others) and, crinoids. In addition, the presence and absence (but not relative abundance of) sponges and tunicates in all forms and shapes were recorded.

Component 7 – The observation of marine debris (deb) or remnant structure underwater was recorded as present or absent. The type of structure or debris was recorded (UXO, tires, misc., etc.).

Component 8 – The final component was the compilation of an overall species list for all algae and invertebrate species observed. Species were identified to the lowest taxonomic level possible, either *in situ* or by subsequent examination of photographs taken on-site. , but it is an estimate of species richness along one transect

Post-Field Work Data Processing

Data Preparation

At the end of each dive day, digital images and GPS data were downloaded using appropriate software. Images were placed into daily folders and GPS data were downloaded using DNRGPS 6.0© as a tab-delimited text file (.txt). Benthic data were entered into a Microsoft Access© database. After all data were entered into the Access database, the gps data, dive data, habitat-coral data, and algae-invert data were validated for errors or anomalies. All errors were corrected and the data was processed for geosyncronization. The final, validated, georeferenced data were outputted as a database file (.mdb).

Data Processing

Habitat map data layers were produced with a Service custom built scripts (Marine_Mapping _Model1_v4.R and Marine_Mapping_Model2_v4.R) using R software (R Core Team, 2020). These custom built scripts use several packages including RODBC (Ripley and Lapsley 2020), sf (Pebesma et al. 2020), raster (Hijmans et al. 2020), rgdal (Bivand et al. 2020a), dismo (Hijmans et al. 2017), deldir (Turner 2020), maptools (Bivand et al. 2020b), rgeos (Bivand et al. 2020c), smoothr (Strimas-Mackey 2020), spatialEco (Evans et al. 2020), and cleangeo (Blondel 2019). The first script (Marine_Mapping_Model1_v4.R) processes the raw survey data exported from the database file. External data can be incorporated into the data processing including NOAA's Benthic Habitat Maps (Battista et al. 2007), land classification layers, existing DEM layers, or habitat classification from Feature Analyst©. In this current project, NOAA's benthic classification data was incorporated into the classification layer produced from this projects field data that provided a comparative option for the final classification. After these individual datasets were processed, they were incorporated and combined into the draft classification layer. This draft layer was processed based on comparative criteria and manual interpretation of the results that produced a final classification layer in the second script (Marine_Mapping_Model2 _v4.R). The second script also finalized the geoprocessing steps and incorporated a series of interpolations for all the biological groups as described previously. Currently, this script remains in development after transition the model from Modelbuilder in ArcGIS© 10.2.2 to R and the final interpretation layers are not available for this project.

Initial input layers used to begin the data processing included an area enclosure, target area shapefiles, land classification layer, and raw database output file. The target area shapefile represented the total, maximum area (inclusion of all potential alternatives) of the anticipated direct impact area of the proposed action. This layer was provided to the Service by the USACE. The area enclosure shapefile represented the area that bounds the total project area. The land classification layer was a layer developed prior to data collection that estimated the land boundary (including any dock area) from marine areas below the mean higher high waterline (MHHW) or estimated MHHW.

During the classification stage, there were set classification criteria as well as manual interpretation of the layer classifications used to make the final classification determination. The set classification criteria and manual interpretation determined the boundaries of the habitat structures by: 1) direct observation, 2) transects that were swum along habitat structure transition boundaries (i.e. scattered rock in unconsolidated sediment on one side and unconsolidated sediment-sand on the other side), 3) utilizing NOAA's Benthic Habitat Maps where deemed appropriate, or 4) other data sources as described previously (Feature Analyst outputs based on WorldView-2 imagery) that provided information on habitat structures. These boundaries may not represent the exact delineation between habitat structures, but serve as an estimate based on the available information. After the boundaries are drawn for each habitat character, the edited Theissen polygon was validated to reassure all changes are correct and complete.

The models also generated output tables that included all geodetic area calculations for each habitat major structure, habitat structure, sediment type, and habitat zones.

Phase II Quantitative Habitat Characterization

Stratified, Random Sampling Design

Prior to the quantitative field surveys, random survey locations were determined using a stratified, random sampling design across the project area. The project area includes the estimated area along the coastline and out to a 90–100 m offshore (estimated distance of potential sand impacts on the reef flat). Strata were developed based on the Phase I data describe above.

A total of four strata were initially determined based on different habitat characteristics (Figure 3) across the project area. These strata included the habitat structures of Unconsolidated Sediment (sand), Pavement, and Scattered Coral/Rock in Unconsolidated Sediment and the habitat zone of Shoreline Intertidal. Within the Shoreline Intertidal, the area was broken into four areas based on intertidal characteristics. After data collection, it was decided that the Shoreline Intertidal stratum should be split into Rocky and Sandy strata resulting in a total of 5 strata evaluated.

Five to 20 random points were placed in each stratum polygon using ArcGIS© and the Create Random Points tool. The points were limited to not be within 10 m of other points. Each point was assigned a bearing that was approximately parallel to the shoreline (approximately north or south based on distance to stratum edge) or in a direction that allowed for 25 m to remain within the stratum. If transects would cross due on location and bearing, the first assigned transect would be used and the crossing transect(s) would be deleted that represents sampling without replacement. These points were exported into a Microsoft Excel© table with a corresponding latitude and longitude. The pre-determined bearing was used to guide the direction of the transect line and reduce any bias by the diver. The result provided 35 potential transects across the project including 10 in Scattered Coral/Rock in Unconsolidated Sediment, 7 in Pavement, 5 in Sand, and 13 in Shoreline Intertidal strata.

Rapid Ecological Assessment Survey Protocols

Each day a survey team was assembled to collect reef fish, coral, marine plant, non-coral macroinvertebrate, and geomorphological data for subtidal surveys (intertidal surveys were modified as described below). The team was comprised of 3 biologists including one coral biologist, one reef fish biologist, and one non-coral macroinvertebrate and algal biologist. This fish biologist also collected rugosity and the coral biologist collected (at some sites) imagery for photogrammetry. Each survey team was equipped with digital cameras, GPS units (Garmin 64st), two red surface buoys with line reels, bottom transect reels, and clipboards with datasheets to record data.

For these surveys, there was no vessel available for support. A safety diver (on snorkel) was added to the overall team and provided surface support. The safety diver accompanied all divers during surveys to help support divers while swimming along the transect. Divers were not always in sight due to water visibility, so the safety diver remained on the surface to serve as a back-up buddy for the divers.

Before divers entered the water, small marker buoys were deployed at pre-determined sites to guide the divers where transects need to be placed. The team, then entered the water and swam to the surface marker buoy towing two red surface buoys. The team collected GPS waypoints to mark the starting point of the 25-m survey transect before descending. At the bottom, the team determined if the habitat observed in the pre-determined bearing direction was that expected for the stratum (e.g. not sand in an expected hard bottom habitat). If the habitat was not as expected, the reciprocal bearing was assessed and used, with changes noted in the site information list. The same protocol was repeated for every dive.

After descending at a survey point, the team secured one red buoy at the 3-lb weight marking the 0-m point of the first transect. The reef fish diver then led the team along a pre-determined compass bearing while laying out a 25-m transect line and towing a second red buoy. The surface support diver tracked the fish diver and kept visual contact during the survey. While swimming the line out, the diver identified and counted the number of reef fish species present. When the diver reached the end of the 25-m transect line, the reel and line with the second red buoy was secured to the substrate. The safety diver collected a GPS waypoint after the fish diver secures the float to the end of the transect. The fish diver then swam back to the 0-m mark and began to collect a rugosity measurement along the transect. After finishing, the fish diver retrieved the second red buoy and remained on the surface until the rest of the team was completed. The coral and invertebrate divers then started collecting coral and invertebrate data along the transect line soon after the fish diver started. The invertebrate diver collected quadrat point count data while swimming back along the transect line. After completing data collection, the divers rolled up the transect line and surfaced together at the first red buoy. The divers regrouped on the surface and moved to the next survey site.

Reef Fish Survey Protocols

The reef fish diver (Gordon Smith) identified to the lowest taxa level possible (usually species), counted, and sized of each fish observed within an estimated 4-m wide area (ie.,2-m wide on each side) while deploying the 25-m transect line. When the diver reached the end of the 25-m transect line, the line was secured to the substrate. The same diver then swam back toward the beginning of the transect, with the surface support diver following. Transect width was adjusted for water visibility as necessary. Each 25-m x 4-m transect (100 m^2), the survey station, was treated as a unit for summarization.

Rugosity Survey Protocols

The reef fish diver was also tasked with obtaining rugosity measurements from the 0-m to 10-m section of each transect. Rugosity (f_r) is a measurement of reef complexity and is an indication of reef relief and/or of the presence of coral, which creates a complex surface as it grows. A diver used a 25-m light brass chain marked at 0.5 m intervals and draped it over the bottom along the transect line. The length of chain was recorded for the 10-m section. Each rugosity measurement for each transect was treated as a separate unit for data analysis.

Coral Survey Protocols

The coral diver (Tony Montgomery) conducted surveys for coral number, size, and morphology. All coral colonies within a 25-m x 1-m belt transect were counted, sized, and assigned a morphological category. Corals were identified to the lowest possible taxonomic level (generally species), and two horizontal dimensions of each colony were measured and recorded on a data sheet. Coral colonies were counted and measured using the center-point rule; only colonies with their center falling within the 1-m belt width were included. Each 25-m (25 m^2) transect section was treated as a separate unit for data analysis.

In addition, colony condition was recorded, noting whether partial mortality, fragmentation, bleaching, and/or growth anomalies were present. Each colony that had undergone complete fission was also noted, sized as if the colony were whole across parts, and its percent of live/dead tissue visually estimated. Fission is the partial mortality of a coral colony that results in separation of a colony into pieces that are genetically identical (*i.e.*, ramets) and remain attached to the substratum. Unattached fragments were also noted and sized separately. Gross growth anomalies and/or anomalous patterns of tissue loss by taxa were photographed if encountered.

Non-coral Macroinvertebrate Survey Protocols

The non-coral macroinvertebrate and algal diver (Dr. Nadiera Sukhraj) conducted counts for non-coral macroinvertebrates while following the coral diver. The diver swam along the 25-m transect line and counted and identified unattached non-coral macroinvertebrates 1-m to either side of the line to the lowest possible taxonomic level. Time limitations reduced the ability to search for organisms in crevices and cavities, and turbidity reduced visibility in some cases. It is therefore likely the survey observations are an underestimate of true species density and diversity. Each transect (i.e. the station) is treated as a 50 m^2 (25-m x 2-m) unit for data analysis.

Benthic Cover Survey Protocols

The non-coral macroinvertebrate and algal diver conducted benthic cover surveys as well as counts for non-coral macroinvertebrates while swimming back along the transect line. The diver placed three 0.5 m x 0.5 m (0.25 m^2) quadrats at three pre-determine points (5, 12, and 20 m mark) on the reef substrate along each of the 25-m survey transect line at each station. Using a point-intercept method, the diver identified all benthic taxa (*e.g*., marine plants, urchins, sponges) and abiotic components (*e.g*., rock, sand, mud) under each point and assigned each point a value of one (1) on the data sheet. If two benthic components existed under a point, each component was assigned a 0.5 value. For example, if the point fell on a coral colony that was colonized with sponge, coral would receive 0.5 and sponge would receive 0.5. Each quadrat contained of grid of 25 equally spaced points. There were a total of 75 points assigned at each station and these data were used to estimate the percent of benthic cover. Each quadrat is treated as a separate unit for data analysis.

Algae and non-coral macroinvertebrates were identified to the lowest possible taxonomic level in the field, but it was generally not possible to achieve the same level of taxonomic resolution for some groups (e.g. sponges) as was possible for other groups. No samples or specimens were collected. Photos of each photoquadrat were taken and archived for reference, but not used or analyzed for this report.

Intertidal Survey Protocols

Protocols for intertidal stations mirrored the above protocols, but only conducted the macro-invertebrate, fish density (no size data was collected), and benthic cover protocols while walking through the intertidal zone. The fish and macro-invertebrate surveys were completed by an expert in intertidal communities (Dr. Caitlin Shishido) and the benthic cover data was collected by Dr. Sukhraj.

DESCRIPTION OF FISH AND WILDLIFE RESOURCES AND HABITAT

General

Appendix A contains 10 maps depicting the habitats and biological resources within and around the Haleiwa Beach Park area.

- Figure A1 shows the Project Area.
- Figure A2 shows the area observed within the Project Area, highlighting the area directly observed versus not observed.
- Figure A3 shows the size and length of the dive tracks of the survey
- Figures A4 to A7 show the habitat zones, habitat major structures, sediment types, and habitat structures, respectively.
- Figure A8 shows the habitat structure clipped by Alternative 5.
- Figure A10 shows the location of debris.
- Figure A11 shows the location of protected species observed.

Appendix D, E, and F contains 10 (11 maps in Appendix F) maps depicting the habitats and biological resources within and around the Haleiwa Beach Park area.

- Figures D1, E1, F1 shows the Project Area.
- Figures D2, E2, F2 shows the area observed within the Project Area, highlighting the area directly observed versus not observed.

- Figures D3, E3, F3 shows the size and length of the dive tracks of the survey
- Figures D4–D7, E4–E7, F4–F7 show the habitat zones, habitat major structures, sediment types, and habitat structures, respectively.
- Figures D8, E8, F8 shows the habitat structure clipped by Alternative 5.
- Figures D10, E10, F10 shows the location of debris.
- Figures D11, E11, F11 shows the location of protected species observed.
- Figure F13 shows that coral morphology present

Details for each of these maps are discussed below. Not all figure numbers are sequential, because certain standardized maps were not appropriate or available for this project and subsequently not included in this report.

Table 3 shows the breakdown of Project Area (surveyed area) measurements for different habitat structures, zones, and sediment types. The total area is 43,765 m^2. It consists of three habitat zones: Land (4,538 m^2 or 10.4%), Shoreline Intertidal (5,977 m^2 or 13.7%), and Reef Flat (33.250 m^2 or 76%). The major geomorphological habitat structures of the area consist of 7,743 m^2 of Hard Bottom (17.7%), 24,274 m^2 of Mixed Bottom (55.5%), 7,210 m^2 of Unconsolidated Sediment (16.5%), and 4,538 m^2 of Land (10.4%). In the Unconsolidated Sediment areas, the sediment type consists of sand or sand/rubble mix. The geomorphological habitat structures of the artificial reef area consist of: 1) Pavement (7,743 m^2 or 17.7%), 2) Scattered Coral/Rock in Unconsolidated Sediment (24,274 m^2 or 55.5%), 3) Unconsolidated Sediment (7,210 m^2 or 16.5%), and 4) Land (4,538 m^2 or 10.4%). These habitat structures correspond exactly to the hard (represented by only Pavement), Mixed (represented only by Scattered Coral/Rock in Unconsolidated Sediment), and Unconsolidated Sediment major habitat structures. The Project Area represents the area surveyed and does not reflect sizes of alternatives or the total impact area. While the Project Area was intended to cover the likely area of both direct and indirect effects, it may be larger or smaller than actual impacts.

As described in the methods, the project area was split into five distinct strata for the purposes of the developing a quantitative sampling design. The description of the marine resources within this area will highlight those specific strata.

Sand

Habitat Characteristics

This stratum was characterized as sand and a sand/rubble mixture as shown in Figure 3 and Appendix A – Figure A6. However, quantitative evaluation of the bottom cover of this area shows 65% of the cover was mud and 33% was sand. The discrepancy is most likely a result of the low visibility during the mapping surveys and the specific locations of the three transects used to characterize the habitat. This area was entirely in the southern portion of the project area next to the southern groin bounding the beach park. The high percentage of mud is likely due to the area's proximity to the mouth of the Anahulu River.

Biological Resources

This area was fairly depauperate except for a few organisms observed on one transect. This transect (Sand-17, Appendix B - Figure B17) extended, in the last few meters, into the Scattered

Coral/Rock in Unconsolidated Sediment stratum (Figure 9). It is important to note that these surveys did not investigate the infaunal community, so the true diversity of the community is not considered at all biological community scales.

Pavement

Habitat Characteristics

This stratum was characterized by a low rugosity (1.03) hard bottom area. This area was mostly located in the northern section of the project area with some Pavement found adjacent to the middle section as shown in Figure 3 and Appendix A – Figure A5. Quantitative analysis of bottom cover consisted of 32% uncolonized hard bottom, 29% sand, and 6% rubble. Sand was sparsely interspered across the Pavement stratum, but did not constitute the underlying structure of the habitat.

Biological Resources

The biological diversity of the Pavement area was generally low compared to most coral reef areas. Four species of algae, 6 species of stony coral, 6 species of fishes, and 27 species of invertebrates were observed in this area (Figure 10). Of the corals observed, the most dominant species was *Psammocora stellata* (0.44 colonies/m^2), which is a small branching coral usually not attached to the substrate and most were small colonies of less than five centimeters (cm). It was abundant on some transects (Pav-11 and Pav-13). The two most dominant invertebrate species were the rock boring urchins, *Echinometra mathaei* (1.75 individuals/m^2) and *Echinometra oblonga* (0.46 individuals/m^2). The most abundant fish species was *Acanthurus nigrofuscus* (0.02 individuals/m^2 and 0.03 tonnes per hectare), which is a valuable fish for human consumption. However, the abundance of this species was very low compared to other coral reefs in Hawaii.

Green sea turtles, *Chelonia mydas*, were also regularly seen foraging and resting within this area (Appendix A – Figure A11).

Scattered Coral/Rock in Unconsolidated Sediment

Habitat Characteristics

This stratum was characterized by a slightly higher rugosity than the Pavement stratum, but still had a relatively low value of 1.09. This area was the most dominant habitat type through the project area (58%; Table 3). Most of the area consisted of small rocks (larger than rubble) and scattered hard bottom pavement mixed with sand (35%) and rubble (40%; Figure 11).

Biological Resources

The biological diversity of this stratum was slightly higher than the Pavement stratum, with 5 species of algae, 10 species of coral, 32 species of invertebrates, and 5 species of fishes. The most abundant alga observed was the non-native alga, *Acanthophora spicifera* at 13%. The top five coral species were *Pocillopora damicornis* (0.12 colonies/m^2), *Psammocora stellata* (0.11 colonies/m^2), *Porites lobata* (0.09 colonies/m^2), *Leptastrea purpurea* (0.08 colonies/m^2), and

Montipora capitata (0.07 colonies/m^2). The most abundant invertebrate was *Echinometra mathaei* (0.4 individuals/m^2). The three most abundant fishes were *Stethojulis balteata* (0.005 individuals/m^2 and 0.009 tonnes per hectare), *Acanthurus nigrofuscus* (0.004 individuals/m^2 and 0.009 tonnes per hectare), and *Rhinecanthus rectangulus* (0.001 individuals/m^2 and 0.015 tonnes per hectare). All of these abundances are relatively low compared to typical Hawaiian coral reefs.

Green sea turtles, *Chelonia mydas*, were also regularly seen foraging and resting within this area (Appendix A – Figure A11).

Shoreline Intertidal - Rocky

Habitat Characteristics

This stratum was characterized predominantly hard bottom (66%; Figure 12) area along the intertidal section of the coastline which is exposed air during low tide periods. The rugosity of this stratum was the highest observed at the project site due to boulders and large rocks along the shoreline (1.21). The rugosity varied depending on the exact location and depth within this zone and hence influenced on the community described below. There were two main sections of this stratum along the project area (Figure 3 and Appendix A – Figure A4). One section was in front the Haleiwa Beach Park parking lot, while the other was in front of the comfort station pavilion. These two sections were slightly separated by a small sandy/rocky beach.

Biological Resources

The biological diversity of this stratum was similar to the Pavement stratum with 2 species of algae, 22 species of invertebrates, and 3 species of fishes. No coral or fish size data was collected in this stratum, and no coral colonies were observed during the invertebrate counts. While the species richness was similar to other strata, the community species composition of this stratum was distinct. The most dominant invertebrate species were *Nerita picea* (10.2 individuals/m^2), a small intertidal gastropod snail, an unidentified Gastropod egg species (4.6 m^2), *Echinometra oblonga* (3.2 individuals/m^2), and *Siphonaria normalis* (2.8 individuals/m^2), a limpet or false opihi. *Nerita picea* was present predominantly as juveniles, and based on similar summertime surveys around Oahu, the observed density and ratio of juvenile to adults for this species has only been documented at two other sites (C, Shishido, Pers. Obs.) The majority of the unidentified Gastropod eggs observed may have been eggs of *N. picea*. The three fish species present were *Acanthurus triostegus* (0.08 individuals/m^2), *Gnatholepis knighti* (0.05 individuals/m^2), and *Istiblennius zebra* (0.02 individuals/m^2). *Acanthurus triostegus* is an important herbivore and valuable fish for human consumption. While size data was not collected, the individuals observed were juveniles indicating this habitat may be a nursery area for this species (Sale 1969). This species was not observed on transects in the other strata, but was broadly present.

Shoreline Intertidal - Sandy

Habitat Characteristics

This stratum was characterized as predominantly sand (86%) and rubble (11%) with a small amount of hard bottom (4%; Figure 13). The rugosity was very low at 1.01, which is typical of sandy areas. This stratum was present in three sections (Figure 3 and Appendix A – Figure A4): in the northern section of the project area near the inside parking lot; a small section in between the Shoreline Intertidal – Rocky stratum; and as a large section in the southern portion of the project area that represents the majority of the recreational beach used by the community. The limited hard bottom habitat observed in this stratum represents the area where the biological resources were observed.

Biological Resources

The biological diversity within this stratum was very low, with no corals observed (they were not enumerated in the methods), no algae species, no fish species, and nine invertebrate species. Of the invertebrates observed, the four most dominant ones counted were an unidentified gastropod egg species (2 individuals/m^2), *Anthopleura nigrescens* (1.4 individuals/m^2), *Siphonaria normalis* (0.9 individuals/m^2), and *Nerita picea* (0.4 individuals/m^2). These invertebrates were only observed on the exposed rocks within the sandy area. It is important to note that these surveys did not capture the infaunal community, so the true diversity of the community is not considered at all biological community scales.

Green sea turtles, *Chelonia mydas*, were not observed on the beach within this area (Appendix A – Figure A11). Additionally, basking turtles have not been observed at Haleiwa Beach Park during the summer of 2020 based on U.S. Fish and Wildlife Service data. However, basking turtles are common at Haleiwa Alii Beach Park and Puaena Point Beach Park as well as around the mouth of Anahulu River (Sheldon Plentovich, pers. comm.).

Offshore Sand Area

Habitat Characteristics

This area consists entirely of sand except for a small area well outside the dredge footprint (Table 4; Appendix D – Figures D4–D8). The sand within this area appeared to be high quality beach sand (Appendix D – Figures D6).

Biological Resources

The diversity of this area was very low with few benthic organisms observed. We did not survey the infaunal community and it is expected there may be many mollusks and other infaunal communities present

Sand Deposition Area between Groins

Habitat Characteristics

This area consists of Unconsolidated Sediment sand and mud spanning from the water to areas above the high water mark (Table 4; Appendix F – Figures F4–F8). The sediment in this area consists of a mixture of sand and mud (Appendix F – Figures F6).

Biological Resources

The diversity of this area was very low with few benthic organisms observed.

Federal Channel

Habitat Characteristics

The outer portion of the federal channel consists of Unconsolidated Sediment as well as Scattered Coral/ Rock in Unconsolidated Sediment. The Scattered Coral/ Rock in Unconsolidated Sediment is mostly dominant in the outer portion while the central portion of the federal channel mostly consists of Unconsolidated Sediment (Table 4; Appendix F – Figures F4–F8). The sediment in this area varies across the channel with sand in the central section and a mixture of sand/mud or mud/rubble in other areas (Appendix F – Figures F6).

Biological Resources

The federal channel area has algae cover on the hard surfaces and coral colonies in the adjacent areas. There were large coral colonies (approximately 2 meters in diameter) outside the federal channel, but within the area in which dredge barges or other equipment may work or anchor. The location of these colonies are shown in Appendix F – Figure F13.

Barge Sand Offload Area

Habitat Characteristics

This area consists entirely of mud and leaf litter with no hard habitat structures present. Occasional driftwood debris was observed. A small area adjacent to the groin included sand that appeared to be leaking through the groin. (Table 4; Appendix E – Figures E4–E8). The sediment in this area is almost entirely mud with some sand adjacent to the groin (Appendix E – Figure E6).

Biological Resources

The diversity of this area was very low with few benthic organisms observed. No corals were observed and a few small mollusks were observed near the groin and an occasional anemone in the mud.

DESCRIPTION OF ALTERNATIVES UNDER CONSIDERATION

The proposed project is the beneficial reuse of dredged sand along the beach to re-nourish the shoreline at Haleiwa Beach Park, Oahu. The sand sources include the federal channel of the Haleiwa Small Boat Harbor, a sand deposition area to the west of the federal channel (~2,000 cubic yards), and an offshore sand location as shown in Figure 4. The sand source areas are not considered as individual alternatives, but rather project components that serve as potential sources of suitable quality beach sand. The components described in this report and the various sand placement alternatives do not match actual project alternatives analyzed by the USACE in the Integrated Feasibility Report and Environmental Assessment.

The offshore sand area represents an area of 6,698 m^2 while the shoaling of sand between the stub groin and the outer groin represents an area of 1,211 m^2. The federal channel represents an area of 8,250 m^2, but the entre channel is not slated to be dredged. Additionally, an area next to the southern groin at Haleiwa Beach Park may need to be dredged in order to efficiently offload dredged sand to the beach area. The estimated area by the USACE is 2,226 m^2.

The location for placement of sand along Haleiwa Beach will be determined by the amount of sand available from the above-mentioned sand sources. In order to assess the potential impacts of sand placement, the USACE has determined five potential sand placement alternatives. These alternatives are approximate and meant for scaling purposes and not exact delineation of sand placement. The five alternatives show a greater area of sand placement on the beach with Alternative 1 being a No Action alternative, and Alternatives 2 through 5 being the placement of sand from a small portion of the beach (Alternative 2) to the entire length of the beach (Alternative 5; for the size and location of the alternatives, please see Figures 5–8). The area of the alternatives (Table 2) include: 4,660 m^2 for Alternative 2, 6,356 m^2 for Alternative 3, 8,685 m^2 for Alternative 4, and 18,003 m^2 for Alternative 5.

PROJECT IMPACTS

The primary impacts from this project include the direct impact to benthic resources from the placement of sand along the coastline, as well as the indirect effects from sand shifting and migration after initial placement of sand. The direct impacts are straightforward, as the sand placement will cover portions of the project area. Of the strata assessed, the Shoreline Intertidal – Rocky stratum will be impacted most significantly. Of the estimated 2,907 m^2 of Shoreline Intertidal – Rocky area, the direct impacts to this area will be 1,506 m^2, 1,556 m^2, 2,088 m^2, and 2,799 m^2 for Alternatives 2, 3, 4, and 5, respectively. This represents impacts to 51%, 53%, 72%, and 96% of this area, respectively. Alternative 5 would remove the vast majority of this habitat from the rocky shoreline intertidal area. While surveys were not conducted in other shoreline intertidal areas, this would be expected to represent a significant impact to those marine resources. Given the depth profile of this area and its hard bottom characteristics, any sand placed in this area may not remain long, as high tides and higher swells could erode this section first. Sand placement in this area would have a large impact to the intertidal community, but may not persist, nor achieve its purpose of facilities protection. Of the resources present, the most significantly impacted would be juvenile *A. triostegus,* which use the hard bottom Shoreline Intertidal as a nursery and grazing area.

Impacts to corals are anticipated to be minimal across the area proposed in Alternative 5. However, the transect Pav-13 is within the footprint of Alternative 5 and had three species of corals: *Psammocora stellata* (0.28 m^2), *Leptastrea purpurea* (0.08 m^2), and *Pocillopora damicornis* (0.08 m^2). In order to calculate the number of colonies impacted, more analysis of the size of that specific area and additional transects may be needed, since only a single transect counted corals within this specific area. However, a rough estimate of that specific area indicates approximately 477 colonies would be impacted (304 colonies of *Psammocora stellata*, 87 colonies of *Leptastrea purpurea*, and 87 colonies of *Pocillopora damicornis*). Of these, approximately 90% of the colonies are less than 5 cm, and 10% are between 6 and 10 cm in size. *Psammocora stellata* was petitioned to be listed under the endangered Species Act in 2014, but ultimately NMFS decided to not list this species.

The assessment of these impacts assumes that sand will not drift beyond the estimated boundary of the Alternative 5 footprint, nor to the north. Based on current sand deposition patterns, this may be a valid assumption, but future impacts to offshore areas may occur.

The impacts associated with the offshore sand dredging should be minimal if the operation is kept within the proposed boundaries. Corals are present in the nearby vicinity, but are far enough away that minimal to no impact should occur with proper sedimentation control measures.

The impacts associated with the sand deposition area near the channel should also be minimal if proper sediment control measures are taken. The habitat structures are more complicated within the outer federal channel because a mixture of Unconsolidated Sediment and hard bottom exists. Where hard bottom exists, coral colonies are often present. Within this portion of the federal channel, there were very few coral colonies within the federal channel limits. However, there were a few colonies of significant size (approximately 2 meters in diameter) in between the federal channel and the small sand deposition area. There is a reasonable chance these large colonies could be impacted without minimization measures. The location of these colonies is shown in Appendix F – Figure F13. Depending on conditions, these colonies are partially visible from the surface.

The impacts in the area of the barge sand offloading are expected to be minimal and discountable. Impacts associated with the operations in this area can be further minimized with proper sediment control measures.

State of Hawaii, Division of Aquatic Resources Concerns

Additional consideration of project impacts should include resources regulated under the State of Hawaii authority. These include all stony corals and live rock (see Appendix G). In this study, any hard bottom or rubble would likely qualify under the State of Hawaii's definition of live rock, and hence subject to State of Hawaii's jurisdiction for regulated resources. Table 5 shows the percent cover of hard bottom, rubble, and coral, and thus indicates the amount of live rock and coral that may be subject to State of Hawaii regulatory consideration. Table 6 shows the coral density across the various strata. Size class data also exists, but is not shown within Table

6. With refined estimates of the size and location of sand placement, additional calculations can be made to assist with navigating the State of Hawaii regulatory process.

If impacts to State of Hawaii regulation resources are not avoided, the USACE will need to make a determination that the impact to these resources cannot be avoided and minimized and may be subject to acquiring a Special Activity Permit from the Department of Land and Natural Resources. The Special Activity Permit may require transplantation of corals and live rock to a nearby site. For resources that cannot be transplanted, DAR may require as a condition of the permit an offset of these losses, possibly involving restoration of the coral and live rock in another area.

RECOMMENDATIONS

Based on the description of resources within the project area, the Service provides the following recommendations.

1) The Service recommends that measures be taken to minimize water from discharging back into the coastal area that could create a sediment plume. It is possible that placement of sand may occur directly from the water to the beach area. Minimization measures such as sand berms should be used to slow and pool water on the beach. In addition, silt curtains should be used to minimize sediment generated from the dewatering of dredged sediment.

2) The Service recommends avoiding placing sand in the Shoreline Intertidal – Rocky stratum given the unique intertidal community documented. Sand placement should avoid the northern section of the project area based on the amount of Shoreline Intertidal community impacted, and specifically a higher density of corals in the northern Pavement stratum. While the number of corals is generally low, more sand placement in this section may have increased impacts to the limited coral community.

3) The Service recommends that the amount of sand placed in the northern section and in the Shoreline Intertidal – Rocky stratum should be limited, or only nourished to the extent that is needed to protect the shore-side structures. Alternatives to sand should also be explored to protect the structures, but also maintain the integrity of the intertidal community.

4) The Service also recommends that annual quantitative surveys be conducted for a minimum of five years post sand placement in order to document the changes to the marine communities. This effort can also show any effects of movement of sand across the area and help determine if future re-nourishment initiatives will have continuing impacts.

5) During all dredging operations, sufficient sediment control measures must be taken. The proposed dredge areas are known for low water clarity, but sediment curtains and turbidity monitoring should be incorporated to minimize impacts to resources. We further recommend that some baseline turbidity monitoring be conducted in the area during

various weather cycles in order to develop appropriate turbidity thresholds to be used during dredging operations.

6) Extra measures must be taken to avoid impacts to large coral colonies adjacent to the small boat harbor federal channel shown in Appendix F – Figure F13. This small area should be delineated daily by small buoys if the barge is required to be anchored or will routinely move around the area.

7) The groin that is on the southern boundary of Haleiwa Beach Park should be grouted to minimize sand leaking through the boulders. This will help to retain the beach with less maintenance required.

8) All of the potential sand source areas should undergo extensive sediment and coring analysis. The surface sediment observed in the barge access area and the federal channel seem to consist mostly of mud and does not appear to be of suitable quality for a beach. Excess material that is not suitable for deposition on the beach will need to be disposed of in another manner and this will likely increase costs associated with the project.

9) DAR recommends the following:

    a) Make a formal determination of the areas that can be avoided, or not, and work with them to determine if a Special Activity permit can be issued or will be required;
    b) Provide more information on the potential increased turbidity in the area and the potential movement of such turbidity;
    c) Initiate a public outreach and education effort to effectively document and attempt to mitigate any on-going concerns brought forward from the community or local fisherman;
    d) Provide more details of the project delineation and the footprints of these areas as the project moves from the Feasibility Study to the Design Phase; and
    e) Provide BMPs which will minimize sedimentation and turbidity during the nourishment activities.

SUMMARY AND FWS POSITION

The Service conducted extensive surveys across the nearshore area of Haleiwa Beach Park to document the natural resources within the area and the potential impacts associated with adding supplemental sand to the beach. Overall, the diversity of marine resources within this area was low and coral numbers were low compared to other areas in Hawaii. Within this area, the majority of corals were found in the northern section and represent an area where avoidance and minimization measures should be undertaken. The Service further documented the intertidal community across the area and notes that sand placement will have a significant impact to the Shoreline Intertidal – Rocky habitat. To minimize negative impacts associated with adding additional sand along the beach area, the Service recommends avoiding sand addition in the northern section of the beach park and minimizing the sand placement across the rocky portions of the intertidal communities. The overall position of the Service is supportive of the project moving forward, while incorporating all appropriate minimization measures.

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FIGURES

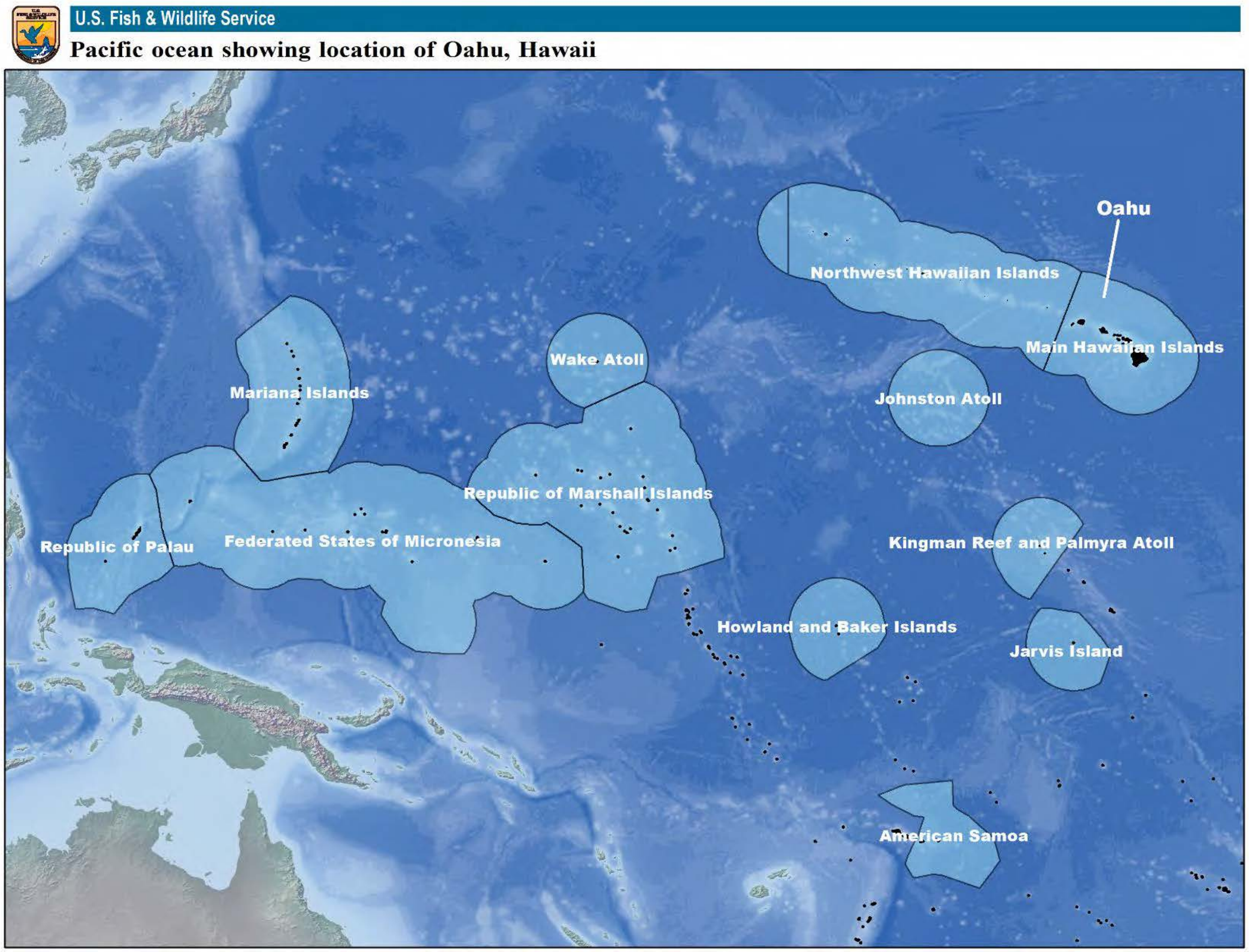

Figure 1: Pacific Ocean. Map of the Pacific Ocean showing the location of Oahu, Hawaii.

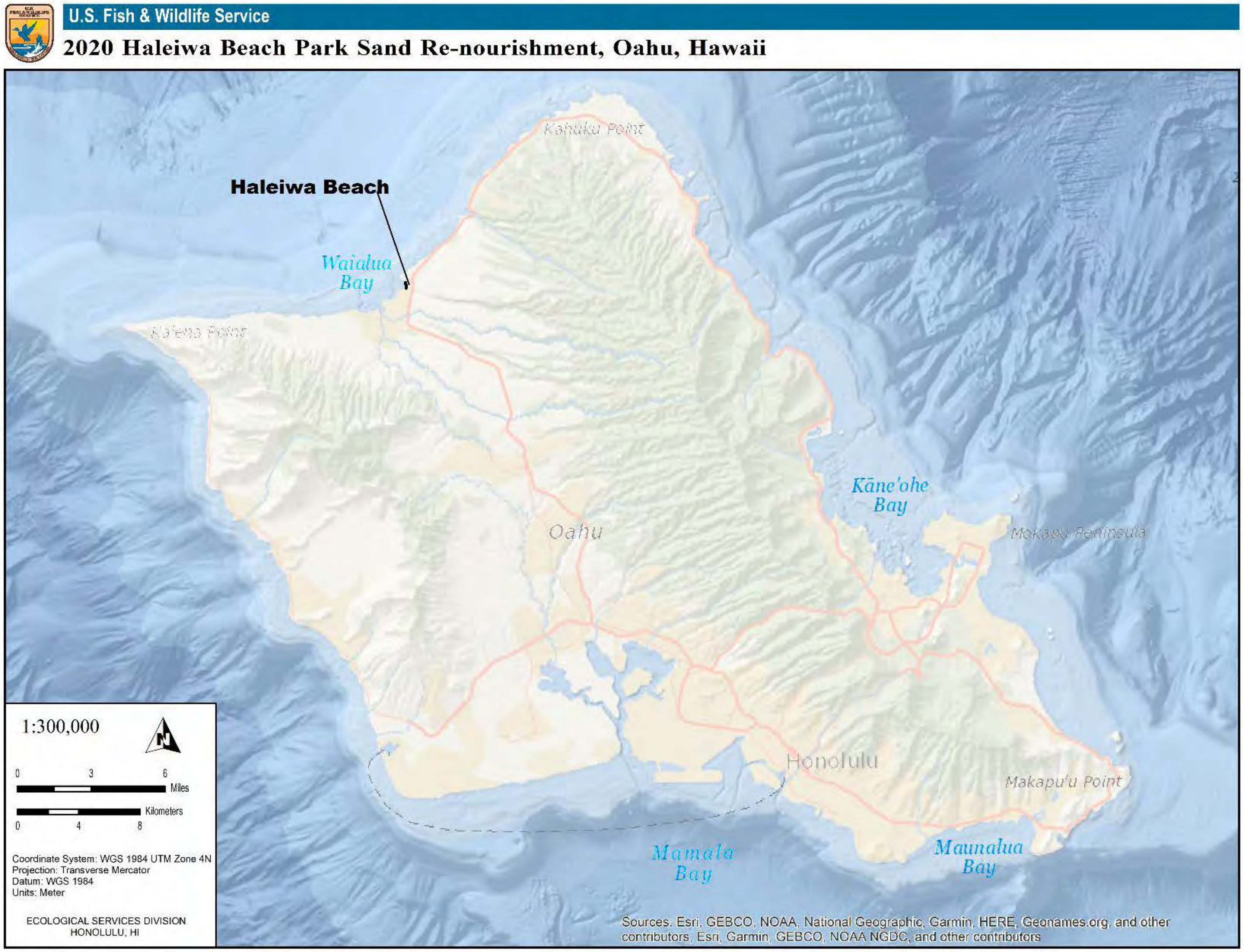

Figure 2: Oahu, Hawaii. Map of Oahu, Hawaii showing the location of Haleiwa Beach Park.

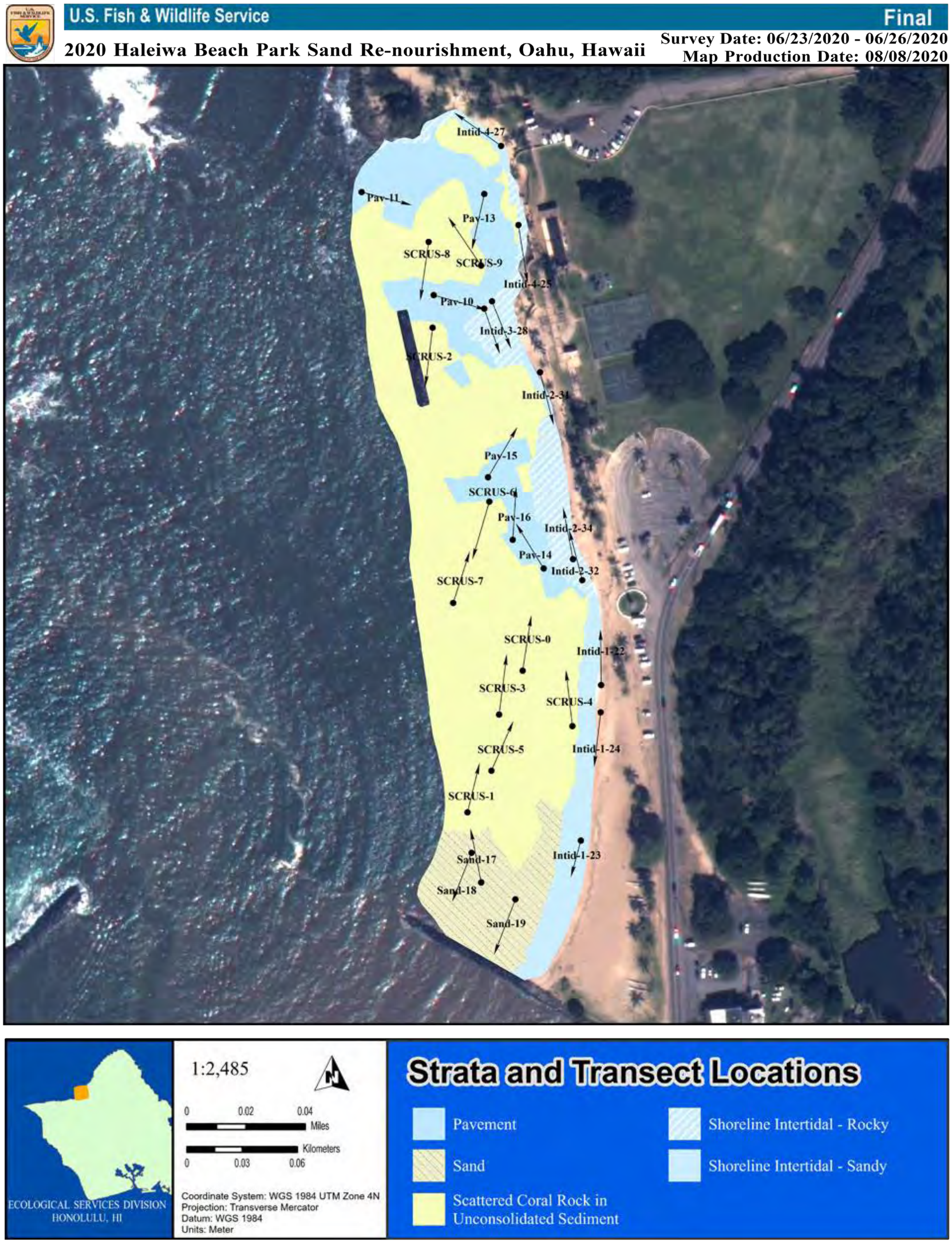

Figure 3: Strata and Transect Locations. The strata and transect locations surveyed for the project.

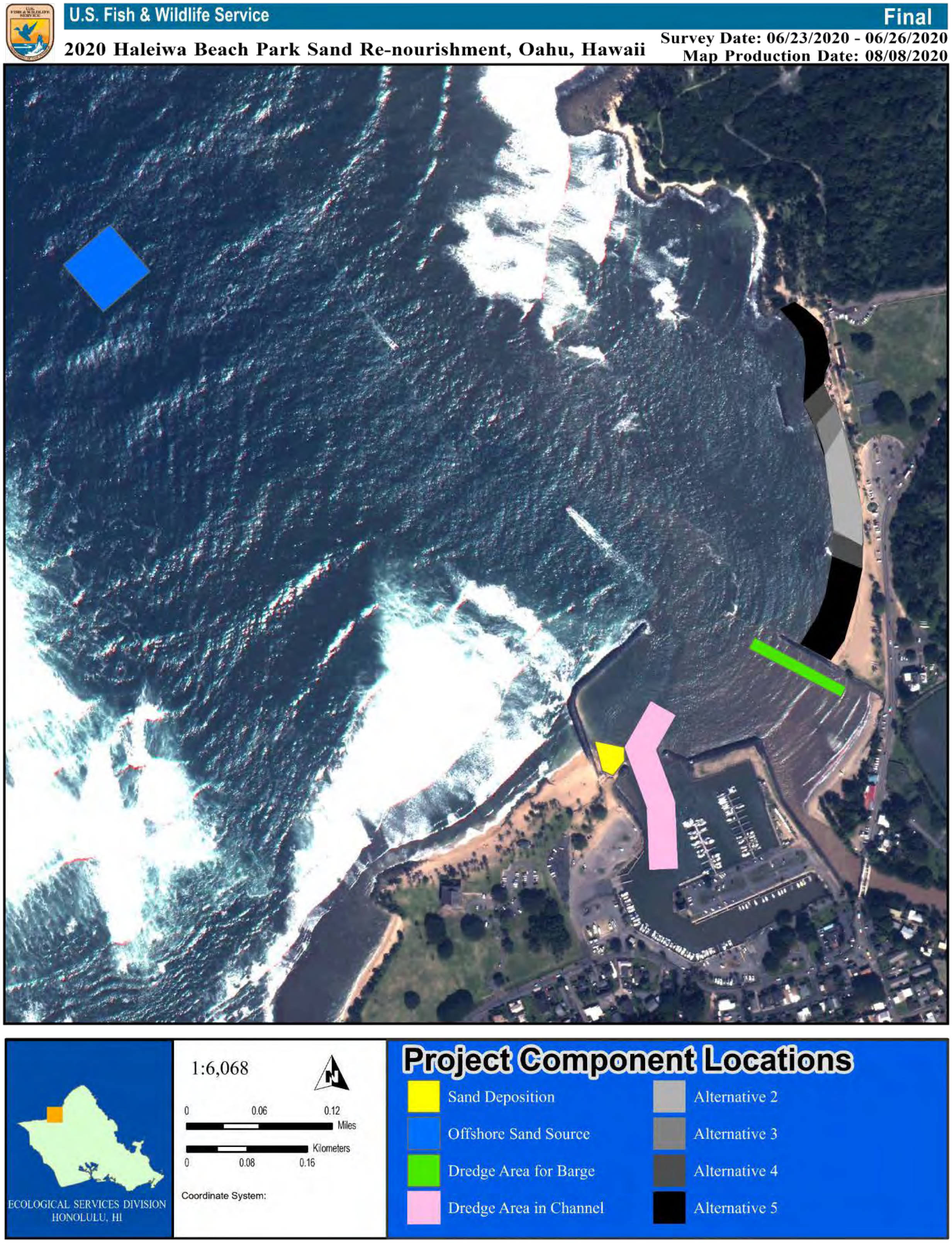

Figure 4: Project Components. The various project components for the beach re-nourishment project.

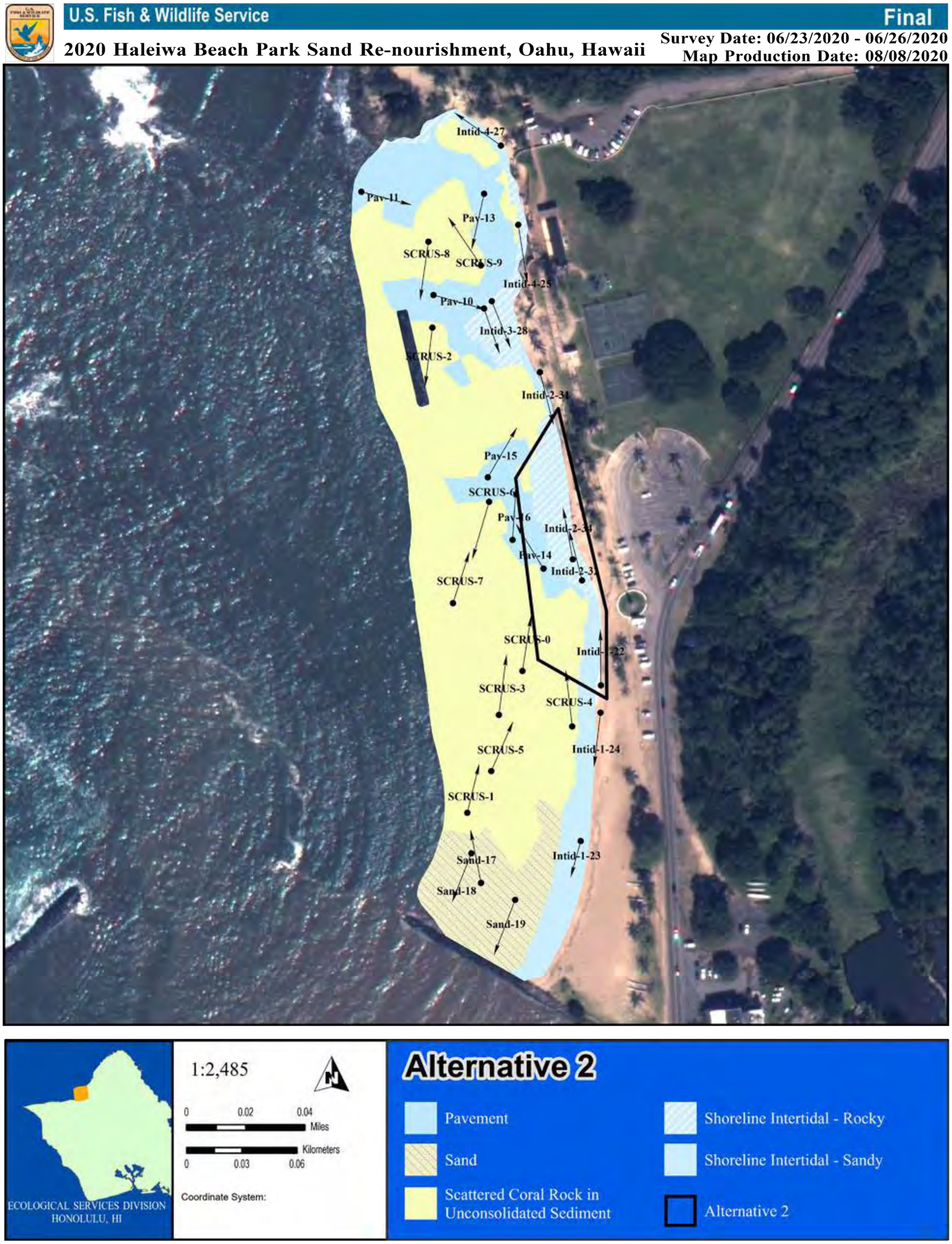

Figure 5: Alternative 2. The strata and transect locations in relationship to Alternative 2.

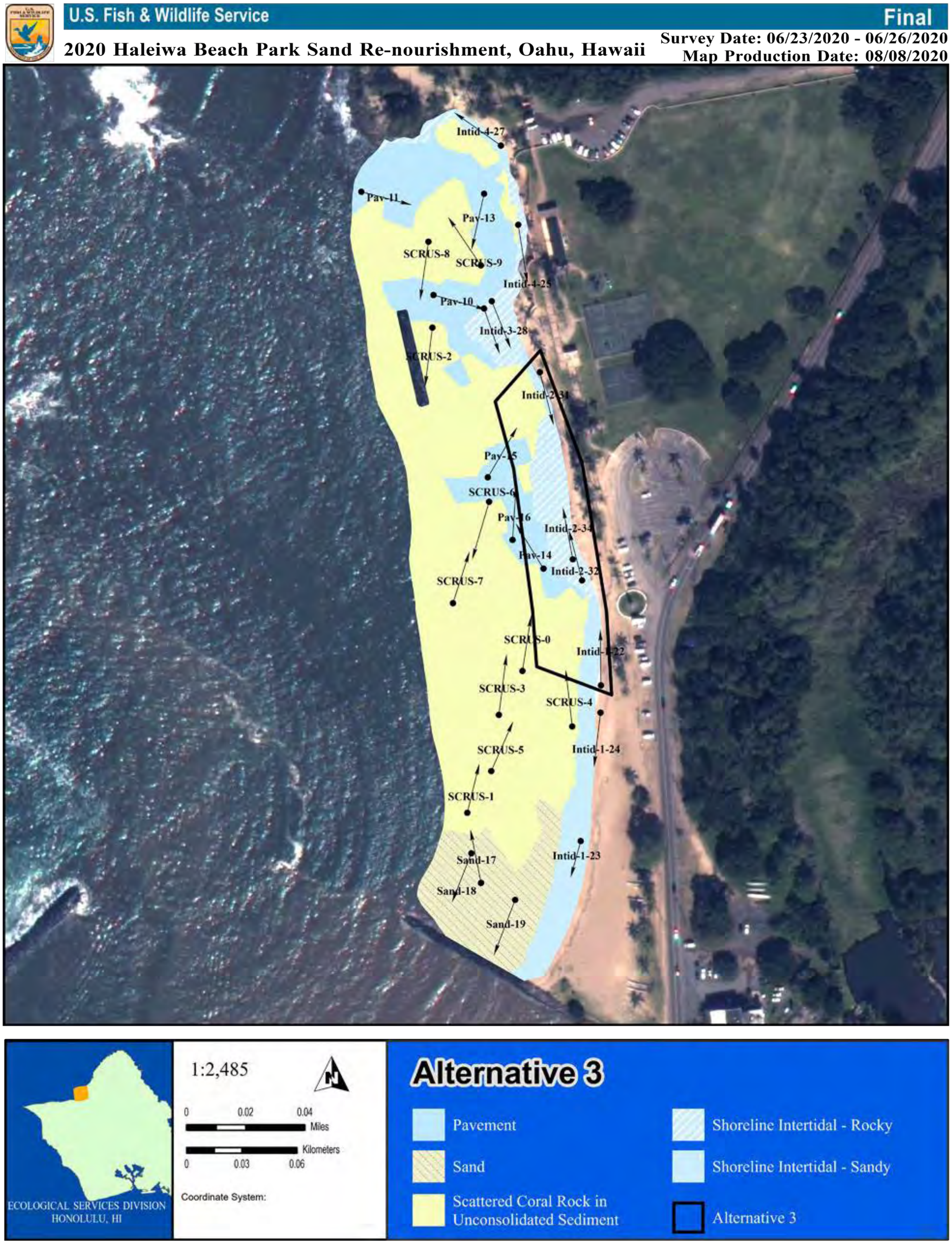

Figure 6: Alternative 3. The strata and transect locations in relationship to Alternative 3.

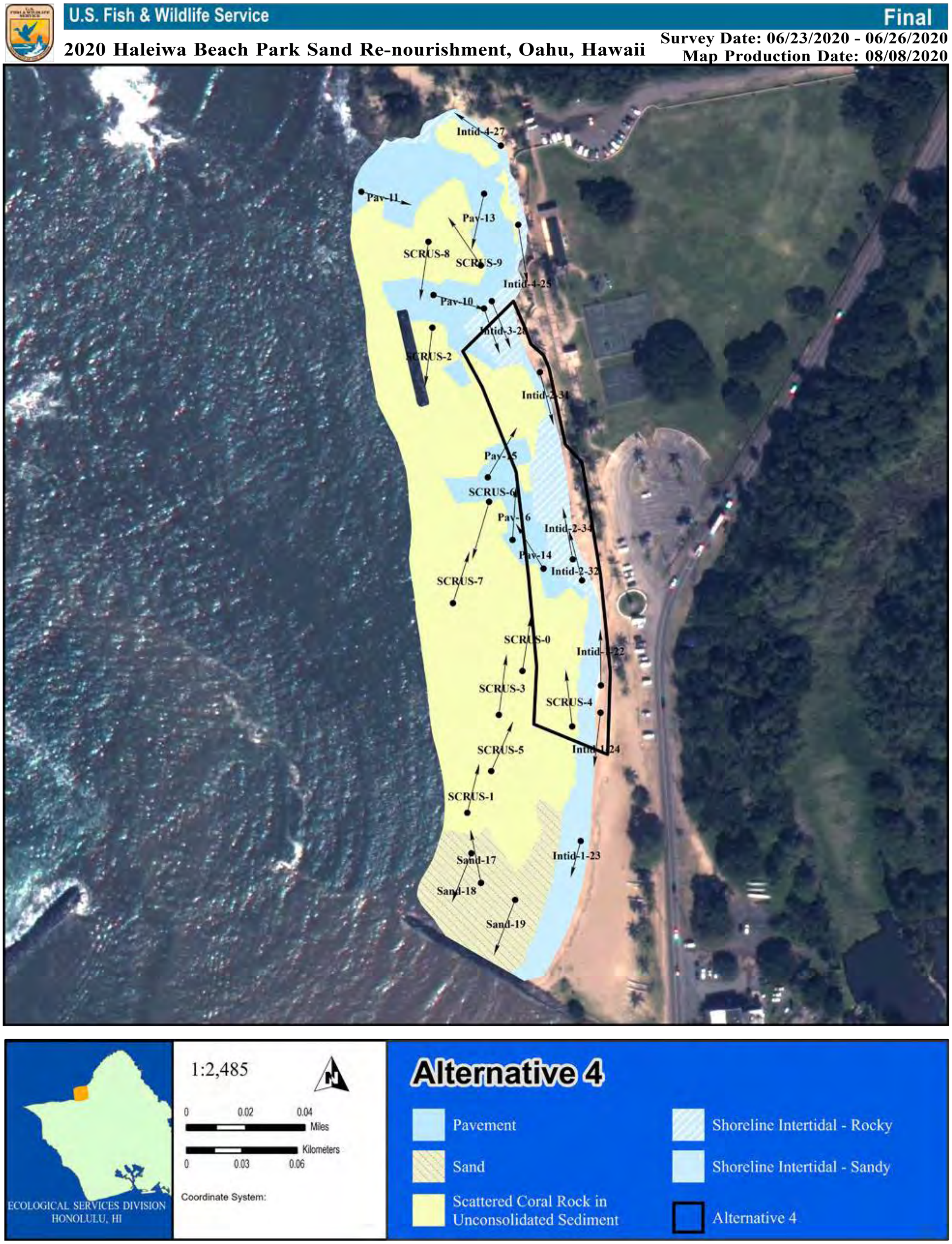

Figure 7: Alternative 4. The strata and transect locations in relationship to Alternative 4.

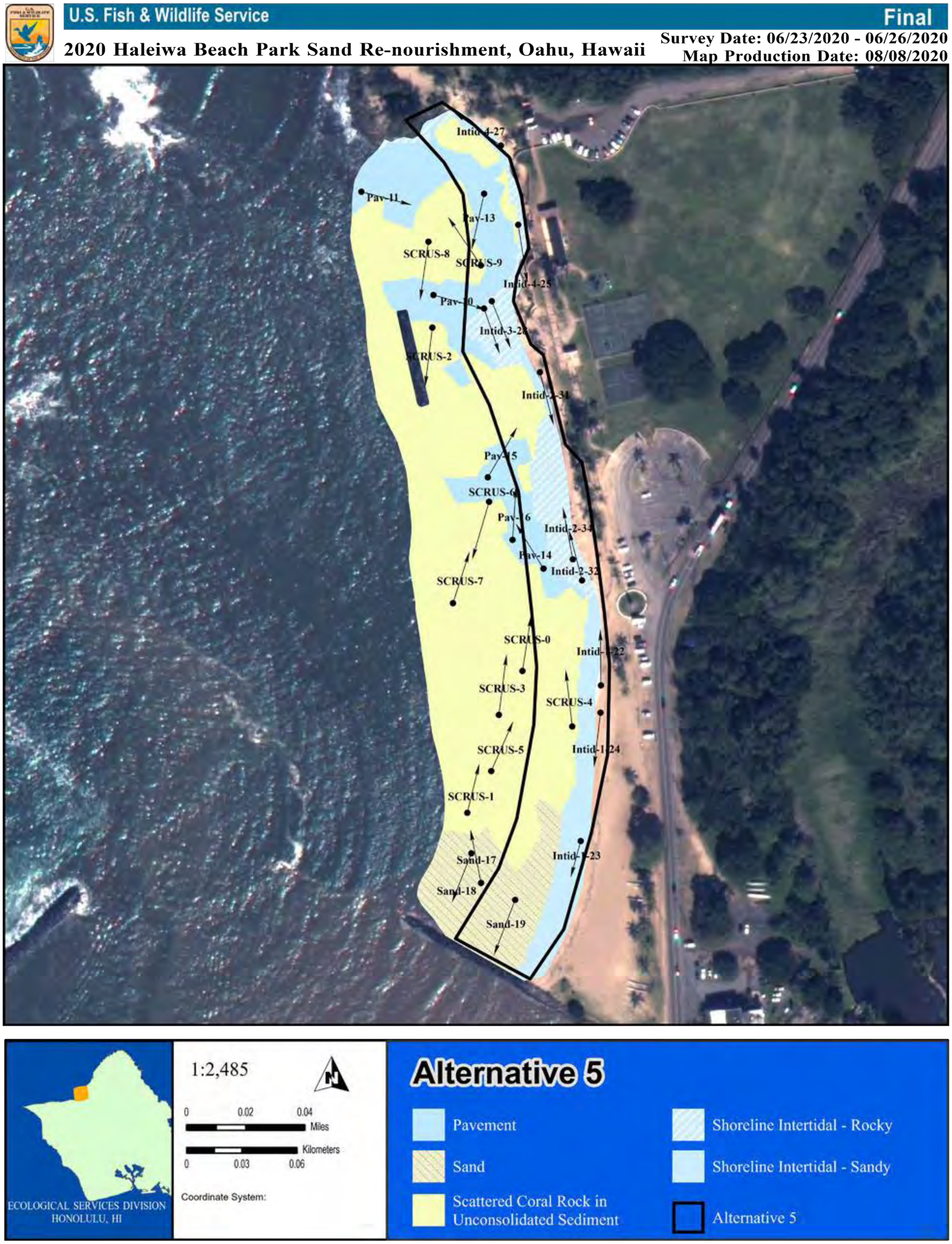

Figure 8: Alternative 5. The strata and transect locations in relationship to Alternative 5.

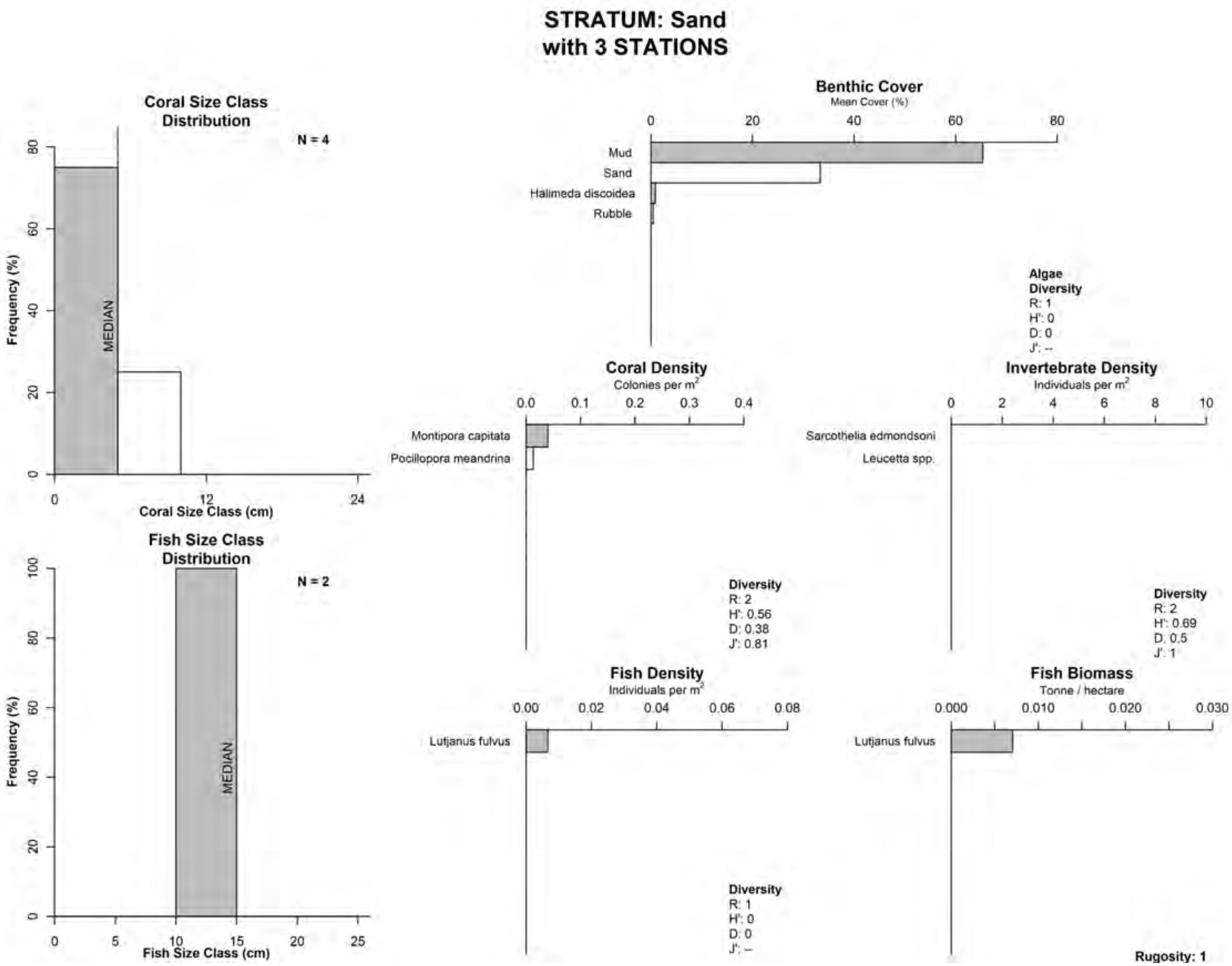

Figure 9: Stratum Sand. Biological characterization for the Sand stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

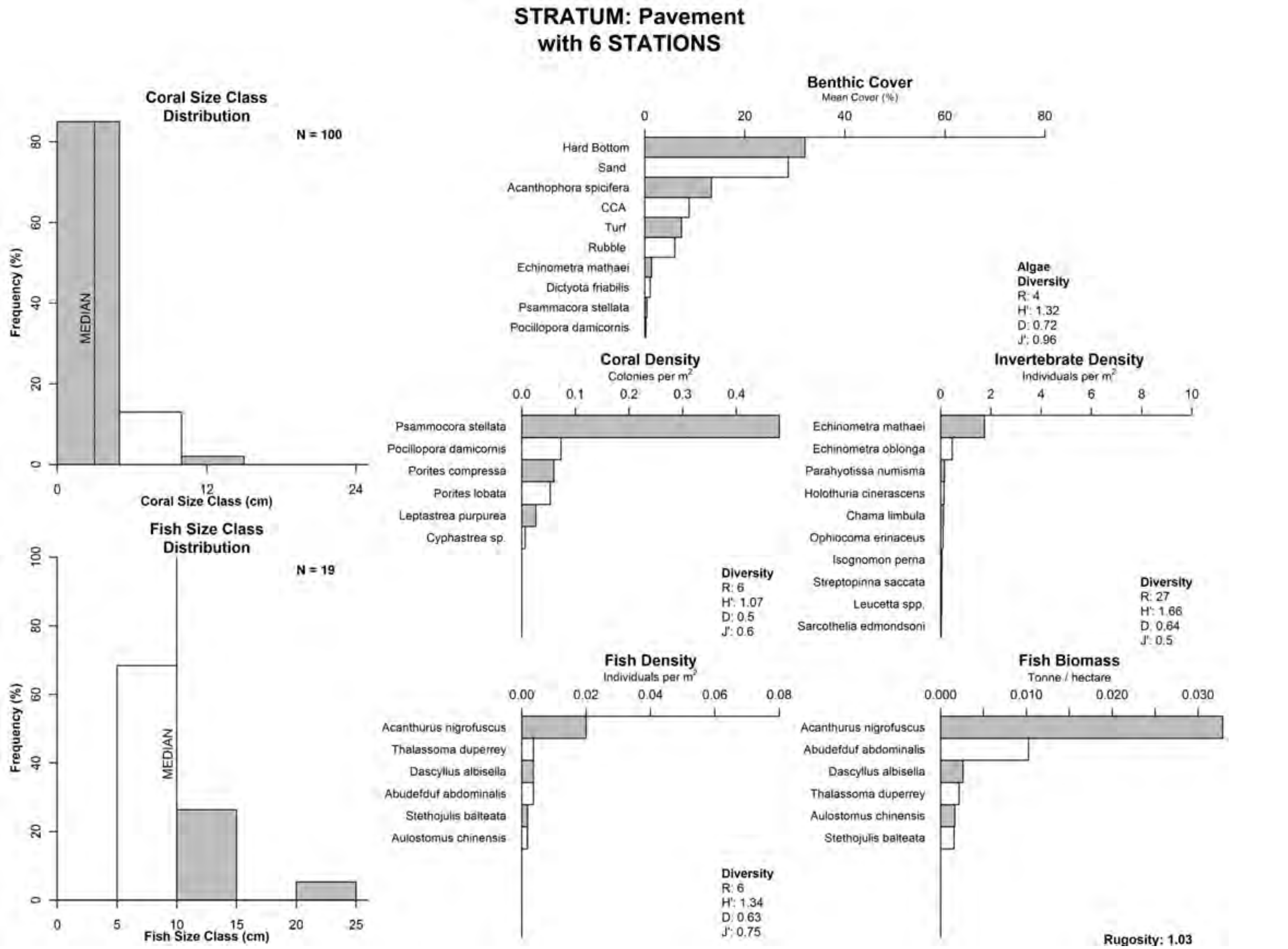

Figure 10: Stratum Pavement. Biological characterization for the Pavement stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

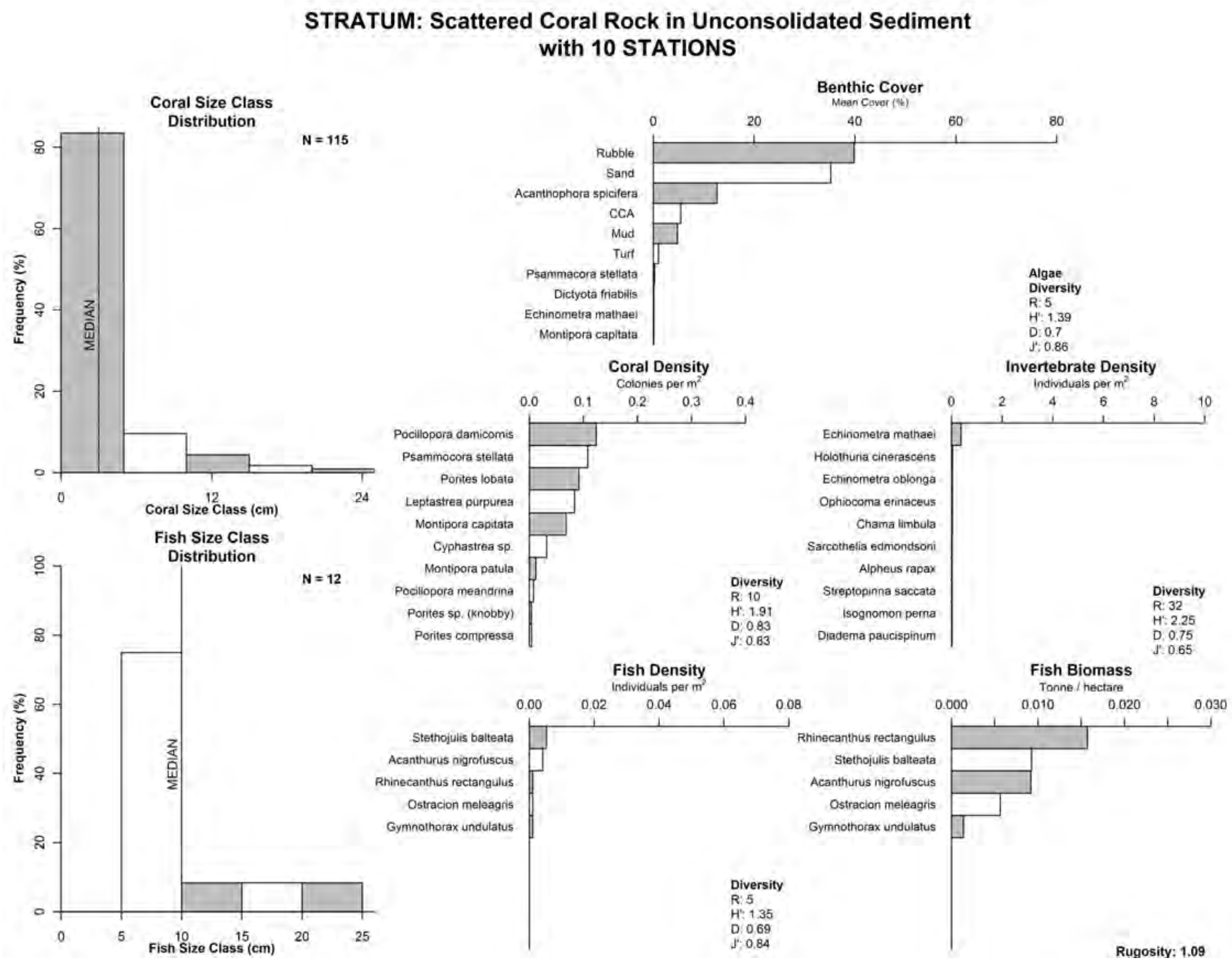

Figure 11: Stratum Scattered Coral/Rock in Unconsolidated Sediment. Biological characterization for the Scattered Coral/Rock in Unconsolidated Sediment stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

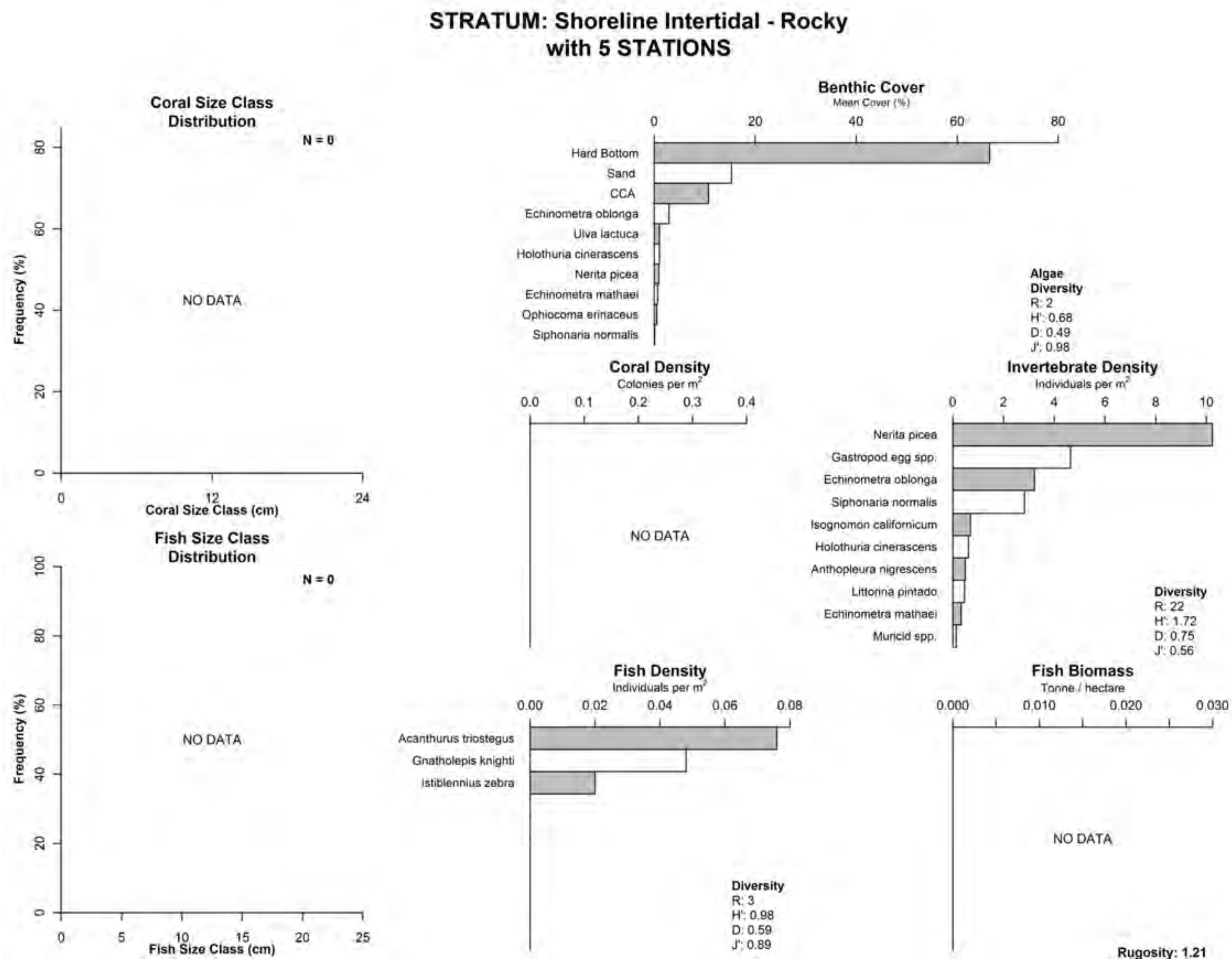

Figure 12: Stratum Shoreline Intertidal - Rocky. Biological characterization for the Shoreline Intertidal – Rocky stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

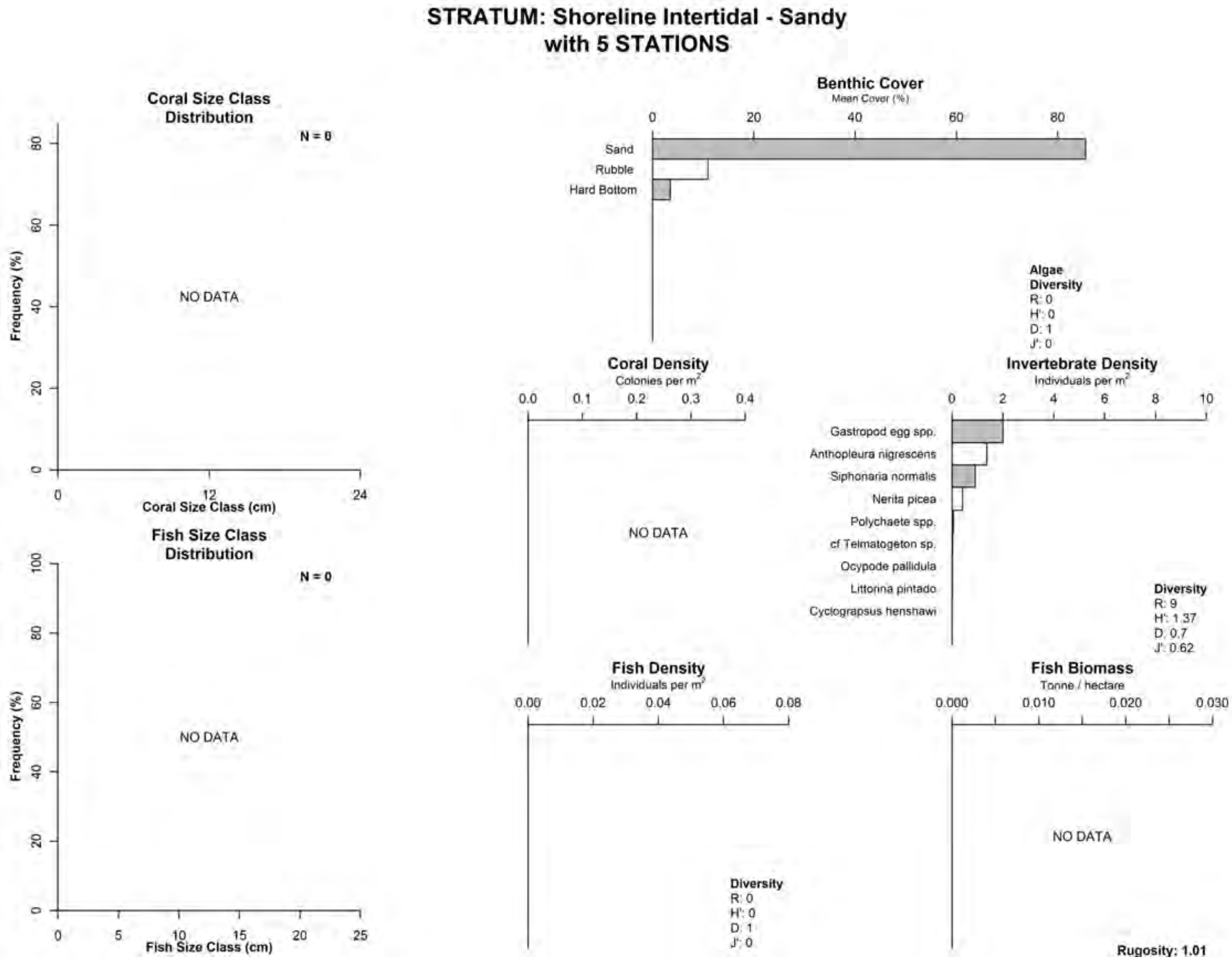

Figure 13: Stratum Shoreline intertidal - Sandy. Biological characterization for the Shoreline Intertidal – Sandy stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

TABLES

Table 2: Area calculations for each alternative. Area calculations for each alternative and stratum.

Alternative	Strata	Area (m^2)	Percent of Area
2	Pavement	663	14.2
	Scattered Coral Rock in Unconsolidated Sediment	1,342	28.8
	Shoreline Intertidal - Rocky	1,506	32.3
	Shoreline Intertidal - Sandy	449	9.6
	Land	700	15.0
	Total	**4,660**	
3	Pavement	825	13.0
	Scattered Coral Rock in Unconsolidated Sediment	2,133	33.6
	Shoreline Intertidal - Rocky	1,556	24.5
	Shoreline Intertidal - Sandy	652	10.3
	Land	1,190	18.7
	Total	**6,356**	
4	Pavement	901	10.4
	Scattered Coral Rock in Unconsolidated Sediment	3,303	38.0
	Shoreline Intertidal - Rocky	2,088	24.0
	Shoreline Intertidal - Sandy	920	10.6
	Land	1,473	17.0
	Total	**8,685**	
5	Pavement	2,688	14.9
	Sand	2,305	12.8
	Scattered Coral Rock in Unconsolidated Sediment	5,694	31.6
	Shoreline Intertidal - Rocky	2,799	15.5
	Shoreline Intertidal - Sandy	2,721	15.1
	Land	1,796	10.0
	Total	**18,003**	

Table 3: Area calculations for project area. Area calculations for surveyed project area.

	Area Type	**Area (m^2)**	**Percent of Area**
Strata	Pavement	6,442	16.4
	Sand	4,071	10.4
	Scattered Coral Rock in Unconsolidated Sediment	22,737	58.0
	Shoreline Intertidal - Rocky	2,907	7.4
	Shoreline Intertidal - Sandy	3,069	7.8
	Total	**39,226**	
Zones	Land	4,538	10.4
	Reef Flat	33,250	76.0
	Shoreline Intertidal	5,977	13.7
	Total	**43,765**	
Major Structures	Land	4,538	10.4
	Hard Bottom	7,743	17.7
	Mixed	24,274	55.5
	Unconsolidated Sediment	7,210	16.5
	Total	**43,765**	
Structures	Land	4,538	10.4
	Pavement	7,743	17.7
	Scattered Coral Rock in Unconsolidated Sediment	24,274	55.5
	Unconsolidated Sediment	7,210	16.5
	Total	**43,765**	

Table 4: Area calculations for sand source areas and barge offload area. Area calculations for estimated area of various sand sources and sand offloading area.

	Barge Offload Area	Area (m^2)	Percent of Area
Zones	Bank/ Shelf	2,225	100.0
	Total	**2,225**	
Major Structures	Unconsolidated Sediment	2,225	100.0
	Total	**2,225**	
Structures	Unconsolidated Sediment	2,225	100.0
	Total	**2,225**	

	Channel Area	Area (m^2)	Percent of Area
Zones	Channel	6,003	100.0
	Total	**6,003**	
Major Structures	Unconsolidated Sediment	4,265	71.1
	Mixed	1,738	28.9
	Total	**6,003**	
Structures	Scattered Coral Rock in Unconsolidated Sediment	1,738	28.9
	Unconsolidated Sediment	4,265	71.1
	Total	**6,003**	

	Offshore Sand Area	Area (m^2)	Percent of Area
Zones	Bank/ Shelf	6,694	100.0
	Total	**6,694**	
Major Structures	Unconsolidated Sediment	6,694	100.0
	Total	**6,694**	
Structures	Unconsolidated Sediment	6,694	100.0
	Total	**6,694**	

Table 5: Percent cover of Live Rock and Stony Corals. The percent cover of hard bottom, rubble (live rock) and four coral species observed during the quadrat surveys.

Strata	Hard Bottom	Rubble	*Montipora capitata*	*Pocillopora damicornis*	*Porites compressa*	*Psammacora stellata*
Shoreline Intertidal - Sandy	3.5	11.0	0.0	0.0	0.0	0.0
Shoreline Intertidal - Rocky	66.4	0.1	0.0	0.0	0.0	0.0
Pavement	32.0	6.0	0.0	0.2	0.2	0.4
Sand	0.0	0.4	0.0	0.0	0.0	0.0
Scattered Coral Rock in Unconsolidated Sediment	0.0	39.9	0.1	0.0	0.0	0.3

Table 6: Stony Coral Density. The density of coral colonies (colonies per meter squared) observed during coral transects.

Strata	*Cyphastrea sp.*	*Leptastrea purpurea*	*Montipora capitata*	*Montipora patula*	*Pocillopora damicornis*	*Pocillopora meandrina*	*Porites compressa*	*Porites lobata*	*Porites sp. (knobby)*	*Psammocora stellata*
Shoreline Intertidal - Sandy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shoreline Intertidal - Rocky	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pavement	0.01	0.03	0.00	0.00	0.07	0.00	0.06	0.05	0.00	0.48
Sand	0.00	0.00	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Scattered Coral Rock in Unconsolidated Sediment	0.03	0.08	0.07	0.01	0.12	0.01	0.00	0.09	0.00	0.11

APPENDIX A: Maps of Haleiwa Beach Re-nourishment Area

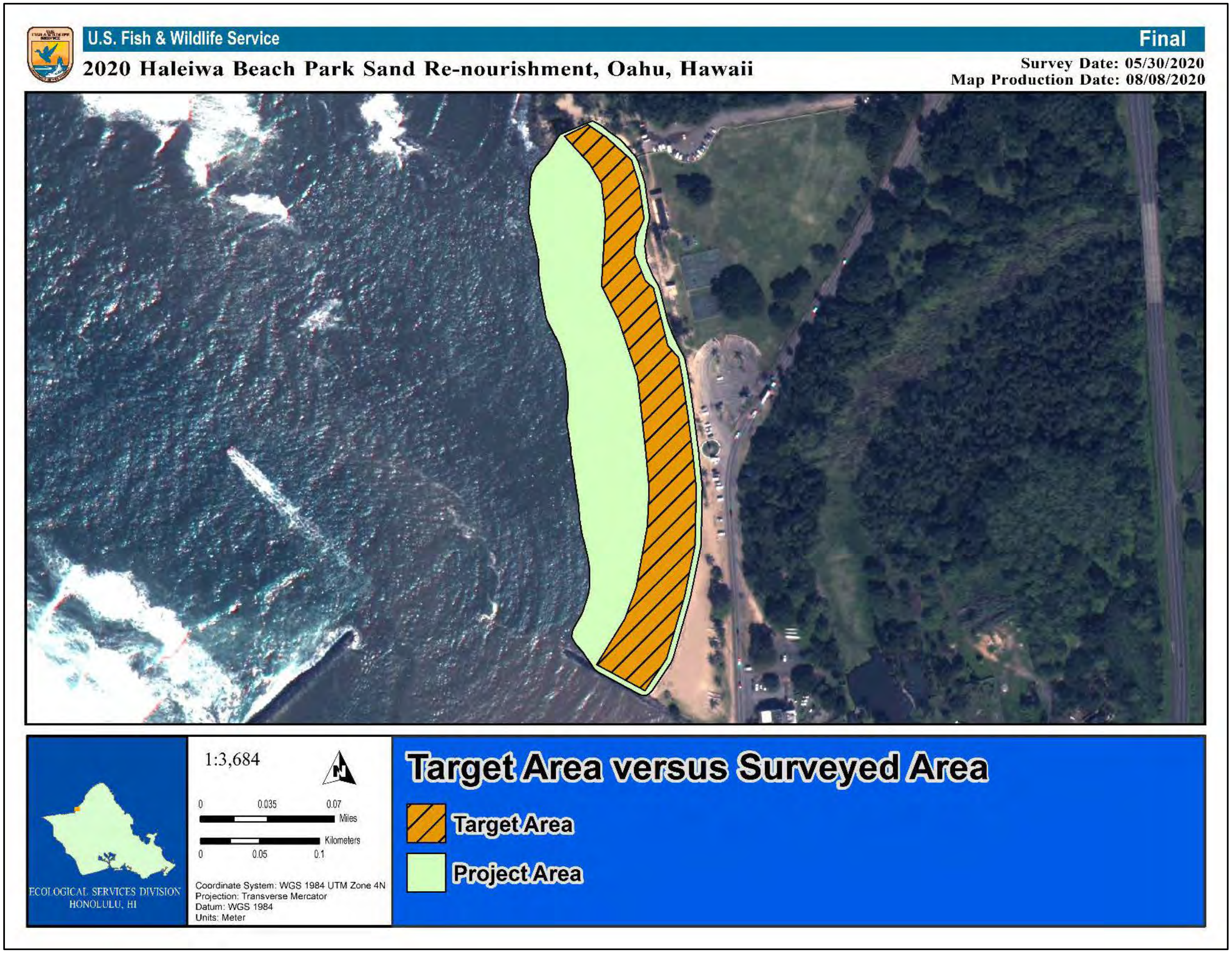

Figure A1: Target Area vs. Surveyed Area. Overview of the Project Area (total surveyed area plus project footprint) versus the Target Area (project footprint).

Figure A2: Area Observed. Overview of the area observed by in-water observers versus the area interpolated in all maps.

Figure A3: Dive Tracks. Overview of the dive tracks within the project area contains.

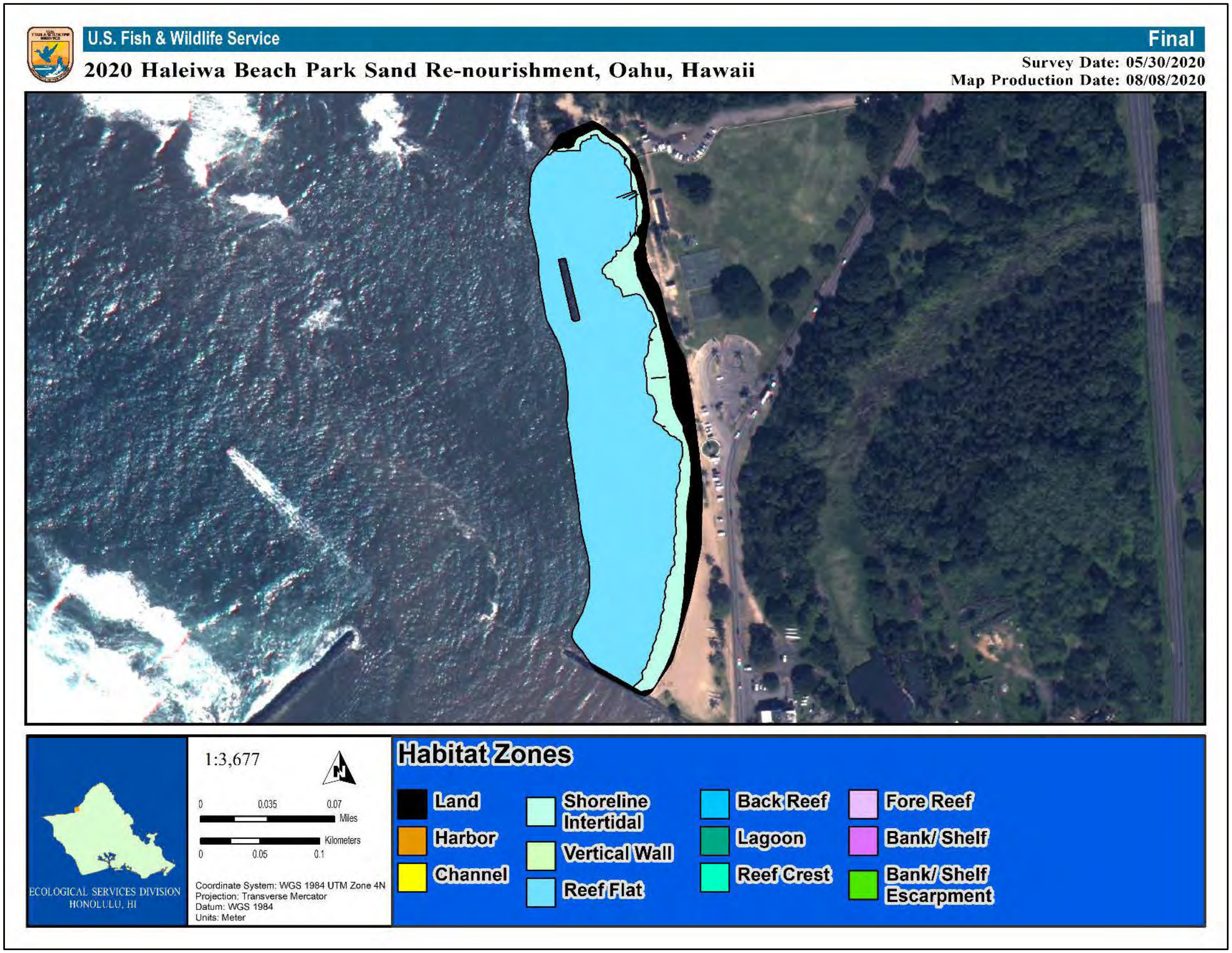

Figure A4: Habitat Zones. Overview of the various habitat zones that the project area contains.

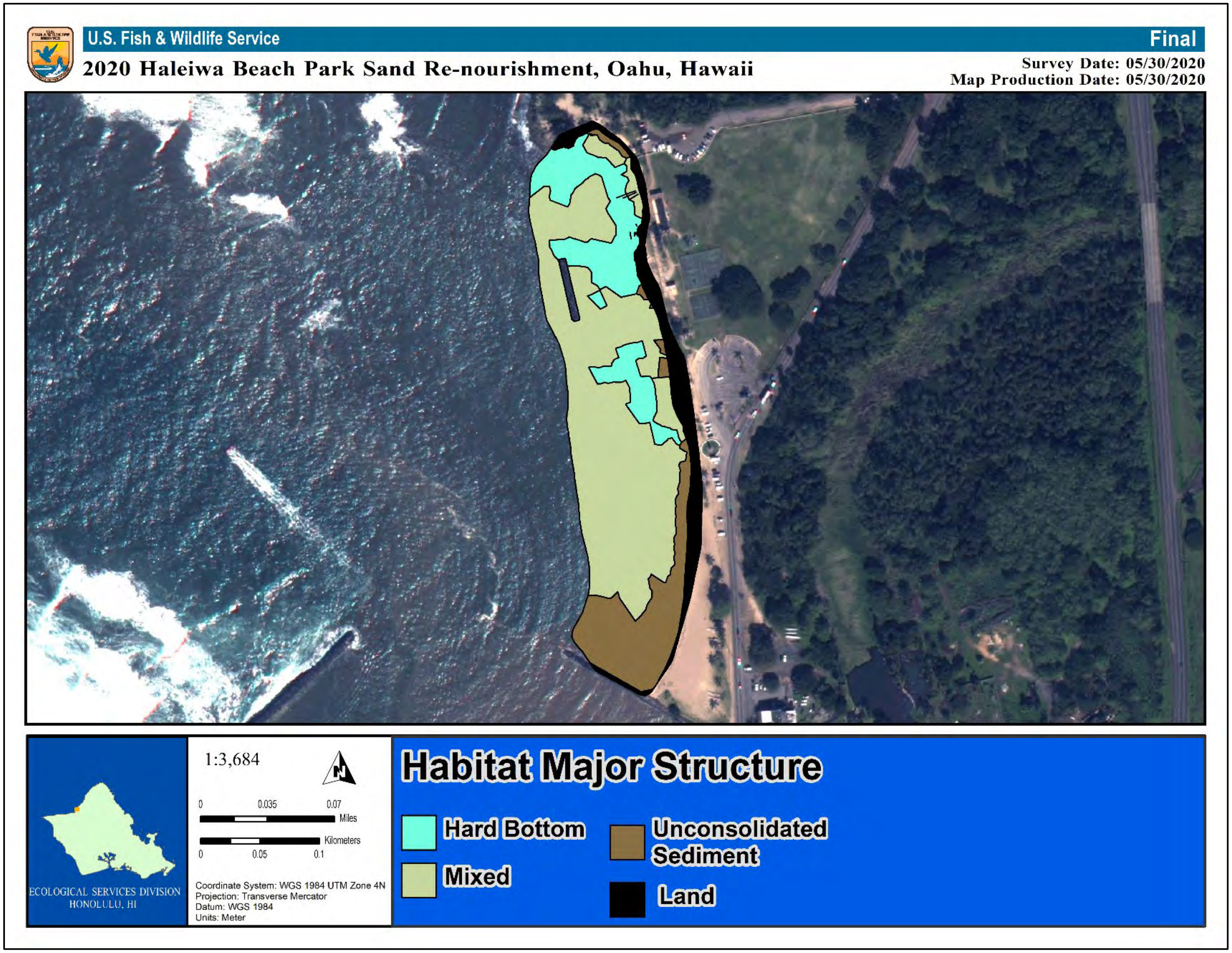

Figure A5: Habitat Major Structure. Overview of the major habitat structures that the project area contains.

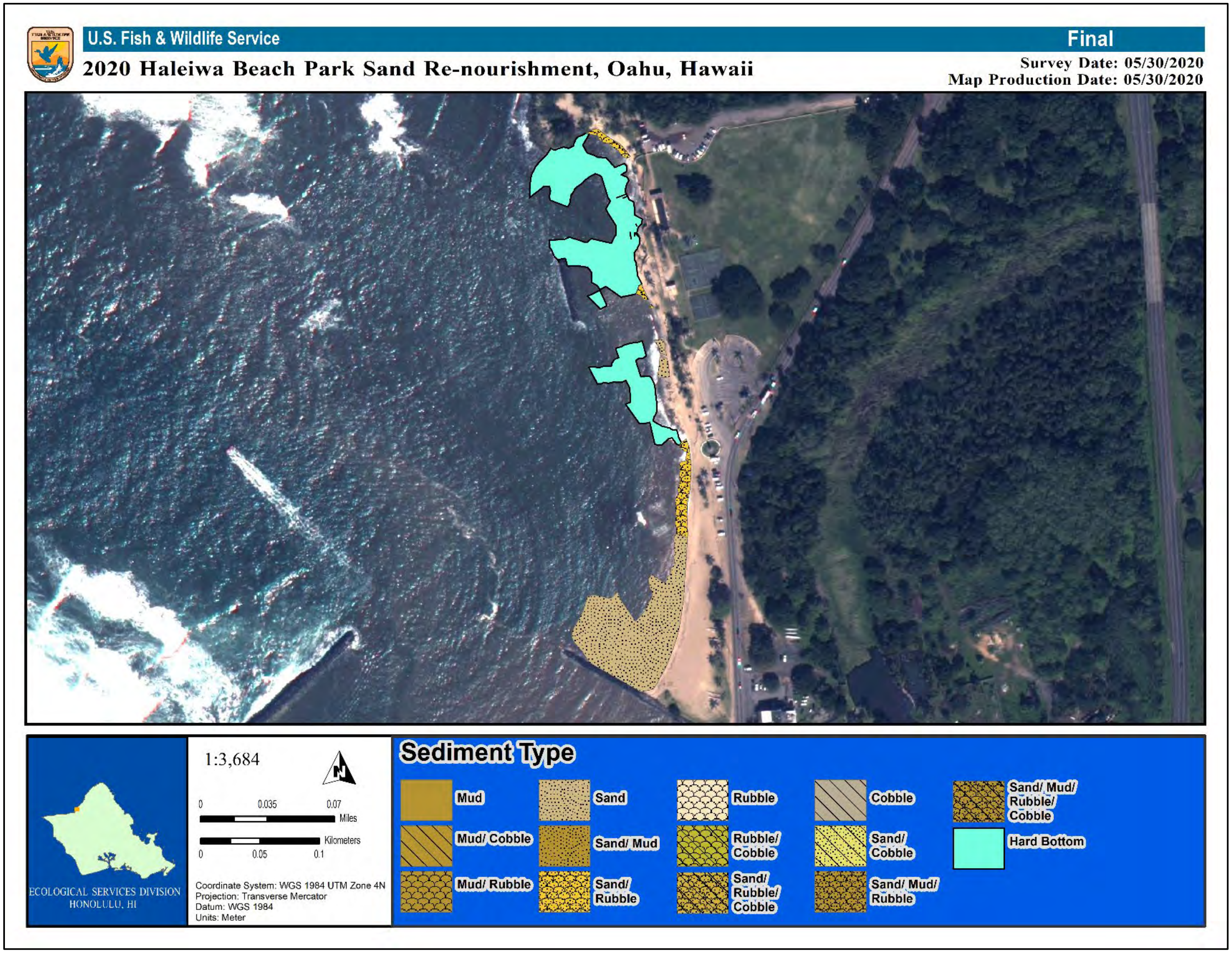

Figure A6: Sediment Type. Overview of the various sediment types that the project area contains.

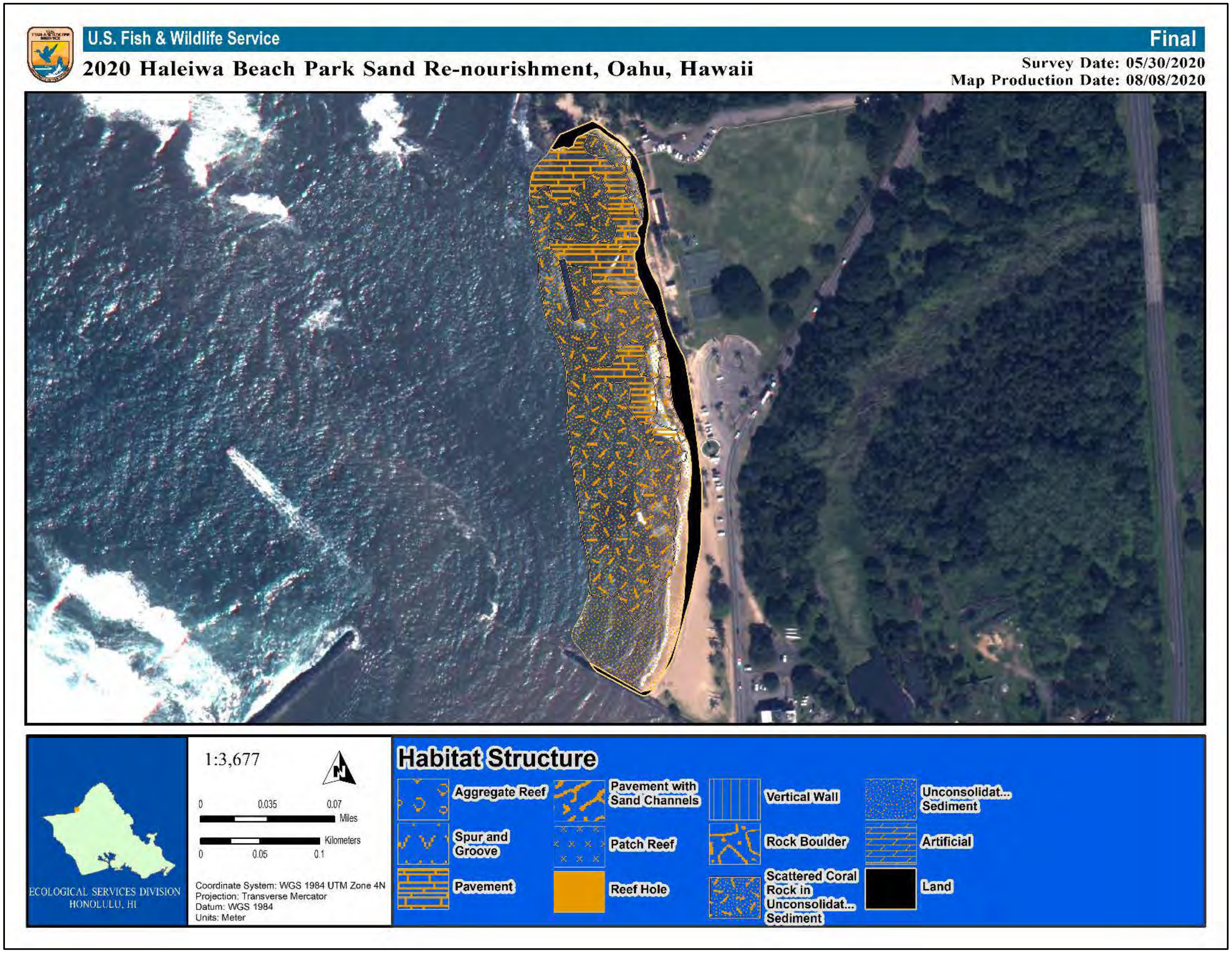

Figure A7: Habitat Structure. Overview of the habitat structures that the project area contains.

Figure A8: Habitat Structure within Target Area. Overview of the habitat structures within the Target Area.

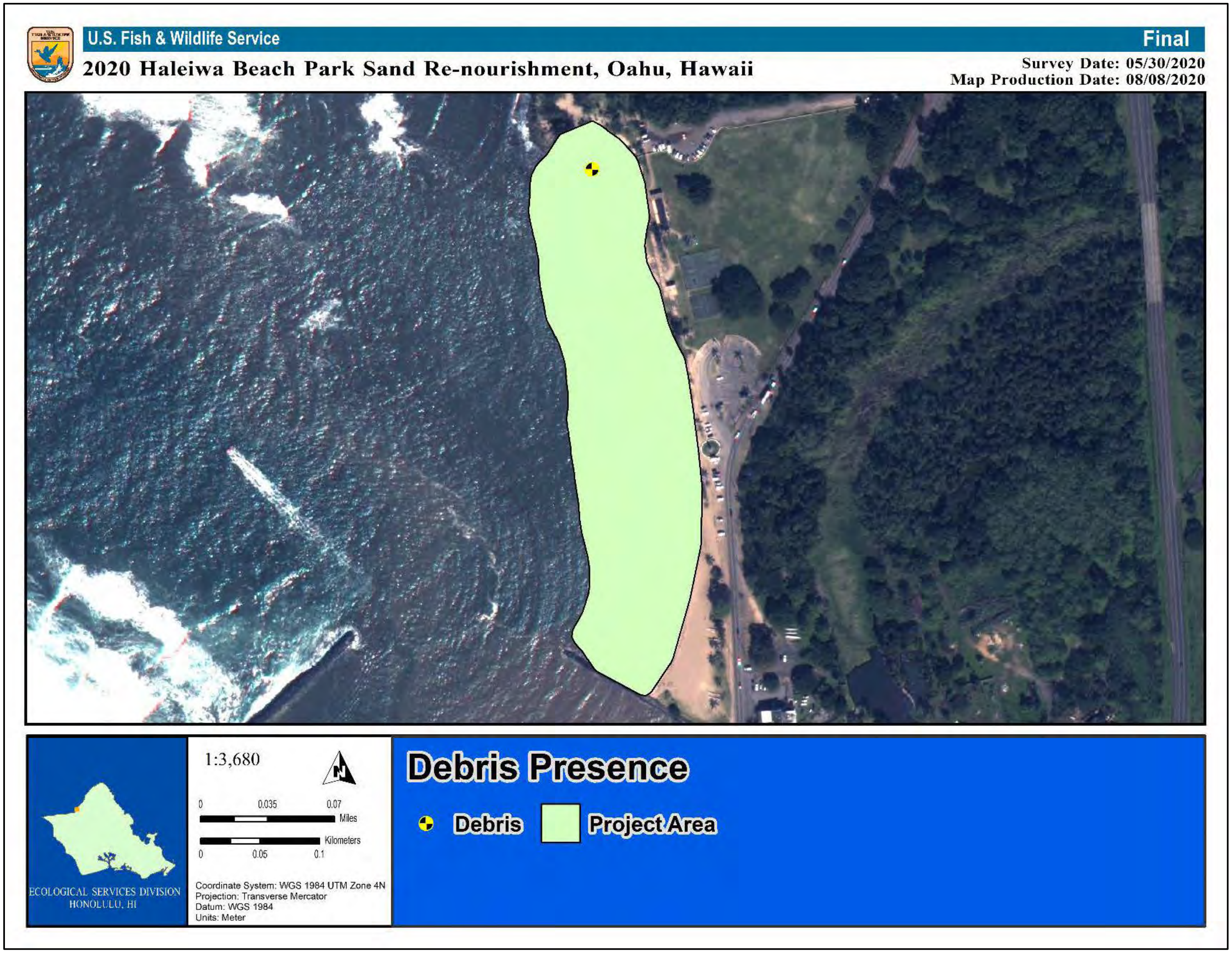

Figure A10: Debris. Overview of the debris observed within the project area.

