US Army Corps of Engineers®

Validation Report

Craig Harbor Navigation Improvements Validation Report Craig, Alaska

Validation Report

Craig Harbor Navigation Improvements

Craig, Alaska

Prepared By:

U.S. Army Corps of Engineers
Alaska District

February 2023

EXECUTIVE SUMMARY

Navigation-related problems at Craig, Alaska stem from excessive demand for moorage. Craig has multiple existing moorage facilities. However, due to the area's rich marine resources and natural beauty, there is a high level of demand for moorage for both commercial and recreational vessels. Existing facilities attempt to meet as much demand as possible, but overcrowding leads to increased damages to vessels and harbor facilities, as well as vessel delays.

In 2015, USACE produced an Integrated Feasibility Report, Environmental Assessment (IFREA) and Finding of No Significant Impact (FONSI). The authorized plan provides dual rubblemound breakwaters totaling approximately 1,933 feet in length. The breakwater will provide protection for a 10.1-acre mooring basin that can accommodate 145 vessels.

The purpose of the Validation Report is to update total project costs and economic analysis to FY23 cost levels and to verify environmental compliance and engineering feasibility based on the authorized Craig Navigation Improvements IFREA and FONSI (2015).

Through government-to-government consultation and community engagement it was determined that subsistence activities are more prevalent in the project footprint than described in the 2015 IFREA. The proximity and ease of access of the project site attracts elderly and non-boat owning lower income subsistence users and a completed project would have a disproportional negative impact.

The new certified cost estimate from 2022 has increased by almost $16.1 million to 52.5 million, a 45% higher cost than the original 2014 estimate. The cost increase represents the significant increase in rock, material, fuel, and labor prices over this time.

Subsistence benefits accounted for more than a quarter of the economic benefits calculated in the 2015 IFREA. The level of subsistence benefit from the 2015 IFREA is now evaluated as an ideal scenario. Due to the uncertainty of the subsistence benefits within the community these benefits are now represented by a range from no benefit to the ideal benefit represented in the IFREA.

The change in subsistence benefits as well as the increase in cost lowers the benefit-cost-ratio (BCR) of the project from 1.24 in the 2015 IFREA to a range of 0.7–1.05. The likely BCR given this range and uncertainty is 0.88. This makes the project potentially no longer justified under a net economic development plan (NED).

The study has not been able to validate significant economic or environmental findings of the 2015 IFREA and the project is not within the Chief's discretion or authority to implement in its current form.

After assessing the planning, economics, engineering, and environmental findings of the 2015 IFREA, USACE either validated or updated these conclusions to reflect new information and analysis. While many of the finding of the IFREA were confirmed, new economic and environmental findings require reanalysis of project formulation through development of a general reevaluation report.

LIST OF ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADCPs	Acoustic Doppler Current Profilers
ADEC	Alaska Department of Environmental Conservation
AHRS	Alaska Heritage Resources Survey
AKDOL&WD	Alaska Department of Labor and Workforce Development
APE	Area of Potential Effect
BCR	Benefit-to-Cost Ratio
CTA	Craig Tribal Association
DPS	Distinct Population Segments
EA	Environmental Assessment
EFH	Essential Fish Habitat
EGM	Economic Guidance Memorandum
EQ	Environmental Quality
ERDC-CHL	Engineering Research and Development Center, Coastal Hydraulics Lab
ESA	Endangered Species Act
G2G	Government-to-Government
FONSI	Finding of No Significant Impact
FWOP	Future Without Project Condition
FWP	Future With Project
GNF	General Navigation Features
IFREA	Integrated Feasibility Report, Environmental Assessment
MHHW	Mean Higher High Water
MLLW	Mean Lower Low Water
MOA	Memorandum of Agreement
MSL	Mean Sea Level
MTL	Mean Tide Level
NED	National Economic Development
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
OMB	Office of Management and Budget
OSE	Other Social Effects
PDT	Project Delivery Team

PED	Preconstruction Engineering and Design
RECONS	Regional Economic Systems
RED	Regional Economic Development
SHPO	State Historic Preservation Officer
UDV	Unit Day Values
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 STUDY OVERVIEW

1.1 Validation Report Purpose

The U.S. Army Corps of Engineers, Alaska District (USACE), conducted this validation study to reexamine and verify the findings of the "Interim Integrated Feasibility Report, Environmental Assessment and Finding of No Significant Impact: Craig Navigation Improvements" (USACE 2015). The Craig Navigation Improvements Project IFREA was authorized under Section 204 of the Flood Control Act of 1948 and construction authorized by Section 1401 of the Water Infrastructure Improvements for the Nation Act of 2016 (PL114-322). The authorized project is currently in the Preconstruction Engineering and Design (PED) phase, with 95% of the design complete. PED efforts are currently on hold.

The purpose of this validation report is to update total project costs and economic analysis to FY23 cost levels, show the costs of the features being recommended for construction, and to verify environmental compliance and engineering feasibility based on the authorized 2015 IFREA. In the report, the Project Delivery Team (PDT) will validate the conditions documented in the 2015 IFREA and verify whether the authorized project is technically sound, environmentally and socially acceptable, and economically justified.

1.2 Validation Report Scope

The scope of the report includes validating assumptions of the 2015 IFREA and determining whether project features continue to be appropriate to meet the project and sponsor needs. The scope of the report is limited to aspects that affect the authorization and suitability of the project.

1.3 Project Area

The City of Craig, Alaska is located on the western coast of Prince of Wales Island, approximately 55 air miles west of Ketchikan and approximately 725 air miles southeast of Anchorage (**Error! Reference source not found.**).

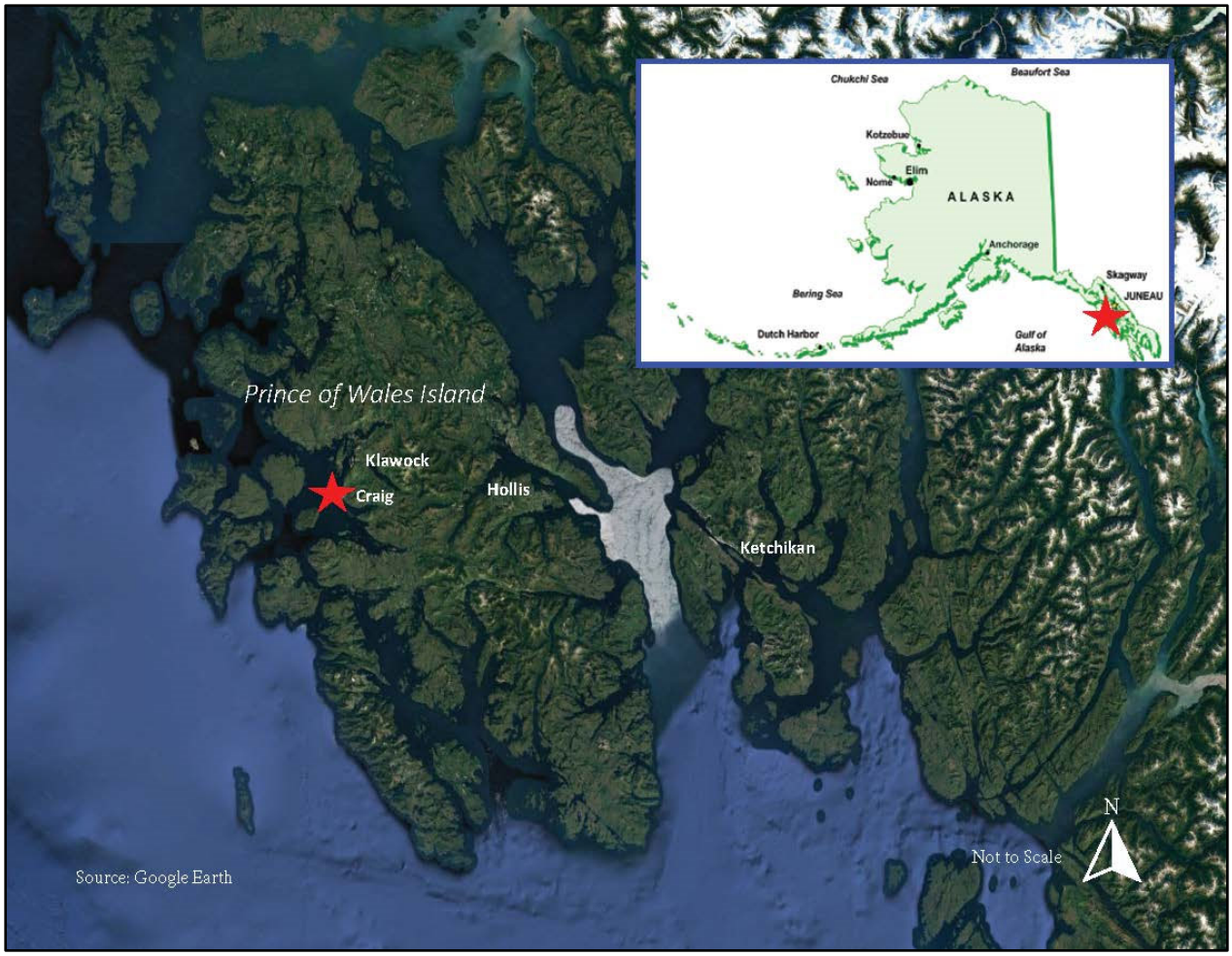

Figure 1: Project Area

Craig and surrounding areas have been used extensively by the Tlingit and Haida people for fish camps and village sites throughout history. The location of Craig's townsite was originally called Sháan da and was an important fishery and village site. Fish Egg Island (to the west of Craig Island in Figure 3) was also culturally important and used for seasonal food-gathering activities. Around 1907 Craig Miller and local residents set up a fish saltery, followed by a cannery and cold storage facility in 1911. These facilities became the center of the town of Craig.