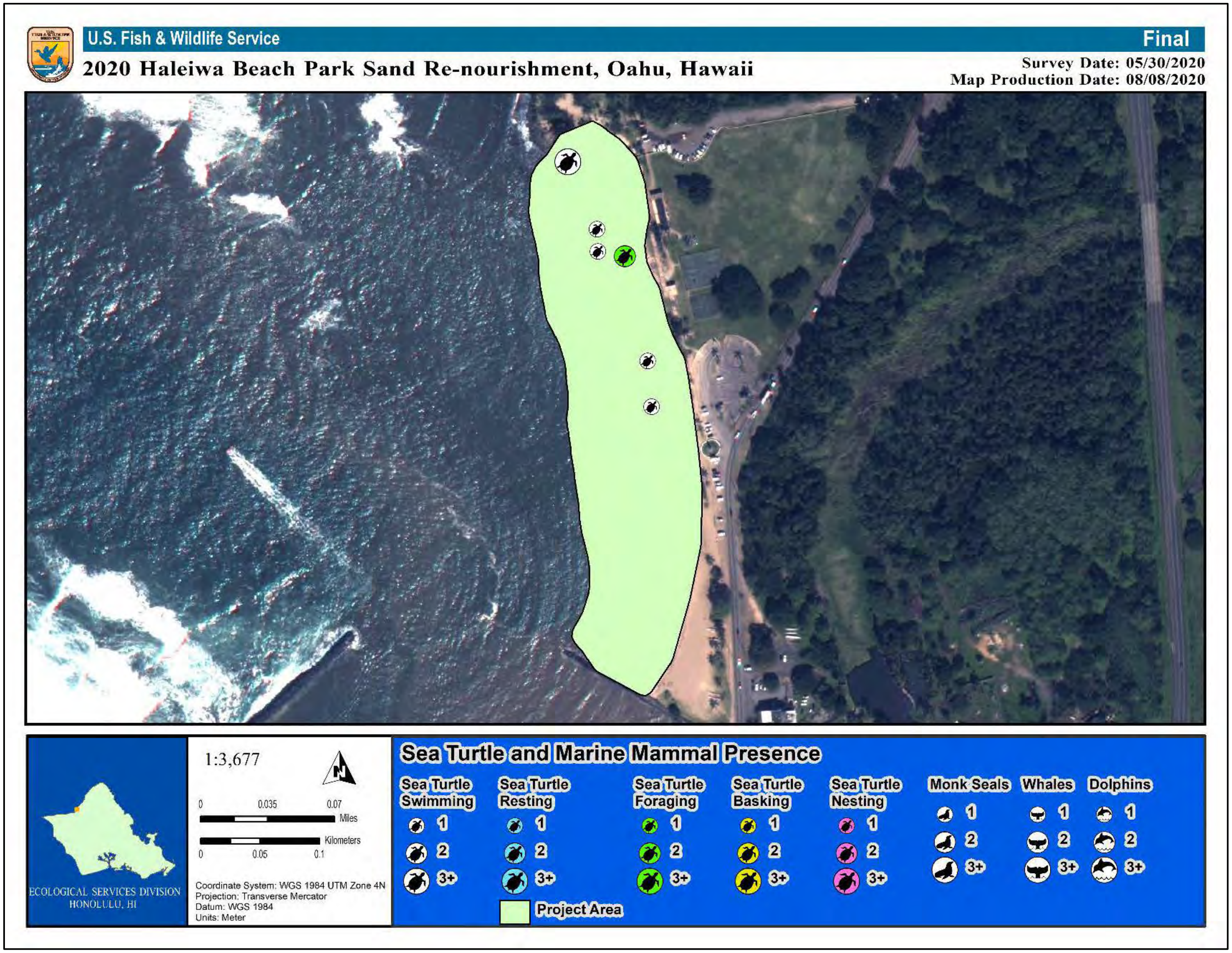

Figure A11: Protected Species. Overview of the observed protected species within the project area.

APPENDIX B: Quantitative summary of Individual Survey Stations

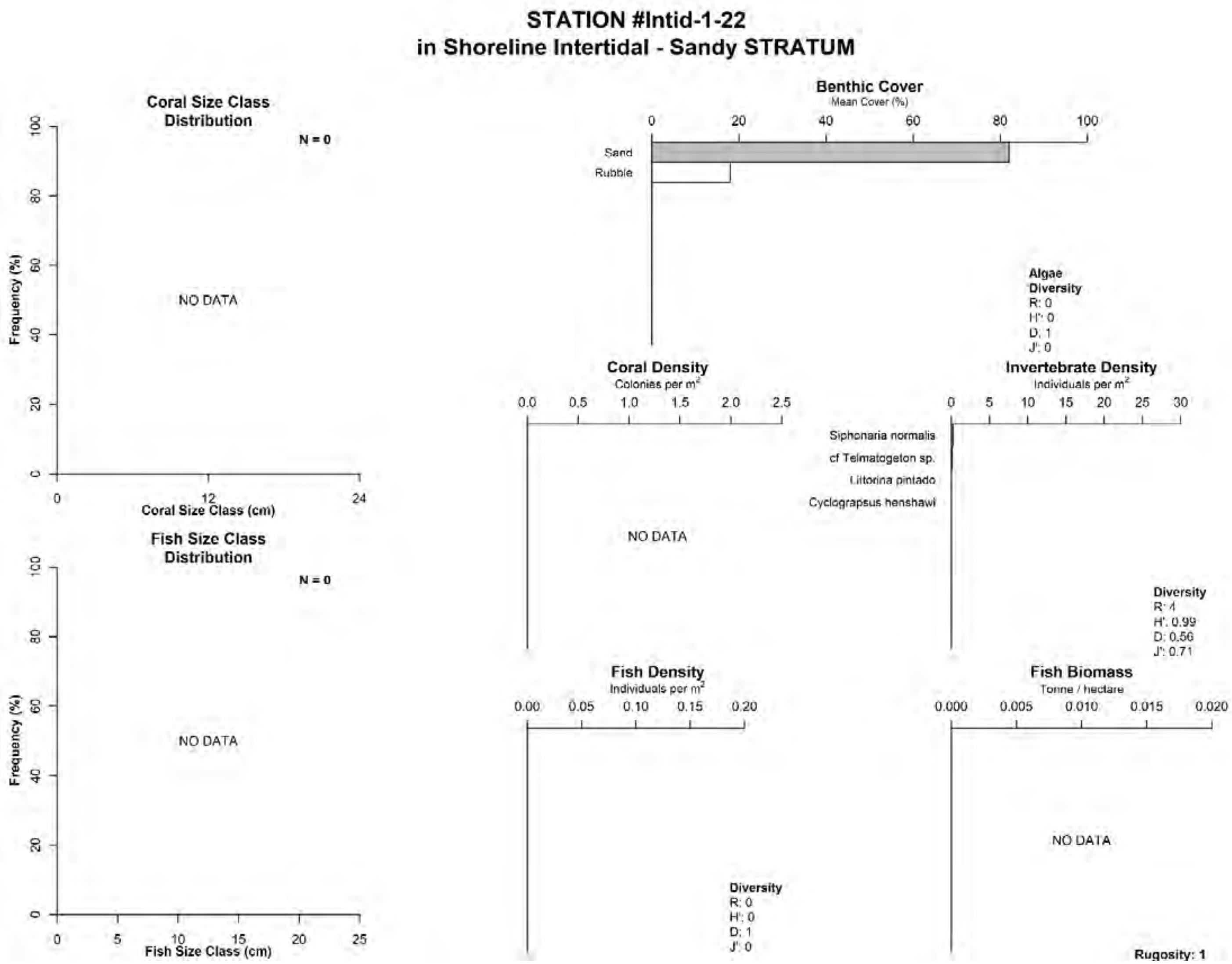

Figure B1: Station Intid-1-22. Biological characterization for station Intid-1-22 in the Shoreline Intertidal – Sandy Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

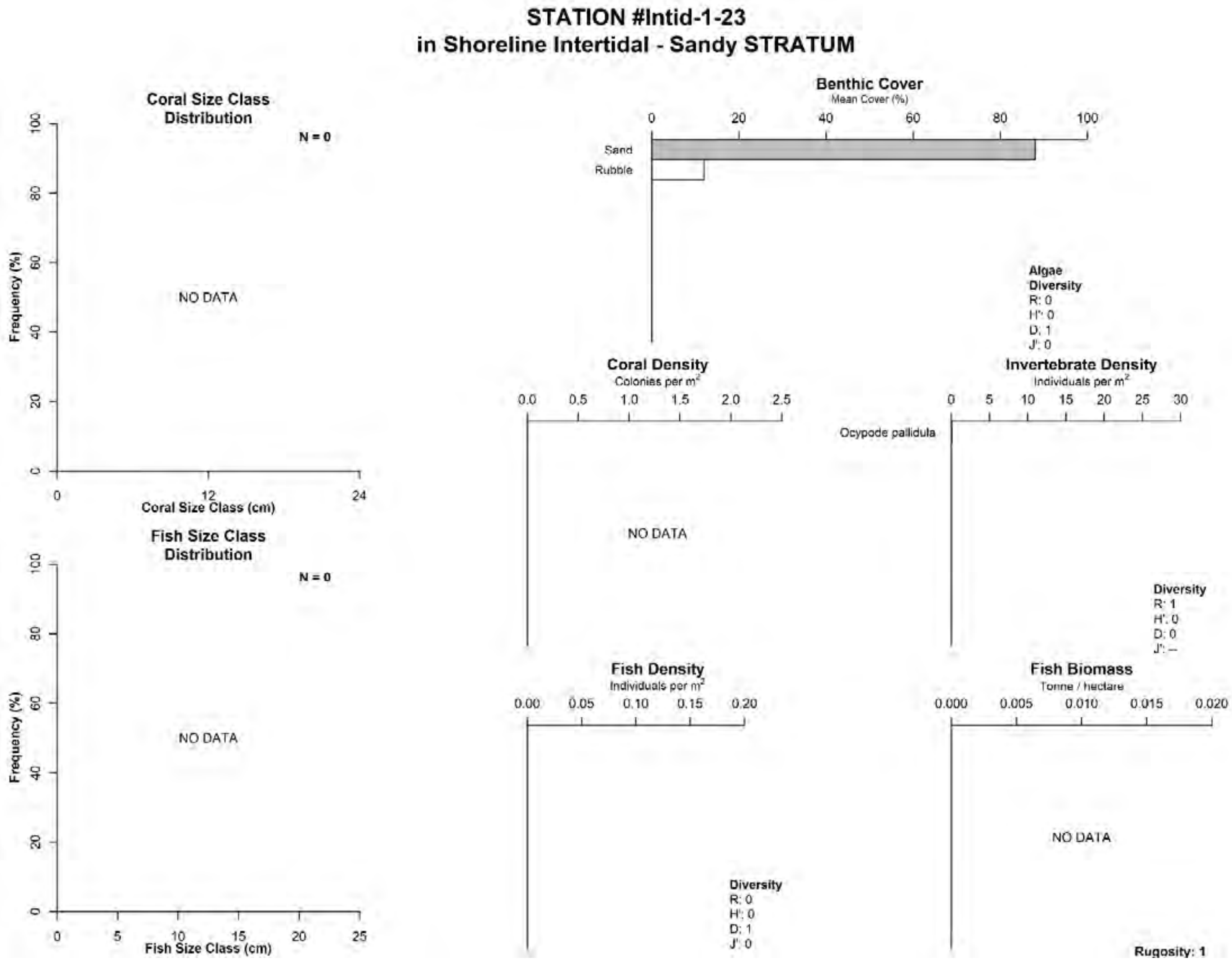

Figure B2: Station Intid-1-23. Biological characterization for station Intid-1-23 in the Shoreline Intertidal – Sandy Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

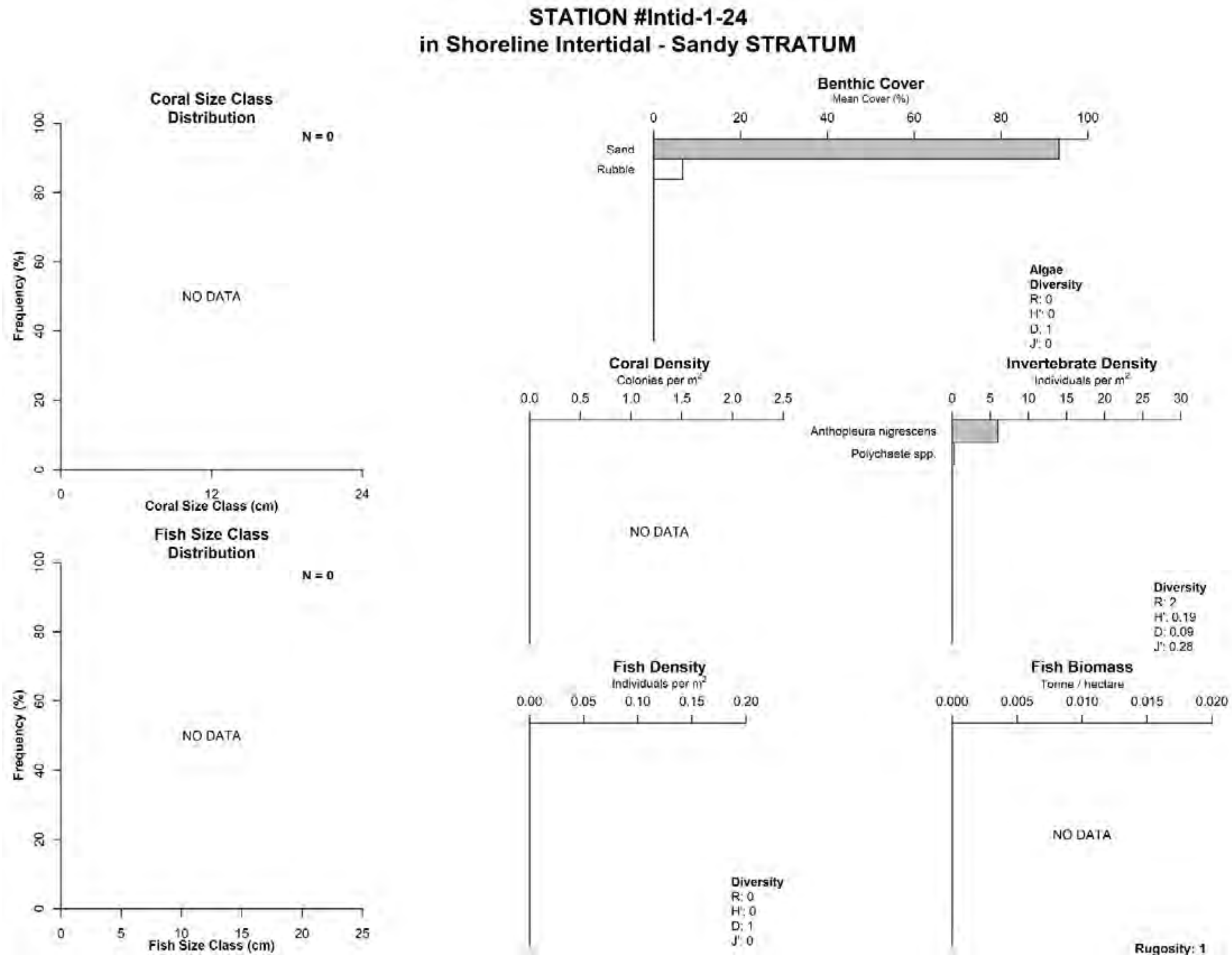

Figure B3: Station Intid-1-24. Biological characterization for station Intid-1-24 in the Shoreline Intertidal – Sandy Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

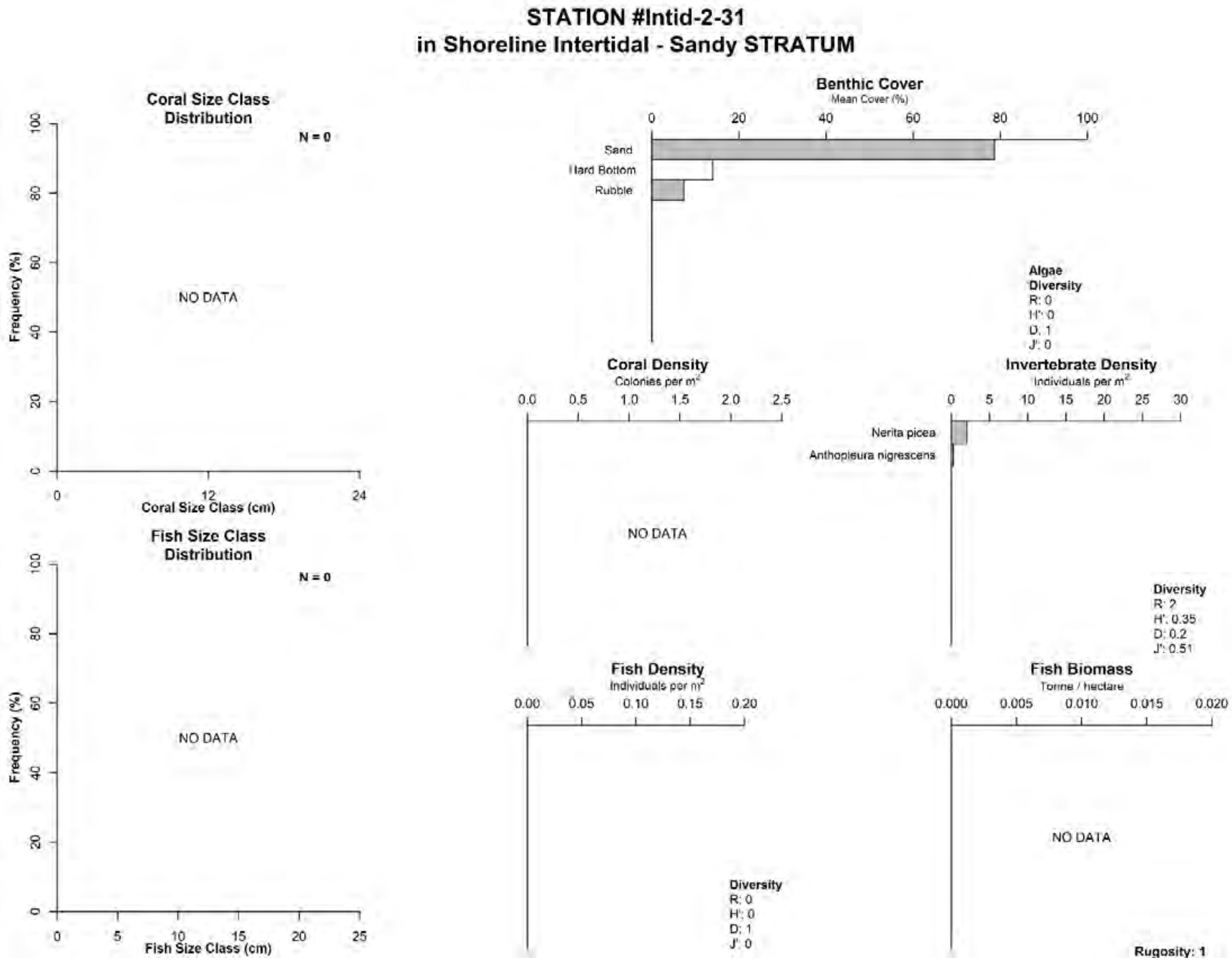

Figure B4: Station Intid-2-31. Biological characterization for station Intid-2-31 in the Shoreline Intertidal – Sandy Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

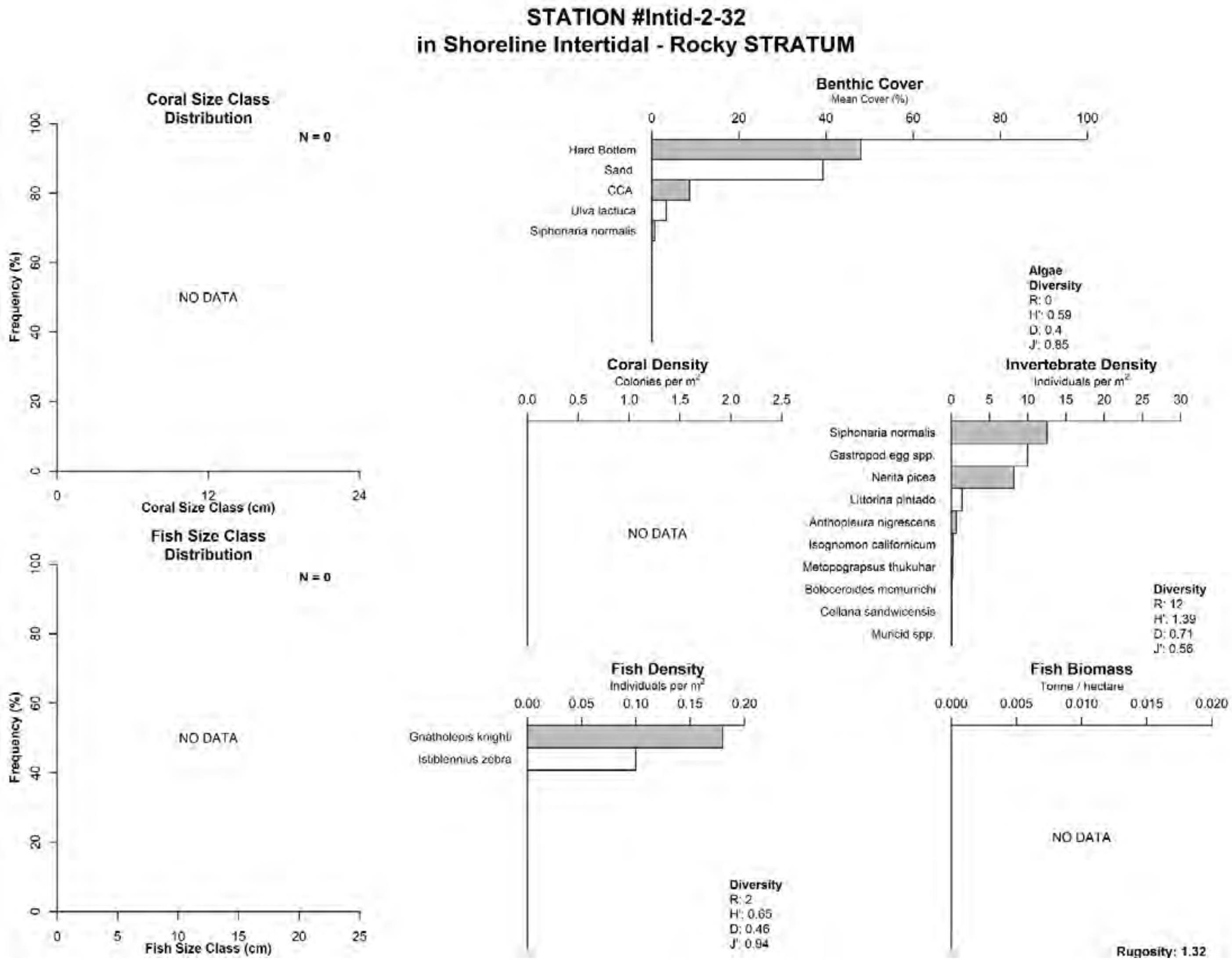

Figure B5: Station Intid-2-32. Biological characterization for station Intid-2-32 in the Shoreline Intertidal – Rocky Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

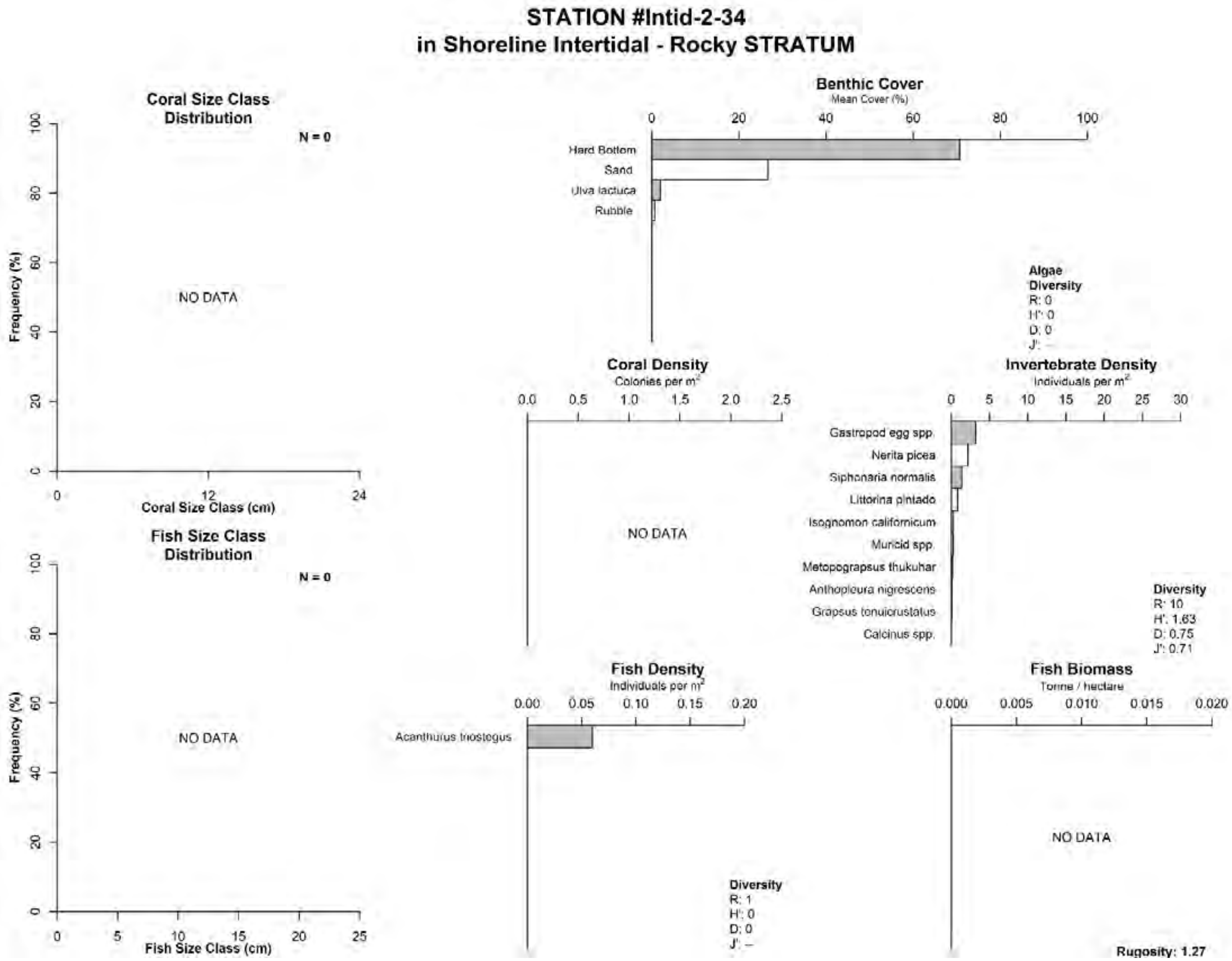

Figure B6: Station Intid-2-34. Biological characterization for station Intid-2-34 in the Shoreline Intertidal – Rocky Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

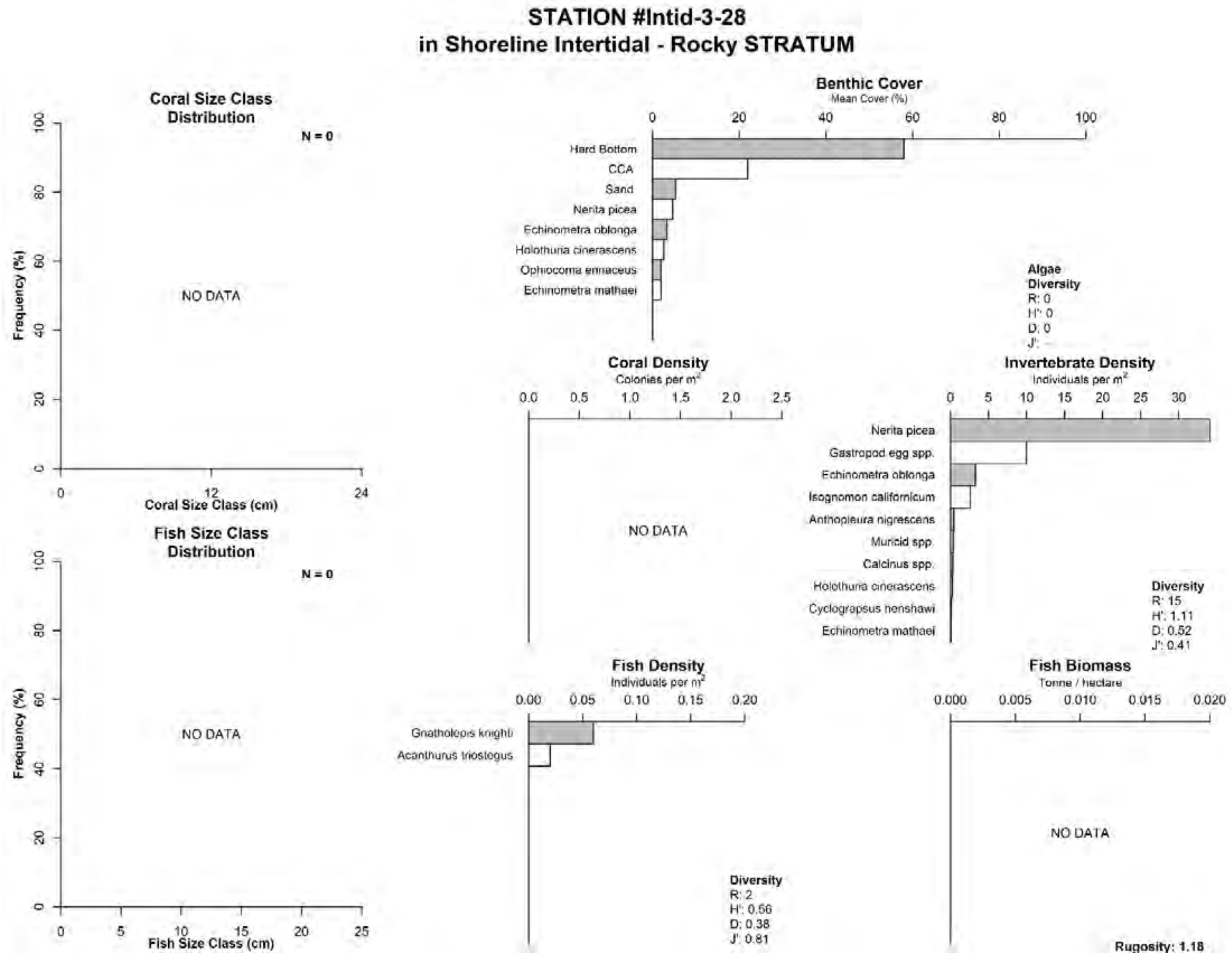

Figure B7: Station Intid-3-28. Biological characterization for station Intid-3-28 in the Shoreline Intertidal – Rocky Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

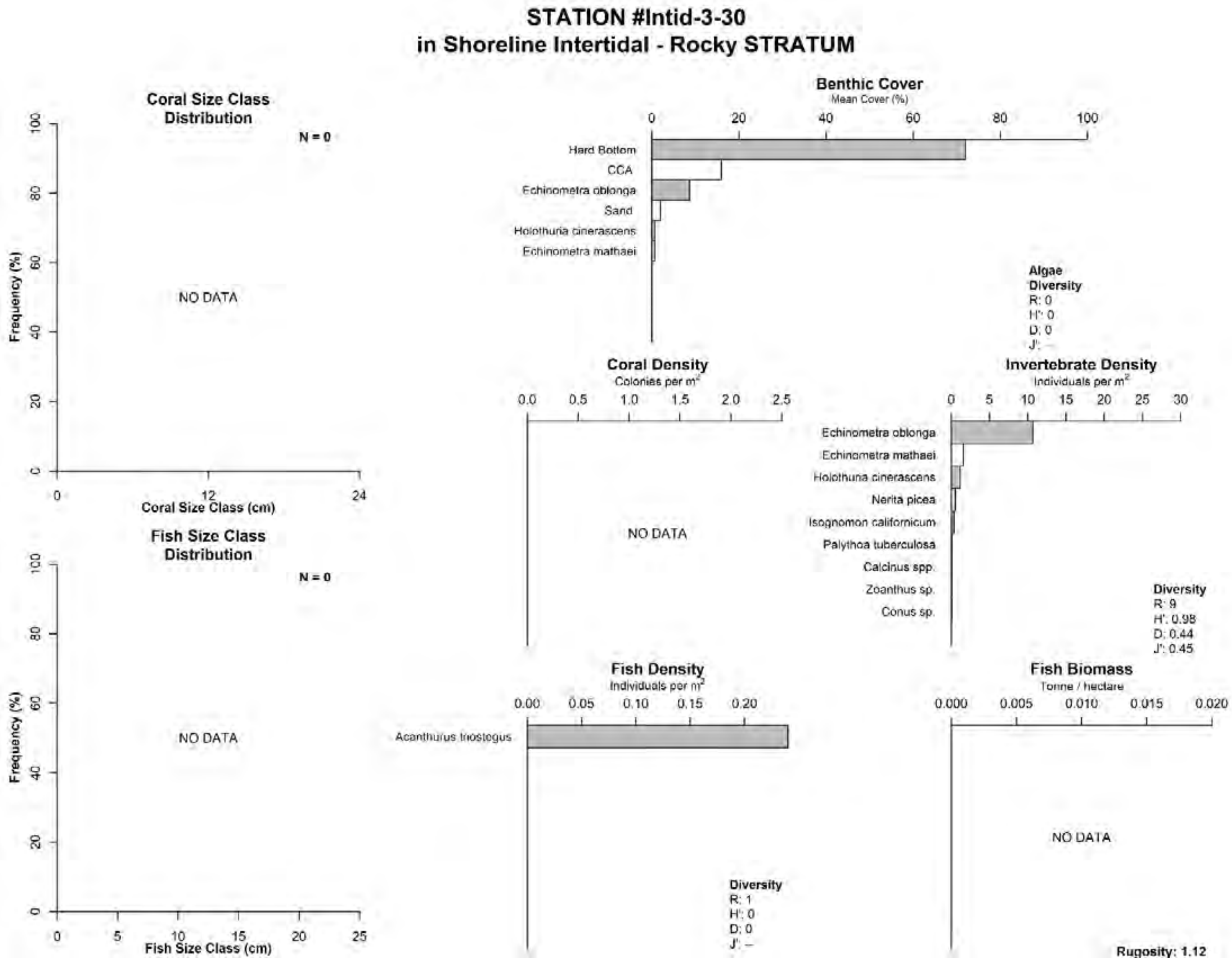

Figure B8: Station Intid-3-30. Biological characterization for station Intid-3-30 in the Shoreline Intertidal – Rocky Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

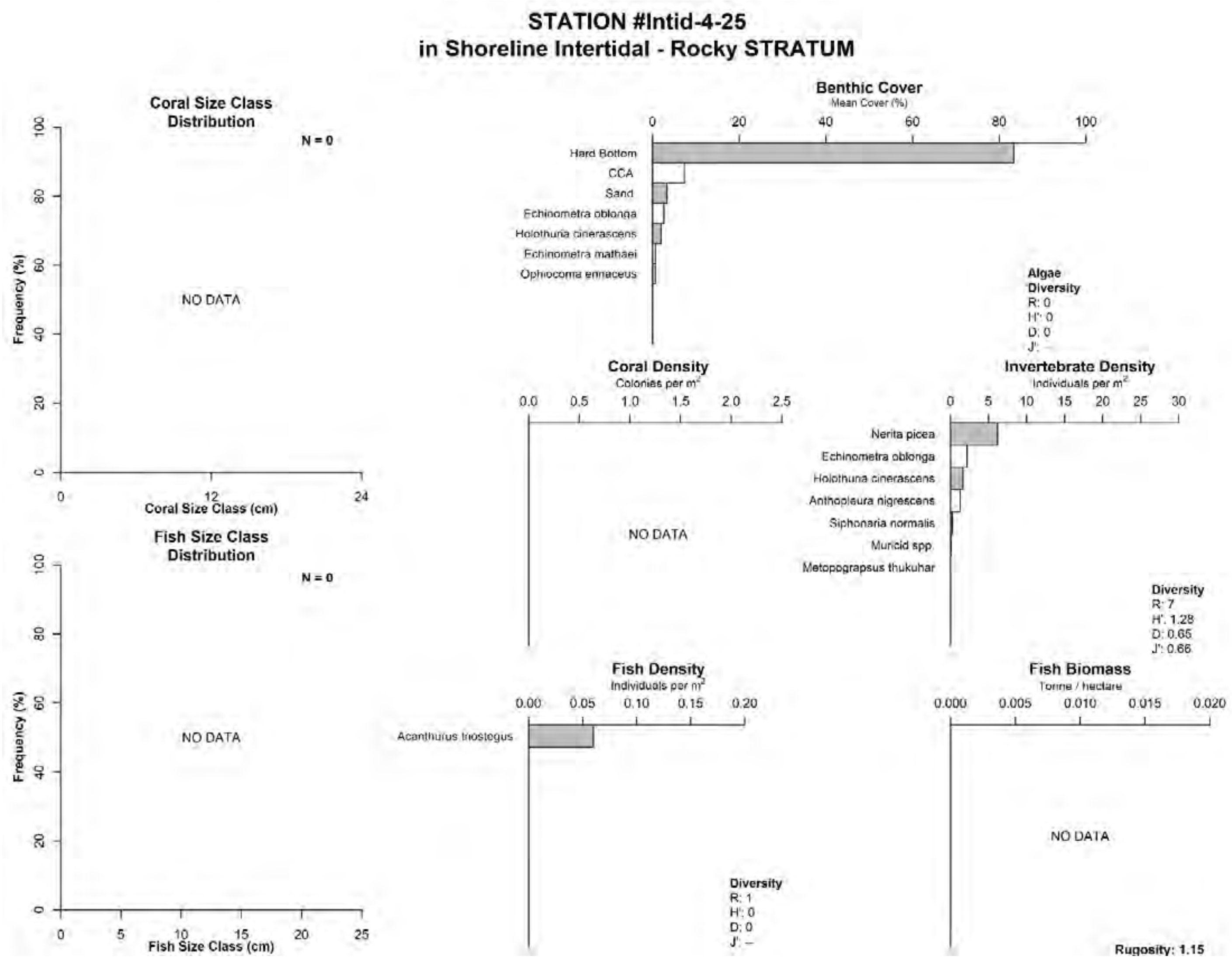

Figure B9: Station Intid-4-25. Biological characterization for station Intid-4-25 in the Shoreline Intertidal – Rocky Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

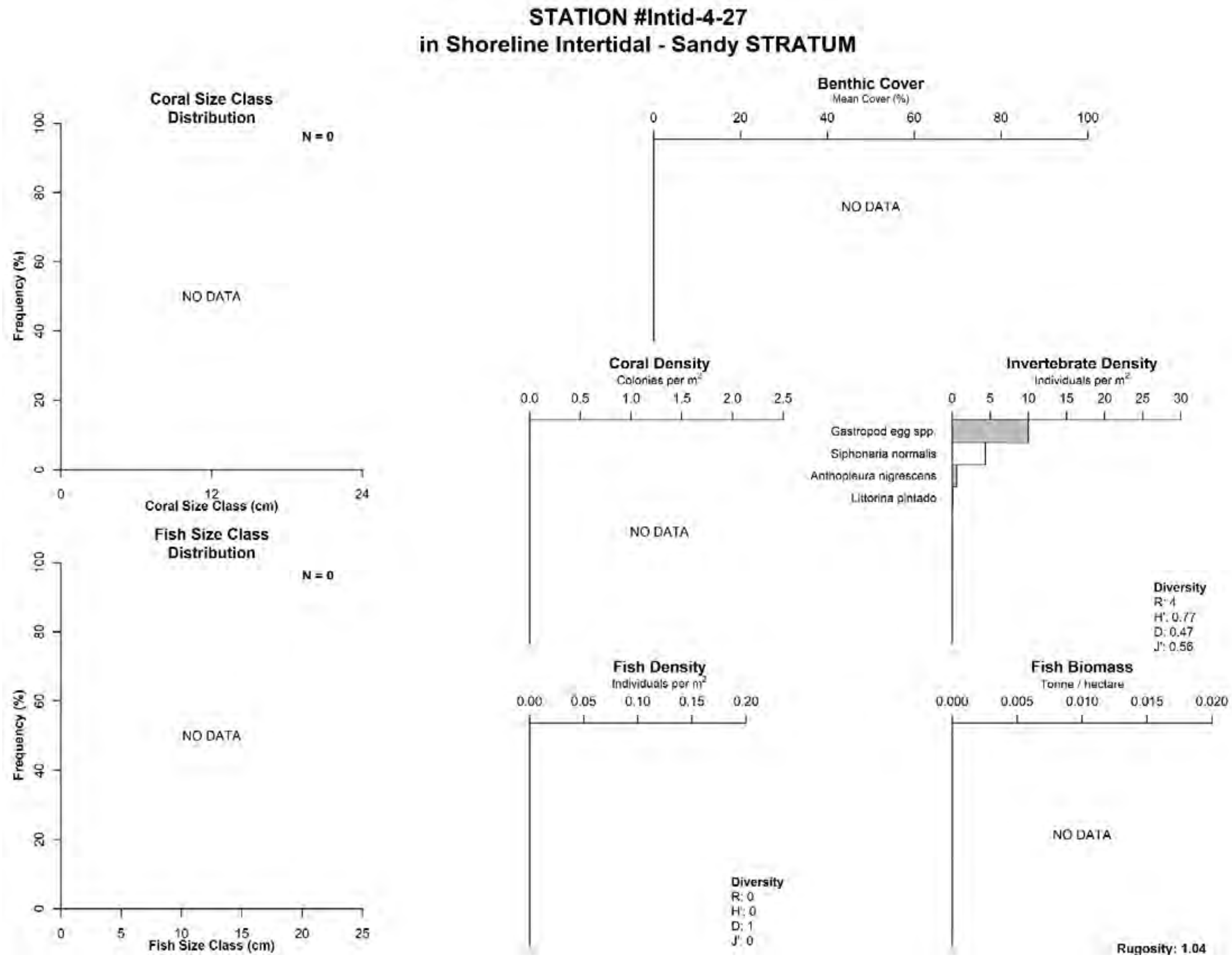

Figure B10: Station Intid-4-27. Biological characterization for station Intid-4-27 in the Shoreline Intertidal – Sandy Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

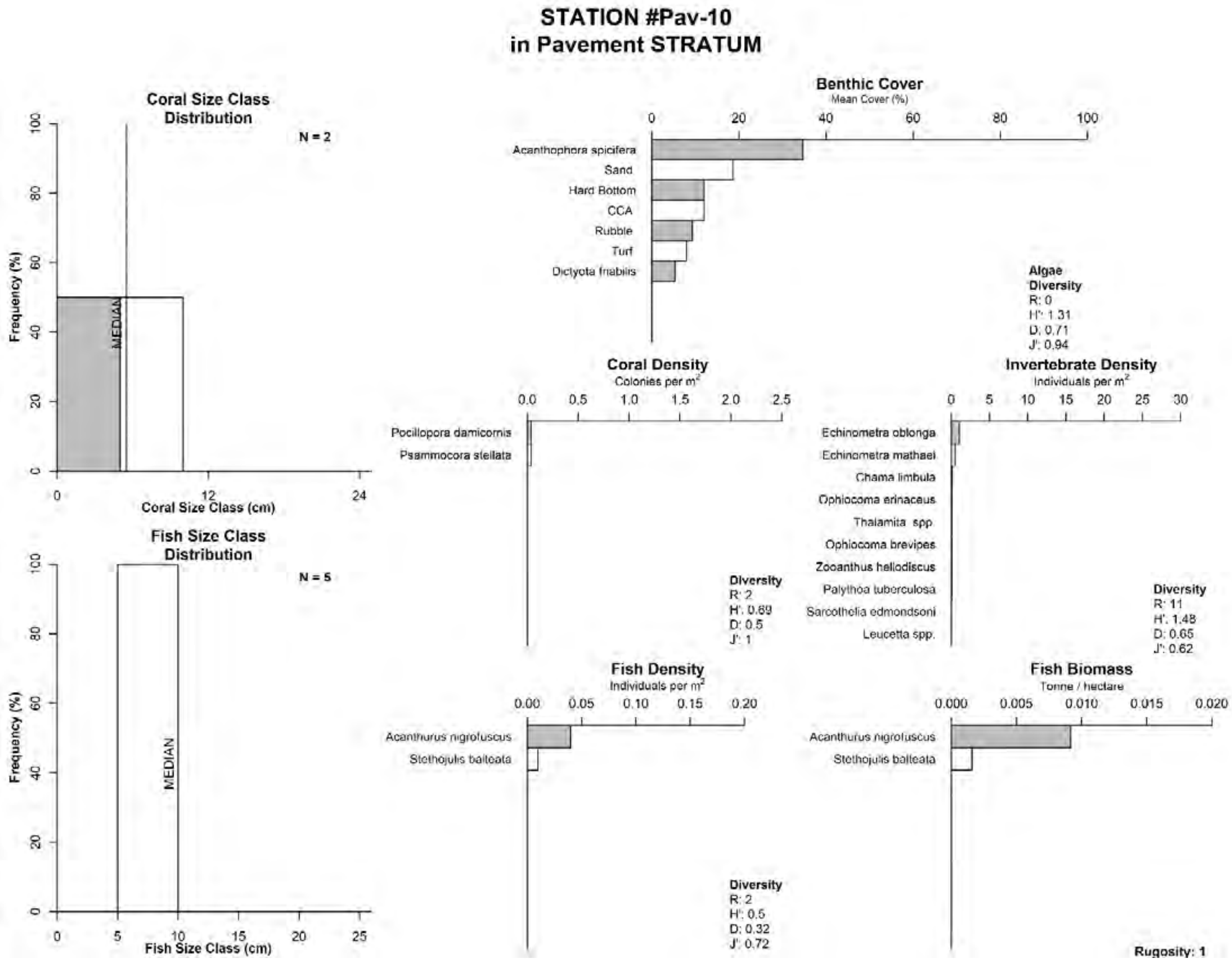

Figure B11: Station Pav-10. Biological characterization for station Pav10 in the Pavement Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

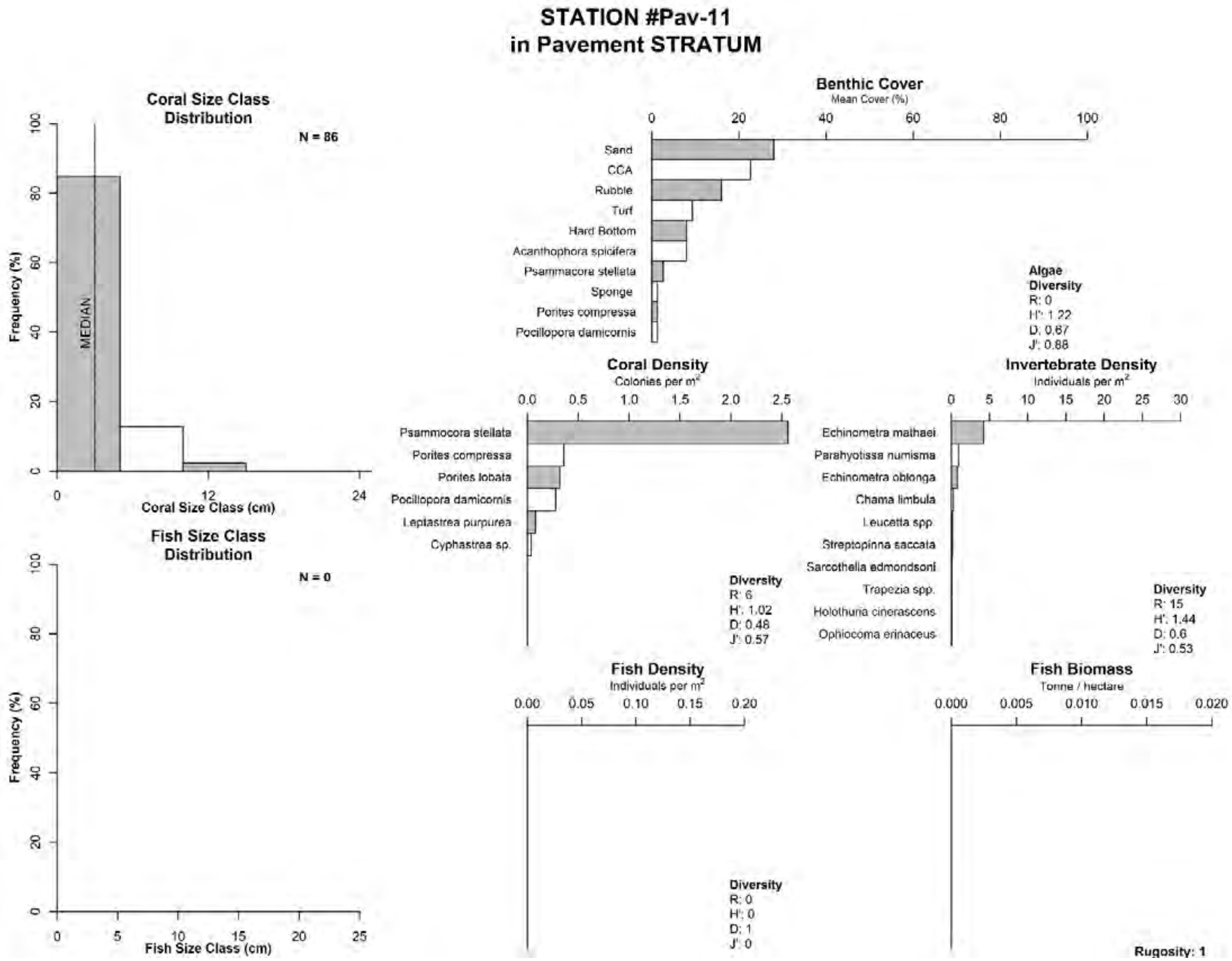

Figure B12: Station Pav-11. Biological characterization for station Pav-11 in the Pavement Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

STATION #Pav-13
in Pavement STRATUM

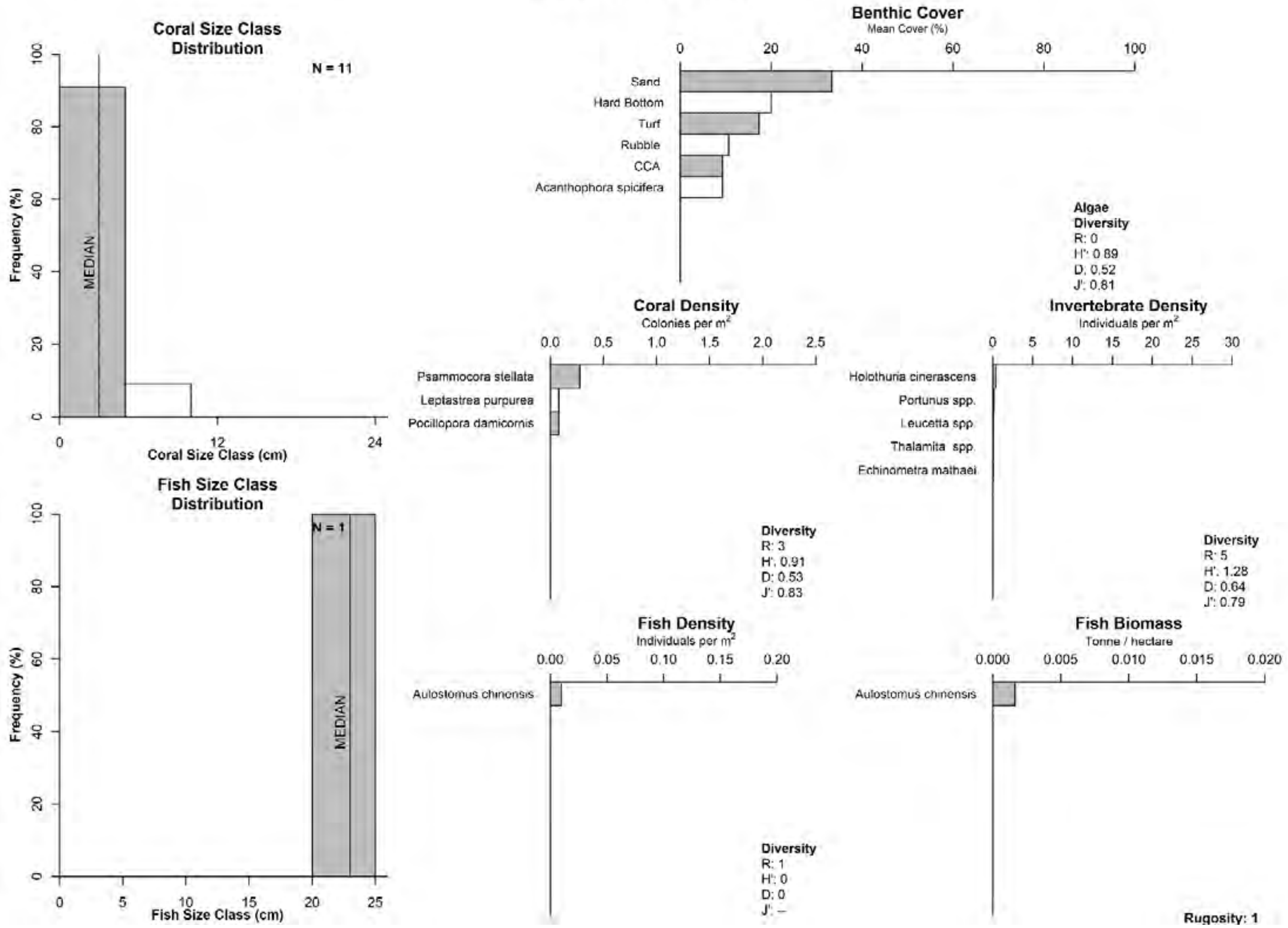

Figure B13: Station Pav-13. Biological characterization for station Pav-13 in the Pavement Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

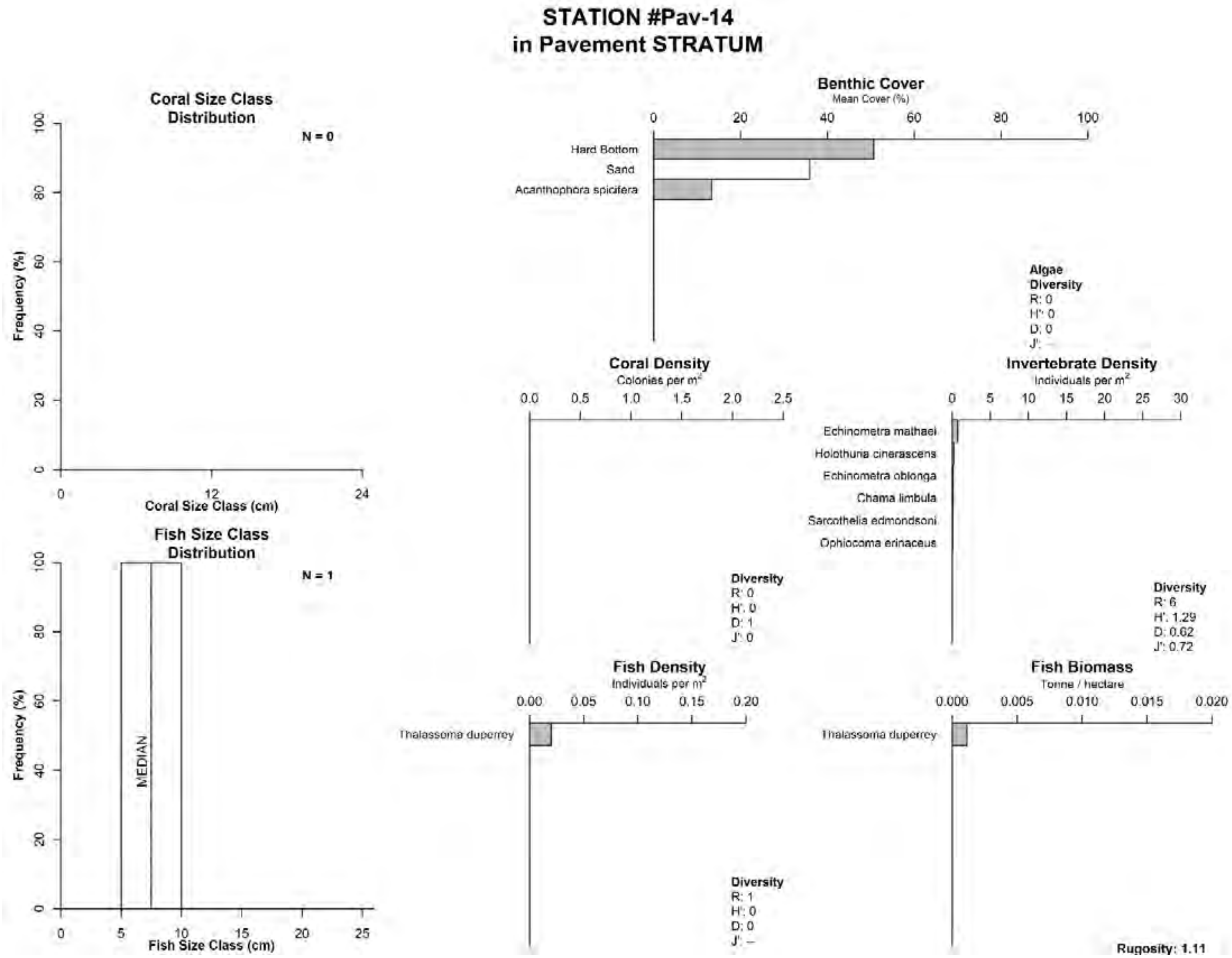

Figure B14: Station Pav-14. Biological characterization for station Pav-14 in the Pavement Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

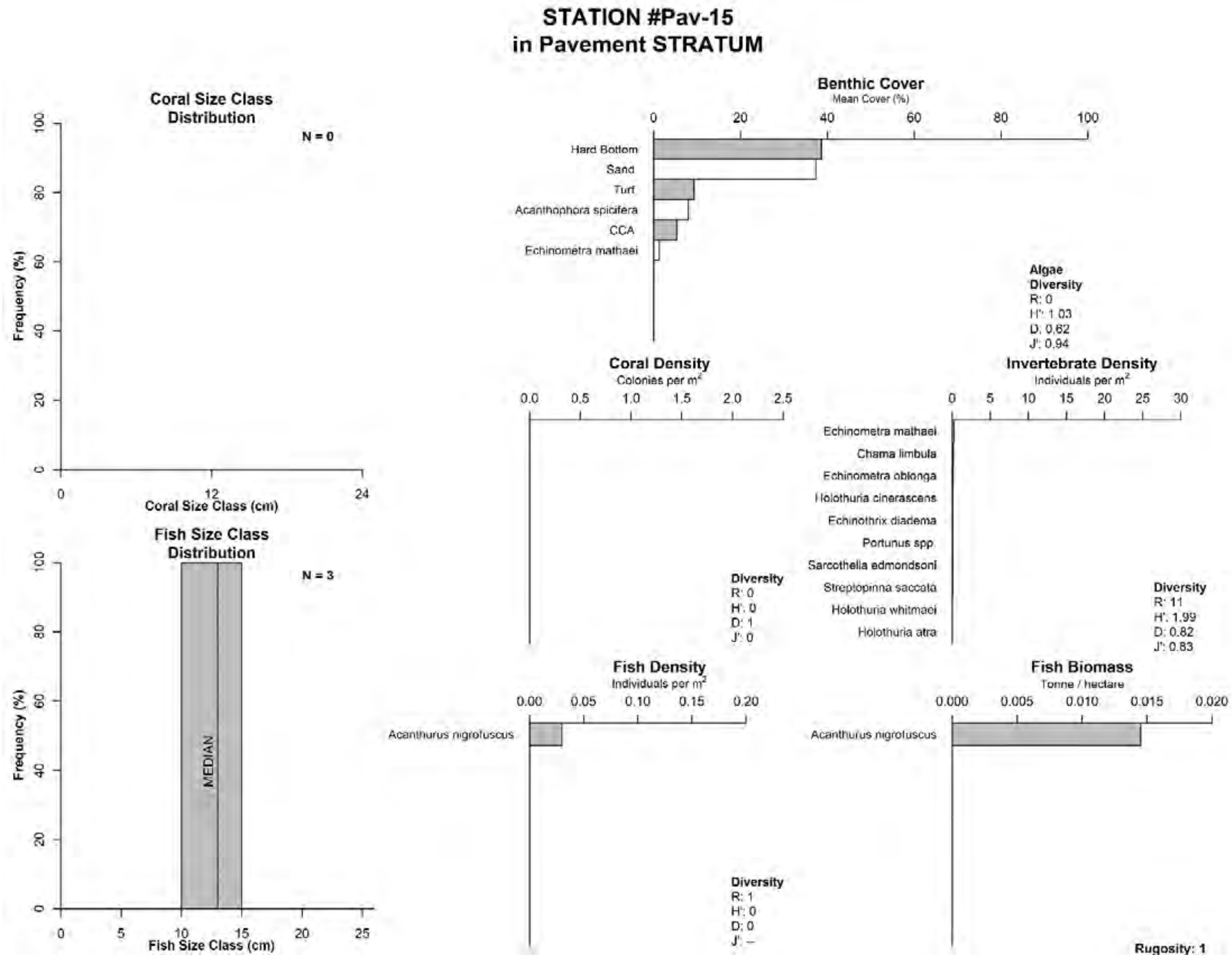

Figure B15: Station Pav-15. Biological characterization for station Pav-15 in the Pavement Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

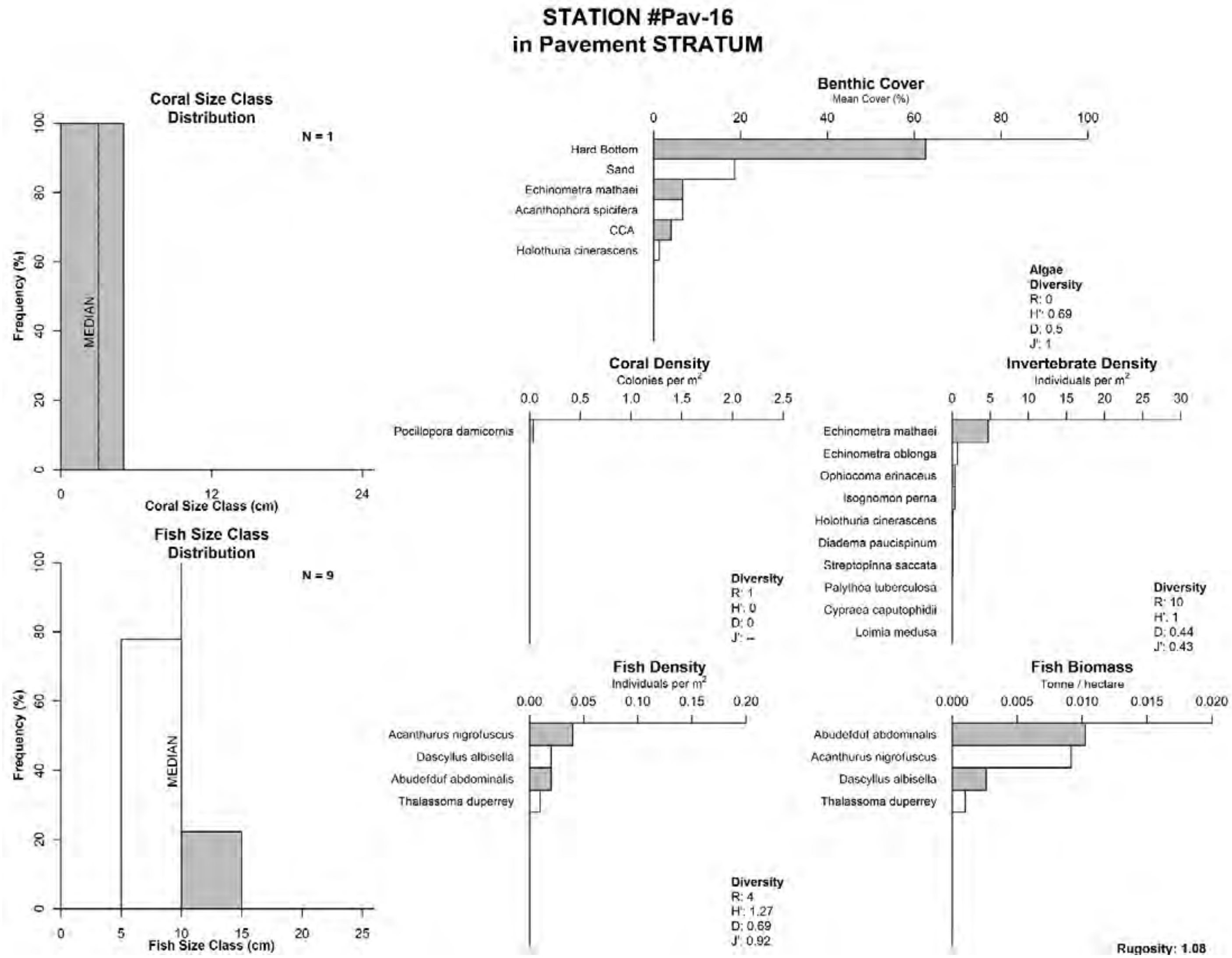

Figure B16: Station Pav-16. Biological characterization for station Pav-16 in the Pavement Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

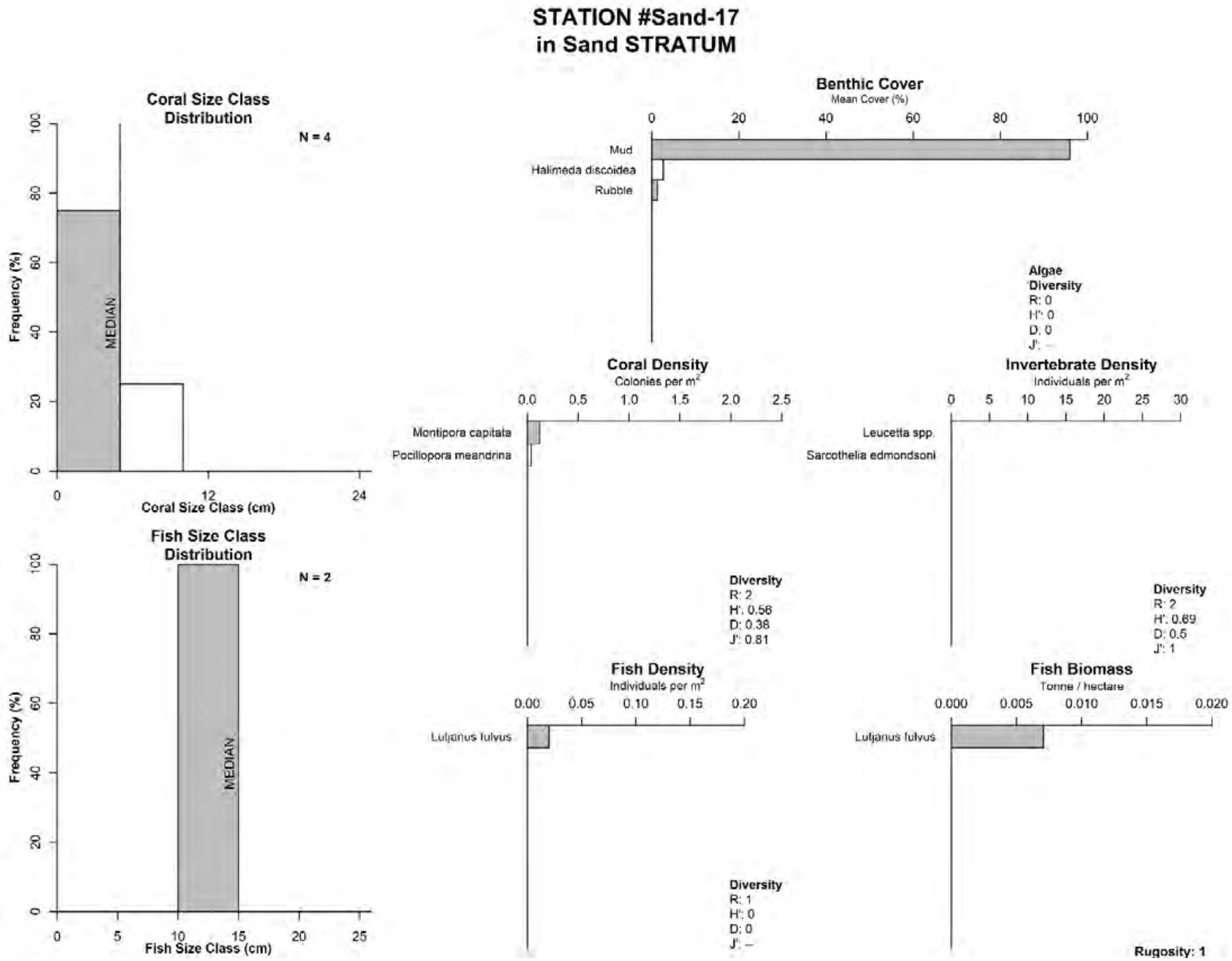

Figure B17: Station Sand-17. Biological characterization for station Sand-17 in the Sand Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

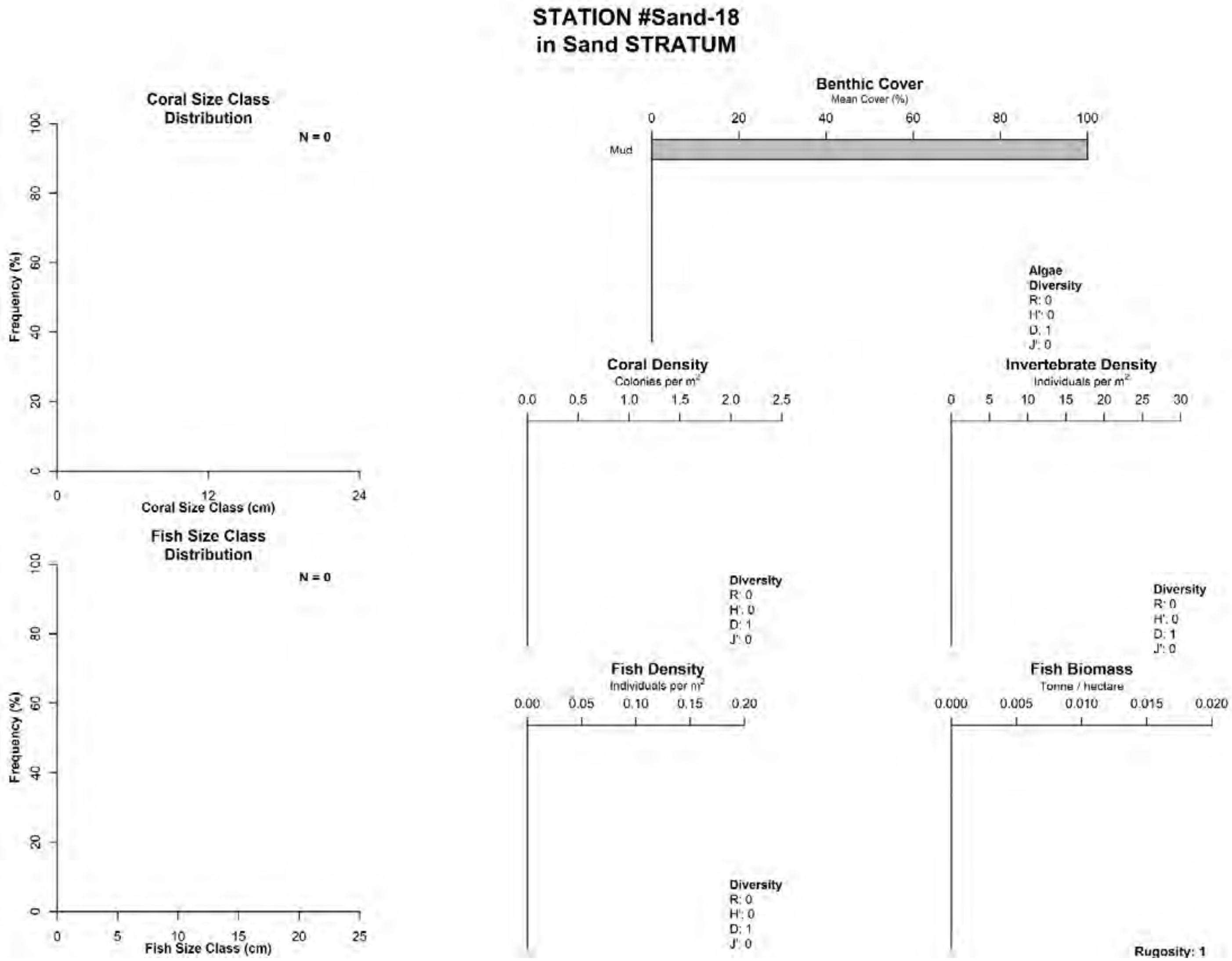

Figure B18: Station Sand-18. Biological characterization for station Sand-18 in the Sand Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

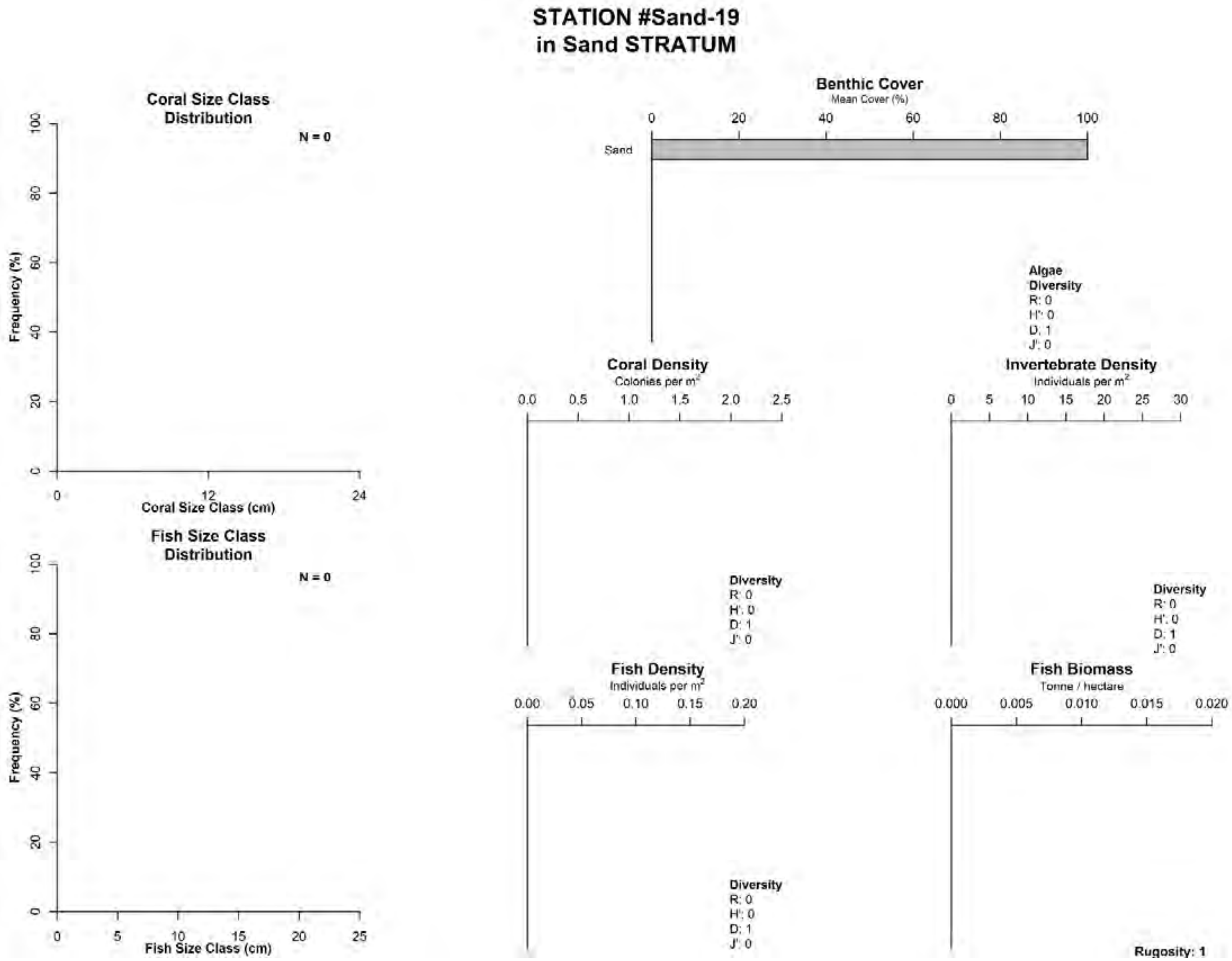

Figure B19: Station Sand-19. Biological characterization for station Sand-19 in the Sand Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

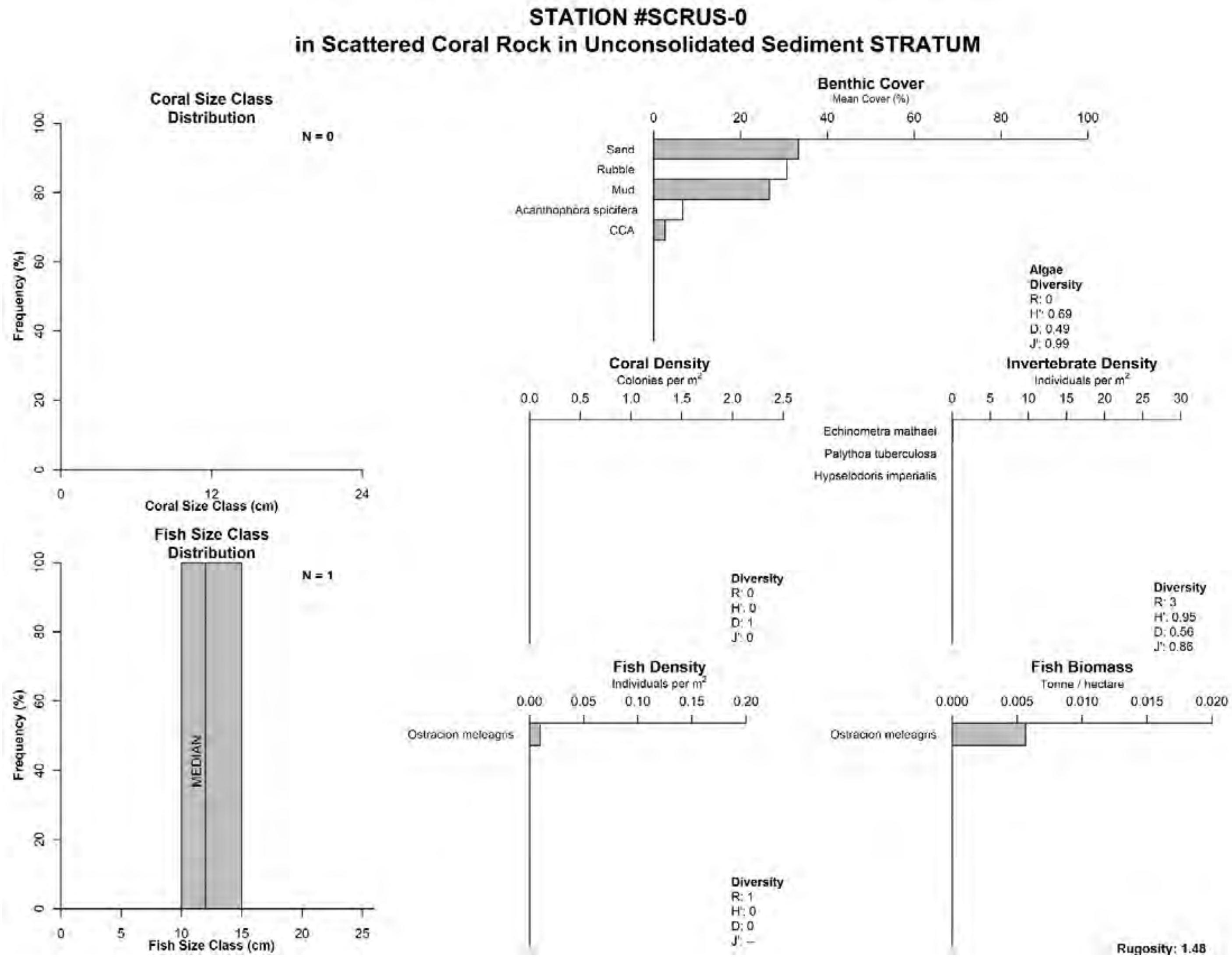

Figure B20: Station SCRUS-0. Biological characterization for station SCRUS-0 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

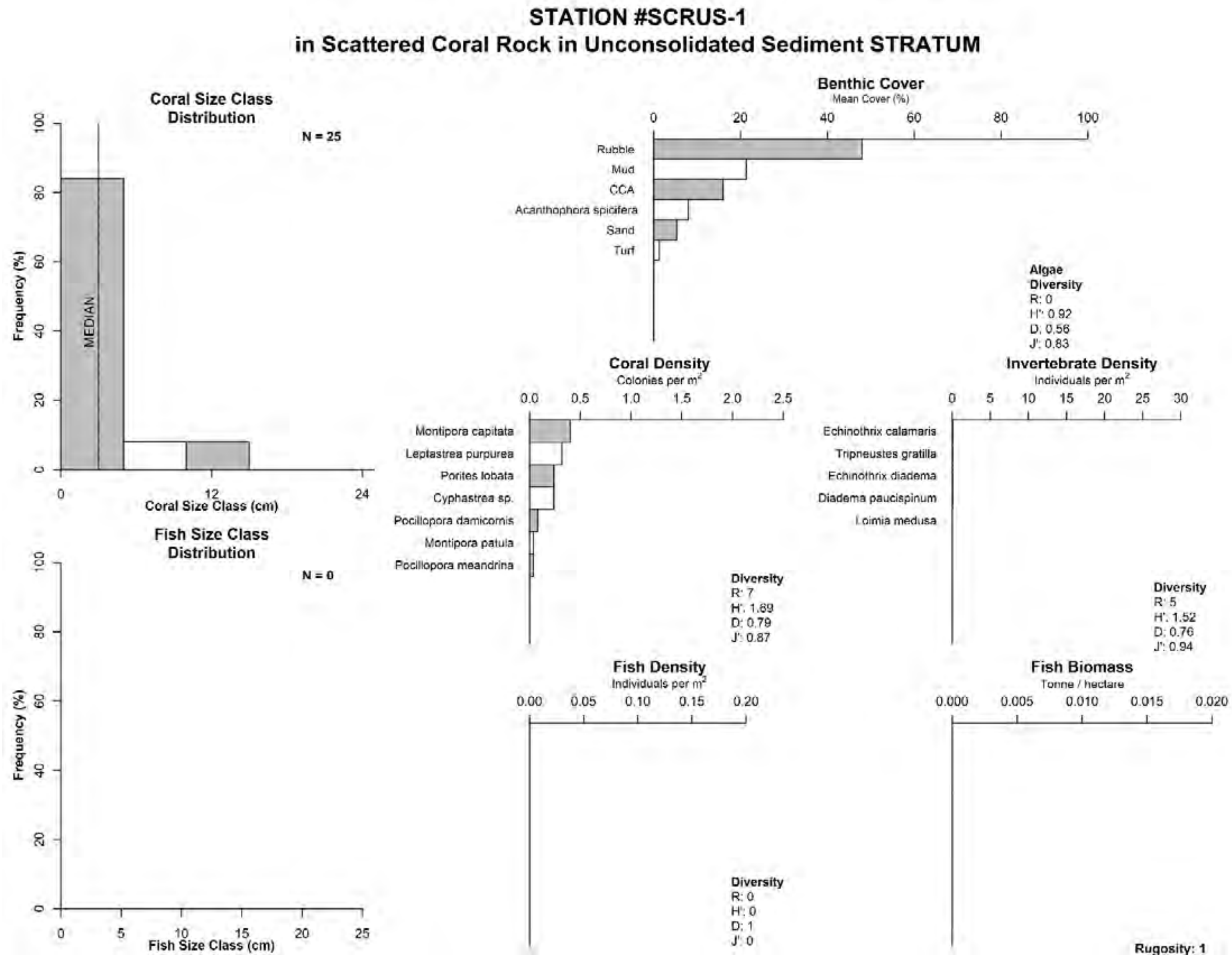

Figure B21: Station SCRUS-1. Biological characterization for station SCRUS-1 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

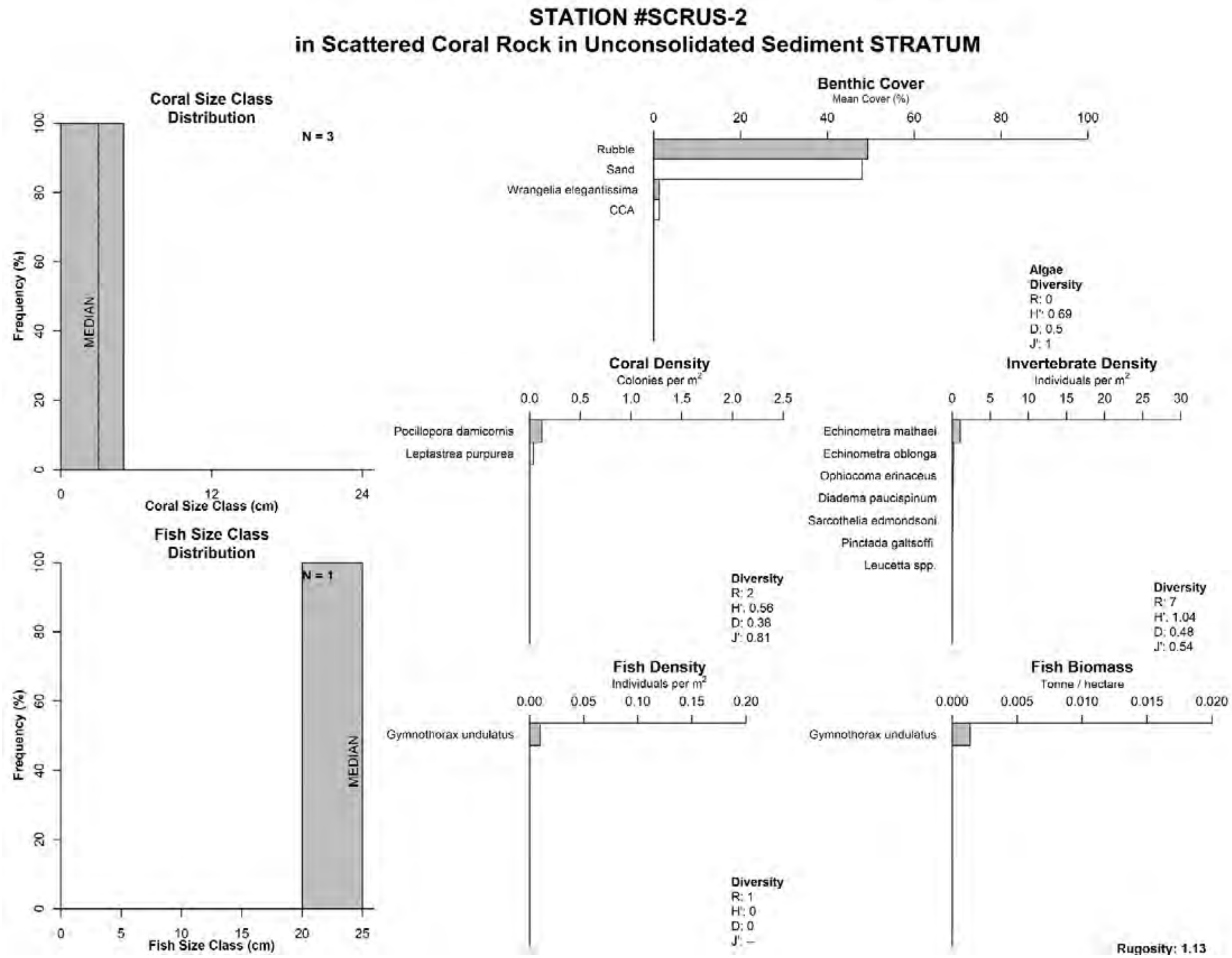

Figure B22: Station SCRUS-2. Biological characterization for station SCRUS-2 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

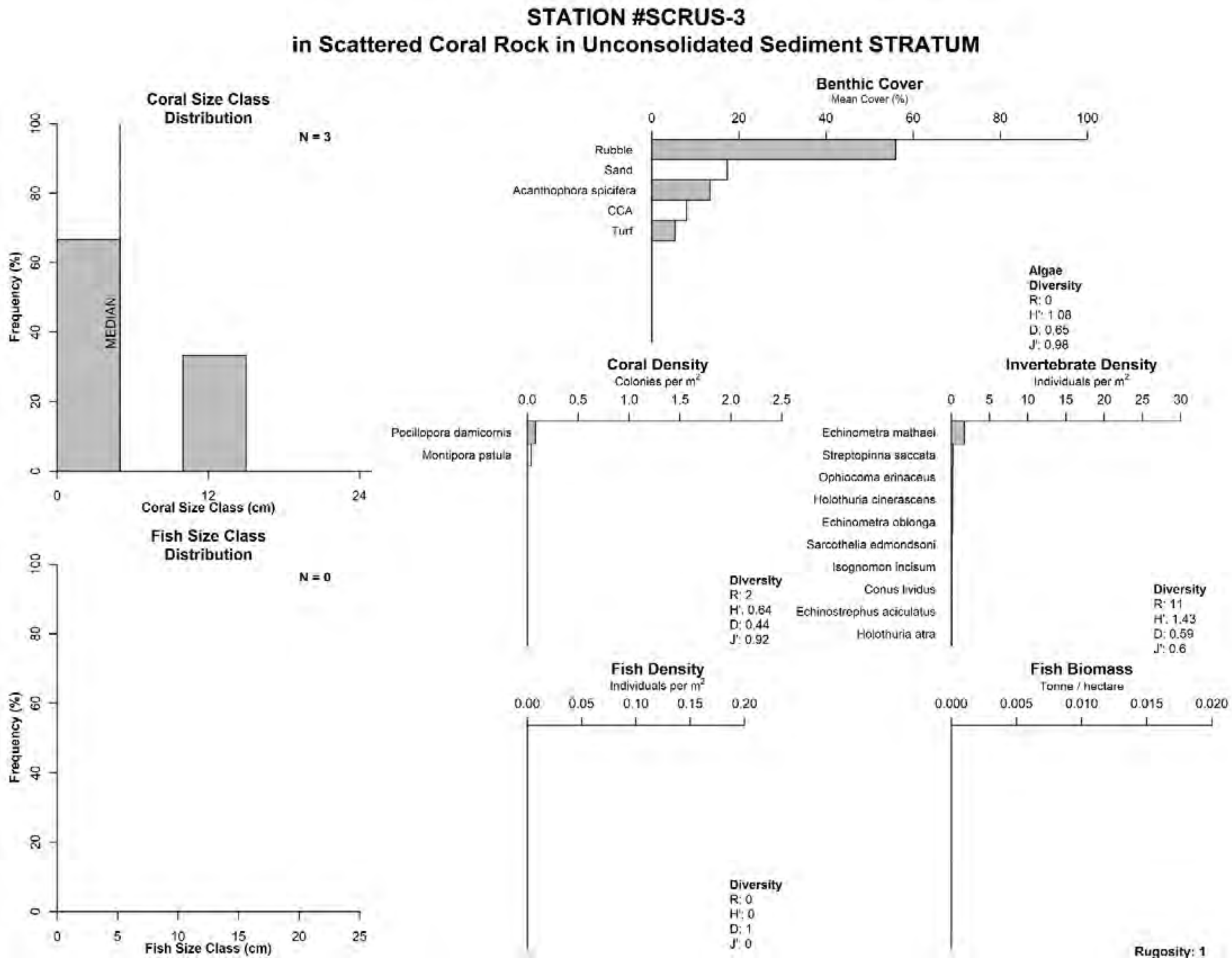

Figure B23: Station SCRUS-3. Biological characterization for station SCRUS-3 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

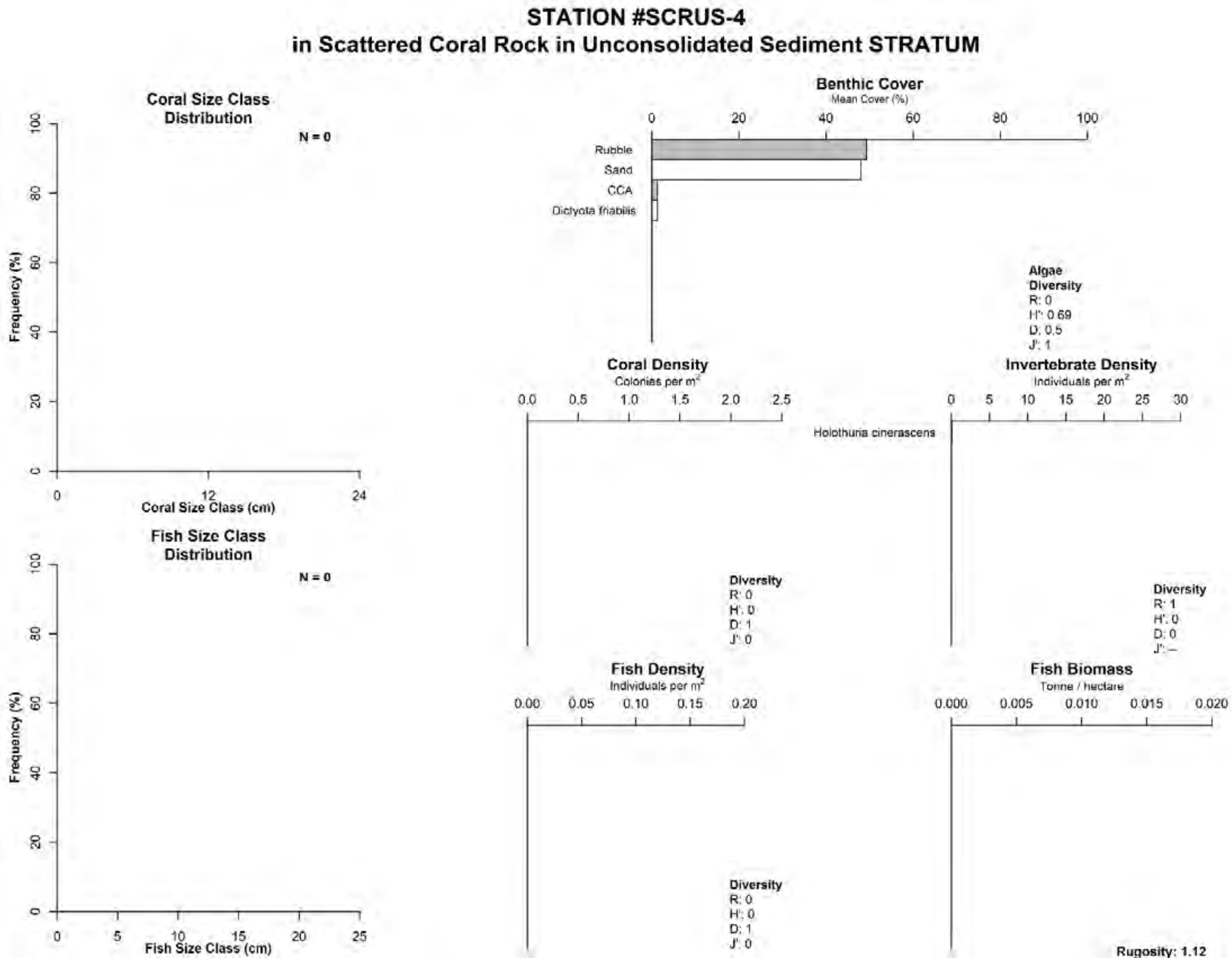

Figure B24: Station SCRUS-4. Biological characterization for station SCRUS-4 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

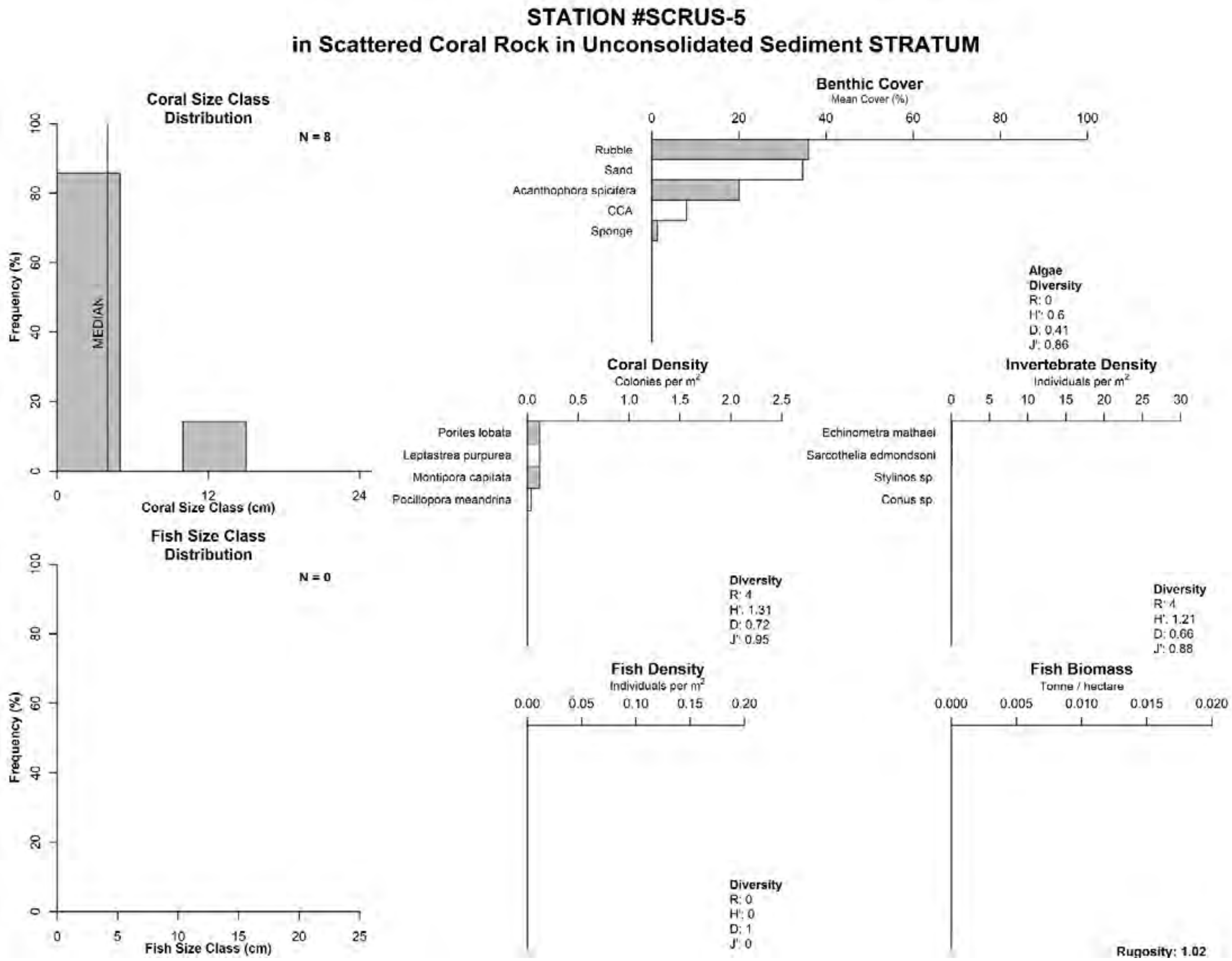

Figure B25: Station SCRUS-5. Biological characterization for station SCRUS-5 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

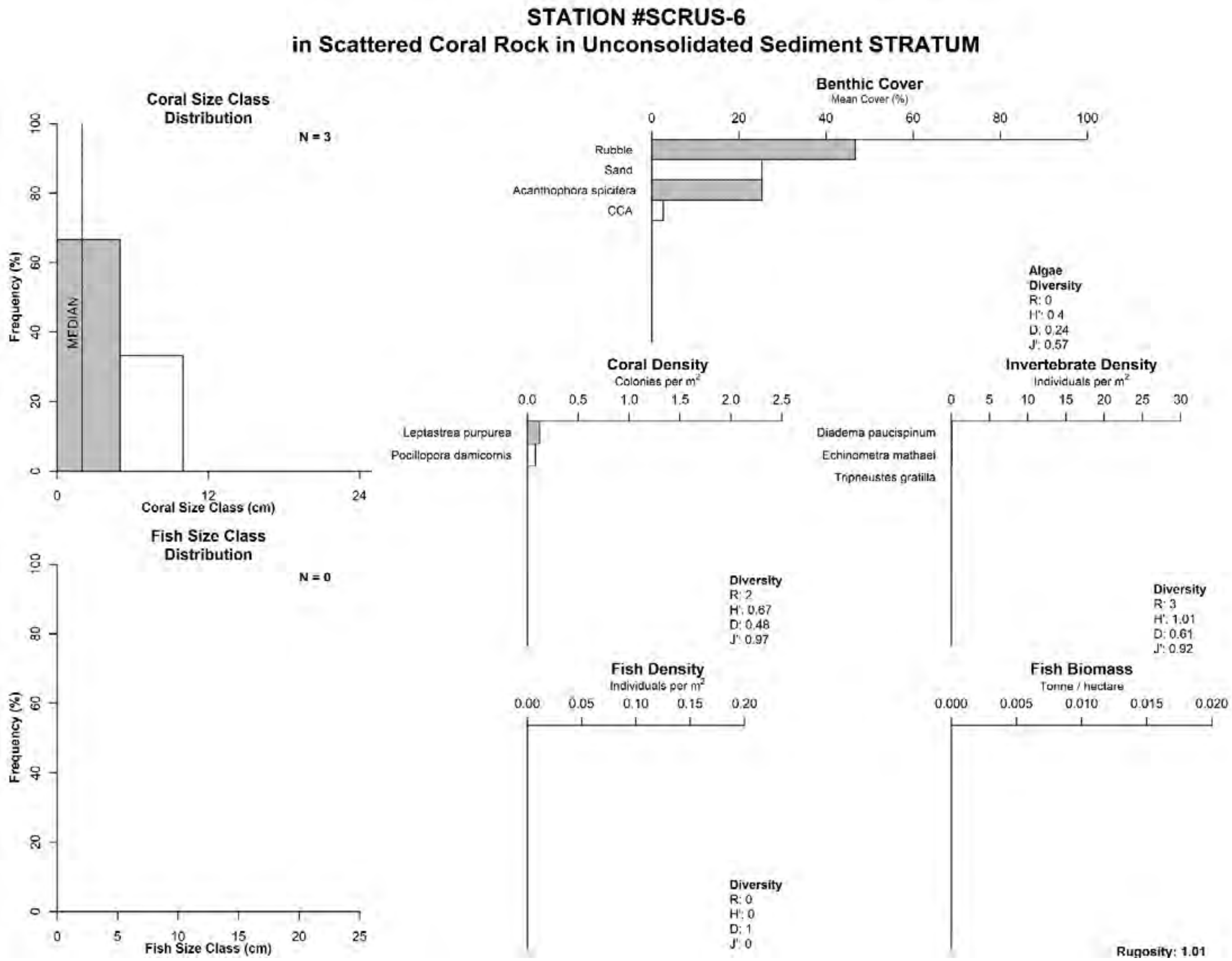

Figure B26: Station SCRUS-6. Biological characterization for station SCRUS-6 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

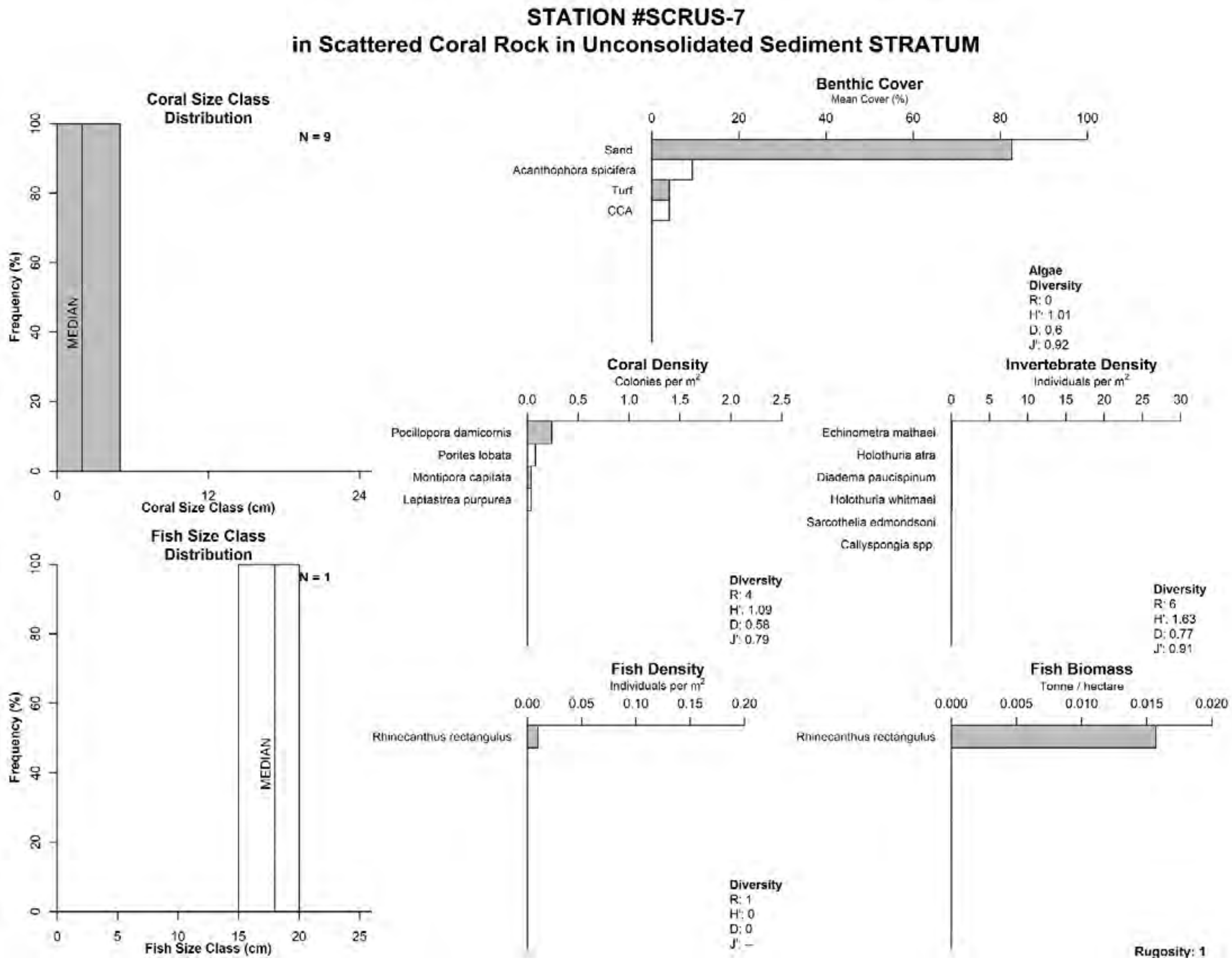

Figure B27: Station SCRUS-7. Biological characterization for station SCRUS-7 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

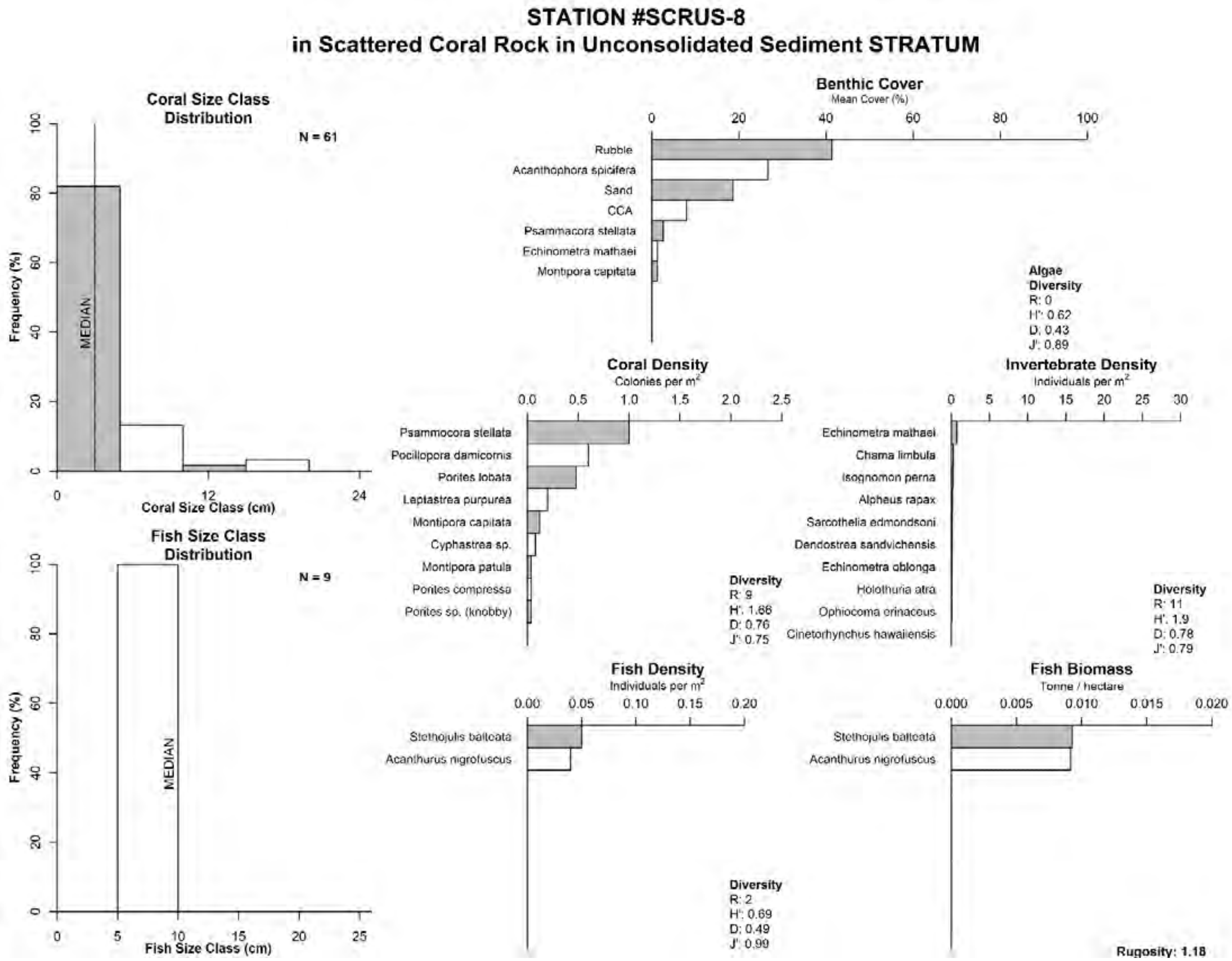

Figure B28: Station SCRUS-8. Biological characterization for station SCRUS-8 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

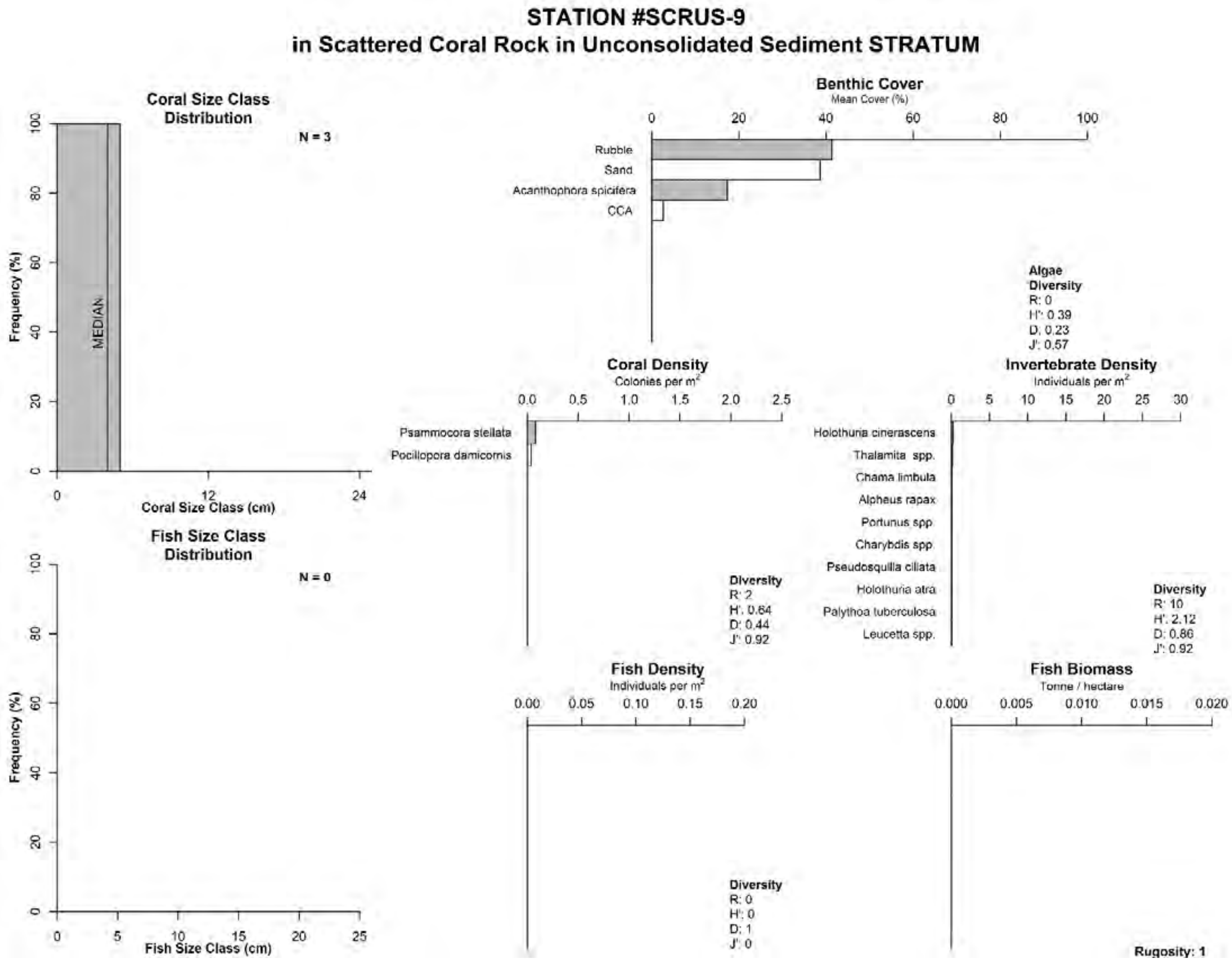

Figure B29: Station SCRUS-9. Biological characterization for station SCRUS-9 in the Scattered Coral/Rock in Unconsolidated Sediment Stratum. Note: NO DATA means that this data component was not collected, while blank graphs represent no observations.

APPENDIX C: Images of the Haleiwa Beach Area

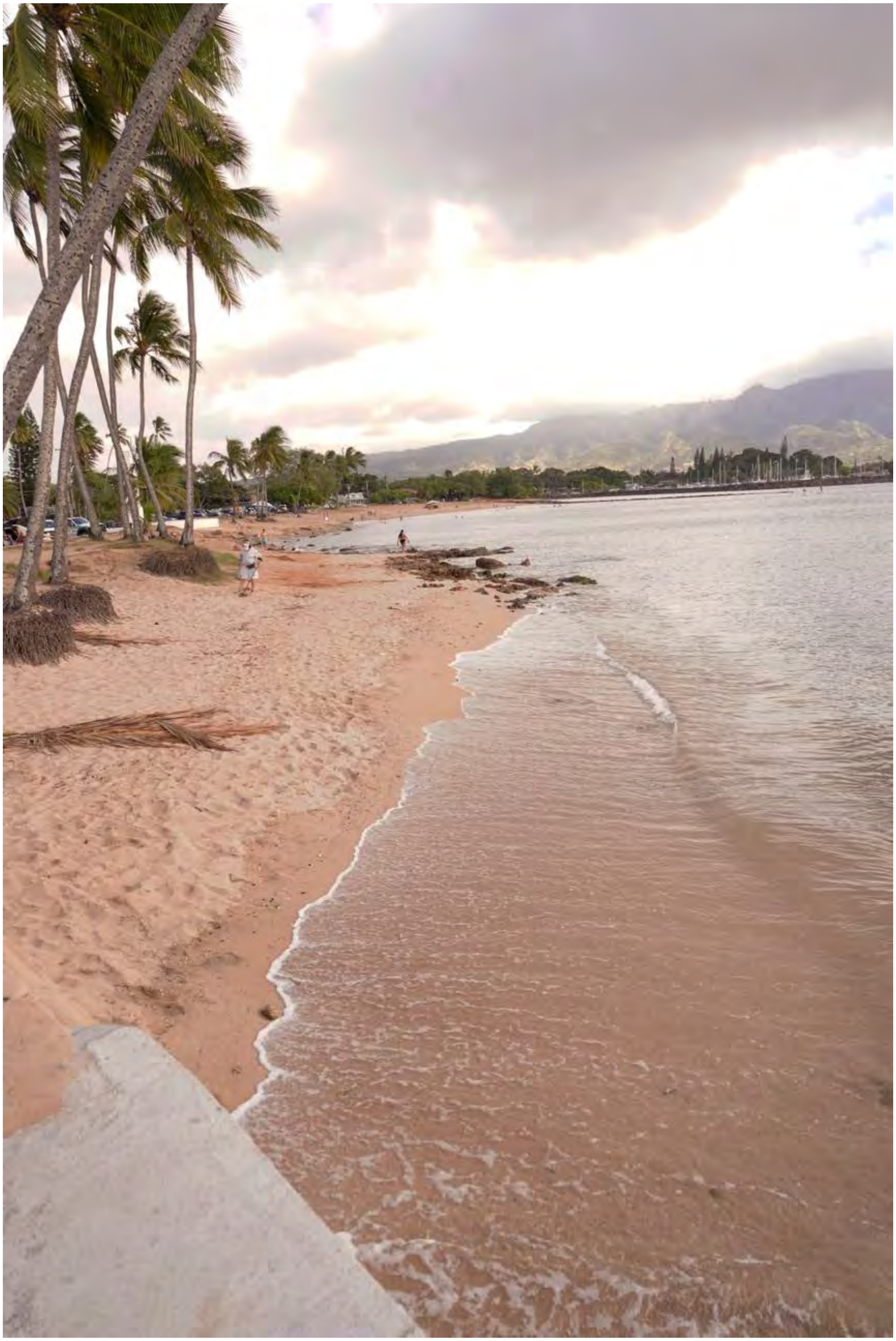

Figure C1: Beach area facing south. Beach area from the comfort station facing south.

Figure C2: Beach area facing north. Beach area from the comfort station facing north.

Figure C3: Beach area facing north and seaward. Beach area from the comfort station facing north and seaward showing the offshore jetty past the rocky shoreline intertidal area.

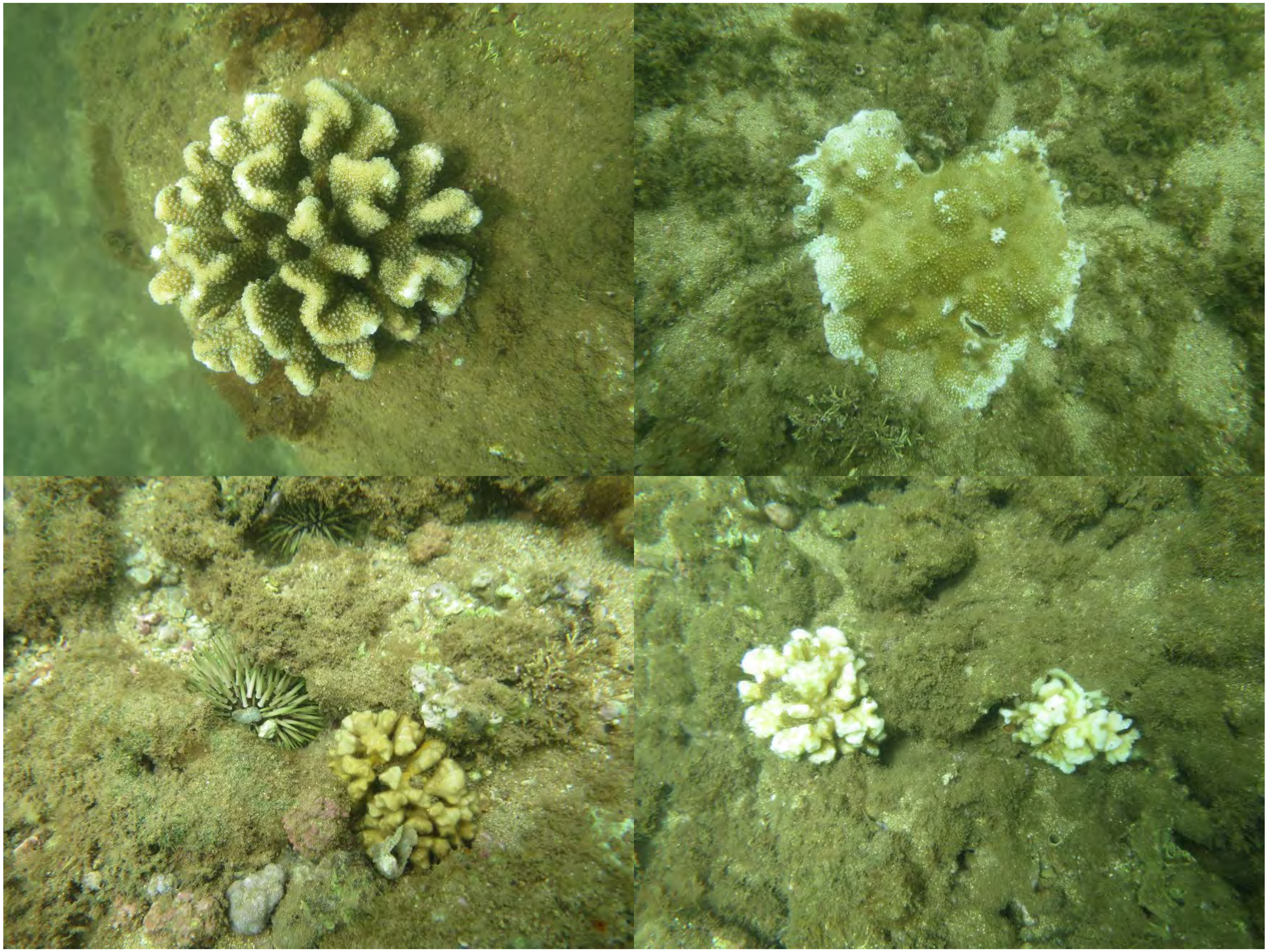

Figure C4: Coral Examples. Examples of coral species within the project area. Upper left: *Pocillopora meandrina*; Upper right: *Montipora capitata*; Lower left: *Psammocora stellata*; Lower right: *Pocillopora damicornis*.

Figure C5: Scattered Coral/Rock in Unconsolidated Sediment Stratum Example. A typical example of the Scattered Coral/Rock in Unconsolidated Sediment habitat structure.

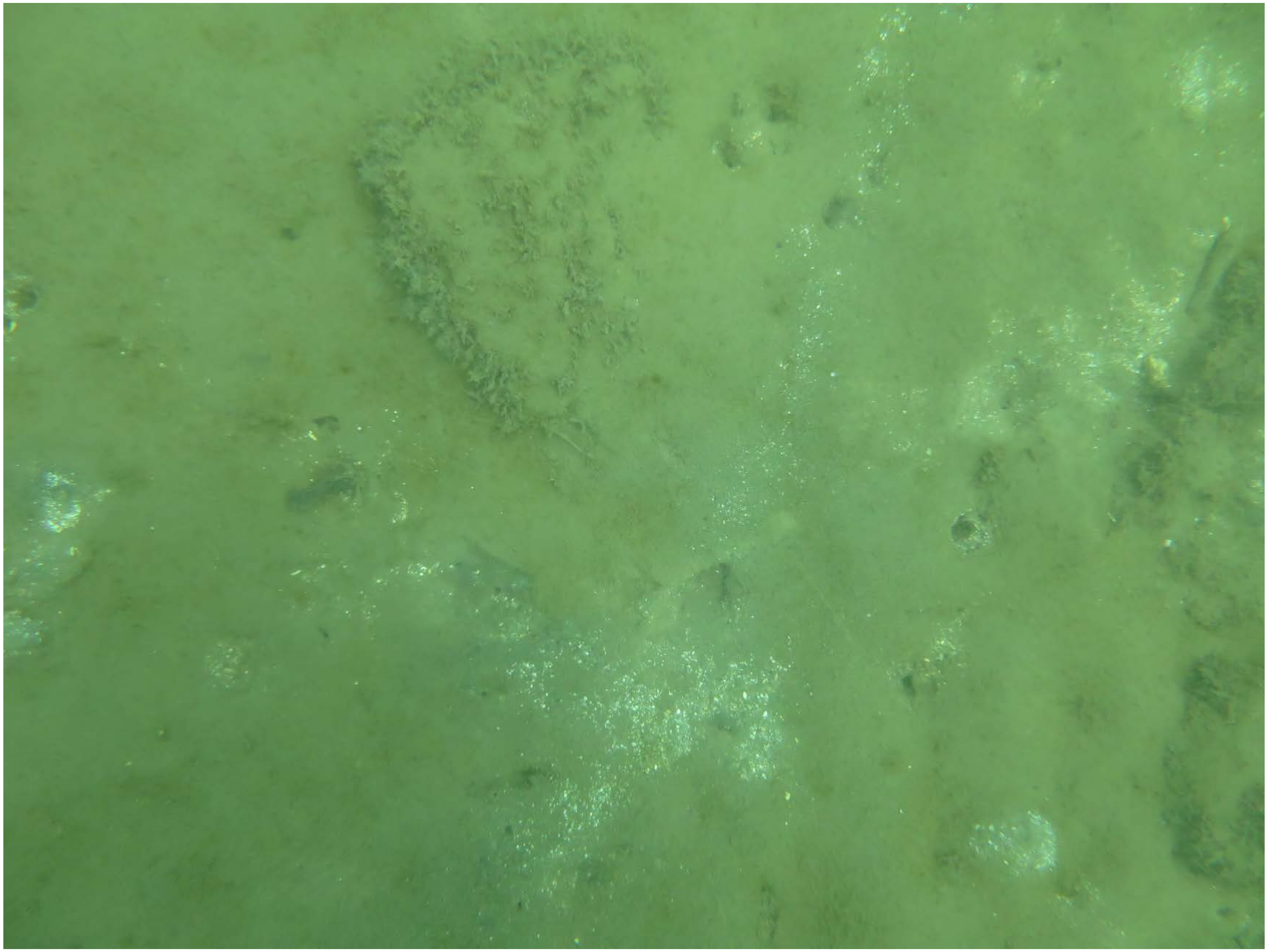

Figure C6: Sand Stratum Example. Example of the substrate composition of the Sand stratum indicating a mixture of mud and sand.

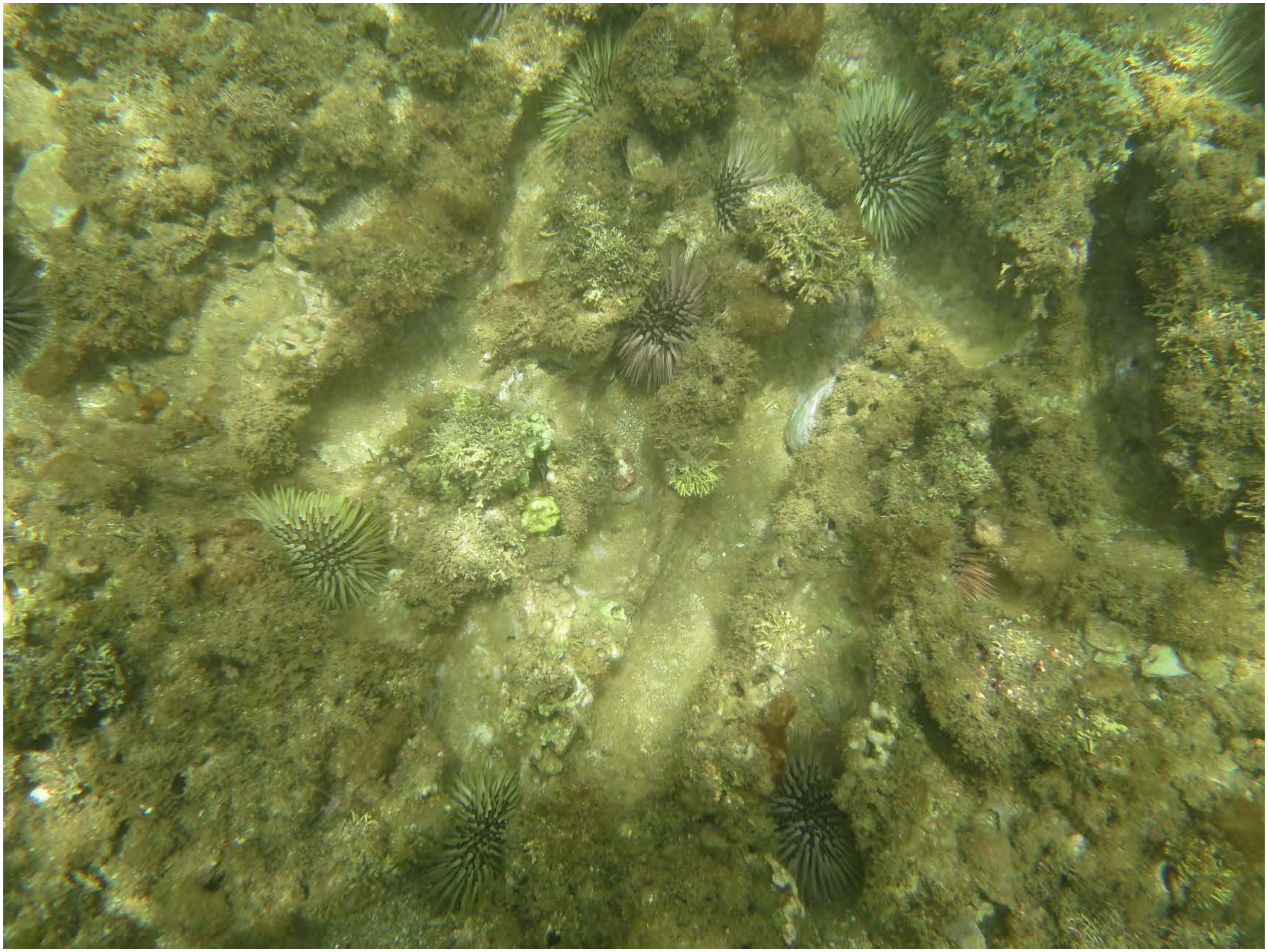

Figure C7: Pavement Stratum Example. Example of the pavement stratum with many rock-boring sea urchins, *Echinometra mathaei*.

Figure C8: Offshore Sand Area. Examples of the habitat in the offshore sand area.

Figure C9: Barge Offload Area. Examples of the habitat in the barge offload area.

APPENDIX D: Maps of Haleiwa Beach Re-nourishment Project Offshore Sand Area

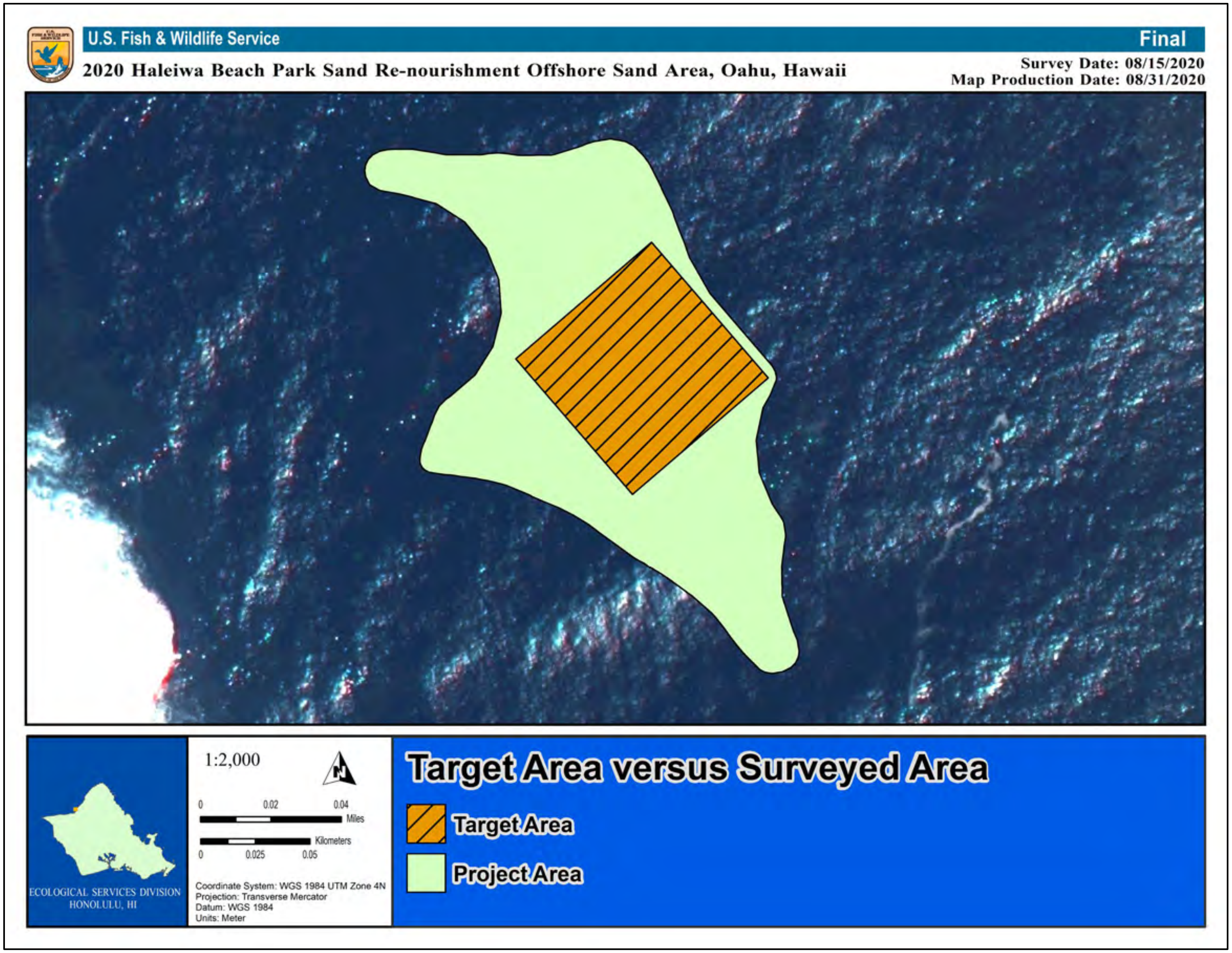

Figure D1: Target Area vs. Surveyed Area. Overview of the Project Area (total surveyed area plus project footprint) versus the Target Area (project footprint).

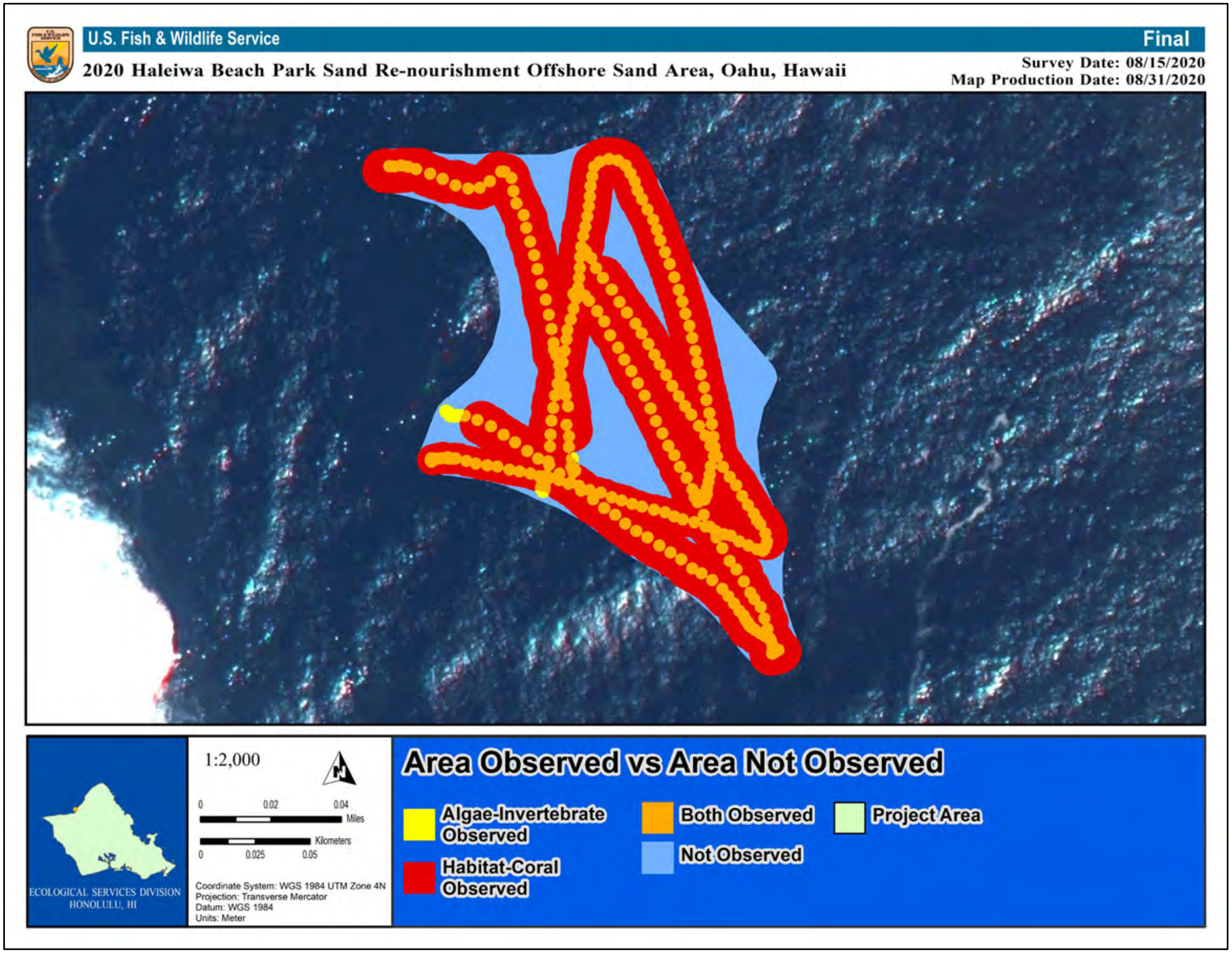

Figure D2: Area Observed. Overview of the area observed by in-water observers versus the area interpolated in all maps.

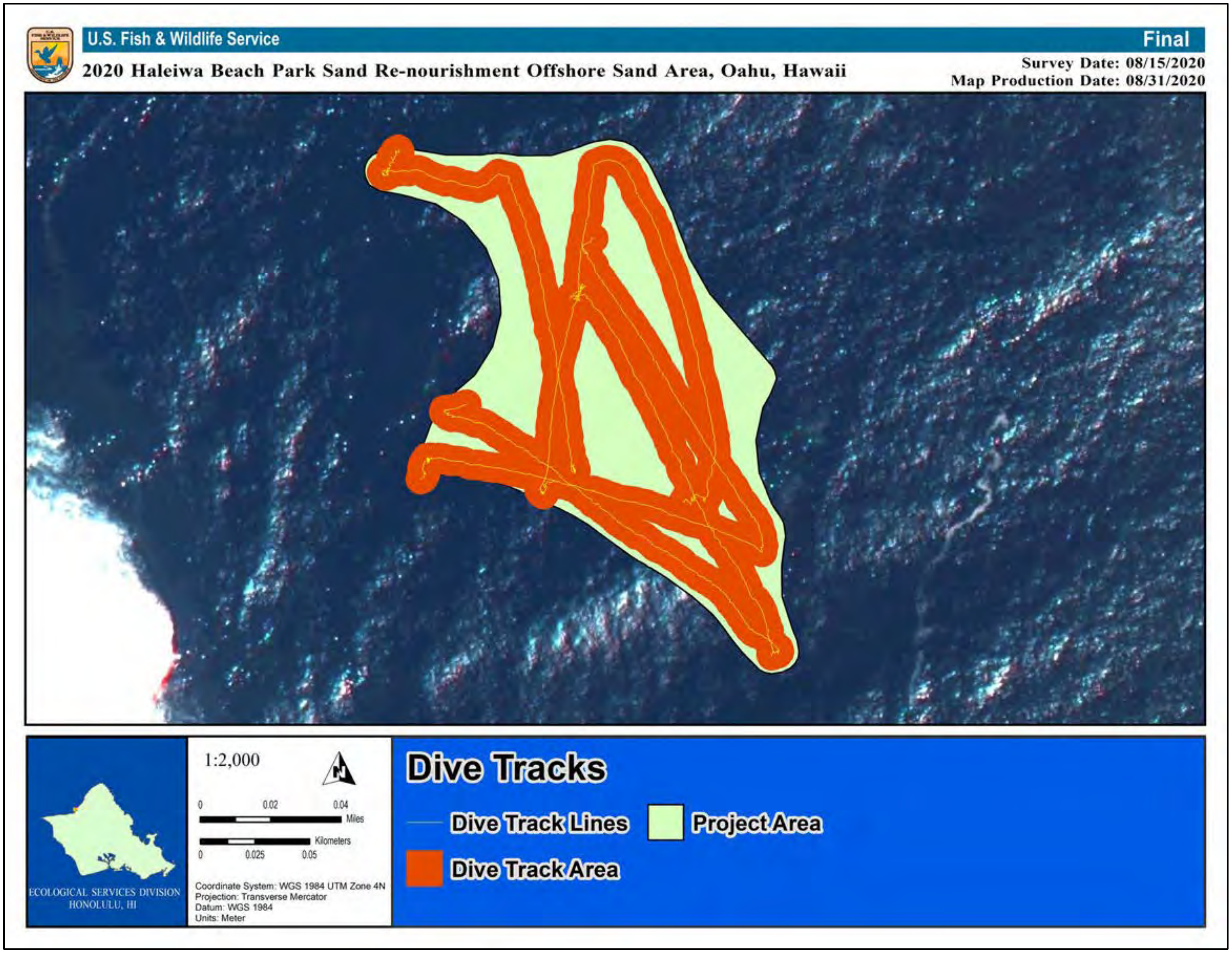

Figure D3: Dive Tracks. Overview of the dive tracks within the project area contains.

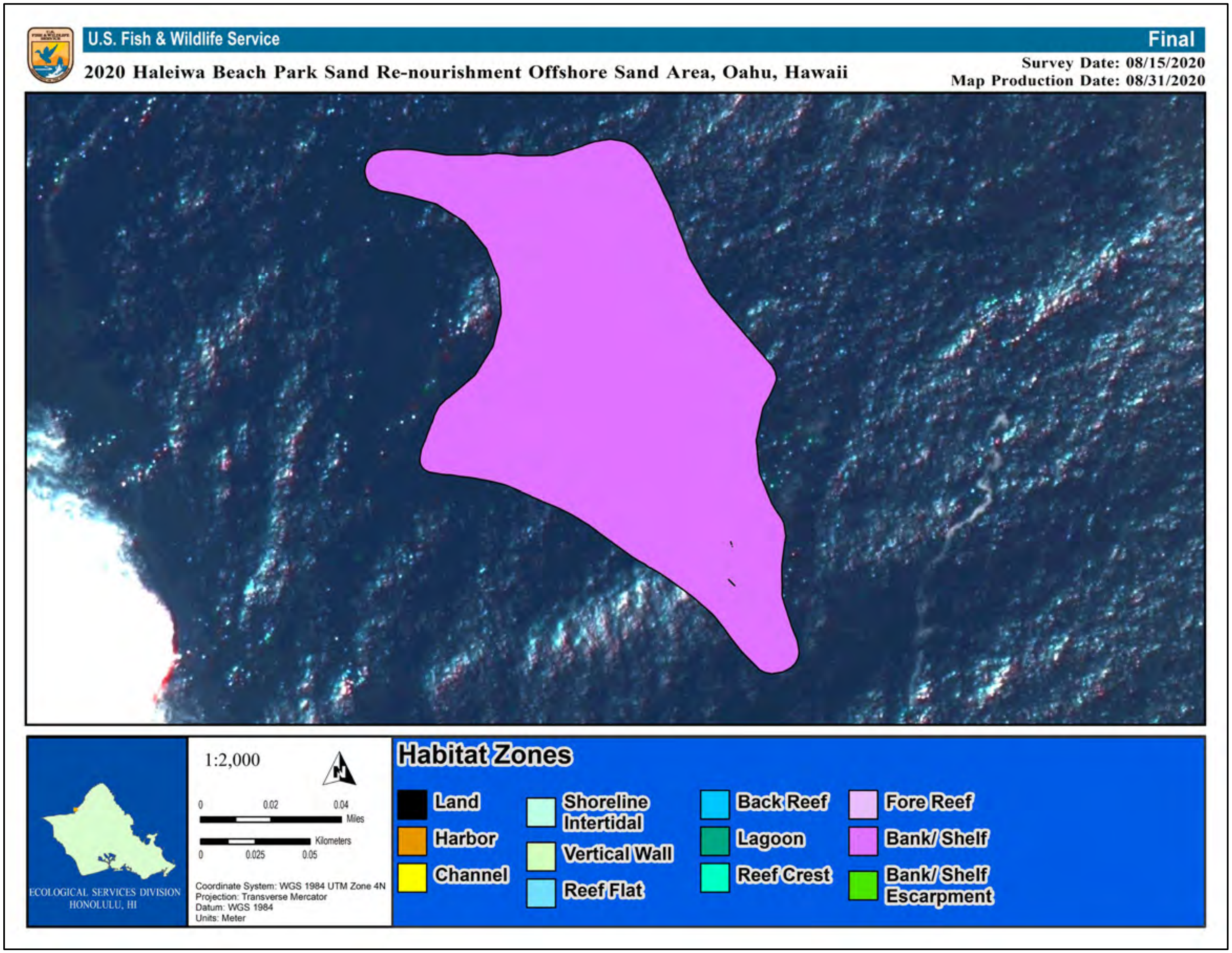

Figure D4: Habitat Zones. Overview of the various habitat zones that the project area contains.

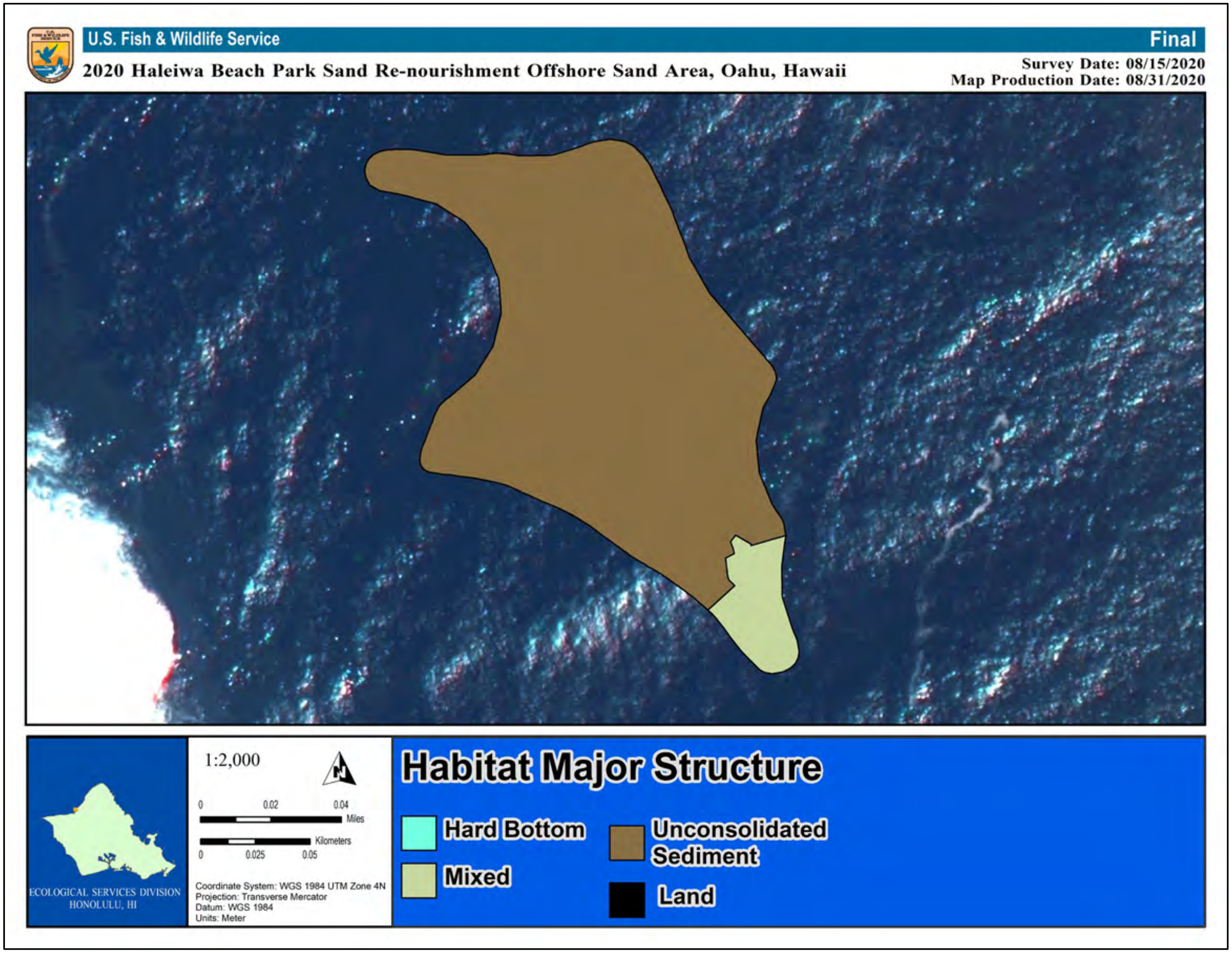

Figure D5: Habitat Major Structure. Overview of the major habitat structures that the project area contains.

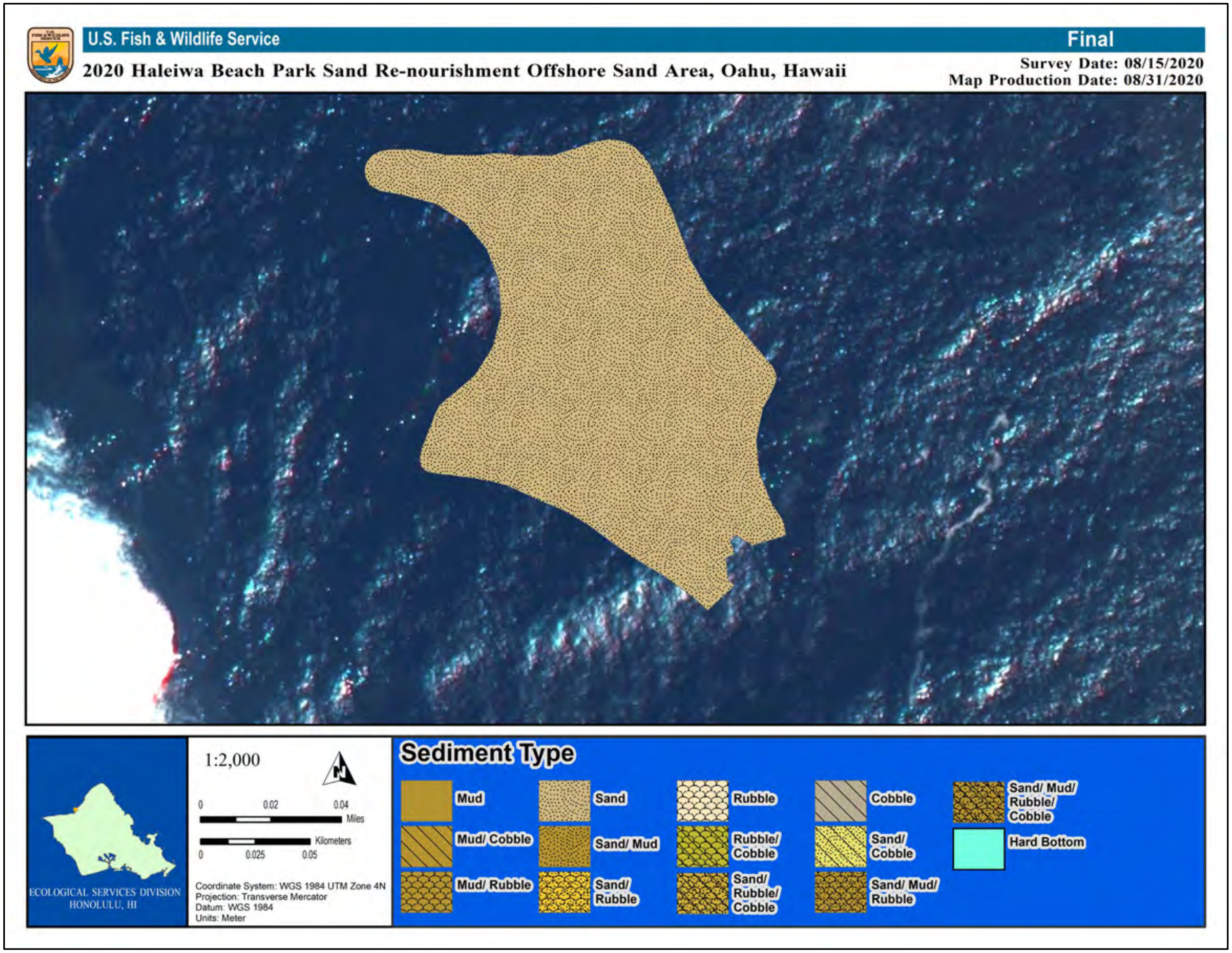

Figure D6: Sediment Type. Overview of the various sediment types that the project area contains.

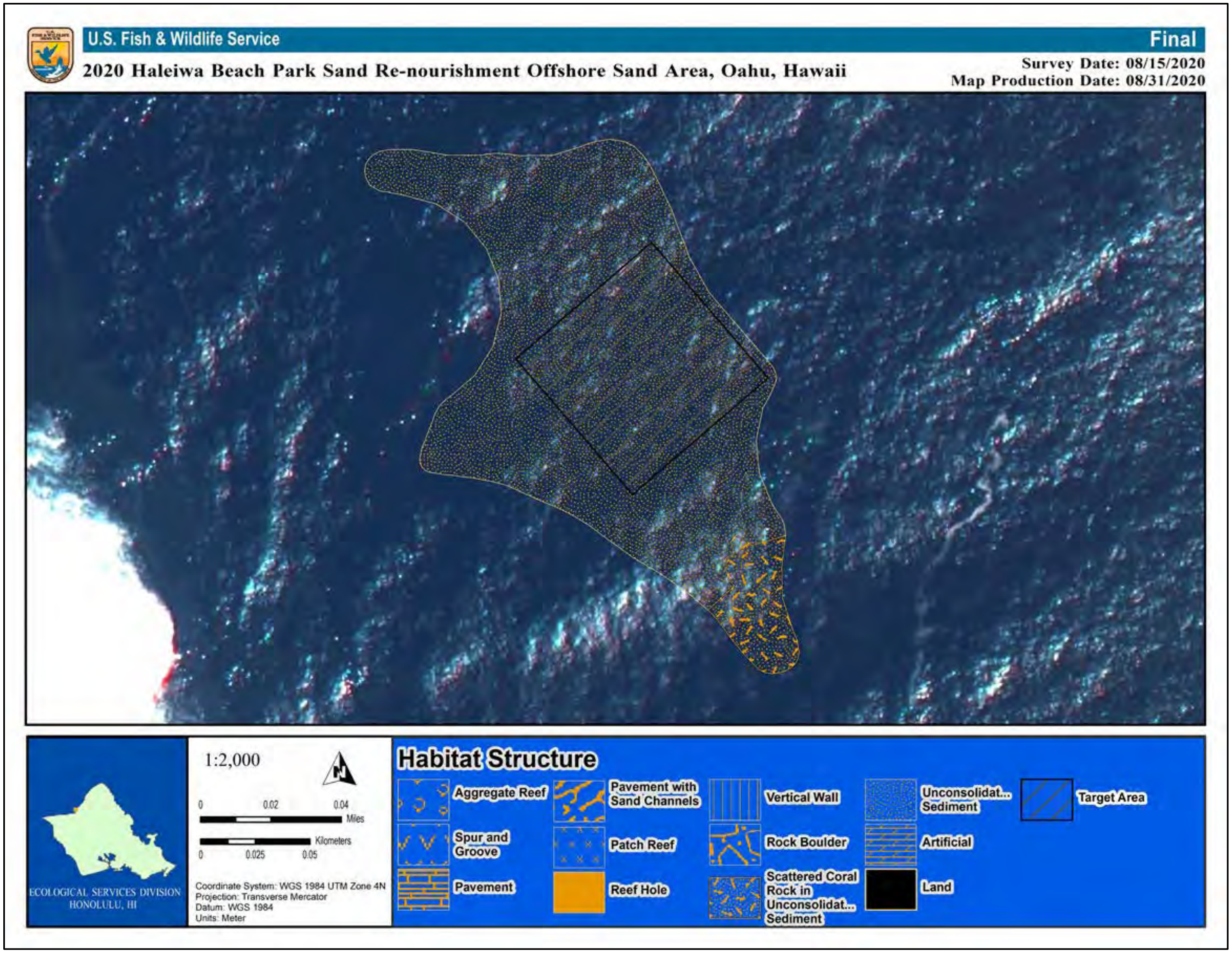

Figure D7: Habitat Structure. Overview of the habitat structures that the project area contains.

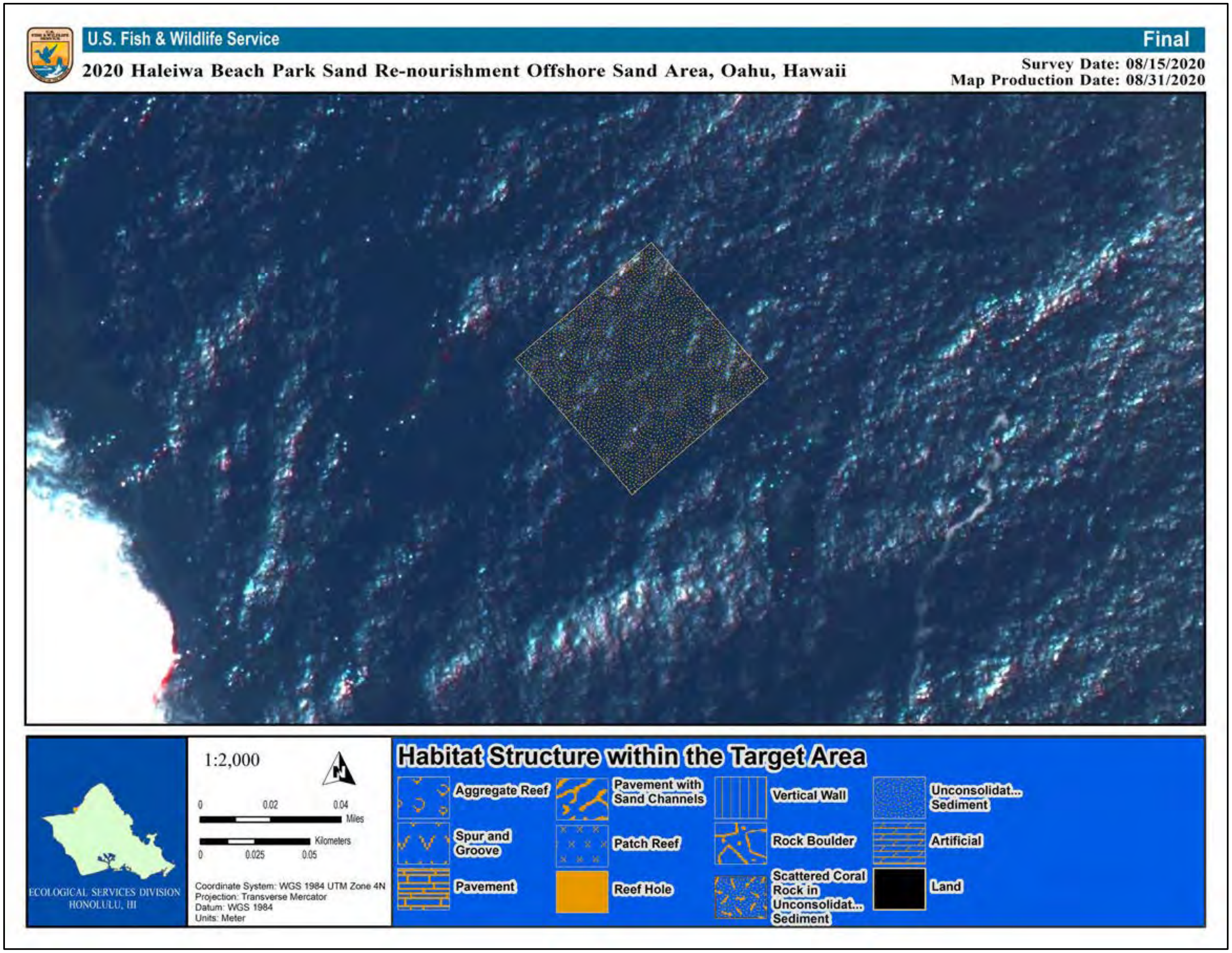

Figure D8: Habitat Structure within Target Area. Overview of the habitat structures within the Target Area.

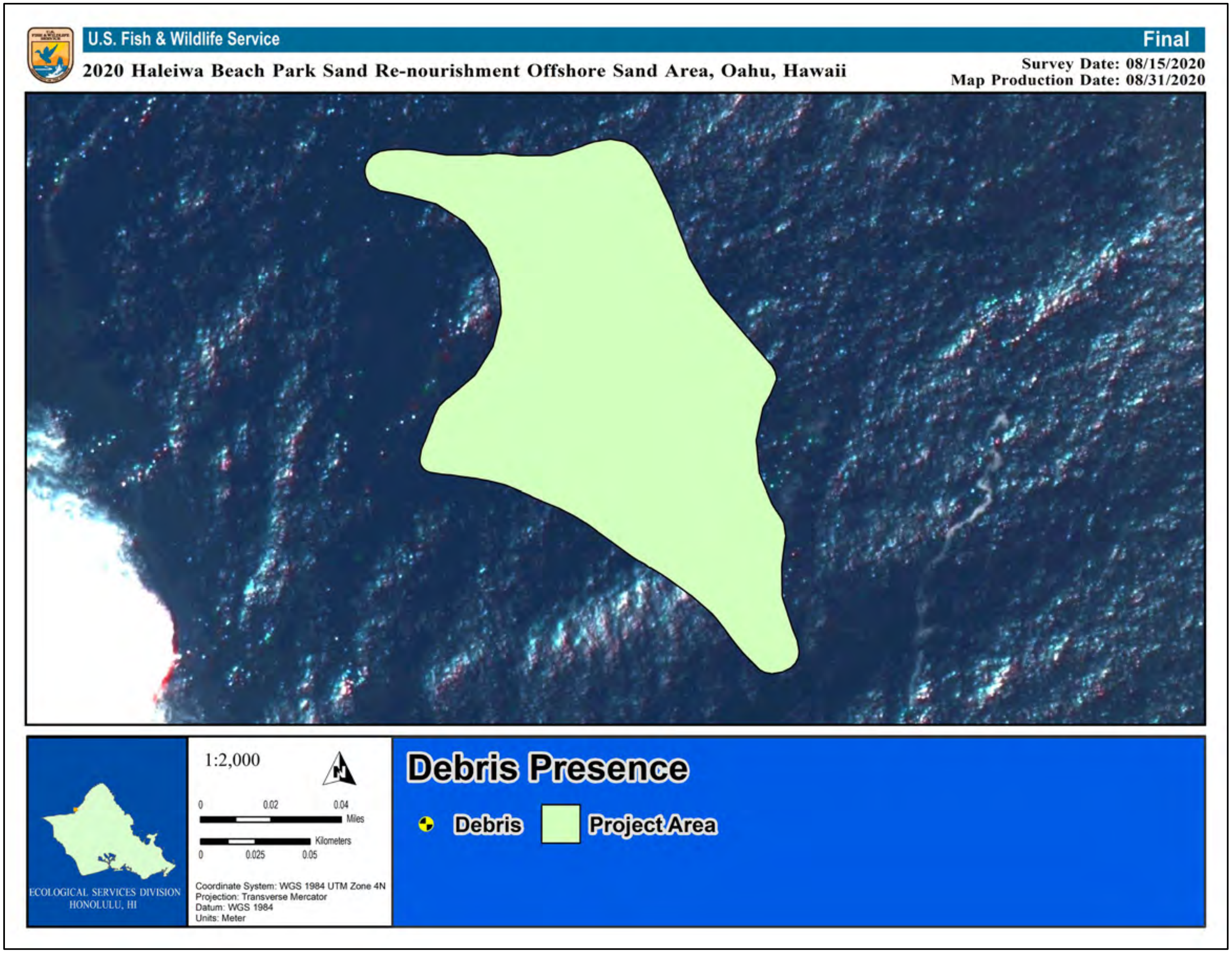

Figure D10: Debris. Overview of the debris observed within the project area.

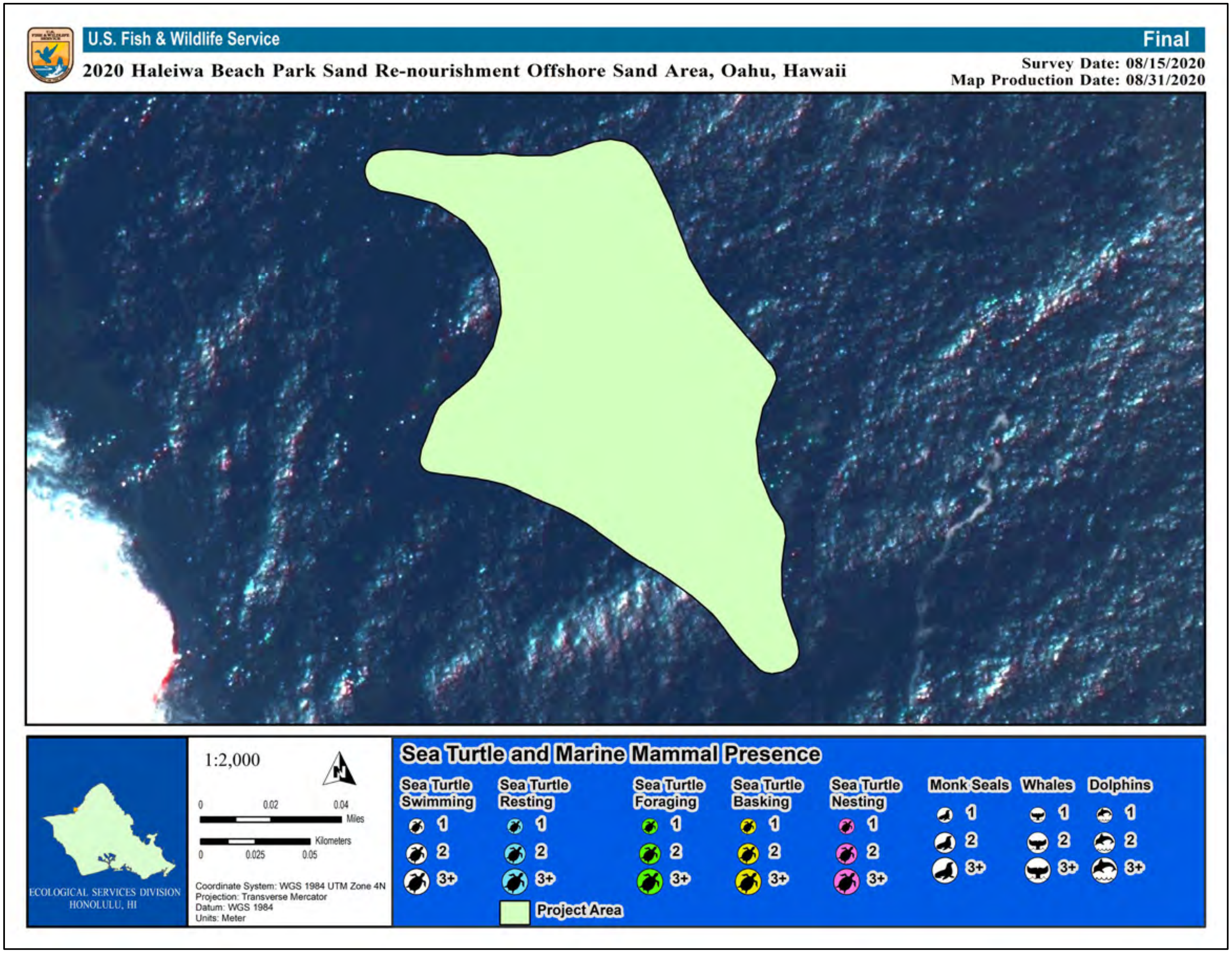

Figure D11: Protected Species. Overview of the observed protected species within the project area.

APPENDIX E: Maps of Haleiwa Beach Re-nourishment Project Sand Barge Offload Area

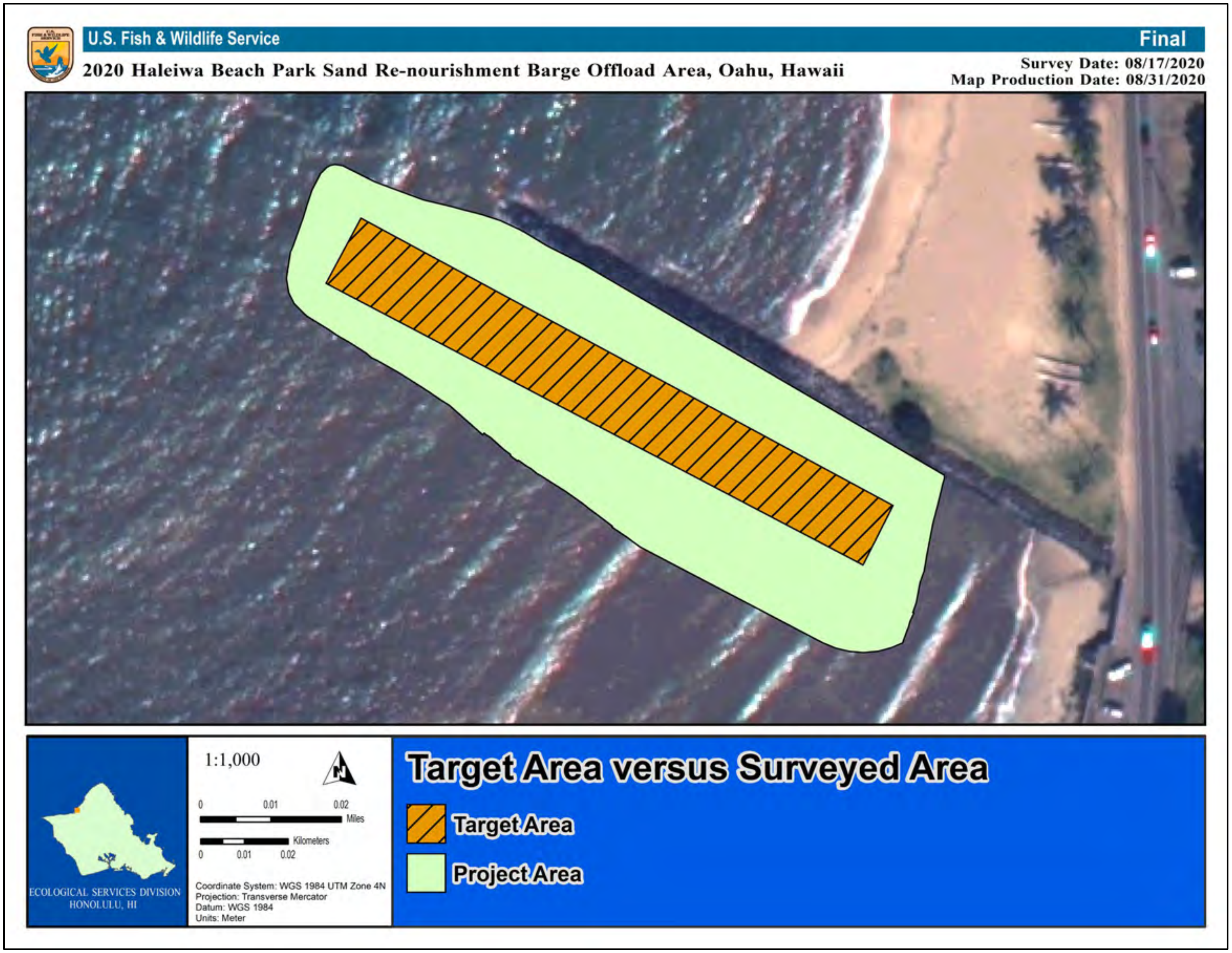

Figure E1: Target Area vs. Surveyed Area. Overview of the Project Area (total surveyed area plus project footprint) versus the Target Area (project footprint).

Figure E2: Area Observed. Overview of the area observed by in-water observers versus the area interpolated in all maps.

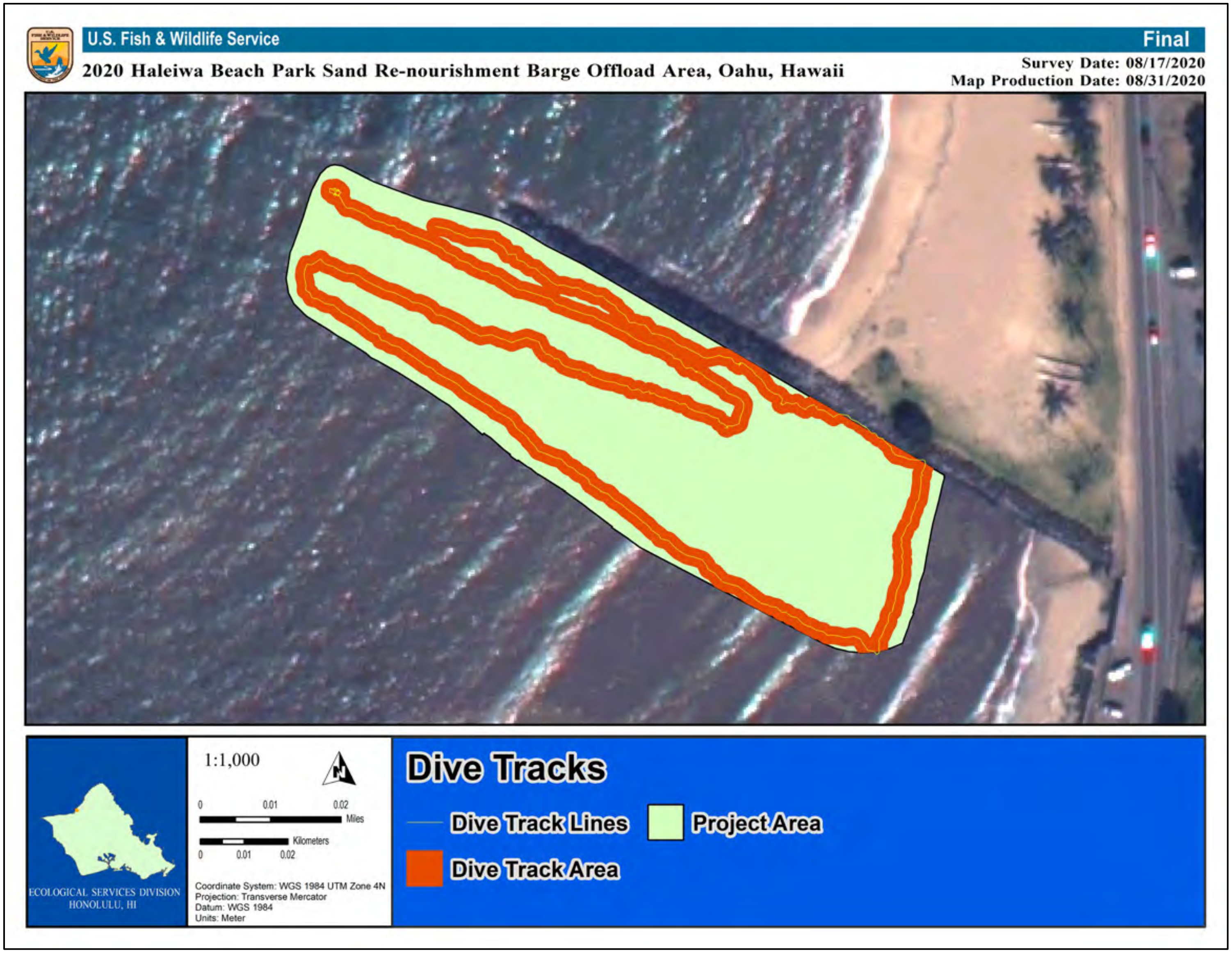

Figure E3: Dive Tracks. Overview of the dive tracks within the project area contains.

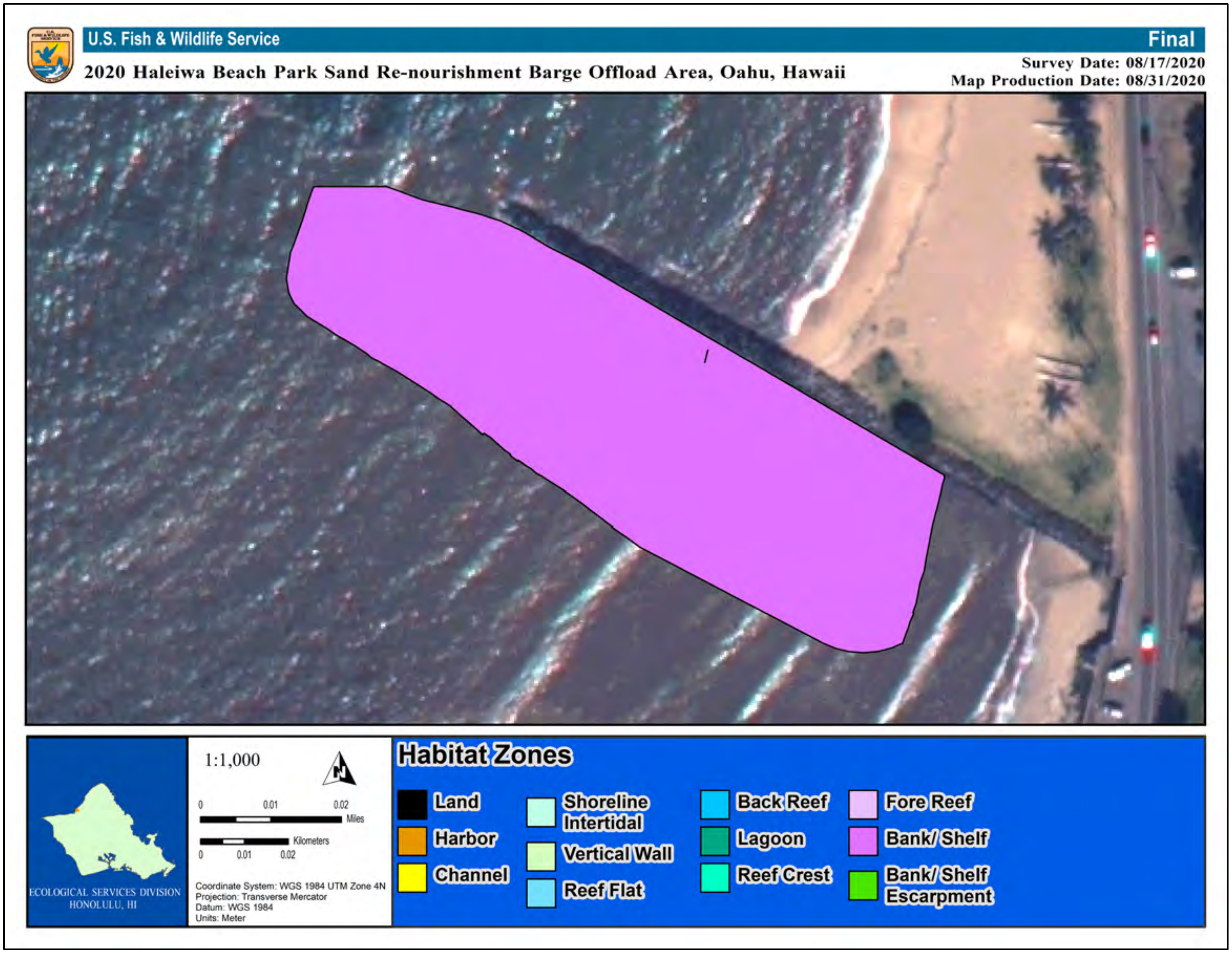

Figure E4: Habitat Zones. Overview of the various habitat zones that the project area contains.

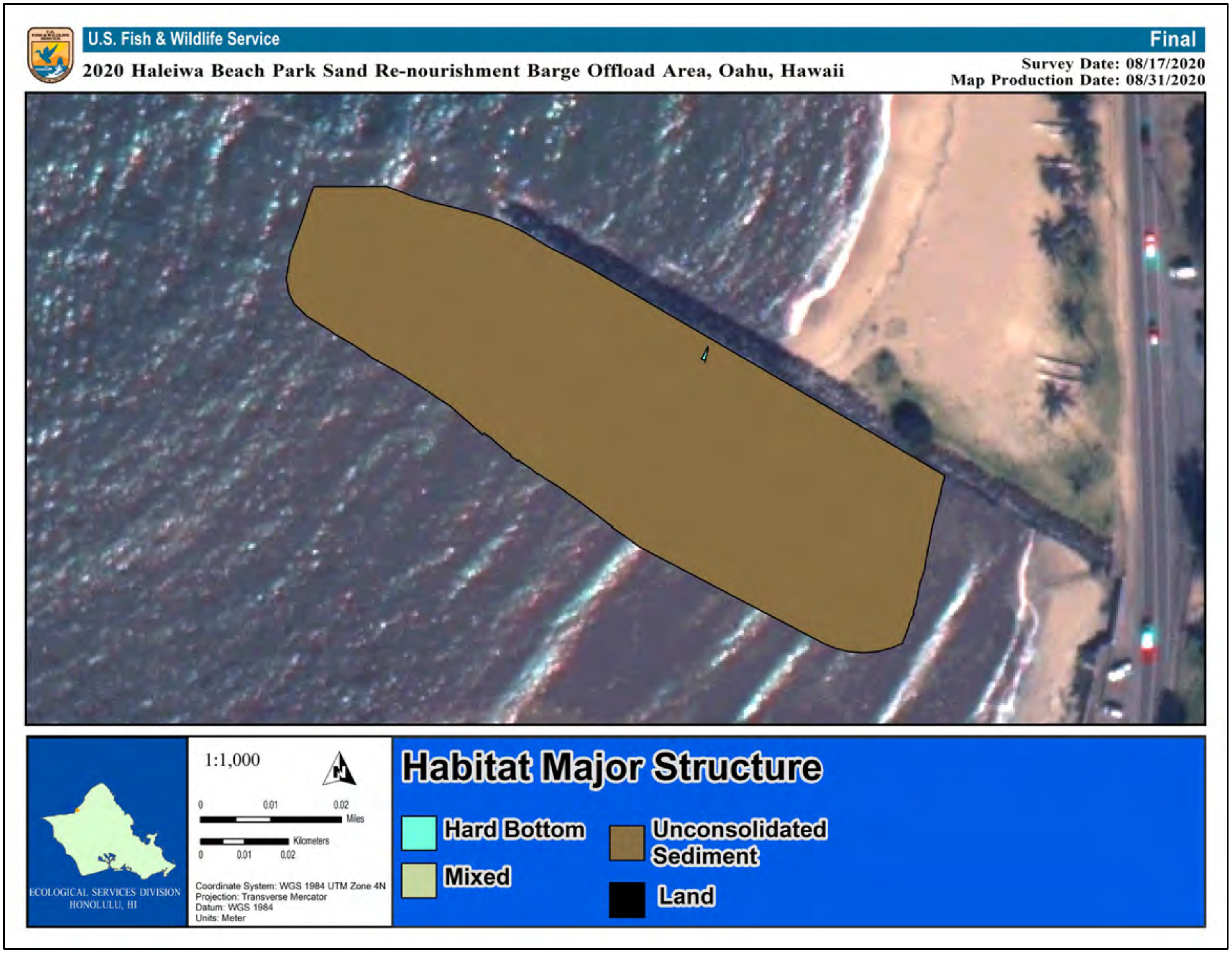

Figure E5: Habitat Major Structure. Overview of the major habitat structures that the project area contains.

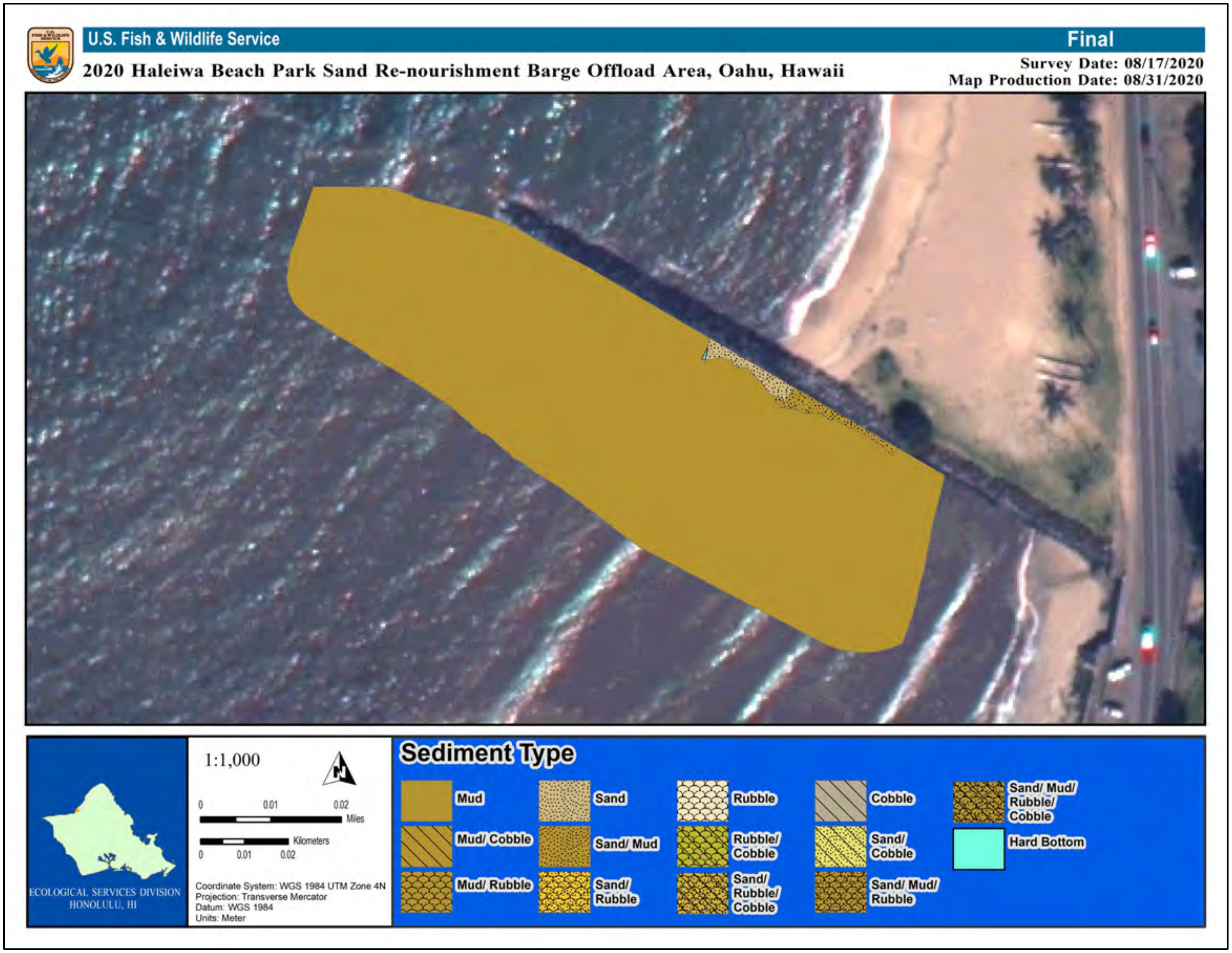

Figure E6: Sediment Type. Overview of the various sediment types that the project area contains.

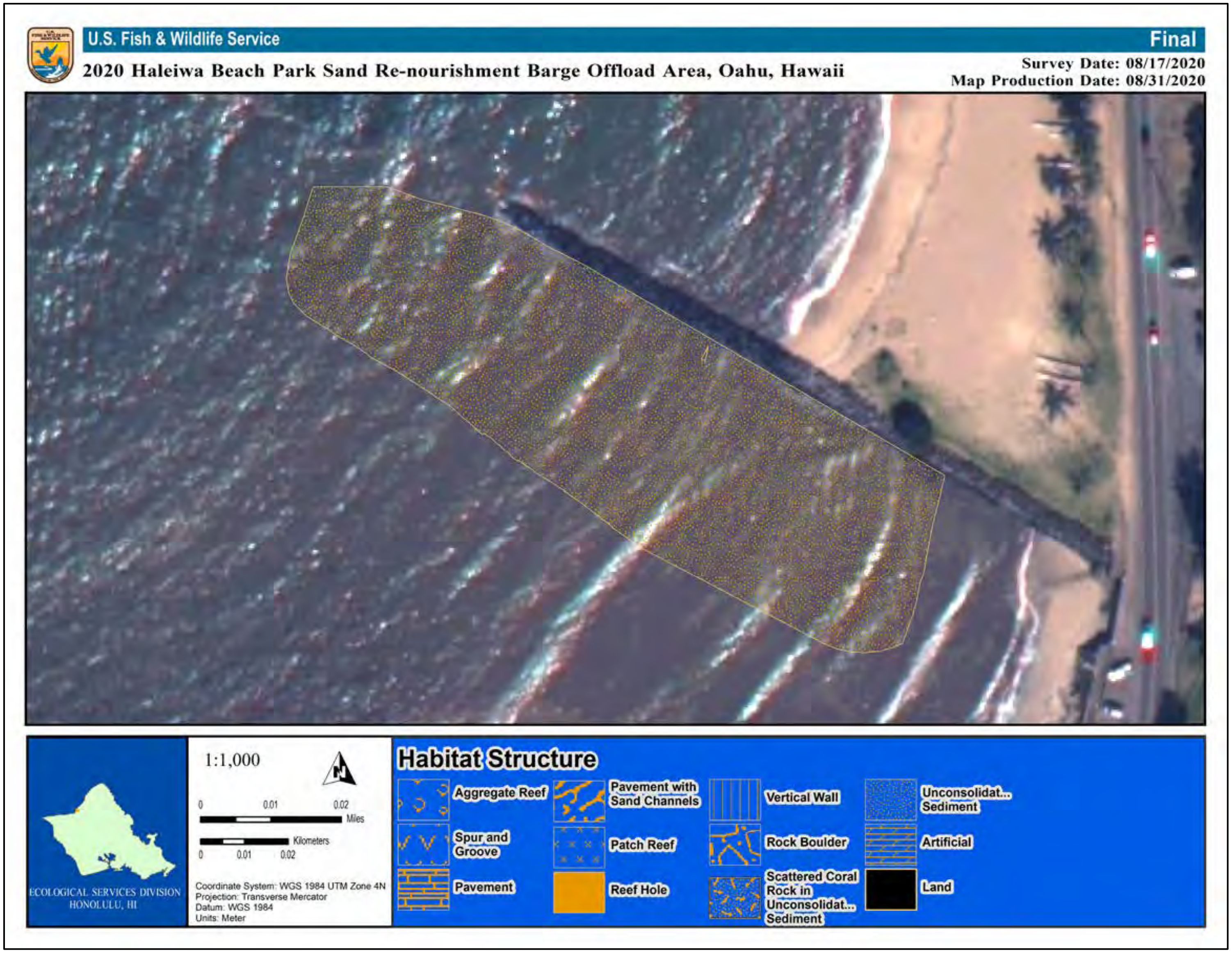

Figure E7: Habitat Structure. Overview of the habitat structures that the project area contains.

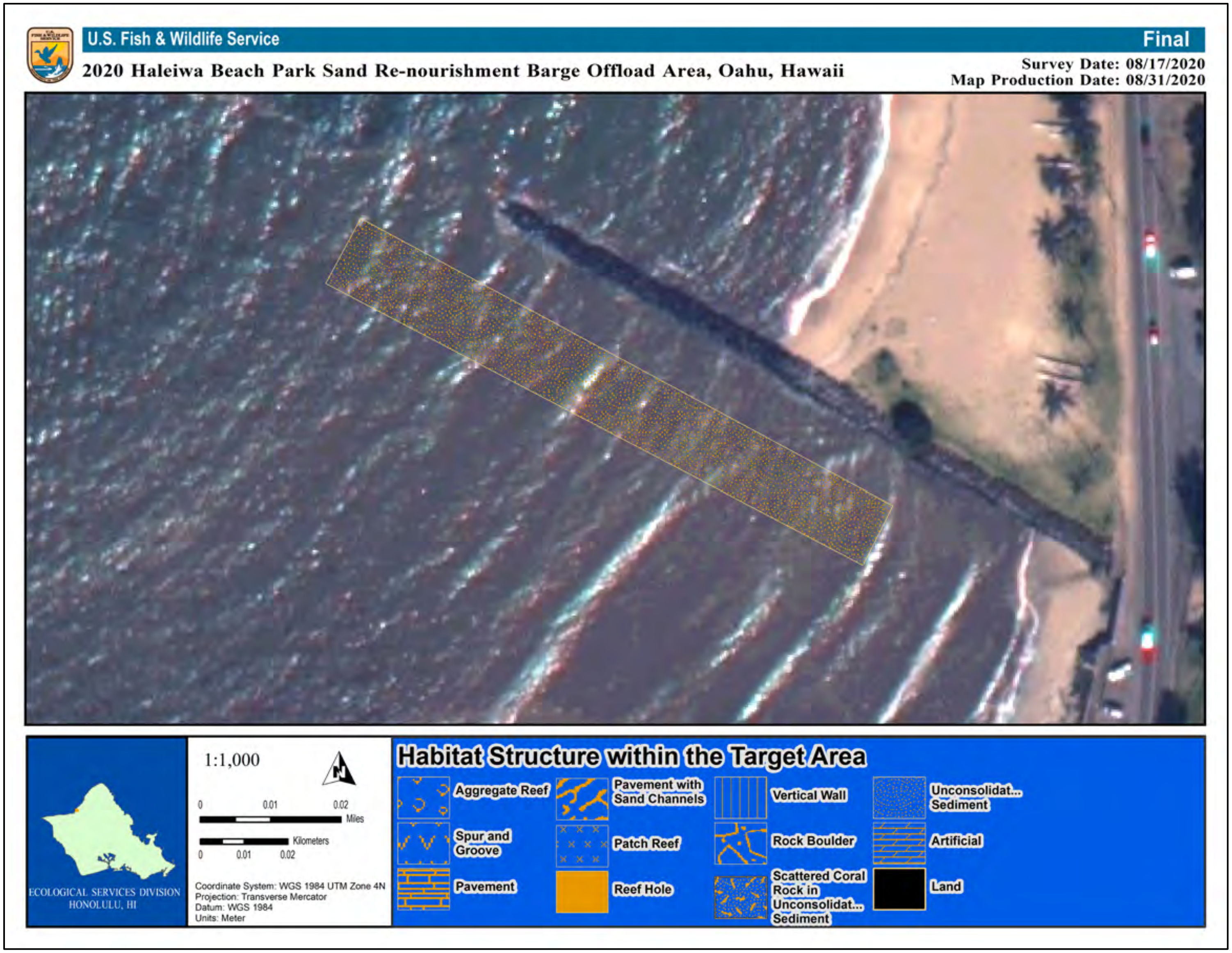

Figure E8: Habitat Structure within Target Area. Overview of the habitat structures within the Target Area.

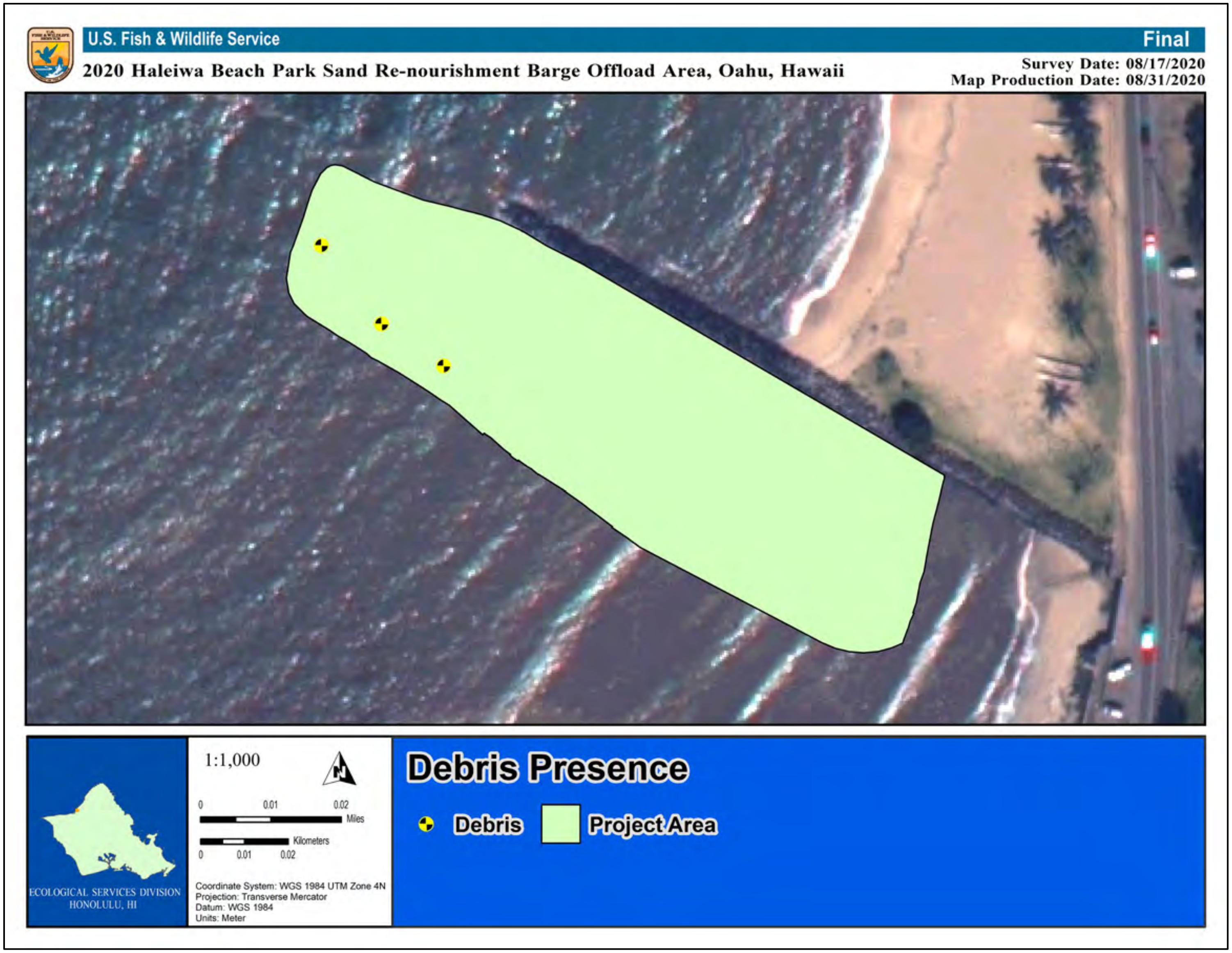

Figure E10: Debris. Overview of the debris observed within the project area.

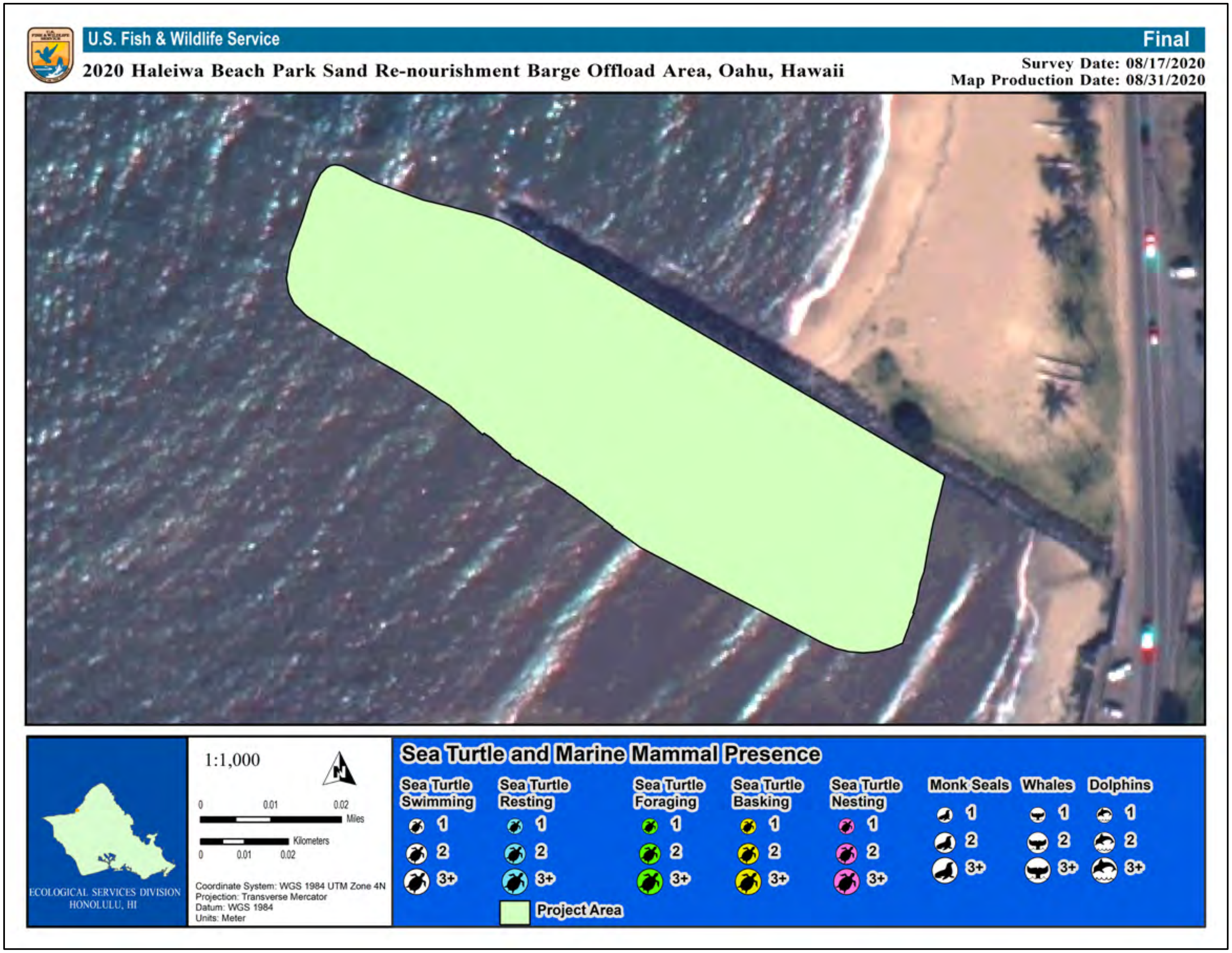

Figure E11: Protected Species. Overview of the observed protected species within the project area.

APPENDIX F: Maps of Haleiwa Beach Re-nourishment Project Small Boat Harbor Channel Area

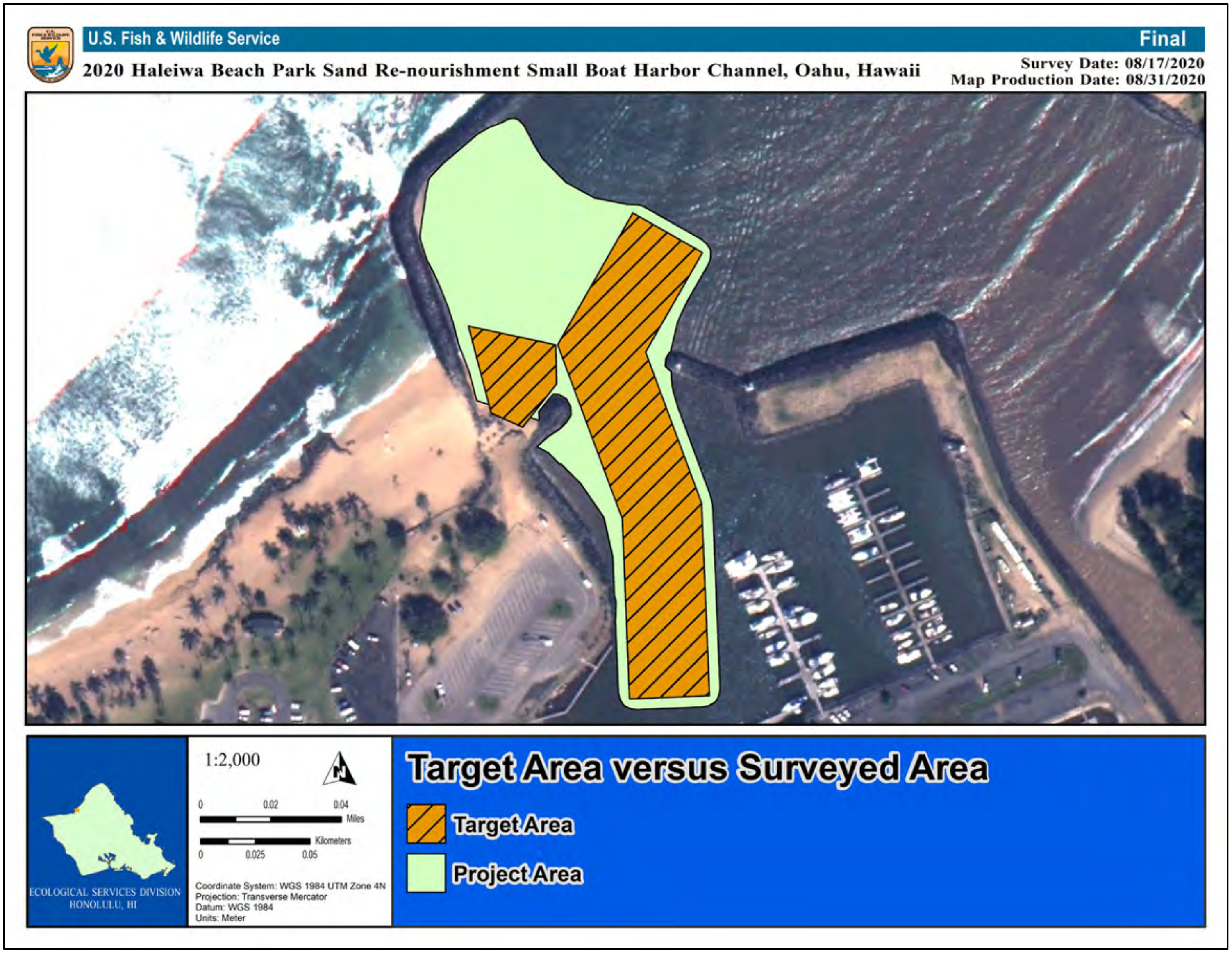

Figure F1: Target Area vs. Surveyed Area. Overview of the Project Area (total surveyed area plus project footprint) versus the Target Area (project footprint).

Figure F2: Area Observed. Overview of the area observed by in-water observers versus the area interpolated in all maps.

Figure F3: Dive Tracks. Overview of the dive tracks within the project area contains.

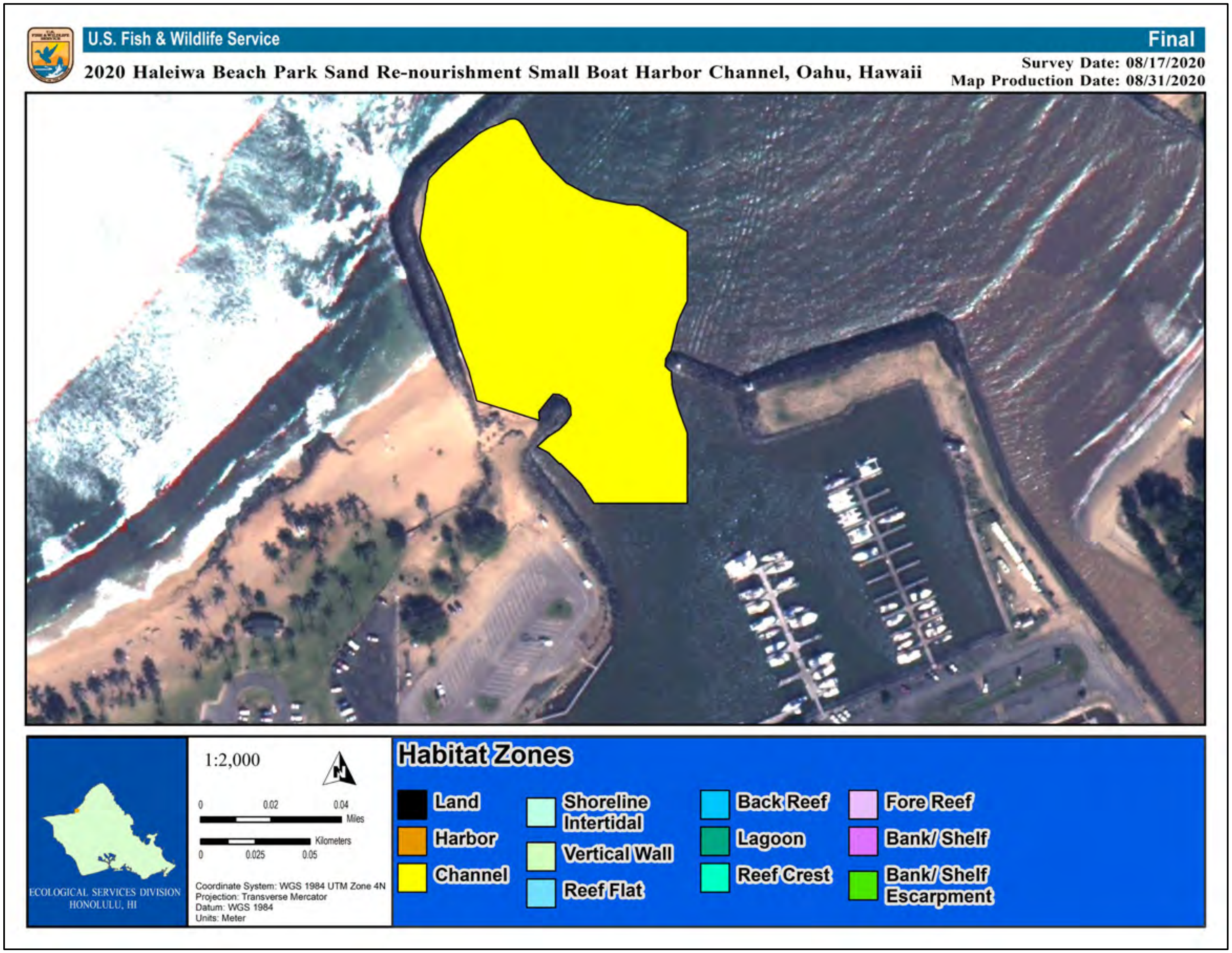

Figure F4: Habitat Zones. Overview of the various habitat zones that the project area contains.

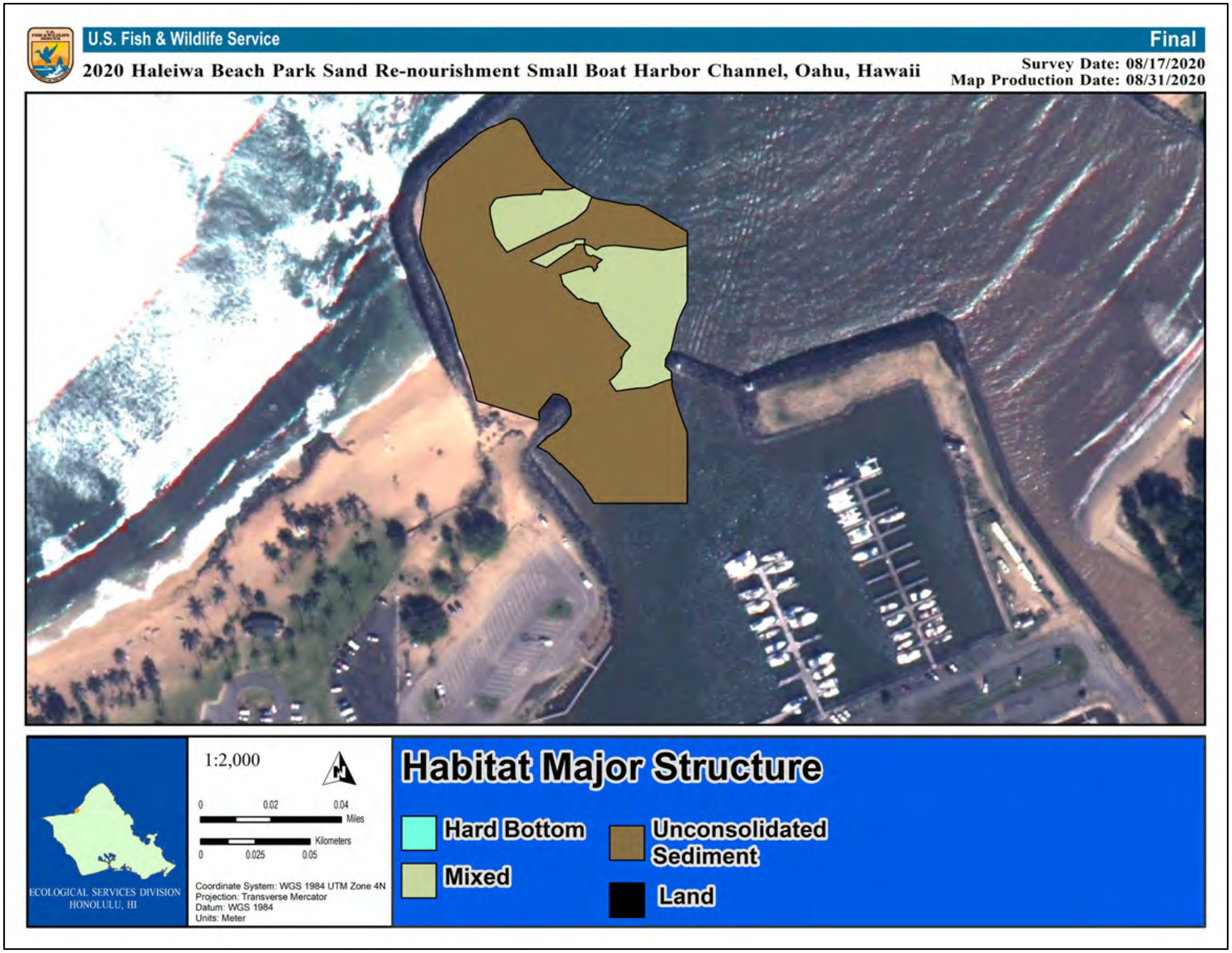

Figure F5: Habitat Major Structure. Overview of the major habitat structures that the project area contains.

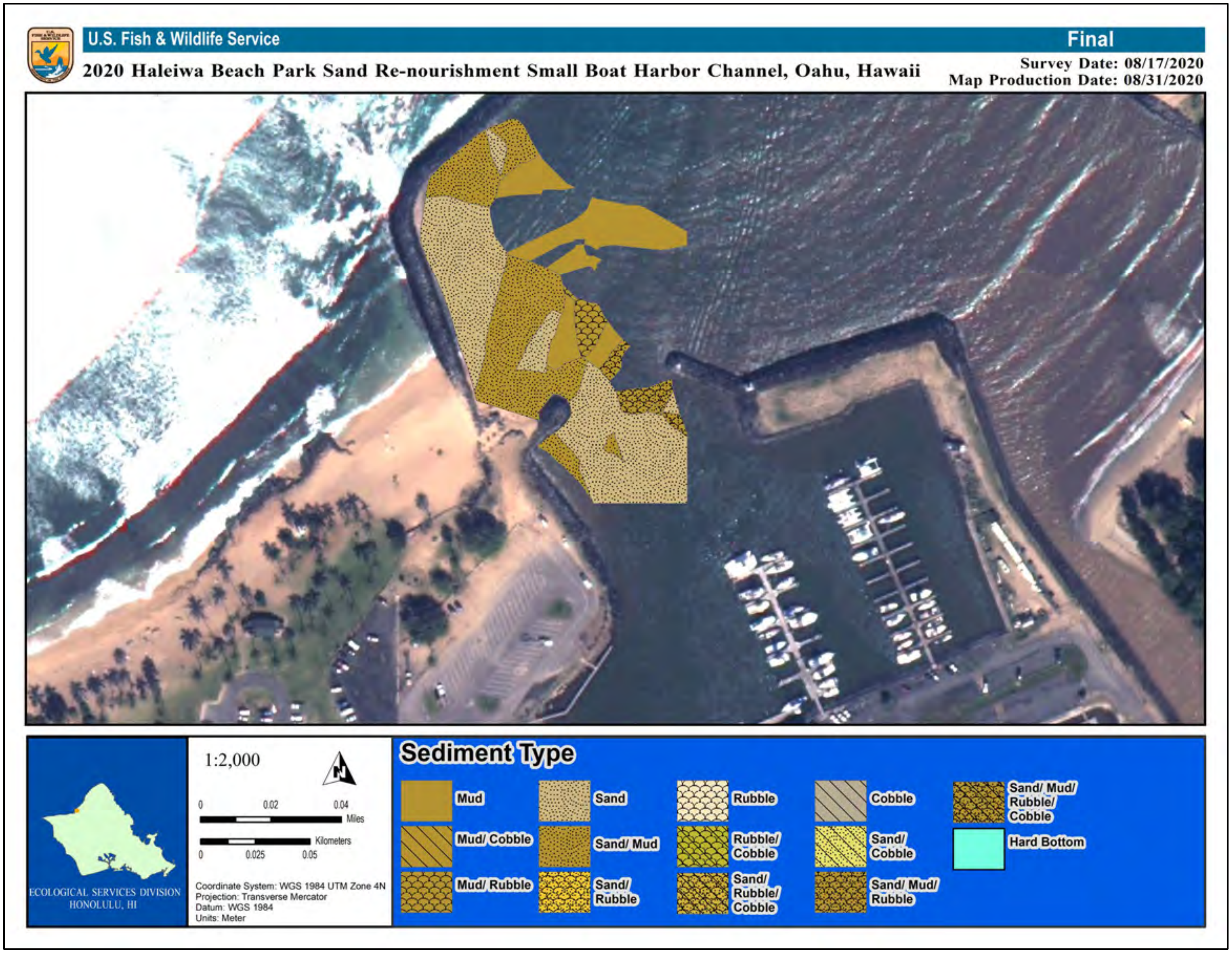

Figure F6: Sediment Type. Overview of the various sediment types that the project area contains.

Figure F7: Habitat Structure. Overview of the habitat structures that the project area contains.

Figure F8: Habitat Structure within Target Area. Overview of the habitat structures within the Target Area.

Figure F10: Debris. Overview of the debris observed within the project area.