The project area is in Wards Cove, located in southern Klawock Inlet on the northern side of Craig Island (Figure 3). The area was commercially developed for use as a cannery in the early twentieth century. There are a number of historical cannery structures located in the uplands with pilings and piers extending offshore. The area is naturally protected from the south by Craig Island, from the east by Prince of Wales Island, and from the west by Fish Egg Island. Highly used marine facilities are located to the immediate east of Wards Cove including three docks and North Cove Harbor. The area is accessible by road and has sufficient uplands to support harbor operations.

Offshore and intertidal structures within the project area include a 200-foot-long by 25-foot-wide pier terminating in a 145-foot-long dock (Figure 2). Both structures are supported by wooden piles. According to the City of Craig's site development plan, the pier was in fair condition, was used to moor vessels, and had the potential to be upgraded for future use (City of Craig 2006b). Several clusters of older wooden piles still exist to the east and west of the remaining pier. These piles were previously used to support docks or piers, but those structures no longer remain. A wooden beam boatway and haul out structure still exists in the intertidal zone to the east of the existing pier (City of Craig 2006b).

Figure 2: Current Structures Within Project Area

Source: Coastview, July 7, 2022

1.4 Authorization and Prior Reports

1.4.1 Authorization

Technical feasibility, economic justification, and environmental acceptability for the Craig Navigation Improvements were originally described in the feasibility report. In 2016, the Chief of Engineers submitted a report to the Secretary of the Army recommending authorization to construct the project (USACE 2016)

The project was authorized under Section 1401 of the Water Resources Development Act of 2016.

1.4.2 Prior Studies at Craig

1979 – U.S. Army Corps of Engineers, “Navigation Improvements for Small Boat Harbor, South Cove Harbor,” (October 1979). This report recommended construction of navigation improvements at South Cove Harbor.

1992 – BST Associates, “Craig Small Boat Harbor Expansion Study,” (April 1992). This study was prepared to evaluate the existing socioeconomic conditions at Craig and provide data to aid in decision making on the requested expansion of North Cove Harbor.

1993 – U.S. Army Corps of Engineers, “Small Boat Harbor Section 107 Reconnaissance Report,” (May 1993). This study evaluated the economic viability of navigation improvements at the North Cove Harbor site. A Federal Interest in providing navigation improvements could not be established at that time.

2003 – U.S. Army Corps of Engineers, Section 905(b) (WRDA 86) Analysis – Craig Small Boat Harbor, Alaska (January 2003). The reconnaissance study evaluated various sites at Craig and recommended a feasibility analysis be conducted. The selected alternative was located at the Wards Cove site. Benefits to the Nation would include reduced damage costs, increased efficient use of time, decreased delays, increased efficient harbor operations, and increased recreational opportunities.

1.5 Authorized Project Design

The feasibility study was concluded in 2015 with the Cannery Point site at Wards Cove identified as the Recommended Plan. This was the preferred option, selected from approximately 10 potential harbor sites across the area. This site was considered the most advantageous based on the already degraded eel grass beds, immediate proximity to city-owned uplands, and no requirement to dredge. The plan was further refined as 4 options in size of harbor, ranging from 7.5 to 40-acre basins. A 10.1-acre option was found to have the highest net economic benefits of 1.26. Based on these factors, the 10.1-acre option was advanced to design.

The authorized project consists of dual rubble mound breakwaters approximately 1,933 feet in length that combine to extend northward from Cannery Point on Craig Island for approximately 700 feet, then extend to the east for approximately 1,200 feet. A stub breakwater extends northwest from the northwest tip of Craig Island to allow for fish passage (Figure 3). A float system would be constructed by the Non-Federal Sponsor, the City of Craig. The 10.1-acre moorage basin would be accessed from the east. The entrance channel’s width would allow for safe two-way vessel traffic to proceed to and from the floats, taking into account vessels which may be moored at the existing City Dock. The entrance channel’s natural controlling depth is shallower than -20 feet mean lower low water (MLLW). The harbor would be in naturally deep water; vessels in the fleet have a required depth for navigation of -13 feet MLLW. Minimal sedimentation is expected to occur within the channel basin. Therefore, dredging is expected to be infrequent, if necessary at all.

Figure 3: Project Site Map of Proposed Breakwater, Craig, Alaska

1.6 USACE Validation Efforts

The PDT's primary investigations were focused on the proposed project's impacts on natural resources and subsistence practices, and the economic changes since the 2015 IFREA. To better investigate the historic impacts, the project team archaeologist, conducted a second site visit in July 2022 and engaged with the CTA on site. This visit focused on the impacts at Cannery Point as well as the immediate areas. To investigate natural resources impacts and changes in economic values, the PDT National Environmental Policy Act (NEPA) biologist and economist conducted a site visit in November 2022. These on-site investigations were focused on collecting information as provided that was expressed as overlooked or unrepresented impacts in the 2015 IFREA. Additionally, sensors were deployed from December 16, 2022 through 23 January, 2023 to collect ocean current velocities between Cannery Point and Fish Egg Island to validate the modeled flows. This remaining information was received in February 2023 and added to this study.

During this process of studying and discussing the impacts, the project parameters were reviewed for potential changes, modifications, or reassessments. The USACE efforts

were firstly to hear what the concerns were, and to then to understand the concerns. Areas of concern were experienced firsthand through site visits by members of the PDT as on-the-ground engagements to understand the proposed projects impacts. Following the site visits, the PDT reviewed the project for its existing design and how these impacts would change the potential outcomes. The PDT also met with the sponsor to discuss concerns heard through local engagement. The findings of these project concerns and impacts are summarized in the conclusion and recommendations of this study.

2.0 GOVERNMENT-TO-GOVERNMENT CONSULTATION

2.1 Background

In Fiscal Year 2020, the Pre-Construction Engineering & Design (PED) Phase of the proposed undertaking was funded. On February 20, 2020, a kick-off meeting was held in Craig to initiate discussions regarding appropriate mitigation on historic properties; representatives from the CTA, City of Craig, and SHPO attended the meeting. During the meeting many concerns regarding the impacts of the project were raised.

In October 2021, the USACE received a request for government-to-government (G2G) consultation from the CTA. On May 31, 2022, the CTA followed up the concerns expressed in G2G consultation with a letter documenting specific comments that the 2015 IFREA did not sufficiently address the proposed project's potential impacts on fishery resources, cultural sites, navigation, recreation, wildlife, and marine habitat.

2.2 Government to Government Engagement

The USACE met with the CTA in formal G2G consultation in November 2021 and March 2022. In the initial consultation the CTA expressed concern that the insufficient consideration of the Tribe's cultural resources, subsistence practices. USACE staff also met with the CTA December 2021 and February 2022. The USACE received detailed comments on the IFREA and FONSI from the CTA May 31, 2022, documenting the CTA's concerns over insufficient consideration of cultural and historic resources as well as concerns for their community's socio-economic status and reliance on subsistence fishing. Comments stated that the 2015 IFREA and FONSI did not sufficiently address the proposed project's potential impacts on fishery resources, cultural sites, navigation, recreation, wildlife, and marine habitat. During consultation the CTA provided accounts on current strengths that included speeds that would affect the viability of the project as originally designed.

The robust tribal engagement over the 16 months has also included three additional leadership site visits, including a visit by District Commander Delarosa and Division Commander Gibbs to Craig in September 2021, a visit by Commander Delarosa to Craig in March 2022, a visit from the CTA President to District offices in May 2022. Additional online staff engagements were held on September 26 and September 30, 2022. Members of the PDT made two site visits to Craig to meet with tribal and

community members and tour areas of concern in July and November of 2022. During all these discussions, the impacts and concerns were reviewed for their scale, type, and location. The USACE has made a full effort to see, hear, and understand the Tribes concerns.

3.0 INVESTIGATED ENVIRONMENTAL CONDITIONS

This section describes the few notable exceptions to the existing environmental conditions described in the 2015 IFREA. The general environmental baseline for the proposed project has remained unchanged.

3.1 Biological Resources

3.1.1 Marine Habitat

A USACE biologist conducted shoreline surveys of the intertidal zone in the vicinity of the proposed project's footprint over a four-day span in November 2022. The existing conditions closely resembled those described by the intertidal transect survey conducted in 2014.

3.1.1.1 Intertidal Zone

Conditions as observed at Cannery Point in November 2022 strongly resembled the description presented in the 2015 IFREA. Exposed substrates were mixed-sized cobbles and gravels with underlying sands. The seaward most cobbles exhibited colonization by barnacles, tunicates, and various species of marine algae.

3.1.1.2 Subtidal Zone

Although no formal USACE investigations of the subtidal habitat have occurred since 2014, kelp petioles were observed at the surface along the margins of the channel between Craig and Fish Egg Islands and along the bar that extends from the northwest point of Craig Island, indicating that subtidal habitat conditions suitable for kelp proliferation persist in the areas within and adjacent to the proposed project's footprint.

3.1.2 Marine Birds

Observations of marine birds occurred during USACE's November 2022 site visit and included cackling goose (*Branta hutchinsii*), snow goose (*Anser caerulescens*), harlequin duck (*Histrionicus histrionicus*), common loon (*Gavia immer*), pigeon guillemot (*Ceppus columbia*), red-breasted merganser (*Mergus serrator*), belted kingfisher (*Megaceryle alcyon*), herring gull (*Larus argentatus*), and mew gull (Larus canus). Although the window of observation was limited (four days in November of 2022), there exist no indications to suggest that the general species composition of marine birds as described in the 2015 IFREA has changed.

3.1.3 Marine Fishes and Invertebrates

Engagements with local residents in November 2022 confirmed that herring had spawned along the western margin of Craig Island and in similar marine habitat along

the south and eastern shore of Fish Egg Island during the spring of 2022. Similarly, it was relayed to the USACE through those same engagements with local residents that chinook salmon reliably migrate along the western contour of Craig Island and then turn east northeast, between the remnant pier pilings and the navigational aid to the northwest of Cannery Point, an area entirely within the proposed project's footprint. Remnant pilings within the proposed project's footprint and the piling structures of existing, actively used piers along the north margin of Craig Island likely serve as an attractant for baitfish and other smaller fishes that similarly attract chinook and other salmonids.

3.1.4 Marine Mammals

November 2022 observations of marine mammals occurring within or transiting through the proposed project's footprint included killer whales (*Orcinus orca*), harbor seals (*Phoca vitulina*), and northern sea otters (*Enhydra lutris kenyoni*). Although the window of observation was limited (four days in November of 2022), there exists no indication to suggest that the general species composition of marine mammals that may be present in Klawock Inlet as described in the 2015 IFREA has changed. Additionally, November 2022 engagements with local residents indicated that observations of Steller sea lions (*Eumetopias jubatus*), humpback whales (*Megaptera novaeangliae*), and gray whales (*Enschrichtius robustus*) in the channel between Craig Island and Fish Egg Island occurred regularly during the migratory seasons.

3.1.5 Federal and State Threatened and Endangered Species

During the development of the 2015 IFREA, the yellow-billed loon (*Gavia adamsii*) was undergoing candidate review for listing under the Federal Endangered Species Act (ESA). On October 1, 2014, the United States Fish and Wildlife Service (USFWS) determined that listing the yellow-billed loon as a threatened or endangered species was not warranted (Fish and Wildlife Service, Interior 2014).

Two humpback whale Distinct Population Segments (DPS), the Mexico DPS and the Hawaii DPS have ranges that encompass Craig's surrounding waters. Humpback whales comprising the Hawaii DPS are not listed under the ESA, while humpback whales that comprise the Mexico DPS are listed as threatened under the ESA. Based upon the NMFS', Alaska Region's Occurrence of Endangered Species Act Listed Humpback Whales off Alaska (NMFS 2021), the probability of encountering humpback whales from each DPS in the North Pacific Ocean, specifically Southeast Alaska/Northern BC, is 98% for the Hawaii DPS and 2% for the Mexico DPS.

According to the National Marine Fisheries Service's ESA and Critical Habitat mapping tool, accessed in December of 2022, the marine waters adjacent to Craig and Klawock Inlet do not serve as critical habitat for any threatened or endangered species.

3.1.6 Special Aquatic Sites

During the November 2022 site visit, a USACE biologist observed the proliferation of eelgrass in the north harbor. Although heavily disturbed, aspects of the north harbor site seem to facilitate eelgrass presence. Specifically, the reduced wave and action provided

by the breakwater system situated at the head of the north harbor basin which allows for finer sediments to fall out of suspension, creating a silty-sandy substrate which eelgrass readily colonizes.

3.1.7 Essential Fish Habitat

In the ensuing time since they were first presented in the 2015 IFREA, the description of Essential Fish Habitat (EFH) elements for those waters that comprise the proposed project's footprint has changed in a single respect to include the yellowfin sole egg life stage (summer), as included in Amendment 105 to the Gulf of Alaska Groundfish Fishery Management Plan.

4.0 INVESTIGATED ENGINEERING CONDITIONS

4.1 Bathymetry

According to navigation charts prepared by the National Oceanic and Atmospheric Administration (NOAA), the seafloor around Craig Island and southern Klawock Inlet is fairly flat and uniform. The southern end of Klawock Inlet forms a broad basin along the northern end of the project area with depths that do not exceed 50 feet below mean lower low water (MLLW). Due to shoaling, depths around Craig Island Reef are approximately 10 to 20 feet below MLLW. A bar extends from the northwest point of Craig Island and limits depths to 7 to 15 feet below MLLW. eTrac, under contract with the Alaska District, performed a hydrographic survey for the proposed harbor in December 2019. The results of the hydrographic survey are consistent with the navigation charts prepared by NOAA for the area.

4.2 Soil/Sediments

Observations during Corps site visits, including underwater video, indicate bottom material of coarse to fine sand up to several hundred feet from shore. The NOAA chart for the area indicates "soft" or "mud" bottoms in southern Klawock Inlet. Cobbles appear to increase in frequency and size entering the intertidal zone. The beach immediately south of the project site contains very large cobbles and boulders. The intertidal and high subtidal zones north of the former cannery site are littered with debris including machine parts, steel cables, lead net weights, pieces of sheet metal, and firebrick. This debris is presumably from the cannery or from ships that have tied up to the existing dock.

An offshore subsurface exploration for the proposed harbor was conducted in August 2020. The surface material encountered at the site where the proposed breakwater ties into the existing beach typically consisted of well graded sand with gravel and cobbles. Sparce vegetation consisting of eelgrass and kelp is located on the seabed in various locations within the project footprint. The typical soil profile beneath the footprint of the proposed breakwaters consists of approximately 3 feet of loose to very loose well graded sands and gravels with cobbles transitioning into medium dense to dense clayey sands and gravels with cobbles and boulders.

Previous environmental investigations of the cannery site by the Alaska Department of Environmental Conservation (ADEC) included some limited sampling of intertidal sediment. A sample collected near the boatway contained lead at concentrations above the 400 mg/kg State of Alaska cleanup level, and a groundwater sample from a probe installed in the intertidal zone showed elevated fuel constituent compounds. A 2002 remediation report claimed that petroleum and lead contamination near the boatway was due to historic boat maintenance operations and not directly connected to the more extensive upland contamination and remedial efforts (City of Craig 2006b).

Based upon available data, known history, and previous uses of the project area, the Corps has proceeded with this project under the assumption that marine sediments in the project area contain chemical contamination. However, the contaminants are likely concentrated in the area immediately surrounding the boatway due to the types of vessel maintenance that were performed on that structure. Petroleum hydrocarbons are likely to have dispersed and biodegraded to some degree, but metals associated with vessel paints and fittings such as lead, copper, nickel, tin, etc. are likely to persist.

4.3 Currents and Tides

Two-layered estuarine circulation systems are expected to occur seasonally in protected bays and passages along the outer coast. The area experiences increased freshwater discharge beginning with the spring thaw in April and continuing into October due to heavy rainfall. This results in a layer of reduced-salinity water to form at the surface with more saline oceanic waters at lower depths. This two-layer system is disrupted over the winter by storm activity and reduced freshwater runoff, resulting in a more uniform, saline, and colder water column (City of Craig 2006a).

Current data has previously been measured by NOAA north of Fish Egg Island from April 26 through June 7, 2009 and a velocity profile survey, using vessel mounted acoustic doppler current profilers (ADCP) was performed by the Engineering Research and Development Center, Coastal Hydraulics Lab (ERDC-CHL) over a 10-hour period on May 13, 2021 along the authorized breakwater alignment and between the Fish Egg Island and Craig Island. These two data collection operations indicated a maximum velocity of 1.3 to 1.9 knots.

These measurements are not in alignment with local observations by tribal members that indicate a maximum current between 8 and 9 knots between the islands. This large discrepancy in measured current data and local observations indicate the site conditions at the project site may not be accurately accounted for in the design of the breakwater or constructability concerns. To ensure the currents are being properly accounted for in the final design of the final project and potential changes in navigability between the two islands, the Alaska District worked with ERDC-CHL to conduct a second velocity profile data collection effort at two locations for 38 days between Fish Egg Island and Craig Island (Figure 4) from December 16, 2022 through 23 January, 2023.