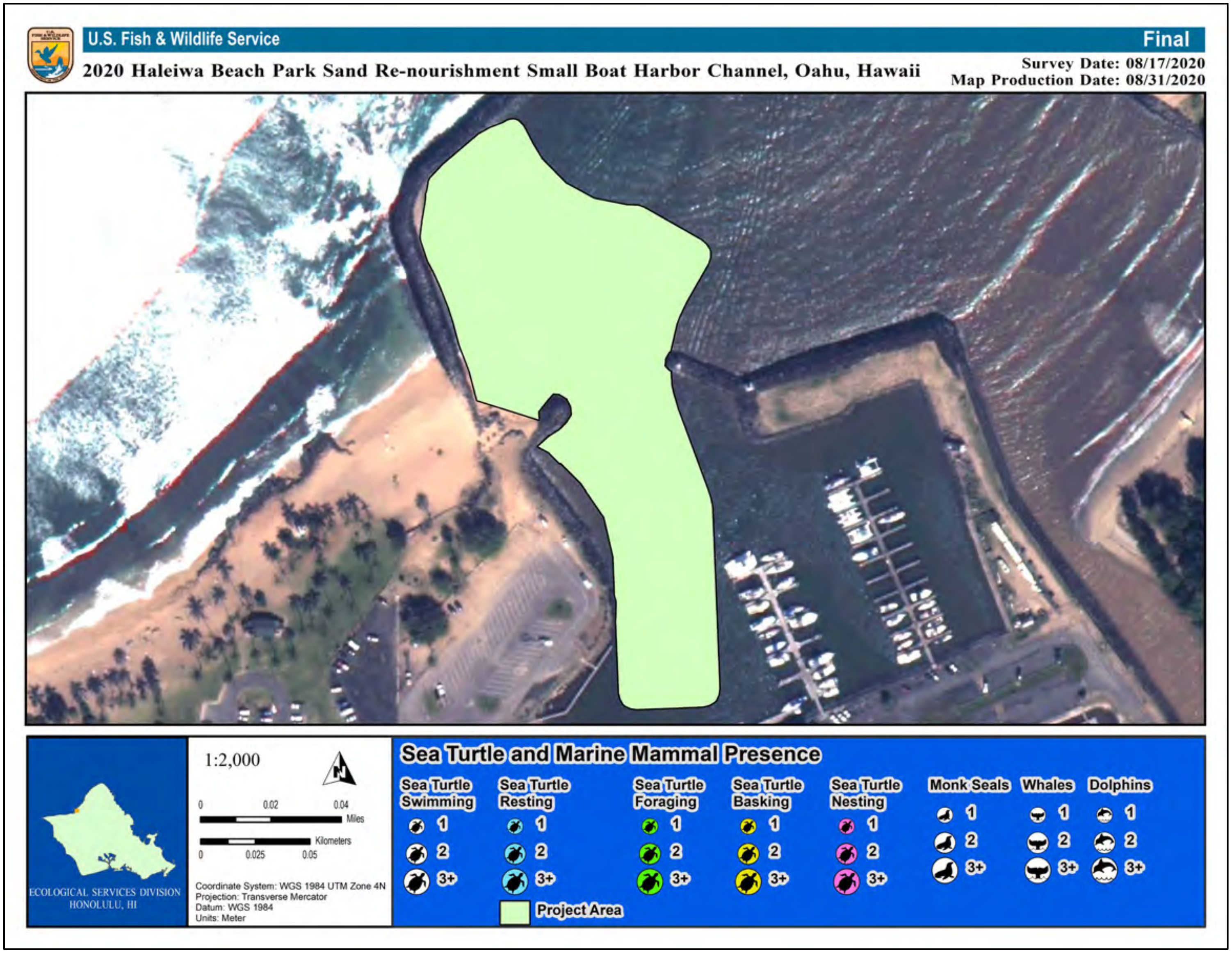

Figure F11: Protected Species. Overview of the observed protected species within the project area.

Figure F13: Coral Presence and Morphology. Overview of the observed coral presence and morphologies within the Project Area.

APPENDIX G: Comments Received on Draft Report

Comments from State of Hawaii, Division of Aquatic Resources

DAVID Y. IGE
GOVERNOR OF
HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
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
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 9/22/2020
DAR # AR0013

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Catherine Gewecke, Aquatic Biologist

SUBJECT: Request for Comments - Phase I and II Marine Habitat Characterization
Haleiwa Beach Park Beach Re-Nourishment

Request Submitted by: U.S. Fish and Wildlife Service (Pacific Islands Fish & Wildlife Office)

Location of Project: Haleiwa Beach Park Beach, Oahu

Brief Description of Project:

The U.S. Army Corps of Engineers (USACE) Civil Works Branch is proposing to place sand at Haleiwa Beach Park, Oahu, Hawaii, as part of a beneficial reuse of dredged material from the Haleiwa Small Boat Harbor and nearby offshore sand sources. The proposed project will incorporate the placement of sand along the beach at Haleiwa Beach Park, Oahu; the sand sources include the federal channel of the Haleiwa Small Boat Harbor, a sand deposition area to the west of the federal channel (~2,000 cubic yards), and an offshore sand location. The U.S. Fish and Wildlife Service(Pacific Islands Fish and Wildlife Office -PIFWO), conducted this resource investigation to document the resources within the project area and analyze the potential impacts to marine resources.

Comments:

☐ No Comments ☒ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: Date: Sep 22, 2020

Brian J. Neilson
DAR Administrator

DAR# AR0013

Brief Description of Project

The proposed project will incorporate the placement of sand along the beach at Haleiwa Beach Park, Oahu. The sand sources include the federal channel of the Haleiwa Small Boat Harbor, a sand deposition area to the west of the federal channel (~2,000 cubic yards), and an offshore sand location as shown in Figure 4. The impact assessment of these areas will be provided in a supplement to this report.

The location and placement of sand along Haleiwa Beach will be determined by the amount of sand available from the above-mentioned sand sources. In order to assess the potential impacts of sand placement, the USACE has determined five potential alternatives. These alternatives are approximate and meant for scaling purposes and not definitive sand placement. The five alternatives show a greater area of sand placement on the beach with Alternative 1 being a No Action alternative, and alternatives 2 through 5 being the placement of sand from a small portion of the beach (Alternative 2) to the entire length of the beach (Alternative 5; for the size and location of the alternatives, please see Figures 5–8 in the). The area of the alternatives (Table 2) include: 4,660 m2 for Alternative 2, 6,356 m2 for Alternative 3, 8,685 m2 for Alternative 4, and 18,003 m2 for Alternative 5.

Resource Concerns:
The primary concerns associated with the proposed project include the direct impacts associated with the placement of sand on existing marine habitat, particularly the Shoreline Intertidal community. The proposed Alternative 5 would cover a significant amount of Shoreline Intertidal area as well as some portions of the Pavement and Scattered Coral/Rock in Unconsolidated Sediment habitats, although the latter is a much smaller portion of the total area. The specific planning objective of this draft resource investigation is to provide technical assistance and recommendations to USACE to allow equal weight project benefits and natural resources in decision-making. To achieve this goal, the USFWS provide the following: 1) biological and habitat data for the Haleiwa Beach Park area; 2) analysis of potential impacts of the proposed project to fish and wildlife resources and their habitats; and 3) recommendations for minimization and avoidance measures.

All maps and figures can be referenced in the Draft Fish and Wildlife Coordination Act Report for Phase I and II Marine Habitat Characterization Haleiwa Beach Park Beach Re-Nourishment.

DAR# AR0013

Comments

DAR supports USFWS recommendations but with additional requirements and recommendations as stated below.

USFWS RECOMMENDATIONS
Based on the description of resources within the project area, the Service provides the following recommendations.

1) The Service recommends that measures be taken to minimize water from discharging back into the coastal area that could create a sediment plume. It is possible that placement of sand may occur directly from the water to the beach area. Minimization measures such as sand berms should be used to slow and pool water on the beach. In addition, silt curtains should be used to minimize sediment generated from the dewatering of dredged sediment.

2) The Service recommends avoiding placing sand in the Shoreline Intertidal – Rocky stratum given the unique intertidal community documented. Sand placement should avoid the northern section of the project area based on the amount of Shoreline Intertidal community impacted, and specifically a higher density of corals in the northern Pavement stratum. While the number of corals is generally low, more sand placement in this section may have increased impacts to the limited coral community. (See additional requirements from DAR below regarding avoiding impacts to stony corals and live rock).

3) The Service recommends that the amount of sand placed in the northern section and in the Shoreline Intertidal – Rocky stratum should be limited, or only nourished to the extent that is needed to protect the shore-side structures. Alternatives to sand should also be explored to protect the structures, but also maintain the integrity of the intertidal community. (See additional requirements from DAR below regarding avoiding impacts to stony corals and live rock).

4) The Service also recommends that annual quantitative surveys be conducted for a minimum of five years post sand placement in order to document the changes to the marine communities. This effort can also show any effects of movement of sand across the area and help determine if future re-nourishment initiatives will have continuing impacts.

As stated by USFWS, the direct impacts are straightforward, as the sand placement will cover portions of the project area. Of particular concern to DAR is impact to regulated resources, including stony coral and live rock.

DAR# AR0013

Comments

DAR Comments: Review of USFWS marine resource maps in the Draft Fish and Wildlife Coordination Act Report indicate that certain areas within the entire proposed project area are populated with regulated stony corals and live rock. The area was divided into the following five distinct strata for the purposes of the developing a quantitative sampling design: Shoreline Intertidal – Sandy, Shoreline Intertidal -Rocky, Scattered Coral/Rock in Unconsolidated Sediment, Pavement and Sand. These five strata consisted of the following aquatic resources (see Draft FWCA Report for more detail):

1. Shoreline Intertidal – Sandy: characterized as predominantly sand (86%) and rubble (11%) with a small amount of hard bottom (4%). The biological diversity within this stratum was very low with no corals observed (they were not enumerated in the methods), no algae species, no fish species, and nine invertebrate species.

2. Shoreline Intertidal -Rocky: characterized by the fact that it was predominantly hard bottom (66%) along the intertidal section of the coastline which exposes the habitat to air during low tide periods. The biological diversity of this stratum was similar to the Pavement stratum with 2 species of algae, 22 species of invertebrates, and 3 species of fishes. No coral or fish size data was collected in this stratum, and no coral colonies were observed during the invertebrate counts.

3. Scattered Coral/Rock in Unconsolidated Sediment: characterized by a slightly higher rugosity than the Pavement stratum, but still had a relatively low value of 1.09. This area was the most dominant habitat type through the project area (58%). Most of the area consisted of small rocks (larger than rubble) and scattered hard bottom pavement mixed with sand (35%) and rubble (40%; Figure 11). The biological diversity of this stratum was slightly higher than the Pavement stratum, with 5 species of algae, 10 species of coral, 32 species of invertebrates, and 5 species of fishes. The dominant alga present was the non-native alga, Acanthophora spicifera at 13%. The top five coral species were Pocillopora damicornis (0.12 colonies/m2), Psammocora stellata (0.11 colonies/m2), Porites lobata (0.09 colonies/m2), Leptastrea purpurea (0.08 colonies/m2), and Montipora capitata (0.07 colonies/m2).

4. Pavement: characterized by a low rugosity (1.03) hard bottom area. This area was mostly located in the northern section of the project area with some adjacent to the middle section. Quantitative analysis of bottom cover consisted of 32% uncolonized hard bottom, 29% sand, and 6% rubble. Sand was periodically scattered across the Pavement stratum, but did not constitute the underlying structure of the habitat. The biological diversity of this area was generally low compared to most coral reef areas. This area had 4 species of algae, 6 species of stony coral, 6 species of fishes, and 27 species of invertebrates. Of the coral species, the dominant coral

Comments

species was Psammocora stellata (0.44 colonies/m2), which is a small branching coral usually not attached and most were small colonies of less than five centimeters (cm).

5. Sand: characterized as sand and a sand/rubble mixture. However, quantitative evaluation on the bottom cover of this area shows 65% cover was mud and 33% was sand. The discrepancy is most likely a result of the low visibility during the mapping surveys and the location of the three transects used to characterize the habitat. This area was entirely in the southern portion of the project area next to the southern groin bounding the beach park. The high percentage of mud is likely due to the proximity to the mouth of the Anahulu River. This area was fairly depauperate except for a few organisms observed on one transect. This transect was a result of the last few meters crossing into the Scattered Coral/Rock in Unconsolidated Sediment stratum.

Note: It is important to note that these surveys did not investigate the infaunal community, so the true diversity of the community is not considered at all biological community scales.

Under section § 13-95-70 Stony corals and § 13-95-71 Live Rock (Hawaii Administrative Rules) it is unlawful for any person to take, break, or damage any stony coral or live rock except for inadvertent breakage, damage, or displacement of an aggregate area of less than one half square meter of coral or less than one square meter of live rock, and it is unlawful for any person to damage any stony coral by any intentional or negligent activity causing the introduction of sediment, biological contaminants, or pollution into state waters.

"Stony coral" means any invertebrate species belonging to the Order Scleractinia, characterized by having a hard, calcareous skeleton, that are native to the Hawaiian islands.

"Live rock" means any natural hard substrate to which marine life is visibly attached or affixed.

In order to avoid impact to regulated stony coral and live rock DAR requests that the sand be placed in areas which are absent of stony corals and live rock. Based on the USFWS marine biological surveys in the Draft FWCA Report, the two areas that are relatively void of stony coral and live rock or have the least amount of these resources are the strata defined as "Shoreline Intertidal – Sandy" and "Sand".

DAR# AR0013

Comments

Within these areas with zero to sparse coverage of stony coral and live rock, DAR would additionally request that any corals or live rock that are present be transplanted from the site to a nearby environmentally similar site (e.g. similar types of corals and live rock currently exist in the proposed transplant site, site has similar habitat parameters such as depth, light, water motion and the proposed site is not anticipated to be developed in the future and will not be affected by the current project). Any type of transplantation effort would require multi-year monitoring under some type of agreement or permit.

As noted by USFWS in their biological surveys, under the currently proposed alternatives and their associated footprints of sand deposition (see figures/maps in the Draft FWCA Report), the Shoreline Intertidal – Rocky stratum (of the five of the strata assessed) will be impacted most significantly. Of the estimated 2,907 m2 of Shoreline Intertidal – Rocky area, the direct impacts to this area will be 1,506 m2, 1,556 m2, 2,088 m2, and 2,799 m2 for Alternatives 2, 3, 4,and 5, respectively. This represents impacts to 51%, 53%, 72%, and 96% of this area respectively. Alternative 5 would remove the vast majority of this habitat from the rocky shoreline intertidal area. No corals were documented during surveys within this area, but the area was predominantly (66%) hard bottom (i.e. live rock).

If it is not feasible or practical to target the areas with zero to sparse coverage of stony coral and live rock (i.e. depositing sand only in the "Shoreline Intertidal – Sandy" and "Sand" areas) and the other three remaining areas are proposed for nourishment instead (Shoreline Intertidal -Rocky, Scattered Coral/Rock in Unconsolidated Sediment, Pavement), the Department (DLNR) may determine that this activity qualifies as one which may receive an exemption from coral and live rock administrative rules (after review of the full proposal from the USACE), under the Hawaii Revised Statute for Special Activity Permits (§187A-6, HRS).

Under §187A-6, HRS, Special Activity Permits, there are provisions that exist for the take of regulated resources for specific purposes: Under the department may issue permits, not longer than one year in duration, to any person to take aquatic life, possess or use fishing gear, or engage in any feeding, watching, or other such non-consumptive activity related to aquatic resources, otherwise prohibited by law, in any part of the State, for scientific, educational,
management, or propagation purposes, subject to chapter 195D and subject to those restrictions the department deems desirable.

DAR# AR0013

Comments

If the Department makes this determination, it may be possible to categorize this beach nourishment activity under a "management" purpose, and issue a Special Activity Permit for the take of limited amounts of stony coral and live rock if the take has been minimized to the extent practicable (i.e. this would mean targeting areas that have the least amount of coral and live rock, implementing transplantation efforts or supporting offset measure/projects to restore coral or live rock in another area).

If it is determined possible to issue a Special Activity Permit for this activity then DAR would request (as conditions of the permit) that any corals or live rock that are present be transplanted from the site to a nearby environmentally similar site (e.g. similar types of corals and live rock currently exist in the proposed transplant site, site has similar habitat parameters such as depth, light, water motion and the proposed site is not anticipated to be developed in the future and will not be affected by the current project). That would be the initial recommendation of DAR: transplantation with multi-year monitoring under some type of agreement or permit.

If there are any corals or live rock that cannot be realistically* transplanted (e.g. large volumes of natural rubble or hard consolidated substrate/reef flat which presumably cannot be moved) from the area that will affected by the project, then DAR would require an offset measure/project (as conditions of permit or an agreement) to restore coral or live rock in another area (e.g. providing support to a coral restoration project to restore or grow coral or an herbivore/grazer project to restore live rock). If tis was a viable option, the USACE would need to quantify the number and sizes of coral colonies to be impacted and square area of live rock to be impacted.

Note: The transplant site needs to be an environmentally similar site (e.g. similar types of corals and live rock currently exist in the proposed transplant site, site has similar habitat parameters such as depth, light, water motion and the proposed site is not anticipated to be developed in the future and will not be affected by the current project), where the corals will realistically* survive transplantation and the amount of rubble to be transplanted should not negatively affect the new site – *i.e. the volume of loose rubble should not impact existing coral colonies or other aquatic resources at site by smothering or abrasion etc.

If the Department cannot make the determination that sand nourishment can qualify under the management purpose under §187A-6, then avoidance measures would need to be implemented.

DAR# AR0013

Comments

CWA 404(b)(1) guidelines consider vegetated shallows to be Special Aquatic Sites. Within the Pacific Islands, the USFWS considers Halimeda meadows and seagrass communities to be vegetated shallows. DAR additionally recommends avoiding nourishing of sand in areas with other important aquatic resources such as these vegetated shallows, as they may provide foraging grounds for regulated fish species and protected turtle species.

The Office of Conservation and Coastal Lands (OCCL) is another office within DLNR that may need to be consulted for this activity, if the lands that are being dredged or nourished are considered to fall under their jurisdiction as submerged lands or conservation district lands.

DAR would request more information on turbidity cause by the nourishment (e.g. potential duration for turbidity in the water column to be increased during nourishment activities, estimated area to be affected by turbidity, potential drift of sediment to areas other than target nourishment areas).

Based on potential concern from fishermen that may use this area, it would be recommended that the project managers initiate a public outreach and education effort to effectively document and attempt to mitigate any on-going concerns brought forward from the community.

DAR would request the USACE to specify/confirm the delineations and footprints of the areas under each alternative in order to identify which areas with which resources will impacted.

DAR requests BMPs which minimize sedimentation/turbidity during nourishment activities to be implemented (e.g. sediment fences/booms/socks), and would like the chance to review and comment on any BMPs to reduce sedimentation or turbidity.

Thank you for providing DAR the opportunity to review and comment on the Request for Comments - Phase I and II Marine Habitat Characterization Haleiwa Beach Park Beach Re-Nourishment Draft Report - U.S. Fish and Wildlife Service (Pacific Islands Fish & Wildlife Office). DAR requests the opportunity to review and additionally comment on the official proposal for this activity from the USACE. Should there be any changes, amendments or modifications to the current plans, DAR requests the opportunity to review and comment on those changes.

Attachment 5 - Magnuson-Stevens Fishery Conservation and Management Act

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

August 24, 2021

Civil and Public Works Branch
Programs and Project Management Division

Mr. Gerald Davis
Assistant Regional Administrator
National Marine Fisheries Service
Pacific Islands Region, Habitat Conservation Division
National Oceanic and Atmospheric Administration
Inouye Regional Center
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Dear Mr. Davis:

The Honolulu District, U.S. Army Corps of Engineers (Corps) is proposing to maintenance dredge the federal limits of the Haleiwa Small Boat Harbor with beneficial placement of dredged material to restore the beach fronting the Haleiwa Beach Park located in Haleiwa, Island of Oahu, Hawaii. The Corps proposes to mechanically dredge approximately 22,638 cy of beach suitable sand with restoration of 4.2 ac of beach to prevent erosion of landside facilities at Haleiwa Beach Park and restore the beach constructed as part of the Haleiwa Beach Shoreline Protection Project. Any material determined not suitable for beach restoration will be transported by scow and taken to the U.S. Environmental Protection Agency South Oahu Ocean Dredged Material Disposal Site. The Corps intends to award a construction contract for the proposed work in Fiscal Year 2023 (Calendar Year 2024) with completion of in-water work within one year.

The Corps has prepared an assessment in accordance with paragraph (e) of Title 50 Code of Federal Regulations Part 600.920 (Subpart K) to evaluate the impact of the proposed action on Essential Fish Habitat (EFH) designated for federally managed fishery species. The Corps has determined the proposed action may adversely affect EFH, but does not have the potential to cause substantial adverse effects to EFH. Accordingly, the Corps transmits the enclosed EFH assessment and this written request to initiate abbreviated consultation with the National Marine Fisheries Service (NMFS) pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act.

Based on this determination, the Corps requests written response from NMFS within 30-days of your receipt of this letter in accordance with Subpart K, paragraph (h), sub-paragraph (3). Should NMFS respond with recommendations to conserve such habitat, the Corps will respond within 30 days, and no less than 10 days prior to final agency action for any responses inconsistent with a conservation recommendation. The absence of a response pursuant to the aforementioned regulation will indicate to the Corps that NMFS is in concurrence with the Corps' determination and that no EFH Conservation Recommendations are needed.

Should you have any questions, comments, or wish to request either an extension for response or a meeting to discuss this consultation, please contact Ms. Jessie Paahana, Environmental Coordinator in my Civil and Public Works Branch, at (808) 835-4042 or e-mail jessie.k.paahana@usace.army.mil.

Sincerely,

R. Kucharski

Rhiannon L. Kucharski
Chief, Civil and Public Works Branch

Enclosure

Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration
Haleiwa Beach Park, Haleiwa, Island of Oahu, Hawaii
Essential Fish Habitat Assessment

Haleiwa Beach Park shoreline

Prepared by:

U.S. Army Corps of Engineers
Honolulu District

TABLE OF CONTENTS

Figures

Acronyms and Abbreviations

Acronym or Abbreviation	Definition or Meaning
BMP	Best Management Practices
BUDM	Beneficial Use of Dredge Material
CFR	Code of Federal Regulations
CY	Cubic Yards
EFH	Essential Fish Habitat
EO	Executive Order
FMP	Fishery Management Plan
FR-EIS	Feasibility Report – Environmental Impact Statement
FWOP	Future Without Project
HAPC	Habitat Areas of Particular Concern
HBP	Haleiwa Beach Park
HSBH	Haleiwa Small Boat Harbor
MLLW	Mean Lower Low Water
MSFCMA	Magnuson-Stevens Fishery and Conservation and Management Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NWI	National Wetlands Inventory
ODMDS	Offshore Dredge Material Disposal Site
OSD	Offshore Sand Deposit
PL	Public Law
USACE	United States Army Corps of Engineers
WRDA	Water Resource Development Act

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), in partnership with the State of Hawaii, is assessing the beneficial use of dredged material at Haleiwa Beach Park (HBP), Island of Oahu, Hawaii. As part of the Feasibility Study, the USACE has prepared an integrated Feasibility Report and Environmental Assessment (FR-EA) in compliance with the National Environmental Policy Act (NEPA), USACE NEPA implementing regulations at Engineering Regulation (ER)-200-2, 33 Code of Federal Regulations (CFR) 230, and other Federal, state, and local environmental policies and procedures.

This assessment was prepared to fulfill the USACE's requirements under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), which addresses the authorized responsibilities for the protection of essential fish habitat (EFH) by the National Marine Fisheries Service (NMFS) in association with regional Fishery Management Councils. The Act establishes eight regional Fishery Management Councils responsible for the protection of marine fisheries within their respective jurisdictions. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." This definition extends to habitat specific to an individual species or group of species, whichever is appropriate, within each Fishery Management Plan (FMP). The Act also authorizes the designation of Habitat Areas of Particular Concern (HAPC) for marine fisheries. HAPCs are subsets of EFH that are rare, susceptible to human degradation, ecologically important, or located in an ecologically stressed area. Any Federal agency that proposes an action that may adversely affect EFH must consult with the Secretary of Commerce and Fishery Management Council authority per the Magnuson-Stevens Act, as amended (2005). Interim final rules were published on December 19, 1997, in the Federal Register (Vol. 62. No. 244) to establish guidelines for the identification and description of EFH in fishery management plans. These guidelines include impacts from fishing and non-fishing activities as well as the identification of actions needed to conserve and enhance EFH. The rule was established to provide protection, conservation, and enhancement of EFH.

Per 50 CFR 600.920(e)(3), all EFH assessments must include the following information:

1. Description of the action;

2. Analysis of the potential adverse effects of the action on EFH and the managed species;

3. Federal agency's conclusions regarding the effects of the action on EFH; and

4. Proposed mitigation, if applicable.

Mandatory contents are annotated in the Sections below, where documented.

2.0 DESCRIPTION OF THE PROPOSED ACTION (*(i) A description of the action.*)

2.1 Background Information and Authority

Haleiwa Beach, adjacent to Haleiwa Beach Park (HBP), is less than one mile from Haleiwa Harbor (Error! Reference source not found.). The Haleiwa Beach Shore Protection Project was authorized by the River and Harbor Act of 1965 and was constructed in 1965. The protection project consists of an offshore breakwater 160 ft long, a 520 ft long terminal groin at the southern end Haleiwa beach, and a beach fill 1,600 ft long and 140–265 ft wide.

In the 1970s, the protection project was repaired several times due to storm damages. In December 1969, USACE conducted emergency repairs on the groin and offshore breakwater in response to damages caused by severe storms and placed approximately 12,000 cy of sand on the beach. Storms in January 1974 and November 1976 again caused damages requiring emergency repairs for the project, in 1975 and 1978, respectively. The project authorization states that the non-federal sponsor is responsible for ongoing maintenance of the project and that USACE may conduct emergency repairs to the project in accordance with Public Law (PL) 84-99. The non- federal sponsor for the Haleiwa Beach Shore Protection Project is the State of Hawaii, Department of Transportation.

Regular maintenance of the Haleiwa Beach Shore Protection Project (HBSPP) has been limited; Haleiwa beach is known to be erosive with current rates of erosion at an average of 2.2 ft. per year (University Hawaii, 2010). Recent erosion has exposed underlying beach rock, which reduces the ability of the beach to be used for recreation and has led to reduction in suitable habitat for federally listed sea turtles for hauling out and basking. Additionally, the erosion has undermined the retaining wall fronting the HBP comfort station and associated infrastructure.

The current study is authorized under Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law 114-322), as amended. Section 1122 of WRDA 2016 requires USACE establish a pilot program to carry out 10 projects for the beneficial use of dredged material, including projects for the purposes of— (1) Reducing storm damage to property and infrastructure; (2) promoting public safety; (3) protecting, restoring, and creating aquatic ecosystem habitats; (4) stabilizing stream systems and enhancing shorelines; (5) promoting recreation; (6) supporting risk management adaptation strategies; and (7) reducing the costs of dredging and dredged material placement or disposal.

This study examines the feasibility and environmental effects of implementing beneficial use of dredged material (BUDM) measures at Haleiwa, Oahu, Hawaii. Haleiwa is located on the central north coast of the island of Oahu, approximately 30 miles northwest of Honolulu. The non-Federal partner for the feasibility study is the State of Hawaii as represented by the Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) and Division of Boating and Ocean Recreation (DOBOR).

2.2 Project Location

As described above, the HBP is located on the north shore of Oahu, approximately 30 miles north of Honolulu, Hawaii (Figure 1). The study area, or "review area" for the purposes of this assessment, (Figure 2) encompasses the federally authorized Haleiwa Small Boat Harbor (HSBH) and the HBP located near the mouth of the Anahulu River (21° 35' 49.24" N, 158° 05' 47.50 W"). The study area also includes a 0.3 acre settling basin located immediately to the east of the state breakwater on Alii Beach, and a 1.7-acre offshore sand deposit (OSD) located 3,400 feet northwest of HBP.

Figure 1. Project Location

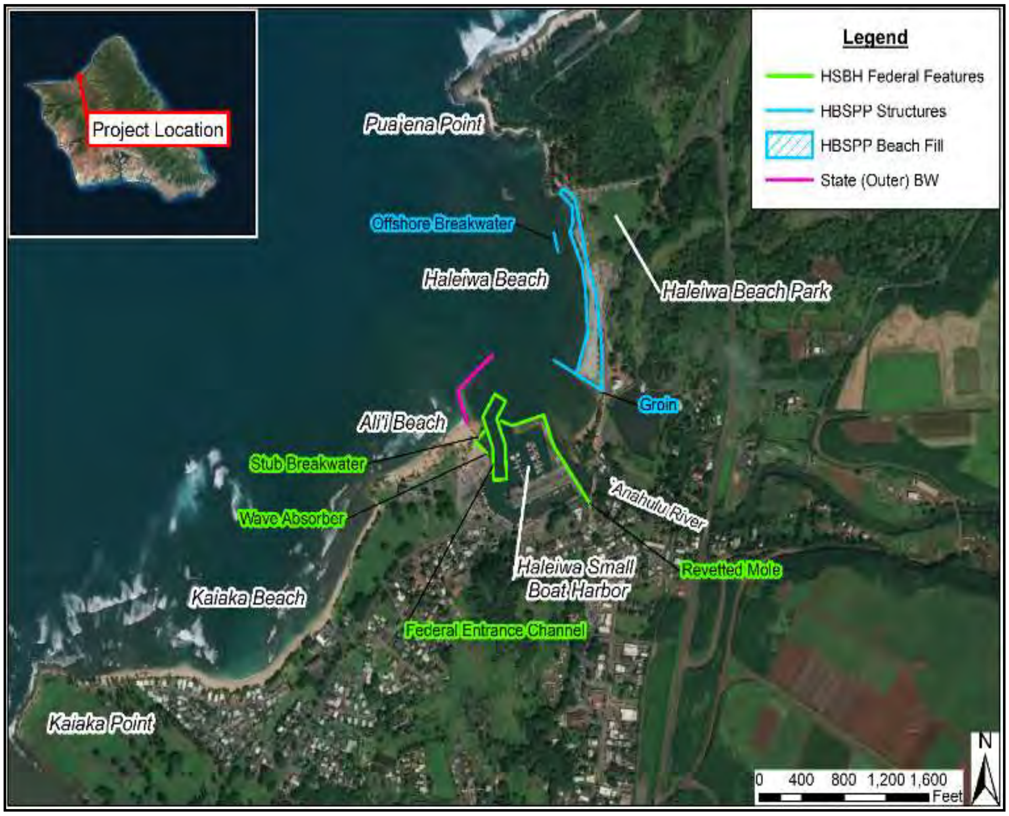

Figure 2. Project Location and Review Area

2.3 Proposed Action

Dredged material will be obtained from the HSBH Federal Navigation Channel, the State Breakwater Settling Basin that is part of the HSBH, and an Offshore Sand Borrow Area (Figure 3). The beach suitable dredged material from these locations will be used to nourish the beach that is part of the federally authorized HBSPP. Dredging from these locations will yield approximately 22,638 cy of beach suitable sand and will be used to restore 4.2 ac of beach. This beach would experience wave driven erosion and scour immediately following placement. Based on estimated rates of erosion for the area, it is anticipated that the beach created under this alternative would persist for twenty-six years before returning to the existing condition. This project life assumes that no other measures are performed by other state or local agencies to protect the beach or reduce scour.

The fine-grained dredged material from the Federal Navigation Channel that is not suitable for beach restoration, approximately 2,000 cy, will be transported by scow and taken to the South Oʻahu ODMDS.

This beach is part of the federally authorized project, and nourishment with dredged material will help restore storm damage reduction benefits, as well as ancillary ecosystem restoration in the form of beach habitat for listed sea turtles and monk seals. This alternative also provides recreational benefits.

All dredging will be completed by using a clam shell dredge to excavate material from the proposed areas and load scows for transportation to the HBSPP. The scows will be unloaded directly to the beach at the HBSPP. Scows will use a barge access zone, excavated as part of this project, to move adjacent to the HBSPP for unloading. The dredged material will be unloaded directly onto the beach and is not anticipated to require dewatering. The beach sand would be graded to a typical cross section.

The proposed action contains six major components, which are listed below.

O&M Navigation Channel Dredging – Dredging of the Federal Navigation Channel to twelve ft (-12 ft) depth below MLLW to meet O&M requirements. This dredging will produce approximately 4,433 cy of sediment. Approximately 2,433 cy is anticipated to be beach suitable and will be transported to the HBSPP for beach restoration. The remaining 2,000 cy will be transported to the south Oʻahu ODMDS for open-water placement.

Barge Access Zone – A Barge Access Zone will be excavated near the southern groin at the HBSPP to allow for efficient transport and unloading of dredged material to the HBSPP. The Barge Access Zone will be excavated to a depth of minus ten ft (-10’) MLLW parallel to the south groin of the HBSPP. Scows will use this Barge Access Zone to move adjacent to the HBSPP for unloading. Excavation of the Barge Access Zone is anticipated to produce 1,300 cy of beach suitable sand that will be used for beach restoration at the HBSPP. The Barge Access Zone is necessary as part of the least cost placement method as evaluated according to EM 1110-2-5025.

Additional Navigation Channel Deepening – The seaward portion of the Federal Navigation Channel with sandy substrate will be dredged by an additional foot, to thirteen feet below MLLW. This will produce an additional 1,705 cy of beach suitable sand that will be used for beach restoration at the HBSPP.

State Breakwater Settling Basin – A 0.3 ac area adjacent to, but outside of, the Federal Navigation Channel will be excavated to a depth of eight ft (8’) below MLLW to create the State Breakwater Settling Basin. Dredging of this area is anticipated to produce 2,200 cy of beach quality sand that will be used for beach restoration at the HBSPP. Dredging, transport, and placement of dredged material from this area would be considered “additional work” for the purposes of a project partnership agreement (PPA).

Offshore Sand Borrow Area – An Offshore Sand Borrow Area will be dredged to provide additional beach suitable sand for beach restoration. This 16.5 ac Offshore Sand Borrow area is outside of HSBH and the Federal Navigation Channel; and is located 3,400 ft offshore at a depth of 60 ft. This area will function as a borrow area for the procurement of approximately 15,000 cy of beach suitable sand. The dredging of sand from this area and placement at the HBSPP would require the use of a barge-mounted crane and clamshell dredge. The sand would be dewatered during excavation using an environmental clamshell bucket, placed on a scow, and barged to the access channel where it would be mechanically placed on the beach. Dredging, transport, and placement of dredged material from this area would be considered “additional work” for the purposes of a project partnership agreement (PPA).

Beneficial-Use of Dredged Material – Beach suitable sand dredged from the Federal Navigation Channel, State Breakwater Settling Basin, and the Offshore Sand Borrow Area will be transported to the HBSPP for beach restoration. Beach restoration is anticipated to restore an aquatic ecosystem, reduce storm damage to public property and infrastructure, and also promote recreation.

When sand is transported to the beach, it will be offloaded to a single location (dependent on the method of transport) and spread across the beach using equipment such as bulldozers or bobcats, which is considered part of placement and would be conducted under the federal dredging contract. The Section 1122 authority does not allow for the “shaping” of beach features such as dunes or berms, but for the purposes of estimating the coverage area of the placed sand, a typical placement template was assumed. The City and County of Honolulu has indicated that it has the equipment and labor necessary to complete further shaping or spreading of the sand as needed and could complete this using existing parks maintenance funding.

It is anticipated that this beneficial-use project would be constructed in FY23 (calendar year 2024). This coincides with the existing FY22 request for design funds to develop plans and specification for maintenance dredging of the harbor, and the planned request for maintenance dredging construction funds in the FY23 budget. Section 1122 funds for the incremental costs of design and construction would need to be received on a concurrent FY22/FY23 schedule with maintenance dredging (O&M) funds.

Figure 3 Proposed Action Site Plan

Equipment and Method.

Mechanical Dredging. The Corps proposes to conduct dredge activities via mechanical dredge, specifically, a barge-mounted long reach excavator or crane retrofitted with either a traditional clamshell dredge bucket or environmental dredge bucket. An environmental bucket has smooth cutting edge and utilizes hydraulic pressure to open and stay shut. The environmental bucket features a venting system that is open on the descent to reduce downward pressure, remains open during the scoop to reduce water content of dredged material and seals in dredge spoils prior to ascent (Figure 4). An environmental bucket is

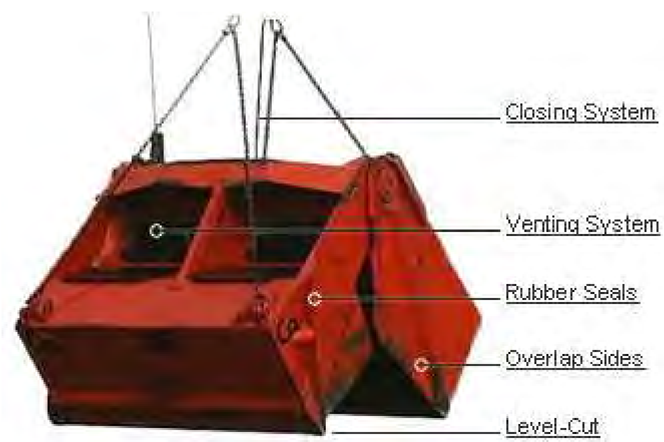

Figure 4. Example environmental bucket with features. (http://www.cablearm.com/buckets/Enviro.html)

specifically designed to prevent leakage of dredged spoils and is typically utilized for cleanup of contaminated sediments. The size of the bucket to be used will not be determined until the construction phase, by the construction contractor.

The Corps anticipates the dredge operation will require use of a barge to stage the dredge equipment, a scow to hold and transport dredged material prior to disposal, an ancillary tug vessel to assist with positioning and a second assist vessel to transport crew and/or conduct water quality monitoring. The barge and scow will be temporarily anchored in soft sediments at each dredge area and the tugs will freely navigate. The exact specifications (type, number, size) of equipment and ancillary support vessels/barges necessary to complete the work will not be determined until the construction phase, by the construction contractor. To maximize efficiency i.e., reduce trips, and reduce construction duration, the scow will passively dewater excess dredged effluent using a pipe that extends from near the top of the scow down, into the active dredge area encircled by a sediment containment device.

The Corps anticipates dredging operations to be a 24 hour, 7 day per week schedule in the inner harbor and offshore sand deposit. Deposition along the shoreline to restore the beach would most likely occur during daylight hours. The construction duration is estimated at up to one calendar year.

Dredged Material Handling and Disposal. Dredged material will be placed in a scow as dredging proceeds. Material from the scow may either 1) be offloaded at HSBH and transported via trucks to the nearby HBP, or 2) be transported by scow to HBP for direct offloading to the dredged material placement site fronting HBP. The first option may encounter challenges associated with truck loads crossing the size-limited Anahulu Bridge. The second option would alleviate such challenges, but will require excavation of a barge access zone down to -10 feet MLLW along the north face of the Southern Groin of the Haleiwa Beach Shore Protection Project Any material that is not considered beach-quality sand and/or that does not comply with state or federal standard for nearshore placement and that is suitable for ocean disposal will follow the Federal standard and will be barged to the U.S. Environmental Protection Agency's South Oahu Ocean Dredged Material Disposal Site. Any material not suitable for beach placement or ocean disposal will be disposed of at an appropriate and approved upland disposal site.

Beach Nourishment. Clean, sandy material would be placed along the shoreline in the area of greatest erosion, located immediately in front of the seawall by HBP comfort station. Typical sand placement via mechanical means involves a single, concentrated placement site on the beach using a dump truck or large excavator. To prevent use of heavy machinery in the marine environment, smaller machinery e.g. bobcat, small bulldozer, front-end loader, etc. are staged atop the placement pile and are used to push the material from the placement pile out into the water, as it progresses down the shoreline. No in-water staging is necessary. A bulldozer will be used to grade the placed sand to a stable beach profile. Placement of this material would prevent erosion of the shoreline and restore the HBSPP to provide a variety of benefits. Anticipated benefits include improved haul out/basking habitat for listed sea turtles and monk seals, rehabilitation of beach recreation, and improved protection of facilities from wave and storm damage.

Avoidance/Minimization.

The Corps considers “mitigation” with respect to potential adverse effects to EFH under the MSA to include avoidance, minimization and also offset, where appropriate. The following avoidance and minimization measures are intended to mitigate potential adverse effects to EFH from the proposed action and are, as such, considered a part of the proposed action. The measures proposed in this document are a component of the overall project Best Management Practice (BMP) plan developed for the proposed action, in consultation with the resource agencies and with final details provided by the construction contractor for review and approval by the Corps.

<u>Avoidance</u>.

While no areas have been explicitly identified as avoidance areas, the Corps has specified only soft sediment will be dredged, and expects all hard substrate including pavement, reef flats, channel ledges and boulders will be avoided. In addition, the Corps proposes only to dredge shoaled areas within the federal limits and at the offshore borrow site consisting entirely of beach-quality sand.

<u>Minimization</u>.

Construction Method. In general, mechanical dredging is more precise and minimizes potential for inadvertent cuts. Where implemented, use of an environmental bucket will reduce dredging-generated turbidity as it was originally designed for removal of contaminated sediments. In a field study comparing use of an environmental bucket and a typical clamshell bucket, an environmental bucket generated 1/7th the turbidity, in comparison to typical clamshell bucket without environmental features. Additionally, the study demonstrated that in comparison to a typical clamshell bucket, turbidity readings were greatest at the seafloor (likely as a result of impact) using an environmental bucket, whereas the typical equipment generates turbidity throughout the water column during ascent and especially near the surface (Powell, 2010).

BMPs. The Corps has proposed a number of BMPs to be implemented before, during and after dredging operations to avoid and/or minimize potential adverse effects to EFH. All Corps personnel, including its contractors, will be made aware of any identified sensitive resources and BMPs intended to prevent impact to such resources and will be required to adhere to and comply with the BMPs throughout project implementation.

In addition to preferential use of an environmental bucket, the Corps will require its contractor to encircle the active dredge area with properly installed and actively maintained sediment containment devices such as silt curtains positioned at the water surface and extending down into the water column. The inner harbor waters are quiescent and would permit use of near full-depth silt curtains (within 5-feet of the seafloor), as is standard practice for mechanical dredge operations. Any turbidity generated within the active dredge area will be contained by the silt curtains and settle to the seafloor. To address the higher energy physical forces in the offshore sand deposit, the Corps proposes use of silt curtains that extend down into the water column to a minimum of half the depth at the location of deployment. The intent of deploying approximately mid-depth silt curtains in the entrance channel is not to contain sediment, rather it is intended to funnel any de minimis dredge effluent released into the upper water column back down towards the seafloor to settle and reducing the potential for dispersion beyond the entrance channel. Note that use of an environmental bucket is designed and expected to reduce little to no de minimis discharge in the upper water column. Use of a mid-depth silt curtain would also minimize the potential for tears or failure of the silt curtain caused by wave energy or currents that may cause excessive pressure on the seams.

Project-specific BMPs are considered a part of the proposed action and will be incorporated into the contract specifications for implementation by the Corps and its construction contractor. Note, there are BMPs that require submittal to and approval by the Corps prior to implementation. The Corps proposes the following BMPs to avoid or minimize potential adverse effects to EFH:

1. The construction contractor must develop a comprehensive plan to be submitted to the government for approval that describes how the following conditions will be met.
2. Vessels, barges or other in-water structures must first attempt to tie-off to existing harbor structures. If anchoring on the seafloor is necessary, then anchors must be placed exclusively in soft sediments. Anchors and anchor components must cause no direct physical impact to corals beyond the federal limits. Anchor and anchorline footprints of all in-water equipment must be designed to occupy the smallest footprint necessary to achieve safe and effective anchorage.
3. During peak coral spawning (one week before and after the full moon in July and August), 1) dredging at night will be prohibited, and 2) any in-water sediment containment devices must not be left overnight.
4. While entering or exiting the harbor, all vessels, barges and scows must remain in the marked USCG ingress/egress channel until it passes the outer buoy.
5. Weather conditions must be considered to ensure the safety of equipment and personnel during in-water operations. Work must cease during unfavorable weather conditions such as storm surge, etc. that could compound impacts to surrounding resources.
6. Each vessel must have a written spill prevention plan on board that identifies the appropriate response and safety protocols and the contact information for appropriate authorities to be notified in the unlikely event of a spill.
7. The contractor must designate on-site personnel responsible for ensuring no inadvertent discharges of debris, petroleum, or other harmful materials into the water.
8. The contractor must submit a contingency plan detailing progressive, action-specific, risk-based responses to potential malfunctions of dredge equipment, barges, scows and in-water BMPs such as sediment containment devices.
9. All dredge vessels, barges and scows must be equipped with Dredging Quality

Management (DQM) instrumentation systems, or similar, to allow near real-time monitoring of the scow's status (e.g. GPS positioning, hull status (open or closed), heading (course and speed), volume (draft), displacement and bin ullage sounding) at all times to ensure performance, accuracy and accountability. The Contractor shall provide DQM tracking information to the Government upon request.

10. The Contractor must submit maintenance and inspection records, current to within six months or since its last use for whatever purpose, for any containment scow to be used to complete the proposed work, and a plan for the continued maintenance and inspection through the construction period.
11. In-water sediment containment devices must be used to contain project-generated turbidity and prevent spread beyond the active work area. At a minimum, the reach of the equipment is positioned inside the sediment containment device while the containment scow is positioned outside the sediment containment device, to minimize ingress/egress frequency. Sediment containment devices must be appropriately sized; the length adjusted as the dredge progresses and the area deepens. The size and position of the area enclosed by the sediment containment device must be strategically planned to reduce the number of times it must be repositioned. Prior to repositioning, sediment containment devices must remain in place until turbidity levels within the enclosure have returned to ambient levels per visual inspection.
12. Containment scows must be adequately sized to prevent overflow/over-topping and must be equipped with functional seals to prevent leakage of dredged material.
13. Contractor must develop and submit to the Government a site-specific BMP plan to be reviewed and approved by the Government prior to start of work. The Site-Specific BMP Plan must contain turbidity to the active dredge area to the greatest extent practicable. The plan must include a visual and instrumented turbidity monitoring plan to ensure the efficacy of the sediment containment BMP in comparison to ambient levels, with minimum once-daily visual inspections and instrumented readings throughout the duration of construction. When reviewing the contractor's proposed BMP plan, the Corps will only approve a plan that, at a minimum, includes the following or comparable alternative components:
    i. Visual inspection of sediment containment devices of sufficient frequency to minimize potential failure and to ensure proper use and installation;
    ii. Instrumented or other monitoring that ensures compliance of the action with State Water Quality Standards;
    iii. Establishment of a turbidity threshold (e.g. 10% above ambient) and corresponding progressive responses to exceedances beginning with taking a second reading to verify threshold exceedances, followed by inspecting the BMPs to identify the source of the plume, to replacing the BMPs, adjusting/doubling up BMPs and stopping work.

<u>Offset.</u> The Corps anticipates less than substantial adverse effects to EFH with no permanent reduction in quantity or quality of EFH. The Corps does not propose any offset for the proposed action.

Contingency Planning. The above BMPs include measures, such as current and continual maintenance and inspection of equipment, to address and minimize the potential for containment scow malfunction and ineffective sediment containment devices. In addition, the Corps will require its construction contractor develop a plan to swiftly implement pre-approved contingency response procedures in the event of equipment or BMP failure. In the unlikely event of absolute failure, the Corps will coordinate with appropriate resource and regulatory agencies to discuss appropriate and timely response.

3.0 ESSENTIAL FISH HABITAT AND MANAGED SPECIES IN THE REVIEW AREA

3.1 Federally Managed Fisheries

The Corps reviewed the Western Pacific Region Fishery Management Council (Council) Fishery Ecosystem Plans (FEP) for the Hawaii Archipelago (2009; Amendment 4, 2016; Amendment 5, 2019) and for Pelagics (2009) for the EFH designations for currently federally managed fishery species. Fisheries may comprise a group or complex of species. These fishery species are collectively referred to as management unit species (MUS). EFH is currently designated within the project area for the following federally managed MUS':

Bottomfish (BMUS).
Prior to Amendment 5 to the Hawaii FEP, the Bottomfish Fishery complex included 14 species/species assemblages. Per Amendment 5, the number of Bottomfish Fishery species was reduced to 7 deep bottomfish and 1 non-deep bottomfish. Per Amendment 5 to the Hawaii FEP, the following 8 species comprise the (BMUS):

Scientific name	Hawaiian name	Common name	Family	Depth Range
Aprion virescens	‘uku	gray jobfish	Lutjanidae	0-240m
Hyporthodus quernus	hapu‘upu‘u	sea bass	Serranidae	0-360m
Aphareus rutilans	lehi	silver jaw jobfish	Lutjanidae	40-360m
Etelis carbunculus	ehu	squirrelfish snapper		80-520m
Etelis coruscans	onaga	longtail snapper		80-480m
Pristipomoides filamentosus	‘ōpakapaka	pink snapper		40-400m
Pristipomoides seiboldii	kalekale	pink snapper		40-360m
Pristipomoides zonatus	gindai	snapper		40-360m
Source: Hawaii FEP, Amendment 4 (WPRFMC, 2016) and Amendment 5 (WPRFMC, 2019)				

Crustaceans (CMUS).
Prior to Amendment 5, the Crustacean Fishery complex included 4 species/species assemblages. Per Amendment 5, the number of Crustacean Fishery species was reduced to 2 crustacean species: Deepwater Shrimp, *Heterocarpus spp*. and Kona Crab, *Ranina ranina*. However, deepwater shrimp occur in waters deeper than the depths of the review area and are considered no further in this assessment. Per Amendment 5 to the Hawaii FEP, following species comprising the Hawaii crustacean fishery management unit species occurs within the Corps' review area:

Scientific name	English common name	Local Hawaiian Name	Family name
Ranina ranina	Kona crab	papa‘i kua loa	Raninidae

Source: Hawaii FEP, Amendment 5 (WPRFMC, 2019)

Pelagics (PMUS).
Per the Pelagics FEP, the following species comprise the pelagics fishery management unit species:

Scientific name	Common name	Scientific name	Common name
TUNAS		**BILLFISHES**	
*Thunnus alalunga**	albacore	*Tetrapturus audax**	striped marlin
*T. obesus**	bigeye tuna	*T. angustirostris*	shortbill spearfish
*T. albacares**	yellowfin tuna	*Xiphias gladius**	swordfish
T. thynnus	northern bluefin tuna	*Istiophorus platypterus*	sailfish
*Katsuwonus pelamis**	skipjack tuna	*Makaira mazara**	blue marlin
Euthynnus affinis	kawakawa	*M. indica*	black marlin
Auxis spp. *Scomber* spp. *Allothunus* spp.	other tuna relatives		
SHARKS		**OTHER PELAGICS**	
Alopias pelagicus	pelagic thresher shark	*Coryphaena* spp.	mahimahi (dolphinfish)
A. superciliousus	bigeye thresher shark	*Lampris* spp.	moonfish
A. vulpinus	common thresher shark	*Acanthocybium solandri*	wahoo
Carcharhinus falciformis	silky shark	*Gempylidae*	oilfish family
C. longimanus	oceanic whitetip shark	*Bramidae*	pomfret family
*Prionace glauca**	blue shark	*Ommastrephes bartamii*	neon flying squid
Isurus oxyrinchus	shortfin mako shark	*Thysanoteuthis rhombus*	diamondback squid
I. paucus	longfin mako shark	*Sthenoteuthis oualaniensis*	purple flying squid
Lamna ditropis	salmon shark		
Source: Pelagics FEP (WPRFMC, 2009)			

3.2 EFH Designation.
The combined EFH for all federally managed fisheries in the Hawaii Archipelago and including the Pelagic Fishery is the water column from the surface to 1,000m depth extending from the shoreline out 200 nautical miles, to the Exclusive Economic Zone (EEZ), all bottom habitat from the shoreline to a depth of 400m, and the outer reef slopes at depths between 400m to 700m, per the Hawaii FEP, Amendment 5 (WPRFMC, 2019). Fishery-specific EFH designations for the fisheries listed above are as follows:

BMUS EFH.
Amendment 5 retained the EFH designation described in Amendment 4 of the Hawaii FEP for Bottomfish and Crustacean MUS in the Hawaii Archipelago. Accordingly, the EFH designation for non-deep and deep Bottomfish fishery species is:

	Life Stage:			
	Egg	**Post-hatch pelagic**	**Post-settlement**	**Sub-Adult / Adult**

Non-Deep BMUS	Water column from surface to 240m depth extending from the shoreline out 50 mi	Water column from surface to 240m depth extending from the shoreline to EEZ boundary	Water column from surface to 240m depth, including all bottom habitat, extending from the shoreline to 240m isobath	Water column from surface to 240m depth, including all bottom habitat, extending from the shoreline to 240m isobath
Deep BMUS	Water column from surface to 400m depth extending from the shoreline out 50 mi	Water column from pelagic surface to 400m depth extending from the shoreline to EEZ boundary	Water column from 80 to 400m depth, including all bottom habitat, extending from the shoreline to 400m isobath	Water column from 80 to 400m depth, including all bottom habitat, extending from the shoreline to 400m isobath
Source: Hawaii FEP, Amendment 4 (WPRFMC, 2016)				

Multibeam sonar mapping used to estimate actual area of bottomfish habitat in the main Hawaiian Islands from 0-400m depth indicates BMUS EFH occupies 10,614km^2 or 2,622,777 acres of seafloor (WPRFMC, 2016).

CMUS EFH.

The EFH designation for Crustaceans fishery species is:

CMUS	**Life Stage:**	
	Eggs and Larvae	**Juveniles/adults**
	The water column from the shoreline to the outer limit of the EEZ down to a depth of 150m	All bottom habitat from the shoreline to a depth of 100m
Source: Hawaii FEP, Amendment 4 (WPRFMC, 2016)		

PMUS EFH.

The following EFH designation for Pelagics MUS has not changed since the publishing of the Pelagics FEP:

PMUS	**Life Stage:**	
	Eggs and Larvae	**Juveniles/adults**
	The (epipelagic zone) water column down to a depth of 200 m extending from the shoreline to the outer limit of the EEZ	The water column to 1,000m depth extending from shoreline to outer limit of the EEZ
Source: Pelagic FEP (WPRFMC, 2009)		

Based on the depth and distances from shore, EFH for the fisheries listed above is designated, at least in part, across the Corps' EFH review area for the proposed action. There is no designated Habitat Area of Particular Concern within or near the Honolulu Harbor or throughout the transit corridor to the SOODMDS for any of the federally managed fishery species. Based on the National Oceanic and Atmospheric Administration Office of Coast Survey reported Maritime Limits and Boundaries, the approximate area of cumulative EFH designations for the Hawaii Archipelago and Pelagic Fishery, from the shoreline out to the EEZ, measures over 16 million acres of the Pacific Ocean.

3.3 Fishery Species Information

To provide a project-specific resource context, information regarding select species with EFH designated in the review area is provided below:

Kona Crab, CMUS. Kona crab is the only CMUS species with EFH designated within the Corps' EFH review area. Very little is known about the life history of the kona crab. Kona crab is commonly found in the northwestern Hawaiian Islands (NWHI) at depths of 24 to 115m and also in the main Hawaiian Islands (MHI). A small, directed fishery, primarily recreational, for kona crabs exists in the MHI. (WPRFMC, 2005). Over an 18 year period, greatest commercial kona crab landings were concentrated at two specific coasts, off the northwest facing shore of Niihau and west south west of Molokai at Penguin Bank, with more than 1,000 pounds caught annually. Haleiwa Beach and the greater Waialua Bay are known crabbing grounds (Onizuka, 1972). Peak spawning is in June and July in the MHI. Fertilization of eggs is external, adhering to the abdomen of the female crab until hatching. Therefore, egg habitat is synonymous with sexually mature, adult kona crab habitat (NMFS, 1986). Little is known about the planktonic larval stage of kona crabs. There is no information available concerning the distribution or habitat utilization patterns of juvenile kona crabs. Few juvenile catches are recorded. A single juvenile specimen was caught at 50 fathom depth (Onizuka, 1972). Adult kona crabs are found inhabiting sandy bottom habitat at depths between 24 and 115 meters. Kona crabs are diurnal, opportunistic carnivores that bury in the sand, waiting for prey or food particles (WPRFMC, 2005). The NOAA Fisheries 2018 Benchmark Stock Assessment for the MHI kona crab fishery, based on data from 1957 through 2016, indicates that the stock has not been overfished historically, is not currently experiencing overfishing and could withstand more fishing pressure as overfishing into the future is not anticipated (Kapur, et. al., 2019).

Uku, BMUS. Uku are the only federally-managed shallow bottomfish fishery species in the Hawaii archipelago. Uku are pelagic spawners. The species aggregate to spawn in open water, with eggs scattering to the seafloor below, unguarded (Allen, 1985, NMFS, 1986). Similar to kona crab catches concentrated at Penguin Bank, at 40-60m depth, Penguin Bank is a known and preferred uku spawning ground (WPRFMC, 2019). There is very little information available concerning the distribution and habitat requirements of juvenile uku. Researchers attempted to observe juvenile uku habitat. During the study, juvenile uku were caught off Kaneohe Bay in 40m depth over hard, flat substrate covered with coarse sand and Halimeda algae (Parrish, 1989). The flat, featureless habitat apparently favored by juvenile snappers, including uku, is very different from the high relief areas preferred by adult snappers. It is hypothesized that juveniles prefer featureless, flat bottom to avoid predation (WPRFMC, 2005). While most adult bottomfish species are caught along the steep drop-offs and slopes that surround the islands and banks, uku is primarily caught on the tops, not the sides or slopes, of these banks. In the MHI adult uku have been recorded at depths of 54-227m, per the results of a record search conducted by the University of Hawaii (WPRFMC, 2016). Uku are known to be reef predators feeding throughout the water column from surface to bottom, but not taking shelter in coral (NMFS, 1986). In a study focusing on six snapper species, including uku, 71 uku were caught at a depth range of 46-134m off Penguin Bank, (Haight, 1993). A recent ten year commercial catch report indicates uku catch has been trending upward in recent years to 85% of the Annual Catch Limit and 82% of the overfishing limit set by NMFS. The most recent stock assessment of uku in the MHI was done by Nadon in 2017 and suggested that population abundance appeared to be increasing from 2003 to 2016 (WPRFMC, 2019). Based on the 2018 stock assessment the 7 other BMUS deep bottomfish species, likewise, are not categorized as overfished and are not experiencing overfishing (NMFS, 2018)

Summary. Throughout the review area, the dredge areas in the federal harbor and offshore borrow area and portions of the shoreline fill area feature sandy bottom. Sandy bottom supports kona crab. Open ocean supports uku. Portions of the shoreline fill area feature intertidal, rocky shoreline. The proposed action will directly impact substrate that is designated EFH for juvenile and adult kona crab and uku (based on depth and distance from shore), however, based on the best scientific information available that describes the habitat utilization patterns of these fisheries, neither the kona crab nor the uku are documented as utilizing the substrate that will be directly impacted by the proposed action i.e., adult kona crab prefer sandy bottom habitat at depths of 24 to 115m and juvenile and adult uku prefer benthopelagic depths of 40-227 meters. These documented habitat depth preferences are absent in dredge, borrow and fill areas.

4.0 EFFECTS OF PROPOSED ACTION ON EFH AND MANAGED SPECIES (*(ii) An analysis of the potential adverse effects of the action on EFH and the managed species.*)

As defined by the Magnuson-Stevens Act (50 CFR 600.810), “adverse effect” includes any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

The proposed action to dredge and place approximately 22,638 cy of beach quality sand along the HBP shoreline (approximately 4.2 acres) has the potential to cause adverse effects to EFH. Construction of the proposed action involving in-water work activities will result in immediate temporary impacts during construction and long-term impacts by design, as described in the following subsections.

4.1 Temporary Effects on EFH and Managed Fishery Species

Temporary construction impacts include increased turbidity and noise generation that can reduce the quality of water column EFH. These impacts will be minimized through the use of appropriate BMPs.

Turbidity. Water column turbidity will increase during and immediately after in-water construction activities over the duration of the construction contract (one year) and will be local to the vicinity of the active construction work area. Both dredging and placement activities will suspend sediment into the water column and generate turbidity. The settling of suspended sediments is sedimentation. Dredge-related turbidity is generally in open water and subject to resuspension by ocean current, tide and wave energy. Dredged material placement is additionally affected by the lapping of waves on the shoreline that will increase potential for resuspension of sediments in the water column until the beach equilibrates and resuspension becomes consistent with ambient conditions typical of the dynamic, high-energy shoreline environment.

Based on a comprehensive literature review, there is a clear trend between response type and increasing concentrations and exposure to suspended sediment, where fish have markedly different tolerances to suspended sediment, with some species able to withstand concentrations up to 28,000 mg/L, while others experience mortality starting at 25 mg/L. Responses to turbidity can range from short to long term, depending on the nature of the activity. Behavioral responses include avoidance, which typically ceases once the turbidity subsides or the fish acclimates, shifts in local abundance and community composition resulting from long-term or chronic, inability to detect and avoid fishing gear, inability for larvae to detect and settle in suitable habitat, reduced foraging, especially for herbivorous and planktivorous fish species, and impacts on predation, especially for species that depend upon vision for predation. Physiological effects to fish species from turbidity include damage to gill tissue and structure, including associated accumulation of pathogenic microbiota accumulation, which affects oxygen absorption and respiration in a potentially oxygen-deprived environment via turbidity-induced reduced dissolved oxygen, triggering stress responses and compounding effects of turbidity by adversely impacting growth, development and ability to swim (away) (Wenger, 2017).

The Corps proposes to minimize both generation and spread of suspended sediments through modified means and methods and implementation of BMPs. Use of an environmental bucket and employment of soft starts will minimize generation of turbidity while use of silt curtains to encircle the active dredge area will minimize lateral drift of suspended sediments beyond the active dredge area. Quiescent harbor waters will likely permit use of full depth (within 5-feet of the seafloor) silt curtains, however, the offshore sand deposit likely will not. Currents and wave energy in open water environments are known to cause significant damage to full depth silt curtains causing failure of the enclosure. The contractor will likely have to resort to using mid-depth silt curtains that are designed to prevent lateral drift of suspended sediments in the upper water column while ensuring adequate flexibility to reduce pressure on the curtains underwater. Where use of full depth silt curtains is not possible, an environmental bucket will be employed. The Corps will require its contractor to implement necessary monitoring to ensure compliance with the State Water Quality Standards, anticipating coverage under the Blanket Water Quality Certification (WQC 0901). Dredged material in the entrance channel and especially the offshore sand deposit are primarily coarse grain sand and is expected to settle out of suspension immediately.

While a wide range of effects from turbidity is possible, the Corps anticipates the proposed action would temporarily suspend sediments in the water column and temporarily reduce the quality of water column habitat for managed fish species. The temporary reduction in quality of EFH would be limited to the review area and would be minimized to the greatest extent practical with the aforementioned modified dredge means and methods and implementation of sediment containment BMPs. Accordingly, the Corps anticipates the impacts to managed fishery species and associated prey to be temporary and non-lethal, causing negligible impacts to the managed fishery populations, and therefore would not cause substantial adverse effects to EFH.

Noise. In water-construction activities generate noise greater than ambient, potentially affecting the quality of EFH in the review area. In particular, dredging is anticipated to be the greatest source of noise associated with the proposed action. Mechanical dredge operations typically produce repetitive underwater noise at low frequency (<1,000 Hertz (Hz)), ranging from seconds to a few minutes per cycle. The events of the cycle, as represented by noise-generating actions, include winch lowering to the seafloor, impact with the seafloor, scooping of the bucket in sediment, closure of the bucket, winch ascent through the water column and disposal of the material into the scow, repeated; the loudest of which, is generally generated by the impact of the bucket with the seafloor. The generation of sound depends upon many factors including, water depth, sea state e.g., quiescent vs. dynamic, type of sediment being dredged e.g., gravel vs. sand, dredge operation including maintenance of dredge machinery and experience and skill of dredge operator and ambient noise. Dredging in soft sediments generates considerably lower sound levels (107 decibels (dB)) than dredging in coarser material such as gravel (124 dB), in comparison to ambient (50 dB average; 72.3 dB peak) (Dickerson, 2001). NMFS interim guidance on hearing threshold in fish species is not comprehensively developed, with focused regulation on impacts to marine mammals. Interim NMFS guidance set peak threshold for physical injury or mortality of fish at 206 dB with anticipated behavioral disturbance/harassment resulting from a continuous source at 120 dB (Reine, 2014). Underwater noise generated by a range of natural and anthropogenic causes has been demonstrated to affect fish in the following ways: (i) behavioral responses, (ii) masking, (iii) stress and physiological responses, (iv) hearing loss and damage to auditory tissues, (v) structural and cellular damage of non-auditory tissues and total mortality, (vi) impairment of lateral line functions and (vii) particle motion-based effects on eggs and larvae (Popper, 2014). A comprehensive review of available scientific information indicates dredging related sounds, in particular, are non-lethal, may cause temporary hearing loss, may induce behavior or stress response and in the case of larvae, may mask natural sounds used to detect suitable habitat (Wenger, 2017).

The Corps anticipates the noise generated from mechanically dredging soft sediments i.e., the proposed action, would be temporarily elevated above ambient conditions, resulting in temporary reduction in quality of water column EFH and causing non-lethal, non-injurious effects to managed fishery species and associated prey. These effects would cease immediately upon completion of the in-water construction activities. Accordingly, the Corps anticipates noise-related impacts to cause less than substantial adverse effects to EFH.

4.2 Long-Term Effects on EFH and Managed Fishery Species

Long-term impacts include modifying the shoreline, which may reduce quantity and quality of EFH. The intent of the proposed action is to beneficially reuse dredged material via beach placement, as opposed to the Federal standard of ocean disposal. The Corps anticipates the overall environmental benefit would outweigh resulting adverse effects to EFH.

Modified Shoreline. The Corps proposes to place beach quality sand dredged from the federal limits of the Haleiwa Small Boat Harbor, the Proposed action Settling Basin and Offshore Sand Deposit along the shoreline fronting the Haleiwa Beach Park. The existing shoreline features sandy beach, exposed intertidal, rocky shoreline where the beach has eroded and open water nearshore habitat. The proposed action would convert the 4.2-acre placement area to sandy beach, with an expected long-term permanence of 26 years (with no maintenance or other additional placement). At the request of the Corps and pursuant to the Fish and Wildlife Coordination Act (FWCA), the U.S. Fish and Wildlife Service (USFWS) conducted underwater surveys to characterize the review area. The sand placement area will convert existing Sand, Pavement, Scattered Coral/Rock in Unconsolidated Sediment, Rocky Shoreline Intertidal, and Sandy Shoreline Intertidal strata into Sandy Beach. Of note by USFWS in its FWCA report is the conversion of all of the 2,907 m^2 Rocky Shoreline Intertidal habitat fronting the HBP comfort station and parking lot to sandy beach (USFWS, 2020, attached). The Rocky Shoreline Intertidal habitat represents substrate that has been exposed by erosion of the overlying sandy beach.

The conversion of existing shoreline habitats to a homogenous sandy beach would result in the reduction in quantity of water column and seafloor EFH. Federally managed fishery species and associated prey would no longer be able to forage or seek refuge in this area. Due to the longevity of the anticipated conversion, 26 years, the Corps anticipates that fish will acclimate to the long-term conversion and reduction in localized open water, intertidal habitat. The Kona Crab prefers sandy habitat in deeper waters and the Uku is a shallow bottomfish commonly caught in deeper waters. USFWS noted that the density and biomass of fishes were low across all sites, with the highest density in the Rocky Shoreline Intertidal stratum and highest biomass in the Pavement stratum. The most abundant fish species was *Acanthurus triostegus* (0.08/m2), while *Acanthurus nigrofuscus* had the highest biomass (0.03 tonnes/ hectare); both species are not federally managed fishery species and are monitored by the State as Ecosystem Component Species (WPRFMC, 2020). The loss of 4.2 acres of open water nearshore and intertidal rocky and sandy habitat represents a relatively small fraction of the vast EFH designation Federally Managed Fisheries across the Hawaii Archipelago and is anticipated to have deleterious effect on the continued sustainability of both the Crustacean and Bottomfish fisheries. While the anticipated impacts would reduce quantity of EFH, the adverse effects would not be substantial.

4.3 Conclusion (*(iii) The Federal agency's conclusions regarding the effects of the action on EFH, and (iv) any proposed mitigation, if applicable.*)

The proposed action would temporarily reduce quantity of water column EFH during construction and have long-term reduction in quantity of water column and substrate EFH localized to the review area. There are no anticipated permanent effects to EFH or federally managed fishery species with no discernible impact to the sustainability of the fishery. The Corps anticipates the proposed action may adversely affect EFH, but does not have the potential to cause substantial adverse effect to EFH or any federally managed fishery.

5.0 REFERENCES

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Attachment 1: Fish and Wildlife Coordination Act

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 Ala Moana Boulevard, Rm. 3-122
Honolulu, Hawai'i 96850

In Reply Refer To:
2020-CPA-0023

Stephen N. Cayetano, P.E.
Deputy District Engineer for
Programs and Project Management
Honolulu District, U.S. Army Corps of Engineers
Fort Shafter, HI 96858-5440

Dear Mr. Cayetano:

In coordination with your staff, the U.S. Fish and Wildlife Service (Service) is providing this Draft Fish and Wildlife Coordination Act Report for the proposed Haleiwa Beach Park Re-nourishment project. The Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 et seq.; 48 Stat. 401], as amended (FWCA), was established to provide a basic procedural framework for the orderly consideration of fish and wildlife conservation measures to be incorporated into Federal water resources development projects. This report has been prepared under the authority of and in accordance with provisions of the FWCA, the Federal Clean Water Act of 1977 [33 U.S.C. 1251 et seq.; 62 stat. 1155], as amended (CWA), and the Endangered Species Act [16 U.S.C 1531 et seq.], as amended (ESA). These comments are also consistent with the National Environmental Policy Act of 1969 [42 U.S.C. 4321 et seq.; 83 Stat. 852], as amended, and other authorities mandating the Service's review of projects and provision of technical assistance to conserve trust resources.

This report was prepared by the Service; however, we have also solicited comments from the State of Hawaii's Department of Land and Natural Resources, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), and U.S. Environmental Protection Agency (EPA).

We appreciate the opportunity to provide input on the proposed project. If you have questions regarding the report, please contact Marine Biologist Tony Montgomery (Tony_Montgomery@fws.gov or 808-792-9456).

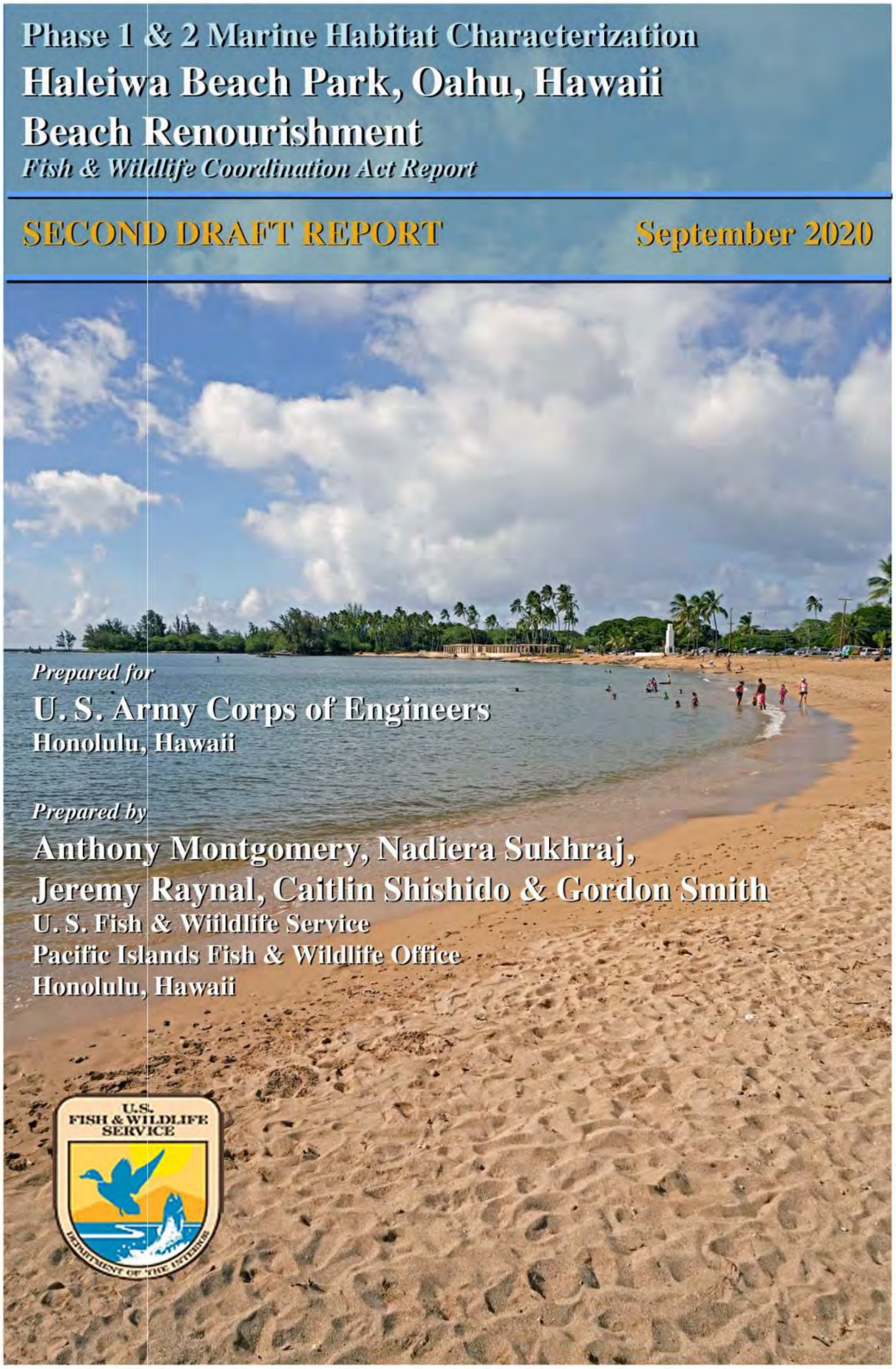
Sincerely,

DAN POLHEMUS Digitally signed by DAN POLHEMUS
Date: 2020.08.18 10:24:14 -10'00'

for Katharine Mullett
Field Supervisor

INTERIOR REGION 9
COLUMBIA–PACIFIC NORTHWEST
IDAHO, MONTANA*, OREGON*, WASHINGTON
*PARTIAL

INTERIOR REGION 12
PACIFIC ISLANDS
AMERICAN SAMOA, GUAM, HAWAII, NORTHERN MARIANA ISLANDS


Phase 1 & 2 Marine Habitat Characterization

Haleiwa Beach Park, Oahu, Hawaii

Beach Renourishment

Fish & Wildlife Coordination Act Report

SECOND DRAFT REPORT **September 2020**

Prepared for

U. S. Army Corps of Engineers

Honolulu, Hawaii

Prepared by

Anthony Montgomery, Nadiera Sukhraj,

Jeremy Raynal, Caitlin Shishido & Gordon Smith

U. S. Fish & Wiildlife Service

Pacific Islands Fish & Wildlife Office

Honolulu, Hawaii

Second Draft

FISH AND WILDLIFE COORDINATION ACT REPORT

PHASE I AND II MARINE HABITAT CHARACTERIZATION
HALEIWA BEACH PARK BEACH RE-NOURISHMENT

OAHU, HAWAII

Prepared by

Anthony Montgomery
Nadiera Sukhraj
Jeremy Raynal
Caitlin Shishido
Gordon Smith

U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, HI

Prepared for

U.S. Army Corps of Engineers
Honolulu District, Civil and Public Works Branch

SEPTEMBER 2020

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers, Honolulu District's Civil Works Branch is proposing a pilot project under Section 1122 of the Water Resources Development Act of 2016 to place sand at Haleiwa Beach Park, Oahu, Hawaii. This project would beneficially reuse dredged material from the Haleiwa Small Boat Harbor as well as a sand deposition area adjacent to the harbor, a nearby offshore location, and an adjacent area south of the beach. This proposed action will provide services such as coastal protection and enhanced recreational and commercial opportunities for residents and tourists utilizing the beach area.

The U.S Fish and Wildlife Service has conducted a Fish and Wildlife Coordination Act investigation to assess the marine resources within the project area and the potential impacts associated with the proposed action. In order to complete a biological characterization of the project area, surveys were conducted to map the marine habitat and its resources at each of the project component sites. Based on that data, we divided the Haleiwa Beach Park area into five strata in order to develop a stratified, random sampling design for quantitative surveys. Quantitative surveys were then conducted at 29 sites across Sand, Pavement, Scattered Coral/Rock in Unconsolidated Sediment, Rocky Shoreline Intertidal, and Sandy Shoreline Intertidal strata. The quantitative data collected included species, size, and number of coral colonies and fishes, species and number of macroinvertebrates, estimate of benthic cover (substrate, algae, and invertebrate percent cover), and habitat rugosity.

The uncolonized bottom across all strata was high, being 100% of the Shoreline Intertidal – Sandy stratum, 99.1% of the Sand stratum, 81.9% of the Rocky Shoreline Intertidal stratum, 79.9% of the Scattered Coral/Rock in Unconsolidated Sediment stratum, and 66.7% of the Pavement stratum. This study documented a relatively low diversity of marine species, with 10 species of corals, 7 species of algae, 13 species of fishes, and 60 species of invertebrates across all 29 sites. Coral density was low across all sites, but was the most dominant in the Pavement and Scattered Coral/ Rock in Unconsolidated Sediment strata, with the most abundant species being *Psammocora stellata* (0.48 colonies/ m^2) in the Pavement stratum. The density and biomass of fishes were low across all sites, with the highest density in the Rocky Shoreline Intertidal stratum and highest biomass in the Pavement stratum. The most abundant fish species was *Acanthurus triostegus* (0.08/ m^2), while *Acanthurus nigrofuscus* had the highest biomass (0.03 tonnes/ hectare). The highest invertebrate density was in the Rocky Shoreline Intertidal stratum, while the Pavement stratum had the highest invertebrate density for subtidal habitats. The most abundant invertebrates were *Nerita picea* (10.24/ m^2) in the intertidal habitat and *Echinometra mathaei* (1.75/ m^2) among subtidal habitats. An invasive alga, *Acanthophora spicifera*, made up the highest benthic biological cover in subtidal habitats (13.3% in Pavement stratum and 12.7% in Scattered Coral/Rock in Unconsolidated Sediment stratum).

The potential impacts associated with this project are relatively small, but include possible impacts to corals, particularly *Psammocora stellata* in the northern portion of the beach park area. The most significant impact includes the loss of the majority of the Rocky Shoreline Intertidal habitat from sand placement under Alternative 5. The U.S. Fish and Wildlife Service recommends steps to minimize the impact to these two areas by avoiding sand placement in the northern section or across the Rocky Shoreline Intertidal habitat. Our position is supportive of this project with consideration of avoiding and minimizing these impacts.

TABLE OF CONTENTS

INTRODUCTION

Authority, Purpose and Scope

The U.S. Army Corps of Engineers (USACE) Civil Works Branch is proposing to place sand at Haleiwa Beach Park, Oahu, Hawaii as part of a beneficial reuse of dredged material from the Haleiwa Small Boat Harbor and nearby offshore sand sources. The USACE received funding under Section 1122 of the Water Resources Development Act of 2016 as a pilot project. The scope of this project requires consultation under the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended (FWCA). This report, in the form of a Fish and Wildlife Coordination Act Report (FWCAR), has been prepared under the authority of and in accordance with provisions of the FWCA (Section 2b); the Clean Water Act of 1977 [33 USC 1251 *et seq.*; 91 Stat. 1566], as amended (CWA); the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended (ESA); and other authorities that authorize the Service to provide technical assistance to conserve trust resources.

The FWCA provides the basic authority for the Secretary of the Interior, Secretary of Commerce, and the appropriate State fish and game agency to assist and cooperate with Federal, State and public or private agencies and organizations in the conservation and rehabilitation of aquatic wildlife. This authority provided to the Secretary of the Interior is through the U.S. Fish and Wildlife Service (and subsequently delegated to Ecological Services Program), for the Secretary of Commerce through the National Marine Fisheries Service (NMFS) via Reorganization Plan No. 4, and to the State of Hawaii through Department of Land and Natural Resources, Division of Aquatic Resources (DAR).

The Pacific Islands Fish and Wildlife Office (PIFWO) conducted this FWCA investigation to document the resources within the project area and analyze the potential impacts to marine resources, and as the lead agency has the responsibility of ensuring that concerns and recommendations of the other resource agencies are considered fully in FWCA reviews. The NMFS and DAR were invited to take part in the fieldwork, but were unable to participate. The draft report (August 2020) was sent to NMFS, the Environmental Protection Agency (EPA), and DAR. NMFS and EPA notified the Service they had no comments while DAR has provided comments (Appendix G). Those comments have been incorporated into this report. This report was prepared using the guidance described in Smalley (2004).

Description of Project Area and Proposed Action

The Haleiwa Beach Park is located on the island of Oahu, Hawaii, in the tropical north Pacific (Figures 1 & 2). The site lies along the northern coast of Oahu at Waialua Bay. The depths in this area range from 0 to 3 meters (m) (0 to 10 feet). The Haleiwa Beach Park is at the mouth of the Anahulu River and northeast of the Haleiwa Small Boat Harbor. The Beach Park is operated and maintained by City and County of Honolulu (CCH).

The Haleiwa Beach Shore Protection Project was authorized by the River and Harbors Act of 1965 and constructed in the same year. The project consisted of an offshore breakwater (160 feet by 520 feet), terminal groin on the southern edge of the beach, and beach fill 1,600 feet long and 140–265 feet wide. The USACE undertook emergency repairs of the project in the 1970s, consisting of repairs to the groin and offshore breakwater, as well as placing approximately 12,000 cubic yards of sand. The project authorization allows the USACE to undertake emergency repairs as needed, but the non-federal sponsor (State of Hawaii's Department of Transportation) is responsible for maintenance (USACE 2018).

The Haleiwa Small Boat Harbor was constructed in 1966 and modified in 1975 with the addition of the stub breakwater and wave absorber. It was dredged in 1999, with 7,214 cubic yards of material removed, and again in 2009 with 6,500 cubic yards removed. The material was disposed in an upland area, except for a small amount in 2009, which was used at Haleiwa Beach Park for repairs.

This proposed project aims to place beach quality sand within the existing beach and nearshore marine waters of Haleiwa Beach Park. The placement of additional sand will provide services such as coastal protection, as well as enhanced recreational and commercial opportunities for residents and tourists utilizing the beach area. Coastal erosion of this area has been severe, and most pronounced in front of the CCH comfort station. In 2019, the CCH repaired the wall of the comfort station due to concern of eminent collapse, but this wall will be subject to further erosion without additional protection. The USACE proposal for project funding reports that the area in front of the comfort station would receive sand first, as this is the most critical portion of the beach (USACE 2018). Please see below (section DESCRIPTION OF ALTERNATIVES UNDER CONSIDERATION) for the description of the five proposed alternatives.

Proposed sources of sand for the beach re-nourishment include an offshore sand area, the outer portion of the small boat harbor federal channel, a small sand deposition area adjacent to the channel, and a dredged access channel adjacent to the groin at the southern end of Haleiwa Beach Park. Dredging of the offshore sand area would remove 15,000 cubic yards of beach suitable sand. Routine Operations and Maintenance of the federal channel would dredge the channel to 13 feet below Mean Lower Low Waterline (MLLW) by removing an estimated 2,433 cubic yards beach suitable sand and 2,000 cubic yards of non-suitable material. Dredging of the sand deposition area adjacent the channel would remove 2,200 cubic yards beach quality sand to 8 feet below MLLW. In order to offload the sand, a dredged channel south of the southern beach groin will be dredged to 10 feet below MLLW by removing 4,733 cubic yards of material. The proposed dredging activities will be conducted with a barge-mounted crane and environmental clamshell bucket dredge, placed on a scow, and barged to the access channel to be mechanically placed on the beach. Material not suitable for the beach will be disposed at the South Oahu Ocean Dredged Material Disposal Site located 3 miles south of Pearl Harbor and 46 miles from Haleiwa Small Boat Harbor at depths of 1,300 to 1,650 feet.

Prior Fish and Wildlife Service Studies and Reports

The Service completed a Phase I habitat-mapping survey for Haleiwa Small Boat Harbor in August – September 2012 and sent a report to the USACE on September 14, 2012 (2012-CPA-0003). The report included a qualitative description of the resources within the federal channel and data on coral colonies growing on the rock revetment.

Prior Studies and Reports from other agencies

The Service is unaware of any other studies or resource investigations within the area.

Coordination with Federal and State Resource Agencies

USACE charrette planning site visit – June 18, 2019

USACE charrette planning meeting – June 19, 2019

USACE request for FWCA consultation – August 27, 2019

USFWS coordination with NMFS – August 28 – September 24, 2019

USFWS Scope of Work and Budget – October 2, 2019

USFWS Revised Scope of Work and Budget – January 29, 2020

Receipt of the Military Inter-department Purchase Request – February 25, 2020

Invitation to State of Hawaii, Division of Aquatic Resources to participate – March 11, 2020

Fieldwork conducted – May 30 and June 23–26, 2020

Draft data graphs to USACE – July 13, 2020

Draft report sent to NMFS – August 18, 2020

Draft report sent to DAR – August 18, 2020

Draft report sent to Environmental Protection Agency – August 18, 2020

Draft report sent to USACE – August 19, 2020

Comments on draft report from USACE – August 25, 2020

Comments on draft report from NMFS – August 26, 2020

Comments on draft report from EPA – September 8, 2020

Comments on draft report from DAR – September 22, 2020

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES

U.S. Fish and Wildlife Service Planning Objectives

The mission of the Service consists of working with partners to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. In 2016, the Service updated its 1981 mitigation policy to better meet this mission (USFWS, 2016), but has since rescinded the revised 2016 mitigation policy (USFWS, 2018) leaving the 1981 policy in effect. The Service's 1981 Mitigation Policy (USFWS, 1981) outlines internal guidance for evaluating project impacts affecting fish and wildlife resources. The Mitigation Policy complements the Service's participation under NEPA and the FWCA. The Service's Mitigation Policy was formulated with the intent of protecting and conserving the most important fish and wildlife resources while facilitating balanced development of this nation's natural resources. The policy focuses primarily on habitat values and identifies four resource categories and mitigation guidelines. The resource categories are shown in Table 1.

The Haleiwa Beach area is considered a coral reef and meets the description of Resource Category 3. This coral reef area should be considered medium to high value due to the marine resources documented in this survey. However, this reef has been classified as Category 3, based on its current condition described below, while most Hawaiian coral reefs are rated at Category 2. In general, coral reefs are considered scarce based on their local, national, and global decline (Williams et al., 2009; Walsh et al., 2010; Waddell (ed.), 2005; Waddell and Clarke (eds.), 2008; Wilkinson (ed), 1998; Wilkinson (ed), 2000; Wilkinson (ed), 2004; Wilkinson (ed), 2008) and their geographical constraints within the United States. Coral reefs have also been designated as Special Aquatic Sites under the Clean Water Act (CWA). Special Aquatic Sites are defined as "geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values." They are further described as "significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region" (40 CFR Part 230 §230.44/FR v.45n.249).

Table 1: Resource categories. Resource categories and mitigation planning goals.

Resource Category	Designation Criteria	Mitigation Planning Goal
1	High value for evaluation species and unique and irreplaceable.	No loss of existing habitat value.
2	High value for evaluation species and scarce or becoming scarce.	No net loss of in-kind habitat value.
3	High to medium value for evaluation species and abundant.	No net loss of habitat value while minimizing loss of in-kind habitat value.
4	Medium to low value for evaluation species.	Minimize loss of habitat value.

These designations of Resource Category 3 and Special Aquatic Site require the Service to recommend ways for the action agency to mitigate losses, through measures to avoid or minimize significant adverse impacts. In the event losses are unavoidable, measures to rectify immediately, reduce, or eliminate losses commensurate with project permitting or implementation will be recommended under the FWCA. Recommendations will focus on compensation for the replacement of in-kind habitat values and ecological functions. An effective and verifiable mitigation program planned and executed by the project proponent is required under NEPA and the CWA.

To this end, it is the policy of the Service to provide federal leadership for the conservation, protection, and enhancement of fish, wildlife, and their habitats by seeking to mitigate their losses with a facilitated, balanced approach to proposed water development actions. The Service's 1981 mitigation planning policies achieve this by the following: 1) State-Federal Partnership, 2) Resource Category Determinations, 3) Impact Assessment Principles, 4) Mitigation Recommendations, 5) Mitigation means and Measures, and 6) Follow-up.

Within these planning policies, *evaluation species* is a key term to describe the fish and wildlife resources selected for impact analysis. There are two basic approaches to the implementation of evaluation species: 1) selection of species with high public interest, economic value, or both, and 2) selection of species to provide a broad ecological perspective of an area. While some species may be appropriate for both approaches, we emphasize using species that provide a broad ecological perspective.

The evaluation species typically used for tropical Pacific marine ecosystems include stony corals, seagrasses, and certain benthic algal groups (*Halimeda* meadows or unique coralline algal communities). Some situations may dictate the use of additional species, and the Phase 1 protocols that the Service uses capture the key benthic resources that are of interest. Other situations may warrant considering key fish species as important evaluation species.

These evaluation species are important as they also relate to other federal agency policies. Coral reefs in general are considered high value habitat and have been defined in the CWA Section 404(b)(1) guidelines as "skeletal deposits, usually of calcareous or silicaceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of the reef." Stony corals are a foundation species to the development of coral reefs and hence are often the central focus of mitigation within the Pacific Island region. Coral reefs are further considered to be Special Aquatic Sites under the CWA 404(b)(1) guidelines. Finally, the 404(b)(1) guidelines also consider vegetated shallows to be Special Aquatic Sites. Within the Pacific Islands, the Service considers *Halimeda* meadows and seagrass communities to be vegetated shallows. Such Special Aquatic Sites are areas that possess special ecological characteristics and contribute to the overall benefit of the ecosystem.

This report is a Phase I and II investigation that addresses the Service's mitigation framework to the extent that the data are sufficient. A Phase I report aims to provide broad information for avoidance and minimization of negative environmental impacts, but does not include information necessary for scaling and planning a compensatory mitigation package. A Phase II investigation addresses the remaining components of the Service's mitigation framework and can also provide information for scaling and planning a compensatory mitigation package, if necessary.

Resource Concerns

The primary concerns associated with the proposed project include the direct impacts associated with the placement of sand on existing marine habitat, particularly the Shoreline Intertidal community. The proposed Alternative 5 would cover a significant amount of Shoreline Intertidal area as well as some portions of the Pavement and Scattered Coral/Rock in Unconsolidated Sediment habitats, although the latter is a much smaller portion of the total area. The specific planning objective is to provide technical assistance and recommendations to USACE to allow equal weight to be given to both project benefits and natural resources in decision-making. To achieve this goal, we provide the following: 1) biological and habitat data for the Haleiwa Beach Park area; 2) analysis of potential impacts of the proposed project to fish and wildlife resources and their habitats; and 3) recommendations for minimization and avoidance measures.

EVALUATION METHODOLOGY

Phase I Habitat Mapping

A team of two biologists using snorkel collected information on the habitats and biological communities within and adjacent to the project footprint. The survey team was equipped with digital cameras, dive watches, floated GPS units, and datasheets attached to a clipboard to record data. The time on the digital camera was synchronized with the GPS units by photographing the time of the GPS unit before entering the water. In addition, the time difference between the dive watch and GPS unit was recorded on the datasheet. The team was familiar with the proposed project area and had pre-determined starting points and areas for the initial survey. The number of survey transects was determined based on the time available and an estimated area covered.

A survey transect consisted of the team collecting habitat and biological information as described below along a swim path while towing a pair of floated GPS units. The floated GPS units were always maintained/aligned near the team to minimize spatial error between the biologists and the GPS. All survey transects were marked by a starting waypoint and an ending waypoint. GPS units were set to the local time and set to record a track log automatically at 5-second intervals.

The biologists on the survey team consisted of a habitat/coral surveyor and an algal/invertebrate surveyor. All biologists collected data on observed habitat zones, debris observations, and protected species as well as their respective biological groups. The visual observation area that was qualitatively evaluated was estimated by each biologist and recorded in meters. The estimation distance was influenced by water clarity, rugosity of habitat, complexity of habitat, water depth, and other environmental conditions that limit visual distance. One biologist was assigned as the navigator; this person followed a pre-determined compass bearing, depth contour, habitat boundary or other criteria that determined the survey transect path. Each biologist carried an underwater camera to document species and habitat types observed.

Habitat Terminology and Characterization

Habitat terminology used was modified from Battista et al. (2007) and detailed definitions ae available from the Pacific Islands Fish and Wildlife Office upon request. Although the classification of Battista et al. (2007) was not developed specifically for impact assessments, the terminology and characterization framework were deemed generally appropriate for the purposes of characterizing habitats for this Phase I survey. The framework described in Battista et al. (2007) included three data layers of habitat information, consisting of a classification of geographic zones, geomorphological structures, and biological cover. The terms for geographic zones, geomorphological structures, and major geomorphological structures are used here with slight modification. The "geographic zones" are subsequently called "habitat zones," the "geomorphological structures" are subsequently called "habitat structures," and the "major geomorphological structures" are subsequently called "major habitat structures." By contrast, the biological cover classification scheme of Battista et al. (2007) is not used. Instead, the biological cover classification scheme used here is modified and expanded substantially from Battista et al. (2007), as described below.

Habitat zones were generally determined prior to entering the water or after exiting from the water and were recorded by the habitat/coral and algae/invertebrate surveyors. Habitat structures were determined in the water to the best ability of the habitat/coral surveyor. Water clarity and conditions could impact the diver's ability to determine the specific habitat structure, but it was generally determined while in the water. Biologists, particularly the navigator, followed along a habitat structure boundary when appropriate in order to assist with further delineation between habitat structures. Care was taken when conducting the biological characterization along these boundaries. The biological characterization was focused on one side of the observed boundary so that it was applied appropriately to each particular habitat structure involved. This aspect was coordinated by the observers and noted on the datasheet. The boundaries between habitat structures were evaluated or refined during the data processing phase (see Habitat Map Production methods). The types of unconsolidated sediments observed were also recorded, being scored as present or absent. These included sand, mud, rubble, and cobble as described below.

In addition to characterizing the habitat structures, the habitat/coral surveyor also characterized habitat complexity. The categories of habitat complexity are the same as used by NOAA's Pacific Islands Fishery Science Center (Brainard et al. 2008; Brainard et al. 2012). As stated in Brainard et al. 2008, "Estimates of habitat complexity were subjective assessments of topographical diversity and complexity of the benthic habitat and were classified according to one of six categories: low, medium-low, medium, medium-high, high, and very high (Fig. 2.4.2b). As examples, low habitat complexity is often associated with flat sand plains or rubble habitats; medium habitat complexity is often associated with small to moderate spur and groove, coral or boulder habitats; and high or very high habitat complexity are often observed as high or extreme vertical relief associated with steep spur-and-groove canyons, pinnacles, and walls." These six categories were recorded on a 0-5 scale with 0 for low, 1 for medium-low, 2 for medium, 3 for medium-high, 4 for high, and 5 for very high.

Biotic Characterization

The biologists collected information on various biological groups/categories and species inventoried along the survey transect. The information on the various biological groups/categories (as described below) was recorded at a frequency of every 15 to 60 seconds depending on the habitat area and speed of swimming, but varied under different circumstances. The area that could be reasonably visually assessed was recorded at each point and varied based on water depth, water visibly, or other environmental factors. The biotic characterization included three main survey components (habitat/coral, algae/invertebrate, and ESA corals) and each main component had multiple data collection components.

Habitat/Coral Characterization

The habitat/coral surveyor (Tony Montgomery) collected information on habitat as described above, as well as six different components of the coral population within an area. These components included the relative abundance of stony coral, stony coral growth forms observed, estimated stony coral sizes present, and presence of non-stony corals. Details for each component are given below. Each observation was collected with the specific time (hh:mm:ss) that was later converted to a GPS coordinate by the closest GPS track log coordinate within a five second window. This conversion was completed in a Microsoft Access© database. The area that could be visually assessed reasonably for coral abundance was estimated as a visual distance in meters (in terms of a radius) and recorded on the datasheet. The observer also carried an underwater camera to take photographs of representative habitats, representative coral communities, coral colonies for species identification, or any other notable feature of interest.

Component 1 – Habitat structure and sediment were classified on a continual basis and with the same frequency as other data. Habitat zone was classified at the start of the dive or when a change of zone was found.

Component 2 – Relative abundance of coral was recorded utilizing a modified DACOR method. DACOR stands for dominant (5), abundant (4), common (3), occasional (2), or rare (1), and categories were recorded on a 1-5 scale with 1 being Rare and 5 being Dominant. Zero was used for coral absence. Each category was approximated to represent a broad range of percent coral cover such as 1 – <1% (scattered corals), 2 – <10%, 3 – 10-50%, 4 – 50-80%, and 5 – >80%.

Component 3 – The stony coral growth forms included: 1) lobate/massive, 2) conical, 3) small-branching, 4) medium-branching, 5) large-branching, 6) digitate, 7) columnar, 8) table, 9) plate, 10) foliaceous, 11) encrusting, 12) free-living, and 13) mixed. Possible mixed growth forms included forms like plates-and-column and plates-and-branched, but if other combinations existed, they were recorded. The distinction between small and medium branching colonies were made by using the approximate diameter of a pencil (< 1 cm) while the distinction between medium and large branching colonies were made by using the approximate diameter of a small wrist (< 5 cm). For data analysis, these growth forms were lumped into fewer categories including: 1) lobate, microatoll, branching, encrusting, plate-like, and free-living.

Component 4 – For each growth form observed, the sizes observed were recorded into broad size categories, including: 1) small included colonies estimated less than 50 cm, 2) large included colonies greater than 50 cm, 3) mixed included colonies of both small and large, and 4) extra-large included colonies greater than 2 m.

Component 5 – Non-stony coral groups were recorded as present or absent. The groups included: 1) soft corals, 2) zoanthids, 3) gorgonians or sea fans, and 4) black or wire corals.

Component 6 – If coral disease or bleaching were observed, it was noted in the comments section of the datasheet and recorded in the Access database. It was recorded as present or absent as coral stress, and then logged as disease, pale bleached, partial bleached, or complete bleached.

Algae/Non-Coral Invertebrate Characterization

The algal/invertebrate observer (Dr. Nadiera Sukhraj) collected information on up to eight different components. These components included relative abundances for seagrass, turf algae, coralline algae, filamentous algae, macroalgae, and several invertebrate groups. The observer also recorded observations of debris. Additionally, the observer developed an overall species list for algae and non-coral invertebrates. The details for each component are listed below. Each observation was collected with the specific time (hh:mm:ss) that was later converted to a GPS coordinate by the closest GPS track log coordinate within a five second window. This conversion was completed in a Microsoft Access© database. The area that could be reasonably assessed for algal/invertebrate abundance was estimated as a visual distance in meters (in terms of a radius) and recorded on the datasheet. The observer also carried an underwater camera to take photographs of representative habitats, representative algal and invertebrate communities, algae and invertebrates for species identification, or any other notable feature of interest.

Component 1 – Relative abundance for seagrass was recorded on a scale of 0–3. Zero was used for seagrass absence. Category 1 represented seagrass abundance that consisted of isolated patches and did not have continuous coverage within an area. Category 2 represented seagrass that had a semi-continuous or continuous coverage, but had a low density of blades. Category 3 represented seagrass with a continuous coverage and had a high density of blades or a tall canopy height. The species of seagrass was recorded.

Component 2 – Relative abundance for turf algae was recorded on a scale of 0–3. Zero was used for turf algae absence. Category 1 represented turf algae that had sparse or patchy coverage and/or low density of turf algae. Category 2 represented a moderate, semi-continuous coverage and a low to moderate density of turf algae. Category 3 represented a continuous coverage and a high density of turf algae. Turf algae for the purpose of this assessment were sparse to thick multi-specific assemblage of diminutive and juvenile algae less than 2–3 cm in canopy height.

Component 3 – Relative abundance for coralline algae was recorded on a scale of 0–3. Zero was used for coralline algae absence. Category 1 represented a sparse or patchy coverage of coralline algae. Category 2 represented a moderate or semi-continuous coverage of coralline algae. Category 3 represented a continuous coverage of coralline algae. Coralline algae were assessed for readily visible corallines mostly that are red or pink on the reef surface. The observer did not look in holes or under rocks to assess the coralline algae abundance.

Component 4 – Relative abundance of filamentous algae and cyanobacteria was recorded on a scale of 0–3. Zero was used for absence of filamentous algae or cyanobacteria. Category 1 represented a sparse or patchy coverage of filamentous algae or cyanobacteria. Category 2 represented a moderate or semi-continuous coverage of filamentous algae or cyanobacteria. Category 3 represented a continuous coverage and a high density of filamentous algae or cyanobacteria. Filamentous algae for the purposes of this assessment was defined as hair-like plants that do not form a substantial thallus or a coherent tissue (definition modified from Huisman et al. 2007, page 254). Common filamentous algae that are representative of this group include *Cladophora* spp. or *Bryopsis hypnoides* (not *Bryopsis pennata*). Common cyanobacteria that are representative of this category include *Lyngbya* spp. and *Hormothamnion* sp.

Component 5 – Relative abundance of macroalgae was recorded on a scale of 0–3. Zero was used for macroalgae absence. Category one classification represented sparse or patchy (even individual plants) and a low density of macroalgae. Category two classification represented moderate, semi-continuous coverage and a low to moderate density of macroalgae. Category 3 represented a continuous coverage with a high density of macroalgae. In addition to recording the relative abundance, four forms of macroalgae were recorded as being present or absent and included short frondose, tall frondose, *Halimeda* algae, or invasive macroalgae. Short frondose macroalgae was defined as having a maximum canopy height of 20 cm and tall frondose macroalgae was defined as a canopy minimum canopy height of 20 cm.

Component 6 – Relative abundance for all non-coral invertebrates was recorded on a scale of 0–3. Zero was used for invertebrate absence. Category one classification represented an observation of 1–2 individuals. Category two classification represented the observation of 3–10 individuals. Category 3 represented the observation of more than 10 individuals. If an aggregation of significantly more than 10 individuals was observed, this was recorded in the comments section. The invertebrate groups included grazing sea urchins, rock boring sea urchins, crown-of-thorns starfish, lobsters, *Pinctada margaritifera*, giant clams, anemones, sea cucumbers, mollusks (strombids, top or turbin shells, Triton's Trumpet, helmet shells, etc.), octopus, seastars (*Linckia* sp., *Culcita* sp., or others) and, crinoids. In addition, the presence and absence (but not relative abundance of) sponges and tunicates in all forms and shapes were recorded.

Component 7 – The observation of marine debris (deb) or remnant structure underwater was recorded as present or absent. The type of structure or debris was recorded (UXO, tires, misc., etc.).

Component 8 – The final component was the compilation of an overall species list for all algae and invertebrate species observed. Species were identified to the lowest taxonomic level possible, either *in situ* or by subsequent examination of photographs taken on-site. , but it is an estimate of species richness along one transect

Post-Field Work Data Processing

Data Preparation

At the end of each dive day, digital images and GPS data were downloaded using appropriate software. Images were placed into daily folders and GPS data were downloaded using DNRGPS 6.0© as a tab-delimited text file (.txt). Benthic data were entered into a Microsoft Access© database. After all data were entered into the Access database, the gps data, dive data, habitat-coral data, and algae-invert data were validated for errors or anomalies. All errors were corrected and the data was processed for geosyncronization. The final, validated, georeferenced data were outputted as a database file (.mdb).

Data Processing

Habitat map data layers were produced with a Service custom built scripts (Marine_Mapping_Model1_v4.R and Marine_Mapping_Model2_v4.R) using R software (R Core Team, 2020). These custom built scripts use several packages including RODBC (Ripley and Lapsley 2020), sf (Pebesma et al. 2020), raster (Hijmans et al. 2020), rgdal (Bivand et al. 2020a), dismo (Hijmans et al. 2017), deldir (Turner 2020), maptools (Bivand et al. 2020b), rgeos (Bivand et al. 2020c), smoothr (Strimas-Mackey 2020), spatialEco (Evans et al. 2020), and cleangeo (Blondel 2019). The first script (Marine_Mapping_Model1_v4.R) processes the raw survey data exported from the database file. External data can be incorporated into the data processing including NOAA's Benthic Habitat Maps (Battista et al. 2007), land classification layers, existing DEM layers, or habitat classification from Feature Analyst©. In this current project, NOAA's benthic classification data was incorporated into the classification layer produced from this projects field data that provided a comparative option for the final classification. After these individual datasets were processed, they were incorporated and combined into the draft classification layer. This draft layer was processed based on comparative criteria and manual interpretation of the results that produced a final classification layer in the second script (Marine_Mapping_Model2_v4.R). The second script also finalized the geoprocessing steps and incorporated a series of interpolations for all the biological groups as described previously. Currently, this script remains in development after transition the model from Modelbuilder in ArcGIS© 10.2.2 to R and the final interpretation layers are not available for this project.

Initial input layers used to begin the data processing included an area enclosure, target area shapefiles, land classification layer, and raw database output file. The target area shapefile represented the total, maximum area (inclusion of all potential alternatives) of the anticipated direct impact area of the proposed action. This layer was provided to the Service by the USACE. The area enclosure shapefile represented the area that bounds the total project area. The land classification layer was a layer developed prior to data collection that estimated the land boundary (including any dock area) from marine areas below the mean higher high waterline (MHHW) or estimated MHHW.

During the classification stage, there were set classification criteria as well as manual interpretation of the layer classifications used to make the final classification determination. The set classification criteria and manual interpretation determined the boundaries of the habitat structures by: 1) direct observation, 2) transects that were swum along habitat structure transition boundaries (i.e. scattered rock in unconsolidated sediment on one side and unconsolidated sediment-sand on the other side), 3) utilizing NOAA's Benthic Habitat Maps where deemed appropriate, or 4) other data sources as described previously (Feature Analyst outputs based on WorldView-2 imagery) that provided information on habitat structures. These boundaries may not represent the exact delineation between habitat structures, but serve as an estimate based on the available information. After the boundaries are drawn for each habitat character, the edited Theissen polygon was validated to reassure all changes are correct and complete.

The models also generated output tables that included all geodetic area calculations for each habitat major structure, habitat structure, sediment type, and habitat zones.

Phase II Quantitative Habitat Characterization

Stratified, Random Sampling Design

Prior to the quantitative field surveys, random survey locations were determined using a stratified, random sampling design across the project area. The project area includes the estimated area along the coastline and out to a 90–100 m offshore (estimated distance of potential sand impacts on the reef flat). Strata were developed based on the Phase I data describe above.

A total of four strata were initially determined based on different habitat characteristics (Figure 3) across the project area. These strata included the habitat structures of unconsolidated sediment (sand), pavement, and scattered Coral/Rock in unconsolidated sediment and the habitat zone of shoreline intertidal. Within the shoreline intertidal, the area was broken into four areas based on intertidal characteristics. After data collection, it was decided that the Shoreline Intertidal stratum should be split into Rocky and Sandy strata resulting in a total of 5 strata evaluated.

Five to 20 random points were placed in each stratum polygon using ArcGIS© and the Create Random Points tool. The points were limited to not be within 10 m of other points. Each point was assigned a bearing that was approximately parallel to the shoreline (approximately north or south based on distance to stratum edge) or in a direction that allowed for 25 m to remain within the stratum. If transects would cross due on location and bearing, the first assigned transect would be used and the crossing transect(s) would be deleted that represents sampling without replacement. These points were exported into a Microsoft Excel© table with a corresponding latitude and longitude. The pre-determined bearing was used to guide the direction of the transect line and reduce any bias by the diver. The result provided 35 potential transects across the project including 10 in Scattered Coral/Rock in Unconsolidated Sediment, 7 in Pavement, 5 in Sand, and 13 in Shoreline Intertidal strata.

Rapid Ecological Assessment Survey Protocols

Each day a survey team was assembled to collect reef fish, coral, marine plant, non-coral macroinvertebrate, and geomorphological data for subtidal surveys (intertidal surveys were modified as described below). The team was comprised of 3 biologists including one coral biologist, one reef fish biologist, and one non-coral macroinvertebrate and algal biologist. This fish biologist also collected rugosity and the coral biologist collected (at some sites) imagery for photogrammetry. Each survey team was equipped with digital cameras, GPS units (Garmin 64st), two red surface buoys with line reels, bottom transect reels, and clipboards with datasheets to record data.

For these surveys, there was no vessel available for support. A safety diver (on snorkel) was added to the overall team and provided surface support. The safety diver accompanied all divers during surveys to help support divers while swimming along the transect. Divers were not always in sight due to water visibility, so the safety diver remained on the surface to serve as a back-up buddy for the divers.

Before divers entered the water, small marker buoys were deployed at pre-determined sites to guide the divers where transects need to be placed. The team, then entered the water and swam to the surface marker buoy towing two red surface buoys. The team collected GPS waypoints to mark the starting point of the 25-m survey transect before descending. At the bottom, the team determined if the habitat observed in the pre-determined bearing direction was that expected for the stratum (e.g. not sand in an expected hard bottom habitat). If the habitat was not as expected, the reciprocal bearing was assessed and used, with changes noted in the site information list. The same protocol was repeated for every dive.

After descending at a survey point, the team secured one red buoy at the 3-lb weight marking the 0-m point of the first transect. The reef fish diver then led the team along a pre-determined compass bearing while laying out a 25-m transect line and towing a second red buoy. The surface support diver tracked the fish diver and kept visual contact during the survey. While swimming the line out, the diver identified and counted the number of reef fish species present. When the diver reached the end of the 25-m transect line, the reel and line with the second red buoy was secured to the substrate. The safety diver collected a GPS waypoint after the fish diver secures the float to the end of the transect. The fish diver then swam back to the 0-m mark and began to collect a rugosity measurement along the transect. After finishing, the fish diver retrieved the second red buoy and remained on the surface until the rest of the team was completed. The coral and invertebrate divers then started collecting coral and invertebrate data along the transect line soon after the fish diver started. The invertebrate diver collected quadrat point count data while swimming back along the transect line. After completing data collection, the divers rolled up the transect line and surfaced together at the first red buoy. The divers regrouped on the surface and moved to the next survey site.

Reef Fish Survey Protocols

The reef fish diver (Gordon Smith) identified to the lowest taxa level possible (usually species), counted, and sized of each fish observed within an estimated 4-m wide area (ie.,2-m wide on each side) while deploying the 25-m transect line. When the diver reached the end of the 25-m transect line, the line was secured to the substrate. The same diver then swam back toward the beginning of the transect, with the surface support diver following. Transect width was adjusted for water visibility as necessary. Each 25-m x 4-m transect (100 m^2), the survey station, was treated as a unit for summarization.

Rugosity Survey Protocols

The reef fish diver was also tasked with obtaining rugosity measurements from the 0-m to 10-m section of each transect. Rugosity (f_r) is a measurement of reef complexity and is an indication of reef relief and/or of the presence of coral, which creates a complex surface as it grows. A diver used a 25-m light brass chain marked at 0.5 m intervals and draped it over the bottom along the transect line. The length of chain was recorded for the 10-m section. Each rugosity measurement for each transect was treated as a separate unit for data analysis.

Coral Survey Protocols

The coral diver (Tony Montgomery) conducted surveys for coral number, size, and morphology. All coral colonies within a 25-m x 1-m belt transect were counted, sized, and assigned a morphological category. Corals were identified to the lowest possible taxonomic level (generally species), and two horizontal dimensions of each colony were measured and recorded on a data sheet. Coral colonies were counted and measured using the center-point rule; only colonies with their center falling within the 1-m belt width were included. Each 25-m (25 m^2) transect section was treated as a separate unit for data analysis.

In addition, colony condition was recorded, noting whether partial mortality, fragmentation, bleaching, and/or growth anomalies were present. Each colony that had undergone complete fission was also noted, sized as if the colony were whole across parts, and its percent of live/dead tissue visually estimated. Fission is the partial mortality of a coral colony that results in separation of a colony into pieces that are genetically identical (*i.e.*, ramets) and remain attached to the substratum. Unattached fragments were also noted and sized separately. Gross growth anomalies and/or anomalous patterns of tissue loss by taxa were photographed if encountered.