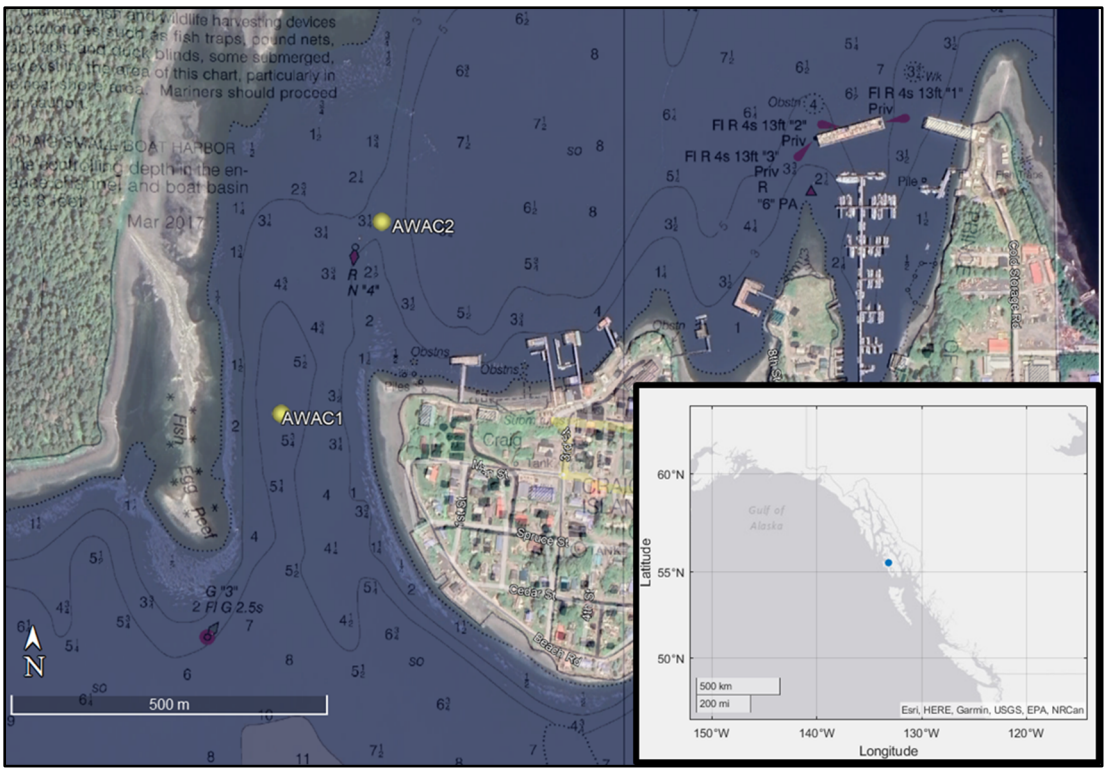

Figure 4: Vertical Current Profile Data Collection Locations

The current data was collected using bottom mounted ADCP, which use sound waves to measure the speed and direction of currents throughout the water column. During the data collection period there were two periods of large tides and two storms, with maximum windspeeds of approximately 19.5 knots each, that impacted the project site. Based on predominately homogenous current readings through the water column during the periods of the two storms, the primary current that occurs between Fish Egg Island and Craig Island is due to tides. Maximum observed current speeds at the AWAC1 and AWAC2 sites were 0.84 m/s and 0.78 m/s (1.6 knots and 1.5 knots), respectively (**Error! Reference source not found.**). Results from the second ERDC-CHL ADCP deployment are consistent with the NOAA observations, ERDC-CHL first ADCP deployment, and the highest predicted flood and ebb currents based on the tidal constituents.

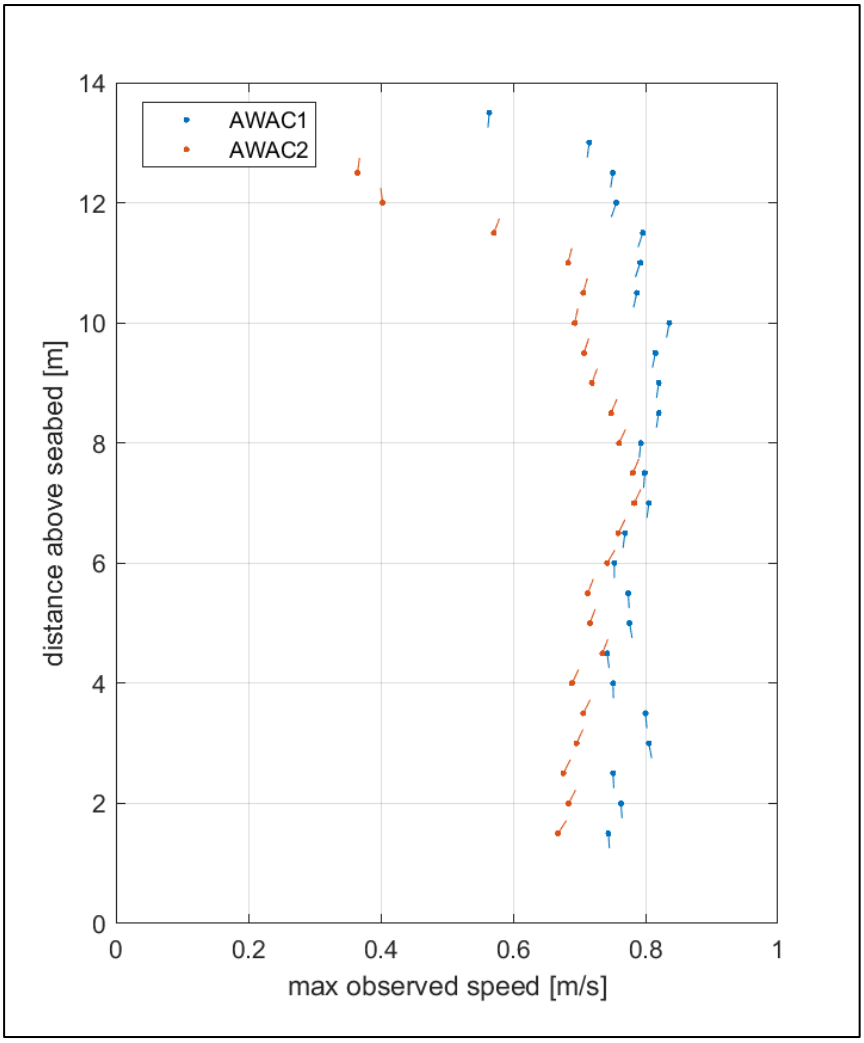

Figure 5: Maximum Observed Current Speed Through the Water Column at AWAC1 and AWAC2 Sites

**Note: Observations are reported in metric units*

Craig is in an area of semi-diurnal tides with two high waters and two low waters each lunar day. The tidal parameters in Table 1 were determined using data published by the National Oceanic and Atmospheric Administration. The data is based on observations made during May and June 2007. No highest observed water or lowest observed water levels were reported.

Table 1: Tides

Parameter	Elevation (ft)
Highest Astronomical Tide	12.59
Mean Higher High Water (MHHW)	10.17
Mean Sea Level (MSL)*	5.34
Mean Tide Level (MTL)**	5.35
Mean Lower Low Water (MLLW)	0.00
Lowest Astronomical Tide	-2.95

**-MSL is the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter Series are specified in the name: e.g. monthly mean sea level and yearly mean sea level.*

***-MTL is the arithmetic mean of mean high water and mean low water*

5.0 ENVIRONMENTAL JUSTICE

5.1 Subsistence Conditions

Both Alaska state law (Alaska Statute [AS] 16.05.940[33]) and Federal law (Title VIII of Alaska National Interest Lands Conservation Act, Section 803) define subsistence use as the “customary and traditional” uses of wild resources for various uses including food, shelter, fuel, clothing, tools, transportation, handicrafts, sharing, barter, and customary trade. Hunting, fishing, and the gathering of traditional foods are a priority for many Alaska Native residents of Craig and the surrounding Prince of Wales Island region as a way of maintaining their cultural heritage and as a matter of economic necessity. The CTA relayed to the USACE in consultation that their concerns regarding impacts to traditional subsistence practices were not accurately considered during the development of the 2015 IFREA.

Alaska Native people’s utilization of areas within or immediately adjacent to the project’s proposed footprint for practicing subsistence activities is well documented and date back to before the founding of the community of Craig and the subsequent development of the cannery site. Subsistence practices reported at the proposed project’s location include herring roe collection along the beachfront intertidal zone of Cannery Point and fishing for spring-run chinook salmon between Cannery Point and the navigational aid immediately north of Cannery Point. Subsistence activities were also reported to include the uses of these same areas to access culturally important locations at Fish Egg Island and areas of the greater San Alberto and Bucareli Bays and beyond. Similarly, the USACE was made aware of ongoing efforts to revitalize cultural heritage practices

throughout the community which included the teaching and practice of traditional subsistence activities at the Cannery Point location.

During the USACE's November 2022 site visit, it was again conveyed to the PDT members that there was a general sense of extreme distress from the Alaska Native population in Craig originating from the anticipated encroachment upon traditional subsistence practices from USACE's proposed project and how it might permanently affect access to and utilization of culturally significant subsistence areas. Alaska Native residents of Craig were also concerned that the proposed project's implementation would negatively affect the natural environment in a variety of different ways from the permanent alteration of the viewshed to the traditional migration patterns of marine mammals, salmon, and herring.

The 2015 IFREA did not differentiate between subsistence user groups, recognize the importance of Alaska Native people's subsistence practices in the project area, or develop mitigation measures for impacts to localized subsistence practices. Overall, the 2015 IFREA evaluated impacts to subsistence activities from the perspective of subsistence fishing, which is different than the cultural practice of subsistence. However, in the context of subsistence fishing, CTA members conveyed that the proposed project would negatively affect their access to subsistence fishery resources at Cannery Point by altering salmon and herring migration routes through the nearshore zone and by creating potentially dangerous navigational conditions in the channel between Craig and Fish Egg Islands. As an example of the impacts of infrastructure development, CTA members stated that that other historic subsistence activities like the harvest of shellfish, had been negatively and irreparably affected by the construction and operation of the south harbor basin.

5.1.1 Subsistence Fishing

AS 16.05.940(32) defines subsistence fishing as the taking of, fishing for, or possession of fish, shellfish, or other fisheries resources by a resident domiciled in a rural area of the state for subsistence use with a gill net, seine, fish wheel, long line, or other means defined by the Board of Fisheries. The State of Alaska collects subsistence fisheries harvest data specific to the community of Craig. The most recent harvest information for the community of Craig is from 1997, in which 90% of households reported harvesting subsistence fishery resources and 98% of households reported using subsistence fishery resources (ADFG 2023).

In November 2022, the USACE conducted in-person community engagements with various subsistence fishery users in the Craig community. Through these discussions, a general theme emerged that implementation of the proposed project would negatively affect access to subsistence fishing resources. Access to subsistence fisheries resources was anticipated to be affected in three particular ways: first, access to the traditionally utilized nearshore areas adjacent to Cannery Point would be affected by the USACE's project; second, access to other subsistence fishing areas would be affected by a new navigational paradigm through the channel between Craig and Fish Egg Islands; and third, the proposed project would facilitate the proliferation of the region's charter fleet which would directly compete with local residents for fisheries resources.

During consultation and site visits it was conveyed to the USACE that the portion of the local community who have traditionally utilized the area within the project's proposed footprint for subsistence fishing would no longer have access to those areas. Subsistence fishery users were concerned about how the size and configuration of the USACE's proposed project would affect the traditional migration route of salmon and herring spawning areas adjacent to Cannery Point as they enter or exit Klawock Inlet from the south. Currently, many subsistence fishery users in the local community typically access subsistence fishery resources from small skiffs with shallow drafts that are capable of navigating between Cannery Point and the navigational aid and along the north margin of Craig Island, which includes those areas immediately adjacent to the remnant pier pilings. Generally, skiffs utilized by subsistence fishery users launch from the City's launch facilities on False Island, approximately one mile to the northeast of Cannery Point. Subsequently, it was conveyed to the USACE that subsistence fishery users in the area adjacent to Cannery Point may be over-represented by older or more economically disadvantaged members of the community because of its ease of access. The USACE's proposed project would preclude or severely disrupt access to subsistence fishery resources that are reportedly being utilized within and immediately adjacent to the project footprint. Negative impacts to subsistence fishery access as considered in the 2015 IFREA were assessed primarily on how overcrowded harbor conditions affected access to such resources and not as a of function of potentially reduced access to subsistence fisheries resources as a result of the implementation of the USACE's proposed project.

In a similar fashion, subsistence fishery users and recreational users were concerned that implementation of the breakwater structure itself would cause an impediment to the safe navigation conditions required for access to subsistence fishery areas outside of Klawock Inlet. Currently, the existing navigational channel between Craig and Fish Egg Islands is naturally constrained by both width and navigable depth which can be compounded by the tidal state, precipitation, and wind events. However, navigation of the channel is generally considered safe because vessel traffic in the channel is readily visible by approaching vessel traffic from the north and south. Subsistence fishery users' primary concern for navigational safety and safe access to subsistence fishery resources was that USACE's proposed project would essentially further constrain the existing navigational channel and create a blind, 90-degree turn into and out of the north end of the channel. The modified navigational channel would be permanently obscured from the northeast by the proposed +18 ft MLLW elevation rubble mound breakwater and would likely disproportionately affect those subsistence fishery users that utilize smaller vessels to access subsistence fishery resources because they would not be able to see oncoming vessel traffic. Similarly, recreational users operating in unpowered vessels such as kayaks would be disadvantaged by the obstructed view of the channel. Navigational improvements were considered in the 2015 IFREA in the context of actions that would provide safe moorage for vessels and did not evaluate potential effects upon vessel navigation through the channel between Craig and Fish Egg Islands.

In November 2022, subsistence fishery users also conveyed their concern regarding encroachment by the area's charter vessel fleet. Essentially, the sentiment was that the subsistence fishery users and the charter fleet were competing for the same fisheries resources and that more time and resource expenditure was required by subsistence fishery users to reach their own harvest goals. Despite the lack of recent subsistence fishery harvest data, annual sport fishing catch reports indicate that there has been a substantial increase in the annual number of fish harvested in the decade following 2010 from the decade preceding 2010 with specific emphasis on halibut and salmon species. The 2015 IFREA considered that the community of Craig's reduced access to subsistence fishery resources when compared against other Prince of Wales Island communities was associated with vessel delays at the existing harbor sites but did not assess direct competition for resources between subsistence fishery users and the area's charter vessel fleet. Similarly, there was no analysis on how the region's increased salmon hatchery operations directly affected subsistence fishery or sport fishery harvests.

5.2 Cultural Resources Conditions

5.2.1 Cultural History

Prince of Wales Island has been occupied by Alaska Native peoples since time immemorial, based on Tlingit oral histories and 10,300-year-old radiocarbon dates recovered from On Your Knees Cave (PET-00408) (Dixon 1999; USFS 2020). The western coast of Prince of Wales Island is traditionally the southern extent of Tlingit territory. Prince of Wales Island is occupied by two Tlingit groups: Klawakkwan and Henyakwan (Langdon 2006), also known as the Klawock and Stikine Tlingit (USFS 2020). The Haida moved into southern Prince of Wales Island approximately 400 years ago (Langdon 1979; USFS 2020).

The City of Craig is in traditional Tlingit territory, in the center portion of Prince of Wales Island. Historically, the Tlingit had a village on nearby Fish Egg Island and used Craig Island as an important seasonal fish camp, which was known as *"Shaan da*." The small strait between Fish Egg Island and Craig is called "Sháan Séet." Elders from Craig, Klawock, and Hydaburg maintain oral histories about the cultural significance of Shaan da and the surrounding region (Shaan Seet 2021).

In 1907, Craig Millar established a saltery on Craig Island. In 1909, the Lindenberger brothers hired Millar to build a salmon cannery at Wards Cove, on the northeastern point of Craig Island. In 1912, a post office, school, and sawmill were also constructed (USACE 2014a; CoastView 2022).

In 2014, USACE archaeologist Shona Pierce conducted informal oral history interviews with local community members in Craig. Interviewees indicated that the local Alaska Native community was displaced from their homes located on the point at "Old Craig" around 1912, and moved to "New Craig," a section of land near the base of Sunnahae Mountain. Pierce was also told that a seasonal Haida subsistence camp had been

established on the northeastern point of Craig Island prior to Western contact (USACE 2014c:6).

5.2.2 Previous Identification of Historic Properties within the Area of Potential Effect

During the Feasibility Study, the project's Area of Potential Effect (APE) was determined to encompass only the General Navigation Features (GNF) associated with this proposed undertaking. The USACE identified cultural resources within and adjacent to the APE and evaluated their eligibility for listing in the National Register of Historic Places (NRHP). Three historic properties were identified; USACE determined that the Wards Cove Cannery Site (CRG-00721), the Pier of Wards Cove Cannery (CRG-00722), and the Old Craig Historic Site (CRG-00728) were eligible for listing in the NRHP and the Alaska State Historic Preservation Officer (SHPO) concurred (USACE 2014a, 2014b, 2015; SHPO 2014, 2015). The USACE determined that the "historic features within the APE include the wood pile-supported Pier (CRG-722) and associated free-standing pilings, and the Old Craig Historic Site (CRG-728)" (USACE 2014b:9).

5.2.2.1 Wards Cove Cannery (CRG-00721)

What is now known as the Wards Cove Cannery (CRG-00721) started as the Lyndenburger (Lindenberger) Packing Company in 1912. In 1917, the cannery was purchased by the Columbia Salmon Canning Company. In 1929, it was sold again to the Libby, McNeill & Libby Company. In 1935, they expanded into a second cannery on Craig Island. Reduced fishery production in the 1950s saw the decline in cannery operations. After an extensive fire at the cannery and docks in 1956, Columbia Wards Fisheries purchased the property in 1959. They used it primarily as a maintenance area for their fishing fleet (USACE 2014a).

In 2014, standing buildings and structures associated with the Cannery included "a web loft, storage buildings, maintenance building, shower room building, administration building, a house, bunkhouse, family housing, a carpenter shop, a generator shed, the Pier, a marine haul-out, and boardwalk" (USACE 2014c:5).

The USACE determined that Wards Cove Cannery was eligible for listing in the National Register of Historic Places (NRHP) under Criteria A, C, and D (USACE 2014b). The Alaska State Historic Preservation Officer (SHPO) concurred (SHPO 2014).

5.2.2.2 Pier at Wards Cove Cannery (CRG-00722)

The Pier at Wards Cove Cannery has been modified since its original construction. In 1956, a fire destroyed the pier decking. Since 2005, the gangway was rebuilt to lie flush with a new road elevation with blocks of cut wood had been stacked on top of the original pilings. In 2007, approximately 80% of the pier and gangway decking was redone, with the preferred construction method overlaying the new decking across the grain on top of the original decking. Later, additional steel pilings were driven along the pier face and two mooring dolphins, one at each end of the pier, were installed (USACE 2015:3).

USACE determined that the Pier at Wards Cove Cannery was a contributing feature of the Wards Cove Cannery (CRG-00721) and therefore eligible for listing in the NRHP (USACE 2015). The SHPO concurred (SHPO 2015).