Non-coral Macroinvertebrate Survey Protocols

The non-coral macroinvertebrate and algal diver (Dr. Nadiera Sukhraj) conducted counts for non-coral macroinvertebrates while following the coral diver. The diver swam along the 25-m transect line and counted and identified unattached non-coral macroinvertebrates 1-m to either side of the line to the lowest possible taxonomic level. Time limitations reduced the ability to search for organisms in crevices and cavities, and turbidity reduced visibility in some cases. It is therefore likely the survey observations are an underestimate of true species density and diversity. Each transect (i.e. the station) is treated as a 50 m^2 (25-m x 2-m) unit for data analysis.

Benthic Cover Survey Protocols

The non-coral macroinvertebrate and algal diver conducted benthic cover surveys as well as counts for non-coral macroinvertebrates while swimming back along the transect line. The diver placed three 0.5 m x 0.5 m (0.25 m^2) quadrats at three pre-determine points (5, 12, and 20 m mark) on the reef substrate along each of the 25-m survey transect line at each station. Using a point-intercept method, the diver identified all benthic taxa (*e.g.*, marine plants, urchins, sponges) and abiotic components (*e.g.*, rock, sand, mud) under each point and assigned each point a value of one (1) on the data sheet. If two benthic components existed under a point, each component was assigned a 0.5 value. For example, if the point fell on a coral colony that was colonized with sponge, coral would receive 0.5 and sponge would receive 0.5. Each quadrat contained of grid of 25 equally spaced points. There were a total of 75 points assigned at each station and these data were used to estimate the percent of benthic cover. Each quadrat is treated as a separate unit for data analysis.

Algae and non-coral macroinvertebrates were identified to the lowest possible taxonomic level in the field, but it was generally not possible to achieve the same level of taxonomic resolution for some groups (e.g. sponges) as was possible for other groups. No samples or specimens were collected. Photos of each photoquadrat were taken and archived for reference, but not used or analyzed for this report.

Intertidal Survey Protocols

Protocols for intertidal stations mirrored the above protocols, but only conducted the macro-invertebrate, fish density (no size data was collected), and benthic cover protocols while walking through the intertidal zone. The fish and macro-invertebrate surveys were completed by an expert in intertidal communities (Dr. Caitlin Shishido) and the benthic cover data was collected by Dr. Sukhraj.

DESCRIPTION OF FISH AND WILDLIFE RESOURCES AND HABITAT

General

Appendix A contains 10 maps depicting the habitats and biological resources within and around the Haleiwa Beach Park area.

- Figure A1 shows the Project Area.
- Figure A2 shows the area observed within the Project Area, highlighting the area directly observed versus not observed.
- Figure A3 shows the size and length of the dive tracks of the survey
- Figures A4 to A7 show the habitat zones, habitat major structures, sediment types, and habitat structures, respectively.
- Figure A8 shows the habitat structure clipped by Alternative 5.
- Figure A10 shows the location of debris.
- Figure A11 shows the location of protected species observed.

Appendix D, E, and F contains 10 (11 maps in Appendix F) maps depicting the habitats and biological resources within and around the Haleiwa Beach Park area.

- Figures D1, E1, F1 shows the Project Area.
- Figures D2, E2, F2 shows the area observed within the Project Area, highlighting the area directly observed versus not observed.

- Figures D3, E3, F3 shows the size and length of the dive tracks of the survey
- Figures D4–D7, E4–E7, F4–F7 show the habitat zones, habitat major structures, sediment types, and habitat structures, respectively.
- Figures D8, E8, F8 shows the habitat structure clipped by Alternative 5.
- Figures D10, E10, F10 shows the location of debris.
- Figures D11, E11, F11 shows the location of protected species observed.
- Figure F13 shows that coral morphology present

Details for each of these maps are discussed below. Not all figure numbers are sequential, because certain standardized maps were not appropriate or available for this project and subsequently not included in this report.

Table 3 shows the breakdown of Project Area (surveyed area) measurements for different habitat structures, zones, and sediment types. The total area is 43,765 m^2. It consists of three habitat zones: Land (4,538 m^2 or 10.4%), Shoreline Intertidal (5,977 m^2 or 13.7%), and Reef Flat (33.250 m^2 or 76%). The major geomorphological habitat structures of the area consist of 7,743 m^2 of Hard Bottom (17.7%), 24,274 m^2 of Mixed Bottom (55.5%), 7,210 m^2 of Unconsolidated Sediment (16.5%), and 4,538 m^2 of Land (10.4%). In the Unconsolidated Sediment areas, the sediment type consists of sand or sand/rubble mix. The geomorphological habitat structures of the artificial reef area consist of: 1) Pavement (7,743 m^2 or 17.7%), 2) Scattered Coral/Rock in Unconsolidated Sediment (24,274 m^2 or 55.5%), 3) Unconsolidated Sediment (7,210 m^2 or 16.5%), and 4) Land (4,538 m^2 or 10.4%). These habitat structures correspond exactly to the hard (represented by only Pavement), Mixed (represented only by Scattered Coral/Rock in Unconsolidated Sediment), and Unconsolidated Sediment major habitat structures. The Project Area represents the area surveyed and does not reflect sizes of alternatives or the total impact area. While the Project Area was intended to cover the likely area of both direct and indirect effects, it may be larger or smaller than actual impacts.

As described in the methods, the project area was split into five distinct strata for the purposes of the developing a quantitative sampling design. The description of the marine resources within this area will highlight those specific strata.

Sand

Habitat Characteristics

This stratum was characterized as sand and a sand/rubble mixture as shown in Figure 3 and Appendix A – Figure A6. However, quantitative evaluation of the bottom cover of this area shows 65% of the cover was mud and 33% was sand. The discrepancy is most likely a result of the low visibility during the mapping surveys and the specific locations of the three transects used to characterize the habitat. This area was entirely in the southern portion of the project area next to the southern groin bounding the beach park. The high percentage of mud is likely due to the area's proximity to the mouth of the Anahulu River.

Biological Resources

This area was fairly depauperate except for a few organisms observed on one transect. This transect (Sand-17, Appendix B – Figure B17) extended, in the last few meters, into the Scattered

Coral/Rock in Unconsolidated Sediment stratum (Figure 9). It is important to note that these surveys did not investigate the infaunal community, so the true diversity of the community is not considered at all biological community scales.

Pavement

Habitat Characteristics

This stratum was characterized by a low rugosity (1.03) hard bottom area. This area was mostly located in the northern section of the project area with some Pavement found adjacent to the middle section as shown in Figure 3 and Appendix A – Figure A5. Quantitative analysis of bottom cover consisted of 32% uncolonized hard bottom, 29% sand, and 6% rubble. Sand was sparsely interspered across the Pavement stratum, but did not constitute the underlying structure of the habitat.

Biological Resources

The biological diversity of the Pavement area was generally low compared to most coral reef areas. Four species of algae, 6 species of stony coral, 6 species of fishes, and 27 species of invertebrates were observed in this area (Figure 10). Of the corals observed, the most dominant species was *Psammocora stellata* (0.44 colonies/m^2), which is a small branching coral usually not attached to the substrate and most were small colonies of less than five centimeters (cm). It was abundant on some transects (Pav-11 and Pav-13). The two most dominant invertebrate species were the rock boring urchins, *Echinometra mathaei* (1.75 individuals/m^2) and *Echinometra oblonga* (0.46 individuals/m^2). The most abundant fish species was *Acanthurus nigrofuscus* (0.02 individuals/m^2 and 0.03 tonnes per hectare), which is a valuable fish for human consumption. However, the abundance of this species was very low compared to other coral reefs in Hawaii.

Green sea turtles, *Chelonia mydas*, were also regularly seen foraging and resting within this area (Appendix A – Figure A11).

Scattered Coral/Rock in Unconsolidated Sediment

Habitat Characteristics

This stratum was characterized by a slightly higher rugosity than the Pavement stratum, but still had a relatively low value of 1.09. This area was the most dominant habitat type through the project area (58%; Table 3). Most of the area consisted of small rocks (larger than rubble) and scattered hard bottom pavement mixed with sand (35%) and rubble (40%; Figure 11).

Biological Resources

The biological diversity of this stratum was slightly higher than the Pavement stratum, with 5 species of algae, 10 species of coral, 32 species of invertebrates, and 5 species of fishes. The most abundant alga observed was the non-native alga, *Acanthophora spicifera* at 13%. The top five coral species were *Pocillopora damicornis* (0.12 colonies/m^2), *Psammocora stellata* (0.11 colonies/m^2), *Porites lobata* (0.09 colonies/m^2), *Leptastrea purpurea* (0.08 colonies/m^2), and

Montipora capitata (0.07 colonies/m^2). The most abundant invertebrate was *Echinometra mathaei* (0.4 individuals/m^2). The three most abundant fishes were *Stethojulis balteata* (0.005 individuals/m^2 and 0.009 tonnes per hectare), *Acanthurus nigrofuscus* (0.004 individuals/m^2 and 0.009 tonnes per hectare), and *Rhinecanthus rectangulus* (0.001 individuals/m^2 and 0.015 tonnes per hectare). All of these abundances are relatively low compared to typical Hawaiian coral reefs.

Green sea turtles, *Chelonia mydas*, were also regularly seen foraging and resting within this area (Appendix A – Figure A11).

Shoreline Intertidal - Rocky

Habitat Characteristics

This stratum was characterized predominantly hard bottom (66%; Figure 12) area along the intertidal section of the coastline which is exposed air during low tide periods. The rugosity of this stratum was the highest observed at the project site due to boulders and large rocks along the shoreline (1.21). The rugosity varied depending on the exact location and depth within this zone and hence influenced on the community described below. There were two main sections of this stratum along the project area (Figure 3 and Appendix A – Figure A4). One section was in front the Haleiwa Beach Park parking lot, while the other was in front of the comfort station pavilion. These two sections were slightly separated by a small sandy/rocky beach.

Biological Resources

The biological diversity of this stratum was similar to the Pavement stratum with 2 species of algae, 22 species of invertebrates, and 3 species of fishes. No coral or fish size data was collected in this stratum, and no coral colonies were observed during the invertebrate counts. While the species richness was similar to other strata, the community species composition of this stratum was distinct. The most dominant invertebrate species were *Nerita picea* (10.2 individuals/m^2), a small intertidal gastropod snail, an unidentified Gastropod egg species (4.6 m^2), *Echinometra oblonga* (3.2 individuals/m^2), and *Siphonaria normalis* (2.8 individuals/m^2), a limpet or false opihi. *Nerita picea* was present predominantly as juveniles, and based on similar summertime surveys around Oahu, the observed density and ratio of juvenile to adults for this species has only been documented at two other sites (C. Shishido, Pers. Obs.) The majority of the unidentified Gastropod eggs observed may have been eggs of *N. picea*. The three fish species present were *Acanthurus triostegus* (0.08 individuals/m^2), *Gnatholepis knighti* (0.05 individuals/m^2), and *Istiblennius zebra* (0.02 individuals/m^2). *Acanthurus triostegus* is an important herbivore and valuable fish for human consumption. While size data was not collected, the individuals observed were juveniles indicating this habitat may be a nursery area for this species (Sale 1969). This species was not observed on transects in the other strata, but was broadly present.

Shoreline Intertidal - Sandy

Habitat Characteristics

This stratum was characterized as predominantly sand (86%) and rubble (11%) with a small amount of hard bottom (4%; Figure 13). The rugosity was very low at 1.01, which is typical of sandy areas. This stratum was present in three sections (Figure 3 and Appendix A – Figure A4): in the northern section of the project area near the inside parking lot; a small section in between the Shoreline Intertidal – Rocky stratum; and as a large section in the southern portion of the project area that represents the majority of the recreational beach used by the community. The limited hard bottom habitat observed in this stratum represents the area where the biological resources were observed.

Biological Resources

The biological diversity within this stratum was very low with no corals observed (they were not enumerated in the methods), no algae species, no fish species, and nine invertebrate species. Of the invertebrates observed, the four most dominant ones counted were an unidentified gastropod egg species (2 individuals/m^2), *Anthopleura nigrescens* (1.4 individuals/m^2), *Siphonaria normalis* (0.9 individuals/m^2), and *Nerita picea* (0.4 individuals/m^2). These invertebrates were only observed on the exposed rocks within the sandy area. It is important to note that these surveys did not capture the infaunal community, so the true diversity of the community is not considered at all biological community scales.

Green sea turtles, *Chelonia mydas*, were not observed on the beach within this area (Appendix A – Figure A11). Additionally, basking turtles have not been observed at Haleiwa Beach Park during the summer of 2020 based on U.S. Fish and Wildlife Service data. However, basking turtles are common at Haleiwa Alii Beach Park and Puaena Point Beach Park as well as around the mouth of Anahulu River (Sheldon Plentovich, pers. comm.).

Offshore Sand Area

Habitat Characteristics

This area consists entirely of sand except for a small area well outside the dredge footprint (Table 4; Appendix D – Figures D4–D8). The sand within this area appeared to be high quality beach sand (Appendix D – Figures D6).

Biological Resources

The diversity of this area was very low with few benthic organisms observed. We did not survey the infaunal community and it is expected there may be many mollusks and other infaunal communities present

Sand Deposition Area between Groins

Habitat Characteristics

This area consists of Unconsolidated Sediment sand and mud spanning from the water to areas above the high water mark (Table 4; Appendix F – Figures F4–F8). The sediment in this area consists of a mixture of sand and mud (Appendix F – Figures F6).

Biological Resources

The diversity of this area was very low with few benthic organisms observed.

Federal Channel

Habitat Characteristics

The outer portion of the federal channel consists of Unconsolidated Sediment as well as Scattered Coral/ Rock in Unconsolidated Sediment. The Scattered Coral/ Rock in Unconsolidated Sediment is mostly dominant in the outer portion while the central portion of the federal channel mostly consists of Unconsolidated Sediment (Table 4; Appendix F – Figures F4–F8). The sediment in this area varies across the channel with sand in the central section and a mixture of sand/mud or mud/rubble in other areas (Appendix F – Figures F6).

Biological Resources

The federal channel area has algae cover on the hard surfaces and coral colonies in the adjacent areas. There were large coral colonies (approximately 2 meters in diameter) outside the federal channel, but within the area in which dredge barges or other equipment may work or anchor. The location of these colonies are shown in Appendix F – Figure F13.

Barge Sand Offload Area

Habitat Characteristics

This area consists entirely of mud and leaf litter with no hard habitat structures present. Occasional driftwood debris was observed. A small area adjacent to the groin included sand that appeared to be leaking through the groin. (Table 4; Appendix E – Figures E4–E8). The sediment in this area is almost entirely mud with some sand adjacent to the groin (Appendix E – Figure E6).

Biological Resources

The diversity of this area was very low with few benthic organisms observed. No corals were observed and a few small mollusks were observed near the groin and an occasional anemone in the mud.

DESCRIPTION OF ALTERNATIVES UNDER CONSIDERATION

The proposed project is the beneficial reuse of dredged sand along the beach to re-nourish the shoreline at Haleiwa Beach Park, Oahu. The sand sources include the federal channel of the Haleiwa Small Boat Harbor, a sand deposition area to the west of the federal channel (~2,000 cubic yards), and an offshore sand location as shown in Figure 4. The sand source areas are not considered as individual alternatives, but rather project components that serve as potential sources of suitable quality beach sand. The components described in this report and the various sand placement alternatives do not match actual project alternatives analyzed by the USACE in the Integrated Feasibility Report and Environmental Assessment.

The offshore sand area represents an area of 6,698 m^2 while the shoaling of sand between the stub groin and the outer groin represents an area of 1,211 m^2. The federal channel represents an area of 8,250 m^2, but the entre channel is not slated to be dredged. Additionally, an area next to the southern groin at Haleiwa Beach Park may need to be dredged in order to efficiently offload dredged sand to the beach area. The estimated area by the USACE is 2,226 m^2.

The location for placement of sand along Haleiwa Beach will be determined by the amount of sand available from the above-mentioned sand sources. In order to assess the potential impacts of sand placement, the USACE has determined five potential sand placement alternatives. These alternatives are approximate and meant for scaling purposes and not exact delineation of sand placement. The five alternatives show a greater area of sand placement on the beach with Alternative 1 being a No Action alternative, and Alternatives 2 through 5 being the placement of sand from a small portion of the beach (Alternative 2) to the entire length of the beach (Alternative 5; for the size and location of the alternatives, please see Figures 5–8). The area of the alternatives (Table 2) include: 4,660 m^2 for Alternative 2, 6,356 m^2 for Alternative 3, 8,685 m^2 for Alternative 4, and 18,003 m^2 for Alternative 5.

PROJECT IMPACTS

The primary impacts from this project include the direct impact to benthic resources from the placement of sand along the coastline, as well as the indirect effects from sand shifting and migration after initial placement of sand. The direct impacts are straightforward, as the sand placement will cover portions of the project area. Of the strata assessed, the Shoreline Intertidal – Rocky stratum will be impacted most significantly. Of the estimated 2,907 m^2 of Shoreline Intertidal – Rocky area, the direct impacts to this area will be 1,506 m^2, 1,556 m^2, 2,088 m^2, and 2,799 m^2 for Alternatives 2, 3, 4,and 5, respectively. This represents impacts to 51%, 53%, 72%, and 96% of this area, respectively. Alternative 5 would remove the vast majority of this habitat from the rocky shoreline intertidal area. While surveys were not conducted in other shoreline intertidal areas, this would be expected to represent a significant impact to those marine resources. Given the depth profile of this area and its hard bottom characteristics, any sand placed in this area may not remain long, as high tides and higher swells could erode this section first. Sand placement in this area would have a large impact to the intertidal community, but may not persist, nor achieve its purpose of facilities protection. Of the resources present, the most significantly impacted would be juvenile *A. triostegus*, which use the hard bottom Shoreline Intertidal as a nursery and grazing area.

Impacts to corals are anticipated to be minimal across the area proposed in Alternative 5. However, the transect Pav-13 is within the footprint of Alternative 5 and had three species of corals: *Psammocora stellata* (0.28 m^2), *Leptastrea purpurea* (0.08 m^2), and *Pocillopora damicornis* (0.08 m^2). In order to calculate the number of colonies impacted, more analysis of the size of that specific area and additional transects may be needed, since only a single transect counted corals within this specific area. However, a rough estimate of that specific area indicates approximately 477 colonies would be impacted (304 colonies of *Psammocora stellata*, 87 colonies of *Leptastrea purpurea*, and 87 colonies of *Pocillopora damicornis*). Of these, approximately 90% of the colonies are less than 5 cm, and 10% are between 6 and 10 cm in size. *Psammocora. stellata* was petitioned to be listed under the endangered Species Act in 2014, but ultimately NMFS decided to not list this species.

The assessment of these impacts assumes that sand will not drift beyond the estimated boundary of the Alternative 5 footprint, nor to the north. Based on current sand deposition patterns, this may be a valid assumption, but future impacts to offshore areas may occur.

The impacts associated with the offshore sand dredging should be minimal if the operation is kept within the proposed boundaries. Corals are present in the nearby vicinity, but are far enough away that minimal to no impact should occur with proper sedimentation control measures.

The impacts associated with the sand deposition area near the channel should also be minimal if proper sediment control measures are taken. The habitat structures are more complicated within the outer federal channel because a mixture of Unconsolidated Sediment and hard bottom exists. Where hard bottom exists, coral colonies are often present. Within this portion of the federal channel, there were very few coral colonies within the federal channel limits. However, there were a few colonies of significant size (approximately 2 meters in diameter) in between the federal channel and the small sand deposition area. There is a reasonable chance these large colonies could be impacted without minimization measures. The location of these colonies is shown in Appendix F – Figure F13. Depending on conditions, these colonies are partially visible from the surface.

The impacts in the area of the barge sand offloading are expected to be minimal or less. Impacts associated with the operations in this area can be further minimized with proper sediment control measures.

State of Hawaii, Division of Aquatic Resources Concerns

Additional consideration of project impacts should include resources regulated under the State of Hawaii authority. These include all stony corals and live rock (see Appendix G). In this study, any hard bottom or rubble would likely qualify under the State of Hawaii's definition of live rock, and hence subject to State of Hawaii's jurisdiction for regulated resources. Table 5 shows the percent cover of hard bottom, rubble, and coral that indicates the amount of live rock and coral that may be subject to State of Hawaii regulatory consideration. Table 6 shows the coral density across the various strata. Size class data also exists, but is not shown within Table 6.

With refined estimates of the size and location of sand placement, additional calculations can be made to assist with navigating the State of Hawaii regulatory process.

If impacts to State of Hawaii regulation resources are not avoided, the USACE will need to make a determination that the impact to these resources cannot be avoided and minimized and may be subject to acquiring a Special Activity Permit from the Department of Land and Natural Resources. The Special Activity Permit may require transplantation of corals and live rock to a nearby site. For resources that cannot be transplanted, DAR may require as a condition of the permit an offset of these losses, possibly involving restoration of the coral and live rock in another area.

RECOMMENDATIONS

Based on the description of resources within the project area, the Service provides the following recommendations.

1) The Service recommends that measures be taken to minimize water from discharging back into the coastal area that could create a sediment plume. It is possible that placement of sand may occur directly from the water to the beach area. Minimization measures such as sand berms should be used to slow and pool water on the beach. In addition, silt curtains should be used to minimize sediment generated from the dewatering of dredged sediment.

2) The Service recommends avoiding placing sand in the Shoreline Intertidal – Rocky stratum given the unique intertidal community documented. Sand placement should avoid the northern section of the project area based on the amount of Shoreline Intertidal community impacted, and specifically a higher density of corals in the northern Pavement stratum. While the number of corals is generally low, more sand placement in this section may have increased impacts to the limited coral community.

3) The Service recommends that the amount of sand placed in the northern section and in the Shoreline Intertidal – Rocky stratum should be limited, or only nourished to the extent that is needed to protect the shore-side structures. Alternatives to sand should also be explored to protect the structures, but also maintain the integrity of the intertidal community.

4) The Service also recommends that annual quantitative surveys be conducted for a minimum of five years post sand placement in order to document the changes to the marine communities. This effort can also show any effects of movement of sand across the area and help determine if future re-nourishment initiatives will have continuing impacts.

5) During all dredging operations, sufficient sediment control measures must be taken. The proposed dredge areas are known for low water clarity, but sediment curtains and turbidity monitoring should be incorporated to minimize impacts to resources. We further recommend that some baseline turbidity monitoring be conducted in the area during

various weather cycles in order to develop appropriate turbidity thresholds to be used during dredging operations.

6) Extra measures must be taken to avoid impacts to large coral colonies adjacent to the small boat harbor federal channel shown in Appendix F – Figure F13. This small area should be delineated daily by small buoys if the barge is required to be anchored or will routinely move around the area.

7) The groin that is on the southern boundary of Haleiwa Beach Park should be grouted to minimize sand leaking through the boulders. This will help to retain the beach with less maintenance required.

8) All of the potential sand source areas should undergo extensive sediment and coring analysis. The surface sediment observed in the barge access area and the federal channel seem to consist mostly of mud and does not appear to be of suitable quality for a beach. Excess material that is not suitable for deposition on the beach will need to be disposed of in another manner and this will likely increase costs associated with the project.

9) DAR recommends the following:

    a) Make a formal determination of the areas that can be avoided, or not, and work with them to determine if a Special Activity permit can be issued or will be required;
    b) Provide more information on the potential increased turbidity in the area and the potential movement of such turbidity;
    c) Initiate a public outreach and education effort to effectively document and attempt to mitigate any on-going concerns brought forward from the community or local fisherman;
    d) Provide more details of the project delineation and the footprints of these areas as the project moves from the Feasibility Study to the Design Phase; and
    e) Provide BMPs which will minimize sedimentation and turbidity during the nourishment activities.

SUMMARY AND FWS POSITION

The service conducted extensive surveys across the nearshore area of Haleiwa Beach Park to document the natural resources within the area and the potential impacts associated with adding supplemental sand to the beach. Overall, the diversity of marine resources within this area was low and coral numbers were low compared to other areas in Hawaii. Within this area, the majority of corals were found in the northern section and represent an area where avoidance and minimization measures should be undertaken. The Service further documented the intertidal community across the area and notes that sand placement will have a significant impact to the Shoreline Intertidal – Rocky habitat. To minimize negative impacts associated with adding additional sand along the beach area, the Service recommends avoiding sand addition in the northern section of the beach park and minimizing the sand placement across the rocky portions of the intertidal communities. The overall position of the Service is supportive of the project moving forward, while incorporating all appropriate minimization measures.

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Rhiannon L. Kucharski
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September 24, 2021

Dear Ms. Kucharski:

The National Marine Fisheries Service, Pacific Islands Regional Office (NMFS), received the U.S. Army Corps of Engineers, Honolulu District, Civil Works Branch's (USACE) August 25, 2021 request for an abbreviated essential fish habitat (EFH) consultation and EFH Assessment (EFHA) for mechanical maintenance dredging and sand reuse within Haleʻiwa Harbor on Oʻahu, Hawaiʻi. We have reviewed the proposed activities and have determined that there will be adverse effects to EFH. There will be direct adverse effects to EFH resulting in habitat conversion (4.2 acres of rocky intertidal to sand) and unavoidable loss of 477 small corals (i.e., <10 centimeters). Indirect adverse effects from turbidity and physical damage may occur if silt curtains fail or if the curtains and/or barge and scow anchor systems (e.g., moorings, anchors, chains, etc.) physically contact corals and any seagrass present. We are providing conservation recommendations pursuant to the EFH provision within 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 unaddressed adverse effects are avoided, minimized, offset for, or otherwise mitigated.

Project Description

The USACE proposes to use barge-based mechanical clamshell dredging to restore Haleʻiwa Harbor to its authorized depth; the State of Hawaiʻi, Department of Transportation, Harbors Division is the non-federal sponsor. Proposed dredging will remove an estimated 22,638 cubic yards of accumulated unconsolidated sediment to achieve the authorized depth of -12 feet Mean Lower Low Water (MLLW). A portion of the sand deemed suitable for reuse will be placed to restore 4.2 acres of the beach fronting the Haleʻiwa Beach Park. The USACE expects to conduct the work in 2024, and the dredging should be completed within 12 months. The dredged material will be barged offshore for disposal at the U.S. Environmental Protection Agency's (EPA) South Oahu Ocean Dredge Material Disposal Site.

The project will have six major components (Figure 1):

1. Dredging of the Federal Navigation Channel, which will produce 4,433 cubic yards of sediment of which approximately 2,433 cubic yards is anticipated to be use for beach restoration.
2. Creating a barge access zone to allow for transport and unloading of dredged material. The barge access zone will be excavated to -10 feet MLLW and will produce 1,300 cubic yards of sand that will be used for beach restoration.
3. Excavating a portion of the Federal Navigation Channel to -8 feet MMLW producing 1,705 cubic yards of beach suitable sand that will be used for beach restoration.
4. Creating a 0.3 acre State Breakwater Settling Basin adjacent to and outside of the Federal Navigation Channel by excavating 2,200 cubic yards of sand that will be used for beach restoration.
5. Dredging an offshore sand borrow area to provide approximately an additional 15,000 cubic yards of sand for beach restoration.
6. Placing beach suitable dredged sand at Hale‘iwa Beach Park, unloaded to a single location and then spread using bulldozers or bobcats. The project would result in the conversion of 4.2 acres of rocky intertidal habitat to sand habitat and the direct loss of 477 coral colonies through sand placement on the rocky intertidal zone. These colonies are quite small (90% of the colonies are less than 5 centimeters, and 10% are between 6 and 10 centimeters in size) and are comprised of 304 colonies of *Psammocora stellata*, 87 colonies of *Leptastrea purpurea*, and 87 colonies of *Pocillopora damicornis.*

Figure 1. Site plan for the proposed action.

Essential Fish Habitat

Effective March 11, 2019, the Western Pacific Fisheries Management Council (WPFMC) amended the Fishery Ecosystem Plans (FEP) for American Samoa, the Mariana Archipelago, and the Hawaiʻi Archipelago to reclassify thousands of Management Unit Species (MUS) as ecosystem component species. Under the changes, the number of MUS in the Hawaiʻi archipelago was reduced to three (e.g., Bottomfish, Crustaceans, and Pelagics); however, EFH designations largely remained the same. Currently in the Hawaiʻi archipelago, the marine water column from the surface to a depth of 1,000 m from shoreline to the outer boundary of the Exclusive Economic Zone (200 nautical 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. In Haleʻiwa Harbor, EFH is designated for the following MUS and life stages: 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, artificial substrate, seagrass beds, soft substrate, mangrove, lagoon, estuarine, surge zone, deep-slope terraces and pelagic/open ocean.

While the Coral Reef Ecosystem MUS (CREMUS) no longer exists, benthic substrate and habitat forming EFH (e.g., corals and seagrass, including corals growing on artificial substrate) remain designated in the nearshore coral reef ecosystem—including that in and nearby Haleʻiwa Harbor—for shallow stock complexes of Bottomfish (e.g., uku: *Aprion virescens*) and Crustaceans (e.g., Kona crab; *Ranina ranina*) MUS. Specifically, the WPFMC has determined that EFH designated for uku includes benthic or benthopelagic zones, including all bottom habitats, in depths from the surface to 240 m bounded by the official U.S. baseline and 240 m isobaths. The WPFMC has also determined that benthic EFH designated for Kona crab includes all of the bottom habitat from the shoreline to a depth of 100 m.

Baseline Condition

A marine habitat characterization of Haleʻiwa Harbor was conducted by the U.S. Fish and Wildlife Service (USFWS) through the Fish and Wildlife Coordination Act in September 2020. The USFWS survey found the project area to be mostly comprised of uncolonized bottom, particularly in the shoreline intertidal area. There was a low diversity of marine species and coral density was low across all sites. In the northern portion of the beach park area coral was more common, particularly *Psammocora stellata*. There were also large coral colonies (approximately two meters in diameter) outside the federal channel but within an area where barges or equipment could be working or anchoring. The USFWS estimated that 477 coral colonies would be impacted by the proposed action through sand placement on the rocky intertidal zone. The invasive alga, *Acanthophora spicifera*, was common in subtidal habitats.

Ecological Roles

The principal benthic organisms provide ecological services (e.g., water filtration and maintaining balanced nutrient concentrations) and provide physical habitat at both micro- and macro-scales. At a micro scale, the shape of benthic organisms change water movement, which can influence the settlement (McDougall 1943) and behavior of larvae and the availability of planktonic prey (Williams 1964). Sessile organisms provide refuge from predators, particularly for larvae and small sized species (Russ 1980; Sutherland 1974). Sessile organisms provide new ecological niches increasing species diversity. At a macro-scale, corals are the primary habitat builders in the coral reef ecosystem that benefit juvenile, sub-adult, and adult life stages of the MUS that utilize this designated EFH. The morphology, shape, and composite features of benthic organisms can also influence feeding strategies of MUS.

Adverse Effects

The proposed maintenance dredging requires in-water work that will result in the direct permanent removal of soft-bottom EFH substrate (i.e., dredging); direct removal of hard bottom and corals will be avoided. Short-term adverse effects may occur and include the following stressors: sedimentation and turbidity from potential unmitigated (i.e., no silt curtain or if half-length used during rough seas) dredging, increased risk of unintended physical damage (if curtains and/or barge and scow anchors, moorings, chains; or other equipment drag across corals and seagrass and hardbottom habitat), nutrient loading, chemical contamination from equipment, invasive species, reduced irradiance, noise, and hypoxia.

Dredging will result in the loss of 477 corals <10 centimeters; sand placement will convert 4.2 acres rocky intertidal habitat to sand. Additional long-term to permanent and potentially substantial indirect adverse effects to EFH resources, including corals, may occur from sedimentation and turbidity and unintended physical damage (if curtains and/or barge and scow anchors, moorings, chains; or other equipment drag across corals and seagrass and hardbottom habitat). It is not possible for NMFS to estimate the total area and species of coral that may be adversely affected because the USACE is deferring to the selected contractor to adaptively manage silt curtain implementation in real time. Below are descriptions of the potential stressors to EFH.

Physical Damage/Removal (physical stressor): Dredging in Haleʻiwa Harbor is anticipated to result in the loss of 477 coral colonies found in the sand placement area. In addition, the action will result in the conversion of 4.2 acres from rocky intertidal habitat to sand habitat including all benthic organisms, mainly successional infauna, including any macroalgae, filter feeders (e.g., sponges), and bioturbators. Complete removal of the benthic successional community (including filter feeders) living mostly in soft and or unconsolidated substrate may reduce larval connectivity through habitat fragmentation and the loss of brood stock (Hughes et al. 2005). Removal would also adversely affect the quality of substrate and water column EFH by reducing sediment bioturbation, the flow of water, and likely the balance of both dissolved and particulate nutrients and organic matter (Petersen and Riisgård 1992; Randløv and Riisgård 1979) until the community recovers to pre-dredge levels.

Sedimentation (pollution stressor): There is an increased risk of increased sedimentation to nearby coral habitat due to potential ineffective turbidity and sedimentation minimization during rough sea states. Sedimentation due to dredging, if not contained through effective minimization, may smother, scour, and bury these benthic habitat-forming organisms. If silt curtains and water quality monitoring fail to effectively avoid and minimize, it is likely fine sediment would be transported and deposited over nearby sensitive and hard-to-replace EFH (corals).

Coral reef organisms are easily smothered by sediment (Golbuu et al. 2003), and suspended sediment rates of >10 milligrams per liter (mg/L) and deposited sedimentation rates >1 mg/L can adverse effect juvenile and adult corals (Tuttle et al. 2020) although corals show considerable interspecific variability. Sedimentation can also reduce photosynthetic rates (Philipp and Fabricius 2003), disrupt polyp gas exchange, inhibit nutrient acquisition (Richmond 1996), cause tissue damage (Rogers, 1990), reduce recruitment success (Gilmour 1999; Hodgson 1990), and increase metabolic costs due to enhanced mucus production (Telesnicki and Goldberg 1995).

Nutrient Loading (pollution stressor): Nutrient loading may occur due to the dredging of sediments and any future development, hardening, and urbanization of the associated nearby watersheds. Coral reef ecosystems thrive in oligotrophic (i.e., nutrient-poor) waters (D'Elia and Wiebe 1990), and nutrient enrichment has been shown to negatively affect coral reef ecosystems (Dubinsky and Stambler 1996; Pastorok and Bilyard 1985; Stambler et al. 1991). Adverse effects of nutrient enrichment vary by coral species, type of nutrient input, and the history of the exposed individuals or population. Growth rates of macroalgae are constrained by nutrient limitation and herbivore grazing, thereby preventing algae from overgrowing and killing corals under normal conditions (Birkeland 1988; Carpenter 1986; Hay 1991; Lapointe 1997; Lewis 1986; Littler et al. 1991). Exposure to elevated nutrients can cause a shift to an assemblage dominated by algae (Dudgeon et al. 2010; Edinger et al. 2000; Lapointe 1997). Eutrophication has been reported to cause subtle physiological changes in parameters such as coral growth, skeletal tensile strength, reproduction (Bucher and Harrison 2002; Cox and Ward 2002; Dunn et al. 2012; Stambler et al. 1991), and suppressed calcification rates (Kinsey and Davies 1979; Marubini and Davies 1996). Corals exposed to elevated nutrients often show lower larvae and planula production, impaired planula settlement, decreased gonadal index and fertilization rates, and higher rates of irregular embryos and hermaphroditism (Koop et al. 2001; Loya et al. 2001). Nutrient enrichment has been implicated in reduced ability to withstand disease (Bruno et al. 2003; Harvell et al. 2007; Voss and Richardson 2006) and may increase susceptibility to temperature stress, thereby increasing the chances of bleaching (Wiedenmann et al. 2012).

<u>Chemical Contamination (pollution stressor)</u>: Chemical pollutants can have a variety of lethal and sub-lethal effects on habitat-forming marine organisms, including alteration of growth, interference with reproduction, disruption of metabolic processes, and changes in behavior. These adverse effects can cascade through ecosystems, altering species composition and ecosystem functions and services. Some pollutants are environmentally persistent and can take years or even decades to biodegrade, and others can bioaccumulate and biomagnify through the food chain, eventually posing a direct threat to human health. Many contaminants readily attach to sediment particles and are transported into the ocean where they become entrained in the bottom sediment of estuaries, reefs, and potentially deeper ocean ecosystems. Once trapped in sediment pore water, they can continue to flux into the overlying water column, creating a persistent source of contamination long after the initial input has ended, especially in the sediment of many industrialized bays and watersheds. Dredging can release containments trapped in layers of accumulated sediment and pore water at concentrated levels, sometimes referred to as "black water." Petroleum contamination can adversely affect coral, with results including mortality, inhibition of reproduction, reduced calcium deposition, alteration of physiological processes, tissue loss, and reduced carbon fixation (Turner and Renegar 2017).

Sediment grain size is one of the main factors governing heavy metal contamination in the particulate fraction (Yao et al. 2015). The concentration of heavy metals can increase with decreasing particle size because the soil character of smaller particle size fractions (i.e., clays and silt) bind more contaminants due to the presence of minerals, organic matter, and oxides (Cai et al. 2002; Ljung et al. 2006; Semlali et al. 2001; Yao et al. 2015).

<u>Invasive Species (biological stressor)</u>: Introduced species are organisms that have been moved, intentionally or unintentionally, into areas where they do not naturally occur. Species can be introduced to new biogeographies, typically via transport on vessel hulls or in ballast water, such as those that may be used in the proposed dredging operations. Invasive species rapidly increase in abundance to the point that they come to dominate their new environment, creating adverse ecological effects to other species of the ecosystem and the functions and services it may provide (Goldberg and Wilkinson 2004). Nearly 500 introduced species have been identified in Hawaiʻi (Carlton and Eldredge 2009; Coles and Eldredge 2002; Diaz and Rosenberg 1995; Randall 1987).

<u>Irradiance (environmental stressor)</u>: Staging of the mechanical dredge barge platform, scow, tugs, support vessels, and installation of silt curtains for extended time periods will temporarily reduce light attenuation through the water column, varying spatially as the sun transits its daily arc. Turbidity from dredging with no curtain or a half-length silt curtain may adversely affect water column EFH, including corals, by decreasing water clarity. Reduced irradiance generally can reduce photosynthetic rates of seagrass and corals (Josselyn et al. 1986; Richmond 1993), mask coral spawning cues, and reduce coral fecundity (Erftemeijer et al. 2012). When this stress is acute,

photosynthetic organisms receive less energy for carbon fixation, potentially impairing a host of metabolic processes at the individual scale.

Noise (environmental stressor): Dredging will expose individual habitat-forming marine organisms to sound and vibratory stressors. Behavioral changes can occur, resulting in animals leaving feeding or reproduction grounds (Slabbekoorn et al. 2010) or becoming more susceptible to mortality through decreased predator-avoidance responses (Simpson et al. 2016). Less intense but chronic noise, such as that produced by continuous boating, can cause a general increase in background noise over a large area. Although not likely to kill organisms, chronic noise can mask biologically important sounds and alter the natural soundscape, cause hearing loss, and/or have an adverse effect on an organism's stress levels and immune system.

Hypoxia (environmental stressor): Dredging often releases pore water from accumulated sediments, which is oxygen-poor (Erftemeijer et al. 2012). The condition of low dissolved oxygen is known as hypoxia, while the complete absence of oxygen is called anoxia. When dissolved oxygen concentrations decline below the point that sustains most marine life (i.e., 2-3 milligrams/liter), growth and feeding of marine animals is reduced. If low oxygen conditions persist, individual fitness can become compromised (Baden et al. 1990a; Baden et al. 1990b; Brown 1997; Das and Stickle 1994; Forbes and Lopez 1990; Llanso and Diaz 1994; Petersen and Pihl 1995; Wu 2002). Hypoxic conditions can also increase embryo failure and larval mortality (Baker and Mann 1992; Keckeis et al. 1996; Wang and Widdows 1991; Wu et al. 2003). Crustaceans and fish appear to be particularly susceptible to hypoxic conditions, and mollusks and non-coral cnidarians appear most tolerant (Vaquer-Sunyer and Duarte 2008). Avoidance of hypoxic conditions can make organisms more vulnerable to predation (Abrahams et al. 2007; Altieri 2008; Bertrand et al. 2008; Diaz et al. 1992; Hervant et al. 1996; Johnson et al. 1984; Nilsson and Rosenberg 1994; Pihl et al. 1992; Sandberg 1997; Sandberg et al. 1996). At a population and ecosystem scale, sensitive species may be eliminated in hypoxic areas, thereby causing changes in species composition of benthic, fish, and phytoplankton assemblages. Decreases in species diversity and species richness are well documented in hypoxic areas, and changes to food web structure and functional groups have also been reported in areas with low oxygen availability (Altieri, 2008; Dauer, 1993; Pihl, 1994; Wu, 1982; Brown, 1997).

Applicant-proposed Avoidance and Minimization Measures

The USACE proposes suite of best management practices (BMPs) to decrease the likelihood and prevalence of some likely adverse effects. These measures are described in the EFHA (see Section 2.3), and a selection have been adapted and listed below:

1. The construction contractor must develop a plan that describes how the following conditions will be met.
2. Vessels, barges, and other in-water structures must first attempt to tie-off to existing harbor structures.
3. Anchors must be must be placed exclusively in soft sediments and cause no direct physical damage to corals.
4. No dredging will occur at night during peak coral spawning (one week before and after full moon in July and August).
5. Work must cease during unfavorable weather conditions.

6. While entering or existing the harbor, all vessels, barges, and scows must remain in the marked U.S. Coast Guard ingress/egress channel until it passes the outer buoy.
7. Each vessel must have a written spill prevention plan on board that identified the appropriate response and safety protocols.
8. The contractor must designate on-site personnel responsible for ensuring no inadvertent discharges of debris, petroleum, or other harmful materials into the water.
9. The contractor must submit a contingency plan detailing responses to potential malfunctions of dredge equipment.
10. All dredge vessels, barges, and scows must be equipped with Dredging Quality Management (DQM) instrumentational systems to monitor the real-time monitoring of the scow's status.
11. The contractor must submit maintenance and inspection records.
12. In-water sediment containment devices must be used to contain project-generated turbidity and prevent spread beyond the active work area.
13. Containment scows must be adequately sized to prevent overflow/over-topping.
14. Contractor must develop and submit a site-specific BMP plan to be reviewed and approved prior to the start of work that must include visual inspection of sediment containment devices, instrumented or other monitoring, and establishment of a turbidity threshold 10% above ambient levels.

<u>Contingency Planning</u>: The USACE is proposing regular equipment inspection to minimize the potential for scow malfunction and ineffective sediment containment, with potential exception of the latter during rough sea states. The USACE will also require its construction contractor to develop a plan to swiftly implement pre-approved contingency response procedures in the event of equipment or BMP failure. In the unlikely event of absolute failure, the USACE will coordinate with appropriate resource and regulatory agencies to discuss appropriate and timely response.

<u>Water Quality Monitoring</u>: The USACE proposes to implement relevant BMPs to adhere to the State of Hawaiʻi, Department of Health, Clean Water Branch and USACE Blanket Section 401 Water Quality Certification. An ancillary assist vessel will transport crew and conduct water quality monitoring.

Cumulative Adverse Effects

Considering that many adverse effects in marine ecosystems have long durations due to slow ecosystem recovery (e.g., corals), activities proposed today could result in significant and irreversible damage to EFH in coming decades. In addition, individual adverse effects (stressors) often interact in ways that increases the combined magnitude of adverse effects, by acting synergistically (Brown 1997; Negri and Hoogenboom 2011). A cumulative effects analysis must consider the changes to the marine environment that are expected to occur under our current climate trajectory. For example, elevated seawater temperatures can cause coral bleaching, but the temperature threshold at which coral bleaching occurs is lowered under elevated nutrient conditions (Wooldridge 2009; Wooldridge et al. 2012). In another example, nutrient enrichment combined with large-scale physical damage can increase the probability of a shift in dominance from coral to algae, known as a "phase-shift."

Crain et al. (2008) reviewed over 200 studies examining cumulative effects for multiple stressors in intertidal and nearshore marine ecosystems to elucidate general patterns in cumulative stressor effects. The cumulative effects of any two stressors were distributed among all interaction types, with 26% being additive, (i.e., no interaction), 36% synergistic, and 38% antagonistic. In 62% of all cases, interactions between stressors resulted in an adverse effect on the species or ecosystem that was at least additive. In cases where a third stressor was considered, over two-thirds of the interactions became more negative, and the number of synergistic interactions increased to 66% of the cases. Of all the potential two-way combinations of stressor interactions possible for the proposed maintenance dredging project, increased nutrients interact most additively and/or synergistically with other stressors from the action itself (i.e., sedimentation, contaminants), and also with stressors that will result from climate change (i.e., sea-level rise, ocean acidification, ocean warming. Thus, any activity or set of activities that significantly increases the negative effects of three or more stressors should be closely examined for adverse effects on EFH.

Other areas and projects are likely planned for dredging or improvements in Haleʻiwa Harbor, including the past, on-going, and future activities of other state and federal agencies. Effectively, the EFH throughout and nearby Haleʻiwa Harbor will continue to be impaired by harbor maintenance activities. Unless adequate offset for adverse effects to the baseline condition of EFH have been previously proposed by the USACE and maintained in perpetuity through the regulatory framework, cumulative effects must be iteratively considered. Therefore, unaddressed adverse effects become additive without offset, and the baseline for cumulative effects begins when EFH is defined through regulation.

Recovery Potential

Recovery of benthic communities that have been exposed to broad lethal stressors can take years for individuals to recruit back to affected areas and grow to previous sizes and abundances (Diaz and Rosenberg 1995). However, acute exposures that are only lethal to individual members of a population within a community, or exposures with only sub-lethal effects, recover more quickly. Mobile organisms typically migrate out of affected areas, returning after the stress has abated (Rosenberg 1976). Recovery rates are highly variable by species, and calcareous organisms (e.g., corals) recover more slowly. Recovery from physical damage can be slow, often on the order of years to decades (Rogers and Garrison 2001). In general, recovery rates for major taxa found in the dredging footprints decreases from relatively fast for the successional benthic community (6-8 months), to slow for hard corals (tens of years). Restoration and recovery of the ecological functions and services that bioturbators and filter feeders (i.e., successional community) provide depends on the number of recruits present in and nearby the impacted area (Pearson and Rosenberg 1978; Rosenberg 2001; Thrush and Whitlatch 2001). Literature reviews (ICES 2016; Newell et al. 1998) suggest that most benthic successional marine communities require at least 6-8 months to recover back to initial levels after removal; however, recovery of successional communities can occur on timescales of 1-2 months after dredging (Newell et al. 1998), but these are exceptions to the norm.

In Hawaiʻi, the growth rate of most small sessile invertebrates (e.g., barnacles, bryozoans, serpulid worms) is most rapid just following recruitment. For example, *Balanus amphitrite* matures between 30-60 days, at approximately 15 mm in diameter, and matures up to 22 to 26 mm in diameter (Edmondson and Ingram 1939). Sponges reproduce sexually (broadcast spawning) and asexually. Without considering shrinkage, predation, or partial die-off, which can produce negative growth rates; reported growth rates of sponges vary from zero to several cm/yr. Fast growing zooxanthellae-bearing encrusting clionaids (*e.g.*, *Cliona varians* and C. *caribbaea)* may spread as much as 13 cm/yr, while excavating their substratum to depths of 10 mm or more (Aerts and Kooistra 1999; Rützler 2001a). The fastest growing species, *Desmapsamma anchorata,* reportedly overgrows its substratum at a mean rate of 80 cm linear growth per year (Aerts et al. 1999). Loose fragments of many sponges can reattach to rock rapidly, although heavily damaged sponges regenerate more slowly than slightly injured specimens (Schmahl 1990).

In regards to coral recovery, it will likely take tens of years for corals that may be indirectly lost to sedimentation and turbidity in Hale‘iwa Harbor to recover naturally. The initial growth rates following a disturbance may be slower until certain size is attained (Kolinski 2004; 2007). Recovery can also be hampered by loose rubble (Dollar 1982; Raymundo et al. 2007), which is often generated by the pulverizing of fragile coral morphologies, such as branching or foliose forms.

NMFS Concerns

NMFS is concerned about the permanent loss of 4.2 acres of intertidal habitat and 477 coral colonies through sand placement at Hale‘iwa Beach Park. In addition, NMFS appreciates that the USACE is proposing to have the chosen contractor use full-length turbidity curtains as much as practical. However, despite BMPs, there is a concern based on recent dredging activity damage in Honolulu Harbor that unintentional damage could occur by dredging equipment and/or silt curtains coming into contact with adjacent hardbottom and coral habitat. The USACE can minimize these potential adverse effects by ensuring that the chosen contractor does the following critical BMPs:

- Ensure that full-length curtains are used at all times nearest perimeter areas with high coral cover. To achieve this, the contractor could only dredge near these areas during calm sea states.
- Reduce the size of silt-curtained dredge areas to further minimize potential sedimentation and turbidity. Smaller dredge areas require a smaller curtain footprint, which would enhance their integrity and function.
- Ensure that barge and dredge anchor systems (e.g., anchors, chains, moorings, etc.) are properly installed to avoid damaging hardbottom and corals. Systems should be inspected daily and monitored over time to assess integrity and potential damages.

If this suggested minimization cannot be implemented, resource monitoring and equitable offset would be required. Finally, NMFS is concerned about lacking details in the EFHA related to harbor sediment characterization. Without this information, NMFS must assume there would be adverse effects stemming from the grain size and/or chemical composition of the dredged sediment being placed in the beach park.

Conservation Recommendations

NMFS offers the following conservation recommendations to the USACE pursuant to 50 CFR 600.920 so that potential adverse effects from the proposed project activities are avoided, minimized, offset for, or otherwise mitigated.

Conservation Recommendation 1 (CR#1): The USACE should describe and share with NMFS the characterization of sediments in Haleʻiwa Harbor. Specific emphasis should be placed on the grain size and presence of any contaminants or pollutants.

Conservation Recommendation 2 (CR#2): To the extent possible, the USACE should avoid placing dredged sand directly on intertidal habitat, especially in areas of higher coral density in the north end of the beach park. Throughout the sand placement area, dredged sand should be spread away from the ocean where placement could smother rocky habitat and/or cause sedimentation.

Conservation Recommendation 3 (CR#3): The USACE should ensure that full-length curtains are used at all times nearest perimeter areas with high coral cover. To achieve this, the contractor could only dredge near these areas during calm sea states.

Conservation Recommendation 4 (CR#4): The USACE should reduce the size of silt-curtained dredge areas to further minimize potential sedimentation and turbidity. Smaller dredge areas require a smaller curtain footprint, which would enhance their integrity and function.

Conservation Recommendation 5 (CR#5): Ensure that barge and dredge anchor systems (e.g., anchors, chains, moorings, etc.) are properly installed to avoid damaging hardbottom and corals, and installed only in the Federal channel. Systems should be inspected daily and monitored over time to assess integrity and potential damages.

Conservation Recommendation 6 (CR#6): The USACE should require post-dredging reconnaissance surveys to fully quantify any substantial unavoidable and/or unintended degradation in condition and/or mortality in areas outside of the dredge footprints. The USACE should assess the abundance, size, speciation, condition, and mortality of corals, seagrass, and other any habitat supporting organisms)

Conservation Recommendation 7 (CR#7): The USACE should propose offset for the unavoidable loss of 477 coral colonies and their ecological services and functions.

Conservation Recommendation 8 (CR#8): If substantial unavoidable and/or unintended degradation is observed due to the USACE' contracted dredging and nourishment operations, the USACE should immediately notify NMFS, reinitiate EFH consultation and develop, in coordination with NMFS, equitable compensation to offset the loss of ecosystem services and function.

Conclusion

NMFS greatly appreciates the efforts of the USACE to comply with the EFH provision of the Magnuson Stevens Act. The Corps has determined that the project may adversely affect EFH, but will not cause substantial adverse effects. We agree that there will be adverse effects and have determined that these could be substantial if BMPs and anchoring/mooring/chain systems fail (i.e., oversight of these mechanisms). We have provided EFH conservation recommendations that when implemented—along with the USACE-proposed avoidance and minimization measures—will ensure that potential adverse effects to EFH are avoided, minimized, offset for, or otherwise mitigated.

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.

NMFS is committed to providing continued cooperation and subject matter technical expertise as identified in the conservation recommendations, and as requested, to the USACE 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 Anne Chung at anne.chung@noaa.gov with any comments, questions or to request further technical assistance.

Sincerely,

Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

cc by e-mail:
Malia Chow, NMFS
Stu Goldberg, NMFS
Add Appropriate USACE POCs

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19 NOV 2021

Civil and Public Works Branch
Programs and Project Management Division

Mr. Gerald Davis
Assistant Regional Administrator
National Marine Fisheries Service
Pacific Islands Region, Habitat Conservation Division
National Oceanic and Atmospheric Administration
Inouye Regional Center
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Dear Mr. Davis:

Thank you for the National Marine Fisheries Service's (NMFS) letter dated September 24, 2021, providing Essential Fish Habitat (EFH) Conservation Recommendations (CRs) for the proposed Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Restoration, Hale'iwa, Oahu, Hawaii. NMFS provided CRs in response to receiving the U.S. Army Corps of Engineers' (USACE) EFH Assessment and request on August 25, 2021, to initiate consultation pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act for the proposed action. Pursuant to 50 CFR 600.920(k)(1), USACE notified NMFS on October 25, 2021 that responses to the CRs were forthcoming. Provided below is the USACE response to the eight CRs provided in your letter.

CR#1: USACE should describe and share with NMFS the characterization of sediments in Hale'iwa Harbor. Specific emphasis should be placed on the grain size and presence of any contaminants or pollutants.

Response: Consistent with this CR, USACE has enclosed the 2008 Sampling and Analysis Report for Maintenance Dredging for Hale'iwa Small Boat Harbor and Navigation Channel which describes the characterization of sediments, including grain size and contaminants. This report reflects the most current information available to the USACE and is used to inform planning assumptions.

CR#2: To the extent possible, the USACE should avoid placing dredged sand directly on intertidal habitat, especially in areas of higher coral density in the north end of the beach park. Throughout the sand placement area, dredged sand should be spread away from the ocean where placement could smother rocky habitat and/or cause sedimentation.

Response: Consistent with this CR, to the greatest extent possible, USACE will avoid placing dredged sand directly on intertidal habitat and spread dredged material to avoid smothering rocky habitat.

Rationale: USACE will avoid placing dredged material directly on intertidal rocky habitat to the greatest extent possible; however, it should be noted that impacts to intertidal habitat cannot be completely avoided given that the purpose of the project is to beneficially use dredged material for the purposes of beach restoration and reduce storm damage to public property and infrastructure. USACE will require that dredge material be placed above the Mean Lower Low Water (MLLW) when feasible to do so. For the purposes of the feasibility study, it was assumed that any placement, regardless of the quantity, would be centered at Station 3+00 in front of the war memorial at the beach park. This is an area of continued erosion and any material placed in this location would spread to the north and south by adjusting to an equilibrium due to wave action in the short-term. In the longer-term, placed sand would move to the south in accordance with the direction of dominant longshore transport along this beach.

CR#3: USACE should ensure that full-length curtains are used at all times nearest perimeter areas with high coral cover. To achieve this, the contractor could only dredge near these areas during calm sea states.

Response: Inconsistent with CR #2, USACE will implement full-length silt curtains as a primary measure to minimize water quality degradation during dredging, unless site conditions prevent use of full-length silt curtains.

Rationale: Full-length silt curtains will be required of the contractor during dredging for the entire project unless weather or water conditions will not allow for these to be properly employed or maintained. USACE received feedback from several contractors involving in-water construction that use of full-length silt curtains in open-ocean environments are at imminent risk of failure due to opposing natural forces of tides, currents, and wave fluctuations. To minimize risk of failure and maximize use of full-length silt curtains, the contractor shall monitor for heightened sea states or other conditions that may cause the silt curtain ballast to shift position and/or the silt curtain to move about excessively, and thereby increase the risk of abrasion or other damage to coral, or damage to the silt curtain causing failure of the enclosure. If there is an opportunity to wait until a calm sea state exists, that will be the first option that will be exercised. Where a full-length silt curtain is not practical given wave or current conditions, even under a calm sea state, a mid-length silt curtain may be used. In areas where a full-length silt curtain cannot be employed, an environmental bucket retrofitted with seals and valves to prevent leakage of dredge effluent must be used.

CR#4: USACE should reduce the size of silt-curtained dredge areas to further minimize potential sedimentation and turbidity. Smaller dredge areas require a smaller curtain footprint, which would enhance their integrity and function.

Response: Consistent with the above CR, USACE will require the contractor to scale the dredge and sediment containment devices to the minimum size necessary to safely complete the in-water work and minimize potential sedimentation and turbidity.

Rationale: The contractor will be required to appropriately size the active dredge area to the minimum footprint necessary as described within the contract plans and specifications. The dredging impact area shall be no larger than required to operate the necessary equipment, and the size and position of the area must be strategically planned to reduce the number of times it must be repositioned. Prior to repositioning, sediment containment devices must remain in place until turbidity levels within the enclosure return to ambient levels.

CR#5: Ensure that barge and dredge anchor systems (e.g., anchors, chains, moorings, etc.) are properly installed to avoid damaging hardbottom and corals, and installed only in the Federal channel. Systems should be inspected daily and monitored over time to assess integrity and potential damages.

Response: Consistent with CR#5, USACE will ensure that barge and dredge anchor systems are properly installed to avoid damaging hardbottom and corals outside the Federal channel. Systems will be inspected daily and monitored over time to assess integrity and potential damages. Inconsistent with CR#5, the barge anchor system will be outside the Federal channel when along the shore.

Rationale: The contractor shall prepare, as a stand-alone document or part of the best management practices (BMP) plan, an anchor monitoring plan detailing measures to control and monitor the positions of all anchors and anchor cables, sufficient to avoid damage to corals beyond the Federal channel. The plan will ensure that vessels, barges, and other in-water structures must first attempt to tie-off to existing harbor structures. If anchoring on the seafloor is necessary, then anchors must be placed exclusively in soft sediments. Anchors and anchor components must cause no direct physical impact to corals. Anchor and anchor line footprints of all in-water equipment must be designed to occupy the smallest footprint necessary to achieve safe and effective anchorage. The anchor monitoring plan will be designed by the contractor and reviewed by USACE after the pre-construction, engineering and design phase of the project.

CR#6: USACE should require post-dredging reconnaissance surveys to fully quantify any substantial unavoidable and/or unintended degradation in condition and/or mortality in areas outside of the dredge footprints. USACE should assess the abundance, size, speciation, condition, and mortality of corals, seagrass, and other any habitat supporting organisms.

Response: Inconsistent with this CR, USACE will not be conducting post-dredge reconnaissance surveys of Hale'iwa Harbor. However, if there is anchor misplacement with a potential to damage adjacent coral resources, then USACE will require implementation of a contingency plan that involves underwater impact assessment surveys.

Rationale: Since impacts to high coral coverage areas outside of the Federal project area will be avoided and substantial BMPs will be employed to ensure that direct and indirect impacts are minimal, USACE does not anticipate the need for post-dredge surveys, as the risk for potential impacts have been abated. As a matter of contingency, if there is an instance where anchor misplacement occurs, e.g., an anchor is placed within the restricted coral reef area, all work will stop and the contractor will conduct an underwater survey to assess potential damages. If no damage is observed, work will resume.

CR#7: USACE should propose offset for the unavoidable loss of 477 coral colonies and their ecological services and functions.

Response: Inconsistent with the above CR #7, USACE will not offset for the unavoidable loss of 477 coral colonies and their ecological services and functions.

Rationale: The Marine Habitat Characterization Report by USFWS, dated September 2020, states that a roughly 477 coral colonies are located within near shore habitat. Of these, approximately 90% of the colonies are less than 5 cm, and 10% are between 6 and 10 cm in size. The report also states that impacts to corals are anticipated to be minimal across the project footprint.

The Essential Fish Habitat Descriptions within Amendment 5 to the Fishery Ecosystem Plan for the Hawaii Archipelago (FEP), dated November 1, 2018, is the latest document to describe Managed Unit Species (MUS) habitat by the Western Pacific Regional Fisheries Management Council (WPFMC) and NMFS. The WPFMC defines EFH for various MUS in all of their FEPs, and these designations are the current standard that NMFS implements. The WPFMC concluded the following in the Bottomfish Fishery Management Plan and the Hawai'i Archipelago FEP: "At present, there are insufficient data on the relative productivity of different habitats to develop EFH designations based on Level 3 or Level 4 data. Given the uncertainty concerning the life histories and habitat requirements of many Bottomfish MUS, the Council designated EFH for adult and juvenile bottomfish as the water column and all bottom habitat extending from the shoreline to a depth of 400 meters (200 fathoms) encompassing the steep drop-offs and high-relief habitats that are important for bottomfish throughout the Western Pacific Region."

The FEP states that "the consultation on a federal agency's proposed project in Hawaii that occurs within Bottomfish and Crustacean EFH would need to consider the habitat utilization patterns of both remaining MUS species, uku (Aprion virescns) and Kona crab, to determine the level of adverse impact and appropriate EFH conservation recommendations. The uku EFH in Hawaii is designated as all substrate from the official US shoreline to 240 m depth. The life history information in the FEP describes adult habitat as consisting of the open waters of deep lagoons, channels, or seaward reefs (WPFMC 2016). Uku, unlike the deeper water bottomfish, do not have feeding habits constrained by substrate association (Parrish 1987). EFH for the juvenile and adult life stage of Kona crab is designated as all bottom habitat from the shoreline to 100 m. The life history information in the FEP describes adult Kona crab habitat as sandy bottom habitat at depths between 24 and 115 m (WPFMC 1998). In order to maintain yields of uku and Kona crab and their contribution to a healthy ecosystem, conservation recommendations for a proposed project that impact both species would reflect the need to protect the designated EFH for both of these species (shoreline to 240 m depth and all bottom habitat from the shoreline to 100 m), which includes the open waters of deep lagoons, channels, seaward reefs, and sandy bottom habitats."

USACE acknowledges potential adverse impacts to relatively small coral colonies (90% < 5 cm, 10% < 10 cm) from the beach nourishment portion of the project in waters up to 3 m deep. However, based on a review WPRFMC's Bottomfish Fishery Management Plan and the Hawai'i Archipelago FEP and their amendments, USACE could not identify any habitat utilization patterns or dependency of lifecycle stages of any bottomfish or other Managed Unit Species on coral. Adult Kona crab habitat consists of sandy substrate between 24 and 115 m deep; therefore, impacts to corals in depths less than 3 m can be assumed to have little to no impact to this MUS. As stated in the FEP, uku feeding habitat is not constrained by substrate association. When the project is fully constructed, uku, Kona crab, and other Bottomfish EFH will remain within the project footprint for both MUS as the project will not permanently reduce the amount of open water EFH habitat or detrimentally impact EFH substrate.

Considering that only temporary and minimal impacts are expected to EFH, USACE concludes that there will be a negligible impact to ecosystem functions or services for each MUS from the proposed dredging and beach restoration project; therefore, EFH offset is not warranted.

CR#8: If substantial unavoidable and/or unintended degradation is observed due to the USACE' contracted dredging and nourishment operations, USACE should immediately notify NMFS, re-initiate EFH consultation and develop, in coordination with NMFS, equitable compensation to offset the loss of ecosystem services and function.

Response: Consistent with this CR#8, USACE will immediately notify NMFS if unavoidable and/or unintended degradation occur(s) to EFH as a result of contractor operations. Inconsistent with CR#8, USACE will re-initiate EFH consultation with NMFS if USACE determines that it is required to do so based on information provided at 50 CFR 600.920(l). At that time, it will determined if EFH offset is appropriate for the loss of ecosystems services and function.

Rationale: USACE will follow the regulations at 50 CFR 600.920(l) which state, "A Federal agency must reinitiate consultation with NMFS if the agency substantially revises its plans for an action in a manner that may adversely affect EFH or if new information becomes available that affects the basis for NMFS EFH Conservation Recommendations."

USACE appreciates working with NMFS on the consultation of this project and acknowledges the importance of implementing conservation recommendations to protect important marine resources. USACE is confident that the incorporation of conservation recommendations into the plans and specifications, combined with the best management practices that are required by the contractor, will ensure that there are no substantial adverse effects to EFH.

Should you have any questions, comments, or wish to request a meeting to discuss our response, please contact Ms. Kate Bliss, Regulatory and Environmental Program Manager, at (808) 835-4626 and kate.m.bliss@usace.army.mil.

Sincerely,

WONG.MICHAEL.F.1179365576 Digitally signed by WONG.MICHAEL.F.1179365576 Date: 2021.11.19 14:53:13 -10'00'

for Jennifer R. Moore
Deputy District Engineer for
Programs and Project Management

Enclosure

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December 6, 2021

Dear Ms. Moore,

On November 26, 2021, the National Marine Fisheries Service, Pacific Islands Regional Office, Habitat Conservation Division (NMFS) received the U.S. Army Corps of Engineers, Honolulu District Regulatory Branch's (USACE) response letter to our essential fish habitat (EFH) conservation recommendations for the proposed maintenance dredging in Haleʻiwa Harbor on Oʻahu, Hawaiʻi. The USACE letter provides individual responses to each of the EFH conservation recommendations provided by NMFS. Below, and pursuant to the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, Section 305(b) as described by 50 CFR 600.920), NMFS evaluates the sufficiency of the USACE responses.

NMFS Responses

NMFS appreciates that the USACE has accepted conservation recommendation #1, #2, #4, and #5 and provided additional information on how these conditions will be incorporated into the project. When implemented, these four conservation recommendations will collectively support minimizing adverse effects to EFH. Below, we restate conservation recommendations #3, #6, and #7, the USACE response; and the subsequent response by NMFS maintaining our position.

Conservation Recommendation 3 (CR#3): USACE should ensure that full-length curtains are used at all times nearest perimeter areas with high coral cover. To achieve this, the contractor could only dredge near these areas during calm sea states.

USACE Response: Inconsistent with CR #2, the USACE will implement full-length silt curtains as a primary measure to minimize water quality degradation during dredging, unless site conditions prevent the use of full-length silt curtains.

Rationale: Full-length silt curtains will be required of the contractor during dredging for the entire project unless weather or water conditions will not allow for these to be properly employed or maintained. USACE received feedback from several contractors involving in-water construction that use of full-length silt curtains in open-ocean environments are at imminent risk of failure due to opposing natural forces of tides, currents, and wave fluctuations. To minimize risk of failure and maximize use of full-length silt curtains, the contractor shall monitor for heightened sea states or other conditions that may cause the silt curtain ballast to shift position and/or the silt curtain to move about excessively, and thereby increase the risk of abrasion or other damage to coral, or damage to the silt curtain causing failure of the enclosure. If there is an opportunity to wait until a calm sea state exists, that will be the first option that will be exercised. Where a full-length silt curtain is not practical given wave or current conditions, even under a calm sea state, a mid-length silt curtain may be used. In areas where a full-length silt curtain cannot be employed, an environmental bucket retrofitted with seals and valves to prevent leakage of dredge effluent must be used.

NMFS Response: NMFS disagrees with the USACE, and maintains the recommendation that full-length curtains are used and the contractor should only dredge near areas of coral during calm sea states.

Conservation Recommendation 6 (CR #6): USACE should require post-dredging reconnaissance surveys to fully quantify any substantial unavoidable and/or unintended degradation in condition and/or mortality in areas outside of the dredge footprints. USACE should assess the abundance, size, speciation, condition, and mortality of corals, seagrass, and other any habitat supporting organisms.

USACE Response: Inconsistent with this CR, USACE will not be conducting post-dredge reconnaissance surveys of Hale'iwa Harbor. However, if there is anchor misplacement with a potential to damage adjacent coral resources, then USACE will require implementation of a contingency plan that involves underwater impact assessment surveys.

Rationale: Since impacts to high coral coverage areas outside of the Federal project area will be avoided and substantial BMPs will be employed to ensure that direct and indirect impacts are minimal, USACE does not anticipate the need for post-dredge surveys, as the risk for potential impacts have been abated. As a matter of contingency, if there is an instance where anchor misplacement occurs, e.g., an anchor is placed within the restricted coral reef area, all work will stop and the contractor will conduct an underwater survey to assess potential damages. If no damage is observed, work will resume.

NMFS Response: NMFS disagrees with the USACE response. Pursuant to 50 CFR 600.920(l), reinitiation of the EFH consultation would be required if unintended damage to areas of high coral were to occur.

Conservation Recommendation 7 (CR #7): The USACE should propose offset for the unavoidable loss of 477 coral colonies and their ecological services and functions.

USACE Response: Inconsistent with the above CR #7, USACE will not offset for the unavoidable loss of 477 coral colonies and their ecological services and functions.

Rationale: The Marine Habitat Characterization Report by USFWS, dated September 2020, states that a roughly 477 coral colonies are located within near shore habitat. Of these, approximately 90% of the colonies are less than 5 cm, and 10% are between 6 and 10 cm in size. The report also states that impacts to corals are anticipated to be minimal across the project footprint.

The Essential Fish Habitat Descriptions within Amendment 5 to the Fishery Ecosystem Plan for the Hawaii Archipelago (FEP), dated November 1, 2018, is the latest document to describe Managed Unit Species (MUS) habitat by the Western Pacific Regional Fisheries Management Council (WPFMC) and NMFS. The WPFMC defines EFH for various MUS in all of their FEPs, and these designations are the current standard that NMFS implements. The WPFMC concluded the following in the Bottomfish Fishery Management Plan and the Hawai'i Archipelago FEP: "At present, there are insufficient data on the relative productivity of different habitats to develop EFH designations based on Level 3 or Level 4 data. Given the uncertainty concerning the life histories and habitat requirements of many Bottomfish MUS, the Council designated EFH for adult and juvenile bottomfish as the water column and all bottom habitat extending from the shoreline to a depth of 400 meters (200 fathoms) encompassing the steep drop-offs and high-relief habitats that are important for bottomfish throughout the Western Pacific Region."

The FEP states that "the consultation on a federal agency's proposed project in Hawaii that occurs within Bottomfish and Crustacean EFH would need to consider the habitat utilization patterns of both remaining MUS species, uku (*Aprion virescens*) and Kona crab, to determine the level of adverse impact and appropriate EFH conservation recommendations. The uku EFH in Hawaii is designated as all substrate from the official US shoreline to 240 m depth. The life history information in the FEP describes adult habitat as consisting of the open waters of deep lagoons, channels, or seaward reefs (WP FMC 2016). Uku, unlike the deeper water bottomfish, do not have feeding habits constrained by substrate association (Parrish 1987). EFH for the juvenile and adult life stage of Kona crab is designated as all bottom habitat from the shoreline to 100 m. The life history information in the FEP describes adult Kona crab habitat as sandy bottom habitat at depths between 24 and 115 m (WPFMC 1998). In order to maintain yields of uku and Kona crab and their contribution to a healthy ecosystem, conservation recommendations for a proposed project that impact both species would reflect the need to protect the designated EFH for both of these species (shoreline to 240 m depth and all bottom habitat from the shoreline to 100 m), which includes the open waters of deep lagoons, channels, seaward reefs, and sandy bottom habitats."

USACE acknowledges potential adverse impacts to relatively small coral colonies (90% < 5 cm, 10% < 10 cm) from the beach nourishment portion of the project in waters up to 3 m deep. However, based on a review WPRFMC's Bottomfish Fishery Management Plan and the Hawai'i Archipelago FEP and their amendments, USACE could not identify any habitat utilization patterns or dependency of lifecycle stages of any bottomfish or other Managed Unit Species on coral. Adult Kona crab habitat consists of sandy substrate between 24 and 115 m deep; therefore, impacts to corals in depths less than 3 m can be assumed to have little to no impact to this MUS. As stated in the FEP, uku feeding habitat is not constrained by substrate association. When the project is fully constructed, uku, Kona crab, and other Bottomfish EFH will remain within the project footprint for both MUS as the project will not permanently reduce the amount of open water EFH habitat or detrimentally impact EFH substrate.

Considering that only temporary and minimal impacts are expected to EFH, USACE concludes that there will be a negligible impact to ecosystem functions or services for each MUS from the proposed dredging and beach restoration project; therefore, EFH offset is not warranted.

NMFS Response: The USACE is misinterpreting the current EFH designations described in the Hawaiʻi Archipelago FEP and Amendment 5. EFH designations are not defined by individual Federal action agencies during EFH consultation. Rather, the WPFMC defines EFH for various MUS in all of their FEPs, and these designations are the current standard that NMFS, not action agencies, implements. The process for designating and refining EFH designations uses a four-level system and is described in the Hawaiʻi Archipelago FEP. At present, the WPFMC has concluded the following in the Bottomfish Fishery Management Plan (see page 41) and the Hawaiʻi Archipelago FEP (see page 177): "At present, there are insufficient data on the relative productivity of different habitats to develop EFH designations based on Level 3 or Level 4 data. Given the uncertainty concerning the life histories and habitat requirements of many Bottomfish MUS, the Council designated EFH for adult and juvenile bottomfish as the water column and all bottom habitat extending from the shoreline to a depth of 400 meters (200 fathoms) encompassing the steep drop-offs and high-relief habitats that are important for bottomfish throughout the Western Pacific Region." This description is also reflected in Table 5 of Amendment 5 to the Hawaiʻi Archipelago FEP (see page 28) for bottomfish. EFH designations are supposed to be refined by the WPFMC on 5-year time frames, and it is possible that these Bottomfish MUS designations will be changed.

If any of the Federal action agency's proposed activities—in this case maintenance dredging—result in the unavoidable loss of coral, that Federal action agency should offset the impact of the activity on EFH (see 50 CFR 600.920(k)(1)). Therefore, and pursuant to 50 CFR 600.920(k)(1), we maintain our position that the USACE should offset for, or otherwise mitigate any unavoidable loss of coral due to the proposed maintenance dredging activities.

Conclusion

NMFS has addressed each of the USACE responses to individual EFH conservation recommendations provided in our September 24, 2021 letter for the proposed maintenance dredging of Haleiwa Harbor. We appreciate the coordination provided by the USACE project manager throughout the EFH consultation process and the USACE acceptance of conservation recommendations #1, #2, #4, and #5. However, NMFS maintains our position in conservation recommendations #3, #6, and #7 as described above.

Despite our present disagreement, NMFS hopes that we can find an amicable resolution that is consistent with the standards and requirements of the Magnuson-Stevens Act; and we are open to discussing possible solutions with the USACE at the earliest convenient time. Alternatively, disagreements referenced in this letter can be elevated for further review. Regardless, we appreciate the opportunity to provide comments on the USACE response to our EFH conservation recommendations for this proposed project. We are committed to providing continued cooperation and subject matter technical expertise as identified in the conservation recommendations, and as requested, to the USACE 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 Anne Chung at anne.chung@noaa.gov with any comments, questions or to request further technical assistance.

Sincerely,

Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

cc by e-mail:
Malia Chow, NMFS
Stu Goldberg, NMFS
Kate Bliss, USACE

DEPARTMENT OF THE ARMY
HONOLULU DISTRICT, U.S. ARMY CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

07 February 2022

Mr. Gerald Davis
Assistant Regional Administrator
National Marine Fisheries Service
Pacific Islands Region, Habitat Conservation Division
National Oceanic and Atmospheric Administration
Inouye Regional Center
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Dear Mr. Davis:

Thank you for the National Marine Fisheries Service's (NMFS') letters dated December 6, 2021, regarding our response to NMFS' Conservation Recommendations and requesting continued consultation under the Essential Fish Habitat (EFH) provisions (Subpart K) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for adverse effects to EFH from the proposed Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Restoration project located in Hale'iwa, Oahu, Hawaii.

The U.S. Army Corps of Engineers (Corps) carefully considered each of NMFS' eight EFH Conservation Recommendations prior to providing written response by letter dated November 19, 2021, in accordance with 50 CFR 600.920(k). While some of our responses are inconsistent with NMFS Conservation Recommendations, the Corps provided an explanation for why we are not following the recommendations either in whole or in part, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects. We understand this is important to you; so, we dedicated time to conduct significant coordination across multiple business lines.

The Corps has determined that we have complied with the procedural and statutory requirements of the EFH provisions of the MSA and that consultation is concluded. When this project enters the Pre-Construction Engineering and Design phase, the Corps will ensure that the plans and specifications include the EFH Conservation Recommendations and other appropriate best management practices to avoid and minimize adverse impacts to sensitive marine resources.

The Corps appreciates NMFS' role in conserving and managing EFH and we welcome your agencies' Conservation Recommendations for projects that may adversely impact EFH. If you would like to discuss this project's EFH consultation further, please do not hesitate to contact the Deputy for Programs and Project Management, Ms. Jennifer Moore at Jennifer.R.Moore2@usace.army.mil, or 808-835-4111. Thank you for your cooperation with the Honolulu District Civil and Public Works Program.

Sincerely,

Eric S. Marshall, P.E., PMP
Lieutenant Colonel, U.S. Army
District Engineer

Attachment 6 - Marine Mammal Protection Act (MMPA)

Paahana, Jessie A CIV USARMY CEPOH (USA)

From: Paahana, Jessie A CIV USARMY CEPOH (USA)
Sent: Tuesday, November 9, 2021 2:43 PM
To: Bliss, Kate M CIV USARMY CEPOD (USA)
Subject: FW: [Non-DoD Source] Re: MMPA in the Pacific Islands Region

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From: Joel Moribe - NOAA Federal <joel.moribe@noaa.gov>
Sent: Tuesday, November 9, 2021 2:14 PM
To: Paahana, Jessie A CIV USARMY CEPOH (USA) <Jessie.K.Paahana@usace.army.mil>
Subject: Re: [Non-DoD Source] Re: MMPA in the Pacific Islands Region

OK. It always applies. If you adversely affect marine mammals (all are covered in the MMPA), you have to either get a Letter of Authorization or an Incidental Harassment Authorization, depending on the severity. The LOA being for the more severe. These are all done by people at headquarters. We do none of them. That can sort of put you in a bind because the line can get longer than black friday. Note that these things are only necessary when you adversely affect them. It's not like the ESA where "may affect" is the threshold. Generally speaking, if we are expecting take to a marine mammal, be it a seal or one of the listed whales, you will also need to get either a LOA or IHA from headquarters.

https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act

Joel Moribe
Endangered Species Biologist, NMFS/Pacific Islands Regional Office/PRD
NOAA Fisheries | U.S. Department of Commerce
Office: (808) 725-5142
www.fisheries.noaa.gov

On Tue, Nov 9, 2021 at 2:02 PM Paahana, Jessie A CIV USARMY CEPOH (USA) <Jessie.K.Paahana@usace.army.mil> wrote:

> Someone from another district reviewed our Haleiwa project you just concurred with. I'll try to call you to discuss further. Any info you can provide by email regarding when MMPA applies and not, would be helpful.
>
> ---
>
> **From:** Joel Moribe - NOAA Federal <joel.moribe@noaa.gov>
> **Sent:** Tuesday, November 9, 2021 1:35 PM
> **To:** Paahana, Jessie A CIV USARMY CEPOH (USA) <Jessie.K.Paahana@usace.army.mil>
> **Subject:** [Non-DoD Source] Re: MMPA in the Pacific Islands Region

What are you talking about? Who is requiring you to get an MMPA permit?

Joel Moribe

Endangered Species Biologist, NMFS/Pacific Islands Regional Office/PRD
NOAA Fisheries | U.S. Department of Commerce

Office: (808) 725-5142

www.fisheries.noaa.gov

On Tue, Nov 9, 2021 at 1:31 PM Paahana, Jessie A CIV USARMY CEPOH (USA) <Jessie.K.Paahana@usace.army.mil> wrote:

> Hi, Joel:
>
> Do you have time to educate me on the MMPA? When and where does it apply in the Pacific Islands Region? I don't recall ever consulting or receiving an MMPA permit either in Regulatory or Civil Works. Am I missing something?
>
> Mahalo,
>
> Jessie

Attachment 7 - Coastal Zone Management Act (CZMA)

Hawaii CZM Program
Coastal Zone Management

www.hawaii.gov/dbedt/czm

APPLICATION FOR CZM FEDERAL CONSISTENCY REVIEW

Project/Activity Title or Description: Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Study

Location: Haleiwa, Hawaii

Island: Oahu

Tax Map Key: N/A

Applicant or Agency

U.S. Army Corps of Engineers, Honolulu District
Name of Applicant or Agency

Programs and Project Management Division, B230
Mailing Address

Fort Shafter / HI / 96858-5440
City / State / Zip Code

808-835-4203 (POC: Benjamin Reder)
Phone

benjamin.e.reder@usace.army.mil
E-mail Address

Agent or Representative for Applicant

Kate Bliss
Agent or Representative for Applicant

Bonney Loop
Mailing Address

Honolulu / HI / 96858
City / State / Zip Code

808-835-4626
Phone

kate.m.bliss@usace.army.mil
E-mail Address

CZM Consistency Determination or Certification

✓ Check the applicable type of federal action below and sign.

☑ Federal Agency Activity

CZM Consistency Determination: "The proposed activity will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the Hawaii Coastal Zone Management Program."

Signature BLISS.KATE.M.1265406811 Digitally signed by BLISS.KATE.M.1265406811 Date: 2021.08.23 10:34:19 -10'00' Date

☐ Federal Permit or License

CZM Consistency Certification: "The proposed activity complies with the enforceable policies of Hawaii's approved management program and will be conducted in a manner consistent with such program."

Signature __________ Date __________

☐ Federal Grants and Assistance

CZM Consistency Certification: "The proposed activity complies with the enforceable policies of Hawaii's approved management program and will be conducted in a manner consistent with such program."

Signature __________ Date __________

Mail Application To: Office of Planning, State of Hawaii, P.O. Box 2359, Honolulu, Hawaii 96804

HAWAII CZM PROGRAM
FEDERAL CONSISTENCY ASSESSMENT FORM

RECREATIONAL RESOURCES

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

1) Improve coordination and funding of coastal recreational planning and management.
2) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:
   a) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas.
   b) Requiring replacement of coastal resources having significant recreational value including, but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable.
   c) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value.
   d) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.
   e) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources.
   f) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.
   g) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing.
   h) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Hawaii Revised Statutes, section 46-6.

RECREATIONAL RESOURCES (continued)

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Will the proposed action occur in or adjacent to a dedicated public right-of-way, e.g., public beach access, hiking trail, shared-use path?	✔	☐
2. Will the proposed action affect public access to and along the shoreline?	✔	☐
3. Does the project site abut the shoreline?	✔	☐
4. Is the project site on or adjacent to a sandy beach?	✔	☐
5. Is the project site in or adjacent to a state or county park?	✔	☐
6. Is the project site in or adjacent to a water body such as a stream, river, pond, lake, or ocean?	✔	☐
7. Will the proposed action occur in or affect an ocean recreation area, swimming area, surf site, fishing area, or boating area?	✔	☐

Discussion: (If more space is needed, attach a separate sheet.)

The proposed project area encompasses the Federal Navigation Channel of the Hale'iwa Small Boat Harbor (HSBH), located near the mouth of the Anahulu River, Hale'iwa Beach, which is adjacent to Hale'iwa Beach Park (HBP) on the northeastern shore of O'ahu, and an off-shore sand borrow area. The use of dredged material to restore Hale'iwa Beach will improve public access and recreational value as the current state of the beach is degraded due to erosion. The harbor waters encompassing the project area constitute a reach of the Pacific Ocean. While the navigable portions of the harbor waters restrict recreational use such as swimming, surfing, and fishing, the marine waters adjacent to the harbor are open to and are conducive to such recreational activity. The proposed action would not obstruct engagement in or access to ocean recreation. The dredging of the HSBH Federal Navigation Channel will maintain recreational boat access to the harbor, therefore maintaining access to ocean recreation and fishing. Access to the HSBH may be reduced during the period of dredging, but dredging activities would be limited to weekdays. The proposed dredging will involve excavation of material from the proposed areas and load scows for transportation to the Hale'iwa Beach Shore Protection Project (HBSPP). Scows will use a barge access zone, excavated as part of this project, to move adjacent to the HBSPP for unloading. The dredged material will be unloaded directly onto the beach. The beach area where placement would occur would need to be closed temporarily for safety reasons, limiting its use. Noise from the project may affect recreation at nearby HBP, but construction activities would be limited to weekdays and once completed, recreational activities such as paddling/canoeing, shore-fishing, swimming, and beach activities would be improved. Any adjacent public right-of-ways beyond the project boundaries will not be impacted.

HISTORIC RESOURCES

Objective: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

1) Identify and analyze significant archaeological resources.
2) Maximize information retention through preservation of remains and artifacts or salvage operations.
3) Support state goals for protection, restoration, interpretation, and display of historic resources.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Is the project site within a designated historic or cultural district?	☐	☑
2. Is the project site listed on or nominated to the Hawaii or National Register of Historic Places?	☑	☐
3. Has the project site been surveyed for historic or archaeological resources?	☑	☐
4. Does the project parcel include undeveloped land which has not been surveyed by an archaeologist?	☐	☑
5. Is the project site within or adjacent to a Hawaiian fishpond or historic settlement area?	☑	☐

Discussion: (If more space is needed, attach a separate sheet.)

Research was conducted at the Hawaiʻi State Historic Preservation Division library to determine the presence or absence of potential historic properties within or adjacent to the study area. Additionally, publicly available aerial photographs were examined to determine the potential for marine historic resources. Overall, the historically dredged HSBH channel is unlikely to contain marine historic properties. Aerial photos indicate that the offshore area consists strictly of sand deposits with no indication of anomalous features. No traditional Hawaiian historic properties are known to exist within the terrestrial portion of the study area. Despite this, the region is archaeologically active, containing a number of known sites in the general vicinity. There are two important cultural locales north of HBP, which include McAllister's Site 234 (Kahakakau Kanaka) and Site 235 (Curative Stone). East of the study area is Loko Ea Fishpond (Site 233), known to contain subsurface deposits along its perimeter. Loʻi deposits (State Inventory of Historic Places (SIHP) 50-80-04-7152) have been recorded just south of HSBH, apparently associated with a cluster of former Land Claim Award parcels. A potential pre-contact cultural layer (SIHP 50-80-04-5916) was also recorded in this general area. Hawaiian skeletal remains (SIHP 50-10-04- 7561) were recovered from the area of the former Haleʻiwa Hotel (current Haleʻiwa Joe's), adjacent to HSBH. Thus, the evidence indicates that although no traditional Hawaiian historic properties are known to exist within the terrestrial portion of the study area, there is a relatively high potential for such properties to exist in the general area in the form of subsurface deposits, to include traditional human burials. The Corps has determined that no historic properties will be affected and has initiated consultation with SHPD and the appropriate NHOs on this determination (see Attachment 1 - 106 letters).

SCENIC AND OPEN SPACE RESOURCES

Objective: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

1) Identify valued scenic resources in the coastal zone management area.
2) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.
3) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources.
4) Encourage those developments that are not coastal dependent to locate in inland areas.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Will the proposed action alter any natural landforms or existing public views to and along the shoreline?	☐	☑
2. Does the proposed action involve the construction of a multi-story structure?	☐	☑
3. Is the project site located on or adjacent to an undeveloped parcel, including a beach or oceanfront land?	☑	☐
4. Does the proposed action involve the construction of a structure visible between the nearest coastal roadway and the shoreline?	☐	☑
5. Will the proposed action involve constructing or placing a structure in waters seaward of the shoreline?	☐	☑

Discussion: (If more space is needed, attach a separate sheet.)

The proposed action is maintenance dredging of an existing, active small boat harbor and beneficial use of that dredge material to restore a beach to its historical extent. The proposed action proposes no new development(s). The restoration of Hale'iwa Beach will improve the visual environment for beach users.

COASTAL ECOSYSTEMS

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

1) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources.
2) Improve the technical basis for natural resource management.
3) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance.
4) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land water uses, recognizing competing water needs.
5) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Does the proposed action involve dredge or fill activities?	✔	☐
2. Is the project site within the Special Management Area (SMA) or the Shoreline Setback Area?	✔	☐
3. Is the project site within the State Conservation District?	☐	✔
4. Will the proposed action involve some form of discharge or placement of material into a body of water or wetland?	✔	☐
5. Will the proposed action require earthwork, grading, clearing, or grubbing?	✔	☐
6. Will the proposed action include the construction of waste treatment facilities, such as injection wells, discharge pipes, or septic systems?	☐	✔
7. Is an intermittent or perennial stream located on or adjacent to the project parcel?	✔	☐
8. Does the project site provide habitat for endangered species of plants, birds, or mammals?	✔	☐
9. Is any such habitat located in close proximity to the project site?	✔	☐

COASTAL ECOSYSTEMS (continued)

	Yes	No
10. Is a wetland located on the project site or parcel?	☐	☑
11. Is the project site situated in or abutting a Natural Area Reserve, a Marine Life Conservation District, or an estuary?	☐	☑
12. Will the proposed action occur on or in close proximity to a reef or coral colonies?	☑	☐

Discussion: (If more space is needed, attach a separate sheet.)

The proposed project area is located within a County SMA and shoreline setback area. The proposed project is not located within a State Conservation District

Dredging from the Federal Navigation Channel, State Breakwater Settling Base, and the Offshore Sand Borrow Area will yield approximately 22,638 cy of beach suitable sand that will be placed at the Hale'iwa Beach Shore Protection Project (HBSPP). The remaining dredged material from the Federal Navigation Channel that is not suitable for beach restoration, approximately 2,000 cy, will be transported by scow and taken to the South Oʻahu Ocean Dredged Material Disposal Site (ODMDS).
The proposed action will require earthwork and grading to spread the dredged sand after it is placed on the beach. The proposed action involves no construction of any kind including waste treatment facilities, such as injection wells, discharge pipes, or septic systems.
The Anahulu River discharges into the harbor and will be unaffected by the proposed maintenance dredging activity. There are no wetlands within the project area and the proposed action will cause no effect to any wetlands adjacent to the project area. The project area is absent of any Natural Area Reserves and Marine Life Conservation Districts.

The project area provides open water marine habitat for the threatened Green Sea Turtle and the endangered Hawksbill Sea Turtle and Hawaiian Monk Seal. The Corps initiated consultation with NMFS and USFWS pursuant to Section 7 of the Endangered Species Act requesting their concurrence with our determination that the proposed dredging action may affect, but is not likely to adversely affect the endangered or threatened species and would not adversely affect or otherwise modify or destroy critical habitat. The beach restoration activity at the HBSPP is anticipated to benefit Green Sea Turtles by creating beach habitat that is representative of other beach habitat in the area and aims to enhance sea turtle basking habitat.

U.S. Fish and Wildlife Service (USFWS) completed a biologic survey (June 2020) of the nearshore waters within the project area. The draft Fish and Wildlife Coordination Act (FWCA) Report (August 2020) characterizes the coral reef habitat, adjacent to HBP as “Resource Category 3”. The draft report notes “this coral reef area should be considered medium to high value due to the marine resources documented in this survey."

Further, the Corps has included an assessment of project-related impacts in its essential fish habitat (EFH) assessment submitted to NMFS on for consultation under the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act. The Corps has preliminarily determined the proposed action has no potential to cause substantial adverse effects on fishery resources and essential fish habitat. We will ensure compliance with Section 305.b.2 of the Magnuson-Stevens Act prior to any final agency decision.

ECONOMIC USES

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

1) Concentrate coastal development in appropriate areas.
2) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area.
3) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such development and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
   a) Use of presently designated locations is not feasible;
   b) Adverse environmental effects are minimized; and
   c) The development is important to the State's economy.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Does the proposed action involve a harbor or port?	☑	☐
2. Is the proposed action a visitor industry facility or a visitor industry related activity?	☑	☐
3. Does the project site include agricultural lands or lands designated for such use?	☐	☑
4. Does the proposed action relate to commercial fishing or seafood production?	☐	☑
5. Is the proposed action related to energy production or transmission?	☐	☑
6. Is the proposed action related to seabed mining?	☐	☑

Discussion: (If more space is needed, attach a separate sheet.)

The proposed action involves maintenance dredging of Hale'iwa Small Boat Harbor (HSBH). HSBH provides berth for personal recreational boating as well as commercial activities tied to the visitor industry, such as sailing cruises, whale watching, sport fishing, diving charters, and shark encounters. The proposed action will ensure safe navigation of the harbor by restoring the current depth to the original design depths.

The beach restoration activity at HBSPP will improve recreational use including surfing, swimming, and beach use.

The project area is absent of any agricultural lands or lands designated for such use.
The proposed action is not directly or indirectly related to energy production or transmission or seabed mining.

COASTAL HAZARDS

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:

1) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards.
2) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards.
3) Ensure that developments comply with requirements of the Federal Flood Insurance Program.
4) Prevent coastal flooding from inland projects.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Is the project site on or abutting a sandy beach?	✔	☐
2. If "Yes" to question no. 1, has the project parcel or adjoining shoreline areas experienced erosion?	✔	☐
3. Is the project site within a potential tsunami inundation area? Refer to tsunami evacuation maps at http://www.scd.hawaii.gov	✔	☐
4. Is the project site within a flood hazard area according to a FEMA Flood Insurance Rate Map (https://msc.fema.gov)?	✔	☐
5. Is the project site within a subsidence hazard area?	☐	✔

Discussion: (If more space is needed, attach a separate sheet.)

The project involves Hale'iwa Beach on the northeastern short of O'ahu. Haleiwa Beach sits on Waialua Bay and is exposed to wave action throughout the year, with larger more intense waves occurring in the winter. A general north to south longshore transport persists throughout the year, which causes erosion of the beach. The northern portion of this beach experienced significant erosion and its area is significantly reduced from its initial extent, reducing the recreational value of the beach. An analysis of shoreline change rates indicated the maximum long-term erosion rate to be -4.3 +/- 2.6 ft/yr at Hale'iwa Beach. This is the highest erosion measured in the north O'ahu region. At these average rates, 4,300 square ft (0.1 ac) of beach would be lost each year. Current rates of erosion have caused Hale'iwa Beach to have a High Erosion Hazard Priority Rating compared with other beaches of O'ahu. Beach erosion has resulted in damage to the vertical wall that protects the backshore area, including Hale'iwa Beach Park, from erosion. Implementation of the proposed action will not eliminate beach erosion or risks associated with storm damage to infrastructure at HBP. It is anticipated that, based on projected erosion rates, the placed beach sand would persist for 26 years.
The Federal Emergency Management Agency Digital Flood Insurance Rate Map of the study area was analyzed to establish the locations of the 100-year flood zones. The Recommended Plan would not increase the risk of flood to the surrounding community. The proposed action would remain in compliance with EO 11988.

MANAGING DEVELOPMENT

<u>Objective</u>: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

<u>Policies</u>:

1) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development.
2) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements.
3) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

<u>Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section</u>:

	Yes	No
1. List the permits or approvals required for the proposed action and provide the status of each in the Discussion section below.		
2. Does the proposed action conform with state and county land use designations for the site?	☑	☐
3. Has the public been notified of the proposed action?	☑	☐
4. Has an environmental impact statement or environmental assessment been prepared for the proposed action?	☑	☐

<u>Discussion</u>: (If more space is needed, attach a separate sheet.)

For environmental compliance the Corps as a federal action agency is subject to the following federal laws and regulations:
-Endangered Species Act consultation (in progress, draft BE attached)
-Essential Fish Habitat consultation (in progress, draft EFHA attached)
-National Historic Preservation Act consultation (in progress, consultation letter attached)
-Section 401 Water Quality Certification (April 19, 2021, letter of confirmation attached)
-Coastal Zone Management Federal Consistency review (in progress)
-Section 402 Clean Water Act National Pollutant Discharge Elimination System permit (to be obtained prior to construction)

The proposed action conforms to state and county land use designations as a commercial harbor and public beach.

The public was notified of the proposed action under Phase I through publishing of the draft Environmental Assessment (EA) for public and agency comment. The proposed dredging and beach restoration are within the scope of the Phase I EA and finding of no significant impact.

PUBLIC PARTICIPATION

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

1) Promote public involvement in coastal zone management processes.
2) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities.
3) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Has information about the proposed action been disseminated to the public?	✔	☐
2. Has the public been provided an opportunity to comment on the proposed action?	✔	☐
3. Has or will a public hearing or public informational meeting be held?	☐	✔

Discussion: (If more space is needed, attach a separate sheet.)

The public was notified of the proposed action through publishing of the draft Environmental Assessment (EA) for public and agency comment on December 8, 2020. Public meetings were held on December 22, 2021 and January 4, 2021. A public hearing was not requested.

BEACH PROTECTION

Objective: Protect beaches for public use and recreation.

Policies:

1) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion.
2) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities.
3) Minimize the construction of public erosion-protection structures seaward of the shoreline.
4) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor.
5) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Will the proposed action occur on or adjacent to a beach?	☑	☐
2. Is the proposed action located within the shoreline setback area?	☑	☐
3. Will the proposed action affect natural shoreline processes?	☑	☐
4. Will the proposed action affect recreational activities?	☑	☐
5. Will the proposed action affect public access to and along the shoreline?	☑	☐

Discussion: (If more space is needed, attach a separate sheet.)

The proposed action will occur on and adjacent to HBSPP. The proposed action is located within the shoreline setback area and will affect shoreline erosion. The progress of shoreline erosion will be delayed by approximately 26 years as a result of this action.

The restoration of Hale'iwa Beach will positively impact recreational activities by increasing the amount of sandy beach available for recreational use.

The proposed action will temporarily affect public access to the placement site while work is being conducted, but will not affect public access to Hale'iwa Beach Park.

MARINE RESOURCES

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

1) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial.
2) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency.
4) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone.
5) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources.
6) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Check either Yes or No for each of the following questions, and provide an explanation or information for Yes responses in the Discussion section:

	Yes	No
1. Will the proposed action involve the use or development of marine or coastal resources?	✔	☐
2. Will the proposed action affect the use or development of marine or coastal resources?	✔	☐
3. Does the proposed action involve research of ocean processes or resources?	☐	✔

Discussion: (If more space is needed, attach a separate sheet.)

The proposed action involves the restoration of Hale'iwa Beach, which includes development of additional square footage of usable sandy beach, will increase recreational value and habitat for Green Turtles.

The proposed action to remove accumulated sediments through maintenance dredging of the federal limits of the Hale'iwa Small Boat Harbor will not involve the use of marine or coastal resources, however, in restoring safe navigation to the harbor, will beneficially affect the use of marine waters within the harbor for its designated purpose.

The proposed action does not involve research of open processes or resources.

STATE OF HAWAII
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
DIRECTOR

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
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Coastal Zone Management Program

Environmental Review Program

Land Use Commission

Land Use Division

Special Plans Branch

State Transit-Oriented Development

Statewide Geographic Information System

Statewide Sustainability Program

DTS202108251120NA

September 27, 2021

Mr. Benjamin Reder
U.S. Army Corps of Engineers, Honolulu District
Programs and Project Management Division
Building 230
Fort Shafter, Hawaii 96858-5440
benjamin.e.reder@usace.army.mil

Dear Mr. Reder:

Subject: Coastal Zone Management Act Federal Consistency Review for Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration, Haleiwa, Oahu

The Hawaii Coastal Zone Management (CZM) Program has reviewed the U.S. Army Corps of Engineers, Honolulu District, Coastal Zone Management Act (CZMA) consistency determination, received on August 25, 2021, for the Haleiwa Small Boat Harbor (SBH) maintenance dredging and beach restoration adjacent to Haleiwa Beach Park, Haleiwa, Oahu (proposed activity). This federal consistency review covers the proposed activity and specifically includes the following:

Maintenance dredging of the Haleiwa SBH Federal Navigation Channel to 13 feet mean lower low water (MLLW); dredging a shoaling deposit caused by a state-owned breakwater referred to as State Breakwater Settling Basin; excavation of a Barge Access Zone near the southern groin at the Haleiwa Beach Shore Protection Project (HBSPP); and dredging of an Offshore Sand Borrow Area. Beneficial use of dredged material from these locations is proposed for the purposes of restoring aquatic habitat and reducing storm damage to property and infrastructure. The dredged material from these locations that is beach suitable will be used to nourish the beach adjacent to Haleiwa Beach Park, which is part of the HBSPP. Dredging from these locations will yield approximately 22,638 cubic yards (cy) of beach suitable sand and will be used to restore approximately 4.2 acres of Haleiwa Beach to its original extent. The fine-grained dredged material from the Federal Navigation Channel that is not suitable for beach restoration, approximately 2,000 cy, will be transported by scow and taken to the South Oahu Ocean Dredged Material Disposal Site. Construction is expected to occur over the span of one year from March 2023 through March 2024. The non-federal sponsor for this project is the State of Hawaii as represented by the Department of Land and Natural Resources, Office of Conservation and Coastal Lands and the Division of Boating and Ocean Recreation.

The Hawaii CZM Program published a public notice in the State Environmental Review Program publication "The Environmental Notice" on September 8, 2021, with the public review and comment period concluding on September 22, 2021. During the public notice period no public comments or inquiries were received. Comments from the City and County of Honolulu, Department of Planning and Permitting, dated September 17, 2021, were received on September 22, 2021.

We conditionally concur with the U.S. Army Corps of Engineers' determination that the proposed activity is consistent to the maximum extent practicable with the enforceable policies of the Hawaii CZM Program based on the following conditions.

1. The proposed activity shall be carried out as represented in the CZMA federal consistency determination and all supporting materials and information provided to the Hawaii CZM Program. Any changes to the proposed activity shall be submitted to the Hawaii CZM Program for review and approval. Changes to the proposed activity may require a full CZM federal consistency review, including publication of a public notice and provision for public review and comment. This condition is necessary to ensure that the proposed activity is implemented as reviewed for consistency with the enforceable policies of the Hawaii CZM Program. Hawaii Revised Statutes (HRS) Chapter 205A Coastal Zone Management, is the federally approved enforceable policy of the Hawaii CZM Program that applies to this condition.

2. To mitigate potential adverse effects to water quality and State of Hawaii protected species, best management practices (BMPs) shall be implemented during construction as represented in the CZMA consistency determination and supporting information: Attachment 7 - Proposed BMPs (received August 25, 2021); Essential Fish Habitat Assessment, August 2021; and the Draft Integrated Feasibility Report and Environmental Assessment, November 2020. This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policies: HRS Chapter 205A Coastal Zone Management, Section 205A-2 Coastal Ecosystems; HRS Chapter 342D Water Pollution; and HRS Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants.

3. The proposed activity shall be conducted in compliance with State of Hawaii water quality standards and requirements as specified in Hawaii Administrative Rules (HAR) Chapter 11-54 Water Quality Standards, including obtaining a Section 401 Water Quality Certification (WQC) from the State Department of Health (DOH). The commitment to obtain a WQC was represented in the U.S. Army Corps of Engineers letter to DOH on April 1, 2021 and confirmed by DOH by letter dated April 19, 2021 that a WQC is required. This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policies HRS Chapter 342D Water Pollution, and HAR Chapter 11-54.

4. HRS Chapter 6E consultation was initiated with the State Historic Preservation Division (SHPD) by letter dated August 17, 2021. The proposed activity shall be conducted in compliance with the SHPD requirements resulting from the HRS Chapter 6E Historic Preservation consultation.

This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policy HRS Chapter 6E.

5. The City and County of Honolulu Department of Parks and Recreation (DPR) is not identified as one of the non-federal sponsors of the proposed activity, therefore, close coordination with DPR shall be carried out since activities will be occurring on coastal areas under the authority of DPR. This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policy HRS Chapter 205 Coastal Zone Management, Section 205A-2 Managing Development.

If the requirements for conditional concurrences specified in 15 CFR § 930.4(a), (1) through (3), are not met, then all parties shall treat this conditional concurrence letter as an objection pursuant to 15 CFR Part 930, subpart C. The U.S. Army Corps of Engineers, Honolulu District, shall notify the Hawaii CZM Program if the conditions are not acceptable in accordance with 15 CFR § 930.4(a)(2). Otherwise, acceptance of the conditions shall be presumed at the end of the 90-day federal consistency notification period on November 23, 2021. In accordance with 15 CFR § 930.41(c), final federal agency action shall not be taken sooner than November 23, 2021, unless the Corps of Engineers notifies the Hawaii CZM Program that the conditions of concurrence are acceptable, thereby confirming this concurrence and closing the federal consistency notification period on the date of receipt of the Corps acceptance of the conditions.

This CZM consistency conditional concurrence does not represent an endorsement of the proposed activity nor does it convey approval with any regulations administered by any state or county agency. Thank you for your cooperation in complying with the Hawaii CZM Program. If you have any questions, please contact John Nakagawa of our CZM Program at john.d.nakagawa@hawaii.gov or (808) 587-2878.

Sincerely,

Mary Alice Evans

Mary Alice Evans
Director

cc: Kate Bliss, U.S. Army Corps of Engineers, Honolulu District (by email)
Darryl Lum, DOH Clean Water Branch (by email)
State Historic Preservation Division (by email)
DLNR, OCCL (by email)
DLNR, DOBOR (by email)
Katia Balassiano, Department of Planning and Permitting (by email)
Janet Meinke-Lau, Department of Planning and Permitting (by email)

Attachment 8 – National Historic Preservation Act (NHPA)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

August 17, 2021

Civil and Public Works Branch
Programs and Project Management Division

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

Dear Dr. Downer:

The United States Army Corps of Engineers (Corps), Honolulu District, requests to formally initiate National Historic Preservation Act (NHPA) Section 106 and Hawaii Revised Statutes (HRS) Chapter 6E consultation with the Hawaii State Historic Preservation Division (SHPD) for the proposed Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration (Haleiwa SBHM) Project located in the town of Haleiwa, Waialua District, Island of Oahu, Hawaii (TMKs 1-6-2-001:002 por. and 1-6-2-003:011 por.). This federally-funded project is an undertaking, as defined at 36 Code of Federal Regulation 800.16(y), and involves a type of activity that has the potential to affect historic properties. The Corps has partnered with the State of Hawaii Department of Land and Natural Resources (DLNR) as the non-federal sponsor for the Haleiwa Small Boat Harbor.

The Corps is the agency responsible for compliance with Section 106 and the DLNR is the agency responsible for compliance with HRS Chapter 6E for this project. The Corps is pursuing a single consultation with your office and all consulting parties to comply with both Section 106 and HRS Chapter 6E. Please continue communication as it relates to the consultation for this project with the Corps as the primary point of contact.

In this letter, we present a detailed description of the undertaking, define the Area of Potential Effect (APE), present data on the presence/absence of Historic Properties within the APE, and inform you of our finding of effect. Additional information is provided regarding Native Hawaiian Organization consultation and our plan for public involvement. At this time, we are seeking concurrence with our definition of the undertaking APE and our determination of effect.

The Undertaking

The Haleiwa SBHM Project is authorized under Section 1122 of the Water Resources Development Act of 2016 (Public Law 114-322), as amended. Section 1122 requires that the Corps establish a pilot program to carry out 10 projects across the nation for the beneficial use of dredged material for the purposes of: 1) Reducing storm damage to property and infrastructure; 2) promoting public safety; 3) protecting, restoring, and creating aquatic ecosystem habitats; 4) stabilizing stream systems and enhancing shorelines; 5) promoting recreation; 6) supporting risk management adaptation strategies; 7) reducing the costs of dredging and dredged material placement or disposal. The Haleiwa SBHM Project falls under USACE's Section 1122 pilot program and the DLNR has stated its intention to serve as a cost-share partner.

The undertaking consists of dredging marine sand from various near-shore locales and depositing the material along the shoreline fronting Haleiwa Beach Park, with the intention of beneficially reusing dredged material to replenish the beach. Primary activities associated with the project include the following:

- dredging of 6,338 cubic yards (cy) of beach-suitable sediment from Haleiwa Harbor Federal Navigation Channel and the State Breakwater Settling Basin (.03-acres);

- dredging of approximately 15,000 cy of beach-suitable sand from a 16.5-acre offshore sand deposit located 3,400 feet off-shore (at a depth of 60 ft below sea level);

- dredging of 1,300 cy of beach suitable sand adjacent to the groin on the south end of Haleiwa Beach Park, to a depth of-10 ft mean lower low water, to allow for scow offloading directly to the beach;

- deposition of the dredged sand along the shoreline fronting Haleiwa Beach Park to replenish 4.4 acres of beach (see Enclosure 1); and

- disposal of approximately 2,000 cubic yards of sediment at the U.S. Environmental Protection Agency-designated South Oahu Ocean Dredged Material Disposal Site (a federally-managed off-shore, open-water disposal site).

Importantly, there will be **<u>no ground disturbing activities</u>** associated with the undertaking. Work will only include dredging from offshore locales and depositing material onto the existing shoreline. Nearby staging areas located int terrestrial portions of the at Haleiwa Beach Park and Haleiwa Small Boat Harbor are intended to support mobilization and storage of equipment only and involve no ground disturbance.

Area of Potential Effect

The Haleiwa SBHM Project is located on the north shore of the island of Oahu, approximately 30 miles north of Honolulu in Haleiwa town. The terrestrial portion of the undertaking's APE encompasses portions of Haleiwa Small Boat Harbor (TMK 1-6-2-001:002 por.) and Haleiwa Beach Park (1-6-2-003:011 por.), located near the mouth of the Anahulu River.

The terrestrial portion of the APE includes the 3.46-acre shoreline area fronting Haleiwa Beach Park as well as two equipment staging areas: 1) a 1.0-acre at Haleiwa Beach Park, and 2) a .21-acre area at Haleiwa Small Boat Harbor. The total terrestrial APE thus encompasses 4.67 acres. The marine portion of the APE includes the total 4.55-acre area covered by the dredging activities, which include: 1) a 0.3-acre settling basin at Haleiwa Small Boat Harbor, 2) a 2.0-acre portion of the Federal Entrance Channel, 3) a 0.55 acre scow access area adjacent to the Haleiwa Beach Park southern groin, and 4) a 1.7-acre offshore sand deposit located 3,400 feet northwest of Haleiwa Beach Park. Both marine and terrestrial APE locales are shown in Enclosure 1. The Corps requests review of and concurrence with the Corps' delineated APE for this undertaking.

Due to redesign of the barge activity area (i.e., shifting it to the north side of the groin), the APE no longer includes Loko Ea, more specifically, the western-most perimeter of the fishpond wall. This was accomplished based on consultation with Malama Loko Ea Foundation (MLEF), as detailed below (see the Native Hawaiian Organization (NHO) Consultation section for additional information).

Identification of Historic Properties

Research was conducted at the Hawaii SHPD library to determine the presence or absence of potential historic properties within or adjacent to the undertaking APE. Additionally, publicly available aerial photographs were examined to determine the potential for marine historic resources. One technical report was found which covers a portion of the direct APE, and two reports associated with work on nearby parcels had extensive background archaeology sections which provide regional context for the Haleiwa SBHM project (O'Hare et. al., 2012 and Robins and Desilets, 2014).

Current and recent historic aerial photographs available on Google Earth provide reasonably good visibility for the relatively shallow areas proposed for dredging. Special attention was given to the off-shore locale, since it is assumed that the routinely-dredged Haleiwa Small Boat Harbor channel is unlikely to contain marine historic properties. Aerial photos indicate clearly that the offshore dredge area consists entirely of sand deposits with no indication of anomalous features. Furthermore, the few literary resources available regarding shipwrecks in Hawaii indicates no known historical wrecks within or near the project area (Rogers 1999, Van Tilburg 2003, Wikipedia Category: Shipwrecks_of_Hawaii, Dec 2020).

Background research indicates that no traditional Hawaiian historic properties are known to exist within the terrestrial portion of the APE. Portions of Haleiwa Beach Park were surveyed in 2003 and 2004 by Borthwick.

Furthermore, no Land Claim Awards are present in or near the APE. Despite this, it is clear that the region is archaeologically active, and a number of known cultural sites are nearby. There are two important cultural locales north of Haleiwa Beach Park, which including McAllister's Site 234 (Kahakakau Kanaka) and Site 235 (Curative Stone).

East of the APE is Loko Ea Fishpond (Site 233), known to contain subsurface deposits along its perimeter. Loko Ea Fishpond is currently comprised of both original and reconstructed structural elements (e.g., walls and gates) and is actively managed by MLEF for cultural and educational purposes. Loko Ea Fishpond is quite large, and only the westernmost perimeter of the fishpond is pertinent to the present undertaking.

Loi deposits (State Inventory of Historic Places (SIHP) 50-80-04-7152) have been recorded just south of Haleiwa Small Boat Harbor, apparently associated with a cluster of former Land Claim Award parcels. A potential pre-Contact cultural layer (SIHP 50-80-04-5916) was also recorded in this general area. Finally, Hawaiian skeletal remains (SIHP 50-10-04-7561) were recovered from the area of the former Haleiwa Hotel (current Haleiwa Joe's), adjacent to Haleiwa Small Boat Harbor. Thus, the evidence indicates that although no traditional Hawaiian historic properties are known to exist within the terrestrial APE, there is a relatively high potential for such properties to exist in the general area in the form of subsurface deposits, to include traditional human burials.

For the portion of the APE along the immediate shoreline, it is important to note that this strand often consists of exposed beach-rock (limestone or sandstone). It is alternately exposed and re-covered with sand on an annual or semi-annual basis, weather depending. The original shoreline appears to have been much further out (see historic 1950s photo in Enclosure 1) and the historical trend thus appears to be retrograde.

Architecturally speaking, the recreation support structures (e.g., comfort station) at Haleiwa Beach Park are contributing properties within a discontinuous "Art Deco Parks" historic district established on June 9, 1988 (SIHP No. 50-80-04-1388). Other properties within the historic district include Ala Wai Park Clubhouse, Ala Moana Beach Park, Mother Waldron Playground, and Kawananakoa Playground. Importantly, the architectural features of Haleiwa Beach Park are not within the project APE and will not be affected by the work performed.

Native Hawaiian Organization Consultation

The Corps is concurrently consulting on this undertaking with the following NHOs: the Office of Hawaiian Affairs (OHA), the Waialua Hawaiian Civic Club (WHCC), and Malama Loko Ea Foundation (MLEF).

Consultation with MLEF during the planning stages of the project resulted in the identification of potential impacts to the Loko Ea Fishpond. A field visit was conducted at Loko Ea Fishpond on February 17, 2021, hosted by MLEF Director Rae Decoito and fishpond consultant and Kiai Loko Graydon Keala. During the visit, MLET directed the Corps' attention to the western portion of the fishpond that would be exposed to any activity occurring at or near the outlet to Haleiwa Harbor that generates larger than normal waves or turbulence that could undermine the western fishpond wall. Additional concern was raised in regards to the potential impact to aquatic life passage into and out of the fishpond outlet that is the primary hydraulic corridor between the fishpond and the open ocean.

To eliminate the potential impact to the western wall of the fishpond and potentially aquatic life passage e.g., fish stock recruitment, etc., the project was redesigned so that all barge activities will occur on the north side of the groin. As currently designed, no project activities will occur at or near the Loko Ea Fishpond outlet. The Corps has modified its undertaking so that Loko Ea Fishpond no longer falls within the APE. The scope of the undertaking will not extend geographically to directly or affect Loko Ea and also will not indirectly affect Loko Ea through wave action or turbulence near the western fishpond wall and outlet.

Public Involvement

The Corps has met its public involvement obligation at 36 CFR 800.2(d) for this undertaking through public meetings (virtual due to COVID restrictions) held on December 22, 2020 (12:00 pm HST) and January 4, 2021 (4:30 pm HST). These meetings were held under the auspices of NEPA public involvement and included multiple resource areas, including specifically cultural resources and historic preservation impacts.

Determination of Effect

Based on our research, there are no documented National or Hawaii Register of Historic Places-eligible traditional Hawaiian or early historic sites within the Haleiwa SBHM APE. Based on nearby archaeological findings, buried deposits may be present, but are unlikely due to the annual fluctuation of the shoreline.

The Corps proposes ***no ground disturbance*** in this undertaking. Accordingly, any potential undocumented traditional Hawaiian or early historic deposits will not be affected. Furthermore, due to the nature of the sand replenishment that is planned, the undertaking is likely to be beneficial for the protection of undocumented traditional Hawaiian subsurface deposits or burials along the shoreline. Deposition of dredge sand is expected to enhance protection of the shoreline by slowing erosion rates.

Loko Ea Fishpond, located southeast of Haleiwa Beach Park and directly east of Haleiwa Harbor, will not be directly or indirectly affected by project activities. Barge work will be restricted to the north side of the outlet groin. No project activities will occur at or near the Loko Ea Fishpond outlet.

Regarding the structures at Haleiwa Beach Park, which are components of SIHP No. 50-80-04-1388 (Art Deco Parks), these will not be affected by the planned work.

Based on the preceding discussion, the Haleiwa SBHM undertaking will not affect any NHPA-defined Historic Properties or any properties considered “significant” under Hawaii Administrative Rules §13-275-6. Our assessment has yielded a determination of “***No Historic Properties Affected***”, as defined at 36 CFR 800.4(d)(1). We respectfully request your consideration of, and concurrence with, this determination.

Should you have any questions, comments, or wish to request either an extension for response or a meeting to discuss this consultation, please contact me at (808) 835-4039 or e-mail Michael.E.Desilets@usace.army.mil.

Sincerely,

DESILETS.MICHAEL.ERNEST.1546258986

Digitally signed by DESILETS.MICHAEL.ERNEST.1546258986
Date: 2021.08.18 09:02:03 -10'00'

Michael Desilets, MA, RPA
Archeologist, Honolulu District

Enclosure

References:

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

August 17, 2021

Civil and Public Works Branch
Programs and Project Management Division

Rae Decoito
Director
Mālama Loko Ea Foundation
P.O. Box 553
Haleiwa, HI 96712

Dear Ms. Decoito:

The United States Army Corps of Engineers (Corps), Honolulu District, requests to formally initiate National Historic Preservation Act (NHPA) Section 106 and Hawaii Revised Statutes (HRS) Chapter 6E consultation with the Hawaii State Historic Preservation Division (SHPD) for the proposed Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration (Haleiwa SBHM) Project located in the town of Haleiwa, Waialua District, Island of Oahu, Hawaii (TMKs 1-6-2-001:002 por. and 1-6-2-003:011 por.). This federally-funded project is an undertaking, as defined at 36 Code of Federal Regulation 800.16(y), and involves a type of activity that has the potential to affect historic properties. The Corps has partnered with the State of Hawaii Department of Land and Natural Resources (DLNR) as the non-federal sponsor for the Haleiwa Small Boat Harbor.

The Corps is the agency responsible for compliance with Section 106 and the DLNR is the agency responsible for compliance with HRS Chapter 6E for this project. The Corps is pursuing a single consultation with your office and all consulting parties to comply with both Section 106 and HRS Chapter 6E. Please continue communication as it relates to the consultation for this project with the Corps as the primary point of contact.

In this letter, we present a detailed description of the undertaking, define the Area of Potential Effect (APE), present data on the presence/absence of Historic Properties within the APE, and inform you of our determination of effect.

The Undertaking

The Haleiwa SBHM Project is authorized under Section 1122 of the Water Resources Development Act of 2016 (Public Law 114-322), as amended. Section 1122 requires that the Corps establish a pilot program to carry out 10 projects across the nation for the beneficial use of dredged material for the purposes of: 1) Reducing storm damage to property and infrastructure; 2) promoting public safety; 3) protecting, restoring, and creating aquatic ecosystem habitats; 4) stabilizing stream systems and enhancing shorelines; 5) promoting recreation; 6) supporting risk management adaptation strategies; and

7) reducing the costs of dredging and dredged material placement or disposal. The Haleiwa SBHM Project falls under USACE's Section 1122 pilot program and the DLNR has stated its intention to serve as a cost-share partner.

The undertaking consists of dredging marine sand from various near-shore locales and depositing the material along the shoreline fronting Haleiwa Beach Park, with the intention of beneficially reusing dredged material to replenish the beach. Primary activities associated with the project include the following:

- dredging of 6,338 cubic yards (cy) of beach-suitable sediment from Haleiwa Harbor Federal Navigation Channel and the State Breakwater Settling Basin (.03-acres);
- dredging of approximately 5,000 cy of beach-suitable sand from a 16.5-acre offshore sand deposit located 3,400 feet off-shore (at a depth of 60 ft below sea level);
- dredging of 1,300 cy of beach suitable sand adjacent to the groin on the south end of Haleiwa Beach Park, to a depth of-10 ft mean lower low water, to allow for scow offloading directly to the beach;
- deposition of the dredged sand along the shoreline fronting Haleiwa Beach Park to replenish 4.4 acres of beach (see Enclosure 1); and
- disposal of approximately 2,000 cubic yards of sediment at the U.S. Environmental Protection Agency-designated South Oahu Ocean Dredged Material Disposal Site (a federally-managed off-shore, open-water disposal site).

Importantly, there will be **no ground disturbing activities** associated with the undertaking. Work will only include dredging from offshore locales and depositing material onto the existing shoreline. Nearby staging areas located in terrestrial portions of the are at Haleiwa Beach Park and Haleiwa Small Boat Harbor are intended to support mobilization and storage of equipment only and involve no ground disturbance.

Area of Potential Effect (APE)

The Haleiwa SBHM Project is located on the north shore of the island of Oahu, approximately 30 miles north of Honolulu in Haleiwa town. The terrestrial portion of the undertaking's APE encompasses portions of Haleiwa Small Boat Harbor (TMK 1-6-2-001:002 por.) and Haleiwa Beach Park (1-6-2-003:011 por.), located near the mouth of the Anahulu River.

The terrestrial portion of the APE includes the 3.46-acre shoreline area fronting Haleiwa Beach Park as well as two equipment staging areas: 1) a 1.0-acre at Haleiwa Beach Park, and 2) a .21-acre area at Haleiwa Small Boat Harbor. The total terrestrial APE thus encompasses 4.67 acres. The marine portion of the APE includes the total 4.55-acre area covered by the dredging activities, which include: 1) a 0.3-acre settling basin at

Haleiwa Small Boat Harbor, 2) a 2.0-acre portion of the Federal Entrance Channel, 3) a 0.55 acre scow access area adjacent to the Haleiwa Beach Park southern groin, and 4) a 1.7-acre offshore sand deposit located 3,400 feet northwest of Haleiwa Beach Park. Both marine and terrestrial APE locales are shown in Enclosure 1. The Corps requests review of and concurrence with the Corps' delineated APE for this undertaking.

Due to redesign of the barge activity area (i.e., shifting it to the north side of the groin), the APE no longer includes Loko Ea, more specifically, the western-most perimeter of the fishpond wall. This was accomplished based on consultation with Malama Loko Ea Foundation (MLEF), as detailed below (see the Native Hawaiian Organization (NHO) Consultation section for additional information).

Identification of Historic Properties

Research was conducted at the Hawaii SHPD library to determine the presence or absence of potential historic properties within or adjacent to the undertaking APE. Additionally, publicly available aerial photographs were examined to determine the potential for marine historic resources. One technical report was found which covers a portion of the direct APE, and two reports associated with work on nearby parcels had extensive background archaeology sections which provide regional context for the Haleiwa SBHM project (O'Hare et. al., 2012 and Robins and Desilets, 2014).

Current and recent historic aerial photographs available on Google Earth provide reasonably good visibility for the relatively shallow areas proposed for dredging. Special attention was given to the off-shore locale, since it is assumed that the routinely-dredged Haleiwa Small Boat Harbor channel is unlikely to contain marine historic properties. Aerial photos indicate clearly that the offshore dredge area consists entirely of sand deposits with no indication of anomalous features. Furthermore, the few literary resources available regarding shipwrecks in Hawaii indicates no known historical wrecks within or near the project area (Rogers 1999, Van Tilburg 2003, Wikipedia Category: Shipwrecks_of_Hawaii, Dec 2020).

Background research indicates that no traditional Hawaiian historic properties are known to exist within the terrestrial portion of the APE. Portions of Haleiwa Beach Park were surveyed in 2002 and 2002 by Cultural Surveys Hawaii (Borthwick et al. 2002, 2003), but no traditional Hawaiian resources were identified within the beach park area. Furthermore, no Land Claim Awards are present in or near the APE. Despite this, it is clear that the region is archaeologically active, and a number of known cultural sites are nearby. There are two important cultural locales north of Haleiwa Beach Park, which including McAllister's Site 234 (Kahakakau Kanaka) and Site 235 (Curative Stone).

East of the APE is Loko Ea Fishpond (Site 233), known to contain subsurface deposits along its perimeter. Loko Ea Fishpond is currently comprised of both original and reconstructed structural elements (e.g., walls and gates) and is actively managed by MLEF for cultural and educational purposes. Loko Ea Fishpond is quite large, and only the westernmost perimeter of the fishpond is pertinent to the present undertaking.

Loi deposits (State Inventory of Historic Places (SIHP) 50-80-04-7152) have been recorded just south of Haleiwa Small Boat Harbor, apparently associated with a cluster of former Land Claim Award parcels. A potential pre-Contact cultural layer (SIHP 50-80-04-5916) was also recorded in this general area. Finally, Hawaiian skeletal remains (SIHP 50-10-04-7561) were recovered from the area of the former Haleiwa Hotel (current Haleiwa Joe's), adjacent to Haleiwa Small Boat Harbor. Thus, the evidence indicates that although no traditional Hawaiian historic properties are known to exist within the terrestrial APE, there is a relatively high potential for such properties to exist in the general area in the form of subsurface deposits, to include traditional human burials.

For the portion of the APE along the immediate shoreline, it is important to note that this strand often consists of exposed beach-rock (limestone or sandstone). It is alternately exposed and re-covered with sand on an annual or semi-annual basis, weather depending. The original shoreline appears to have been much further out (see historic 1950s photo in Enclosure 1) and the historical trend thus appears to be retrograde.

Architecturally speaking, the recreation support structures (e.g., comfort station) at Haleiwa Beach Park are contributing properties within a discontinuous "Art Deco Parks" historic district established on June 9, 1988 (SIHP No. 50-80-04-1388). Other properties within the historic district include Ala Wai Park Clubhouse, Ala Moana Beach Park, Mother Waldron Playground, and Kawananakoa Playground. Importantly, the architectural features of Haleiwa Beach Park are <u>not within the project APE</u> and will not be affected by the work performed.

Prior Office of Hawaiian Affairs (OHA) Correspondence

The Corps has had prior correspondence with OHA regarding this undertaking, beginning with an email on February 1, 2021 expressing concern regard the status of NHPA Section 106 consultation and National Environmental Policy Act (NEPA) coordination for the project. More specifically, the local non-profit NHO Malama Loko Ea Foundation (MLEF) had expressed concerns to OHA regarding the project's potential to impact Loko Ea, and how those concerns might be addressed. This occurred with reference to a NEPA public meeting, which due to an oversight, MLEF was not given notice. As OHA noted in the correspondence with the Corps, the concerns are clearly relevant to NHPA Section 106 consultation as well, and it was unclear to MLEF whether they had been overlooked in that consultation.

NHPA Section 106 consultation had not been initiated at that point, but the concerns of MLEF, supported and highlighted by OHA, were promptly acted upon by the Corps. In order to better understand the nature of MLEF's cultural (and biological) resource concerns, and thereby develop mutually agreeable solutions, the Corps organized a site visit with MLEF which occurred on February 16, 2021. Based on the information and concerns expressed by MLEF leadership during the site visit, the Corps was able to redesign key elements of the project to eliminate the potential for effect to Loko Ea, as detailed in the following section.

Mālama Loko Ea Foundation (MLEF) Consultation and Barge Activity Redesign

Consultation with MLEF resulted in the identification of potential impacts to the western wall of Loko Ea Fishpond. A field visit was conducted at Loko Ea Fishpond on February 16, 2021, hosted by MLEF Director Rae Decoito and fishpond consultant and Kia'i Loko Keala Graydon. During the visit, it was observed by MLEF that the western portion of the fishpond would be exposed to any hydrological activity occurring at or near the outlet to Haleiwa Harbor. Concern was expressed that barge activities planned for the southern side of the outlet groin could potentially cause wave action that could undermine the western fishpond wall.

In order to obviate the potential for impact to the western wall of the fishpond (as well as reduce the potential for ecological effects), the project was redesigned so that all barge activities will occur on the north side of the groin. As currently designed, no project activities will occur at or near the Loko Ea Fishpond outlet. Thus, USACE has redesigned the project so that Loko Ea Fishpond no longer falls within the undertaking's APE. No undertaking activities will occur within or near Loko Ea, and the project has been redesigned to eliminate the potential for indirect effects stemming from wave action or turbulence near the outlet.

Determination of Effect

Based on our background research, and project redesign, there are no documented National or Hawaii Register of Historic Places-eligible traditional Hawaiian or early historic sites within the Haleiwa SBHM APE. Based on nearby archaeological findings, buried deposits may be present, but are unlikely due to the annual fluctuation of the shoreline.

Since there will be ***no ground disturbance*** during this project, any potential undocumented traditional Hawaiian or early historic deposits will not be affected. Furthermore, due to the nature of the sand replenishment that is planned, the undertaking is likely to be beneficial for the protection undocumented traditional Hawaiian subsurface deposits or burials along the shoreline. Deposition of dredge sand is expected to enhance protection of the shoreline by slowing erosion rates.

Loko Ea Fishpond, located southeast of Haleiwa Beach Park and directly east of Haleiwa Harbor, will not be directly or indirectly affected by project activities. Barge work will be restricted to the north side of the outlet groin. No project activities will occur at or near the Lokoea Fishpond outlet.

It is therefore our determination that the Haleiwa SBHM undertaking will not affect any NHPA-defined Historic Properties or any properties considered "significant" under Hawaii Administrative Rules §13-275-6. Our assessment has yielded a determination of "***No Historic Properties Affected***", as defined at 36 CFR 800.4(d)(1). We respectfully request your consideration of, and concurrence with, this determination.

Should you have any questions, comments, or wish to request either an extension for response or a meeting to discuss this consultation, please contact me at 808-835-4039 or Michael.e.desilets@usace.army.mil.

Sincerely,

DESILETS.MICHAEL.ERNEST.1546258986
Digitally signed by DESILETS.MICHAEL.ERNEST.1546258986
Date: 2021.08.18 08:59:05 -10'00'

Michael Desilets, MA, RPA
Archeologist, Honolulu District

Enclosure

References:

O'Hare, C., R. Runyon, D. Borthwick, D. Shideler, and H. Hammatt, 2012, FINAL Archaeological Inventory Survey, Hale'iwa Redevelopment Entitlements Project, Kawailoa Ahupua'a, Waialua District, O'ahu. Prepared for Group 70 International, Inc. Cultural Surveys Hawai'i, Inc., Kailua, Hawaii.

Robins, J. and M. Desilets, 2014, FINAL-Archaeological Monitoring Plan for Remediation Work at Former Chevron Service Station, Hale'iwa, Kawailoa Ahupua'a, Waialua District, O'ahu Island, Hawai'i. Prepared for ARCADIS U.S., Inc., Hawai'i. Garcia and Associates, Kailua, Hawai'i.

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Van Tilburg, H.K., 2003 U.S. Navy Shipwrecks in Hawaiian Waters: an Inventory of Submerged Naval Properties. Department of Defense Legacy Resource Management Program, PROJECT NUMBER (01-121), Underwater Cultural Resources Management and Protection. Prepared by The Marine Option Program University of Hawai`i at Manoa. Prepared for The Naval Historical Center, Washington D.C.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

August 17, 2021

Civil and Public Works Branch
Programs and Project Management Division

Kamakana C. Ferreira, M.A.
Lead Compliance Specialist
Office of Hawaiian Affairs
560 N. Nimitz Hwy
Honolulu, HI 96817

Dear Mr. Ferreira:

The United States Army Corps of Engineers (Corps), Honolulu District, requests to formally initiate National Historic Preservation Act (NHPA) Section 106 and Hawaii Revised Statutes (HRS) Chapter 6E consultation with the Hawaii State Historic Preservation Division (SHPD) for the proposed Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration (Haleiwa SBHM) Project located in the town of Haleiwa, Waialua District, Island of Oahu, Hawaii (TMKs 1-6-2-001:002 por. and 1-6-2-003:011 por.). This federally-funded project is an undertaking, as defined at 36 Code of Federal Regulation 800.16(y), and involves a type of activity that has the potential to affect historic properties. The Corps has partnered with the State of Hawaii Department of Land and Natural Resources (DLNR) as the non-federal sponsor for the Haleiwa Small Boat Harbor.

The Corps is the agency responsible for compliance with Section 106 and the DLNR is the agency responsible for compliance with HRS Chapter 6E for this project. The Corps is pursuing a single consultation with your office and all consulting parties to comply with both Section 106 and HRS Chapter 6E. Please continue communication as it relates to the consultation for this project with the Corps as the primary point of contact.

In this letter, we present a detailed description of the undertaking, define the Area of Potential Effect (APE), present data on the presence/absence of Historic Properties within the APE, and inform you of our determination of effect. Additional information is provided regarding the outcomes of consultation with other Native Hawaiian Organizations.

The Undertaking

The Haleiwa SBHM Project is authorized under Section 1122 of the Water Resources Development Act of 2016 (Public Law 114-322), as amended. Section 1122 requires that the Corps establish a pilot program to carry out 10 projects across the nation for the beneficial use of dredged material for the purposes of: 1) reducing storm damage to property and infrastructure; 2) promoting public safety; 3) protecting, restoring, and creating aquatic ecosystem habitats; 4) stabilizing stream systems and enhancing shorelines; 5) promoting recreation; 6) supporting risk management adaptation strategies; and

7) reducing the costs of dredging and dredged material placement or disposal; The Haleiwa SBHM Project falls under USACE's Section 1122 pilot program and the DLNR has stated its intention to serve as a cost-share partner.

The undertaking consists of dredging marine sand from various near-shore locales and depositing the material along the shoreline fronting Haleiwa Beach Park, with the intention of beneficially reusing dredged material to replenish the beach. Primary activities associated with the project include the following:

- dredging of 6,338 cubic yards (cy) of beach-suitable sediment from Haleiwa Harbor Federal Navigation Channel and the State Breakwater Settling Basin (.03-acres);
- dredging of approximately 15,000 cy of beach-suitable sand from a 16.5-acre offshore sand deposit located 3,400 feet off-shore (at a depth of 60 ft below sea level);
- dredging of 1,300 cy of beach suitable sand adjacent to the groin on the south end of Haleiwa Beach Park, to a depth of-10 ft mean lower low water, to allow for scow offloading directly to the beach;
- deposition of the dredged sand along the shoreline fronting Haleiwa Beach Park to replenish 4.4 acres of beach (see Enclosure 1); and
- disposal of approximately 2,000 cubic yards of sediment at the U.S. Environmental Protection Agency-designated South Oahu Ocean Dredged Material Disposal Site (a federally-managed off-shore, open-water disposal site).

Importantly, there will be **no ground disturbing activities** associated with the undertaking. Work will only include dredging from offshore locales and depositing material onto the existing shoreline. Nearby staging areas located int terrestrial portions of the at Haleiwa Beach Park and Haleiwa Small Boat Harbor are intended to support mobilization and storage of equipment only and involve no ground disturbance.

Area of Potential Effect

The Haleiwa SBHM Project is located on the north shore of the island of Oahu, approximately 30 miles north of Honolulu in Haleiwa town. The terrestrial portion of the undertaking's APE encompasses portions of Haleiwa Small Boat Harbor (TMK 1-6-2-

001:002 por.) and Haleiwa Beach Park (1-6-2-003:011 por.), located near the mouth of the Anahulu River.

The terrestrial portion of the APE includes the 3.46-acre shoreline area fronting Haleiwa Beach Park as well as two equipment staging areas: 1) a 1.0-acre at Haleiwa Beach Park, and 2) a .21-acre area at Haleiwa Small Boat Harbor. The total terrestrial APE thus encompasses 4.67 acres. The marine portion of the APE includes the total 4.55-acre area covered by the dredging activities, which include: 1) a 0.3-acre settling basin at Haleiwa Small Boat Harbor, 2) a 2.0-acre portion of the Federal Entrance Channel, 3) a 0.55 acre scow access area adjacent to the Haleiwa Beach Park southern groin, and 4) a 1.7-acre offshore sand deposit located 3,400 feet northwest of Haleiwa Beach Park. Both marine and terrestrial APE locales are shown in Enclosure 1. The Corps requests review of and concurrence with the Corps' delineated APE for this undertaking.

Due to redesign of the barge activity area (i.e., shifting it to the north side of the groin), the APE no longer includes Loko Ea, more specifically, the western-most perimeter of the fishpond wall. This was accomplished based on consultation with Malama Loko Ea Foundation (MLEF), as detailed below (see the Native Hawaiian Organization (NHO) Consultation section for additional information).

Identification of Historic Properties

Research was conducted at the Hawaii SHPD library to determine the presence or absence of potential historic properties within or adjacent to the undertaking APE. Additionally, publicly available aerial photographs were examined to determine the potential for marine historic resources. One technical report was found which covers a portion of the direct APE, and two reports associated with work on nearby parcels had extensive background archaeology sections which provide regional context for the Haleiwa SBHM project (O'Hare et. al., 2012 and Robins and Desilets, 2014).

Current and recent historic aerial photographs available on Google Earth provide reasonably good visibility for the relatively shallow areas proposed for dredging. Special attention was given to the off-shore locale, since it is assumed that the routinely-dredged Haleiwa Small Boat Harbor channel is unlikely to contain marine historic properties. Aerial photos indicate clearly that the offshore dredge area consists entirely of sand deposits with no indication of anomalous features. Furthermore, the few literary resources available regarding shipwrecks in Hawaii indicates no known historical wrecks within or near the project area (Rogers 1999, Van Tilburg 2003, Wikipedia Category: Shipwrecks_of_Hawaii, Dec 2020).

Background research indicates that no traditional Hawaiian historic properties are known to exist within the terrestrial portion of the APE. Portions of Haleiwa Beach Park were surveyed in 2002 and 2002 by Cultural Surveys Hawaii (Borthwick et al. 2002, 2003), but no traditional Hawaiian resources were identified within the beach park area. Furthermore, no Land Claim Awards are present in or near the APE. Despite this, it is clear that the region is archaeologically active, and a number of known cultural sites are nearby. There are two important cultural locales north of Haleiwa Beach Park, which including McAllister's Site 234 (Kahakakau Kanaka) and Site 235 (Curative Stone).

East of the APE is Loko Ea Fishpond (Site 233), known to contain subsurface deposits along its perimeter. Loko Ea Fishpond is currently comprised of both original and reconstructed structural elements (e.g., walls and gates) and is actively managed by MLEF for cultural and educational purposes. Loko Ea Fishpond is quite large, and only the westernmost perimeter of the fishpond is pertinent to the present undertaking.

Loi deposits (State Inventory of Historic Places (SIHP) 50-80-04-7152) have been recorded just south of Haleiwa Small Boat Harbor, apparently associated with a cluster of former Land Claim Award parcels. A potential pre-Contact cultural layer (SIHP 50-80-04-5916) was also recorded in this general area. Finally, Hawaiian skeletal remains (SIHP 50-10-04-7561) were recovered from the area of the former Haleiwa Hotel (current Haleiwa Joe's), adjacent to Haleiwa Small Boat Harbor. Thus, the evidence indicates that although no traditional Hawaiian historic properties are known to exist within the terrestrial APE, there is a relatively high potential for such properties to exist in the general area in the form of subsurface deposits, to include traditional human burials.

For the portion of the APE along the immediate shoreline, it is important to note that this strand often consists of exposed beach-rock (limestone or sandstone). It is alternately exposed and re-covered with sand on an annual or semi-annual basis, weather depending. The original shoreline appears to have been much further out (see historic 1950s photo in Enclosure 1) and the historical trend thus appears to be retrograde.

Architecturally speaking, the recreation support structures (e.g., comfort station) at Haleiwa Beach Park are contributing properties within a discontinuous "Art Deco Parks" historic district established on June 9, 1988 (SIHP No. 50-80-04-1388). Other properties within the historic district include Ala Wai Park Clubhouse, Ala Moana Beach Park, Mother Waldron Playground, and Kawananakoa Playground. Importantly, the architectural features of Haleiwa Beach Park are <u>not within the project APE</u> and will not be affected by the work performed.

Previous Office of Hawaiian Affairs (OHA) Correspondence

The Corps has had prior correspondence with OHA regarding this undertaking, beginning with an email on February 1, 2021 expressing concern regard the status of NHPA Section 106 consultation and National Environmental Policy Act (NEPA) coordination for the project. More specifically, the local non-profit NHO Malama Loko Ea Foundation (MLEF) had expressed concerns to OHA regarding the project's potential to impact Loko Ea, and how those concerns might be addressed. This occurred with reference to a NEPA public meeting, which due to an oversight, MLEF was not given notice. As OHA noted in the correspondence with the Corps, the concerns are clearly relevant to NHPA Section 106 consultation as well, and it was unclear to MLEF whether they had been overlooked in that consultation.

NHPA Section 106 consultation had not been initiated at that point, but the concerns of MLEF, supported and highlighted by OHA, were promptly acted upon by the Corps. In order to better understand the nature of MLEF's cultural (and biological) resource concerns, and thereby develop mutually agreeable solutions, the Corps organized a site visit with MLEF which occurred on February 16, 2021. Based on the information and concerns expressed by MLEF leadership during the site visit, the Corps was able to redesign key elements of the project to eliminate the potential for effect to Loko Ea, as detailed in the following section.

Malama Loko Ea Foundation (MLRF) Consultation

Consultation with MLEF resulted in the identification of potential impacts to the western wall of Loko Ea Fishpond. A field visit was conducted at Loko Ea Fishpond on February 16, 2021, hosted by MLEF Director Rae Decoito and fishpond consultant and Kia'i Loko Keala Graydon. During the visit, it was observed by MLEF that the western portion of the fishpond would be exposed to any hydrological activity occurring at or near the outlet to Haleiwa Harbor. Concern was expressed that barge activities planned for the southern side of the outlet groin could potentially cause wave action that could undermine the western fishpond wall.

In order to obviate the potential for impact to the western wall of the fishpond (as well as reduce the potential for ecological effects), the project was redesigned so that all barge activities will occur on the north side of the groin. As currently designed, no project activities will occur at or near the Loko Ea Fishpond outlet. Thus, the Corps has redesigned the project so that Loko Ea Fishpond no longer falls within the undertaking's APE. No undertaking activities will occur within or near Loko Ea, and the project has been redesigned to eliminate the potential for direct or indirect effects stemming from wave action or turbulence near the outlet.

Determination of Effect

Based on our background research, there are no documented National or Hawaii Register of Historic Places-eligible traditional Hawaiian or early historic sites within the Haleiwa SBHM APE. Based on nearby archaeological findings, buried deposits may be present, but are unlikely due to the annual fluctuation of the shoreline.

Since there will be ***no ground disturbance*** during this project, any potential undocumented traditional Hawaiian or early historic deposits will not be affected. Furthermore, due to the nature of the sand replenishment that is planned, the undertaking is likely to be beneficial for the protection undocumented traditional Hawaiian subsurface deposits or burials along the shoreline. Deposition of dredge sand is expected to enhance protection of the shoreline by slowing erosion rates.

Loko Ea Fishpond, located southeast of Haleiwa Beach Park and directly east of Haleiwa Harbor, will not be directly or indirectly affected by project activities. Barge work will be restricted to the north side of the outlet groin. No project activities will occur at or near the Loko Ea Fishpond outlet.

It is therefore our determination that the Haleiwa SBHM undertaking will not affect any NHPA-defined Historic Properties or any properties considered "significant" under Hawaii Administrative Rules §13-275-6. Our assessment has yielded a determination of "***No Historic Properties Affected***", as defined at 36 CFR 800.4(d)(1). We respectfully request your consideration of, and concurrence with, this determination.

Should you have any questions, comments, or wish to request either an extension for response or a meeting to discuss this consultation, please contact me at 808-835-4039 or Michael.e.desilets@usace.army.mil.

Sincerely,

DESILETS.MICHAEL.ERNEST.1546258986 Digitally signed by DESILETS.MICHAEL.ERNEST.1546258986 Date: 2021.08.18 09:00:26 -10'00'

Michael Desilets, MA, RPA
Archeologist, Honolulu District

Enclosure

References:

O'Hare, C., R. Runyon, D. Borthwick, D. Shideler, and H. Hammatt, 2012, FINAL Archaeological Inventory Survey, Hale'iwa Redevelopment Entitlements Project, Kawailoa Ahupua'a, Waialua District, O'ahu. Prepared for Group 70 International, Inc. Cultural Surveys Hawai'i, Inc., Kailua, Hawaii.

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Van Tilburg, H.K., 2003 U.S. Navy Shipwrecks in Hawaiian Waters: an Inventory of Submerged Naval Properties. Department of Defense Legacy Resource Management Program, PROJECT NUMBER (01-121), Underwater Cultural Resources Management and Protection. Prepared by The Marine Option Program University of Hawai`i at Manoa. Prepared for The Naval Historical Center, Washington D.C.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

August 17, 2021

Civil and Public Works Branch
Programs and Project Management Division

Waialua Hawaiian Civic Club
P.O. Box 102
Waialua, HI 96791

Dear WHCC:

The United States Army Corps of Engineers (Corps), Honolulu District, requests to formally initiate National Historic Preservation Act (NHPA) Section 106 and Hawaii Revised Statutes (HRS) Chapter 6E consultation with the Hawaii State Historic Preservation Division (SHPD) for the proposed Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration (Haleiwa SBHM) Project located in the town of Haleiwa, Waialua District, Island of Oahu, Hawaii (TMKs 1-6-2-001:002 por. and 1-6-2-003:011 por.). This federally-funded project is an undertaking, as defined at 36 Code of Federal Regulation 800.16(y), and involves a type of activity that has the potential to affect historic properties. The Corps has partnered with the State of Hawaii Department of Land and Natural Resources (DLNR) as the non-federal sponsor for the Haleiwa Small Boat Harbor.

The Corps is the agency responsible for compliance with Section 106 and the DLNR is the agency responsible for compliance with HRS Chapter 6E for this project. The Corps is pursuing a single consultation with your office and all consulting parties to comply with both Section 106 and HRS Chapter 6E. Please continue communication as it relates to the consultation for this project with the Corps as the primary point of contact.

In this letter, we present a detailed description of the undertaking, define the Area of Potential Effect (APE), present data on the presence/absence of Historic Properties within the APE, seek any additional information on historic properties within the APE, and inform you of our determination of effect.

The Undertaking

The Haleiwa SBHM Project is authorized under Section 1122 of the Water Resources Development Act of 2016 (Public Law 114-322), as amended. Section 1122 requires that the Corps establish a pilot program to carry out 10 projects across the nation for the beneficial use of dredged material for the purposes of: 1) Reducing storm damage to property and infrastructure; 2) promoting public safety; 3) protecting, restoring, and creating aquatic ecosystem habitats; 4) stabilizing stream systems and enhancing shorelines; 5) promoting recreation; 6) supporting risk management adaptation strategies; and 7) reducing

the costs of dredging and dredged material placement or disposal. The Haleiwa SBHM Project falls under USACE's Section 1122 pilot program and the DLNR has stated its intention to serve as a cost-share partner.

The undertaking consists of dredging marine sand from various near-shore locales and depositing the material along the shoreline fronting Haleiwa Beach Park, with the intention of beneficially reusing dredged material to replenish the beach. Primary activities associated with the project include the following:

- dredging of 6,338 cubic yards (cy) of beach-suitable sediment from Haleiwa Harbor Federal Navigation Channel and the State Breakwater Settling Basin (.03-acres);
- dredging of approximately 15,000 cy of beach-suitable sand from a 16.5-acre offshore sand deposit located 3,400 feet off-shore (at a depth of 60 ft below sea level);
- dredging of 1,300 cy of beach suitable sand adjacent to the groin on the south end of Haleiwa Beach Park, to a depth of-10 ft mean lower low water, to allow for scow offloading directly to the beach;
- deposition of the dredged sand along the shoreline fronting Haleiwa Beach Park to replenish 4.4 acres of beach (see Enclosure 1); and
- disposal of approximately 2,000 cubic yards of sediment at the U.S. Environmental Protection Agency-designated South Oahu Ocean Dredged Material Disposal Site (a federally-managed off-shore, open-water disposal site).

Importantly, there will be **no ground disturbing activities** associated with the undertaking. Work will only include dredging from offshore locales and depositing material onto the existing shoreline. Nearby staging areas located int terrestrial portions of the at Haleiwa Beach Park and Haleiwa Small Boat Harbor are intended to support mobilization and storage of equipment only and involve no ground disturbance.

Area of Potential Effect

The Haleiwa SBHM Project is located on the north shore of the island of Oahu, approximately 30 miles north of Honolulu in Haleiwa town. The terrestrial portion of the undertaking's APE encompasses portions of Haleiwa Small Boat Harbor (TMK 1-6-2-001:002 por.) and Haleiwa Beach Park (1-6-2-003:011 por.), located near the mouth of the Anahulu River.

The terrestrial portion of the APE includes the 3.46-acre shoreline area fronting Haleiwa Beach Park as well as two equipment staging areas: 1) a 1.0-acre at Haleiwa Beach Park, and 2) a .21-acre area at Haleiwa Small Boat Harbor. The total terrestrial APE thus encompasses 4.67 acres. The marine portion of the APE includes the total 4.55-acre area covered by the dredging activities, which include: 1) a 0.3-acre settling basin at Haleiwa Small Boat Harbor, 2) a 2.0-acre portion of the Federal Entrance Channel, 3) a 0.55 acre scow access area adjacent to the Haleiwa Beach Park southern groin, and

4) a 1.7-acre offshore sand deposit located 3,400 feet northwest of Haleiwa Beach Park. Both marine and terrestrial APE locales are shown in Enclosure 1. The Corps requests review of and concurrence with the Corps' delineated APE for this undertaking.

Due to redesign of the barge activity area (i.e., shifting it to the north side of the groin), the APE no longer includes Loko Ea, more specifically, the western-most perimeter of the fishpond wall. This was accomplished based on consultation with Malama Loko Ea Foundation (MLEF), as detailed below (see the Native Hawaiian Organization (NHO) Consultation section for additional information).

Identification of Historic Properties

Research was conducted at the Hawaii SHPD library to determine the presence or absence of potential historic properties within or adjacent to the undertaking APE. Additionally, publicly available aerial photographs were examined to determine the potential for marine historic resources. One technical report was found which covers a portion of the direct APE, and two reports associated with work on nearby parcels had extensive background archaeology sections which provide regional context for the Haleiwa SBHM project (O'Hare et. al., 2012 and Robins and Desilets, 2014).

Current and recent historic aerial photographs available on Google Earth provide reasonably good visibility for the relatively shallow areas proposed for dredging. Special attention was given to the off-shore locale, since it is assumed that the routinely-dredged Haleiwa Small Boat Harbor channel is unlikely to contain marine historic properties. Aerial photos indicate clearly that the offshore dredge area consists entirely of sand deposits with no indication of anomalous features. Furthermore, the few literary resources available regarding shipwrecks in Hawaii indicates no known historical wrecks within or near the project area (Rogers 1999, Van Tilburg 2003, Wikipedia Category: Shipwrecks_of_Hawaii, Dec 2020).

Background research indicates that no traditional Hawaiian historic properties are known to exist within the terrestrial portion of the APE. Portions of Haleiwa Beach Park were surveyed in 2002 and 2002 by Cultural Surveys Hawaii (Borthwick et al. 2002, 2003), but no traditional Hawaiian resources were identified within the beach park area. Furthermore, no Land Claim Awards are present in or near the APE. Despite this, it is clear that the region is archaeologically active, and a number of known cultural sites are nearby. There are two important cultural locales north of Haleiwa Beach Park, which including McAllister's Site 234 (Kahakakau Kanaka) and Site 235 (Curative Stone).

East of the APE is Loko Ea Fishpond (Site 233), known to contain subsurface deposits along its perimeter. Loko Ea Fishpond is currently comprised of both original and reconstructed structural elements (e.g., walls and gates) and is actively managed by MLEF for cultural and educational purposes. Loko Ea Fishpond is quite large, and only the westernmost perimeter of the fishpond is pertinent to the present undertaking.

Loi deposits (State Inventory of Historic Places (SIHP) 50-80-04-7152) have been recorded just south of Haleiwa Small Boat Harbor, apparently associated with a cluster of former Land Claim Award parcels. A potential pre-Contact cultural layer (SIHP 50-80-04-5916) was also recorded in this general area. Finally, Hawaiian skeletal remains (SIHP 50-10-04-7561) were recovered from the area of the former Haleiwa Hotel (current Haleiwa Joe's), adjacent to Haleiwa Small Boat Harbor. Thus, the evidence indicates that although no traditional Hawaiian historic properties are known to exist within the terrestrial APE, there is a relatively high potential for such properties to exist in the general area in the form of subsurface deposits, to include traditional human burials.

For the portion of the APE along the immediate shoreline, it is important to note that this strand often consists of exposed beach-rock (limestone or sandstone). It is alternately exposed and re-covered with sand on an annual or semi-annual basis, weather depending. The original shoreline appears to have been much further out (see historic 1950s photo in Enclosure 1) and the historical trend thus appears to be retrograde.

Architecturally speaking, the recreation support structures (e.g., comfort station) at Haleiwa Beach Park are contributing properties within a discontinuous "Art Deco Parks" historic district established on June 9, 1988 (SIHP No. 50-80-04-1388). Other properties within the historic district include Ala Wai Park Clubhouse, Ala Moana Beach Park, Mother Waldron Playground, and Kawananakoa Playground. Importantly, the architectural features of Haleiwa Beach Park are <u>not within the project APE</u> and will not be affected by the work performed.

Previous OHA Correspondence

The Corps has had prior correspondence with OHA regarding this undertaking, beginning with an email on February 1, 2021 expressing concern regard the status of NHPA Section 106 consultation and National Environmental Policy Act (NEPA) coordination for the project. More specifically, the local non-profit NHO Malama Loko Ea Foundation (MLEF) had expressed concerns to OHA regarding the project's potential to impact Loko Ea, and how those concerns might be addressed. This occurred with reference to a NEPA public meeting, which due to an oversight, MLEF was not given notice. As OHA noted in the correspondence with the Corps, the concerns are clearly relevant to NHPA Section 106 consultation as well, and it was unclear to MLEF whether they had been overlooked in that consultation.

NHPA Section 106 consultation had not been initiated at that point, but the concerns of MLEF, supported and highlighted by OHA, were promptly acted upon by the Corps. In order to better understand the nature of MLEF's cultural (and biological) resource concerns, and thereby develop mutually agreeable solutions, the Corps organized a site visit with MLEF which occurred on February 16, 2021. Based on the information and concerns expressed by MLEF leadership during the site visit, the Corps was able to redesign key elements of the project to eliminate the potential for effect to Loko Ea, as detailed in the following section.

Malama Loko Ea Foundation (MLRF) Consultation

Consultation with MLEF resulted in the identification of potential impacts to the western wall of Lokoea Fishpond. A field visit was conducted at Lokoea Fishpond on February 16, 2021, hosted by MLEF Director Rae Decoito and fishpond consultant and Kia'i Loko Keala Graydon. During the visit, it was observed by MLEF that the western portion of the fishpond would be exposed to any hydrological activity occurring at or near the outlet to Haleiwa Harbor. Concern was expressed that barge activities planned for the southern side of the outlet groin could potentially cause wave action that could undermine the western fishpond wall.

In order to obviate the potential for impact to the western wall of the fishpond (as well as reduce the potential for ecological effects), the project was redesigned so that all barge activities will occur on the north side of the groin. As currently designed, no project activities will occur at or near the Loko Ea Fishpond outlet. Thus, USACE has redesigned the project so that Loko Ea Fishpond no longer falls within the undertaking's APE. No undertaking activities will occur within or near Loko Ea, and the project has been redesigned to eliminate the potential for direct or indirect effects stemming from wave action or turbulence near the outlet.

Determination of Effect

Based on our background research, there are no documented National or Hawaii Register of Historic Places-eligible traditional Hawaiian or early historic sites within the Haleiwa SBHM APE. Based on nearby archaeological findings, buried deposits may be present, but are unlikely due to the annual fluctuation of the shoreline.

Since there will be ***no ground disturbance*** during this project, any potential undocumented traditional Hawaiian or early historic deposits will not be affected. Furthermore, due to the nature of the sand replenishment that is planned, the undertaking is likely to be beneficial for the protection undocumented traditional Hawaiian subsurface deposits or burials along the shoreline. Deposition of dredge sand is expected to enhance protection of the shoreline by slowing erosion rates.

Loko Ea Fishpond, located southeast of Haleiwa Beach Park and directly east of Haleiwa Harbor, will not be directly or indirectly affected by project activities. Barge work will be restricted to the north side of the outlet groin. No project activities will occur at or near the Loko Ea Fishpond outlet.

Regarding the structures at Haleiwa Beach Park, which are components of SIHP No. 50-80-04-1388 (Art Deco Parks), these will not be affected by the planned work.

It is therefore our determination that the Haleiwa SBHM undertaking will not affect any NHPA-defined Historic Properties or any properties considered “significant” under Hawaii Administrative Rules §13-275-6. Our assessment has yielded a determination of “***No Historic Properties Affected***”, as defined at 36 CFR 800.4(d)(1). We respectfully request your consideration of, and concurrence with, this determination.

Should you have any questions, comments, or wish to request either an extension for response or a meeting to discuss this consultation, please contact me at (808) 835-4039 or e-mail Michael.E.Desilets@usace.army.mil.

Sincerely,

DESILETS.MICHAEL.ERNEST.1546258986 Digitally signed by DESILETS.MICHAEL.ERNEST.1546258986 Date: 2021.08.18 09:03:21 -10'00'

Michael Desilets, MA, RPA
Archeologist, Honolulu District

Enclosure

References:

O’Hare, C., R. Runyon, D. Borthwick, D. Shideler, and H. Hammatt, 2012, FINAL Archaeological Inventory Survey, Hale’iwa Redevelopment Entitlements Project, Kawailoa Ahupua’a, Waialua District, O’ahu. Prepared for Group 70 International, Inc. Cultural Surveys Hawai’i, Inc., Kailua, Hawaii.

Robins, J. and M. Desilets, 2014, FINAL-Archaeological Monitoring Plan for Remediation Work at Former Chevron Service Station, Hale’iwa, Kawailoa Ahupua’a, Waialua District, O’ahu Island, Hawai’i. Prepared for ARCADIS U.S., Inc., Hawai’i. Garcia and Associates, Kailua, Hawai’i.

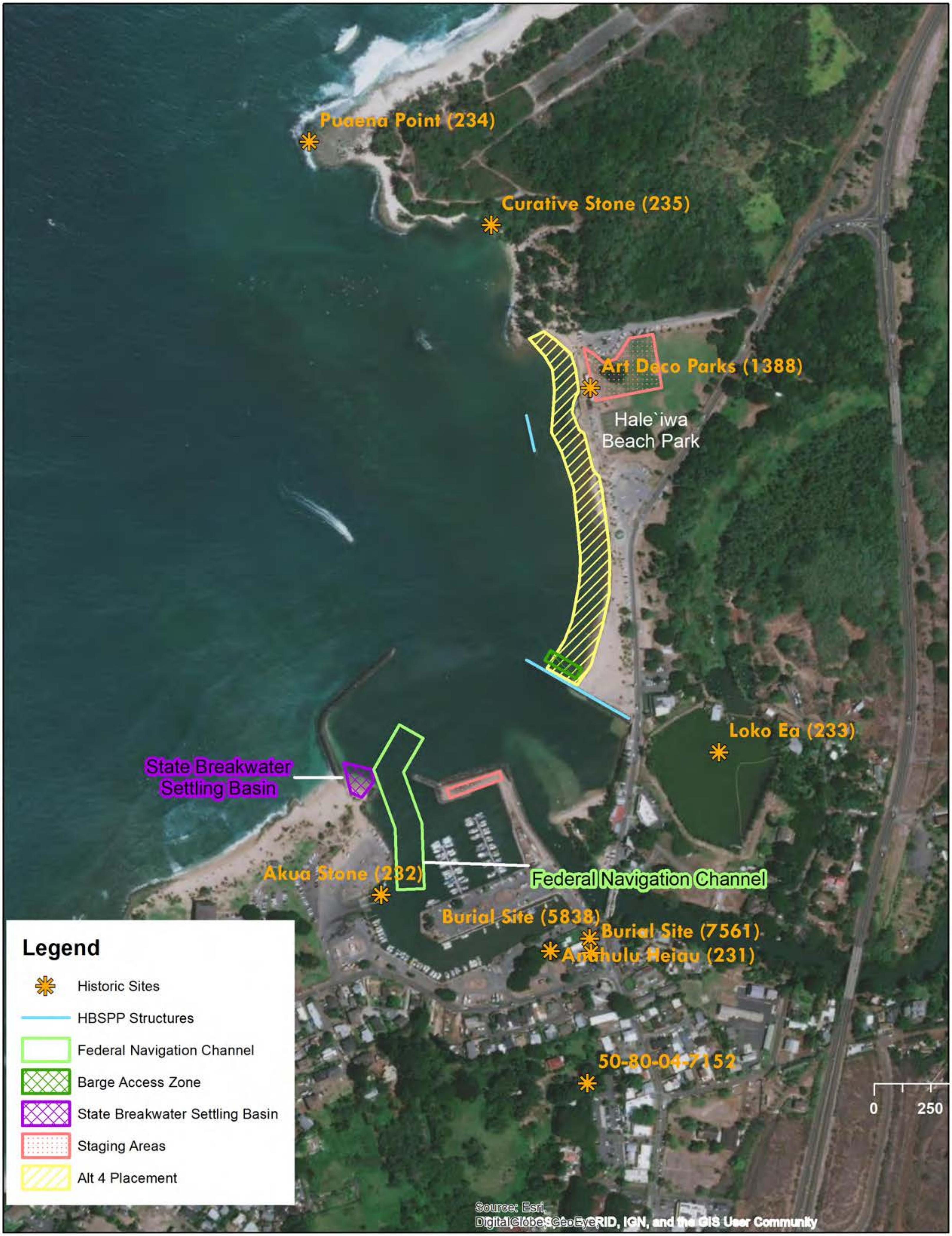
Rogers, R.W, 1999, Shipwrecks of Hawaii: A Maritime History of the Big Island. Pilialoha Publishing, Hawaii.

Shipwrecks of Hawaii. Accessed December 11, 2020 https://en.wikipedia.org/wiki/Category:Shipwrecks_of_Hawaii

Van Tilburg, H.K., 2003 U.S. Navy Shipwrecks in Hawaiian Waters: an Inventory of Submerged Naval Properties. Department of Defense Legacy Resource Management Program, PROJECT NUMBER (01-121), Underwater Cultural Resources Management and Protection. Prepared by The Marine Option Program University of Hawai`i at Manoa. Prepared for The Naval Historical Center, Washington D.C.


Study Area
N

Area of Potential Effect.



Puaena Point (234)
Curative Stone (235)
Art Deco Parks (1388)
Hale`iwa
Beach Park
Loko Ea (233)
State Breakwater
Settling Basin
Akua Stone (232)
Federal Navigation Channel
Burial Site (5838)
Burial Site (7561)
Anahulu Heiau (231)
50-80-04-7152
0
250
Legend
Historic Sites
HBSPP Structures
Federal Navigation Channel
Barge Access Zone
State Breakwater Settling Basin
Staging Areas
Alt 4 Placement
Source: Esri,
DigitalGlobe, GeoEye, ... RID, IGN, and the GIS User Community

Haleiwa Beach Park, circa 1950


Haleiwa Beach Park, 2020

DAVID Y. IGE
GOVERNOR OF
HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

September 23, 2021

IN REPLY REFER TO:
Project No.: 2021PR01029
Submission No.: 2021PR01029.001
Doc No.: 2109SH15
Archaeology

Michael Desilets, Archaeologist
Civil and Public Works Branch, Programs and Project Management Division
United States Army Corps of Engineers, Honolulu District
Department of the Army
Fort Shafter, Hawaiʻi 96858-5440
Email Reply to: Michael.E.Desilets@usace.army.mil

Electronic Transmittal Only, No Hard Copy to Follow

Dear Michael Desilets:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Review –**
Initiation of Consultation and Request for Concurrence with the Effect Determination
Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project
Kawailoa Ahupuaʻa, Waialua District, Island of Oʻahu
TMK: (1) 6-2-001:002 and (1) 6-2-003:011

The State Historic Preservation Division (SHPD) received a letter dated August 17, 2021 from the United States Army Corps of Engineers (Corps), Honolulu District to initiate the Section 106 process and to request the State Historic Preservation Officer's (SHPO's) concurrence with the effect determination for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration project on the island of Oʻahu. The SHPD received this submittal on August 24, 2021.

The Corps has determined the proposed project, in coordination with State of Hawaii Department of Land and Natural Resources (DLNR), is a federal undertaking as defined in 36 CFR 800.16(y). The proposed project is subject to compliance with Section 106 of the NHPA and historic preservation review under Hawaii Revised Statutes (HRS) §6E-8. The Corps is pursuing a single consultation with SHPD and all consulting parties to comply with both Section 106 and HRS Chapter 6E and has taken the responsibility as the primary point of contact.

According to the Corps' letter, the undertaking consists of dredging marine sand from various near-shore locales and depositing the material along the shoreline fronting Haleiwa Beach Park, with the intention of beneficially reusing dredged material to replenish the beach. Primary activities associated with the project include the following:

- Dredging 6,338 cubic yards (cy) of beach-suitable sediment from Haleiwa Harbor Federal Navigation Channel and the State Breakwater Settling Basin (.03-acres).
- Dredging approximately 15,000 cy of beach-suitable sand from a 16.5-acre offshore sand deposit located 3,400 feet off-shore (at a depth of 60 ft below sea level).
- Dredging 1,300 cy of beach suitable sand adjacent to the groin on the south end of Haleiwa Beach Park, to a depth of-10 ft mean lower low water, to allow for scow offloading directly to the beach.
- Depositing the dredged sand along the shoreline fronting Haleiwa Beach Park to replenish 4.4 acres of beach.
- Disposing of approximately 2,000 cy of sediment at the U.S. Environmental Protection Agency-designated South Oahu Ocean Dredged Material Disposal Site (a federally-managed off-shore, open-water disposal site).

There will be no ground disturbing activities associated with the undertaking. Work will only include dredging from offshore locales and depositing material onto the existing shoreline. Nearby staging areas located in terrestrial portions at Haleiwa Beach Park and Haleiwa Small Boat Harbor are intended to support mobilization and storage of equipment only and involve no ground disturbance.

The proposed project is located on the north shore of the island of Oahu in Haleiwa town. The terrestrial portion of the undertaking's Area of Potential Effects (APE) encompasses portions of Haleiwa Small Boat Harbor [TMK: (1) 6-2-001:002 por.] and Haleiwa Beach Park [TMK: (1) 6-2-003:011 por.], located near the mouth of the Anahulu River.

The terrestrial portion of the APE includes the 3.46-acre shoreline area fronting Haleiwa Beach Park as well as two equipment staging areas: a 1.0-acre at Haleiwa Beach Park and a 0.21-acre area at Haleiwa Small Boat Harbor. The total terrestrial APE encompasses 4.67 acres. The marine portion of the APE includes the total 4.55-acre area covered by the dredging activities, which include a 0.3-acre settling basin at Haleiwa Small Boat Harbor, a 2.0-acre portion of the Federal Entrance Channel, a 0.55-acre scow access area adjacent to the Haleiwa Beach Park southern groin, and a 1.7-acre offshore sand deposit located 3,400 feet northwest of Haleiwa Beach Park. The Corps has requested the SHPO's concurrence with the APE; based on the information received, **the SHPO has no objections** to the APE as it is defined.

The Corps did not identify any historic properties within the APE. East of the APE is Loko Ea Fishpond (McAllister Site 233), known to contain subsurface deposits along its perimeter. Loko Ea Fishpond is currently comprised of both original and reconstructed structural elements (e.g., walls and gates) and is actively managed for cultural and educational purposes. Loko Ea Fishpond is quite large, and the Corps states only the westernmost perimeter of the fishpond is pertinent to the present undertaking.

The Corps reports that consultation during the planning stages of the project resulted in the identification of potential impacts to the Loko Ea Fishpond. During a site visit, a consulting party directed the Corps' attention to the western portion of the fishpond that would be exposed to any activity occurring at or near the outlet to Haleiwa Harbor that generates larger than normal waves or turbulence that could undermine the western fishpond wall. Additional concern was raised regarding the potential impact to aquatic life passage into and out of the fishpond outlet that is the primary hydraulic corridor between the fishpond and the open ocean. To eliminate the potential impact to the western wall of the fishpond and potentially aquatic life passage, the project was redesigned so that all barge activities will occur on the north side of the groin. As currently designed, no project activities will occur at or near the Loko Ea Fishpond outlet. The Corps has modified its undertaking so that Loko Ea Fishpond no longer falls within the APE and the scope of the undertaking will not extend geographically to directly affect Loko Ea and also will not indirectly affect Loko Ea through wave action or turbulence near the western fishpond wall and outlet.

The recreation support structures (e.g., comfort station) at Haleiwa Beach Park are contributing properties within a discontinuous "Art Deco Parks" historic district established on June 9, 1988 (State Inventory of Historic Places [SIHP] Site 50-80-04-1388). The Corps states, the architectural features of Haleiwa Beach Park are not within the project APE and will not be affected by the proposed project.

The Corps has determined the proposed project will result in *no historic properties affected*. **The SHPO concurs**.

The SHPD looks forward to receiving from the applicable DLNR division, a request for concurrence with the Chapter 6E historic preservation review process effect determination.

Please submit all forthcoming information and correspondence related to the subject project to the SHPD HICRIS system under Project 2021PR01029 using the Project Supplement option.

The Corps is the offices of record for this undertaking. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Stephanie Hacker, Historic Preservation Archaeologist IV, at Stephanie.Hacker@hawaii.gov or at (808) 692-8046 for matters regarding archaeological resources or this letter.

Aloha,

Alan Downer

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

From:	Reder, Benjamin E CIV USARMY CEPOH (USA)
To:	Graydon Keala; Rae Decoito
Cc:	Desilets, Michael E CIV USARMY CEPOH (USA); Zylka, Jason J CIV (USA); Paahana, Jessie A CIV USARMY CEPOH (USA); Bliss, Kate M CIV USARMY CEPOD (USA)
Subject:	RE: Haleiwa Beneficial Use - NHPA 106 consultation letter
Date:	Wednesday, September 8, 2021 1:27:10 PM

Thanks for reaching out Buddy and we appreciate the input.

Ditto to you – don't hesitate to reach out if you have further questions!

Be well,
Ben

From: Graydon Keala <lokoia.consulting@hotmail.com>
Sent: Friday, August 27, 2021 1:28 PM
To: Reder, Benjamin E CIV USARMY CEPOH (USA) <Benjamin.E.Reder@usace.army.mil>; Rae Decoito <rae@lokoea.org>
Subject: [Non-DoD Source] Re: Haleiwa Beneficial Use - NHPA 106 consultation letter

Aloha Benjamin,

Mahalo for your email. MLEF is pleased with your revisions to the Barge Access Zone in the initial draft Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration project. MLEF finds this needed revision to be acceptable in concept for project planners. But, in that this revision services the physical impacts to historic features of our Hawaiian Fishpond, it is not totally impact free.

Hawaiian Fishpond work at Loko Ea, and all coastal loko i'a depends on *seasonal migrations* of plants and animals; fish, mollusk, crustacea, microalgae, etc., then the recruitment of these species into the pond. It would be a prudent addition to any future fishpond project review to include these historic practices associated with these systems. I see this lacking in most regulators minds and we have this opportunity to apply this knowledge.

Also lacking in the Federal/State definition is the fact that loko i'a are highly productive, coastal *Essential Fish Habitat*. Loko i'a are defined as man-made estuaries with active recruitment of diverse species of juveniles and applied traditional knowledge to create a sustained productive and healthy environment. I've talked with FWS and WESPAC but their EFH are open pelagic water. Loko i'a are Essential Fish Habitat for the Nearshore Fishery environment.

Anyway, I've shared this with Rae and OHA-Kamakana, who sent me the revised aerial map diagram. Southern MLEF greatly appreciates the effort in applying necessary revisions to this

project.
If you need anything else or have questions, don't hesitate to contact me.

Happy Aloha Friday and have a great weekend!

Mahalo
Buddy

Graydon 'Buddy' Keala
Dba: Loko I'a Consulting

Mobile: (808) 227-6648

From: Reder, Benjamin E CIV USARMY CEPOH (USA) <Benjamin.E.Reder@usace.army.mil>
Sent: Monday, August 23, 2021 12:13 PM
To: lokoia.consulting@hotmail.com <lokoia.consulting@hotmail.com>; Rae Decoito <rae@lokoea.org>
Cc: Desilets, Michael E CIV USARMY CEPOH (USA) <Michael.E.Desilets@usace.army.mil>
Subject: Haleiwa Beneficial Use - NHPA 106 consultation letter

Aloha Rae and Buddy,

Attached you'll find the National Historic Preservation Act Section 106 consultation letter for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach
Restoration project. A hard copy has also been mailed.

Please let me know if you have questions and want to connect. Thanks again for your early input which shaped the relocation of the "barge access zone" to the north side of the southern groin at Haleiwa Beach Park.

Wishing you the best!

Regards,
Ben

Benjamin Reder | Project Manager
☎ Office: 808.835.4203
☎ Cell: 808.227.3674
Honolulu District
U.S. Army Corp of Engineers

From:	Bliss, Kate M CIV USARMY CEPOD (USA)
To:	kamakanaf@oha.org
Cc:	okoia.consulting@hotmail.com; Desilets, Michael E CIV USARMY CEPOH (USA); Reder, Benjamin E CIV USARMY CEPOH (USA); Bliss, Kate M CIV USARMY CEPOD (USA)
Subject:	RE: NHPA Sec 106 for Hale"iwa Small Boat Harbor Maintenance Dredging
Date:	Monday, December 20, 2021 2:08:23 PM

Dear Kamakana Ferreira,

Thank you very much for providing the below information and sharing your concerns for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project. We are glad to learn that you agree that moving the barge and staging area will minimize potential impacts to the Loko Ea fishpond. We have coordinated and completed consultation with National Marine Fisheries Service (NMFS) under the Magnusson-Stevens Fishery Conservation and Management Act (MSA). Pursuant to the MSA, we utilize the best available science to make the determination of effect to Essential Fish Habitat (EFH) for federally managed fisheries. Although the species that utilize the Loko Ea Fishpond are not federally-managed fisheries, we are confident that the Best Management Practices (BMPs) that we are implementing will mitigate any serious deleterious effects to the sensitive marine resources surrounding the project. We anticipate that effects from construction of the project will be temporary and minimal.

In terms of the NEPA process, we are currently conducting an internal review of our report for quality assurance and will be publishing the final Feasibility Report and Environmental Assessment in the next few months.

Again thank you very much for your interest and attention to this project. We look forward to working with you in the future.

Sincerely,

Kate M. Bliss
Regulatory and Environmental Program Manager
U.S. Army Corps of Engineers
Building 525
Fort Shafter, HI 96858
808-835-4626

From: Kamakana Ferreira <kamakanaf@oha.org>
Sent: Thursday, September 9, 2021 12:43 PM
To: Desilets, Michael E CIV USARMY CEPOH (USA) <Michael.E.Desilets@usace.army.mil>
Cc: Graydon Keala <lokoia.consulting@hotmail.com>; Reder, Benjamin E CIV USARMY CEPOH (USA) <Benjamin.E.Reder@usace.army.mil>
Subject: [Non-DoD Source] NHPA Sec 106 for Hale'iwa Small Boat Harbor Maintenance Dredging

Aloha,

The Office of Hawaiian Affairs (OHA) is in receipt of your letter dated August 17, 2021, inviting us to National Historic Preservation Act (NHPA) Section 106 and Hawai'i Revised Statutes (HRS) 6E-8 consultations for the Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Restoration (SBHM) project in Hale'iwa, O'ahu, TMKs (1) 6-2-001:002 por. and (1)6-2-003:011 por. The United States Army Corps of Engineers (USACE) is carrying out this project in partnership with the State of Hawai'i Department of Land and Natural Resources (DLNR).

The undertaking consists of: dredging 6338 cubic yards of beach-suitable sediment from the Haleiwa Harbor Federal Navigation Channel; dredging of 15000 cubic yards of beach-suitable sand from a 16.5 acre offshore sand deposit; dredging of 1300 cubic yards of beach suitable sand adjacent to the groin on the south end of Haleiwa Beach Park; deposition of dredged sand along the shoreline fronting Haleiwa Beach Park; and, disposal of 2000 cubic yards of sediment at the United State Environmental Protection Agency-designated South O'ahu Ocean Dredged Material Disposal Site. No ground disturbing work is associated with these activities.

As mentioned in the letter, a redesign of the project occurred to move staging and barge locations away from the nearby Loko Ea Fishpond after consultation with OHA and Malama Loko Ea Foundation (MLEF) earlier this year. OHA originally reached out to USACE after receiving a letter of concern about the project design and lack of consultation from MLEF. USACE subsequently set up a site visit with MLEF on February 16. OHA is pleased to see the redesign occur in a way that respects the concerns of MLEF and allows USACE to still achieve their goal. Given the redesign to eliminate any on land staging and barge access, a determination of no adverse effect to historic properties is proposed.

After receipt of the most recent letter, OHA did reach out again to MLEF to see how they felt about the current project re-design and direction. They shared that the project was moving in a more positive direction by removing the direct physical impacts to the Loko Ea. However, there appears to still be concern regarding possible negative impacts to o'opu, hihiwai, 'opae and other fish species that migrate in and out of the fishpond. MLEF indicated that this was discussed at the February site visit with USACE, but that the topic is not summarized in the portion of the current letter that discusses the site visit. Its currently unclear to MLEF, as well as OHA, if dredging activities and barge travel could possibly impact migratory actions of these fish species that utilize the fishpond via turbidity, movement, and noise.

As these many fish species are invaluable cultural resources to the proper functioning of the fishpond, OHA questions whether or not any studies have been done to understand the aquatic population and existing migratory patterns? In review of the draft Integrated Feasibility Report and Environmental Assessment (FREA) provided earlier this year, it does appear that there was an attempt to locate essential fish habitats affected by the project. At the time, no essential habitat impacts were noted. However, as the project has since been altered from the original design, will supplemental studies be conducted to ensure that essential habitats are still not impacted by the current project re-design? While this question could possibly be deferred for the NEPA process, OHA would argue that such impacts to any fish species that do migrate in and out of the Loko Ea would indirectly affect the health and function of the fishpond. Thus, the question does seem relevant to the current Section 106 and HRS 6E consultation processes.

On the topic of NEPA process, OHA is further curious to know as to where USACE is in terms of the NEPA process now that the project has been redesigned. Any insight on this would be much appreciate.

We look forward to consulting further and certainly open to participating in any virtual discussions.

Mahalo,

Kamakana C. Ferreira, M.A.
Lead Compliance Specialist
Office of Hawaiian Affairs
560 N. Nimitz Hwy
Honolulu, Hi. 96817

(808)594-0227

Attachment 9 – Marine Protection, Research and Sanctuaries Act Compliance (MPRSA)

TIER 1 SECTION 103 EVALUATION of
Haleiwa Small Boat Harbor Dredged Material

for the Haleʻiwa Small Boat Harbor Maintenance Dredging and
Beach Restoration Project, Haleʻiwa, Island of Oʻahu, Hawaiʻi
Section 1122, Water Resources Development Act (WRDA) Of 2016

This document constitutes the Honolulu District (POH) analysis of existing and publicly available information to determine viability of ocean disposal of dredged material from Haleiwa Small Boat Harbor (SBH).

In accordance with the U.S. Army Corps of Engineers (USACE)-U.S. Environmental Protection Agency (USEPA) Ocean Testing Manual (1991), for a Tier I evaluation, the information collected on the proposed dredged material is first compared to the three exclusionary criteria in paragraph 227.13(b). 40 CFR 227.13(b) states, "Dredged material which meets the criteria set forth in the following paragraphs (b)(1), (2), or (3) of this section is environmentally acceptable for ocean dumping without further testing under this section:

(1) Dredged material is composed predominantly of sand, gravel, rock, or any other naturally occurring bottom material with particle sizes larger than silt, and the material is found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels; or

Evaluation: No. Based on a 2008 sediment characterization of sediments accumulated in the Haleiwa SBH, the material in the channel located furthest from the open ocean is known to consist of approximately 45% fines. POH therefore assumes the material is not composed predominately of coarse grain sediments such as sand or gravel.

(2) Dredged material is for beach nourishment or restoration and is composed predominantly of sand, gravel or shell with particle sizes compatible with material on the receiving beaches; or

Evaluation: No. Due to the presence of fine-grained silts and clays, the material is not considered beach-grade sand and is not compatible with material typically utilized for beach nourishment.

(3) *When:*

(i) The material proposed for dumping is substantially the same as the substrate at the proposed disposal site; and

(ii) The site from which the material proposed for dumping is to be taken is far removed from known existing and historical sources of pollution so as to provide reasonable assurance that such material has not been contaminated by such pollution.

Evaluation: No. Since the designation of the USEPA South Oahu Ocean Dredged Material Disposal Site (SOODMDS) in 1980 until the most recent surveys of the SOODMDS by USEPA in 2013, USEPA has approved disposal of a total of 6,286,280 cy of dredged material. In comparison to the 1980 baseline that consisted of 75% sands, the seafloor at the SOODMS now includes more fine grain silts and clays, more gravel size sediments and 44% sand. The material to be dredged at Haleiwa SBH similarly consists of approximately 50% fine-grain sediments and would be substantially the same as the substrate at the SOODMDS. Evaluating potential sources of pollutants upstream and adjacent to the Haleiwa SBH include the following: predominately agricultural-zoned lands upstream; SBH does not support industrial uses, fuel barges do not dock in this harbor and the harbor is absent of fuel tanks on the dock or adjacent to the dock and no known spills or dumping of prohibited items. However, based on past sediment characterization, POH understands that the harbor accumulates chemical constituents or pollutants that must be analyzed to determine suitability.

POH has determined that the three criteria at 40 CFR 227.13(b) are not met. Accordingly, a minimum Tier I analysis is required pursuant to the Ocean Testing Manual. The information-gathering phase of Tier I evaluations has to be as complete as is reasonably possible, and existing information from all reasonably available sources has to be included.

Available results of prior physical, chemical, and biological tests of the material proposed to be dumped.

Sediment Analysis Report, Marine Research Consultants, Inc., 2008. In 2008, sediment samples at Haleiwa SBH were collected and physical and chemical analyses were conducted to determine suitability for upland disposal alternatives. This sampling effort was conducted in support of the Operations and Maintenance dredge cycle at the time. The 2008 dredge cycle constitutes the last, most recent dredge cycle. In addition, the 2008 sampling effort collected and analyzed sediments from Waianae SBH. Those results are not discussed in this analysis.

With respect to Haleiwa SBH, there is a very distinct boundary between mud in the inner harbor that is outside the federal channel and marine carbonate sand within the federal channel. Fine-grained black mud of terrigenous origin is likely deposited in the innermost reaches of the harbor from the Anahulu River. The sediments at the seaward end of the federal navigation channel are extremely clean, well-sorted coarse-grained sand of marine origin with less than 1% fines. The sediments at the inland end of the federal navigation channel, furthest from the open ocean, is 45% sand and gravel and 55% fines.

A comparison table of the 2008 Haleiwa Harbor grain size analysis and most recent grain size analysis at the South Oahu ODMDS by USEPA (USEPA, 2013)[1], is provided below.

Grain Size Category	Haleiwa Outer Channel 2008	Haleiwa Inner Channel 2008	SOODMDS 2013
% Gravel	7.29	1.74	21.6
% Sand	92.35	43.67	44.4
% Silt & Clay	0.37	54.59	33.2

Past physical sediment characteristics in the Haleiwa SBH Federal Channel, particularly in the inner reach, are relatively similar to the sediment found at the SOODMDS. USACE anticipates the material from Haleiwa SBH would be physically compatible with sediments at the ODMDS.

Sediment chemistry analysis[2] of the inner harbor mud indicates that none of the samples contained detectable cyanide, diesel, pesticides, PCB's, acid/base neutral extractables, total and soluble sulfides, oil and grease, gasoline or Volatile Organic Compounds. In addition, for total metals, all detected constituents (*Arsenic*, Cadmium, Chromium, Copper, Lead, *Nickel*, Zinc) were below the ER-M[3] concentration and all but two constituents (denoted in *italics*) were detected at below the ER-L. These effects ranges indicate the likely toxicity to biota and are used for screening purposes (see footnote below). To reiterate, the purpose of the 2008 sampling and analysis was not to determine ocean suitability, so no biological tests were conducted on the Haleiwa SBH sediments.

A comparison table of the 2008 Haleiwa SBH sediment chemistry and most recent sediment test results at the SOODMDS by USEPA (USEPA, 2013)[4], against the ER-L and ER-M screening criteria is provided below.

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[1] https://www.epa.gov/sites/default/files/2017-02/documents/2013_hawaii_ocean_survey_synthesis_report_04-27-15.pdf

[2] Chemical analysis included conventional tests for pH, percent solids, ignitability, total organic carbon (TOC), total and water-soluble sulfides, oil and grease, total recoverable petroleum hydrocarbons (TRPH), and cyanides. Other parameters tested included total metals, toxicity characteristic leaching procedure (TCLP) metals, pesticides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), semi-volatile and halogenated volatile organic compounds (SVOC and HVOCs), total petroleum hydrocarbons (TPH), and benzene, toluene, ethylbenzene, and xylene (BTEX)

[3] In environmental toxicology, effects range low (ERL) and effects range median (ERM) are measures of toxicity in marine sediment. The ERL and ERM measures are expressed as specific chemical concentrations of a toxic substance in sediment. The ERL indicates the concentration below which toxic effects are scarcely observed or predicted e.g. 10th percentile: the ERM indicates that above which effects are generally or always observed e.g. 50th percentile. The numerical values are incorporated in sediment quality guidelines that were developed for the National Oceanic and Atmospheric Administration (NOAA) National Status & Trends program as informal tools to evaluate whether a concentration of a contaminant in sediment might have toxicological effects. These guidelines are used for screening sediments for trace metals and organic contaminants. They are not regulatory criteria in any way and are not intended to be used as such. Exceedance of a screening range does not mean the material is contaminated or unsuitable for ocean disposal.

[4] https://www.epa.gov/sites/default/files/2017-02/documents/2013_hawaii_ocean_survey_synthesis_report_04-27-15.pdf

			Screening Criteria		Haleiwa	SOODMDS Reference Site
Analyte	Type	Units	ER-L	ER-M		
Arsenic	Metals	mg/kg	8.2	70	8.69	20
Cadmium	Metals	mg/kg	1.2	9.6	0.241	0.6
Chromium	Metals	mg/kg	81	370	55	100
Copper	Metals	mg/kg	34	270	24.4	65
Lead	Metals	mg/kg	46.7	218	4.25	25
Nickel	Metals	mg/kg	20.9	51.6	39.1	68
Zinc	Metals	mg/kg	150	410	32.5	78
Notes: ER-L – Effects range-low; ER-M – Effects range-median. Constituents that exceed ER-M are shaded yellow. Constituents that exceed ER-L are shaded light green. Constituents that do not exceed ER-L are shaded green.						

As indicated on the table, all analytes present in Haleiwa SBH sediments are present in lower quantities than at the SOODMDS and accordingly are expected to be suitable for ocean disposal.

Additionally and not documented on the table was the presence of motor oil (12 mg/Kg) and total recoverable petroleum hydrocarbon (14 mg/Kg), in the amounts indicated. Note the reporting limit for these constituents ranges from 25-100+mg/Kg[5]. The amount of hydrocarbons in Haleiwa sediments is well below either of these limits. Accordingly the sediments would not likely be unsuitable for ocean disposal for either analyte.

Due to the age of the most recent sediment characterization, greater than 3 years, the information cannot conclude a suitability determination without updated testing. This information indicates the need to develop a minimum Tier 3 sampling and analysis plan that complies with the requirements of the USACE-USEPA Ocean Testing Manual, conducting the field sampling and analysis per the approved sampling and analysis plan and developing a suitability determination, if applicable, to be coordinated with and seeking concurrence from USEPA.

Available information describing the source of the material to be dumped which would be relevant to the identification of potential contaminants of concern is discussed below.

USACE Regional Sediment Management Study in Haleiwa, 2014. USACE studied longshore sediment transport in the Haleiwa Region. The harbor accumulates sediments at a relatively low shoaling rate of 238 cubic yards annually. According to numerical circulation and wave modelling, coarse-grain sediments i.e. sand/gravel, in the harbor originate from the adjacent Alii and Haleiwa Beaches with fine-grain sediments originating from the Anahulu River.

Coordination with the Non Federal Sponsor: POH queried the local sponsor to understand use of the harbor and any known spills or changes to surrounding land use that may contribute to a change in sediment chemistry at Haleiwa SBH since the 2008

[5] https://apps.ecology.wa.gov/publications/publications/97602.pdf

sampling an analysis. Per email from F. McCall, DLNR-DOBOR, dated 20 Jul 22 a query of harbor staff with at least 15-years presence at Haleiwa SBH indicated no spills or discharges or known sources of contamination at the harbor and no change to the use of the harbor since 2008. Haleiwa SBH primarily supports commercial and recreational fisherman and does not support any industrial or fueling activities at the SBH.

A comprehensive review of publicly available information is provided as an attachment to this document. Below is a summary of that review:

USEPA EnviroAtlas Interactive Map: Identified the following six records since 2008 in the Anahulu Watershed: 1) An active Resource Conservation and Recovery Act (RCRA) hazardous waste site along Kamehameha Highway near the southern parking lot of the Haleiwa Beach Park, 2) four closed underground storage tanks (UST) at Haleiwa Chevron gas station (no longer in operation), 3) 2 open USTs and 5 closed USTs with no offsite contamination detected at Haleiwa Union 76 Gas Station, 4) a second active RCRA hazardous waste site at Haleiwa 76 Gas Station, 5) 5 closed USTs and waste oil sump pit (a Brownfields Low Priority site) in Haleiwa Town and 6) 5 closed USTs at the City and County of Honolulu Waialua Baseyard in Haleiwa Town. The Haleiwa 76 Gas Station maintains permitted open USTs that is actively regulated by the State Department of Health. All six records indicate any reported leaks have been addressed, fully contained in accordance with applicable federal, state and local regulations and resulted in no off-site contamination.

https://enviroatlas.epa.gov/enviroatlas/interactivemap/?featuredcollection=e5f95175f9184d508be636377796f1c2.

USEPA How's My Waterway: Identifies 79% of the waterways within the Anahulu Watershed as Impaired, including both the Waialua Bay and Haleiwa Beach Park for issues related to algae, nitrogen/phosphorus and murky water.

https://mywaterway.epa.gov/community/haleiwa%20boat%20harbor,%20hi/monitoring

State of Hawaii Hazard Evaluation and Emergency Response Office (HEER), iHEER Database: Confirmed the findings of the USEPA EnviroAtlas and identified the following additional record: 1) Formerly Used Defense Site No. H09HI007200 identified as various locations across multiple watersheds along the North Shore of Oahu, including the Anahulu Watershed. A cross-reference to the USACE FUDSMIS database indicates that this site is was assessed between September 1989 and March 1991 and resulted in an "Ineigible" finding.

https://eha-cloud.doh.hawaii.gov/iHEER/#!/viewer.

State of Hawaii Clean Water Branch, Water Pollution Control Viewer: Identified no active discharge permits and no reports of violations or illicit discharges.

Based on a review of existing and publicly available information, POH concludes that the material is likely substantially the same as at the SOODMDS, that no new contaminants of concern are expected to have accumulated since the last dredge cycle and accordingly, the material would likely be suitable for ocean disposal at the SOODMDS. POH will confirm this assumption in the design phase to complete the Section 103 evaluation. Suitability for ocean disposal will be confirmed with full Tier 3 sediment testing, including the required three suspended phase bioassays, two acute toxicity solid phase tests, and two bioaccumulation tests. This document demonstrates POH has conducted and to the fullest extent practicable completed Section 103 evaluation in feasibility per ER 1105-2-100, Appendix C.

ATTACHMENT

Spills in the Watershed of Haleiwa Small Boat Harbor Since 2008

A review of available information from the State of Hawaii and US EPA did not find any records of measurable contamination in sediments of Haleiwa Small Boat Harbor (SBH). Records of spills to the Harbor are of nonrecoverable sheens (iHEER online database). Any contaminants found in Haleiwa SBH sediments are expected to be in very low concentrations, potentially below detection levels. Based on incidents and sampling results in the immediate Anahulu Watershed, such contaminants may include diesel fuel, unleaded gasoline and vehicle maintenance fluids (HEER online database); the pesticides .alpha.-1,2,3,4,5,6-Hexachlorocyclohexane-D6 or alpha-HCH D6, Atrazine, Barban, 2,4,5-T, 2-Chloro-4-isopropylamino-6-amino-s-triazine, and 2-Hydroxyatrazine; the PFOA Diazinon-D10 (USGE 2014); and nitrogen and phosphorus (HDOH 2020). Where these contaminants have been identified they are in such low or unquantifiable amounts that should they accumulate in the sediments of Haleiwa Small Boat Harbor they would not be found in quantities that are detectable or measurable. This supports the non-federal sponsor's statements that there have been no measurable spills, per USEPA established sampling and analytical methodologies.

Based on Figure 10 of the Haleiwa 122 IFREA (Figure 1 below) and Figure 4-9 (Sea Engineering Inc. 2019), Haleiwa SBH is receiving sediment from Alii Beach and Puaena Point via Haleiwa Beach. The HUC 12 Surface Watershed in which Haleiwa SBH and Alii, Puaena Point and Haleiwa Beaches occur is Anahulu (WUC3084/HUC 200600000104), with an area of 1.63 square miles https://water.usgs.gov/wsc/a_api/wbd/reach20/200600000104.html;

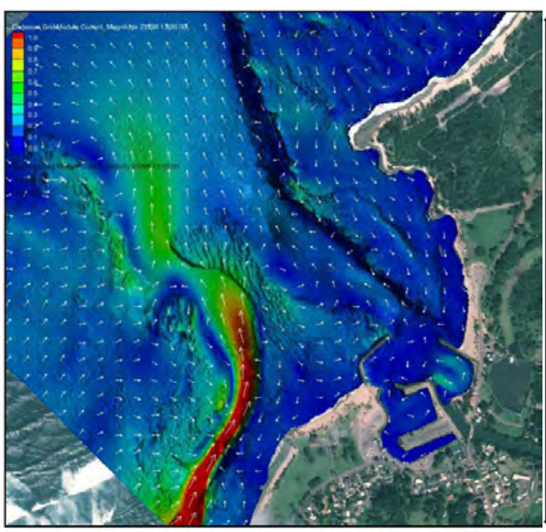

Figure 4-9 Circulation magnitude and vectors from CMS-Wave and CMS-Flow

Figure 10. Sediment budget for the Hale'iwa region (Podoski, 2014).

Spills

Of the 12 Incidents found in iHEER for the vicinity of Haleiwa Small Boat Harbor, only the 4 in Table 1 documented releases, and those were either fully recovered (diesel spill at the 7-11) or non-recoverable sheens.

Table 1: Incidents near Haleiwa Small Boat Harbor recorded in iHEER which included a release of material. Records retrieved September 20, 2022 from https://eha-cloud.doh.hawaii.gov/iHEER/#!/viewer.

HEER Case No.	Release Name	Date	NRC Incident#	Status
20170108-1554	Truck Went Off the Boat Ramp in Haleiwa	01/8/17	1168102	Sheen when vehicle removed from water not recoverable NFA
20190305-1025	Haleiwa channel sheen NRC 1239307	03/5/19	1239307	NFA
20210424-0934	Diesel Spill Hawaiian Ice Truck , 7-11 Haleiwa Gas Station	04/24/21		HFD cleaned up ~5 gallons of diesel from the pavement with absorbents NFA
20210818-0828	Unknown Sheen in Haleiwa Small Boat Harbor	08/18/21	1314059	Smelled like diesel, boom & absorbents applied, not recoverable NFA

Response to petrochemical spills in Hawaii in tidal coastal water are a joint effort between HEER and the US Coast Guard. National Response Center (NRC) Incident numbers are the US Coast Guard records for any spills to tidal coastal waters with petrochemical releases.

Regulated Facilities

Regulated facilities are those requiring permits under Clean Water Act; Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act; Clean Air Act and other federal and state environmental laws.

No Hawaii Emergency Planning and Community Right to Know Act (HEPCRA) regulated facilities are recorded in iHEER within the watershed. With the exception of the USDOD FUDS site (Figure 1), the RCRA sites are associated with active or former gas stations /fueling stations and their Underground Storage Tanks (USTs) (Table 1). Only 1 tank, at location 2 on Figure 1 and C on Figure 2, has a reported leak since 2008. That Leaking Underground Storage Tank (LUST) was closed in 2016 with a No Further action with Institutional and Engineering Controls Determination. Based on groundwater well and soil sampling, it was determined that contamination did not leave the site.

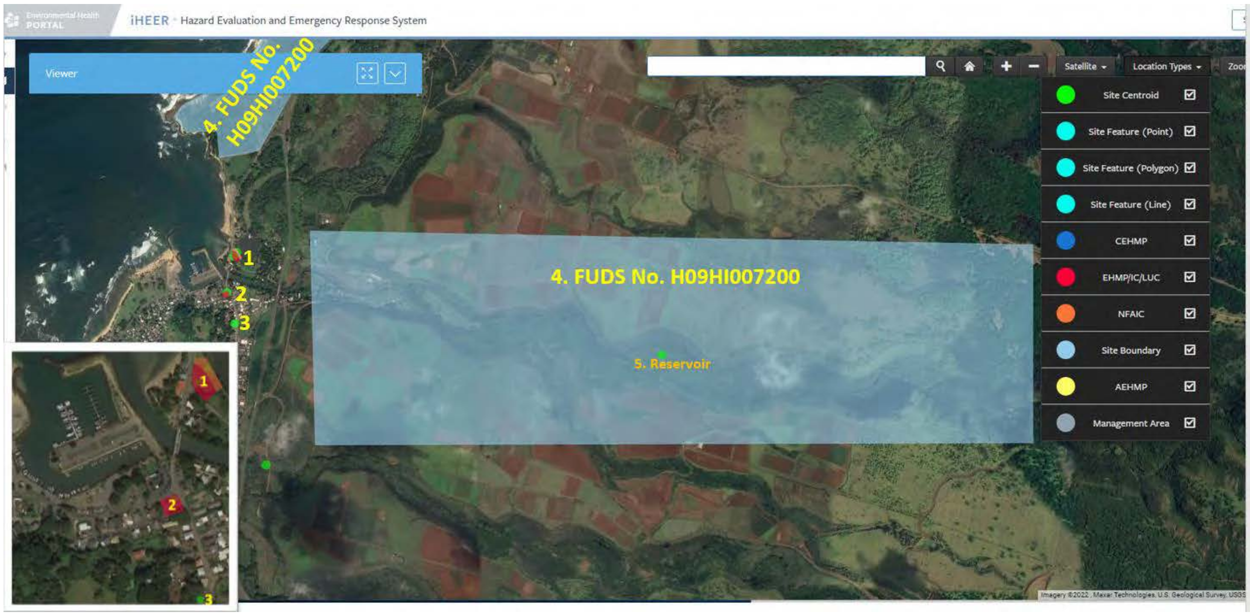

Figure 1: iHEER records for Anahulu watershed. Retrieved September 20, 2022 from https://eha-cloud.doh.hawaii.gov/iHEER/#!/viewer

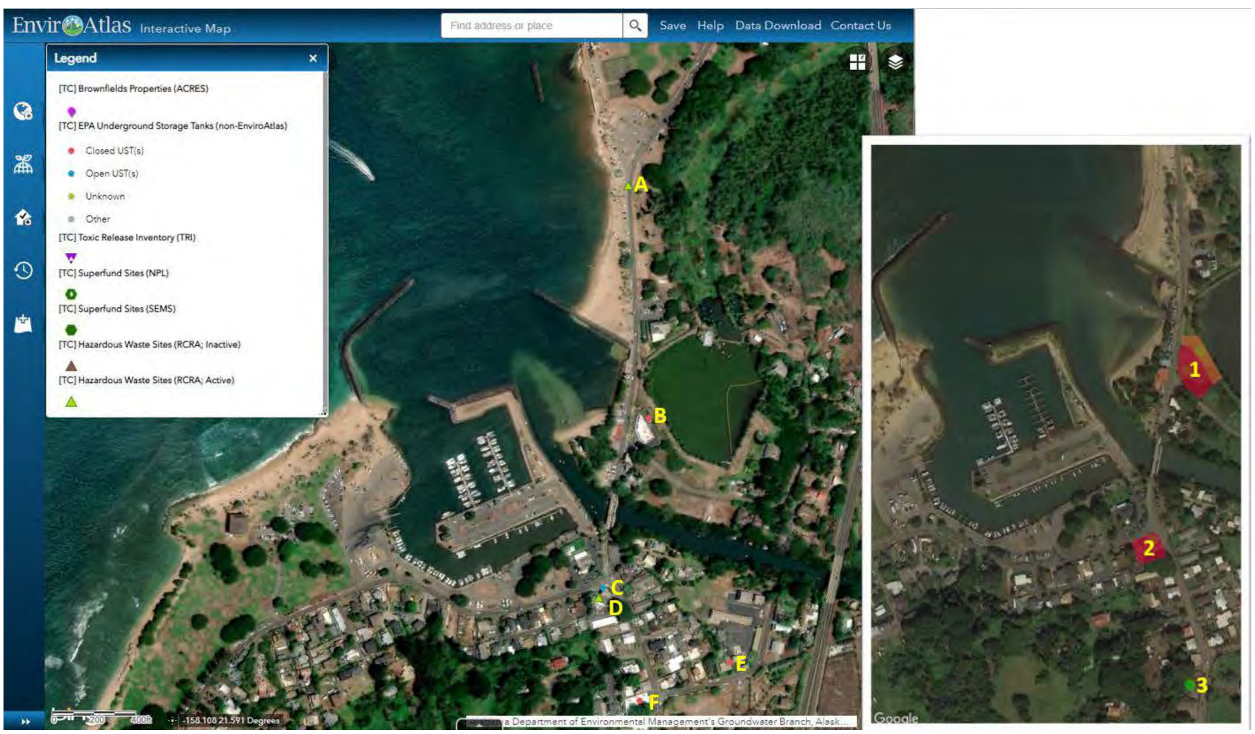

Figure 2: EnviroAtlas Records for Anahulu Watershed and Haleiwa SBH and (ii) corresponding iHEER records. See Table 2 for combined site details. Retrieved September 20, 2022 from *https://enviroatlas.epa.gov/enviroatlas/interactivemap/?featuredcollection=e5f95175f9184d508be636377796f1c2*

Table 2: Case details for iHEER and EnviroAtlas Records as depicted in Figures 1 and 2.

Fig.1	Fig.2	Company	Incident	Address	Case #
	A	CHEVRON 91970	USEPA: Active RCRA Hazardous Waste Site	62-472 KAMEHAMEHA HWY, HALEIWA, HI 96712	HIR000136937
1	B	Haleiwa Chevron	4 Closed USTs HEER No Further Action w/ Institutional Controls, NFAIC, determination on 11/26/2021	62-594 Kamehameha Hwy 62-148 Lokoea Pl, Haleiwa, HI 96712	HI9-201215 OU-QLT (EHMP/IC/LUC), iHEER ID 2719, UST Facility ID 9-201215 OU-KSBE (NFAIC), iHEER ID 2872
2	C	Haleiwa 76 7/11	2 Open USTs, 5 closed USTs Received a No Further Action with Institutional and Engineering Controls, based on groundwater well & soil sampling it does not appear contamination migrated offsite. Haleiwa Service #0913 (Three Corner Service) Haleiwa Union 76	66-031 Kamehameha Hwy, Haleiwa, HI 96712	HI9-200029 HEER Case No. 20150317-1415 Mid Pac Petroleum Station No. 103 UST Facility ID 9-200029 LUST Release ID 150017 (EHMP/IC/LUC) iHEER ID 467
2	D	Active RCRA Hazardous Waste Site	PAR HAWAII LLC - HALEIWA 76 #61103,	66 031 KAMEHAMEHA HWY, HALEIWA, HI 96712	HIR000000364 110013789846
3	F	Haleiwa Commercial Redevelopment	5 Closed USTs Underground Storage Tank system & waste oil sump pit Brownfields Low Priority Site	66-087 Kamehameha Hwy, Haleiwa, HI 96712	HI9-203931 IHEER ID 2375
	E	C&CH WAIALUA CORP YARD	5 Closed USTs	62-126 EMERSON RD	HI9-200132
4		USDOD	FUDS No. H09HI007200	Various locations	iHEER ID 1892

Note: USTs are Underground Storage Tanks. LUSTs are Leaking Underground Storage Tanks

Water Sampling Data Available for Anahulu Watershed since 2008

Monitoring in Anahulu Watershed since 2008 includes Haleiwa Alii Beach Park (Monitoring Site ID 21HI-000247) and Haleiwa Beach Park (Monitoring Site ID 21HI-000171) BEACH Program monitoring for nutrients and bacteria by Hawaii Department of Health Clean Water Branch. HDOH reports the waters as impaired for aquatic life and swimming and boating due to nutrients and bacteria (HDOH 2022). In 2014 USGS detected the pesticides .alpha.-1,2,3,4,5,6-Hexachlorocyclohexane-D6 or alpha-HCH

D6, Atrazine, Barban, 2,4,5-T, 2-Chloro-4-isopropylamino-6-amino-s-triazine, and 2-Hydroxyatrazine; the PFOA Diazinon-D10; and Caffeine-13C, in the Anahulu River at Haleiwa Bypass Road (Site ID: USGS-213535158053501) (USGS 2014).

References

HDOH. 2022. 2022 STATE OF HAWAII WATER QUALITY MONITORING AND ASSESSMENT REPORT: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117). https://attains.epa.gov/attains-public/api/documents/cycles/11424/206016
HEER. 2022. iHEER. https://eha-cloud.doh.hawaii.gov/iHEER/#!/viewer

USEPA. 2022. EnviroAtlas. https://enviroatlas.epa.gov/enviroatlas/interactivemap/?featuredcollection=e5f95175f9184d508be636377796f1c2

USEPA. 2022. How's My Waterway? https://mywaterway.epa.gov/community/haleiwa%20boat%20harbor,%20hi/monitoring

Identifies 79% of the waterways within the Anahulu Watershed as Impaired, including both the Waialua Bay and Haleiwa Beach Park for issues related to algae, nitrogen/phosphorus and murky water.

USGS. 2014. https://mywaterway.epa.gov/monitoring-report/NWIS/USGS-HI/USGS-213535158053501/

Appendix C: Economic Analysis

Hale‘iwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project

Hale’iwa, Island of O’ahu, Hawai’i

SECTION 1122
WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 2016

August 2023

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Contents

Tables:

1. Introduction

The Hale'iwa Section 1122 Beneficial Use of Dredged Materials (BUDM) Feasibility Study documents the analyses completed to investigate uses of dredged material that can provide benefits to the navigation, coastal storm risk management, recreation, and environmental missions. Despite general perceptions of Hawaii, sand is relatively scarce, and the study area is the most visited beach outside of Waikiki and therefore a high-value opportunity for receipt of beach grade sand harvested in accordance with authority granted under Section 1122 of WRDA 2016.

This Economic Appendix describes the methods and results of the economic analyses completed in support of the Hale'iwa Section 1122 Feasibility Study. All economic evaluations were completed in accordance with U.S. Army Corps of Engineers (USACE) policies and evaluation procedures as defined by the *Economic and Environmental Principles & Guidelines for Water and Related Land Resources Implementation Studies* (P&G). The P&G establishes four accounts to facilitate evaluation and display of the effects of alternative plans. These accounts are: national economic development (NED), environmental quality (EQ), regional economic development (RED), and other social effects (OSE).

The NED account displays changes in the economic value of the national output of goods and services. This appendix discusses how benefits were determined for the NED account. The NED benefits of the Hale'iwa Section 1122 include navigation, coastal storm risk management, and recreation.

The RED account displays economic benefits that accrue to the region, but not necessarily the nation, including increased visitation and tourism to the beach and amenities at HBP, as well as construction spending related to the project. The RED account was qualitatively determined to have greater positive benefits with each alternative as more sediment is dredged and the beach is further nourished with usable dredge material. The expected increase in visitation resulting from the Recommended Plan would be expected to have the greatest positive effects on the region, thus providing the greatest RED benefits which may include increased spending at local business, new jobs and additional employment opportunities, increased wages for existing employees, and other recreation-related spending specific to the region.

The EQ account displays economic impacts related to environmental improvements. The Recommended Plan provides ancillary ecosystem restoration benefits by creating beach habitat that supports aquatic life including haul-out and basking habitat for green sea turtles. The environmental benefits are discussed further in the environmental sections of the main report as well as the Environmental Appendix.

The OSE account displays economic impacts that are not counted within the other three accounts but could have some bearing on determining a recommended plan. There were no other social effects that were determined to differ greatly between the alternatives as each alternative includes the same impacts, such as improved quality of life from the businesses that benefit from recreators and improved safety on the beach resulting from the increased stabilization of the seawall. The expectation is that these impacts would increase in scale as the alternatives do, resulting in the Recommended Plan having the greatest OSE impacts.

The initial analysis presented in this appendix was conducted at the FY21 price level using the FY21 federal discount rate. An update to the costs and benefits was required after the recommended plan had been determined and the update would impact all alternatives similarly, so there would be no anticipated change to the alternative selected as the recommended plan. Attachment 1 to this appendix outlines the updated economic analysis for the base plan and recommended plan at the FY22 price level using the FY22 federal discount rate and Attachment 2 outlines the updated economic analysis for the base plan and recommended plan at the FY23 price level using the FY23 federal discount rate.

1.1 NED Benefits and Costs

This appendix presents an NED evaluation of the Base Plan as well as four alternatives that utilize dredged materials for beach nourishment and were determined to be the most cost-effective. These alternatives entail dredging different quantities of sediment in combination from the federal channel, advanced maintenance area, and offshore sand deposit. Alternative 1A is the operations and maintenance (O&M) Base Plan which entails continuing to dredge the federal channel and dispose of the materials at either the ocean dredged material disposal site (ODMDS) or at an approved upland disposal site. Alternative 2 would increase the dredged amount by deepening the federal channel to 12’ and disposing of the dredged material through a combination of beach placement and the ODMDS. Alternative 2a would increase the dredged amount by deepening the federal channel to 13’ and disposing of the dredged material through a combination of beach placement and the ODMDS. Alternative 3 would increase the dredged amount by combining alternative 3 with dredging the deposition basin and disposing of the dredged material through a combination of beach placement and the ODMDS. Alternative 4 would increase the dredged amount by combining alternative 4 with dredging an offshore sand deposit and disposing of the dredged material through a combination of beach placement and the ODMDS.

NED benefits for each alternative were calculated as the sum of the benefits in the following three categories: navigation, coastal storm risk management (CSRM), and recreation. Each benefit category was calculated separately, and the methods used to calculate them are described in detail in section 2.0 below.

NED costs for each alternative include construction costs (mechanical dredging contract costs, mobilization and demobilization costs, and contingency) as well as the preconstruction engineering and design (PED) costs and construction management (CM) costs. NED costs are briefly described in section 3.0 below and in greater detail in Appendix D – Costs.

1.2 Net Benefits and BCR for Alternative Plans

Net NED benefits are calculated as average annual benefits (AAB) less average annual costs (AAC), while the benefit to cost ratio (BCR) is the ratio of AAB to AAC. A BCR greater than 1 indicates a project is economically justified. For this project, there is an additional constraint that the BCR must be greater than 0.51 with the exclusion of recreation benefits.

NED benefits and costs were developed for a 50-year period of analysis, the first project year (PY1) being Fiscal Year 2025 (FY25). The project benefit and cost time streams were converted to average annual values using the 50-year period of analysis, FY21 price levels, and the FY21 federal discount rate (FDR) of 2.500 percent (per Economic Guidance Memorandum, 21-01, Federal Interest Rates for Corps of Engineers Projects for Fiscal Year 2021). The annuity factor is determined using the FY21 FDR. It is used to derive the estimated average annual benefits (AAB) and average annual costs (AAC).

All monetary values in this economic appendix are presented in FY21 prices.

Table C-1: Period of Analysis, Price Level and Federal Discount Rate for Economic Evaluation

Period of Analysis	50 Years
Base Year: Project Year 1 (PY1)	FY25
Project Year 50 (PY50)	FY73
Price Level	FY21
FY21 Federal Discount Rate	2.50%

2. NED Benefits of Alternatives

1.3 Navigation Benefits

The navigation benefits associated with Hale'iwa Harbor are derived from the channel deepening, which deepens the federal channel to a depth of 12' in alternative 2 or a depth of 13' in the other alternative plans. This dredging allows vessels to move through the federal channel unimpeded by sediment until sediment builds up again at which point additional dredging would be required. The key benefit to navigation is the offset of O&M dredging until a later date at which point it would be necessary to deepen the channel to an appropriate depth for safe navigation. The period of offset O&M dredging was determined based on the amount of sediment dredged and the rate of shoaling, creating navigation benefits for differing lengths of time depending on the alternative. Under the base plan and alternative 2, additional dredging to maintain navigation is assumed to be required 10 years after this initial dredging based on 2,433 cy of material dredged and a shoaling rate of 238 cy/year. Under alternative 2a, additional dredging would be required after 17 years based on 4,138 cy of material dredged and a shoaling rate of 238 cy/year. Alternatives 3 and 4 have a greater period of offset O&M dredging resulting from a reduction of the rate of shoaling caused by the settling basin, so under these alternatives additional dredging would be required 26 years after the initial dredging based on 4,138 cy of material dredged and a shoaling rate of 107 cy/year for the initial 17 years and a shoaling rate of 238 cy/year for the remaining 9 years. Table C-2 shows the navigation benefits determined for each alternative.

Table C-2: Hale'iwa Harbor: Navigation Benefits 1/

Alternative	Base Plan	Alt 2	Alt 2a	Alt 3	Alt 4
Years of Offset O&M Dredging	10	10	17	26	26
Nav Benefits	$1,174,000	$1,174,000	$1,996,000	$3,052,000	$3,052,000
Present Value Nav Benefits	$1,053,000	$1,053,000	$1,650,000	$2,280,000	$2,280,000

1/ Navigation benefits were calculated for 10 years starting from project year 1 based on delayed O&M dredging costs.

1.4 Coastal Storm Risk Management (CSRM) Benefits

The Coastal Storm Risk Management (CSRM) benefits associated with Hale'iwa Harbor relate to the reinforcement of a 550 foot long wall at Hale'iwa Beach Park that offers protection to the beach and its facilities but has experienced erosion and the formation of sinkholes due to undermining. Placing dredged material on the beach would help stabilize and protect the wall allowing for a longer period of protection than the current condition offers. Failure of the wall would require rebuilding it to regain that protection, which has been estimated to cost 4.25 million dollars. The CSRM benefits are an estimate of the benefits produced by delaying the failure of the wall and incurring the cost of rebuilding it. The longer period of protection provided by reinforcing the wall with dredged material was estimated based on the amount of material in cubic yards (cy) placed on the beach under each alternative and the current erosion rate of 976 cy/year for the beach. The beach would experience wave driven erosion and scour immediately following placement. This project life assumes that no other measures are performed by state or local agencies to protect the beach or reduce scour. Under the base plan, there is no dredge material placed on the beach so no additional years of CSRM benefits are gained. Under alternative 2, the 7,166 cy erodes after 7 years at the current erosion rate. Under alternative 2a, the 8,871 cy erodes after 9 years at the current erosion rate. Under alternative 3, the 11,071 cy erodes after 11 years at the current erosion rate. Under alternative 4, the 26,071 cy erodes after

23 years at the current erosion rate. The wall is then expected to fail between one and five years after the additional material has eroded away based on the current condition of the wall, after which CSRM benefits would no longer be present. Table C-3 shows the CSRM benefits determined for each alternative.

Table C-3: Hale’iwa Harbor: CSRM Benefits

Alternative	Base Plan	Alt 2	Alt 2a	Alt 3	Alt 4
CSRM Benefits	$276,000	$1,111,000	$1,298,000	$1,440,000	$2,362,000
Present Value CSRM Benefits	$252,000	$887,000	$1,014,000	$1,102,000	$1,553,000

1/ CSRM benefits were calculated for a number of years dependent upon the amount of placed sediment on the beach and the current rate of erosion.

1.5 Recreation Benefits

The recreation benefits associated with Hale’iwa Harbor were calculated based on current visitation to Hale’iwa Beach Park and how the additional sand placed on the beach would affect this visitation with the assumption being that the improvements to the sea turtle habitat from the additional sand will bring additional visitors to the beach as there is still capacity for growth at the beach. Calculations were made based on available data for the beach and IWR Report 86-R-4, which gives guidance on how to determine NED benefits derived from recreation. The capacity method, as outlined in appendix E of the report, was used to estimate the design day load (total number of people using the recreation site in a day) of the beach and, using that value, the annual use of the site was calculated. The design day load is the product of multiplying number of units (parking spaces at Hale’iwa Beach Park), capacity per unit (people per car occupying a parking space), and daily turnover rate (number of uses of a unit per day). Table C-4 shows the calculation for design day load at Hale’iwa Beach Park.

Table C-4: Design Day Use – Hale’iwa Beach Park

Number of units	94
Capacity per Unit	3.4
Daily Turnover Rate	2
Design Day Load	**639.2**

1/ Capacity per unit and daily turnover rate were acquired from IWR Report 74-R1.

Based on the design day load, Hale’iwa Beach Park could theoretically accommodate approximately 233,000 visitors each year. This value does not account for the fact that most days will not see this capacity value reached and that certain seasons within the year will see far fewer visitors in general than what can be referred to as “peak season,” so an expected annual use value is calculated to get a more realistic total number of visitors in a given year. Annual use of Hale’iwa Beach Park was calculated by multiplying the design day load, the average number of weekend days in peak season, the proportion of annual use expected during peak season, and the proportion of peak season use on the weekend. Table C-5 shows the calculation for annual use of Hale’iwa Beach Park.

Table C-5: Annual Use – Hale’iwa Beach Park

Design Day Use	639.2
Ave Number of Weekend Days in Peak Season	24
Proportion of Annual Use Expected in Peak Season	60%

Proportion of Peak Season Use Expected on Weekends	50%
Annual Use	**4,602**

1/ Number of weekend days in peak season was determined based on travel by air to O'ahu island, which occurs in June, July, and September based on 2017 Hawaii Tourism Board data.
2/ Proportions of annual use expected in peak season and peak season use expected on weekends were acquired from IWR Report 74-R1.

Average annual recreation benefits at Hale'iwa Harbor were estimated based on the annual use of Hale'iwa Beach Park and the Unit Day Value (UDV) of recreational activities offered at the beach. The primary recreational activities include surfing, paddle boarding, and turtle watching, thus the specialized recreation UDVs were used to calculate the recreational benefits of the beach. Under the base plan this UDV is $23.91 while under the other alternatives it is $29.82 as the additionally placed sand improves the sea turtle habitat (see the Appendix B – Environmental for additional details) which increases the recreational value of turtle watching. UDV estimates were pulled from EGM22-03.

In the base plan, it is assumed that recreation continues to remain relatively constant as it has in prior years, producing recreation valued at approximately $360,000 annually. In each alternative, it is assumed that recreation will grow as a result of the improved sea turtle habitat and visitors that may come to watch sea turtles and choose to participate in other activities as well, producing recreation valued at approximately $1,300,000 annually. The difference of the base plan and alternative plan (approximately $940,000 annually) was used to calculate the average annual recreational benefits for a number of years based on the amount of sand placed in cubic yards (cy) and an erosion rate of 976 cy/year. The beach would experience wave driven erosion and scour immediately following placement. This project life assumes that no other measures are performed by state or local agencies to protect the beach or reduce scour. Table C-6 shows the additional recreation benefits determined for each alternative.

Table C-6: Hale'iwa Harbor: Recreation Benefits

Alternative	Base Plan	Alt 2	Alt 2a	Alt 3	Alt 4
Years of Additional Rec Benefits	0	3.8	5.6	7.8	23.2
Additional Rec Benefits	$0	$3,746,000	$4,682,000	$5,619,000	$12,643,000
Present Value Rec Benefits	$0	$3,746,000	$4,682,000	$5,186,000	$10,717,000

1/ Recreational benefits were calculated for a number of years dependent upon the amount of placed sediment on the beach and the current rate of erosion.

1.6 Total NED Benefits

The total benefits for Hale’iwa Harbor were calculated as the sum of the three benefit categories: navigation, CSRM, and recreation. Table C-7 shows the total benefits determined for each alternative.

Table C-7: Hale’iwa Harbor: Total NED Benefits

Alternative	Base Plan	Alt 2	Alt 2a	Alt 3	Alt 4
Navigation Benefits	$1,174,000	$1,174,000	$1,996,000	$3,052,000	$3,052,000
CSRM Benefits	$276,000	$1,111,000	$1,298,000	$1,440,000	$2,362,000
Recreation Benefits	$0	$3,746,000	$4,682,000	$5,619,000	$12,643,000
Total Benefits	$1,450,000	$6,031,000	$7,976,000	$10,111,000	$18,525,000
Present Value Total Benefits	$1,293,000	$5,509,000	$7,055,000	$8,568,000	$14,550,000

1/ Total benefits are the sum of all benefits within the 50-year period of analysis.
2/ Totals may not match the sum of each category due to rounding

3. NED Costs and Evaluation of Alternative Plans

The total project cost (present value) and the associated AAC were developed for the O&M Base Plan (Alternative 1A) as well as four additional alternatives: Alternative 2, Alternative 2a, Alternative 3, and Alternative 4. The project cost time stream was converted to an average annual value using a 50-year period of analysis, the FY21 FDR of 2.50 percent, FY21 prices, and a base year of FY25. An annuity factor of 3.5% was used to derive average annual costs (AAC). A summary of each alternative and the associated costs is presented below. All dollar values are presented in FY21 prices.