5.2.2.3 Old Craig Historic Site (CRG-00728)

The USACE requested an Alaska Heritage Resources Survey (AHRS) number for the multicomponent Old Craig Historic Site in 2014. Although the boundaries of this subsurface site are not known, it is thought that there are *in situ* components underneath much if not all of Wards Cove Cannery (CRG-00721). Mr. Tim Marshall, the U.S. Forest Service Heritage Program Lead for the Craig and Thorne Bay Ranger Districts, provided information regarding the prehistoric component of this site. Between 2011 and 2013, a public archaeology project run by the local elementary school was conducted at the location formerly occupied by a bunkhouse; a single basalt flake was recovered from a shallow depth in one of the excavation units. Other artifacts recovered during the excavation included trade beads and more recent historic artifacts. A stylized, ground argillite artifact was also recovered from disturbed soils in the general vicinity (USACE 2014c). It is possible that the Old Craig Historic Site is associated with the prehistoric midden that was identified at the Craig Ranger District parking lot (CRG-00443). Local oral histories indicate that numerous petroglyphs were once located along the western intertidal zone of the site; however, no petroglyphs are currently known (USACE 2014a).

USACE determined that the Old Craig Historic Site was eligible for listing in the NRHP under Criterion D (USACE 2014b), and the SHPO concurred (SHPO 2014).

5.2.3 Previous Assessment of the Undertaking's Effect on Historic Properties

In 2015, USACE found that the proposed undertaking would have an adverse effect on the Wards Cove Cannery Site (CRG-00721) and the Pier of Wards Cove Cannery (CRG-00722) (USACE 2014b, 2014c, 2015). USACE also found that the proposed undertaking would "potentially adversely affect" the Old Craig Historic Site (CRG-00728) (USACE 2014c, 2015). The SHPO concurred with this finding of adverse effect on historic properties (SHPO 2014, 2015). The USACE invited the Advisory Council on Historic Preservation (ACHP) to participate in development of a Memorandum of Agreement (MOA) to resolve these adverse effects (USACE 2014c); however, the ACHP declined to participate (ACHP 2015). A MOA was not prepared and consultation was not completed during the feasibility phase of this project.

5.2.4 Continuing Section 106 Consultation

In Fiscal Year 2020, the Pre-Construction Engineering & Design (PED) Phase of the proposed undertaking was funded. In January 2020, USACE invited the SHPO, the City of Craig, the CTA, Shaan Seet, Incorporated, the Central Council of Tlingit and Haida Indian Tribes, and Sealaska Corporation to participate in the development of an MOA to resolve the adverse effects the proposed undertaking will have on historic properties (USACE 2020). On February 20, 2020, a kick-off meeting was held in Craig to initiate discussions regarding appropriate mitigation; representatives from the CTA, City of Craig, and SHPO attended the meeting.

Consultation with stakeholders regarding the MOA continued sporadically in 2021 and 2022. In 2022, USACE invited the ACHP to participate in the development of the MOA (USACE 2022), and the ACHP agreed (ACHP 2022).

Consultation with stakeholders will continue until appropriate stipulations to resolve adverse effects to the Wards Cove Cannery (CRG-00721), Pier at Wards Cove Cannery (CRG-00722), and the Old Craig Historic Site (CRG-00728) are agreed upon and the MOA is executed.

6.0 ENVIRONMENTAL COMPLIANCE AND VALIDATION

6.1 Background

6.1.1 Compliance with Environmental Requirements

The 2015 IFREA evaluated its actions associated with the proposed project to be compliant with applicable Federal Statutes and Authorities: the Clean Air Act, as amended; the Clean Water Act of 1977, as amended; the Coastal Zone Management Act of 1982; the Endangered Species Act of 1973, as amended; Executive Order 12898 (Environmental Justice); the Fish and Wildlife Coordination Act, as amended; Executive Order 13112 (Invasive Species); the Marine Mammal Protection Act; the Marine Protection, Research, and Sanctuaries Act of 1972; the Migratory Bird Treaty Act of 1918; the Magnuson-Stevens Fishery Conservation and Management Act; the National Environmental Policy Act of 1969, as amended; Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks); Executive Order 13186 (Protection of Migratory Birds); Executive Order 11990 (Protection of Wetlands); Rivers and Harbors Act of 1899; and the Submerged Lands Act, as amended.

Upon review of the compliance documentation initially included in the 2015 IFREA, the Section 401 of the Clean Water Act Water Quality Certificate was found to have expired on 10 April 2020.

The USACE's 09 July 2014 Endangered Species Act determination of "may affect, but is not likely to adversely affect" humpback whales is still appropriate unless the project is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in its initial concurrence letter. However, given the lack of project design information at the time the 2015 IFREA was finalized, a general re-evaluation of this determination and an effects analysis on other marine mammals that are not listed species but regulated under the Marine Mammal Protection Act that may be affected by project construction activities may be warranted.

Compliance with Section 106 of the National Historic Preservation Act (NHPA) is not completed; USACE is in the process of developing an MOA. Stipulations to appropriately mitigate and resolve adverse effects to historic properties will be enacted in accordance with the executed MOA. Execution of the MOA will demonstrate that USACE has satisfied its responsibilities under the NHPA.

Throughout the PED and validation study processes, it has become apparent through consultation with the CTA and communication with local participants in the subsistence

fisheries that this proposed project warrants reevaluation under Executive Order 12898, Section 1-101 due to the likelihood of disproportionate negative environmental effects on minority and low-income populations.

6.1.2 Summary of Original Decision

The 2015 IFREA determined that the development of an Environmental Impact Statement was not warranted because its Environmental Assessment addressed perceived impacts and proposed avoidance and minimization measures that resulted in a Finding of No Significant Impact.

6.2 Validation Study Investigation

Through the validation study investigation process, it has become apparent that the 2015 IFREA did not capture the importance of Alaska Native subsistence practices and did not consider unavoidable adverse impacts to subsistence practices or develop mitigation measures for impacts to subsistence practices.

Similarly, assumptions associated with subsistence fishery practices, benefits, and described impacts were understated and under-evaluated in the 2015 IFREA.

7.0 UPDATED COST

The original project first cost in the 2015 IFREA was $36.4 million. Cost analysis has been updated from original April 2014 estimates to current September 2022 to now be $52.5 million (Table 2). The cost increase from the original estimate is due primarily to significant increases in rock, material, fuel, and labor prices that have occurred over that time span.

For purposes of this analysis, no coastal/H&H/design/other engineering updates were required. There are no significant changes to the layout of the Craig Harbor breakwaters proposed in the 2015 IFREA. The only changes are an additional Aid to Navigation (ATON) and a sub-core material below -22.5 ft MLLW. The sub-core was added to decrease overall rock costs by expanding the rock gradation and is still in alignment with breakwater design criteria due to the decreased wave energy at this depth. These changes are minor and are reflected within the updated cost estimate.

Table 2: Updated Cost Estimate

Task Description	Project First Cost
GENERAL NAVIGATION FEATURES	
Mob/Demob	$2,728,000
Demolition	$522,000
Breakwater, Survey and Nav-Aide Base	$37,061,000
PED	$2,308,000
Construction Management	$3,250,000
NAVIGATION AIDS	
Aids to Navigation	$64,000
LOCAL SERVICE FACILITIES	
Mooring Floats	$3,939,000
Piles, Caps, and Anodes	$1,774,000
Lands and Damages	$31,000
PED	$350,000
Construction Management	$489,000
	$52,516,000

Note: Values include contingency. Sums may not total due to rounding.

8.0 UPDATED ECONOMIC ANALYSIS

The original economic analysis for the Craig Navigation Improvements study included an analysis of total expected moorage demand and an analysis of the four USACE economic accounts - national economic development (NED), regional economic development (RED), environmental quality (EQ), and other social effects (OSE). As a result, the project was economically justified with a NED plan given that the benefit-to-cost ratio (BCR) was higher than 1.0, meaning that the nation's benefits outweighed the government's cost.

The updated economic analysis in this report is two-fold. It provides a thorough reevaluation of the baseline assumptions and conditions used in the 2015 feasibility report for validation purposes, along with a Level 2 economic update required of all USACE projects five years after the original feasibility study once construction starts. Methodology employed for this economic analysis is in accordance with current Principles and Guidelines and standard economic practices. Benefits and costs are computed at Fiscal Year 2023 price levels. The analysis employs the currently established Federal discount rate of 2.50 percent. Benefits and costs are also presented at a 7 percent discount rate, required for Corps budgetary purposes. The period of analysis is 50 years, with a project Base Year of 2025. Methods used to update specific benefit cost categories are documented throughout the text.

The economic reanalysis follows the guidelines of Civil Works Policy Memorandum 12-001, Methodology for Updating Benefit-to-Cost Ratios (BCR) for Budget Development dated March 2012 for conducting a Level 2 analysis. According to the memo, a Level 2 analysis allows for:

- Use sampling to update key data and assumptions
- Re-run economic benefit model
- Minimal effort to verify no new engineering is needed (e.g. H&H)
- Current cost estimates
- Show BCR and RBRCR at current price levels
- No new plan formulation
- No new NEPA

Baseline assumptions and conditions at Craig were revisited for this report. Current information was gathered from primary and secondary sources, including from the State of Alaska, Craig Harbormaster's Office, Craig City Administration, the Craig Tribal Association (CTA), as well from other on-site engagements from critical stakeholders in a November 2022 site visit to utilize the most current and accurate data available for purposes of this analysis.

Economic analysis conducted during the feasibility study utilized an excel model, which was also utilized for this report. This one-time use certified, study specific model calculates the National Economic Development (NED) benefits of small boat harbor navigation improvements in Craig, Alaska. The benefits calculated in the model include reduced travel costs, damages, and other associated issues for vessels seeking moorage in Craig, Alaska. Data inputs were updated using the most current available information gathered through this update, but formulas within the approved model remain unchanged.