1.7 O&M Base Plan

The **O&M Base Plan (Alternative 1A)** includes dredging of the federal channel and hauling sediment to the Ocean Dredged Material Disposal Site (ODMDS). No structural modifications would be implemented at Hale'iwa Harbor. Costs associated with the Base Plan are those associated with dredging operations and approximately 4,433 cy of material would be dredged from the channel. These dredging costs include the construction costs (mechanical dredging contract and mobilization and demobilization (Mob/Demob)) as well as preconstruction engineering and design (PED), construction management (CM), and real estate costs. Interest during construction (IDC) totaling $26,901 was calculated for the first year, in which all dredging is planned to occur. These costs are presented in **Error! Reference source not found.**.

Table C-8: Base Plan Dredging Costs (FY21 Prices) 1/

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$894,000	$268,000	$1,162,000	$1,191,000
PED	$665,000	$200,000	$865,000	$887,000
CM	$63,000	$19,000	$81,000	$83,000
Real Estate	$0	$0	$0	$0
Total Investment Costs	$1,622,000	$486,000	$2,108,000	$2,161,000

1/ Values rounded to nearest thousand. Costs reflect a bulk volume of 4,433 cy of material dredged.

Refer to the Appendix D – Costs for further details.

1.8 Alternatives 2 and 2a

Alternative 2 includes dredging of the federal channel then hauling sediment to the Ocean Dredged Material Disposal Site (ODMDS) as well as placing sediment at the Hale'iwa Beach Park. No structural modifications would be implemented at Hale'iwa Harbor. Costs associated with the Base Plan are those associated with dredging the channel to a depth of 12', placing approximately 2,000 cy of material at the ODMDS, and placing the remaining 2,433 cy of material from the federal channel and 1,300 cy of material from the barge access zone at Hale'iwa Beach Park for a total of 3,733 cy of material placed there. These dredging costs include the construction costs (mechanical dredging contract and mobilization and demobilization (Mob/Demob)) as well as preconstruction engineering and design (PED), construction management (CM), and real estate costs. Interest during construction (IDC) totaling $37,694 was calculated for the first year, in which all dredging is planned to occur.

Alternative 2a is nearly identical to Alternative 2 except that this alternative calls for the channel to be dredged to a depth of 13’ with the additional 1,705 cy of material placed at Hale’iwa Beach Park for a total of 5,438 cy of material placed there. Interest during construction (IDC) totaling $40,258 was calculated for the first year, in which all dredging is planned to occur.

The costs associated with Alternatives 2 and 2a are presented in **Error! Reference source not found.** and Table C-10.

Table C-9: Alternative 2 Dredging Costs (FY21 Prices) 1/

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$1,331,000	$399,000	$1,730,000	$1,773,000
PED	$845,000	$254,000	$1,099,000	$1,126,000
CM	$93,000	$28,000	$121,000	$124,000
Real Estate	$3,000	$1,000	$4,000	$4,000
Total Investment Costs	$2,272,000	$682,000	$2,954,000	$3,028,000

1/ Values rounded to nearest thousand. Costs reflect a bulk volume of 4,853 cy of material dredged.

Table C-10: Alternative 2a Dredging Costs (FY21 Prices) 1/

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$1,466,000	$440,000	$1,906,000	$1,954,000
PED	$855,000	$257,000	$1,112,000	$1,140,000
CM	$103,000	$31,000	$133,000	$136,000
Real Estate	$3,000	$1,000	$4,000	$4,000
Total Investment Costs	$2,427,000	$728,000	$3,155,000	$3,234,000

1/ Values rounded to nearest thousand. Costs reflect a bulk volume of 7,069 cy of material dredged.

Refer to the Appendix D – Costs for further details.

1.9 Alternative 3

Alternative 3 includes dredging of the federal channel as well as the settling basin then hauling sediment to the Ocean Dredged Material Disposal Site (ODMDS) as well as placing sediment at the Hale’iwa Beach Park. No structural modifications would be implemented at Hale’iwa Harbor. Costs associated with Alternative 3 are those associated with dredging the channel to a depth of 13’, dredging the settling basin, placing approximately 2,000 cy of material at the ODMDS, and placing the remaining 7,638 cy of material at Hale’iwa Beach Park. These dredging costs include the construction costs (mechanical dredging contract and mobilization and demobilization (Mob/Demob)) as well as preconstruction engineering and design (PED), construction management (CM), and real estate costs. Interest during construction (IDC) totaling $49,557 was calculated for the first year, in which all dredging is planned to occur. These costs are presented in **Error! Reference source not found.**.

Table C-11: Alternative 3 Dredging Costs (FY21 Prices) 1/

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$1,906,000	$572,000	$2,478,000	$2,540,000
PED	$945,000	$284,000	$1,229,000	$1,260,000
CM	$133,000	$40,000	$173,000	$177,000
Real Estate	$3,000	$1,000	$4,000	$4,000
Total Investment Costs	$2,987,000	$896,000	$3,884,000	$3,981,000

1/ Values rounded to nearest thousand. Costs reflect a dredging volume of 9,929 cy.

Refer to the Appendix D – Costs for further details.

1.10 Alternative 4

Alternative 4 includes dredging of the federal channel as well as the settling basin and an offshore sand deposit then hauling sediment to the Ocean Dredged Material Disposal Site (ODMDS) as well as placing sediment at the Hale'iwa Beach Park. No structural modifications would be implemented at Hale'iwa Harbor. Costs associated with Alternative 4 are those associated with dredging the channel to a depth of 13', dredging the settling basin, dredging the offshore sand deposit, placing approximately 2,000 cy of material at the ODMDS, and placing the remaining 22,638 cy of material at Hale'iwa Beach Park. These dredging costs include the construction costs (mechanical dredging contract and mobilization and demobilization (Mob/Demob)) as well as preconstruction engineering and design (PED), construction management (CM), and real estate costs. Interest during construction (IDC) totaling $72,101 was calculated for the first year, in which all dredging is planned to occur. These costs are presented in **Error! Reference source not found.**.

Table C-12: Alternative 4 Dredging Costs (FY21 Prices) 1/

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$2,971,000	$891,000	$3,862,000	$3,959,000
PED	$1,165,000	$350,000	$1,515,000	$1,553,000
CM	$208,000	$62,000	$270,000	$277,000
Real Estate	$3,000	$1,000	$4,000	$4,000
Total Investment Costs	$4,347,000	$1,304,000	$5,651,000	$5,792,000

1/ Values rounded to nearest thousand. Costs reflect a dredging volume of 29,429 cy.

Refer to the Appendix D – Costs for further details.

1.11 Expected Net Benefits and BCR

Net NED benefits are calculated as average annual benefits (AAB) less average annual costs (AAC), while the benefit to cost ratio (BCR) is the ratio of AAB to AAC. Incremental average annual benefits and incremental average annual costs were calculated to determine the values of each over the base plan since that is the plan that would be implemented if the other alternatives were determined to not be economically justified. For this reason, the BCRs calculated for each alternative are the ratio of incremental AAB to incremental AAC. A BCR greater than 1 indicates a project is economically justified.

The expected (most likely) AAB, AAC, incremental AAB, and incremental AAC for each alternative are presented in **Error! Reference source not found.**. AAC are calculated based on the total investment costs for each alternative as well as interest during construction (IDC) and additional monitoring costs incurred during the 50-year study period. Since each alternative produces a BCR greater than 1.0, all alternatives are economically justified. The Recommended Plan is Alternative 4 as it provides the greatest net benefits.

Table C-13: Expected AAB & AAC, Incremental AAB & AAC, Net Benefits, & BCR for All Alternatives (FY21 Price Level)

	Alt 1 (base)	Alt 2	Alt 2a	Alt 3	Alt 4
Total AAB	$46,000	$194,000	$249,000	$302,000	$513,000
Total AAC	$78,000	$110,000	$118,000	$145,000	$210,000
Net Benefits	-$32,000	$84,000	$131,000	$157,000	$303,000
Incremental AAB	$0	$149,000	$203,000	$256,000	$467,000
Incremental AAC	$0	$32,000	$39,000	$66,000	$131,000
Incremental Net Benefits		$117,000	$164,000	$190,000	$336,000
BCR	0.6	4.66	5.21	3.88	3.56

1/ AAB and AAC were estimated using base year of 2024 (FY25), the FY21 FDR of 2.50%, and 50-year period of analysis.
2/ BCR is calculated as the incremental AAB divided by the incremental AAC

Due to the high value of recreation benefits associated with these alternatives, additional BCRs were calculated for each alternative with recreation benefits removed from the calculation as shown in Table C-14. According to Section 3.7 b (7) of the Planning Guidance Notebook, budget Policy generally precludes using Civil Works resources to implement recreation-oriented projects in the Civil Works program. An exception is where a project is formulated for other primary purposes and average annual recreation benefits are less than 50 percent of the average annual benefits required for justification (i.e., the recreation benefits that are required for justification are less than an amount equal to 50 percent of project costs). Since each alternative produces a BCR greater than 0.50 without recreational benefits, all alternatives are compliant with budgeting policy and Alternative 4 remains the TSP.

Table C-14: Expected AAB & AAC, Incremental AAB & AAC, Net Benefits, & BCR for All Alternatives Less Recreation Benefits (FY21 Price Level)

	Alt 1 (base)	Alt 2	Alt 2a	Alt 3	Alt 4
Total AAB (less Rec Benefits)	$46,000	$68,000	$94,000	$119,000	$135,000
Total AAC	$78,000	$110,000	$118,000	$145,000	$210,000
Net Benefits	-$32,000	-$42,000	-$24,000	-$26,000	-$75,000
Incremental AAB (less Rec Benefits)	$0	$23,000	$48,000	$74,000	$90,000
Incremental AAC	$0	$32,000	$39,000	$66,000	$131,000
Incremental Net Benefits	-$32,000	-$9,000	$9,000	$8,000	-$41,000
BCR	0.6	0.72	1.23	1.12	0.69

1/ AAB and AAC were estimated using base year of 2025 (FY25), the FY21 FDR of 2.50%, and 50-year period of analysis.
2/ BCR is calculated as the incremental AAB divided by the incremental AAC

4. Risk and Uncertainty Related to Economics

The primary risks related to the economics of the project are tied to uncertainties regarding the benefits provided by the alternative plans. Assumptions were made to calculate expected benefits in each benefit category based on existing data and information about Hale'iwa Harbor and Hale'iwa Beach Park, but there are inherent risks if these assumptions are flawed or the data and information are inaccurate. The primary risks and consequences are as follows:

1. Risk: Low Risk. Shoaling rates of the navigation channel could change over the course of the study period, resulting in changes to the need for future dredging. Navigation benefits could change significantly if sediment were to impede the channel at a faster rate and if future dredging is not performed in a timely manner. This is possible, but not expected as the shoaling rates are based on a historic average annual rate, so slight variances from year to year should average out to be approximately the same as the estimated rate.

Consequence: Medium Consequence. Navigation benefits are significant, particularly for alternatives 3 and 4, so changes to these benefits could have a large effect on the BCRs of these alternatives.

2. Risk: Low Risk. CSRM benefits could change significantly if the wall failure is not offset as long as expected by the project or if some external force were to expedite the failure, resulting in the need to rebuild the wall and losing the benefits provided by offsetting that rebuild. This is possible, but unlikely based on the information provided, although there is very little accounting for an external force causing excessive damage to the wall.
Consequence: Medium Consequence. CSRM benefits are significant, particularly for alternative 4, so changes to these benefits could have a large effect on the BCR of this alternative.

3. Risk: Low Risk. Beach erosion rates could change over the course of the study period, resulting in either quicker or slower erosion of the placed material. This could significantly increase or decrease the CSRM and recreation benefits that are tied to those erosion rates. This is possible, but not expected as the erosion rates are based on a historic average annual rate, so slight variances from year to year should average out to be approximately the same as the estimated rate.

Consequence: High Consequence. Recreation benefits in particular are significant for each alternative, so the loss of these benefits due to a higher than expected rate of beach erosion could negatively impact the BCRs of these alternatives and potentially result in them not being economically justified.

5. Acronyms

AAB	average annual benefits
AAC	average annual cost
BCR	benefit-cost ratio
FDR	federal discount rate
FWOP	future without-project
FWP	future with-project
FY	fiscal year
NED	national economic development
P&G	Economic and Environmental Principles & Guidelines for Water and Related Land Resources Implementation Studies
PED	preconstruction engineering and design
PY	project year
S&A	supervision and administration
TSP	Tentatively Selected Plan
USACE	U.S. Army Corps of Engineers

6. Attachment 1: FY 22 Price Level Update for Base Plan and Recommended Plan

An update of economic costs and benefits has been prepared to account for the change in the price level from fiscal year 2021 (FY21) to fiscal year 2022 (FY22). All alternatives were anticipated to be similarly impacted by the updated costs and benefits, so the recommended plan was determined to be unlikely to change as a result of this update. This attachment presents the information in the Economic Appendix updated to the current, FY22 price level for Alternative 1A (O&M Base Plan) and Alternative 4 (Recommended Plan).

Benefits
The NED benefits categories have been updated using the FY22 federal discount rate of 2.25%, which is a decrease of 0.25% from the FY21 federal discount rate of 2.5%. Tables CA-1 and CA-2 below show the benefits and present value benefits respectively for both the base plan and Recommended Plan.

Table CA-1: Hale'iwa Harbor: Total NED Benefits (FY22 Price Level)

Benefit Category	Base Plan	Recommended Plan
Navigation Benefits	$1,174,000	$3,052,000
CSRM Benefits	$328,000	$1,140,000
Recreation Benefits	$0	$12,007,000
Total Benefits	$1,502,000	$16,200,000

Table CA-2: Hale'iwa Harbor: Total Present Value NED Benefits (FY22 Price Level)

Benefit Category	Base Plan	Recommended Plan
Present Value Nav Benefits	$1,041,000	$2,344,000
Present Value CSRM Benefits	$307,000	$850,000
Present Value Rec Benefits	$0	$10,275,000
Total Benefits	$1,348,000	$13,468,000

Costs
The updated costs can be found in greater detail in the Cost Engineering Appendix. Tables CA-3 and CA-4 below summarize the breakdown of costs for the base plan and tentatively selected plan.

Table CA-3: Hale'iwa Harbor: Base Plan Dredging Costs (FY22 Price Level)

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$926,000	$241,000	$1,167,000	$1,193,000
PED	$698,000	$182,000	$880,000	$900,000
CM	$68,000	$18,000	$86,000	$88,000
Real Estate	$0	$0	$0	$0
Total Investment Costs	$1,692,000	$441,000	$2,133,000	$2,181,000

Table CA-4: Hale'iwa Harbor: Recommended Plan Dredging Costs (FY22 Price Level)

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$2,999,500	$780,000	$3,779,500	$3,865,000
PED	$1,165,000	$303,000	$1,468,000	$1,501,000
CM	$208,000	$54,000	$262,000	$268,000
Real Estate	$3,000	$1,000	$4,000	$4,000
Total Investment Costs	$4,375,500	$1,138,000	$5,513,500	$5,638,000

Benefit-Cost Ratio

The updated benefits and costs allow for newly calculated benefit-cost ratios (BCRs) at the FY22 price level. The FY22 price level update resulted in a BCR that still exceeds the 1.00 threshold for total benefits and a BCR that still exceeds 0.50 without including recreation benefits, so alternative 4 remains economically justified as the Recommended Plan. Tables CA-5 and CA-6 summarize these updated BCRs for the total benefits as well as the benefits less recreation benefits.

Table CA-5: Expected AAB & AAC, Incremental AAB & AAC, Net Benefits, & BCR for the Base Plan and Recommended Plan (FY22 Price Level)

	Alt 1 (base)	Alt 4
Total AAB	$43,000	$451,000
Total AAC	$74,000	$192,000
Net Benefits	($31,000)	$259,000
Incremental AAB	$0	$408,000
Incremental AAC	$0	$118,000
Incremental Net Benefits	($31,000)	$290,000
BCR	0.58	3.46

Table CA-6: Expected AAB & AAC, Incremental AAB & AAC, Net Benefits, & BCR for the Base Plan and Recommended Plan, Less Recreation Benefits (FY22 Price Level)

	Alt 1 (base)	Alt 4
Total AAB (less Rec Benefits)	$43,000	$107,000
Total AAC	$74,000	$192,000
Net Benefits	($31,000)	($85,000)
Incremental AAB (less Rec Benefits)	$0	$64,000
Incremental AAC	$0	$118,000
Incremental Net Benefits	($31,000)	($54,000)
BCR	0.58	0.54

7. Attachment 2: FY 23 Price Level Update for Base Plan and Recommended Plan

An update of economic costs and benefits has been prepared to account for the change in the price level from fiscal year 2021 (FY21) to fiscal year 2023 (FY23). All alternatives were anticipated to be similarly impacted by the updated costs and benefits, so the recommended plan was determined to be unlikely to change as a result of this update. This attachment presents the information in the Economic Appendix updated to the current, FY23 price level for Alternative 1A (O&M Base Plan) and Alternative 4 (Recommended Plan).

Benefits
The NED benefits categories have been updated using the FY23 federal discount rate of 2.5%, which is the same as the FY21 federal discount rate of 2.5%. Tables CA-1 and CA-2 below show the benefits and present value benefits respectively for both the base plan and Recommended Plan.

Table CA-1: Hale’iwa Harbor: Total NED Benefits (FY23 Price Level)

Benefit Category	Base Plan	Recommended Plan
Navigation Benefits	$1,174,000	$3,052,000
CSRM Benefits	$297,000	$2,473,000
Recreation Benefits	$0	$12,007,000
Total Benefits	$1,471,000	$17,533,000

Table CA-2: Hale’iwa Harbor: Total Present Value NED Benefits (FY23 Price Level)

Benefit Category	Base Plan	Recommended Plan
Present Value Nav Benefits	$1,053,000	$2,280,000
Present Value CSRM Benefits	$283,000	$1,788,000
Present Value Rec Benefits	$0	$10,110,000
Total Benefits	$1,336,000	$14,178,000

Costs
The updated costs can be found in greater detail in the Cost Engineering Appendix. Tables CA-3 and CA-4 below summarize the breakdown of costs for the base plan and tentatively selected plan.

Table CA-3: Hale’iwa Harbor: Base Plan Dredging Costs (FY23 Price Level)

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$1,111,000	$289,000	$1,400,000	$1,435,000
PED	$745,000	$194,000	$939,000	$962,000
CM	$112,000	$29,000	$141,000	$145,000
Real Estate	$0	$0	$0	$0
Total Investment Costs	$1,968,000	$512,000	$2,480,000	$2,542,000

Table CA-4: Hale’iwa Harbor: Recommended Plan Dredging Costs (FY23 Price Level)

Cost Category	Total Direct Cost ($)	Contingency ($)	Total Project First Cost ($)	Total Present Value Cost ($)
Construction Costs	$3,673,000	$955,000	$4,628,000	$4,744,000
PED	$1,305,000	$340,000	$1,645,000	$1,686,000
CM	$368,000	$96,000	$464,000	$476,000
Real Estate	$13,000	$3,000	$16,000	$16,000
Total Investment Costs	$5,359,000	$1,394,000	$6,753,000	$6,922,000

Benefit-Cost Ratio

The updated benefits and costs allow for newly calculated benefit-cost ratios (BCRs) at the FY23 price level. The FY23 price level update resulted in a BCR that still exceeds the 1.00 threshold for total benefits and a BCR that still exceeds 0.50 without including recreation benefits, so alternative 4 remains economically justified as the Recommended Plan. Tables CA-5 and CA-6 summarize these updated BCRs for the total benefits as well as the benefits less recreation benefits.

Table CA-5: Expected AAB & AAC, Incremental AAB & AAC, Net Benefits, & BCR for the Base Plan and Recommended Plan (FY23 Price Level)

	Alt 1 (base)	Alt 4
Total AAB	$47,000	$500,000
Total AAC	$90,000	$248,000
Net Benefits	($43,000)	$252,000
Incremental AAB	$0	$453,000
Incremental AAC	$0	$158,000
Incremental Net Benefits	($43,000)	$295,000
BCR	0.52	2.87

Table CA-6: Expected AAB & AAC, Incremental AAB & AAC, Net Benefits, & BCR for the Base Plan and Recommended Plan, Less Recreation Benefits (FY23 Price Level)

	Alt 1 (base)	Alt 4
Total AAB (less Rec Benefits)	$47,000	$143,000
Total AAC	$90,000	$248,000
Net Benefits	($43,000)	($105,000)
Incremental AAB (less Rec Benefits)	$0	$96,000
Incremental AAC	$0	$158,000
Incremental Net Benefits	($43,000)	($62,000)
BCR	0.52	0.61

Honolulu District
Pacific Ocean Division

APPENDIX D COST ENGINEERING

SECTION 1122: BENEFICIAL USE OF DREDGED MATERIAL HALEIWA SMALL BOAT HARBOR MAINTENANCE DREDGING AND BEACH RESTORATION, ISLAND OF OAHU, HAWAII.

Draft Feasibility Report

August 2023

ATTACHMENTS

1. Project Description

Haleiwa Beach Park is adjacent to the Harbor and is part of the federally authorized Haleiwa Beach Restoration Project, constructed in 1965. The northern portion of this beach experienced significant erosion and its area is significantly reduced from its initial extent. Additionally, public infrastructure that is part of Haleiwa Beach Park, including a sea wall and comfort station experienced storm damage without the beach to protect it. A World War II Monument is also at risk of storm damage because of the reduced beach extent.

2. Alternatives

Four major Alternatives were considered for this study (not including NO ACTION).

Alternative 1: No-Action

Alternative 2: Beneficial Use from Federal Navigation Channel to 12' Depth

Alternative 2a: Beneficial Use from Federal Navigation Channel to 13' Depths

Alternative 3: Beneficial Use from Federal Navigation Channel to 13' Depth, Settling Basin, and Non-Federal Navigation Settling Basin

Alternative 4: Beneficial Use of Dredged Material from Federal Channel to 13', Settling Basin, and Non-Federal Offshore Sand Borrow Area

National Economic Development Plan (NED) / Tentatively Selected Plan

Alternative 4: Beneficial Use of Dredged Material from Federal Channel to 13', Settling Basin, and Non- Offshore Sand Borrow Area.

Note: Access channel has been moved to inside the HBSPP structure.

Figure 1 – RECOMMENDED PLAN

3. Summary of Quantities - Haleʻiwa Beach Shore Protection Project (HBSPP).

Haleʻiwa Small Boat Harbor

Haleʻiwa Harbor offers amenities to boaters as well as many recreation opportunities including sport fishing, sailing, whale watching, and shark cage encounters. It has 64 berths and 26 moorings.

Estimation of Harbor Shoaling

Historic dredging requirements and survey data were used to estimate shoaling rates in anticipation of future dredging (Table 3). Shoaling rates are calculated as the shoaled volume divided by the years of accumulation.

Between the dredging events of 1999 and 2009, approximately 4,556 cy of material shoaled into the federal channel. This equates to an average shoaling rate of 455 cy/yr over this period. The high shoaling rate between 1999 and 2009 suggests that the harbor may fill-in episodically, such as during storm events, rather than steadily over many years. In addition, high shoaling between 1999-2009 could be due to the initiation of sand moving around the breakwater spur due to high wave events. Comparatively, recent hydrosurveys in 2011, 2014, and 2018, suggest the shoaling rate to be less, at approximately 177 cy/yr. Based on this range of shoaling rates (155 to 455 cy/yr), 238 cy/yr was used as an estimate of future shoaling, for the purposes of cost estimating and design volume calculations.

The next anticipated dredging year is 2024. By this time approximately 4,433 cy of material may need to be dredged; this is based on the average estimated shoaling rate of 238 cy/yr and and an additional 1,100 cy to account for overdepths and infilling from side-slopes. The 2009 dredging indicated that the outer material is mostly sand, inner material is mostly silt, and middle material is a mixture of sand and silt. If the harbor needs to be dredged every 10 to 15 years, over the next 20 years (2020 to 2040), the harbor will be dredged twice with a total dredged volume of approximately 5,000 cy.

Table 1. Shoaling volume and rate

Year	Type of Work	Shoaling Volume (cy)	Shoaling Rate (cy/yr)*
1999	Maint. dredging	7,214	219
2009	Maint. dredging	4,556	455
2011	Hydrosurvey	311	155
2014	Hydrosurvey	800	160
2018	Hydrosurvey	1,600	200

*Equal to shoaled volume/yr since last dredging

Haleʻiwa Beach Park

Haleʻiwa Beach Park is a 15.7- ac park located in the town of Haleʻiwa. It is adjacent to 2,500 ft of beach shoreline between HSBH and Puaʻena Point. The backshore facilities at HBP are protected by a 550 ft of vertical wall, and include a comfort station, World War II monument, pavilion, promenade, and a playground. A 160 ft long rubblemound breakwater, part of the HBSPP discussed in section 1.4.2) is located offshore of the wall.

The northern portion of the park has experienced significant erosion and the vertical wall has become undermined, leading to sinkhole formation on the landward side (Figure 5 and Figure 14). The wall and sink holes were repaired; however, the risks of undermining and collapse still remain. The erosion has greatly reduced the recreation value of the beach (Figure 15). A report by Sea Engineering, Inc. (2019) gave Haleʻiwa Beach a High Erosion Hazard Priority Rating, compared with other beaches of Oʻahu.

An analysis of shoreline change rates indicated the maximum long-term erosion rate to -4.3 +-2.6 ft/yr at Haleʻiwa Beach (USACE, 2014). Utilizing a conversion factor of 0.4 cy per square foot (cy/sq ft) of shoreline change, the volume change rate for Haleʻiwa Beach is 980 cy/yr.

Southern Groin

The southern part of Haleʻiwa Beach abuts a rock rubblemound groin that separates the beach park from the outflows of Loko Ea wetland and Anahulu Stream. This profile groin has a crest elevation of 12 ft MLLW near Kamehameha Hwy and follows the profile of the topography seaward a distance of approximately 500 ft to its offshore end, which has an elevation of +3.5 ft MLLW. The groin is considered to be in good condition; however, sand has been observed passing through it in the swash zone. It should also be noted that the nearshore bottom of the beach toe is muddy in the southern portion of the park.

Beach and Nearshore

The beach is widest adjacent to the groin, where the park is approximately 250 ft wide. The backshore is sandy and sparsely vegetated. This area is frequented by beachgoers and paddlers because it provides easy access to the water. There are no signs of erosion in this area.

The beach and park become narrower toward the north, with the narrowest part of the park being just south of a World War II monument. Erosion scarps are present in the vicinity of this monument. The root balls of palm trees are also exposed due to erosion on the upper beach in this area. Fossil reef is found beyond the beach toe, with little sand offshore.

The park widens north of the monument and opens up to a grassy backshore with shade trees, basketball and volleyball courts, soccer fields, playground facilities, a pavilion, comfort stations, and shower facilities.

Figure 2. Erosion near WWII monument circa 2019 (Sea Engineering, 2019)

Figure 3. Beach in front of seawall and comfort station. Note exposed reef rock and root balls. Photo from 2017 (Sea Engineering, 2019)

The backshore in this area is separated from the shoreline by a vertical wall that was built in the 1950s. The vertical wall extends along approximately 550 ft of shoreline. Severe loss of sand fronting the wall has resulted in its undermining. The wall shows signs of settling, spalling, and cracking with sinkholes directly behind it. Repairs to this wall were completed in 2019. However, continued wave action and scour of beach sand will likely cause additional damage to this wall in the future.

Offshore Breakwater

A rock rubble mound breakwater was constructed offshore to stabilize the shoreline as part of harbor development. The breakwater is approximately 160 ft long and is situated about 210 ft offshore of the seawall. The elevation of the breakwater crest is approximately +5.0ft MLLW. Historic photos indicate a wide historic beach was present behind this breakwater that was nourished multiple times through 1974. At present, little or no sand beach is fronting the seawall in this area, and sharp slippery reef rock is exposed (Figure 5).

Table 1 - Summary of Quantities

Alt 4: Plan Components	Dredged Material Placement	
	Beach Suitable/ Beneficial Use (CY)	Fed Standard ODMDS (CY)
Fed Channel to 12'	2,433	2,000
Additional Fed Channel to 13'	1,705	-
Barge Access Zone	1,300	-
Settling Basin	2,200	-
Offshore Sand Borrow Area	15,000	-
TOTAL	**22,638**	**2,000**

The recommended plan includes beneficial use of dredge material from the Federal Navigation Channel to the authorized depth of -12 ft Mean Lower Low Water (2,433 cy at 100% Federal cost) and an additional 1 ft of depth (-13 ft MLLW) for the purpose of the pilot project (1,705 cy at 65% Federal/35% non-federal), State Breakwater Settling Basin (2,200 cy at 100% non-federal cost), Barge Access Zone (1,300 cy at 100% Federal cost) and an Offshore Sand Borrow Area (15,000 cy at 100% non-federal cost). Dredging from these locations will yield approximately 22,638 cy of beach suitable sand and will be used to restore 4.4 acres of beach at Haleiwa Beach Shore Protection Project.

Approximately 2,000 cy of fine-grained dredged material from the Federal Navigation Channel that is not suitable for beach restoration will be transported by scow and taken to the South Oʻahu Ocean Dredged Material Disposal Site (ODMDS).

The access zone would be 50 ft wide, approximately 140 ft long, and would be dredged to a depth of -10 MLLW. The scow barge would travel from the harbor channel to the access zone along a direct path of approximately 450 ft, in an area with existing depths of -10 ft MLLW or greater. Excavation of this access zone is anticipated to produce approximately 1,300 cy of beach suitable dredged material.

Under this alternative, the additional one foot of dredging is anticipated to produce an additional 1,705 cy of beach suitable sand material that will be used for nourishment of the HBSPP.

Approximately 2,433 cy of material from this area are anticipated to meet the requirements for use as beach sand.

Under this alternative, excavation of the Offshore Sand Borrow Area is anticipated to produce an additional 15,000 cy of beach suitable sand that will be used for nourishment of the HBSPP.

Current material is based on 1999 surveys.

4. Real Estate Cost

The estimated real estate cost associated with the Recommended Plan is approximately $24,100, including all LERRDs, administrative costs to be carried out by the NFS, and Government costs for LERRDs monitoring and certification. Minimal real estate action is needed for project implementation. Based on the findings of the Real Estate Plan (Appendix E), the NFS must acquire a temporary work area easement from the City and County of Honolulu. The City and County of Honolulu owns HBP, which includes the anticipated staging area as well as a portion of the beach above the high-water mark required for beach restoration. The temporary work area easement is estimated at 1.9 acres and is anticipated to be required for one year during project construction. Easement boundaries will be refined during the Preconstruction, Engineering, and Design phase.

5. Basis of Design

The design details are described in the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration
Maintenance Dredging Plans and Specifications. The plan set provides the beach locations, site access, and work limits for beach area placement. The plans show the proposed approach harbor dredging area as well as dredge material placement area next to the harbor for comparison and beach areas.

Basis of Quantities

Quantities were provided by the technical team.

Offshore Sand Borrow Area

~15,000 cy – beach suitable sands taken to Haleiwa Beach Park. Outside of Federal channel – (100% non-Federal cost).

NED - 26,000 cy of sandy material placed at Haleiwa Beach Park, fills littoral cell to capacity

6. Construction Estimate

Marine work was predominantly estimated utilizing CEDEP spreadsheets with specified input factors. Mechanical CEDEP was used for the Baseline dredging, as conducted historically comparing the Alternate 1 placement area barging distance with typical maintenance contract littoral placement. The Pipeline Hydraulic Dredge CEDEP was used for Alternative 2 comparing the difference in transporting and placement costs less the cost of dredging and Alternative 3 considering a small hydraulic dredge or similar hydraulic pumping for offloading dredge material. Developed cost was verified with Historical Data from reference project's Bid Abstracts and RMS documentation for reasonableness.

Major Construction Features for the recommended plan (Alt 4) were estimated as follows.

Mobilization & Demobilization

Marine Mobilization/Demobilization was developed in CEDEP (Mob Input tab). It was assumed that it would take 5 day with a crew of 10 men (8hrs/day) to prep the dredge for transfer to the jobsite and another 2 days using the same crew to prep the equipment for work once it arrived at the jobsite. A 200-mile mob distance was used. The cost to relocate supervisory personnel to the jobsite is also included in CEDEP calcs. Land Mobilization were based on Cost Book items and includes land-based MOB/DEMOB.

Beach Placement of Dredging Material

Based on previous maintenance dredging contracts in RMS, a reduced crew size of 15 was used to account for the hydraulic offloading with an effective working time of 50% as specified in CEDEP. A production rate of 150 CY/HR is assumed for offloading as well as beach placement. The land-based beach placement crew consists of 1 operator and 1 laborer with articulated loader and trailer mounted light set for extending offloading time consistent with the assumed dredging operations.

General Conditions, Overhead, and Profit

The estimate assumes that the prime contractor will self-perform all marine work. It also assumes that the prime contractor will add 10% for home office overhead (HOOH), 15% for job office overhead, and 10% for profit as a running percentage of direct cost.

Miscellaneous TPCS Markups, Assumptions, & General Notes

Escalation on construction features assumes mid-point of first year construction approx. FY24 with Ready to Advertise (RTA). Per EM 110-2-1304 (SEP-2021 INDICES)

Costs for the 30 & 31 accounts (PED and CM respectively) were provided by the POH Cost Engineering Chief at 12.3% and 4.1% respectively of the contract total.

A 14.29% Overtime rate was applied in CEDEP and MII and assumes 2 shifts, 10 HR workdays 6 days per week with 1.5 pay for Saturdays and anytime over a typical 40-hour work.

Marine Labor Rates DEPARTMENT OF LABOR AND INDUSTRIAL, September 19, 2022, WAGE RATE SCHEDULE BULLETIN NO. 502.

MII Equipment rates per EP 1110-1-8, Volume 10, 2022.

Table 2 - MCACES Markups

Prime - Oahu

Markup	Own Work	Sub Work
JOOH [Running %]	15.00%	15.00%
HOOH [Running %]	10.00%	10.00%
Profit [Running %]	10.00%	10.00%
Bond [Running %]	1.00%	1.00%
Excise Tax [Direct Pct]	4.17%	4.17%

Sub Work - Oahu

Markup	Own Work	Sub Work
Sub OH [Running %]	15.00%	15.00%
Sub Profit [Running %]	10.00%	10.00%

Engineering & Surveying

Markup	Own Work	Sub Work
Sub OH [Running %]	15.00%	15.00%
Sub Profit [Running %]	10.00%	10.00%

7. Baseline Cost Estimate for Real Estate

Obtained from Real Estate Plan, Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration, Integrated Feasibility Report, Section 1122

The estimated real estate cost associated with the Recommended Plan is approximately $21,000, including all lands, easements, rights-of-way, relocations, and disposals (LERRDs), administrative costs to be carried out by the NFS, and Government costs for LERRDs monitoring and certification. As the land management agency for the State, the NFS is considered fully capable at present to acquire and provide the LERRDs necessary for the Project. Lands within the Project area are either owned by the NFS or the City and County of Honolulu, which has indicated a willingness to participate as a Project partner.

"The Agreement between the United States of America and the State of Hawaii for local cooperation in connection with emergency repairs to Shore Protection Structures under Public Law 99, Haleiwa Beach, Oahu, Hawaii, dated 8th August 1977, allows for all lands, easements, and rights-of-way necessary for the authorized emergency work. The State further gave the Government the right to enter upon lands which the State owns or controls, for the purpose of operating, repairing, and maintaining the Project."

Assume $3,000 (15%) for contingency.

8. Construction Schedule

The construction schedule for this project is based Dredging contract for FY24 and durations estimated based on the project features contained in the CEDEP spreadsheets and the MII estimate. The anticipated dredging Base year is 2024. The current estimated duration for dredging, offloading and placement of dredged material is within 1 dredging season. Overall quantity is less than 25,000 cyds.

9. Acquisition Plan

The current acquisition strategy is assumed fully open and competitive though an actual contracting plan has yet to be established.

10. Risk Assessment

Detailed cost and schedule risk analysis (CSRS) was performed to develop contingency for the construction cost estimate. The current construction contingency for the NED alternative 4 is approximately 26%.

11. 30 Account PED and 31 Account Construction S&A

As provided

Table 3 - 30 & 31 Account

Alternative	PED Tasks	PED $k	Total $k per Alt	2019 Price Level Cumulative	2021 Adjustment Price Level (5%)	2022 Adjustment Price Levels (2%)	2023 Adjustment Price Levels (4.6%)	
Base	P&S	450						
	Hydro survey	50						
	Sed Sampling (3)	125						
	Environmental	40	665	665	698	**712**	**745**	Federal (O&M)
Alt 2	P&S (8 sheets)	50						
	Topo Survey	50						
	Sed Sampling (0)	0						
	Environmental (401/NPDES)	50	150	815				Federal (1122)
Alt 2A	P&S	$10						
	Sediment Sampling (0)	0						
	Environmental	0	$10	$825				Fed/Non-Fed
Alt 3	P&S (3 sheets)	30						
	Topo Survey	10						
	Sediment Sampling (1)	25						
	Environmental	25	90	$915				Non-Fed (DOBOR)
Alt 4	P&S (3 sheets)	30						
	Add'l Hydrosurvey	40						
	Sediment Sampling (4-6)	125						
	Environmental	25	220	$1,135	$1,192	**$1,216**	**$1,272**	Non-Fed (DLNR)

S&A **10%**

12. References

U.S. Army Corps of Engineers, 1993, Engineering and Design Cost Engineering Policy and General Requirements, Engineering Regulation 1110-1-1300, Department of the Army, Washington D.C., 26 March 1993.

U.S. Army Corps of Engineers, 1999, Engineering and Design for Civil Works Projects,

Engineering Regulation 1110-2-1150, Department of the Army, Washington D.C., 31 August 1999.

U.S. Army Corps of Engineers, 2016, Civil Works Cost Engineering, Engineering Regulation 1110-2-1302, Department of the Army, Washington D.C., 30 June 2016.

U.S. Army Corps of Engineers, 2019, Civil Works Construction Cost Index System (CWCCIS), Engineering Manual 1110-2-1304, Department of the Army, Washington D.C., 31 March 2020.

Unified Facilities Criteria, 2011, Handbook: Construction Cost Estimating, Unified Facilities Criteria (UFC) 3-740-05, Department of Defense, 1 June 2011.

ATTACHMENTS
TOTAL PROJECT COST SUMMARYS (TPCS)
RECOMMENDED PLAN

ATTACHMENTS
TOTAL PROJECT COST SUMMARYS
ALTERNATIVES

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: **(474950) Haleiwa 1122 Beneficial Use Pilot** DISTRICT: **POH** PREPARED: **2/7/2023**
PROJECT NO: **Incremental Cost - Alternative 4 - Beneficial Use From Federal Navigation Channel with Additional Deepening, Settling Basin,**
LOCATION: **Oahu** POC: **CHIEF, COST ENGINEERING**

This Estimate reflects the scope and schedule in report; Report Name and date

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC):				2023					
						Effective Price Level Date:				1-Oct- 22					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	REMAINING COST ($K)	Spent Thru: 10-Feb-23 ($K)	TOTAL FIRST COST ($K)	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
17	BEACH REPLENISHMENT	$2,562	$666	26%	$3,228	0.0%	$2,562	$666	$3,228	$0	$3,228	3.5%	$2,653	$690	$3,342
		$0	$0	-	$0	-	$0	$0	$0	$0	$0	-	$0	$0	$0
		$0	$0	-	$0	-	$0	$0	$0	$0	$0	-	$0	$0	$0
		$0	$0	-	$0	-	$0	$0	$0	$0	$0	-	$0	$0	$0
	CONSTRUCTION ESTIMATE TOTALS:	$2,562	$666		$3,228	0.0%	$2,562	$666	$3,228	$0	$3,228	3.5%	$2,653	$690	$3,342
01	LANDS AND DAMAGES	$14	$3	20%	$16	0.0%	$14	$3	$16		$16	0.0%	$14	$3	$16
30	PLANNING, ENGINEERING & DESIGN	$560	$146	26%	$706	0.0%	$560	$146	$706	$563	$1,269	1.2%	$567	$147	$1,277
31	CONSTRUCTION MANAGEMENT	$256	$67	26%	$323	0.0%	$256	$67	$323		$323	3.4%	$265	$69	$333
	PROJECT COST TOTALS:	$3,391	$881	26%	$4,272		$3,391	$881	$4,272	$563	**$4,835**	3.1%	$3,498	$909	$4,969

CHIEF, COST ENGINEERING

PROJECT MANAGER, XXX

CHIEF, REAL ESTATE, XXX

CHIEF, PLANNING, XXX

CHIEF, ENGINEERING, XXX

CHIEF, OPERATIONS, XXX

CHIEF, CONSTRUCTION, XXX

CHIEF, CONTRACTING, XXX

CHIEF, PM-PB, xxxx

CHIEF, DPM, XXX

Incremental Cost Calculation	**TOTAL FIRST COST**	**PROJECT COST**
Alternative #4	$6,752	**$6,961**
Spent Cost	$563	**$563**
Base Plan (Alt 1)	-$2,480	**-$2,555**
Incremental Total Project Cost	**$4,835**	**$4,969**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: (474950) Haleiwa 1122 Beneficial Use Pilot
LOCATION: Oahu
This Estimate reflects the scope and schedule in report; Report Name and date

DISTRICT: POH
POC: CHIEF, COST ENGINEERING

PREPARED: 2/7/2023

WBS Structure		**ESTIMATED COST**				**PROJECT FIRST COST (Constant Dollar Basis)**				**TOTAL PROJECT COST (FULLY FUNDED)**				
		Estimate Prepared: 2/7/23 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1 -Oct-22								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	Alternative #4													
17	BEACH REPLENISHMENT	$3,673	$955	26.0%	$4,628	0.0%	$3,673	$955	$4,628	2024Q2	3.5%	$3,803	$989	$4,792
		$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
		$0	$0		$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
		$0	$0		$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
							$0							
	CONSTRUCTION ESTIMATE TOTALS:	$3,673	$955	26.0%	$4,628		$3,673	$955	$4,628			$3,803	$989	$4,792
01	LANDS AND DAMAGES	$14	$3	20.0%	$16	0.0%	$14	$3	$16	2023Q1	0.0%	$14	$3	$16
						0.0%								
30	PLANNING, ENGINEERING & DESIGN					0.0%					0.0%			
0.0%	Project Management	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Planning & Environmental Compliance	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
34.6%	Engineering & Design	$1,272	$331	26.0%	$1,603	0.0%	$1,272	$331	$1,603	2023Q3	1.7%	$1,294	$336	$1,630
0.0%	Reviews, ATRs, IEPRs, VE	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Life Cycle Updates (cost, schedule, risks)	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Contracting & Reprographics	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
12.2%	Engineering During Construction	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Planning During Construction	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Adaptive Management & Monitoring	$33	$9	26.0%	$42	0.0%	$33	$9	$42	2025Q3	6.2%	$35	$9	$44
0.0%	Project Operations	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
		$0				0.0%	$0	$0			0.0%	$0	$0	
31	CONSTRUCTION MANAGEMENT					0.0%	$0	$0			0.0%	$0	$0	
10.0%	Construction Management	$368	$96	26.0%	$464	0.0%	$368	$96	$464	2024Q2	3.4%	$380	$99	$479
0.0%	Project Operation:	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Project Management	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
	CONTRACT COST TOTALS:	$5,359	$1,393		$6,752		$5,359	$1,393	**$6,752**			$5,526	$1,436	**$6,961**

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: (474950) Haleiwa 1122 Beneficial Use Pilot — DISTRICT: POH — PREPARED: 2/7/2023
LOCATION: Oahu — POC: CHIEF, COST ENGINEERING
This Estimate reflects the scope and schedule in report; Report Name and date

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 1/0/00 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1 -Oct-22								
WBS NUMBER *A*	Civil Works Feature & Sub-Feature Description *B*	COST ($K) *C*	CNTG ($K) *D*	RISK BASED CNTG (%) *E*	TOTAL ($K) *F*	ESC (%) *G*	COST ($K) *H*	CNTG ($K) *I*	TOTAL ($K) *J*	Mid-Point Date *P*	ESC (%) *L*	COST ($K) *M*	CNTG ($K) *N*	FULL ($K) *O*
	Base Plan (Alt 1)													
17	BEACH REPLENISHMENT	-$1,111	-$289	26.0%	-$1,400	0.0%	-$1,111	-$289	-$1,400	2024Q2	3.5%	-$1,150	-$299	-$1,449
		$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
		$0	$0		$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
		$0	$0		$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
							$0							
	CONSTRUCTION ESTIMATE TOTALS:	-$1,111	-$289	0.0%	-$1,400		-$1,111	-$289	-$1,400			-$1,150	-$299	-$1,449
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
						0.0%								
30	PLANNING, ENGINEERING & DESIGN					0.0%					0.0%			
0.0%	Project Management	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Planning & Environmental Compliance	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
67.1%	Engineering & Design	-$745	-$194	26.0%	-$939	0.0%	-$745	-$194	-$939	2023Q4	2.3%	-$762	-$198	-$960
0.0%	Reviews, ATRs, IEPRs, VE	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Life Cycle Updates (cost, schedule, risks)	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Contracting & Reprographics	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
12.2%	Engineering During Construction	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Planning During Construction	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Adaptive Management & Monitoring	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Project Operations	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
		$0				0.0%	$0	$0			0.0%	$0	$0	
31	CONSTRUCTION MANAGEMENT					0.0%	$0	$0			0.0%	$0	$0	
10.0%	Construction Management	-$112	-$29	26.0%	-$141	0.0%	-$112	-$29	-$141	2024Q2	3.4%	-$116	-$30	-$146
0.0%	Project Operation:	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.0%	Project Management	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
	CONTRACT COST TOTALS:	-$1,968	-$512		-$2,480		-$1,968	-$512	**-$2,480**			-$2,028	-$527	**-$2,555**

ATTACHMENTS
MCACES DETAILED ESTIMATE

Estimated by Cost MCX
Designed by POH
Prepared by Kim Callan
Preparation Date 2/13/2023
Effective Date of Pricing 2/13/2023
Estimated Construction Time Days

Description	Quantity	UOM	ContractCost
Summary			**3,668.6**
RECOMMENDED PLAN Beneficial Use From Federal Navigation Channel with Additional Deepening, Settling Basin, and Offshore Sand Deposit	**1**	**EA**	**3,668.6**
M&D Mobilization and Demobilization	**1**	**EA**	**917.4**
ODMDS ODMDS Disposal	**2,000**	**CY**	**202.3**
BEACH Dispose at Haleiwa Beach Park	**3,733**	**CY**	**547.6**
BEACH Dispose at Haleiwa Beach Park with Addtional Deepening to 13' Depth	**1,705**	**CY**	**157.7**
OFF Offshore Material to Beach	**15,000**	**CY**	**1,843.7**

Currency in US dollars

Description	Quantity	UOM	ContractCost
Details			**3,668,645**
RECOMMENDED PLAN Beneficial Use From Federal Navigation Channel with Additional Deepening, Settling Basin, and Offshore Sand Deposit	**1**	**EA**	**3,668,645**
M&D Mobilization and Demobilization	**1**	**EA**	**917,395**
M&D Mob, Demob & Preparatory Work	**1**	**JOB**	**917,395**
MAR Mob/Demob (Marine)	**1**	**LS**	**839,338**
LAND Mob/Demob (Land)	**1**	**EA**	**78,056**
ODMDS ODMDS Disposal	**2,000**	**CY**	**202,309**
090115 Mechanical Dredging	**2,000**	**CY**	**202,309**
Dredging	**2,000**	**CY**	**116,176**
09011502 Site Work	**2,000**	**CY**	**86,133**
090199 Associated General Items	**1**	**EA**	**86,133**
BEACH Dispose at Haleiwa Beach Park	**3,733**	**CY**	**547,581**
Dredging	**3,733**	**CY**	**461,448**
Dredge Barge Access Zone	**1,300**	**CY**	**132,801**
Dredging	**1,300**	**CY**	**30,495**
Place Access Channel at Haleiwa Beach Park	**80**	**HR**	**102,305**
Dredging	**2,433**	**CY**	**58,130**
Place at Haleiwa Beach Park	**76**	**HR**	**178,167**
Site Work	**2,000**	**CY**	**92,351**
Land Survey & Layout	**1**	**DAY**	**5,766**
BMPs	**1**	**LS**	**75,486**
Final Cleanup of Beach Areas	**1**	**LS**	**11,098**
As-Builts	**1**	**EA**	**86,133**
BEACH Dispose at Haleiwa Beach Park with Addtional Deepening to 13' Depth	**1,705**	**CY**	**157,707**
Dredging	**1,705**	**CY**	**157,707**
Dredging	**1,705**	**CY**	**40,884**
Place at Haleiwa Beach Park	**56**	**HR**	**116,823**
OFF Offshore Material to Beach	**15,000**	**CY**	**1,843,654**
Dredging	**15,000**	**CY**	**1,553,344**
Dredging	**15,000**	**CY**	**476,970**
Place at Haleiwa Beach Park	**470**	**HR**	**912,858**
Site Work	**15,000**	**CY**	**77,384**
Land Survey & Layout	**5**	**DAY**	**26,697**
BMPs	**1**	**LS**	**22,210**
Final Cleanup of Beach Areas	**1**	**LS**	**28,477**
As-Builts	**1**	**EA**	**86,133**
BASIN Remove Sand from Settling Basin Long Reach Excavator (max reach 50ft)	**2,200**	**CY**	**290,309**
Remove Sand	**2,200**	**CY**	**290,309**
Dredging	**2,200**	**CY**	**65,680**
Place at Haleiwa Beach Park	**80**	**HR**	**83,999**
Site Work	**2,200**	**CY**	**140,630**

Currency in US dollars

ATTACHMENTS
COST AND SCHEDULE RISK ANALYSIS

US Army Corps of Engineers®

SECTION 1122: BENEFICIAL USE OF DREDGED MATERIAL

HALEIWA SMALL BOAT HARBOR MAINTENANCE DREDGING AND BEACH RESTORATION, ISLAND OF OAHU, HAWAII

Cost and Schedule Risk Analysis Report for the Feasibility Report

Prepared for:
U.S. Army Corps of Engineers,
POH District

Prepared by:
U.S. Army Corps of Engineers
Walla Walla Cost MCX

Date: February 09, 2023

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX

EXECUTIVE SUMMARY

Project Purpose

Haleiwa Beach Park is adjacent to the Harbor and is part of the federally authorized Haleiwa Beach Restoration Project, constructed in 1965. The northern portion of this beach experienced significant erosion and its area is significantly reduced from its initial extent. Additionally, public infrastructure that is part of Haleiwa Beach Park, including a sea wall and comfort station experienced storm damage without the beach to protect it. A World War II Monument is also at risk of storm damage because of the reduced beach extent.

Project Scope

Figure 1 - Project Reach

Risk Analysis Results

A Cost and Schedule Risk Analysis (CSRA) was performed in 2/26/2021 on this project to identify the 80% confidence level contingencies for the remaining construction activities. The contingencies considered both cost and schedule; the schedule risks then being converted to an additional cost risk. The resulting contingency was then applied to the remaining project activities such as Lands and Damages, Design and Construction Management. The following results were observed:

Table 1 - Risk Analysis Results

Construction Results	Construction Amount	Contingency %
Remaining Construction	$3,673,000	26%
Project Schedule	1 dredge season	0%

Key Risk Items, Cost

The following were high risk items affecting cost. The complete risk register can be viewed in Appendix A.

- ID: 08 - Competition/Market Conditions and Perceived Risk:

Discussion: The number of bidders interested in bidding on the remaining project feature bid packages is dependent on supply and demand. Current market conditions seem to indicate a high degree of interest in the projects. Multiple competitive bids are anticipated, lowering the costs of the projects. In addition

Risk Reduction Measures: Take Actions to Reduce (Mitigate) – Open competition for maximum bidding competition, solicit contract to allow sufficient time for bidding competition.

- ID: 17- Local Plant Availability and Interest

Discussion: Estimate assumes all plant located within the islands. Could affect project with higher Mobilization and Demobilization cost.

Risk Reduction Measures: Take Actions to Reduce (Mitigate) – Obtain contract types that result in highest competition.

- ID: 16 - Current Fuel Price...... (Per Gallon):

Discussion – Project history has shown fluctuation to fuel pricing. Fuel cost. Dredging cost is highly dependent on fuel cost.

Risk Reduction Measures: Accept Risk, Current assumptions are based on a 5-year average

Key Risk Items, Schedule

The following items were high risk items affecting the project schedule. The complete risk register can be viewed in Appendix A.

- None

Discussion – The PDT discussed scoping risk items. It was the consensus of the group, the project was flexible enough to complete within the current schedule. Three moderate risk items were identified could which impact windows on yearly seasons, but overall project schedule should show no impact.

Risk Reduction Measures: NA

Total Project Cost Summary

The following table portrays the full costs of the remaining project features based on the anticipated contracts. The costs are intended to address the congressional requests of estimates to complete the project. Costs are in thousands of dollars.

The 26% contingency is based on an 80% confidence level, as per USACE Civil Works guidance.

Table 2 - Cost Summary

ACCT	DESCRIPTION		COST ($)	CONTG ($)	TOTALS($)
1	Lands & Damages	20%	$ 13,500	$ 2,700	$ 16,200
17	Beach Replenishment	26%	$ 3,673,000	$ 954,980	$ 4,627,980
	Non-construction Costs				
30	Planning, Engineering & Design**	26%	$ 1,305,000	$ 339,300	$ 1,644,300
31	Supervision & Administration**	26%	$ 368,000	$ 95,680	$ 463,680
	Summary 30 & 31 Account		**$ 1,673,000**	**$ 434,980**	**$ 2,107,980**
Estimated Project Cost			**$ 5,359,500**	**$ 1,392,660**	**$ 6,752,160**

PURPOSE/BACKGROUND

Haleiwa Beach Park is adjacent to the Harbor and is part of the federally authorized Haleiwa Beach Restoration Project, constructed in 1965. The northern portion of this beach experienced significant erosion and its area is significantly reduced from its initial extent. Additionally, public infrastructure that is part of Haleiwa Beach Park, including a sea wall and comfort station experienced storm damage without the beach to protect it. A World War II Monument is also at risk of storm damage because of the reduced beach extent.

REPORT SCOPE

The scope of the risk analysis report is to calculate and present the cost and schedule contingencies at the 80 percent confidence level using the risk analysis processes as mandated by U.S. Army Corps of Engineers (USACE) Engineer Regulation (ER) 1110-2-1150, Engineering and Design for Civil Works, ER 1110-2-1302, Civil Works Cost Engineering, and Engineer Technical Letter 1110-2-573, Construction Cost Estimating Guide for Civil Works. The report presents the contingency results for both cost and schedule risks for all project features. The study and presentation can include or exclude consideration for operation and maintenance or life cycle costs, depending upon the program or decision document intended for funding.

Project Scope

Major Project Features studied from the civil works work breakdown structure (CWWBS) for this project includes:

01 – Lands & Damages

17 – Beach Replenishment

30 - Planning, Engineering & Design

31 - Construction Management

USACE Risk Analysis Process

The risk analysis process follows the USACE Headquarters requirements as well as the guidance provided by the Cost Engineering Directory of Expertise for Civil Works (Cost Engineering MCX). The risk analysis process reflected within the risk analysis report uses probabilistic cost and schedule risk analysis methods within the framework of the Crystal Ball software. The risk analysis results are intended to serve several functions, one being the establishment of reasonable contingencies reflective of an 80 percent confidence level to successfully accomplish the project work within that established contingency amount. Furthermore, the scope of the report includes the identification and communication of important steps, logic, key assumptions, limitations, and decisions to help ensure that risk analysis results can be appropriately interpreted.

Risk analysis results are also intended to provide project leadership with contingency information for scheduling, budgeting, and project control purposes, as well as provide tools to support decision making and risk management as the project progresses through planning and implementation. To fully recognize its benefits, cost and schedule risk analyses should be considered as an ongoing process conducted concurrent to, and iteratively with, other important project processes such as scope and execution plan development, resource planning, procurement planning, cost estimating, budgeting, and scheduling.

In addition to broadly defined risk analysis standards and recommended practices, the risk analysis is performed to meet the requirements and recommendations of the following documents and sources:

- ER 1110-2-1150, Engineering and Design for Civil Works Projects.
- ER 1110-2-1302, Civil Works Cost Engineering.
- ETL 1110-2-573, Construction Cost Estimating Guide for Civil Works.
- Cost and Schedule Risk Analysis Process guidance prepared by the USACE Cost Engineering MCX.
- Memorandum from Major General Don T. Riley (U.S. Army Director of Civil Works), dated July 3, 2007.
- Engineering and Construction Bulletin issued by James C. Dalton, P.E. (Chief, Engineering and Construction, Directorate of Civil Works), dated September 10, 2007.

METHODOLOGY/PROCESS

A CSRA meeting was held virtually thru CEPOH office on 2/26/2021. Participants include the following members.

Table 3 - PDT Risk Identification Team

Engineering Risk Analysis

SECTION 1122: BENEFICIAL USE OF DREDGED MATERIAL

Risk Facilitato Kim Callan

Risk Register Meeting

Date: 2/26/2021

Attendance	Name	Office	Representing
Y	Reder, Benjamin E CIV USARMY CEPOH (USA)		**PM**
Y	Stala, Gabriel CIV USARMY CELRP (US)		**Econ**
Y	Paahana, Jessie A CIV USARMY CEPOH (USA)		**Environ**
Y	Podoski, Jessica H CIV USARMY CEPOH (USA)		**Engineering**
Y	Choy, Christine K I		**Dept of Design and Constr**
Y	Lau, Clifford		**Dept of Design and Constr**
Y	Habel, Shellie L		**Office of Conservation & Coastal Lands**
Y	Vomocil, Nathan N POH		**Econ**

The risk analysis process for this study is intended to determine the probability of various cost outcomes and quantify the required contingency needed in the cost estimate to achieve any desired level of cost confidence. A parallel process is also used to determine the probability of various project schedule duration outcomes and quantify the required schedule contingency (float) needed in the schedule to achieve any desired level of schedule confidence.

In simple terms, contingency is an amount added to an estimate (cost or schedule) to allow for items, conditions, or events for which the occurrence or impact is uncertain and that experience suggests will likely result in additional costs being incurred or additional time being required. The amount of contingency included in project control plans depends, at least in part, on the project leadership's willingness to accept risk of project overruns. The less risk that project leadership is willing to accept the more contingency should be applied in the project control plans. The risk of overrun is expressed, in a probabilistic context, using confidence levels.

The Cost Engineering MCX guidance for cost and schedule risk analysis generally focuses on the 80-percent level of confidence (P80) for cost contingency calculation. It should be noted that use of P80 as a decision criteria is a risk adverse approach (whereas the use of P50 would be a risk neutral approach, and use of levels less than 50 percent would be risk seeking). Thus, a P80 confidence level results in greater contingency as compared to a P50 confidence level.

The risk analysis process uses *Monte Carlo* techniques to determine probabilities and contingency. The *Monte Carlo* techniques are facilitated computationally by a commercially available risk analysis software package (Crystal Ball) that is an add-in to Microsoft Excel. Cost estimates are packaged into an

Excel format and used directly for cost risk analysis purposes. Because Crystal Ball is an Excel add-in, the schedules for each option are recreated in an Excel format from their native format. The level of detail recreated in the Excel-format schedule is sufficient for risk analysis purposes that reflect the established risk register, but generally less than that of the native format.

The primary steps, in functional terms, of the risk analysis process are described in the following subsections. Risk analysis results would be provided in section 6.

Identify and Assess Risk Factors

Identifying the risk factors via the PDT are considered a qualitative process that results in establishing a risk register that serves as the document for the further study using the Crystal Ball risk software. Risk factors are events and conditions that may influence or drive uncertainty in project performance. They may be inherent characteristics or conditions of the project or external influences, events, or conditions such as weather or economic conditions. Risk factors may have either favorable or unfavorable impacts on project cost and schedule.

Checklists or historical databases of common risk factors are sometimes used to facilitate risk factor identification. However, key risk factors are often unique to a project and not readily derivable from historical information. Therefore, input from the entire PDT is obtained using creative processes such as brainstorming or other facilitated risk assessment meetings. In practice, a combination of professional judgment from the PDT and empirical data from similar projects is desirable and is considered.

A Formal PDT meeting was held in CESAJ on 3/14/2013 for the purposes of identifying and assessing risk factors. The initial formal meeting focused primarily on risk factor identification using brainstorming techniques, but also included some facilitated discussions based on risk factors common to projects of similar scope and geographic location. Discussions focused primarily on risk factor assessment and quantification.

Quantify Risk Factor Impacts

The quantitative impacts of risk factors on project plans are analyzed using a combination of professional judgment, empirical data, and analytical techniques. Risk factor impacts are quantified using probability distributions (density functions), because risk factors are entered into the Crystal Ball software in the form of probability density functions.

Similar to the identification and assessment process, risk factor quantification involves multiple project team disciplines and functions. However, the quantification process relies more extensively on collaboration between cost engineering, designers, and risk analysis team members with lesser inputs from other functions and disciplines.

The following is an example of the PDT quantifying risk factor impacts by using an iterative, consensus-building approach to estimate the elements of each risk factor:

- Maximum possible value for the risk factor.
- Minimum possible value for the risk factor.
- Most likely value (the statistical mode), if applicable.

- Nature of the probability density function used to approximate risk factor uncertainty.
- Mathematical correlations between risk factors.
- Affected cost estimate and schedule elements.

Risk discussions focused on the various project features as presented within the USACE Civil Works Work Breakdown Structure for cost accounting purposes. It was recognized that the various features carry differing degrees of risk as related to cost, schedule, design complexity, and design progress. It was also understood that features were in various phases of design and construction, varying risks further. The example features under study are presented in table 1:

Table 4 - Work Breakdown Structure by Feature

01	LANDS AND DAMAGES
17	BEACH REPLENISHMENTS
30	PLANNING, ENGINEERING & DESIGN
31	CONSTRUCTION MANAGEMENT

The resulting product from the PDT discussions is captured within a risk register as presented in section 6 for both cost and schedule risk concerns. Note that the risk register records the PDT's risk concerns, discussions related to those concerns, and potential impacts to the current cost and schedule estimates. The concerns and discussions are meant to support the team's decisions related to event likelihood, impact, and the resulting risk levels for each risk event.

Analyze Cost Estimate and Schedule Contingency

Contingency is analyzed using the Crystal Ball software, an add-in to the Microsoft Excel format of the cost estimate and schedule. *Monte Carlo* simulations are performed by applying the risk factors (quantified as probability density functions) to the appropriate estimated cost and schedule elements identified by the PDT. Contingencies are calculated by applying only the moderate and high level risks identified for each option (i.e., low-level risks are typically not considered, but remain within the risk register to serve historical purposes as well as support follow-on risk studies as the project and risks evolve).

For the cost estimate, the contingency is calculated as the difference between the P80 cost forecast and the base cost estimate. Each option-specific contingency is then allocated on a civil works feature level based on the dollar-weighted relative risk of each feature as quantified by *Monte Carlo* simulation. Standard deviation is used as the feature-specific measure of risk for contingency allocation purposes. This approach results in a relatively larger portion of all the project feature cost contingency being allocated to features with relatively higher estimated cost uncertainty.

For schedule contingency analysis, the option schedule contingency is calculated as the difference between the P80 option duration forecast and the base schedule duration. These contingencies are then used to calculate the time value of money impact of project delays that are included in the presentation of total cost contingency in section 6. The resulting time value of money, or added risk escalation, is then added into the contingency amount to reflect the USACE standard for presenting the "total project cost" for the fully funded project amount.

Schedule contingency is analyzed only on the basis of each option and not allocated to specific tasks. Based on Cost Engineering MCX guidance, only critical path and near critical path tasks are considered to be uncertain for the purposes of contingency analysis.

KEY CONSIDERATIONS AND ASSUMPTIONS

Key assumptions include the following:

- Remaining project features will be awarded as multiple projects.
- The project schedule is presented in the main report.
- Various project features are at different stages of design and construction. See 3.1 for details.
- The remaining components are at the feasibility level of design. The design PDT believes that they are conservative and will be reduced as H&H modeling is completed.
- Observed construction practices from work in progress have been included for future features. That is, estimates were based on current observed crews and productivity rates.
- Life Cycle costs have not been included in this cost estimate.
- Contract acquisition strategy will be full and open.

RISK ANALYSIS RESULTS

Risk Register

Risk is unforeseen or unknown factors that can affect a project's cost or schedule. Time and money have a direct relationship due to the time value of money. A risk register is a tool commonly used in project planning and risk analysis and serves as the basis for the risk studies and Crystal Ball risk models. The risk register describes risks in terms of cost and schedule. A summary risk register that includes typical risk events studied (high and moderate levels) is presented in this section. The risk register reflects the results of risk factor identification and assessment, risk factor quantification, and contingency analysis. A more detailed risk register is provided in Appendix A. The detailed risk registers of Appendix A include low level and unrated risks, as well as additional information regarding the specific nature and impacts of each risk.

It is important to note that a risk register can be an effective tool for managing and communicating identified risks throughout the project life cycle. As such, it is generally recommended that risk registers be updated as the designs, cost estimates, and schedule are further refined, especially on large projects with extended schedules. Recommended uses of the risk register going forward include:

- Documenting risk mitigation strategies being pursued in response to the identified risks and their assessment in terms of probability and impact.
- Providing project sponsors, stakeholders, and leadership/management with a documented framework from which risk status can be reported in the context of project controls.
- Communicating risk management issues.
- Providing a mechanism for eliciting risk analysis feedback and project control input.
- Identifying risk transfer, elimination, or mitigation actions required for implementation of risk management plans.

A correlation is a dependency that exists between two risks and may be direct or indirect. An indirect correlation is one in which large values of one risk are associated with small values of the other. Indirect correlations have correlation coefficients between 0 and -1. A direct correlation is one in which large values of one risk are associated with large values of the other. Direct correlations have correlation coefficients between 0 and 1. Correlations were not identified in this analysis.

The risk register identifies thirty one different risks that are either moderate or high risks. An abridged version of the risk register is presented below.

Table 5 - Risk Register (High and Moderate)

RT	Ref #	Risk/Opportunity Event	Description	PDT Discussions	Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)
CA	41	Possibility of Multiple Contracts	Added the removal and construction of the dune walkovers the PDT thinks that there will be a separate contract to handle the walkovers, possibly multiple contracts	The estimate currently assumes that the dredging contractor would sub-contract the work, but the PDT foresees the possibility of the dune walkovers being under a separate contract altogether due to the duration for construction if all 42 are removed and reconstructed, and also due to the mix of public and private structures and varying designs.	Very Likely	Significant	High	Very Likely	Marginal	Moderate
TD	73	Dredge Estimate scope, quantities, equipment	Varying quantity and Project Details	Significant design, recent surveys, however dredge cost is highly dependant on quantity's. Potential for area storms. Current estimates are based on production estimates and schedules.	Likely	Significant	High	Likely	Marginal	Moderate
CO	82	Staging Area of construction	Staging area has not been identified to date.	There are large assessable areas close to construction site to have staging area, There is potential for building of additional ramps.	Likely	Significant	High	Unlikely	Negligible	Low
CO	85	Weather Impacts	Storm Impacts	Coast of Florida is prone to storm events. Adverse weather could reduce dredging effective time for dredging	Likely	Significant	High	Likely	Marginal	Moderate
ES	121	Competition	Matoc, and other acquisition strategy	Schedule is outside of busy window, therefore better competition, however, due to smaller quantities' potential risk for interested Hopper Dredge contractors.	Likely	Significant	High	Unlikely	Negligible	Low
ES	134	Estimate include waste / drop off quantities	Storm Impacts	Water surge may erode existing quantities	Unlikely	Significant	Moderate	Unlikely	Negligible	Low
ES	136	Estimate reasonableness of crews and productivities	Weather	Productivity changes due to weather, new area of dredging with no historical information	Likely	Marginal	Moderate	Unlikely	Negligible	Low
ES	151	Fuel Prices Fluctuate Significantly	Fluctuation of Fuel pricing	Risk will be based on historical fluctuation of Marine fuel rates.	Likely	Significant	High	Unlikely	Negligible	Low
ES	154	Dredging (Plant Value)	Dredge Plant/Labor Cost	Due to Variance in dredge plant/labor cost for limited numbers of contractors and for lack of actual pricing data.	Very Likely	Significant	High	Unlikely	Negligible	Low

Cost Risk Analysis - Cost Contingency Results

The project Cost Contingency at the 80% confidence level is 22.5%. This level was established by analyzing the different cost risk factors that affect the project. Cost risks that were specific to individual project features were discussed in detail. For example, risk EST-7, "MEP Design Build" references risks associated with the two remaining pump stations which are specific features. Other risks apply to the entire project such as EXT-3, "Severe Adverse Weather" which would affect all remaining features. Cost contingencies can be either positive or negative. The cost sensitivity chart shows relative cost contingency of individual risks. The sum of all the risks would be 100% of the cost contingency. See the cost sensitivity chart below.

Figure 2 - Sensitivity Analysis

From this chart, we can see that the top three risks that affect cost are;

- ID:08 - Contractor Competition and Perceived Risk
- ID: 17 - Local Plant Availability and Interest

- ID: 15 - Potential Changes to Contract during Construction

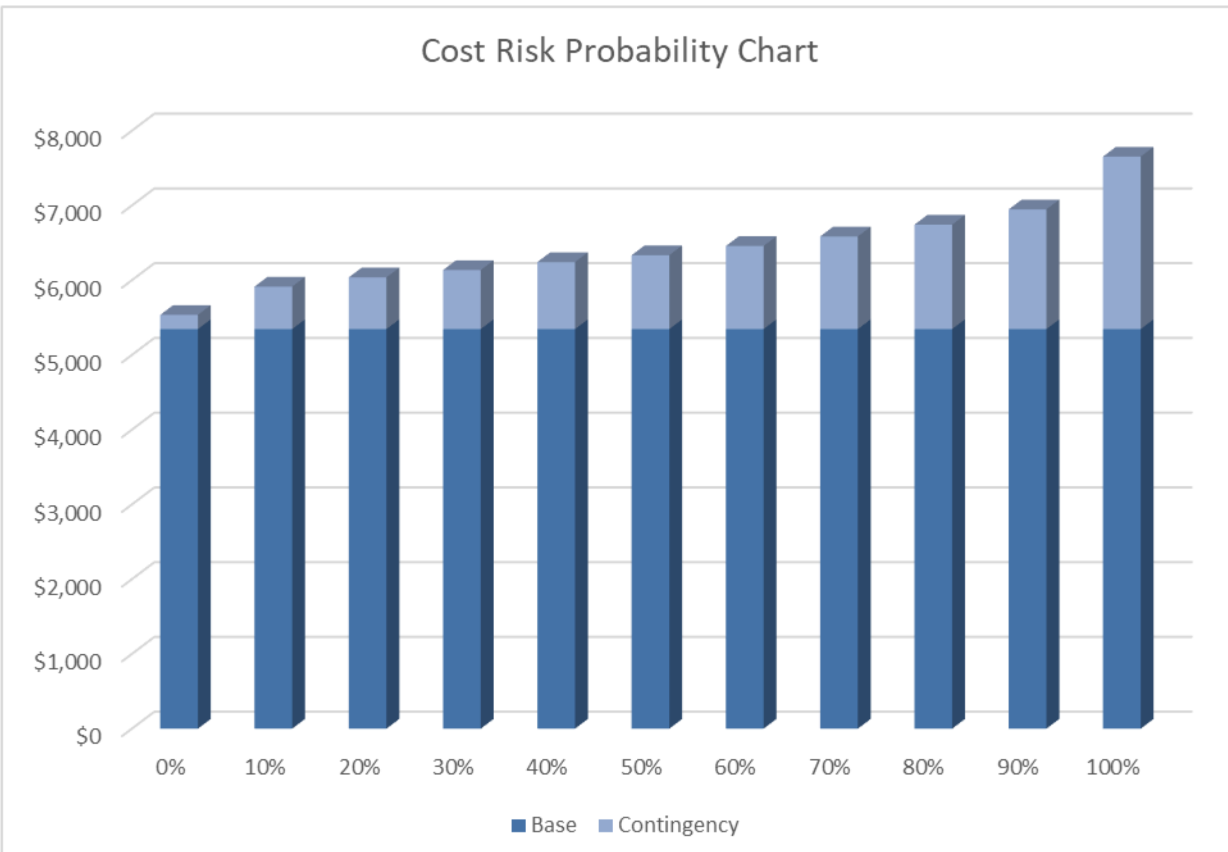
The confidence table and curve showing the 80% confidence level is below.

Note that these results reflect only those contingencies established from the cost risk analysis.

Schedule Risk Analysis - Schedule Contingency Results

No Schedule risk was derived from team. Project is estimated at 5 seasons ranging over the next 50 years.

Table 6 - Contingency Analysis at Various Confidence Levels



APPENDIX A

DETAILED RISK REGISTERS

Detailed Risk Register

RT	Ref #	Risk/Opportunity Event	Description	PDT Discussions	Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)	Cost Variance Distribution	Schedule Variance Distribution	Correlation to Other(s)	Responsibility/ POC	Method for Risk Determination	Affected Project Component
CA	**41**	Possibility of Multiple Contracts	Added the removal and construction of the dune walkovers the PDT thinks that there will be a separate contract to handle the walkovers, possibly multiple contracts	The estimate currently assumes that the dredging contractor would sub-contract the work, but the PDT foresees the possibility of the dune walkovers being under a separate contract altogether due to the duration for construction if all 42 are removed and reconstructed, and also due to the mix of public and private structures and varying designs.	Very Likely	Significant	High	Very Likely	Marginal	Moderate	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Contract Cost
TD	**73**	Dredge Estimate scope, quantities, equipment	Varying qty	Significant design, recent surveys, however dredge cost is highly dependant on qty's. Potential for area storms.	Likely	Significant	High	Likely	Marginal	Moderate	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Contract Cost
CO	**82**	Staging Area of construction	Staging area has not been identified to date.	There are large assessable areas close to construction site to have staging area, There is potential for building of additional ramps.	Likely	Significant	High	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Construction	Modeled as a separate cost item	Contract Cost
CO	**85**	Weather Impacts	Storm Impacts	Coast of Florida is prone to storm events. Adverse weather could reduce dredging effective time for dredging	Likely	Significant	High	Likely	Marginal	Moderate	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Project Cost
CO	**87**	Unknown Cultural Historic Preservation	Surveys have not been completed	Borrow areas has significant areas and qtys. Does have allowance for areas to be restrictive	Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled	N/A	Environmental Compliance	Not Modeled	N/A -Not Modeled
ES	**121**	Competition	Matoc, and other acq strategy	Schedule is outside of busy window, therefore better competition, however, due to smaller qtys' potential risk for interested Hopper Dredge contractors.	Likely	Significant	High	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Contracting	Modeled as Market Condition Factor	Contract Cost
ES	**126**	Mob, Demob & Prepwork	High risk or complex construction elements, site access, in-water?	Staging and Access Areas: Due to the existence of a State Highway right along the beach area and the lack of space on the beach, room for staging areas may present a problem	Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled	N/A	Cost Engineering	Modeled as seperate Cost Factor	Contract Cost
ES	**134**	Estimate include waste / drop off quantities	Storm Impacts	Water surge may erode existing qtys	Unlikely	Significant	Moderate	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled as seperate Cost Factor, and within CEDEP	Contract Cost
ES	**136**	Estimate reasonableness of crews and productivities	Weather	Productivity changes due to weather, new area of dredging with no historical information	Likely	Marginal	Moderate	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Contract Cost

Detailed Risk Register

RT	Ref #	Risk/Opportunity Event	Description	PDT Discussions	Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)	Cost Variance Distribution	Schedule Variance Distribution	Correlation to Other(s)	Responsibility/ POC	Method for Risk Determination	Affected Project Component
ES	151	Fuel Prices Fluctuate Significantly	Fluctuation of Fuel pricing	Risk will be based on historical fluctuation of Marine fuel rates.	Likely	Significant	High	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Contract Cost
ES	154	Dredging (Plant Value)	Dredge Plant/Labor Cost	Due to Variance in dredge plant/labor cost for limited numbers of contractors and for lack of actual pricing data.	Very Likely	Significant	High	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Contract Cost
ES	159	Turbidly Requirements	Decant of disposal water	Basis of estimate currently allows for turbidity monitoring effects.	Unlikely	Marginal	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled	N/A	Cost Engineering	Not Modeled	Contract Cost
ES	160	Hopper Dredging	• Potential for construction modification and claims? • High risk or complex construction elements, site access, in-water?	Borrow Area: First time use of a borrow area- could encounter unsuitable material; Encountering rock or other unsuitable material in a "new and not established" borrow area happens quite frequently and when it happens its usually a big deal; Environmental Restriction: NMFS may impose speed limit restriction due to whale habitat	Unlikely	Negligible	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	Cost Engineering	Not Modeled	N/A -Not Modeled
ES	161	Dune Planting	• High risk or complex construction elements, site access, in-water?	Plant Survival: If plantings do not take root and thrive, may have to do additional plantings	Unlikely	Negligible	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	Cost Engineering	Not Modeled	N/A -Not Modeled
ES	162	Dune Walkovers	demolition of existing dune walkovers and the construction of new ones	Low risk since we have now accounted for the construction cost in the initial construction of the dune. Estimate considered removal of all 42 existing walkovers and reconstruction of 42 new walkovers with the same basic design considerations. The potential risks are 1) not all 42 walkovers are impacted 2) not all impacts result in complete removal and reconstruction 3) some of the walkovers have a more extravagant design and need to be rebuilt the same way thus being more expensive. This risk item can show a cost savings and a potential cost impact to the project.	Unlikely	Negligible	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	Cost Engineering	Not Modeled	N/A -Not Modeled
RE	189	Turtle Mon	Jen to complete	Yearly turtle monitoring will likely be required (typically annually for 3 years after initial construction);	Certain	Negligible	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	N/A	Not Modeled	N/A -Not Modeled
RE	190	Phys Mon Beach Monitoring	Jen to complete	Physical monitoring will be a permit requirement; assumptions were made in the estimate as to the frequency	Certain	Negligible	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	N/A	Not Modeled	N/A -Not Modeled
RE	191	Turtle Nesting Impacts	Jen to complete	Environmental windows are not expected to be imposed on this project that would restrict beach placement outside of the turtle nesting season	Unlikely	Marginal	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	N/A	Not Modeled	N/A -Not Modeled

Detailed Risk Register

RT	Ref #	Risk/Opportunity Event	Description	PDT Discussions	Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)	Cost Variance Distribution	Schedule Variance Distribution	Correlation to Other(s)	Responsibility/ POC	Method for Risk Determination	Affected Project Component
ES	151	Fuel Prices Fluctuate Significantly	Fluctuation of Fuel pricing	Risk will be based on historical fluctuation of Marine fuel rates.	Likely	Significant	High	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Contract Cost
ES	154	Dredging (Plant Value)	Dredge Plant/Labor Cost	Due to Variance in dredge plant/labor cost for limited numbers of contractors and for lack of actual pricing data.	Very Likely	Significant	High	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	N/A	Cost Engineering	Modeled within CEDEP	Contract Cost
ES	159	Turbidly Requirements	Decant of disposal water	Basis of estimate currently allows for turbidity monitoring effects.	Unlikely	Marginal	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled	N/A	Cost Engineering	Not Modeled	Contract Cost
ES	160	Hopper Dredging	• Potential for construction modification and claims? • High risk or complex construction elements, site access, in-water?	Borrow Area: First time use of a borrow area- could encounter unsuitable material; Encountering rock or other unsuitable material in a "new and not established" borrow area happens quite frequently and when it happens its usually a big deal; Environmental Restriction: NMFS may impose speed limit restriction due to whale habitat	Unlikely	Negligible	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	Cost Engineering	Not Modeled	N/A -Not Modeled
RE	192	Hardbottoms	Jen to complete	A hardbottom survey has been completed and nothing was found within the potential footprint of the project.	Unlikely	Marginal	Low	Unlikely	Negligible	Low	Yes-No	Yes-No	N/A	N/A	Not Modeled	N/A -Not Modeled
EX	213	Acts of God (seismic events: volcanic activity, earthquakes, tsunamis; or severe weather: freezing, flooding or hurricane)	Potential for Storm, may change qty or disrupt contractor	Accounted for on CO 81	Unlikely	Marginal	Low	Unlikely	Marginal	Low	N/A -Not Modeled	N/A -Not Modeled	N/A	Cost Engineering	Not Modeled	N/A -Not Modeled
EX	224	Local communities pose objections	Community is divided, could raise issues	Small risk to project, due to project is common on coast.	Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled	N/A	Project Manager	Not Modeled	N/A -Not Modeled
EX	226	Adequacy of project funding (incremental or full funding)	Annual incremental funding expected	Project is small in scale and their are risk mitigation measures such as additional sponsor funding	Likely	Negligible	Low	Likely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled	N/A	District Management	Not Modeled	N/A -Not Modeled

Appendix F

Final Real Estate Plan

Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration
Integrated Feasibility Report
Section 1122
Water Resources Development Act (WRDA) of 2016
Beneficial Use of Dredged Material (BUDM)

March 2022

Prepared for:
U.S. Army Corps of Engineers, Honolulu District

Prepared by:

MURRAY.TIFFANY.MARIE.1384979013 Digitally signed by MURRAY.TIFFANY.MARIE.1384979013 Date: 2022.03.17 18:22:02 -10'00'

March 17, 2022

Tiffany Murray
Realty Specialist
USACE Honolulu District

Date

Reviewed by:

LABESTE.ERICA.A.1286957435 Digitally signed by LABESTE.ERICA.A.1286957435 Date: 2022.03.25 12:03:51 -10'00'

March 25, 2022

Erica Labeste
Chief, Real Estate Branch
USACE Honolulu District

Date

TABLE OF CONTENTS

FIGURES

ATTACHMENTS

1. EXECUTIVE SUMMARY

The Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Feasibility Report and Environmental Assessment (Project) was conducted under authority granted by Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law (PL) 114-322), as amended. The proposed project (Project) is needed to restore the beach that is part of the federally authorized Haleiwa Beach Shore Protection Project (HBSPP) to its original level.

A recommended plan was selected based on economic benefits, completeness, effectiveness, efficiency, and acceptability. The recommended plan includes channel dredging to 12 feet, additional channel dredging to 13 feet, barge access zone, breakwater settling basin, offshore sand borrow area, and beneficial use of dredged materials (BUDM). Beach-suitable dredged material would be used to nourish the beach that is part of the HBSPP. Additionally, two staging areas are planned at the revetted mole and within Haleiwa Beach Park (HBP).

The Non-Federal Sponsor (NFS) for the Project is the State of Hawaii, as represented by the Department of Land and Natural Resources (DLNR). The Real Estate Plan (REP) is prepared as an appendix to the Feasibility Report to support the acquisition requirements of the recommended plan. The REP presents the real estate requirements, proposes the acquisition strategy, develops a cost estimate for real estate acquisition, and incorporates an internal technical review.

The Federal navigation channel within Haleiwa Small Boat Harbor (HSBH) qualifies under the navigation servitude, which is the Government's Constitutional right to use, control, and regulate U.S. navigable waters for commerce-related purposes. Therefore, the Channel Dredging Project features (totaling 3.1 acres) in the HSBH Federal channel are not to be acquired nor eligible for LERRDs credit. Additionally, there are two existing Federal projects with the Project area, which include the HSBH and HBSPP. Any interest in land provided as an item of local cooperation for a previous Federal project is not eligible for credit. Therefore, a portion of the required BUDM Beach Restoration (3.6 acres) and Staging Area on the Revetted Mole (0.2 acres) are not eligible for credit for the current Project.

Outside of navigation servitude and prior Federal projects, the NFS maintains ownership over three areas required for the Project, which include the Barge Access Zone (0.2 acres), Breakwater Settling Basin (0.3 acres), and Sand Borrow Area (1.6 acres).

The anticipated acquisition requirements for the Project are a 0.5-acre beach restoration area and a 1.4-acre staging area within HBP, which are owned by the City and County of Honolulu. The minimum estate to acquire for both the beach restoration area and the staging area is a temporary work area easement for one (1) year during Project construction. Under the BUDM project authority, the NFS is not required to operate and maintain the restorative materials in perpetuity.

The estimated real estate cost associated with the Recommended Plan is approximately $24,100, including all lands, easements, rights-of-way, relocations, and disposals (LERRDs), administrative costs to be carried out by the NFS, and Government costs for

LERRDs monitoring and certification. The NFS is the land management agency for the State. As the NFS plans to perform required real estate actions with contract support, the NFS is considered moderately capable at present to acquire and provide the LERRDs necessary for the Project. Lands within the Project area are either owned by the NFS or the City and County of Honolulu, which has indicated a willingness to participate as a Project partner.

2. AUTHORITY AND PURPOSE

The Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Feasibility Report and Environmental Assessment (Feasibility Report) was conducted under authority granted by Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law (PL) 114-322), as amended. Section 1122 of WRDA 2016 requires the U.S. Army Corps of Engineers (USACE) to establish a pilot program to carry out ten projects for the beneficial use of dredged material, including projects to reduce storm damage to property and infrastructure; promote public safety; protect, restore, and create aquatic ecosystem habitats; stabilize stream systems and enhance shorelines; promote recreation; support risk management adaptation strategies; and reduce the cost of dredging.

In general, WRDA Section 1122 provides that projects under the pilot program will be cost-shared with the NFS in accordance with the cost-sharing requirements for projects carried out under Section 204 of the Continuing Authorities Program (CAP). However, for projects under the pilot program that utilize dredged material from federal navigation projects, Section 1122(e)(2) provides that the incremental costs above the Federal Standard for transporting and depositing such dredged material will be borne entirely by the Federal Government. If such pilot projects involve additional activities other than transportation and placement of dredged material, such as wetland plantings or mechanical shaping of dunes and beach berms, those costs shall be shared in accordance with the cost-sharing requirements of Section 204. If additional material is dredged from a federal navigation project solely for purposes of a pilot project, the costs associated with the additional dredging will be cost-shared with the NFS in accordance with Section 204. If a pilot project relies on dredged material from a non-federal navigation project, the dredging and transportation costs will be solely the responsibility of the NFS; all other costs associated with the pilot project will be cost-shared in accordance with Section 204.

The proposed Project is needed to restore the beach that is part of the federally authorized HBSPP to its original level. Haleiwa Beach is part of a Federal project, which provides a variety of benefits and services. Erosion of the beach has reduced the quality and extent of beach habitat available for aquatic life, including green sea turtles. Additionally, storm and wave-driven erosion is impacting the beach and facilities of HBP. Beach erosion has exposed existing infrastructure and facilities to potential damages from storms and scour. The existing seawall, which protects a comfort station and other park amenities, was undermined and required rehabilitation by the local municipality in 2019.

As a precursor to the current Feasibility Report, *Concept Designs for Selected Beach Parks-Haleiwa Beach Park (May 2019)* presented the results of wave, current, and circulation field studies; sand source investigations; and concept structure and beach design to develop five alternatives for HBP with construction cost estimates. Additionally, *Hawaii RSM: Advance Planning for the Beneficial Reuse of Dredged Material at Haleiwa Harbor, Island of Oahu, Hawaii (October 2018),* a USACE Regional Sediment Management Technical Note (RSM-TN), identified actions needed to implement beneficial reuse and disposal of dredged materials. The study identified two options for dredged material disposal which were evaluated in the Feasibility Report recommended plan, including beach placement and disposal at the South Oahu Ocean Dredged Material Disposal Site (ODMDS), which is an EPA-designated ocean disposal site.

The Real Estate Plan (REP) is prepared by the USACE Honolulu District (District) in support of the Feasibility Report. The REP presents the real estate requirements, proposes the acquisition strategy, develops a cost estimate for real estate acquisition, and incorporates an internal technical review. USACE Mapping determines private tract ownerships and acreages to prepare exhibits to the REP. USACE Appraisal prepares (or contracts for) and approves a cost estimate or gross appraisal, as needed for acquisitions. USACE Environmental provides applicable compliance memoranda and/or documentation in accordance with NEPA. HEPA, National Historic Preservation Act (NHPA), and USACE Hazardous, Toxic, and Radioactive Waste (HTRW) policy. As this is a Section 1122 pilot program, there are no prior project REPs.

Project real estate requirements include a review of NFS-owned parcels as well as recommended lands, easements, rights-of-way, relocations, and disposals (LERRDs) to be acquired by the NFS. LERRDs are the real estate requirements that the Government has determined the NFS must meet for the construction, operation, and maintenance of the Project. If LERRDs are required, USACE Real Estate coordinates with the NFS and provides the NFS with a partner packet outlining the NFS's responsibilities and informing the NFS of the risks of early acquisition.

A Feasibility Cost Share Agreement (FCSA) and Project Partnership Agreement (PPA) have not been signed at this time. Following the execution of a PPA, the District will provide the NFS with a Notice to Acquire (NTA) letter to indicate that the NFS may commence performance of the LERRDs process.

The information contained herein is tentative for planning purposes only. Final real property acquisition acreages, limitations, and cost estimates are subject to change even after approval of the Integrated Feasibility Report, including plan modifications that occur during the Preconstruction Engineering and Design Phase (PED).

3. PROJECT DESCRIPTION AND LOCATION

The Project area is located on the northeastern shore of Oahu, approximately 30 miles north of Honolulu. The Project area is situated near the mouth of the Anahulu River and includes portions of the HSBH and HBP. See Figure 1: Aerial Location Map, Figure 2: Project Feature Map 1, and Figure 3: Project Feature Map 3.

Recommended Plan

Alternatives were evaluated for beneficial use based on economic, engineering, environmental, and other factors. Based on the plan evaluation and comparison process, Alternative 4: Beneficial use of dredged material from the Federal channel to a 13-foot depth, settling basin, and offshore sand borrow area, was selected as the recommended plan that maximized economic benefits.

The recommended plan contains six major components:

1. Channel Dredging to 12 Feet: Navigation channel dredging would involve dredging of the Federal navigation channel to 12 feet to meet federal operations and maintenance (O&M) requirements. This dredging will produce approximately 4,433 cubic yards (cy) of sediment. Approximately 2,433 cy is anticipated to be beach suitable and will be transported to the HBSPP for beach restoration. The remaining 2,000 cy will be transported to the South Oahu ODMDS for open-water placement.

2. Channel Dredging to 12 Feet: additional navigation channel deepening is recommended along the seaward portion of the Federal navigation channel with sandy substrate by one additional foot, to a total depth of 13 feet. This will produce an additional 1,705 cy of beach suitable sand that will be used for beach restoration at the HBSPP.

3. Barge Access Zone: would be excavated north of the southern groin at the HBSPP to allow for efficient transport and unloading of dredged material to the HBSPP. The Barge Access Zone will be excavated to a depth of 10 feet below mean lower low water (MLLW) perpendicular to the south groin of the HBSPP. Excavation of the Barge Access Zone is anticipated to produce 1,300 cy of beach suitable sand that will be used for beach restoration at the HBSPP.

4. State Breakwater Settling Basin: encompasses approximately 0.3 acres adjacent to, but outside of, the federal navigation channel. This would be excavated to a depth of eight feet below MLLW to create the State Breakwater Settling Basin. Dredging of this area is anticipated to produce 2,200 cy of beach quality sand that will be used for beach restoration at the HBSPP.

5. Offshore Sand Borrow Area: will be dredged to provide additional beach suitable sand for beach restoration. This 16.5-acre area is outside of HSBH and the federal navigation channel and is located approximately 3,400 ft offshore at a depth of 60 feet. This area will function as a borrow area for the procurement of approximately 15,000 cy of beach suitable sand.

6. Beach Restoration: Beneficial Use of Dredged Material will utilize beach-suitable sand dredged from the Federal Navigation Channel, State Breakwater Settling Basin, and the Offshore Sand Borrow Area to be transported to the HBSPP for beach restoration. Beach restoration is anticipated to restore an aquatic ecosystem, reduce storm damage to public property and infrastructure, and also promote recreation.

Structures in the Area
The HSBH includes multiple existing features, including a navigation channel, revetted mole, stub breakwater, wave absorber, berths, moorings, loading docks, and ramps.

In addition to HSBH, the 15.7-acre Haleiwa Beach Park is partially located in the Project area. It is adjacent to 2,500 ft of beach shoreline between HSBH and Puaena Point. The backshore facilities are protected by 550 feet of vertical wall and include a comfort station, World War II monument, pavilion, promenade, and a playground. The southern part of Haleiwa Beach abuts a 160-foot-long rock rubblemound groin that separates the beach park from the outflows of Loko Ea wetland and Anahulu Stream. The beach is widest adjacent to the groin, where the park is approximately 250 feet wide.

The proposed Project does not include any constructed structures or modifications to existing structures in the Project area that the NFS will be responsible for maintaining. Additionally, it is not anticipated that the Project will affect any of the above structures in the area.

Staging

Staging and site access is established for the use and distribution of construction materials and equipment. A staging area may contain the contractor's trailers, parking, fencing, and storage of equipment and materials.

7. Staging Area: for additional construction equipment in the harbor area, a staging area encompassing approximately 0.2 acres is planned at the revetted mole.

8. Staging Area: staging is planned along the northern portion of Haleiwa Beach Park and encompasses approximately 1.4. acres.

Site Access
Construction equipment and vehicles are planned to access the harbor from the harbor parking areas, a small boat ramp, and along the access road to the end of the revetted mole. Construction equipment and vehicles are planned to access Haleiwa Beach through the parking lots adjacent to and behind the beach park. Access is planned for existing public roads; therefore, additional land-based access interests are not anticipated. See Figure 7: Access Route Map.

A barge access zone would be excavated near the southern groin at the HBSPP to allow for efficient water transport and unloading of dredged material to the HBSPP. The barge access zone would be excavated to a depth of 10 feet below MLLW perpendicular to the southern groin of the HBSPP. The barge access zone real estate requirement for access is included within the Project's footprint.

Ownership by Project Feature
The following table summarizes the real estate interests by Project feature and ownership.

Feature	Tax Map Key (TMK)	Approximate Area (Acres)	Owner	Zoning/ Property Class	Interest Required	Interest to Acquire
1. Channel dredging to 12 feet	None	2.0	State of Hawaii/U.S. Government (Navigation Servitude)	--	None: Navigation Servitude	None
2. Additional channel dredging between 12-13 ft	None	1.1	State of Hawaii/U.S. Government (Navigation Servitude)	--	None: Navigation Servitude	None
3. Barge Access Zone	None	0.2	State of Hawaii	--	Temporary Work Area Easement (1 year)	None
4. State Breakwater Settling Basin	None	0.3	State of Hawaii	--	Temporary Borrow Easement (1 year)	None
5. Sand Borrow Area	None	1.6	State of Hawaii	--	Temporary Borrow Easement (1 year)	None
6. BUDM Beach Restoration	None	3.6	State of Hawaii	--	Temporary Work Area Easement (1 year)	None
	None	0.5	City and County of Honolulu	--	Temporary Work Area Easement (1 year)	Temporary Work Area Easement (1 year)
7. Staging Area: Revetted Mole	6-2-003-011	0.2	State of Hawaii	Waterfront Industrial (I-3)	None (required for prior Federal Project)	None
8. Staging Area: Haleiwa Beach Park	6-2-001-002	1.4	City and County of Honolulu	General Agriculture/ Preservation (AG-2/P-2)	Temporary Work Area Easement (1 year)	Temporary Work Area Easement (1 year)

See also Figure 4: TMK Ownership Map.

4. SPONSOR'S REAL ESTATE INTERESTS

The NFS for the Project is the State of Hawaii, as represented by the Department of Land and Natural Resources (DLNR). The District will coordinate with the Division of Boating and Ocean Recreation (DOBOR) and Office of Conservation and Coastal Lands (OCCL), offices within the DLNR that have stated their intention to serve as the cost-share sponsors for the Project.

In Hawaii, all submerged lands are owned by the State of Hawaii Department of Land and Natural Resources (DLNR). Under the Submerged Lands Act of 1953, Congress granted state title to natural resources of the lands beneath navigable waters. The term "lands beneath navigable waters" is defined as "all lands permanently or periodically covered by tidal waters up to but not above the line of mean high tide and seaward to a line three geographical miles distant from the coastline."

In accordance with the Submerged Lands Act of 1953 as well as information obtained from the City and County of Honolulu Real Property Asset Division, the NFS, State DLNR, has current ownership of the following Project features:

1. Channel Dredging (to 12 feet): 2.0 aces
2. Channel Dredging (to 13 feet): 1.1 acres
3. Barge Access Zone: 0.2 acres
4. State Breakwater Settling Basin: 0.3 acres
5. Sand Borrow Area: 1.6 acres
6. Beach for BUDM Restoration: 3.6 acres (submerged, below the mean high water mark)
7. Revetted Mole Staging Area: 0.2 acres. This staging area was previously utilized during dredging in 2009.

5. ESTATES TO BE ACQUIRED

The NFS will provide all lands, easements, rights-of-way, relocations, and disposal/ borrow areas (LERRDs) required for the construction, operation, and maintenance of the Project. The NFS is instructed to acquire the minimum real estate interest necessary for the Project. LERRDs to be acquired for the Project include:

6. Beach for BUDM Restoration: 0.5 acres (land-based, above the mean high water mark)

8. Haleiwa Beach Park Staging Area: 1.4 acres. As a Project partner, the City and County of Honolulu has informally offered staging areas within HBP. Based on the large park area available, it is anticipated that a mutually agreed upon location can be finalized before Project implementation.

The minimum estate to acquire for the Beach BUDM Restoration is a temporary work area easement for approximately 0.5 acres. According to the City and County of Honolulu Real Property Asset Division, the beach is owned in fee by the City and County of Honolulu. The temporary work area easement is estimated to be required for one (1) year during Project construction. Under the BUDM project authority, the NFS is not required to operate and maintain the restorative materials in perpetuity.

The minimum estate to acquire for the HBP Staging Area is a temporary work area easement for approximately 1.4 acres. According to the City and County of Honolulu Real Property Asset Division, Haleiwa Beach Park is included in Tax Map Key (TMK) 6-2-001-002 with one tract totaling 14 acres, owned in fee by the City and County of Honolulu. The temporary work area easement is estimated to be required for one (1) year during Project construction.

Temporary Work Area Easement Standard Estate
A temporary easement and right of way in, on, over, and across the land (described in Schedule A) for a period not to exceed ______________, beginning with the date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as a work area, including the right to move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the ____________ Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right of way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

6. FEDERAL PROJECTS/OWNERSHIP

There are two existing Federal projects within the Project area, which include the HSBH and HBSPP.

At the HSBH, USACE, on behalf of the State of Hawaii, constructed the outer breakwater in 1955. The HSBH was authorized on 26 March 1964 and 25 October 1974 under Section 107 of the River and Harbor Act of 1960, as amended. The project was the first joint federal-state harbor constructed on Oahu. The original federal project, which was completed in November 1966, consisted of the entrance channel and revetted mole. The stub breakwater and wave absorber were added in 1975. The current federal general navigation features of HSBH consist of an entrance channel 740 ft long, 100 – 120 ft wide, with an authorized depth of -12 ft MLLW; a revetted mole that is 1,310 ft long; a stub breakwater that is 80 ft long; and a wave absorber that is 140 ft long. Non-Federal project features include 64 berths, 26 moorings, two loading docks, and three ramps. The NFS for the HSBH is the State of Hawaii, DLNR, DOBOR. See Figure 5: Haleiwa Small Boat Harbor Federal Project Map.

The HBSPP is adjacent to HBP and less than one mile from HSBH. The HBSPP was authorized by the River and Harbor Act of 1965 (PL 89-298) and was constructed by USACE, on behalf of the State of Hawaii, in 1965 to restore the eroded public beach at HBP. The shoreline protection project consisted of a sand beach (1,600 ft long and 140-265 ft wide), an offshore breakwater (160 ft long), and a terminal groin (500 ft long) at the southern end of Haleiwa Beach. In December 1969, the USACE conducted emergency repairs on the groin and offshore breakwater in response to damages caused by severe storms and placed an additional 12,000 cy of sand on the beach. Storms in January 1974 and November 1976 caused damage requiring emergency repairs for the project, in 1975 and 1978, respectively. See Figure 6: Haleiwa Beach Shore Protection Project Federal Project Map.

The Revetted Mole (Project Feature 7) was acquired as part of the prior HSBH Federal project; therefore, it is not eligible for LERRDs credit as part of the current Project. The Beach for BUDM Restoration (Project Feature 6) was required as part of the prior HBSPP Federal project; therefore, it is not eligible for LERRDs credit as part of the current Project.

Although there were two prior projects, there are no Federally owned lands within the LERRDs required for the Project.

7. NAVIGATION SERVITUDE

Although there are no Federally owned lands within the LERRDs, the Project includes planned water features of channel dredging, sand borrow area, breakwater settling basin, and barge access zone. Of these Project water features, Channel Dredging (Project Features 1 and 2) are located within the Federal navigation channel and qualify under the navigation servitude. The State Breakwater Settling Basin, Barge Access Zone, and the Offshore Sand Borrow Area are located outside traditional navigable waters.

The navigation servitude is the dominant right of the Government under the Commerce Clause of the U.S. Constitution to use, control, and regulate the navigable waters of the United States and the submerged lands thereunder for various commerce-related purposes including navigation and flood control. In tidal areas, the servitude extends to all lands below the mean high-water mark. In non-tidal areas, the servitude extends to all lands within the bed and banks of a navigable stream that lie below the ordinary high-water mark. Dredging of the HSBH channel serves the purpose of navigation in the aid of commerce. The HSBH serves 64 berths, 26 moorings, three ramps, and two loading docks. The dredging is planned for and up to 13 feet. Dredging is planned below the mean high-water mark. According to the Feasibility Report, the Mean High-Water Mark elevation is 1.6 ft MLLW. Dredging is planned up to 12 and 13 ft MLLW.

Generally, it is the policy of the USACE to utilize the navigation servitude in all available situations, whether or not the project is cost-shared or fully Federally funded. Lands over which the navigation servitude is exercised are not to be acquired nor eligible for credit for a Federal navigation or flood control project or another project to which a navigation nexus can be shown. Therefore, Channel Dredging is not eligible for LERRDs credit as part of the current Project.

8. MAPS

Maps are intended as a preliminary tool to illustrate the Project area, LERRDs to be acquired, and lands within the navigation servitude. Changes to LERRDs footprints may occur and cost estimates are subject to change even after approval of the Integrated Feasibility Report, including plan modifications that occur during the Preconstruction Engineering and Design Phase (PED). Detailed maps will be provided prior to the Notice to Acquire (NTA), which is the formal notification to the NFS of the required LERRDs. For the aerial location, project feature, and TMK maps, refer to Figures 1-6.

9. INDUCED FLOODING

It is not anticipated that the Project would cause any induced flooding.

10. BASELINE COST ESTIMATE FOR REAL ESTATE

The estimated real estate cost associated with the Recommended Plan is approximately $24,100, including all recommended LERRDs, administrative costs to be carried out by the NFS, and Government costs for LERRDs monitoring and certification. Navigation servitude is applicable to the channel dredging location, those channel dredging Project features totaling 3.1 acres with a value of $0 are not to be acquired nor eligible for LERRDs credit. Additionally, the State-owned beach restoration and staging areas totaling 3.8 acres with a value of $4,600 were part of prior Federal projects at HSBH and HBSPP and are not eligible for LERRDs credit for the current Project.

Real Estate Interest and Project Feature	Size (Acres)	Navigation Servitude	Prior Federal Project	NFS-Owned	To Acquire
Navigation Servitude: 1. Channel Dredging 1	2.0	$0			
2. Channel Dredging 2	1.1	$0			
Temporary Work Area Easement (1 year): 3. Barge Access Zone	0.2			$10	
8. Staging Area: Haleiwa Park	1.4				$8,500
Temporary Borrow Easement (1 year): 4. Breakwater Settling Basin	0.3			$20	
5. Sand Borrow Area	1.6			$120	
Prior Federal Project: 6. Beach Restoration	3.6		$3,400		
	0.5				$500

7. Staging Area: Revetted Mole	0.2		$1,200		
Improvements	--				$0
Hazard Removals	--				$0
Mineral Rights	--				$0
Damages	--				$0
Facility/Utility Relocations	--				$0
Uniform Relocation Assistance	--				$0
Incremental Real Estate Costs	--				$2,700
Incidental Real Estate Costs: NFS	--				$4,200
Incidental Real Estate Costs: Government	--				$3,400
TOTAL (rounded)	**--**				**$24,100**

The values for the baseline cost estimate were obtained from a Land Cost Estimate Report prepared by a licensed USACE appraiser, Northwestern Division, effective August 31, 2021. Incremental real estate costs are estimated at 20% of total real estate costs for risk-based contingencies. Additionally, incidental acquisition costs include NFS costs incurred for title work, appraisals, review of appraisals, coordination meetings, review of documents, legal support, and other costs that are incidental to Project LERRDs as well as Government costs for staff monitoring and reviewing and approving LERRDs.

11. PUBLIC LAW 91-646 RELOCATION BENEFITS

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, PL 91-646, as amended, commonly called the Uniform Act, is the primary law for acquisition and relocation activities on Federal or federally assisted projects and programs. The NFS is required to follow the guidance of PL 91-646.

No displacement of towns, businesses, farms, or persons will occur, and there will be neither habitable nor commercial structures affected as a result of this Project. Therefore, the Project is not eligible for the provisions of PL 91-646 related to relocation expenses.

12. MINERALS/TIMBER/CROP ACTIVITY

There are no known surface or subsurface minerals that would impact the Project. Substrate within HSBH and the navigation channel vary from sand to silts. Based on the 2008 Sampling and Analysis Report for Maintenance Dredging (MRC, 2008), sediment samples from the northern part of the navigation channel were the only samples with a least 85% sand or larger material and considered suitable for beach use. Samples from this area had nearly 100% sand and gravel fractions. Samples from other areas indicated much lower sand fractions. Chemical analysis indicated that all sediments from HSBH would have no restrictions on placement. The NFS, State of Hawaii, owns all mineral rights within the State.

Additionally, no known timber or crops will be affected by the Project. Project features are located in shoreline and beach areas.

13. ASSESSMENT OF SPONSOR'S ACQUISITION CAPABILITY

The NFS is the land management agency for the State. As the NFS plans to perform required real estate actions with contract support, the NFS is considered moderately capable at present to acquire and provide the LERRDs necessary for the Project. Lands within the Project area are either owned by the NFS or the City and County of Honolulu, which has indicated a willingness to participate as a Project partner.

The NFS has been provided a Local Sponsor Toolkit, which provides details on NFS acquisition requirements. The NFS has been advised of P.L. 91-646 requirements for documenting expenses for credit purposes. The NFS's Acquisition Capability Assessment is included in Attachment 1.

14. ZONING

No construction of structures is proposed in the Project area. Therefore, no enactments of zoning ordinances are proposed in lieu of, or to facilitate, acquisition in connection with the proposed Project.

15. ACQUISITION MILESTONES

The following preliminary schedule estimates ten (10) months for NFS LERRDs planning and acquisition. The planned timeline below will be mutually agreed upon by Real Estate, Project Manager, and NFS.

The NFS's preliminary acquisition planning is estimated at four (4) months as follows:

Survey/Map/Title	30 Days
Legal Description	30 Days
Appraisal	60 Days

The NFS's LERRD acquisition is estimated at six (6) months as follows:

Documentation	90 Days
Negotiation	30 Days
Payment	30 Days
LERRD Certification	30 Days

It is anticipated that the Project would be constructed in FY23 (calendar year 2024). This coincides with the existing FY22 request for design funds to develop plans and specifications for maintenance dredging of the harbor and the planned request for maintenance dredging construction funds in the FY23 budget. Section 1122 funds for the incremental costs of design and construction would need to be received on a concurrent FY22/FY23 schedule with maintenance dredging (O&M) funds.

16. PUBLIC FACILITY OR UTILITY RELOCATIONS

There are no facility or utility relocations associated with the Project. Therefore, no Attorney's Preliminary Investigation and Report of Compensable Interest are required.

17. ENVIRONMENTAL IMPACTS

Potential environmental impacts resulting from the Project are considered, including investigation under NEPA/HEPA, HTRW Policy, National Historic Preservation Act, Clean Water Act, Rivers and Harbors Act, Endangered Species Act, Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Clean Air Act of 1963, Executive Order 13690, Floodplain Management, and Executive Order 13112, Invasive Species.

<u>National Environmental Policy Act (NEPA) and Hawaii Environmental Policy Act (HEPA)</u>
NEPA (40 CFR 1500 et seq.) requires that environmental consequences and project alternatives be considered before a decision is made to implement a Federal project. NEPA established the requirements for preparation of an Environmental Impact Statement for projects potentially having significant environmental impacts and an EA for projects with no significant environmental impacts. USACE determined a Finding of No Significant Impact (FONSI). All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Public review of the draft Feasibility Report and FONSI was completed on January 9, 2021. All comments submitted during the public review period were responded to in the Final Feasibility Report and FONSI.

<u>Hazardous, Toxic, and Radioactive Waste Policy</u>
According to the Feasibility Report, hazardous, toxic, and radioactive waste (HTRW) is not known nor suspected in the Project area. USACE completed a Phase I HTRW survey, including review of existing environmental documentation and environmental regulatory databases. Documentation and database review indicated:

- No U.S. EPA National Priority List (NPL) or Superfund sites are within a one-mile radius of the project alternative areas;
- No Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site is located within a 0.5-mile radius of the project alternative areas;
- No Resource Conservation and Recovery Information System (RCRIS) treatment, storage, or disposal (TSD) facility is located with a 0.5-mile radius from the project alternative areas;
- No Resource Conservation and Recovery Act (RCRA) Corrective Action Reports (CORRACTS) were identified within a one-mile radius of the project alternative areas;

- No RCRA generators are located within the project alternative areas or adjacent properties;
- One underground storage tanks (USTs) is located within a 0.25-mile radius of the project alternative areas;
- No leaking underground storage tanks (LUST) are located within a one-mile radius of the project alternative areas;
- No active landfills are located within a 0.5-mile radius of the project alternative areas.

Additionally, sediments within the dredged navigation channel were chemically analyzed for pH, percent solids, ignitability, total organic carbon (TOC), total and water-soluble sulfides, oil and grease, total recoverable petroleum hydrocarbons (TRPH), cyanides, toxicity characteristic leaching procedure (TCLP), metals, pesticides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), semi-volatile and halogenated volatile organic compounds (SVOCs and HVOCS), total petroleum hydrocarbons (TPH); and benzene, toluene, ethylbenzene, and xylene (BTEX). The most recent chemical analysis occurred in November 2008 and determined that there would be no restrictions on use placed on dredged material from the HSBH.

National Historic Preservation Act

Federal agencies are required under Section 106 of the National Historic Preservation Act of 1966 (54 USC Chapter 3001 et seq.), as amended, to "take into account the effects of their undertakings on historic properties" and consider alternatives "to avoid, minimize, or mitigate the undertaking's adverse effects on historic properties" In accordance with Section 106 of the NHPA, the USACE will consult with the Hawaii SHPO, the Office of Hawaiian Affairs, and other appropriate consulting parties. USACE has made a finding of "no historic properties affected" and does not anticipate the need for a Memorandum of Agreement or Programmatic Agreement.

The Project area is unlikely to contain marine historic properties, according to the Feasibility Report. Research was conducted at the Hawaii State Historic Preservation Division library to determine the presence or absence of potentially historic properties within or adjacent to the Project area. Additionally, aerial photos indicate that the offshore area consists strictly of sand deposits with no indication of anomalous features. Furthermore, available literature regarding shipwrecks in Hawaii indicates no known historical wrecks within or near the Project area. Despite this, the region is archaeologically active, containing several known sites in the general vicinity. Although no traditional Hawaiian historic properties are known to exist within the terrestrial portion of the Project area, there is a relatively high potential for such properties to exist in the general area in the form of subsurface deposits, including traditional human burials.

One historical architecture resource is present within the Project area but is not anticipated to be affected by the Project. The built components of Haleiwa Beach Park are contributing properties within a discontinuous "Art Deco Parks" historic district established on June 9, 1988 (SIHP No. 50-80-04-1388).

Other Environmental Compliance

Additionally, USACE will consider and investigate potential environmental impacts in accordance with the Clean Water Act, Rivers and Harbors Act, Endangered Species Act, Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Clean Air Act of 1963, Executive Order 13690, Floodplain Management, Executive Order 13112, Invasive Species. Environmental compliance will be documented in required environmental reporting and permitting efforts.

18. LANDOWNER CONCERNS

This Project will involve not only the NFS, State of Hawaii DLNR as represented by the DOBOR and OCCL, but also a participation by the City and County of Honolulu. These public entities are supportive of the proposed Project. No landowner concerns are anticipated at this time and no privately-owned lands are anticipated to be required for the Project.

19. NOTIFICATION TO SPONSOR

The NFS, State DLNR as represented by DOBOR and OCCL, is involved in the planning process. The NFS was provided a Local Sponsor Toolkit and advised of the requirements for documenting expenses for credit and the risks of acquiring LERRDs before the execution of the PPA. Additionally, the NFS was provided with a Risk Letter Advising Against Early Acquisition, which is included in Attachment 2.

Once the LERRDs are finalized, a Notice to Acquire Letter will be transmitted to the NFS. The Notice to Acquire Letter serves as the formal instruction for the NFS to acquire the real estate interests needed for the Project. A Sample Notice to Acquire Letter is included in Attachment 3.

20. OTHER RELEVANT REAL ESTATE ISSUES

There are no other known relevant real estate issues, such as oysters, in the Project area.

21. REFERENCES

Submerged Lands Act of 1953, 43 U.S.C. § 1301 et seq. (2002).

U.S. CONST. art.I, §8,cl.3.

U.S. Army Corps of Engineers, Honolulu District. *Feasibility Report/Environmental Assessment, Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration,* November 2021.

U.S. Army Corps of Engineers, Northwestern Division. *Land Cost Estimate, effective* August 31, 2021.

Figure 1: Aerial Location Map

Figure 2: Project Feature Map 1

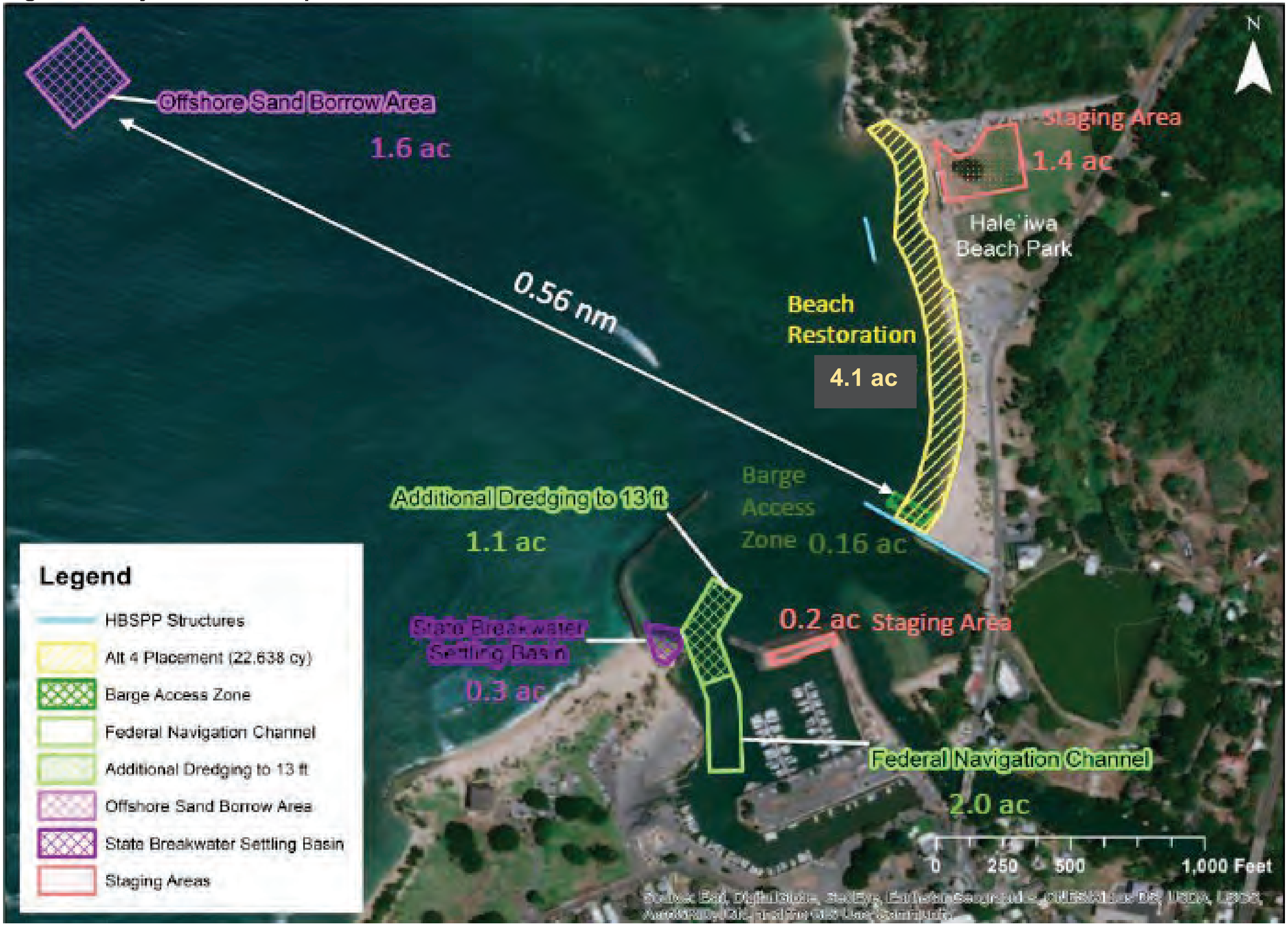


Figure 3: Project Feature Map 2

Figure 4: Tax Map Key Ownership Map

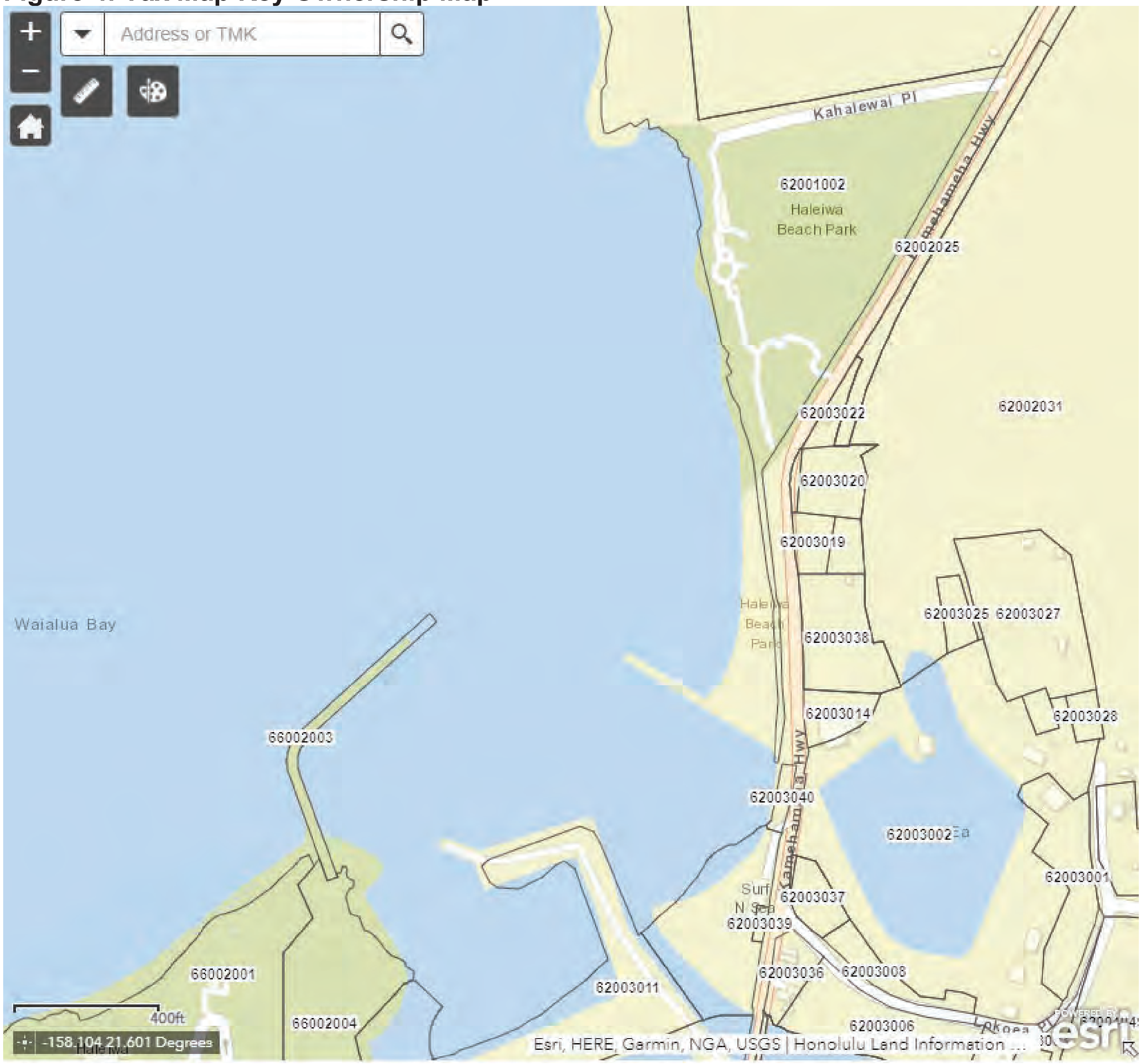


Figure 5: Haleiwa Small Boat Harbor Federal Project Map

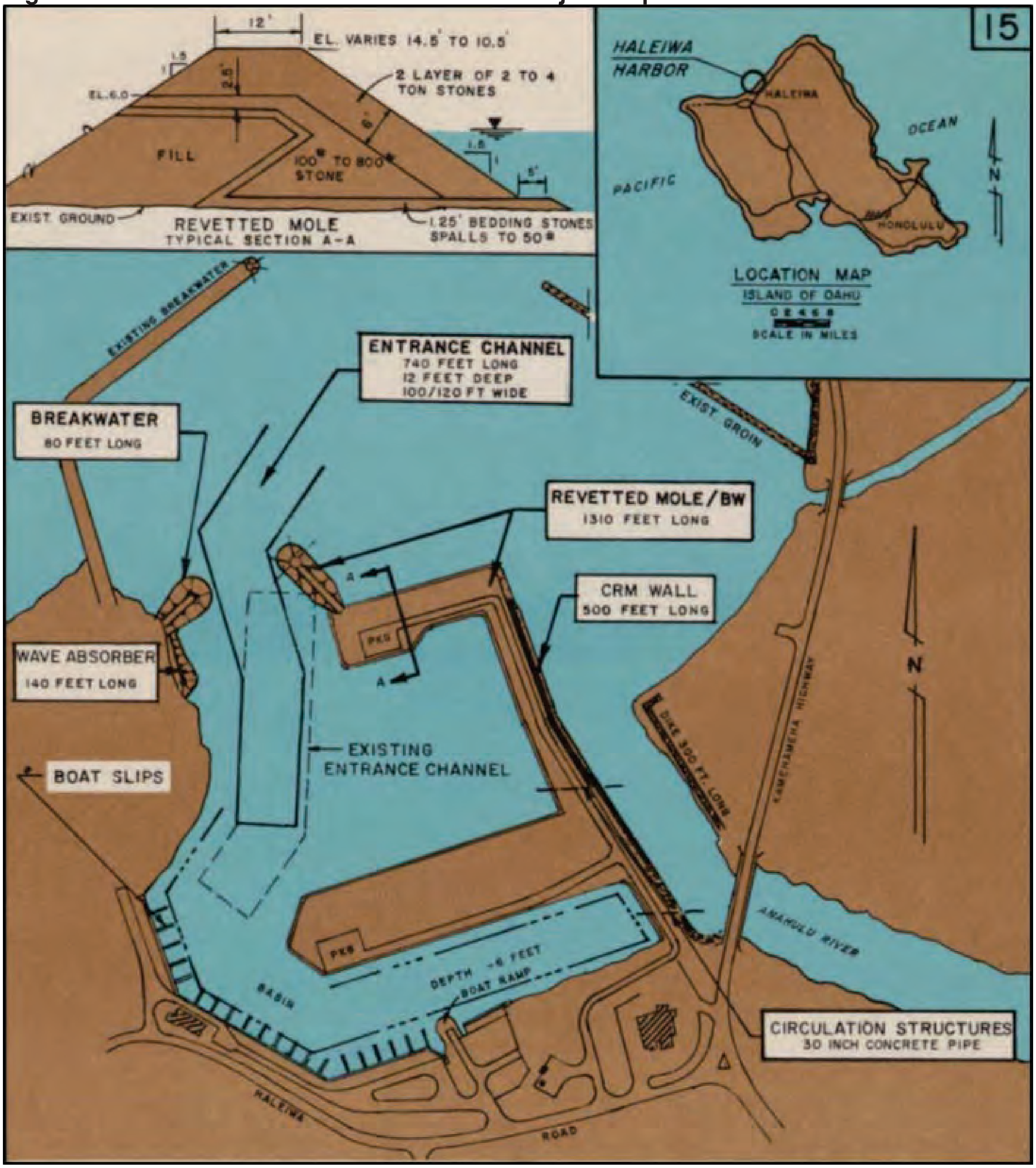


Figure 6: Haleiwa Beach Shore Protection Project Federal Project Map

Figure 7: Access Route Map

Attachment 1: Assessment of NFS's Real Estate Acquisition Capability

Assessment of Non-Federal Sponsor's Real Estate Acquisition Capability

Project: Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Integrated Feasibility Report
Project Authority: Section 1122, Water Resources Development Act (WRDA) of 2016, Beneficial Use of Dredged Material (BUDM)
Non-Federal Sponsor: State of Hawaii Department of Land and Natural Resources
Edward R. Underwood, Administrator
Division of Boating & Ocean Recreation (DOBOR)
4 Sand Island Access Road, Honolulu, HI 96819
(808) 587-1966, ed.r.underwood@hawaii.gov

Legal Authority	**Yes**	**No**
1. Does the NFS have legal authority to acquire and hold title to real property for project purposes? (Hawaii Revised Statutes, Chp. 46)	✓	
2. Does the NFS have the power of eminent domain for the Project (Hawaii Revised Statutes, Chp. 101)	✓	
3. Does the NFS have "quick-take" authority for this project?		✓
4. Are there any lands/interests in land required for the project that are located outside the NFS's authority boundary?		✓
5. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn?		✓
6. Will the NFS's in-house staff require training to become familiar with the real estate requirements of Federal projects, such as PL 91-646, as amended?		✓
7. If #6 is yes, has a reasonable plan been developed to provide training?		NA

Willingness to Participate	**Yes**	**No**
8. Has the NFS stated its general willingness to participate in the project and its understanding of the general scope and role?	✓	
9. Is the NFS agreeable to signing a Project Partnership Agreement and supplying funding as stipulated in the agreement?	✓	
10. Was the NFS provided the Local Sponsor Toolkit? 08/24/2021	✓	

Acquisition Experience and Capability	**Yes**	**No**
11. Taking into consideration the project schedule and complexity, does the NFS have the capability, with in-house staffing or contract support, to provide the necessary services, including surveying, appraisal, title, negotiation, condemnation, closing, and relocation assistance, as required for the project?	✓	
12. Is the NFS's projected in-house staffing level sufficient considering its workload?	✓	
13. Can the NFS obtain contractor support, if required, in a timely manner?	✓	
14. Is the NFS's staff located within reasonable proximity to the project site?	✓	
15. Will the NFS likely request USACE assistance in acquiring real estate?		✓

Schedule Capability	**Yes**	**No**
16. Has the NFS approved the tentative project real estate schedule and indicated its willingness and ability to utilize its financial, acquisition, and condemnation capabilities to provide the necessary project LERRDs in accordance with the proposed project schedule so the Government can advertise and award a construction contract as required by overall project schedules and funding limitations? The anticipated NFS real estate	✓	

acquisition timeframe for the project is ten (10) months from the Notice to Acquire to the Non-Federal Sponsor. **NFS Initials:** EU		

LERRD Crediting	**Yes**	**No**
17. Has the NFS indicating its understanding of LERRD credits and its capability and willingness to gather the necessary information to submit LERRD credits within six (6) months after possession of all real estate and completion of relocations so the project can be financially settled? **NFS Initials:** EU	✓	

Past Action and Coordination	**Yes**	**No**
1. Has the NFS performed satisfactorily on other USACE projects?	✓	
2. Has the assessment been coordinated with NFS?	✓	
3. Does the NFS concur with the assessment? (provide explanation if no)	✓	

With regard to the project, the NFS is anticipated to be:	**Select One**
Fully Capable: previous experience; financial capability; authority to hold title; in-house staff can perform necessary services (survey, appraisal, title, negotiation, closing, relocation assistance, condemnation) as required by the LERRDs.	
Moderately Capable: financial capability; authority to hold title; can perform, with contract support, necessary services (survey, appraisal, title, negotiation, closing, relocation assistance, condemnation) as required by the LERRDs.	✓
Marginally Capable: financial capability; authority to hold title; will rely on approved contractors to provide necessary services (survey, appraisal, title, negotiation, closing, relocation assistance, condemnation) as required by the LERRDs.	
Insufficiently Capable (provide explanation): financial capability; will rely on another entity to hold title; will rely on approved contractors to provide necessary services (survey, appraisal, title, negotiation, closing, relocation assistance, condemnation) as required by the LERRDs.	

USACE Prepared by:	**NFS Reviewed by:**
MURRAY.TIFFANY.MARIE.1384979013 Digitally signed by MURRAY.TIFFANY.MARIE.1384979013 Date: 2021.10.12 07:53:05 -10'00'	
Tiffany Murray Realty Specialist USACE Honolulu District	Edward R. Underwood Administrator DOBOR
Date: October 12, 2021	Date: Oct 7, 2021

USACE Approved by:	
Considering the capability of the NFS and the ancillary support to be provided by contract services, it is my opinion that the risks associated with LERRDs acquisition and closeout of the project have been properly identified and mitigated.	
LABESTE.ERICA.A.1286957435 Digitally signed by LABESTE.ERICA.A.1286957435 Date: 2021.10.19 16:32:16 -10'00'	
Erica Labeste Chief, Real Estate Branch U.S. Army Corps of Engineers Honolulu District	Date: October 19, 2021

Attachment 2: Letter Advising Against Early Acquisition

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

October 19, 2021

Real Estate Division

SUBJECT: Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project, Risks of Early Acquisition

Suzanne D. Case
Chairperson
State of Hawaii, Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, HI 96813

Dear Chairperson Case:

Reference is made to the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project (Project) as authorized under Section 1122 of the Water Resources Development Act (WRDA) of 2016. The Division of Boating and Ocean Recreation (DOBOR) and Office of Conservation and Coastal Lands (OCCL) on behalf of the State of Hawaii Department of Land and Natural Resources (DLNR) as the Non-Federal Sponsor, is responsible for ensuring that it possesses the authority to acquire and hold title for all real property required for the proposed project. The Non-Federal Sponsor shall provide one hundred percent (100%) of the lands, easements, rights-of-way, utility or public facility relocations, and dredged or excavated material disposal areas (LERRDs), as well as operation, maintenance, repair, rehabilitation, and replacement.

The United States Army Corps of Engineers (USACE), Honolulu District, advises your office that there are risks associated with the acquisition of LERRDs prior to the execution of a Project Partnership Agreement (PPA) or Local Cooperation Agreement (LCA). The State of Hawaii will assume full and sole responsibility for any and all costs and liabilities arising out of premature acquisition. Project risks generally include, but are not limited to:

a. Congress may not appropriate funds to construct the proposed project;

b. The proposed project may otherwise not be funded or approved for construction;

c. A PPA/LCA mutually agreed to by the Non-Federal Sponsor and the Government may not be executed;

d. The Non-Federal Sponsor may incur liability and expense by virtue of its ownership of contaminated lands, or interests therein, whether such liability should arise out of local, state, or Federal laws or regulations, including liability arising out of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended;

e. The Non-Federal Sponsor may acquire interest or estates that are later determined by the Government to be inappropriate, inefficient, or otherwise not required for the project;

f. The Non-Federal Sponsor may initially acquire insufficient or excessive real property acreage, which could result in additional negotiations and or/benefit payments under Public Law 91-646 or additional payment of fair market value to affected landowners;

g. The Non-Federal Sponsor may incur costs or expenses in connection with its decision to acquire LERRDs in advance of the executed PPA/LCA and the Government's Notice to Acquire (NTA), which may not be creditable under the provisions of Public Law 99-662 or the PPA/LCA.

If you have further questions, please contact the USACE Honolulu District, Real Estate Branch, at (808) 835-4055.

Sincerely,

LABESTE.ERICA.A.1286957435 Digitally signed by LABESTE.ERICA.A.1286957435 Date: 2021.10.19 16:27:54 -10'00'

Erica Labeste
Chief, Real Estate Branch
U.S. Army Corps of Engineers
Honolulu District

Attachment 3: Sample Notice to Acquire Letter

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

March 17, 2022

Real Estate Division

SUBJECT: Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project, Notice to Acquire

Suzanne D. Case
Chairperson
State of Hawaii, Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, HI 96813

Dear Chairperson Case:

This letter serves as your Notice to Acquire the real estate interests needed from the State of Hawaii for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project (Project) as authorized by Section 1122 of the Water Resources Development Act (WRDA) of 2016. Enclosed are the final Authorization for Entry for Construction, Attorney's Certificate of Authority, and project real estate drawings. Also enclosed is the standard language to be used for the Temporary Work Area Easement conveyance documents between the State of Hawaii, as Non-Federal Sponsor, and City & County of Honolulu.

As required by the Project Local Cooperation Agreement (LCA), the Government has determined the Temporary Work Area Easements as shown on the real estate drawings are required for Project implementation. The State of Hawaii is directed to provide the necessary real estate interests for the operations, maintenance, repair, replacement, and rehabilitation as required by the LCA. The LCA also requires the State of Hawaii to comply with the Uniform Relocations and Assistance and Real Property Acquisition Policies Act. 42 U.S.C. § 4601, et. seq., and the Uniformed Regulations, 49 C.F.R. part 24. More information can be found at http://www.fhwa.dot.gov/realestate/realprop.

After acquisition of the required real estate interests, the State of Hawaii shall complete and sign the Authorization for Entry for Construction and Attorney's Certificate of Authority. Please return the original signed authorization documents to the Corps of Engineers, Honolulu District Real Estate Branch, by mail to the address contained in the letterhead. In addition, the State of Hawaii, shall provide copies of all conveyance documents for required real estate acquisitions (Temporary Work Area Easement) to the Corps of Engineers. The Corps of Engineers requires the conveyance documents prior to advertising a construction contract. Copies of conveyance documents may be scanned and submitted electronically to the contact person below.

If you have any questions, please contact Name, Realty Specialist, at (808) phone or email@usace.army.mil.

Sincerely,

Erica Labeste
Chief, Real Estate Branch
U.S. Army Corps of Engineers
Honolulu District

Enclosures

Haleiwa Harbor, Oahu, Hawaii
Dredged Material Management Plan
Preliminary Assessment
September 2018

Project Name
Haleiwa Small Boat Harbor, Oahu, Hawaii
Project CWIS
073356

Project Authorization
Haleiwa Small Boat Harbor (SBH) is located on the north coast of Oahu at the head of Waialua Bay. The project was authorized on 26 March 1964 and 25 October 1974 under Section 107 of the River and Harbor Act of 1960, as amended. The project, which was initially constructed in 1966, was the first joint Federal-State harbor constructed on Oahu. The total project cost was $1,177,642 (Federal: $683,177; non-Federal: $494,465). The general navigation features of Haleiwa Harbor (Figure 1) consist of an entrance channel 740 feet long, 100 to 120 feet wide, and 12 feet deep; a revetted mole that is 1,310 feet long; a stub breakwater that is 80 feet long; and a wave absorber that is 140 feet long. The non-federal sponsor for the harbor is the State of Hawaii, Department of Land and Natural Resources, Division of Boating and Ocean Recreation (DOBOR).

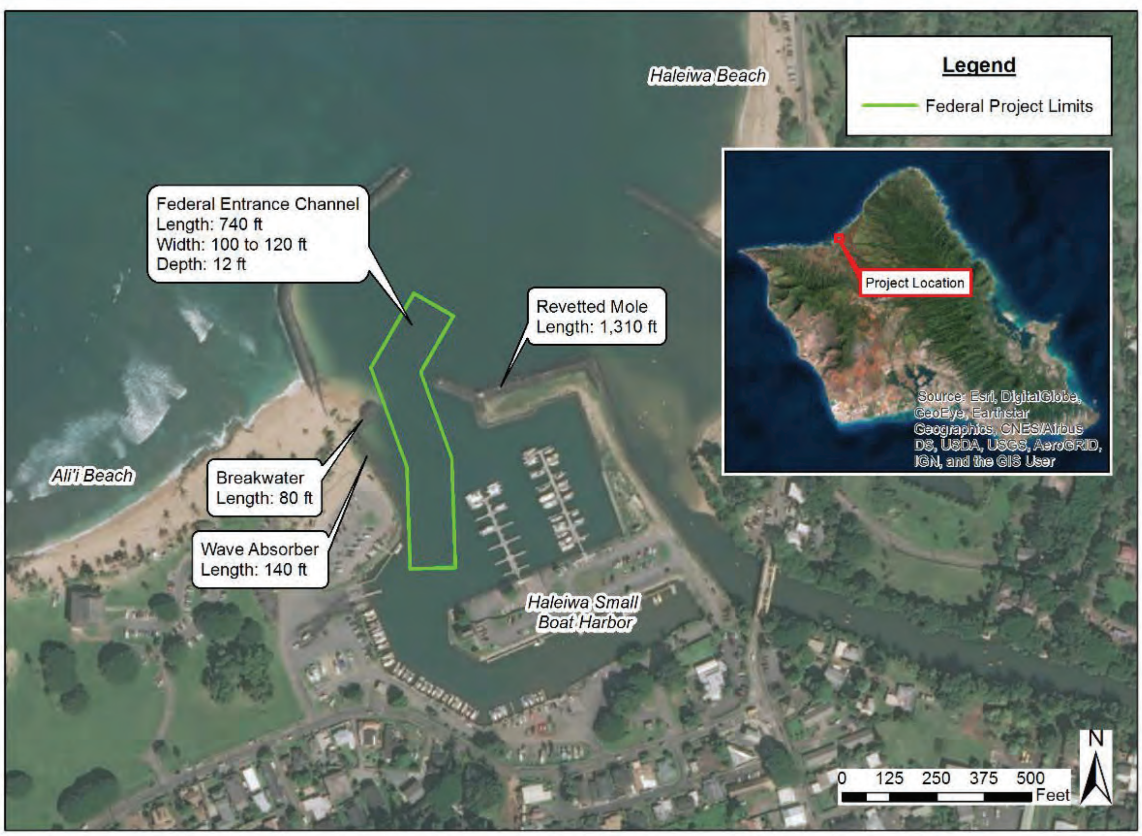


Figure 1. Map of Haleiwa Harbor federal navigation features.

Introduction
Haleiwa SBH is the center for recreational boating activities on the north shore of Oahu. Non-Federal project features include 64 berths, 26 moorings, 2 loading docks, and 3 ramps. Shore side facilities include a harbor office, vessel wash down area, dry land storage, and a fish hoist. Several commercial operations operate out of the harbor, including fishing charters, shark encounters, diving charters, whale watching tours, snorkeling tours, sailing cruises, and other boat tours. The beaches surrounding the harbor are frequented by swimmers, surfers, stand-up paddle boarders, and other recreational ocean users. In the winter, several surf contests are held in this area due to the large surf.

Historically, there has been relatively small quantities and infrequent dredging at the POH navigation harbors. The POH navigation Operations and Maintenance (O&M) project delivery team (PDT) is working to develop the means and methods to better sustain these federal projects and develop plans to better manage the dredged sediment resources on a regional scale. Haleiwa SBH has been dredged twice within the past twenty years, and is expected twice again in the next 20 years.

The State of Hawaii Department of Health (HDOH) maintains a zero allowance for return water from upland disposal and dewatering areas. This Dredged Material Maintenance Plan (DMMP) Preliminary Assessment (PA) lays the ground work for developing upland placement methods acceptable to the HDOH, which will allow for greater opportunities to beneficially use dredged sediments for shoreline protection and other purposes. Management of this scarce sediment resource through streamlined transportation of the materials could potentially lower dredging costs on the main Hawaiian Islands (Tetra Tech 2015).

Site History
Before Haleiwa Harbor was constructed, the mouth of `Anahulu River emptied into the Pacific Ocean at the southwest corner of the current harbor. Part of the harbor authorization in 1964 relocated the river mouth to its present location. The outer breakwater, approximately 840-ft-long, was built by the State of Hawaii in 1955. Section 107 of the River and Harbor Act of 1960 first authorized the construction of Haleiwa SBH, including the entrance channel and revetted mole. The harbor underwent several repair projects in 1970, 1975, and 1978, after sustaining damages during storms. After a storm damaged the harbor in January 1974, emergency repairs and new work were authorized. The new work consisted of a stub breakwater, a wave absorber, and lengthening of both the entrance channel and revetted mole. Construction was completed in November 1975.

Site dredging history
The U.S. Army Corps of Engineers (USACE) has a non-discretionary duty to maintain federally authorized general navigation features. Within the past 20 years, Haleiwa Harbor has been dredged twice, in 1999 and 2009, with a total of about 13,700 cubic yards (cy) of dredged sediment (Table 1).

In 1999, North Pacific Construction, Inc. dredged Haleiwa SBH for a cost of $208,100. They used a clamshell on a floating barge to dredge 7,214 cy of material. Shoaled areas were as shallow as 1ft below MLLW. All the dredged material was stockpiled and disposed of upland.

In December 2009, Trade West Construction, Inc. dredged 6,500 cy of sediment from Haleiwa SBH using a mechanical bucket dredge (Figure 2). Shoaled areas ranged from 4 to 15 feet below mean lower low water (MLLW). During dredging, two high spots composed of hard material were found that apparently hadn't been dredged during the original construction project. All dredged sediments were stockpiled and dewatered at the harbor, then disposed of upland (Figure 3). The dredging was completed at a cost of $1,150,000 that utilized $700,000 of American Recovery and Reinvestment Act funding.

Based on historical dredging and shoaling data, POH anticipates needing to dredge Haleiwa Harbor twice within the next 20 years.

Table 1. USACE dredging history of Haleiwa Harbor.

YEAR	DREDGE OWNER	TYPE OF WORK	TYPE OF DISPOSAL	VOLUME (CY)	TOTAL COST	UNIT COST
1999	CONTRACT	MAINTENANCE	UPLAND	7,214	$208,100	$28.85
2009	CONTRACT	MAINTENANCE	UPLAND	6,500	$1,150,000	$176.92

Figure 2. Photo of dredge operation during 2009 maintenance dredging.

Figure 3. Location of stockpile area at Haleiwa Harbor during the 2009 maintenance dredging.

Shoaling and Maintenance

By evaluating past dredging events and survey data, shoaling rates can be calculated and future dredging requirements can be projected. See Table 2 for a summary of past dredging events and surveys from the past 30 years. The volume is the amount of material that shoaled above the authorized depth of 12 feet, or the amount that was dredged during maintenance dredging. The shoaling rate is calculated in two ways. First, as the volume divided by the number of years since the last dredging. This smooths the data and looks at the longer term trends. Second, as the difference in volume from the previous survey/dredge, divided by the number of years since that event. This method take a look at the shorter-term changes.

Based on the survey data only, the harbor shoals at an average rate of about 100 cy/yr. In fact, prior to the 1999 dredging, the harbor seemed to shoal at a much slower rate. The 1987, 1991, and 1995 volumes were all about 2,000 cy (the small differences may be due to surveying errors). The 1997 survey showed a large increase in shoaled volume, triggering the 1999 dredging. Ten years later, the harbor had to be dredged again. Shoaling rates since the last dredging in 2009 have been low again. This data suggests that the harbor may fill in episodically, such as during storm events, rather than steadily over many years. The average shoaling rates show that over the long term, the harbor shoals at a rate of about 100-200 cy/yr. However, considering the shorter-term episodic events, the harbor shoaling can be estimated at 500 cy/yr.

To predict future dredging needs, a conservative approach will be used. Based on the difference between the two most recent dredging events (i.e. 6,500 cy of material shoaled between 1999 and 2009), we estimate that 650 cy of material shoals each year and that the harbor will need to be dredged about every 10 years. Figure 4, which displays the results of the most recent survey in 2014, depicts the typical shoaling pattern in the harbor.

Table 2. Shoaling Rate based on dredging and hydrosurvey history.

Year	Type of Work	Volume (cy)	Shoaling Rate since last dredging (cy/yr)	Shoaling Rate from previous event (cy/yr)
1966	New Construction	---	---	---
1987	Hydrosurvey	2,053	98	---
1991	Hydrosurvey	2,211	88	40
1995	Hydrosurvey	1,981	68	-58
1997	Hydrosurvey	4,500*	145	1260
1999	Maintenance Dredging	7,214	219	1357
2009	Maintenance Dredging	6,500	650	650
2011	Hydrosurvey	311	156	156
2014	Hydrosurvey	620	124	103
AVERAGE OF HYDROSURVEYS			**113**	**---**
AVERAGE OF ALL			**193**	**523**

*Estimate based on maintenance dredging plans.

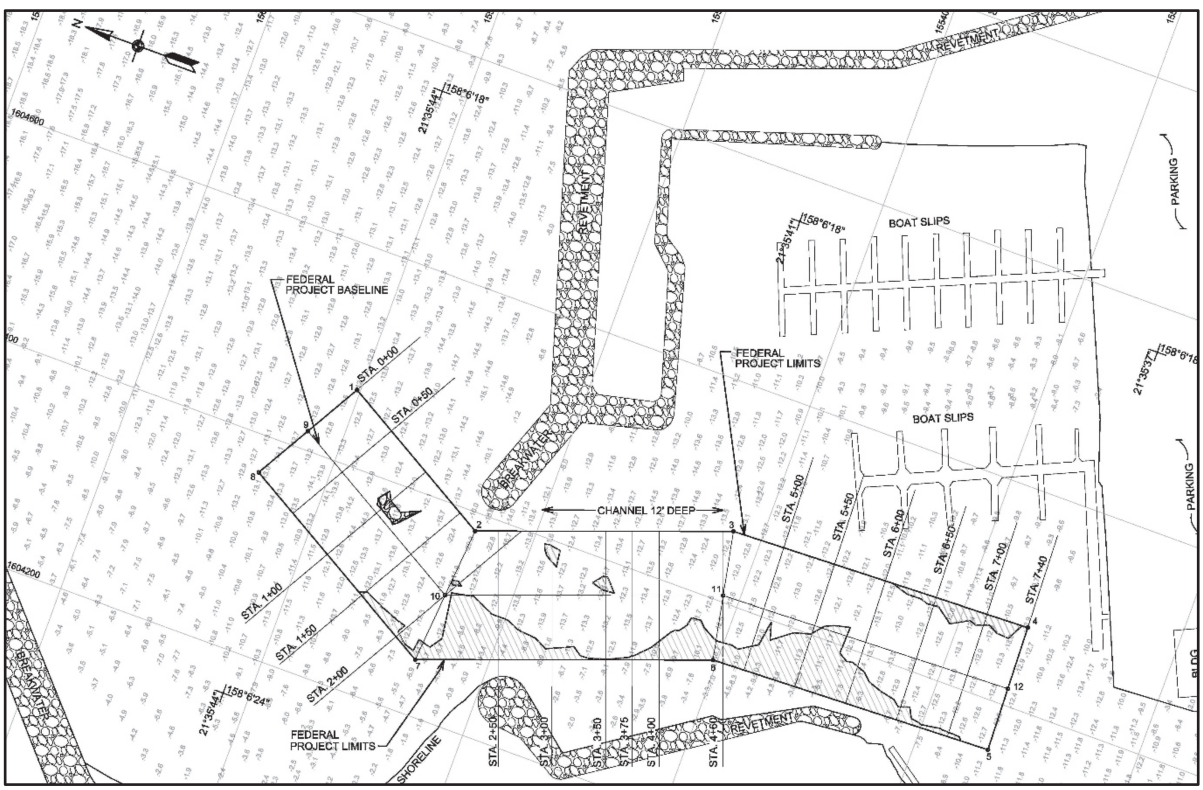


Figure 4. Crosshatched areas are above the authorized project depth in Haleiwa Harbor as of April 2014.

Material Sources

A Regional Sediment Management (RSM) study was conducted in 2013 to identify sediment pathways in the Haleiwa region. The coastal region of Haleiwa is defined by two rocky headlands – Pua`ena Point to the north and Kaiaka Point to the south. For the FY13 RSM study, this region was broken into 6 littoral cells: Kaiaka West, Kaiaka East, Ali`i Beach, Haleiwa Harbor, Haleiwa Beach, and Pua`ena Point (Figure 5). Numerical modeling of the waves and currents was used to identify dominant sediment pathways and to inform the development of the regional sediment budget (Figure 5). Currents were observed to flow along the shoreline and then offshore at the relic stream channels, which can be seen in the aerial photo in Figure 5. The Kaiaka Beach cells were found to be stable, likely due to an onshore/offshore exchange with the nearshore channel in this area, allowing it to act as a storage area. The Ali`i Beach cell is losing sand over the root of the State breakwater and into the harbor as well as along the outside of the breakwater and into the harbor entrance channel. A portion of the sand from Ali`i Beach and Haleiwa Beach is being directed offshore into the channel at the harbor entrance. Some of this sand may be staying within the littoral system, but based on increased erosion rates in recent years, it is likely that some of this sand is being moved into deep water by the offshore current in the channel and is being lost from the system. In the Haleiwa Beach cell, there is strong transport from north to south, which pushes sand up along the groin. It also leaves the section in front of the comfort station severely eroded. Sand leaving the Haleiwa Beach cell but not moving offshore is ending up in the harbor channel in the lee of the State breakwater and nearby areas. In addition, terrestrial sediment enters the back of the harbor from `Anahulu Stream, which passes through agricultural lands before discharging next to the harbor. Figure 5 shows the resulting sediment budget from this study.

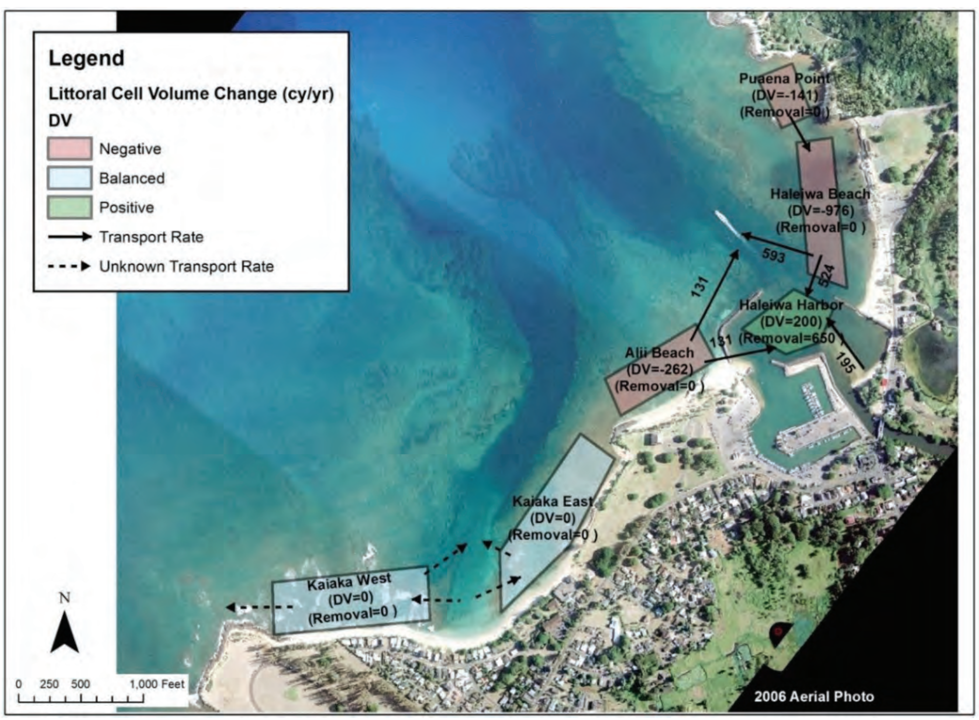


Figure 5. Sediment budget of the Haleiwa Region showing how sediment enters the harbor.

Material Type

Prior to the 2009 maintenance dredging, shoaled areas were characterized for both grain size and chemicals of concern by Marine Research Consultants, Inc. (MRCI) in 2008. MRCI conducted 2 rounds of sampling; the first for grain size analysis (samples 1-6), the second for chemicals of concern (samples 1-5, & 7). Composite sample H123 is in the berthing area, which is the State's dredging responsibility. Composite sample H45 and discrete sample H6 are in the federal channel. Figure 6 shows the sampling locations and Table 3 the grain size results. The data shows the gradation from very fine grained material in the berthing area (sample H123), to clean, well-sorted coarse-grained sand in the outer channel (H6). Since sample H6 had a very small fines fraction, it was considered clean and was not used for the chemical testing, as described in the next section. Figure 6 shows the approximate boundary between the sand/mud areas in the entrance channel.

The U.S. Fish and Wildlife Survey conducted a marine benthic survey in September 2012 to identify living coral and other hard substrate discovered during the 2009 dredging (FWS 2012). Only 1 coral head was identified directly in the entrance channel, and they reported that the benthic substrate was primarily terrigenous sediment. The findings were mapped and will be used as a baseline, for future reference.

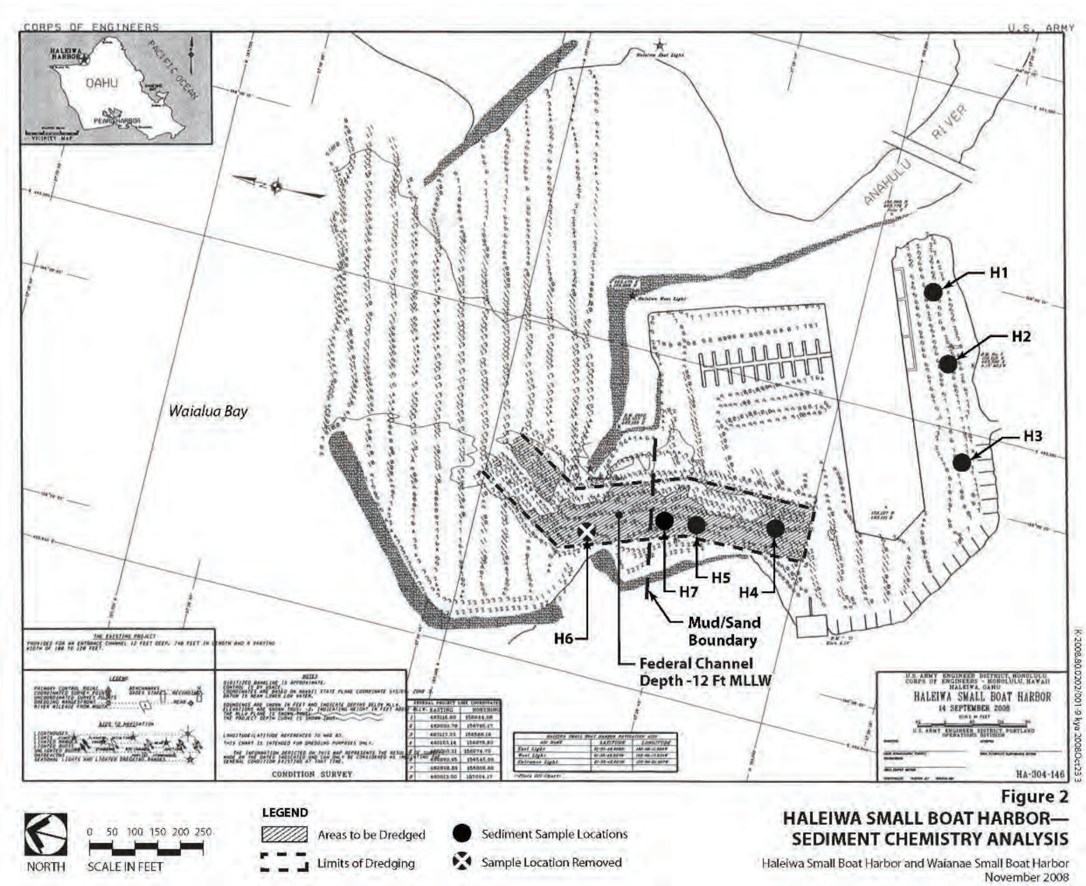


Figure 6. Haleiwa Harbor with sediment sampling locations and estimated sand/mud boundary (MRCI 2008).

Table 3. Particle size distribution by sample (MRCI 2008).

Sample	H123 (%)	H45 (%)	H6 (%)
Gravel (>2 mm)	1.63	1.74	7.29
Sand (>63 µm)	8.11	43.67	92.35
Silt/Clay (<63 µm)	91.89	54.59	0.37

Contaminants

During the 2008 sediment sampling program, the first round of testing quantified grain size distribution as discussed above. Since sample H6 was found to be <1% fines, it was not used for the second round of testing, which was a chemical analysis on material with greater than 15% fines. Instead, another sample location (H7) was added to create composite sample H457 as shown in Figure 6. Although chemical concentrations were detected in sample H457, they were determined to be below the Department of Health's Environmental Action Limits for unrestricted uses. They were also below the criteria for landfill acceptance. Thus, contaminates will not restrict disposal options.

Material Disposal Options

Beach Nourishment

The State of Hawaii is very interested in obtaining sand for beach nourishment as sand is a limited resource on the islands and relatively expensive given its scarcity. Hawaii's beach nourishment projects to date have been relatively small volumes when compared to mainland projects, and at a higher cubic yard cost (Welp 2014). An example of a nourishment project is Waikiki Beach, where sand was dredged from nearby offshore with an 8 inch discharge barge-mounted submersible. A 6 inch diameter discharge booster pump sent 27,000 cy of sand approximately 3,000 ft onshore in an 8 inch diameter HDPE pipeline, where it was dewatered and subsequently placed on the beach at a cost of $47.00/cy. Borrow material percent fines content allowed to be placed on the beach in the state of Hawaii is 0 to 5 percent and due to the HDOH requirement of "no return water", it is very difficult and expensive to find and place acceptable sand (Welp 2014).

For Haleiwa Harbor, the Honolulu District would place clean sand on Haleiwa Beach in the area of greatest erosion, which is immediately in front of the seawall by the bathrooms. It is estimated to be an area of about 8,000 sf (Figure 7). This would help to protect the seawall and the structures behind it. While the C&C and State are interested in renourishing the entire Haleiwa Beach SPP, the beneficial reuse of this dredged material would help protect the most critical shore side facilities before a full renourishment can take place.

Stockpiling

Based on discussion with the City and County of Honolulu (C&C), clean sand material could be stockpiled at Haleiwa Beach Park (HBP) (Figure 8). This material would be turned over to the C&C. Since the C&C is responsible for the maintenance of HBP, they are interested in using the sand to repair the area around the restrooms. They could do this by working with the State to renourish the beach fronting the structures, or by placing sand in the cavities that have eroded behind the seawall. Since the public is very concerned about the sand loss there, the C&C isn't concerned about stockpiling at HBP since it will be used to improve the beach and park. For this option, the C&C would be responsible for all meeting environmental requirements.

Figure 7. Location of potential beach placement for beneficial reuse.

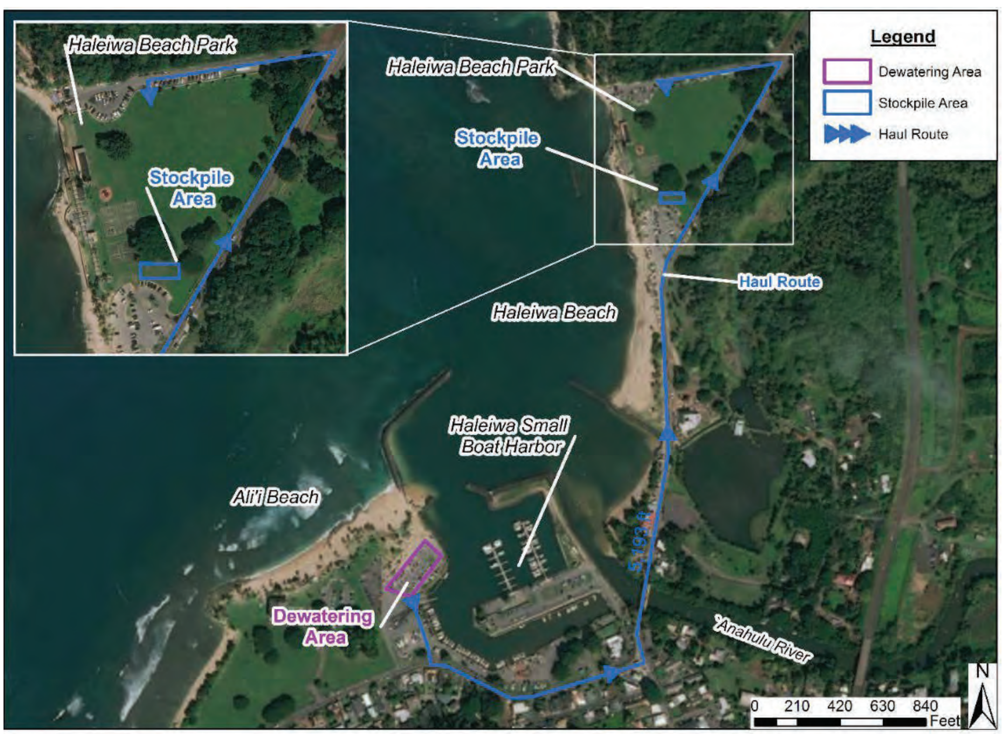


Figure 8. Potential stockpile area for dredged material.

Landfill

Dredged sediment would be taken to the PVT Landfill in west Oahu (Figure 9). This landfill is the only landfill on Oahu that accepts construction and demolition material, including dirt. The dredged material could be used to cap sections of the landfill. The distance to the landfill is about 34.4 miles.

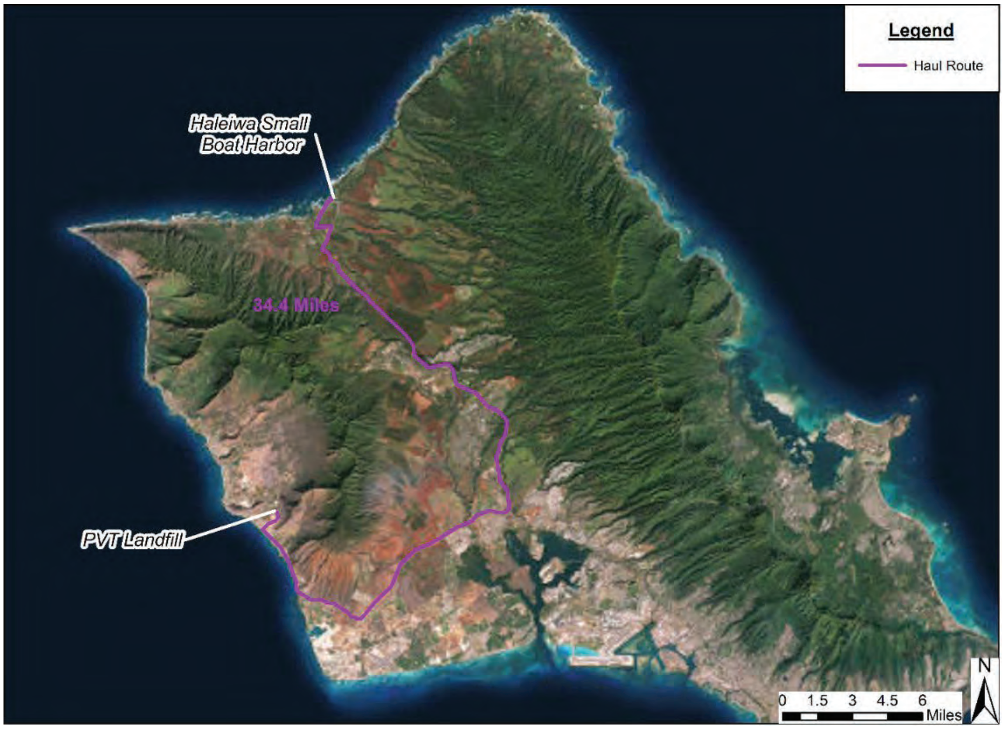


Figure 9. The distance from Haleiwa SBH to the PVT Landfill is 34.4 miles.

ODMDS

The South Oahu Ocean Dredged Material Disposal Site (ODMDS) is 3.3 nautical miles (nmi) offshore of the south shore of Oahu in Mamala Bay (Figure 10). The site lies on the shelf-slope junction in 3,000 ft to 1,560 ft (400 to 475 meters (m)) depth of water. The site is rectangular with sides 1.1 by 1.4 nmi. The bottom terrain is a sloping plain, dropping approximately 250 ft to 6,500 ft (75 m across the 2,000 m). Native sediment is primarily silty sand.

This site has an almost unlimited capacity to accommodate clean dredged material, which it receives from Pearl Harbor, Barbers Point Harbor, and Honolulu Harbor. The EPA does not allow cobbles or other larger substrate to be placed in the ODMDS, as it may create desirable habitat, which will later be buried by subsequent disposal operations.

While this site is far from Haleiwa Harbor, it is the only ODMDS for the island of Oahu. Dredged sediment would be taken via barge to the South ODMDS. The site is 48 miles from Haleiwa Harbor.

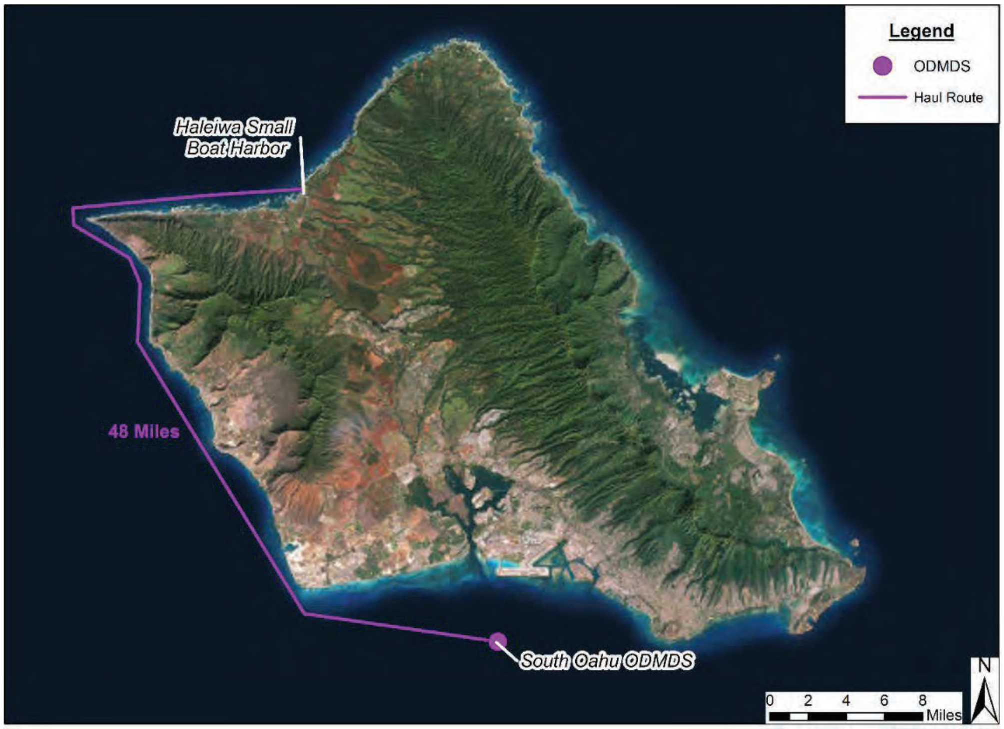


Figure 10. The South Oahu ODMDS is 48 miles from the Haleiwa SBH.

O&M Dredging: 20 Year Horizon

Based on the hyrdosurvey and dredging data, Haleiwa SBH typically shoals at about 100-200 cy/year. However, it seems that episodic events introduce large volumes of sediment to the harbor, accelerating the need to dredge. Thus, as a conservative estimate, the most recent dredging information will be used to predict future dredging needs. Over a ten year period (1999-2009) 6,500 cy of material shoaled in the harbor, giving an average shoaling rate of 650 cy/yr. Assuming the harbor will need to be dredged every 10-15 years, and balancing the Honolulu District's other dredging projections, it's estimated that Haleiwa SBH will be dredged again in 2022 and 2035. Each event would have 8,450 cy of material, or 16,900 cy over the next twenty years. Table 4 is a summary of past dredging events and the 20 year horizon predicted future dredging events and volumes.

Table 4. Past and Predicted Dredging

Year	Volume (cy)
1999	7,214
2009	6,500
2022	8,450
2035	8,450

The sediment sampling from 2008 shows that there are two different types of material in the entrance channel. The sediment in the outer portion of the harbor is beach quality sand that has come from the neighboring beaches via regional sediment transport processes. The material in the inner part of the harbor is finer grained terrestrial sediment. This material cannot be placed on beaches, but since it is not contaminated could be used for other beneficial uses. If beneficial use options were pursued for sediment disposal, it's estimated that for each dredging event 5,070 cy of sand would be available for beach placement and 3,380 cy of silty material for other beneficial use options. Any of the material could be taken to the landfill or to the South Oahu ODMDS. Due to the relatively small volumes of material expected to be dredged from this harbor, none of the evaluated disposal options are limited in capacity. As discussed below, different cost and environmental considerations will be the main factor in deciding how material should be disposed of.

In order to reduce the dredging needs at Haleiwa Harbor, there may be justification to authorize a deposition basin adjacent to the federal channel. Between the federal stub breakwater and state's outer breakwater, a large volume of sand has accumulated (Figure 11). The sand is transported by wind and high waves from Ali`i Beach over the root of the state breakwater and fills in this area. That sand ultimately shoals in the channel and requires maintenance dredging. While the area between the breakwaters is outside of the federal channel limits, USACE may pursue authorization to conduct advanced maintenance, such as construction of a deposition basin. Since this sand will eventually enter the channel via this pathway, this location would be a logical choice for a deposition basin, so that any sand coming over the breakwater would settle there rather than moving into the channel.

The deposition basin would also need to be maintained (using land-based equipment with a limited reach), but would reduce channel maintenance requirements (which require a floating dredge plant). Based on 2013 JABLTCX LiDAR data, it is estimated that 1,200 cy of sand could be removed from the shoaled area to create a 100 ft long by 60 ft wide by 8ft deep (MLLW) deposition basin, at a cost of approximately $180,000. Given the harbor's dredging history, the deposition basin would need to be excavated at a three to five year interval. Assuming a reduced future channel shoaling rate, the dredging interval would increase to well beyond 10 years. In addition, all of the material from the deposition basin would be beach quality material that could be used for beach placement.

In addition, reducing the amount of terrigenous sediment entering the back of the harbor from the `Anahulu River would both reduce the dredging needs and improve the quality of material that is dredged. A culvert connects the river to the harbor for circulation, however, the river water carries suspended fine grained material that settles out in the calmer harbor waters. To reduce the amount of sediment coming through culvert, a few alternatives should be further investigated. These include but are not limited to retrofitting the culvert with a screen to filter out sediment, an upstream settling basin, or closing off the culvert.

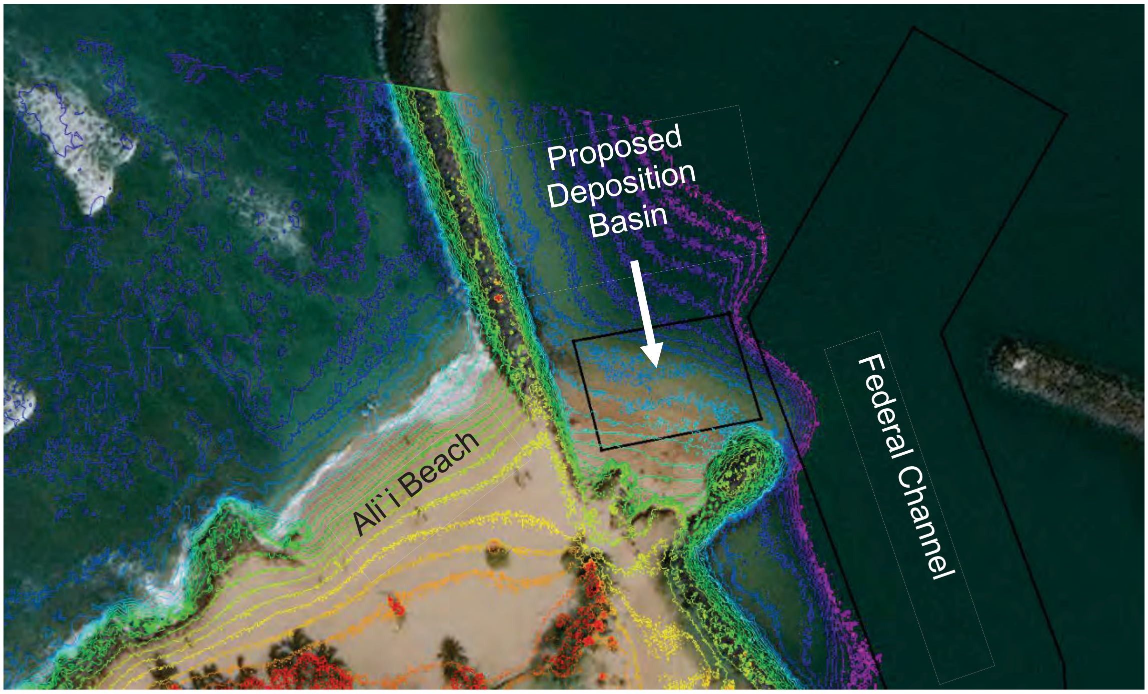


Figure 11. Location of proposed deposition basin to capture sediment from Ali`i Beach before it enters the federal channel.

Economic Assessment

A rough order of magnitude cost estimate is presented in Table 5 to compare the different disposal options. For each option, it is assumed that channel will be dredged to authorized depth and that all material will be disposed of with a single disposal method (i.e. stockpile, beach placement, landfill, or ODMDS). The estimate shows that disposing of the material at the ODMDS is the least cost option, at $33/cy. Taking the material to the ODMDS eliminates the need for landside equipment, and dewatering and trucking the material. Stockpiling and beach placement are very similar in unit cost, pointing to the fact that for construction cost there is not much difference with placing the material at HBP verse placing it on the beach. Trucking the material to the landfill is the most expensive option, about double the stockpile/beach placement options (i.e. $188/cy vs. $91-96/cy).

Table 5. Rough Order of Magnitude cost comparison of disposal options.

Disposal Method	Mob/ Demob	Dredging Project Costs	Total Project Costs	Dredging Unit Costs ($/cy)
Stockpile	$501,121	$593,948	$1,095,069	$91
Beach Placement	$501,121	$621,450	$1,122,571	$96
Landfill	$501,121	$1,220,902	$1,722,023	$188
South Oahu ODMDS	$626,888	$212,880	$839,768	$33

The Federal Standard. The Federal Standard is defined in USACE regulations as the least costly dredged material disposal or placement alternative identified by USACE that is consistent with sound engineering practices and meets all federal environmental requirements. It is also USACE policy to fully consider all aspects of the dredging and placement operations while maximizing benefits to the public. Beneficial use options for the dredged material should be given full and equal consideration with other alternatives. Based on the cost analysis above, open water placement of dredged material in the South Oahu ODMDS is the Federal Standard (or “base plan”).

Beneficial use project costs exceeding the cost of the Federal Standard (or “base plan”) option become either a shared federal and non-federal responsibility, or entirely a non-federal responsibility, depending on the type of beneficial use. Section 145 of WRDA 1976, as amended by Section 933 of WRDA 1986, Section 207 of WRDA 1992, and Section 217 of WRDA 1999, authorizes USACE to place suitable dredged material on local beaches if a state or local government requests it. Although placement for restoration purposes may be authorized under it, this provision is primarily used for storm damage control purposes. The incremental costs of beach nourishment are shared on a 65 percent federal and 35 percent non-federal basis.

Environmental Compliance

An Environmental Impact Statement was prepared for all USACE harbors in 1975. Based on this analysis, the primary environmental impacts of concern were disruption of the benthic community during dredging, increased turbidity in the water column both during dredging and disposal at the offshore site, and possible degradation of the deep ocean environment at the ODMDS. During dredging and disposal, these impacts are minimized to the extent possible through the use of best management practices.

Based on discussions with the resource and permitting agencies in 2017, their concerns with dredging Haleiwa Harbor are primarily related to the potential beach placement disposal option. The dredging operation would only need a Section 402 NPDES permit, however, beach placement would require an Environmental Assessment and several additional permits to be obtained. Details of these requirements can be reviewed in the “Hawaii RSM: Advance Planning for the Beneficial Reuse of Dredged Material at Haleiwa Harbor” report (Molina 2017).

Marine Benthic Survey

The FWS conducted a Marine Survey in 2012 to classify the bottom substrate in the federal channel. Some corals were found along the base of the wave absorber and breakwater. Only one coral head was found in the outer entrance channel (Figure 12). FWS stated that they “would anticipate that future maintenance dredging activities would result in the direct, but temporary loss of infauna and a species of bryozoan that was observed on the sediment. They would also expect to observe the degradation or loss of corals, non-coral macroinvertebrates and marine plants through indirect impacts due to reduced water quality conditions during dredging activities.” FWS recommended that silt curtains be used during dredging operations and provided as list of recommended best management practices (FWS 2012).

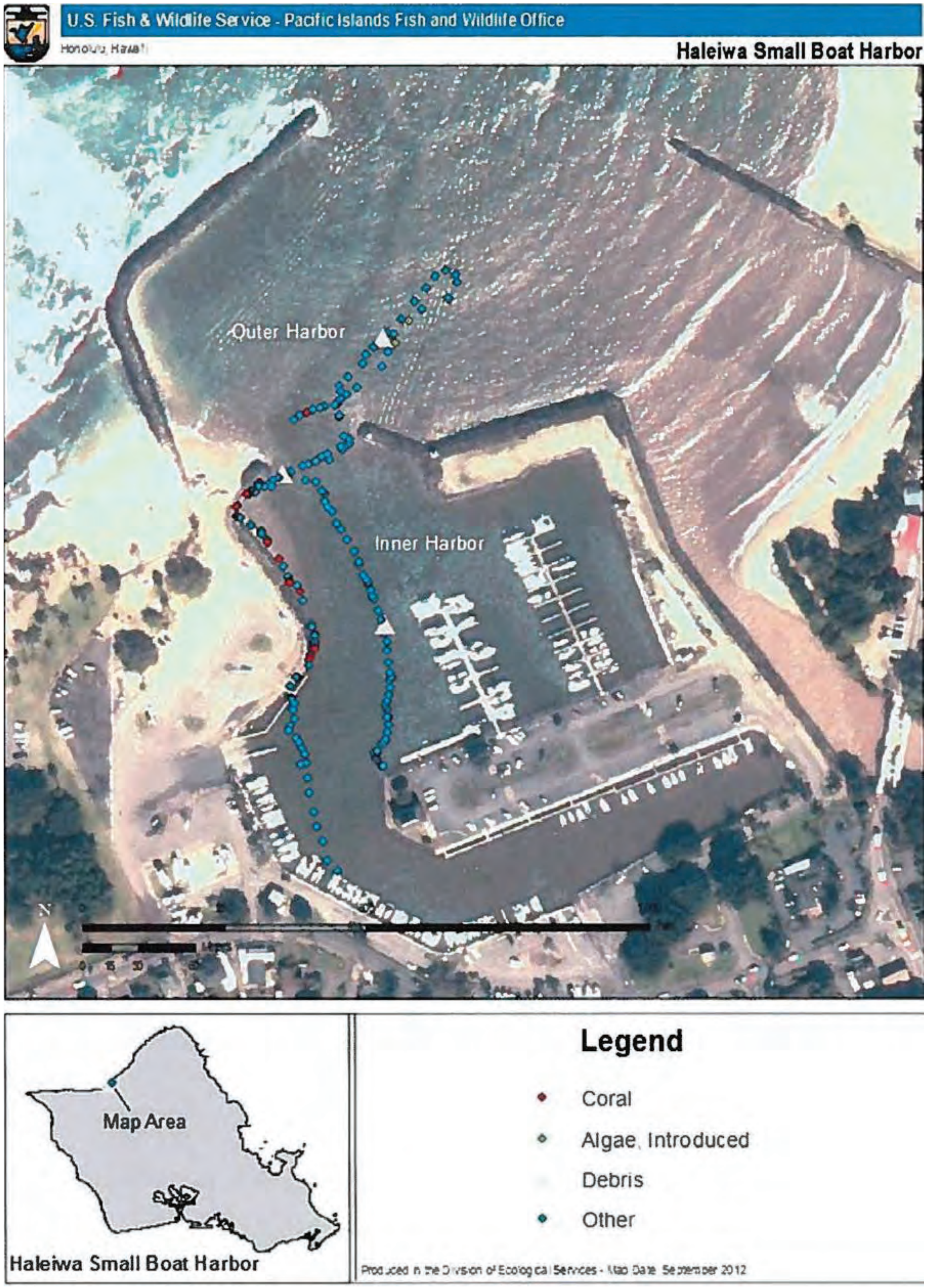


Figure 12. Location track of the FWS marine survey at Haleiwa SBH in 2012, with coral colonies highlighted in red.

Recommendations

The Base Plan for management of material dredged from Haleiwa Harbor is the use of the existing EPA designated ODMDS for all materials able to be deposited within it. It is not expected that any material will have contaminates of concern above EPA's limits, nor that it will exceed the ODMDS grain size requirements. The ODMDS has ample capacity to meet the 20 year dredging needs of Haleiwa Harbor.

In the State of Hawaii, sand is considered a valuable and limited resource that needs to be comprehensively managed. Although offshore disposal is the federal standard, options to keep the sand in the littoral system are preferred and need to be further pursued. The preferred alternative for the beneficial use of sandy material is to stockpile it at Haleiwa Beach Park for future use, when logistically and economically practicable. Once stockpiled, the material would be available for any future city, state, or federal renourishment needs. It is further recommended that the State, C&C, and POH begin working on developing a detailed plan and obtaining the permitting necessary to stockpile and place sand at Haleiwa Beach. A non-federal sponsor would need to fund the incremental cost over that of disposal at the ODMDS of approximately $300,000 for stockpiling the dredged material.

A Dredge Material Management Plan is not required for this project.

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Lauren Molina, P.E., CEPOH-EC-T
Coastal Engineer

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Thomas D. Smith, P.E., CEPOH-EC-T
Technical Lead, CW O&M (PCS)

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Michael F. Wong, P.E., CEPOH-EC-T
Chief, Civil Works Technical Branch

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Program Manager, CW O&M

Appendix H: Public Involvement

SECTION 1122
BENEFICIAL USE OF DREDGED MATERIAL (BUDM)
HALEʻIWA SMALL BOAT HARBOR

August 2023

Distribution List for Draft Integrated Feasibility Report and Environmental Assessment

FEDERAL AGENCIES
Department of the Interior, U.S. Fish and Wildlife Service
Department of Commerce, National Marine Fisheries Service
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
STATE AGENCIES
Department of Business, Economic Dev. and Tourism (DBEDT)
DBEDT, Office of Planning and Sustainable Development/Coastal Zone Manaegement Program
Department of Health
Office of Hawaiian Affairs
Department of Land and Natural Resources (DLNR)
DLNR, Division of Aquatic Resources
DLNR, Division of Boating and Ocean Recreation
DLNR Office of Conservation and Coastal Lands
DLNR, Historic Preservation Division
University of Hawaii, Sea Grant Program
CITY AND COUNTY OF HONOLULU
Department of Design and Construction
Department of Parks and Recreation
NEIGHBORHOOD BOARDS
North Shore Neighborhood Board
COMMUNITY GROUPS, ORGANIZATIONS AND ASSOCIIATIONS
Malama Loko Ea Foundation
Waialua Hawaiian Civic Club
Hawaii Shore and Beach Preservation Association
Hawaii Ocean Resources Management Plan Working Group
LIBRARIES
Kahuku Public Library
Waialua Public Library

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
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

Ref:OCCL:MC

USACE Honolulu District
CEPOH-PPC
ATTN: Rhiannon Kucharski
Chief, Civil and Public Works Branch
Fort Shafter, HI 96858

Beneficial Use of Dredge Material
Section 1122 of Water Resources Development Act of 2016 Pilot Program
Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration
Honolulu, Island of Oahu, Hawaii

Dear Ms. Kucharski:

This letter is to support the recommended plan developed in partnership with the U.S. Army Corps of Engineers Section 1122 of the Water Resources Development Act (WRDA) of 2016 (Public Law (PL) 114-322), in utilizing dredged material to reduce coastal storm damage and improve the aquatic ecosystem, in the vicinity of Haleiwa Beach Park, Haleiwa, Oahu, Hawaii.

The project proposes to dredge approximately 22,638 cubic yards of material from the Federal Navigation Channel and three other sites, and to use the dredged material to nourish 4.2 acres of beach at Haleiwa Beach Park.

The proposed project estimated at $3.9 million provides significant risk reduction to the public infrastructure, historical monuments, and recreation areas frequented by visitors from across the globe.

We understand that there is a need for a non-federal cost sharing partner to cover cost associated with dredging material beyond the federal navigation project. The Department of Land and Natural Resources, represented by both the Division of Boating and Ocean Recreation and the Office of Conservation and Coastal Lands, acknowledges that the non-federal sponsor would be required to pay for:

- 35% of design and construction costs for the dredging of the channel beyond a depth of twelve feet, for a total of $80,000.

- 100% of the design and construction costs associated with both the state breakwater settling basin and the dredging and transport of sand from the offshore sand deposit dredging and transport, for a total of $2.64 million.

We acknowledge that the non-federal cost relating to these features is estimated at approximately $2.72 million. We commit to pursuing State funding for the project.

We understand that the non-federal sponsor is responsible for providing all lands, easements, rights of way, relocations, and disposals (LERRDs) that the Government determines are required for implementation of the Project.

Should you have any questions, please call Michael Cain of the Office of Conservation and Coastal Lands at (808) 798-6912 or email at michael.cain@hawaii.gov.

Sincerely,

for Suzanne D. Case, Chair
Board of Land and Natural Resources

Public Comment Summary Matrix

	General Comment	Comment Reference	Response
1	Which Naitve Hawaiin Organizations were sent the draft report	a	Section consultation letters and notification of the draft report were sent to Waialua awaiian Civic Club, Malama Loko Ea, and Office of Hawaiian Affairs.
2	Concerned with proximity of BAZ to the Loko ea fish pond and back eroion in the Loko Ea tributary mouth	a, b,	The BAZ was relocated to avoid impacts to the Loko ea fish pond and tributary
3	Concerned with negative impacts to migratory fish species (mullet/milkfish), fish diversity, and impacts to water quality	a, b	The BAZ was relocated to avoid impacts to the Loko ea fish pond and tributary
4	The report does not acknowledge the historic and culturally significant Loko Ea and Uko fish pond	a	Feasibility Report has been updated to acknoledge this historic and cultural resources.
5	Encouraged further Section 106 consultation to account fo Loko Ea fish ponds	a, b	Section 106 consultation took full account of potential impacts to Loko EA, and BAZ was relocated specifically to prevent impacts to this historic and cultural site
6	Include description of the MPRSA(Marine Protection, Research, and Sanctuaries Act) in section 7.3. Confirm that USACE will coordinate with EPA on sediment testing and receive EPA concurrene prior to the use of the South Oahu ODMDS.	c	The MPRSA Section 102 gives EPA the authority to issue various categories of ocean dumping permits, including general permits, special permits, emergency permits and research permits, for materials other than dredged material. During the PED phase of the project, USACE will coordinate with USEPA to evaluate the sediments, conduct additional analysis, if necessary, and receive concurrence for sediments that are proposed for ocean disposal at the South Oahu ODMDS.
7	Clarify whether beneficial resuse opprotunities were considered for the 2000 cy of sediment proposed for the ODMDS	c	The feasibility reported investigated other opportunities for benefical use, but no other viable measures were identified.

8	Provide additional information regardin the project's impacts to jurisdiction waters. Address temp./perm. Direct and indirecte impacts to waters for each alt. Describe how the project would avoid/minimize, and mitigate impacts to waters and associated resources	c	The project is expected to impact approximately 4.2 acres of waters of the U.S. due to the restoration of a historic beach project. Temporary impacts include increased turbidity during construction. The avoidance and minimization measures are provided in Section 8 of the Feasibility Report titled, "Environmental Commitments."
9	Include a commitment to coordinate with EPA as additional proj details become available and to ensure that the project complies with the CWA section 404 requirements	c	A copy of our 404b1 analysis has been included with Appendix B.
10	Coordinate closely with USFWS and NMFS to insure project minimizes impacts to aquatic life	c	Coordination with USFWS completed on December 13, 2021. Coordinatinon with NMFS completed November 19, 2021.
11	Avoid placing sand in the rocky shoreline intertidal community and areas containing corals to the fullest extent feasible	c	To the greatest extent possible, USACE will avoid placing dredged sand directly on intertidal habitat and spread dredged material to avoid smothering rocky habitat.
12	Commit to monitoring impacts of sand placement on marine communites after construction is completed	c	Post construction monitoring will be the responsibility of the local sponsor following plan implementation.
13	Include a more detailed descrption of potential impacts to air quality. Estimate emissions of criteria pollutants and discuss the timefram for release of the emissions over the lifespan of the project. Clarify which types of construction equipment will be used. Use source specific information ot identify suitable mitigation measures. Ensure that emissions associated with the transport to the ODMDS are included in air quality impact assessment	c	Section 6.1.2 has been updated with additional information regarding the Clean Air Act.
14	Report should discuss if the EA included in this report will be applicable to the next cycle of dredging?	d	An EA will likely be required for future dredging cycles however implementation of this project may support similar activities in the future.

15	Consider an alternative that includes a permeable groin and new retention structure	d	An alternative that would construct a new groin and retention structure was outside of the scope of this authority.
16	The final report should include an analysis on the projects consistency with the objectives and supporting policies of the Hawaii CZM Program, HRS 205A-2.	d	Conditional concurrence has been recieved from CZM, and it is include with Appendix B.
17	The final report shuld discuss activities and stored materials for the proposed staging areas. Recommend that project consult with Dept of Planning and Permitting, City and County of Honolulu for special management use and shoreline setbacks.	d	Coordination regarding staging areas will be determined in the design phase.
	a. Malama Loko Ea Foundation, 25 Jan 2021 b. Office of Hawaiin Affairs, 8 Mar 2021 c. US EPA, 7 Jan 2021 d. Office of Planning, State of Hawaii, 5 Jan 2021.		

PUBLIC NOTICE

U.S. Army Corps of Engineers, Honolulu District

Civil and Public Works Branch (CEPOH-PPC)
Building 230
Fort Shafter, Hawaii 96858-5440

Public Notice Date: **8 DECEMBER 20**
Expiration Date: 30 DAYS

<u>FEDERAL PUBLIC NOTICE</u>

Interested parties are hereby notified of the availability of a draft Integrated Feasibility Report and Environmental Assessment for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration for public review and comment pursuant to the National Environmental Policy Act (42 United States Code (USC) 4321 et seq.).

<u>ACTION AGENCY</u>: The federal action agency is the Honolulu District, U.S. Army Corps of Engineers, Civil and Public Works Branch (Corps). The non-federal sponsor is the State of Hawaii, Department of Land and Natural Resources' Office of Conservation and Coastal Lands and Division of Boating and Ocean Recreation.

<u>LOCATION OF THE PROPOSED WORK</u>: The proposed project is located offshore and along the shoreline from Haleiwa Small Boat Harbor to Haleiwa Beach Park, Haleiwa, Island of Oahu, Hawaii.

<u>PROPOSED PROJECT AND PURPOSE</u>: This report presents the evaluation of beneficial uses for dredged material resulting from the routine maintenance dredging of the federal channel at Haleiwa Small Boat Harbor. This study evaluated several alternatives for beneficial use based on economic, engineering, environmental and other factors.

The Recommended Plan, Alternative 4, involving beneficial use of dredged material for the purposes of restoring aquatic habitat and reducing storm damage to property and infrastructure. Alternative 4 proposes to beneficially reuse material dredged from the Haleiwa Small Boat Harbor Federal Navigation Channel and an Offshore Sand Borrow Area to nourish the beach which is part of the Haleiwa Beach Shore Protection Project, adjacent to Haleiwa Beach Park. Dredging from these locations will yield approximately 26,071cubic yards of beach suitable sand and will be used to restore 4.4 acres of beach. Dredged material that is not suitable for beach restoration, approximately 2,000 cubic yards, will be transported by scow and disposed of at the U.S. Environmental Protection Agency designated South Oahu Ocean Dredged Material Disposal Site.

The beach is part of the federally authorized HBSPP, and nourishment with dredged material will help restore the beach to its original extent. This will produce both environmental and economic benefits in the form of restored habitat for the threatened green sea turtle (*Chelonia mydas*), recreational opportunity, and storm damage reduction. Reference the attached draft Integrated Feasibility Report and Environmental Assessment for full description.

AUTHORITY: This project is fully federally funded and authorized under Section 1122 of Water Resources Development Act (WRDA) of 2016, as amended.

FEDERAL EVALUATION: The Corps of Engineers is soliciting comments from the public; federal, state, and local agencies and officials; Native Hawaiian Organizations; and other interested parties in order to evaluate the direct, indirect, and cumulative impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to authorize and fund construction of this project and be made a part of the administrative record. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors.

PUBLIC HEARING: Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this proposal. Requests for public hearings shall state clearly and concisely, the reasons and rationale for holding a public hearing. The District Commander will then decide if a hearing should be held.

COMMENT AND REVIEW PERIOD: The draft Integrated Feasibility Report and Environmental Assessment are attached to this notice for your review. Hardcopy versions of this report are also available for the public at Waialua Public Library (67-068 Kealohanui Street, Waialua, Hawaii) and Kahuku Public Library (56-490 Kamehameha Highway, Kahuku, Hawaii). Comments in response to this public notice should be made in writing via conventional mail or e-mail. Comments will be accepted and made part of the record and will be considered in determining whether it would be in the public interest to authorize this proposal. Conventional mail comments should be sent to

U.S. Army Corps of Engineers, Honolulu District
CEPOH-PPC, Attn: Benjamin Reder
Building 230
Fort Shafter, Hawaii 96858-5440.

Alternatively, comments may be emailed CEPOH-Planning@usace.army.mil. Reference “Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration” in the subject heading of the email. In order to be accepted, e-mail comments must originate from the author’s e-mail account.

Both conventional mail and e-mail comments must include the commenter's name, address, and phone number. **All comments whether conventional mail or e-mail should be received by 4:00 PM (HST) on 7 JANUARY 2020.**

PRIVACY & CONFIDENTIALITY: It should be noted that materials submitted as comment to this public notice become part of the public record and are thus available to the general public under the procedures of the Freedom of Information Act (FOIA). Submissions should not include any information that the submitter seeks to preserve as confidential.

If you have any questions about this project, please contact Mr. Benjamin Reder, Project Manager, CEPOH-PPC via telephone at (808) 835-4203 or via email at Benjamin.E.Reder@usace.army.mil.

This public notice is issued by the Chief, Civil and Public Works Branch.

ENCLOSURE

Honolulu District, U.S. Army Corps of Engineers
December 8, 2020 ·

Interested parties are hereby notified of the availability of a draft Integrated Feasibility Report and Environmental Assessment for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration for public review and comment pursuant to the National Environmental Policy Act (42 United States Code (USC) 4321 et seq.).
See more at: https://go.usa.gov/x7hvh
#HaleiwaSBH #usace

US Army Corps of Engineers

Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Restoration Hale'iwa, Island of O'ahu, Hawai'i

SECTION 1122
WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 2016
BENEFICIAL USE OF DREDGED MATERIAL (BUDM)

DRAFT INTEGRATED FEASIBILITY REPORT
AND ENVIRONMENTAL ASSESSMENT

November 2020

Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Restoration Hale'iwa, Island of O'ahu, Hawai'i

SECTION 1122
WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 2016
BENEFICIAL USE OF DREDGED MATERIAL (BUDM)

DRAFT INTEGRATED FEASIBILITY REPORT
AND ENVIRONMENTAL ASSESSMENT

November 2020

Prepared by:

United States Army Corps of Engineers
Honolulu District

Honolulu District, U.S. Army Corps of Engineers

December 17, 2020

The U.S. Army Corps of Engineers will be holding two virtual public question and answer sessions Dec. 22 at 12 p.m. HST and Jan. 4 at 4:30 p.m. HST) about the draft Integrated Feasibility Report and Environmental Assessment for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration. The public is invited to participate in these informational sessions.
The USACE Honolulu District released the draft Integrated Feasibility Report and Environmental Assessment (draft report) for public review and comment Dec. 8, 2020. The draft report presents the evaluation of beneficial uses for dredged material resulting from the routine maintenance dredging of the federal channel at Haleiwa Small Boat Harbor. The Recommended Plan (Alternative 4) proposes to beneficially reuse material dredged from the Haleiwa Small Boat Harbor Federal Navigation Channel and an Offshore Sand Borrow Area to nourish the beach which is part of the Haleiwa Beach Shore Protection Project, adjacent to Haleiwa Beach Park. Dredging from these locations will yield approximately 26,000 cubic yards of beach suitable sand and will be used to restore 4.4 acres of beach.

To access the meeting:
WEBLINK:
https://usace1.webex.com/meet/benjamin.e.reder
or
PHONE ACCESS: 844.800.2712
ACCESS CODE: 199-103-7061 #

All comments for record on the draft report should be either mailed to the address below or emailed to
CEPOH-Planning@usace.army.mil.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

January 7, 2021

Mr. Benjamin Reder
Project Manager
U.S. Army Corps of Engineers, Honolulu District
Building 230
Fort Shafter, Hawaii 96858-5440

Subject: Draft Environmental Assessment for the Hale'iwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project, Honolulu County, Hawaii

Dear Mr. Reder:

The U.S. Environmental Protection Agency has reviewed the above-referenced document. Our review is pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

The proposed project is part of a pilot program that seeks to beneficially reuse dredged material to meet several objectives, including reducing storm risk and restoring aquatic ecosystems. The project would perform maintenance dredging activities at the Hale'iwa Small Boat Harbor and beneficially reuse suitable sediment to nourish Hale'iwa Beach. The Draft Environmental Assessment evaluates three action alternatives, which vary primarily based on dredging location and depth. Alternative 4, which is identified as the Recommended Plan, would mechanically dredge roughly 28,071 cubic yards of material from the Federal Navigation Channel (-13 feet Mean Lower Low Water), the State Breakwater Settling Basin, and an offshore sand borrow area. Approximately 2,000 cy of sediment are expected to be incompatible for beach placement and would be disposed at the South Oahu Ocean Dredged Material Disposal Site. The EPA provides the following comments to assist the U.S. Army Corps of Engineers in determining whether a Finding of No Significant Impact can be concluded at the completion of the Environmental Assessment process.

Dredged Material Management

The EPA supports the USACE's efforts to beneficially reuse most dredged material generated by this project to restore aquatic habitat. As noted in the Draft EA, approximately 2,000 cy of silty material would be disposed at the South Oahu ODMDS. Under the Marine Protection, Research, and Sanctuaries Act, use of designated ocean disposal sites requires EPA review and concurrence. We understand that the USACE intends to coordinate with our Dredging and Sediment Management Team regarding a Sampling and Analysis Plan and MPRSA compliance for this project, and we look forward to such coordination. We recommend that additional information regarding dredged material management be included in the Final EA. For example, it appears that the Draft EA currently lacks a discussion of the MPRSA and associated requirements. It is also unclear whether other beneficial reuse options were considered for the finer sediment that is proposed for disposal at the ODMDS.

Recommendations for the Final EA:

- Include a description of the MPRSA in Section 7.3 – Status of Environmental

Compliance. Confirm that the USACE will coordinate with the EPA on sediment testing and receive EPA concurrence prior to use of the South Oahu ODMDS. Please note that, in addition to the standard ocean disposal conditions included in EPA's Site Management and Monitoring Plan that apply to all ocean disposal projects, we would likely include a special condition that the disposal vessel remain in deep water at least one nautical mile offshore throughout the transit to the ODMDS.

- Clarify whether other beneficial reuse opportunities were considered for the 2,000 cy of sediment that are proposed for disposal at the ODMDS. If such options were eliminated from consideration, explain why they were determined to be infeasible.

Aquatic Resources

The project would discharge dredged material into waters of the U.S. and, therefore, must demonstrate compliance with Section 404 of the Clean Water Act. Special Aquatic Sites such as coral reefs and vegetated shallows are present in the project area and could be affected by the project. The Draft EA states that the USACE currently lacks sufficient project-level detail to evaluate compliance with CWA Section 404, and that a Water Quality Certification pursuant to CWA Section 401 would be obtained prior to construction (p. 73). A short form 404(b)(1) evaluation is included in Appendix D.

Recommendations for the Final EA:

- Provide additional information regarding the project's impacts to jurisdictional waters. Address temporary and permanent direct and indirect impacts to waters for each alternative, including impacts to Special Aquatic Sites, such as corals and vegetated shallows. Describe how the project would avoid, minimize, and, where unavoidable, mitigate impacts to waters and associated aquatic resources.
- Include a commitment to coordinate with the EPA as additional project details become available to ensure that the project complies with CWA Section 404 requirements.

The project area contains several sensitive aquatic resources, including corals, special status species, and Essential Fish Habitat (Section 2.3). Section 6.2 briefly notes that the project may affect, but is not likely to adversely affect, some special status species and habitat due to dredging and placement of dredged material in the nearshore environment. It further states that the project would not affect EHF. As noted in the attached Fish and Wildlife Coordination Act Report (Appendix B, Attachment 1), Alternative 4 would most substantially affect the rocky shoreline intertidal community located in the northern portion of the project area. A higher density of corals was also identified in the northern project area (Appendix B, Attachment 1, p. 2).

Recommendations for the Final EA:

- Given the presence of sensitive aquatic resources in the project area, we recommend that the USACE continue to coordinate closely with the USFWS and the National Marine Fisheries Service in order to ensure that the project minimizes impacts to aquatic life and habitat to the fullest extent feasible.
- Avoid placing sand in the rocky shoreline intertidal community and areas containing corals to the fullest extent feasible.
- Commit to monitoring impacts of sand placement on marine communities after construction is completed.

Air Quality
Section 6.1.2.2 briefly notes that equipment used during the project's construction phase could affect air quality, but that no significant impacts are expected (p. 71). The Draft EA does not appear to include emissions estimates for the project or specify types of construction equipment that would be used. It is unclear whether this assessment accounts for impacts associated with transporting dredged sediment to the South Oahu ODMDS, which is located 48 miles south of Hale'iwa Harbor.

> ***Recommendation for the Final EA:*** Include a more detailed description of potential impacts to air quality. Estimate emissions of criteria pollutants and discuss the timeframe for release of these emissions over the lifespan of the project. Clarify which types of construction equipment would be used. Use source-specific information to identify suitable mitigation measures. Ensure that emissions associated with transporting dredged material to the South Oahu ODMDS are included in the air quality impact assessment.

We appreciate the opportunity to provide feedback on this Draft EA. Please send an electronic copy of the Final EA when it becomes available to capilla.morgan@epa.gov. If you have any questions, please contact me at 415-947-4167, or Morgan Capilla, the lead reviewer for this project, at 415-972-3504 or capilla.morgan@epa.gov.

Sincerely,

Jean Prijatel
Manager, Environmental Review Branch

cc: Dan Polhemus, U.S. Fish and Wildlife Service
Darren LeBlanc, U.S. Fish and Wildlife Service
Malia Chow, National Marine Fisheries Service
Ron Dean, National Marine Fisheries Service

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
DIRECTOR
OFFICE OF PLANNING

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Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

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Web: http://planning.hawaii.gov/

DTS 202012221617HE

January 5, 2021

Mr. Benjamin Reder
Project Manager
U.S. Army Corps of Engineers, Honolulu District
CEPOH-PPC
Building 230
Fort Shafter, Hawaii 96858-5440.

Dear Mr. Reder:

Subject: Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Draft Integrated Feasibility Report and Environmental Assessment

Thank you for the opportunity to provide comments for the Draft Integrated Feasibility Report and Environmental Assessment (Draft IFR-EA) for the proposed Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration proposed action.

It is our understanding that this study examines the feasibility and environmental effects of implementing beneficial use of dredged material measures at Haleiwa, Oahu. This feasibility study is being conducted under authority granted by Section 1122 of the Water Resources Development Act of 2016 (Public Law 114-322), as amended.

This study was developed to fulfill National Environmental Policy Act (NEPA) requirements, as well as environmental impacts will be assessed according to state environmental regulations Hawaii Revised Statutes (HRS) Chapter 343 and Hawaii Revised Rules (HAR) 11-200). Descriptions of the assessment criteria under both state and federal guidelines were presented in this Draft IFR-EA.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Future Harbor Dredging
   The Draft IFR-EA states that the harbor needs to be dredged every 10 to 15 years. The Final Integrated Feasibility Report and Environmental Assessment (Final IFR-EA) may benefit from discussion for whether the subject Environmental Assessment would be applicable to the next cycle dredging project if no significant changes occur in the prefer alternative.

2. Permeable Groin and New Retention Structure
   Section 1.7, page 9 of the Draft IFR-EA states that the strong transport from north to south in the region would require tightening of the permeable groin and construction of new retention structures to aid in keeping the nourished sand within the cell. In addition, short-term water surface elevation in combination with long-term increases such as sea level rise will cause increasing erosion, wave runup and threats to habitat, recreation, and coastal infrastructure at Haleiwa Small Boat Harbor. The Final IFR-EA may consider an additional alternative with permeable groin and new retention structure to combine with the preferable alternative for beach restoration and sand retention to extend the life of the beach. Such an alternative assessment would provide a reference for future dredging and beach restoration project in response to high-wave energy shoreline area and sea level rise.

3. Coastal Zone Management Act (CZMA) Federal Consistency
   We note that Section 5.6.6, page 37 Draft IFR-EA acknowledges that this proposed action is subject to CZMA federal consistency. OP is the lead state agency with the authority to conduct CZMA federal consistency reviews. Please contact our office regarding the policies and procedures on federal consistency reviews.

4. Hawaii Coastal Zone Management (CZM) Program
   Section 5, page 23 of the Draft IFR-EA states that environmental impacts will be assessed according to state environmental regulations (HRS 343 and HAR 11-200), as well as federal guidelines (NEPA). Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As this project involves the participation of both State and County agencies, the Final EA should include analysis on the project's consistency with the objectives and supporting policies of the Hawaii CZM Program, HRS § 205A-2, as amended. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

5. Special Management Use (SMA) and Shoreline Setback
   The Final IFR-EA should discuss the activities and stored materials for the proposed staging areas. To minimize the potential impacts on ocean and the shoreline area as defined in HRS § 205A-41, it is advisable to locate the proposed staging areas outside of the shoreline area. OP recommends that the project consult with the Department of Planning and Permitting, City and County of Honolulu, for the requirements for SMA use and shoreline setbacks.

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845; John Nakagawa on CZMA federal consistency at (808) 587-2878; or Shichao Li on SMA use permitting and shoreline setback issues at (808) 587-2841.

Sincerely,

Mary Alice Evans

Mary Alice Evans
Director

MĀLAMA
LOKO EA FISHPOND

January 25, 2021

Benjamin Reder
USACE Project Manager

RE: Haleiwa Boat Harbor Sand Project

Aloha Mr Reder,

My name is Rae DeCoito, and I am the Executive Director for Mālama Loko Ea Foundation. We are the stewards of historic 400 year old fishpond Loko ea in Haleiwa. I am asking about the Integrated Feasibility Report and Environmental Assessment (draft report) for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration report. Malama Loko Ea Foundation (MLEF) was never given notice of any public hearings for comments on this proposed work. A copy of this draft report was recently shared with a MLEF board member by a community member just days ago, after the comment period was closed. In this document, it states that a Native Hawaiian Organization was also sent this copy for comment and review. Can you clarify which Native Hawaiian Organization was sent this draft for comment? Can you clarify whether our organization can still submit comments on this project?

As traditional loko iʻa stewards working on the restoration and revitalization of this important cultural asset and practices, our organization has concerns with the proposed work plan. Specifically problematic is the Barge Access Zone (BAZ), and the proximity of the BAZ to our traditional cultural landscape. We believe the construction of the BAZ will negatively impact Loko Ea both physically and biologically. The BAZ, that will be constructed a stone's throw from our the Loko Ea Tributary river mouth, is a dredged area, approx. 450 ft. long by 10 ft. deep by 50 ft. wide, is for the offloading of dredged materials which will be used to repair Haleiwa Beach Park.

While MLEF supports the dredging of Haleiwa Harbor and the replenishment of Haleiwa Beach, MLEF has issues with the potential negative impacts to Loko Ea Fishpond and our traditional aquaculture methods which has not been addressed within this draft. These negative impacts include the migration of many species into and out of the pond estuary. It will impact Loko Ea's seasonal seedstock recruitment of our main pond fish, mullet and milkfish, as well as other species that add to the pond's diversity. Water quality will be impacted at the BAZ site that could negatively impact the fishpond and future food production and consumption.

Mālama Loko Ea Foundation
P.O. Box 553, Haleʻiwa, Hawaiʻi 96712

MĀLAMA
LOKO EA FISHPOND

Additionally, the draft lacks some understanding for what could happen if the dredging would cause 'back erosion' into the stream and therefore, destabilize the historic kuapa (wall) causing damages. This draft includes no blow out diagrams of this BAZ dredge area in relation to our auwai (waterway), nor are there any plans describing proposed BMP's and WQ monitoring schedules.

Mr Buddy Keala, our traditional fishpond consultant has experience in writing, reviewing and commenting to public notices and the permit processing before and as written, this document does not do diligence to the National Historic Preservation Act and Section 106 in this review. In fact, Loko Ea and Uko'a Fishponds are absent from this study at all.

MLEF has had management of Loko Ea since 2009. In 2016 Mr. Keala was hired to provide permit processing to restore Loko Ea (POH-2017-00033), we started restoration work on January 8, 2019. We are a working fishpond that is in its 5th year of seasonal collection and stocking of our nursery pond from the auwai (waterway) as part of a 400 year old loko i'a cultural practices.

Mr Keala has left you a voice mail and I tried unsuccessfully to reach you at 808 835-4203. We are asking for an exemption or allowance to the ended comment period to allow Malama Loko Ea Foundation to have an opportunity to comment on this draft and be part of this on-going development. Please get back to our fishpond expert Mr. Buddy Keala by email lokoia.consulting@hotmail.com or mobile 227-6648 as soon as possible.

Mahalo

Rae DeCoito
Executive Director
Mālama Loko Ea Foundation

Draft Integrated Feasibility Report/Environmental Assessment:
https://www.poh.usace.army.mil/Portals/10/docs/Civil%20Works/00%20Haleiwa_1122_draft%20EA_FR_Appendices_combined.pdf?ver=ZvKsWwsv-kcoG8gkM4qZ4Q%3d%3d

From:	Kamakana Ferreira
To:	Reder, Benjamin E CIV USARMY CEPOH (USA); Herzog, Jeffrey A CIV USARMY CEPOH (USA)
Cc:	Graydon Keala
Subject:	[Non-DoD Source] FW: OHA Concern/Inquiry Re: Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project
Date:	Monday, March 8, 2021 7:52:36 PM
Attachments:	Haleiwa Boat Harbor letter.docx.pdf

Aloha Ben and Jeff,

The Office of Hawaiian Affairs (OHA) would like to check in regarding the proposed Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration project. Originally, OHA sent an email of concern back on February 1 regarding consultation and status of the National Historic Preservation Act (NHPA) Section 106 process. Following the email, I was able to speak with Ben over the phone who had indicated that a site visit would be conducted and that they U.S. Army Corps of Engineers (USACE) were consulting with the Malama Loko Ea Fishpond (MLEF) hui. While OHA was not able to attend the meeting, MLEF did provide notes to us. It sounded like things were moving in a positive direction, but there were still concerns remaining regarding possible impacts to the Loko Ea and the overall regulatory processes.

Possible Impacts to Loko Ea

During the site visit, MLEF expressed concern about the 1) back erosion related to the creation of the barge access point, 2) placement of dredge materials, and 3) effects to marine resources due to turbidity and acoustic changes. USACE indicated the barge access zone (BAZ) would be temporary, but it appears there was some debate on where back fill sand would come from and no definitive answer on the subject from USACE. There also appears to have been dispute over the size of the barge area and whether or not it is being properly characterized as a dredging. At one point, the notes indicate that perhaps a 2009 method could be used for the beach restoration work. There at least seemed to be a commitment to explore alternatives.

OHA encourages further consultation on these concerns and initiation of the Section 106 process prior to release of any environmental review document so that any adverse effects can be identified and reasonable alternatives explored. This would likely minimize the need for any kind of supplemental environmental review needed in the future due to any oversight on historic property identification, mitigation measures, or reasonable alternatives. USACE should also reach out to Kamehameha Schools as they own property in the area and have conducted various cultural related programs nearby.

Regulatory Process

OHA is interested to know the status of the Section 106 process and how it will be done in relation to preparation of the NEPA document. The coordination is important from OHA's perspective because it appears an adverse effect to historic properties (i.e., the Loko Ea) is likely due to the current placement of the BAZ. While it appears the Loko Ea was overlooked by USACE's archaeologist, we are fortunate for the ongoing consultation to help make clear that the Loko Ea is present and that it could be impacted. Determining adverse impacts during the Section 106 process will thus help to inform the NEPA document. It would seem prudent to identify any historic properties, possible impacts, and mitigations during the Section 106 process prior to release of a draft NEPA or State level environmental review document.

In reading a follow up email from Ben to MLEK, it seems that USACE is targeting March 8th for release of the draft NEPA document. If this is the case, then it would appear that USACE is not interested in including any Section 106 findings within the document. Potentially, this could be misleading and concerning since the Loko Ea was missed early on and it seems discussions are still ongoing to consult and identify mitigations and proper alternatives. 40 CFR 1501.5 allows Federal agencies to conduct an environmental assessment for any proposed action that is not likely to have significant effects or when the significance of the effects are unknown. Seeing as Section 106 has yet to occur and the apparent concerns presented by MLEF, it would seem that USACE does not have all the information needed to determine whether an environmental assessment is appropriate.

While it is currently unknown to OHA what the timetable is for any State level processes, we note that the State environmental review under Hawai'i Revised Statutes (HRS) Chapter 343, requires that historic/cultural environmental components be identified and proposed mitigations be included within the draft environmental assessment (DEA). In determining whether historic properties will be adversely impacted, the HRS Chapter 6E (historic preservation) review process is essential to identifying historic sites and generating mitigation commitments in consultation with the State Historic Preservation Division (SHPD). This is similar to the way OHA sees the Federal Section 106 assisting the NEPA process. Typically, any resulting mitigations made during the HRS Chapter 6E review process are included in the DEA. If recommended mitigations or additional testing work is requested by SHPD at a later time, the DEA would then not be complete as required by the administrative rules promulgated under HRS Chapter 343. Deferring the HRS Chapter 6E review process would thus hide possible adverse impacts and mitigations from being included in the DEA, skewing any determination and limiting the public's chance to comment. The legislative intent of the HRS 343 process does not seem so far off from the Federal legislative intent to identify environmental components that could be adversely effected first prior to releasing the draft environmental document.

Closing Remarks

We look forward to learning about where the project is in terms of all necessary regulatory processes (i.e., Section 106, NEPA, State level review) and seeing impacts to the Loko Ea determined prior to the release of any NEPA document.

In the future, please contact me via email or on my cell phone at 808-384-0528 regarding this project. When OHA was asked to be invited to the site visit, I assumed Ben would either email me or call me back on my cell phone number since I utilized that line to contact him. Ben called my office phone. Unfortunately, since most OHA employees are working from home, I only check my office answering machine a few times a week. Hopefully we can be included on a future site visit.

Mahalo,

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(808)594-0227

From: Kamakana Ferreira
Sent: Monday, February 1, 2021 10:23 AM
To: Benjamin.E.Reder@usace.army.mil
Cc: Kai Markell <kaim@oha.org>; lokoia.consulting@hotmail.com
Subject: OHA Concern/Inquiry Re: Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration Project

Aloha Benjamin,

The Office of Hawaiian Affairs (OHA) is in receipt of a letter of concern from a beneficiary and Kia'i Loko of Loko Ea Fishpond in Haleiwa regarding consultation for the U.S. Army Corps of Engineers Integrated Feasibility Report and Environmental Assessment (FREA) for the Haleiwa Small Boat Harbor Maintenance Dredging and Beach Restoration project. Please see the attached PDF of the letter for reference.

As indicated in the letter, Mr. Keala indicates that his group was not consulted for the project or given notice of the December public hearing yet the current document published by the U.S. Army Corps indicates that Native Hawaiian organizations (NHOs) were also sent a copy of the document for review and comment. Mr. Keala further asked if OHA was consulted as part of this process or provided notice of the Public Hearing. According to our intake records, it does not appear that OHA Compliance has received any consultation invitation or public hearing notice either.

At this time, we would request which NHOs were sent the document for review and public hearing notification. Also, we'd very much like you to reach out to Mr. Keala to offer him and his group an opportunity to comment at this time. OHA agrees that Mr. Keala raises very valid concerns pertaining to possible impacts to the Loko Ea and cultural landscape from the Barge Access Zone (BAZ) and offloading of dredged materials.

OHA further notes that as this appears to be a Federal undertaking, we would expect that Section 106 consultations would be carried out as well in accordance with the National Historic Preservation Act (NHPA). In fact, this is noted as needing to occur in Section 7.3.1.9 of the draft FREA. This would further serve as an opportunity for consultation with NHOs, including OHA and Malama Loko Ea in Haleiwa. As Section 2.9 of the draft FREA acknowledges the Loko Ea as a recognized historic property, as well as several other Native Hawaiian sites and the possibility of encountering burials, OHA would expect that Mr. Keala's concerns would certainly need to be addressed as part of the Section 106 process.

OHA further points out that the Section 106 process should be coordinated with the National

Environmental Protection Act (NEPA) review process pursuant to 36 CFR 800.8. At this time, OHA would further request how the US Army Corps intends to integrate the Section 106 process with the NEPA process for this project. Notably, the Advisory Council on Historic Preservation (ACHP) published a handbook in March 2013 which recommends that Federal agencies coordinate planning schedules for NHPA and NEPA since the Section 106 process is needed to properly inform NEPA documents regarding possible impacts to historic properties.

Mahalo for your time and we look forward to your response. Please feel free to contact me with any questions at this time.

Mahalo,

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From:	Habel, Shellie L
To:	Reder, Benjamin E CIV USARMY CEPOH (USA); Lemmo, Sam J; McCall, Finn D; christine.choy@honolulu.gov; Kodama, Dennis S
Cc:	Podoski, Jessica H CIV USARMY CEPOH (USA)
Subject:	[Non-DoD Source] Re: USACE draft EA Haleiwa Beneficial Use Pilot Project
Date:	Wednesday, January 20, 2021 5:48:01 PM
Attachments:	Haleiwa_1122__DPREA_Draft_21Oct20 (SH).pdf

Aloha All,
Attached are OCCL comments regarding the draft Integrated Feasibility Report and Environmental Assessment for the Haleiwa Beneficial Reuse Pilot. Thank you for your patience as we took time to review. Please let us know if you have questions/concerns.
Thank you again,
-Shellie

From: Reder, Benjamin E CIV USARMY CEPOH (USA) <Benjamin.E.Reder@usace.army.mil>
Sent: Friday, October 30, 2020 2:11 PM
To: Lemmo, Sam J <sam.j.lemmo@hawaii.gov>; Habel, Shellie L <shellie.l.habel@hawaii.gov>; McCall, Finn D <finn.d.mccall@hawaii.gov>; christine.choy@honolulu.gov <christine.choy@honolulu.gov>; Kodama, Dennis S <dkodama@honolulu.gov>
Cc: Podoski, Jessica H CIV USARMY CEPOH (USA) <jessica.h.podoski@usace.army.mil>
Subject: [EXTERNAL] RE: USACE draft EA Haleiwa Beneficial Use Pilot Project

Greetings all,

An update on the Haleiwa beneficial use/beach restoration project – we're doing our best to get the draft published in the 11/23 Environmental Notice. The draft is currently being vetted among folks in our office, and I wanted to give you all a chance the review/offer input, if desired.

The current draft is attached. Please let me know if you have questions or comments on the draft.

Kind regards,
Ben

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Honolulu District
U.S. Army Corp of Engineers