8.1 Moorage Demand

The 2015 feasibility study utilized data obtained through an Office of Management and Budget (OMB)-approved survey to estimate total moorage demand in Craig. Of the 1527 surveys mailed out to vessel owners and fishing permit holders in the Craig region, 338 were completed and returned to USACE.

Responses were divided into four categories to represent likely harbor users. The first was vessel owners with Craig home address. The second was vessel owners who indicated that their vessel was currently homeported in Craig. The third category was vessel owners who did not have Craig home addresses, did not indicate they were currently homeported at Craig but already utilized Craig for transient moorage or boat launching, or stated a preference for using moorage at Craig in the future. The final category were Craig Harbor users who did not fit into any of the previous categories but indicated they currently use Craig facilities in some capacity. These vessels were all transient or boat launch users who were not homeported at Craig and were not interested in utilizing permanent slips at Craig if they became available.

The percent of survey responses from each category out of the total deliverable surveys were then extrapolated from the survey sample to the user population to estimate moorage demand. To take a more conservative approach for the first category (vessels with home addresses in Craig), since there was no way to account for survey responses from the same vessel, the estimated demand for harbor users with Craig home addresses was divided by 2. Table 3 shows a breakdown of the expected moorage demand.

Table 3: Expected Moorage Demand by Vessel Length

Vessel Length	0-22'	23-32'	33-45'	45-58'	>58'	Total
Permanent	35	69	101	47	5	258
Transient	30	38	135	199	42	444
Boat Launch	25	3	0	0	0	28
Other	0	0	0	0	0	0
Total	**90**	**111**	**236**	**246**	**48**	**730**

An additional Craig Harbor user survey was out of the scope of this report. However, using the same method to determine a population of potential Craig Harbor users (Alaska's permit and vessel owners) as well as other supporting data shows that the potential number of users is very similar to the original 1527 potential users in 2015. The following sections further describes the existing conditions at Craig and the small boat harbor facilities. This includes current population projections, facilities, usage, and vessel types. The data helps validate the unchanged expected overall demand for moorage at Craig, including current overcrowding or unmet moorage demand.

8.1.1 Population and Demographics

According to the 2020 Decennial US Census, the population of Craig was 1,036, making it the largest community on Prince of Wales Island (Census, 2021; AKDOL&WD, 2021). Since 2000, the population has fluctuated between 1,000 and

1,400 people; however, it is projected to decrease over the coming decades. This trend is consistent with expectations presented in the 2015 Feasibility Study; however, it is significantly more pronounced in the Alaska Population Projected in June 2022 (AKDOL&WD 2022), and if these projections hold, the population of Craig will have decreased by nearly 50 percent from 2020 to 2050.

The City of Craig administration has reported that the population in Craig has been stable and did not substantiate the significant population decline; therefore, for this validation report, USACE will use the more conservative report of population projections published by Alaska Department of Labor and Workforce Development (AKDOL&WD) in 2021. Population projections for the next 50 years from AKDOL&WD were used in the 2015 Feasibility Study economic analysis when calculating subsistence benefits and recreation benefits. A more severe population decline would marginally reduce the NED benefits in both categories. Table 4 contains specifics on population projections as predicted by the AKDOL&WD in 2021.

Table 4: Population Projections for Prince of Wales Island and Craig

Year	Population Projection for Prince of Wales Island	Average Annual Percent Change	Population Projection for Craig
2020	6,140	-0.88%	1,036
2025	6,047	-0.31%	997
2030	5,946	-0.34%	981
2035	5,842	-0.36%	965
2040	5,733	-0.38%	948
2045	5,609	-0.44%	929

**Source: Alaska Department of Labor and Workforce Development 2021*

The 2020 population is approximately 61 percent White, 21 percent American Indian and Alaska Native, and 14 percent of the population is two or more races in combination. Other small groups (less than 2 percent) include African Americans, Asians, and Pacific Islanders. The current population is 48.2 percent male and 51.8 percent female (ADCRA, 2021). The median age of the population is 38.8 years.

8.1.2 Maritime Activities Growth

The commercial fisheries in the Craig and Prince of Wales Island areas are bountiful, with many participating in gill netting, longlining, seining, trawling, and trolling, as broken down in the 2015 economic appendix.

Craig has also been actively participating in and anticipating new maritime activities since the original feasibility report was published. This includes the chum salmon fishery

at Port Asumcion, where a new annual release of 18 to 28 million-plus chum salmon is being released, a 200,000-plus release of king salmon each year at Port St. Nicholas, which benefits commercial and non-commercial fisheries, new kelp mariculture facilities now in operation, and others in development. These new conditions of increased maritime activities support Craig's original analysis of expected moorage demand.

8.1.3 Existing Conditions

Conditions of the current harbor space at Craig, at both North and South Cove in September 2021 was compared to when the harbor was surveyed for the 2015 Feasibility Study. There are greater number of boats permanently moored at Craig and fewer transient vessels; however, the total number of vessels has remained relatively constant. The number of open slips is almost the exact same as in 2015, however open slips do not necessarily indicate demand is properly met; the vast majority of the open slips are less than 20 feet long, and vessels utilizing Craig Harbor are skewing larger than before. Table 5 shows the current harbor usage in Craig Harbor.

Table 5: Current Harbor Utilization

	# Permanent Leasable slips	# Permanent boats	# Transient boats	# Open slips	Unusable
Total	221	220	370	27	11

**Source: City of Craig Harbor Use Data.*

During the 2022 site visit, some Craig Harbor users reported that their *leased* slips were unusable due to harbor maintenance issues. These issues, such as broken finger floats, forced users to make use of other open/available slips.

8.1.3.1 Vessels in Slips too Small

Due to limited moorage availability, some vessels which currently use the North or South Cove harbors are in slips which are too small for their vessels. Vessels which are greater than three feet in length overall than their current slip are in slips too small. Vessels in inappropriately sized slips can create maneuvering issues and be exposed to vessel damages. Compared to the Feasibility Study, the City of Craig records indicate that a greater total number of vessels in this condition and the size of the vessels in this condition skews larger. The number of vessels in this situation is shown in Table 6.

Table 6: Count of Vessels too big for Current Stall

Vessel length	0 - 20'	21' - 27'	28' - 36'	37' - 45'	46 - 60'	>60'	Total
Number of vessels	0	1	18	14	24	3	60

**Source: City of Craig records*

8.1.3.2 Waitlist

The Craig Harbormaster office maintains a waitlist for permanent dock space in the harbor. Boaters interested in obtaining a permanent slip may apply and pay a fee to be on the waitlist for the appropriate size of their vessel. The number of total vessels currently waitlisted is higher than in 2013 and the average length of the vessels on the waitlist skews higher than eight years prior (Table 7). Other small boat harbors in the region have full harbors and waitlists, further increasing moorage demand.

Table 7: Craig Permanent Moorage Waitlist

Length	0'-20'	21'-27'	28'-36'	37'-46'	47'-60'	>60’	Total
Vessel Count, 2013	6	20	25	15	10	2	78
Vessel Count, 2021	4	15	33	18	11	0	81
Growth/(Decline)	**(2)**	**(5)**	**8**	**3**	**1**	**(2)**	**3**

NED Benefits

This section reevaluates the analysis of future operation costs for boaters using Craig facilities in the absence and presence of Federal construction. This section aims to estimate how the issues described in the existing conditions section will affect vessels in the future and to quantify these costs. Wherever possible, these costs have been assigned monetary values and, if not possible, are discussed in qualitative terms. The future without project condition (FWOP) provides a benchmark for comparing costs under the future with project condition with the recommended plan. The various subcategories in this section are the different benefit categories that can be realized in the future with project (FWP) conditions.

The NED benefits in the 2015 feasibility study were calculated using six benefit categories. Three categories were calculated using the 2012 OMB-approved survey results (completed by 388 of the 1527 members in the sample): vessel damages, vessel delay, and travel costs. The subsistence benefit category was calculated by using 1997 data collected from the region as well as indirect results from the survey. Unfortunately, harbor staff confirmed that they did not collect the type of data collected in the original craig harbor user survey, so they could not provide updated data for this report that would impact those four benefit categories. However, harbor staff reported that they have seen no evidence to support the change in any conditions from those derived in the 2015 Craig Harbor user survey that would impact the methods used to calculate NED benefits. The NED benefit calculations are based off the expected moorage demand of 730 vessels using the harbor.

The recreation benefit category was calculated from data that was collected via a focus group in 2014 and analyzed using USACE Economic Guidance Memorandum (EGM 21-03) to estimate the value of recreation use. The infrastructure benefit category was calculated using information provided by USACE H&H engineers and the Craig Harbor Office staff.

The following sections show the investigation into each of the benefit categories with significant changes suggested in benefit calculations in the vessel delay category and subsistence category.

8.1.4 Vessel Damages

Overcrowded harbor conditions in Craig Harbor have resulted in vessel damages more likely to occur from rafting, hot-berthing, and other operational practices. To quantify the level of damages in the FWOP conditions, the 2015 study utilized responses from the Craig Small Boat Harbor Survey to identify the proportion of vessels that had sustained damages due to overcrowding and what types of damages occurred. Given that the number of vessels using the harbor since 2015 remains similar, Conversations with the harbormaster’s office and on-site engagement with harbor users have confirmed no significant changes to the likelihood or severity of damages since 2015 are present since the number of vessels using the harbor is like the number used in the original feasibility study. Examples of vessel damages reported by Craig Harbor users include hull wear and dents, propeller damage, grounding, and struck by other vessels.

Survey responses showed an average of 5.6 vessel damages per year, and an @Risk simulation with 1000 iterations provides the average repair cost per incident updated to current dollars. The simulation results are shown in Figure 6, and the total costs of vessel damage are presented in Table 8.

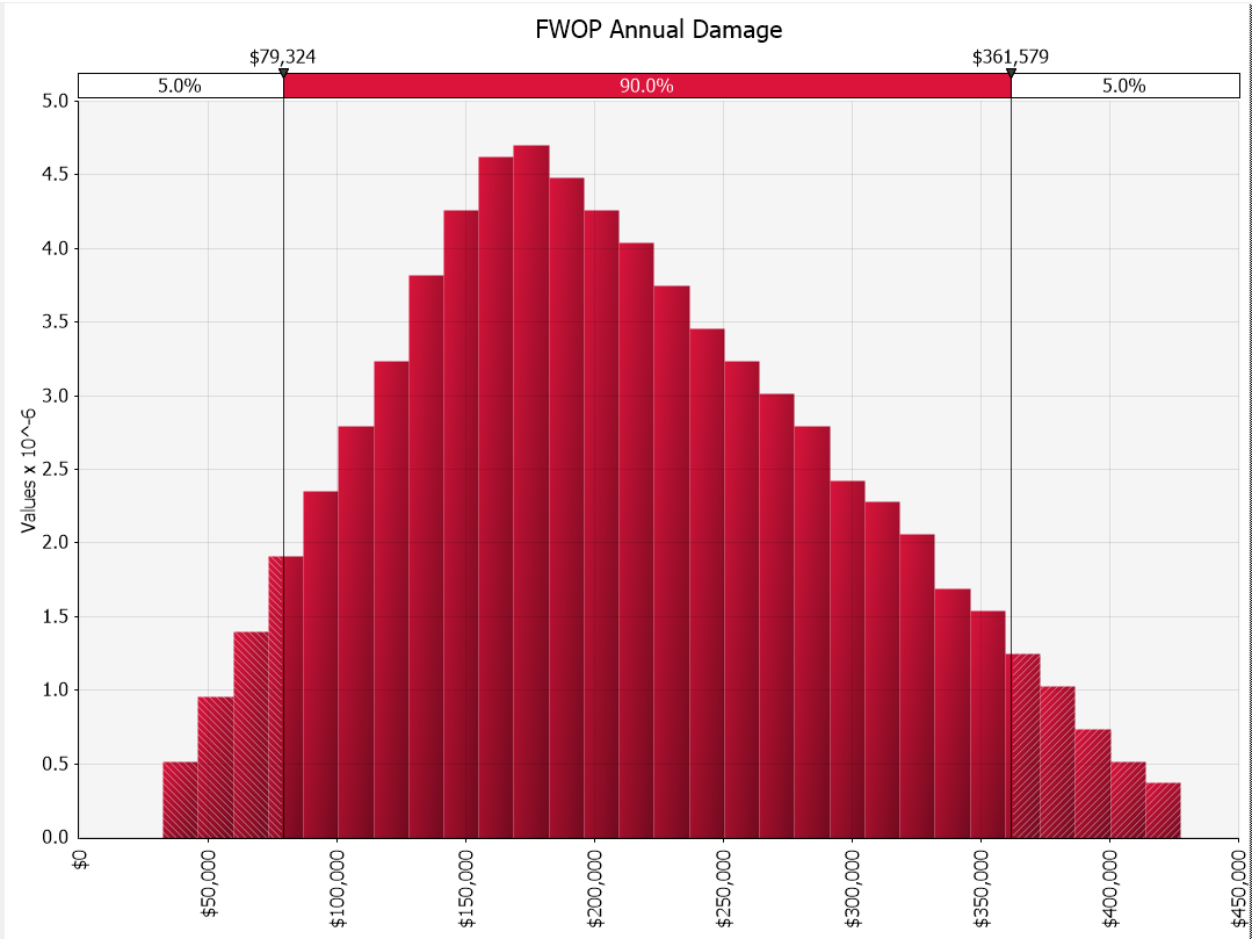

Figure 6: FWOP Annual Damage

Navigation improvements will not alleviate all types of damages reported in the Craig Harbor Survey. Examples of these types of damages, as noted on surveys, include a stolen seat, missing buoys, electrolysis, broken glass, missing mooring lines, and frozen water lines. Mirroring the original analysis, the assumption remains that there are, on average, 1.8 incidents of this type of unavoidable damage per year. Using this knowledge and the same method as was used to calculate the costs of the future without -project costs, the expected costs of these unavoidable damages give us the cost in the FWP. Again, simulation was used to predict the costs of damages in the FWP condition, and the annual vessel damage results are shown in Figure 7 and FWP costs are presented in Table 8.

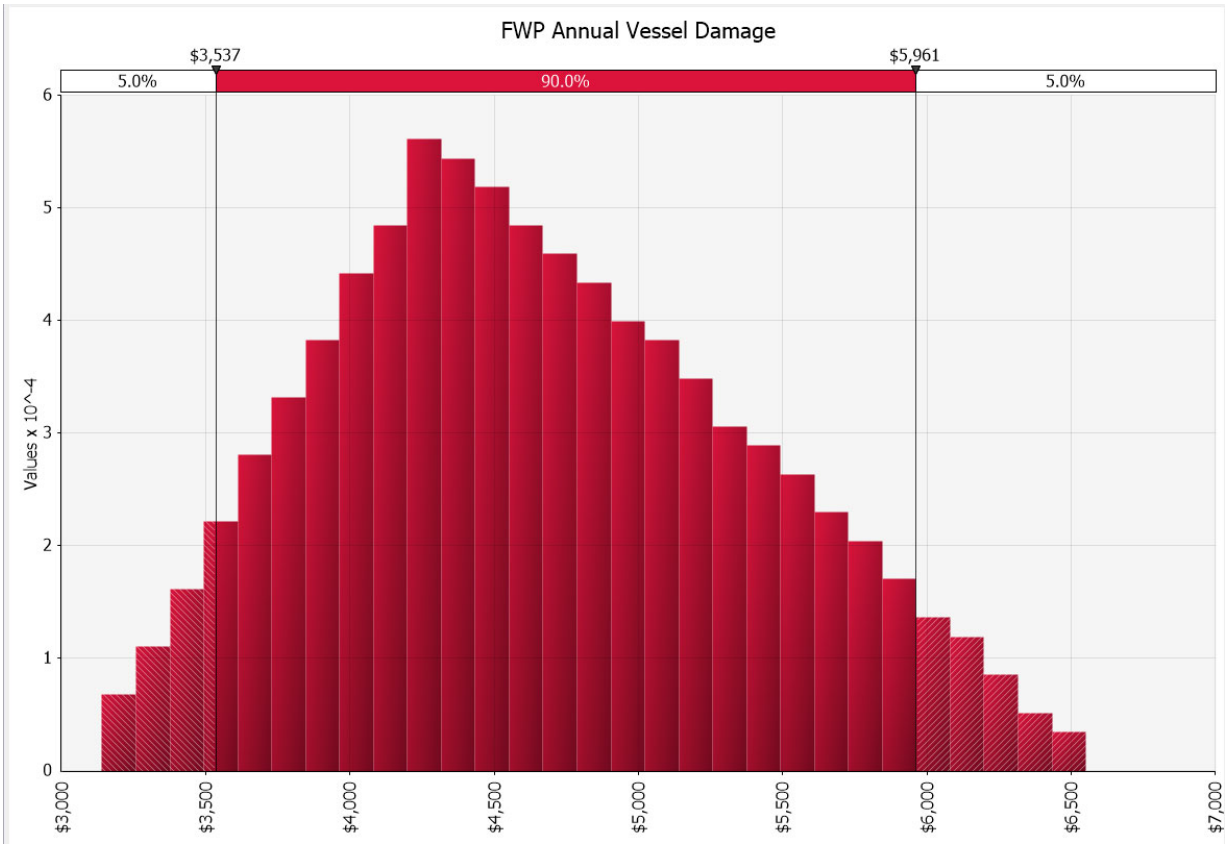

Figure 7: FWP Vessel Damage Simulation Results

Table 8: FWOP and FWP Vessel Damages Costs

Vessel Damage Costs	Net Present Cost	Average Annual Cost
FWOP	$5,945,000	$210,000
FWP	$2,027,000	$71,000

8.1.5 Vessel Delays

The 2012 Craig Harbor Survey identified vessel delays when entering and exiting the current harbors as a significant problem. This forgone productive time costs the vessel owners time, money, and resources, and in the case of commercial fishing harbors, these delays may result in lost time fishing and less revenue for fishermen. This report, as was the case in the 2015 Feasibility Study, does not attempt to quantify this potential lost revenue but instead focuses on the economic value of the delays.

The cost of these delays is a function of the amount, the size of the fleet at Craig, and the variable cost of operating each vessel, including marine fuel prices and wages for captain and crew. Marine fuel prices were updated and estimated for Craig by taking an

average price of #2 Marine Diesel from August 2021 to August 2022 at nearby ports of Juneau, Ketchikan, Petersburg, Sitka, and Wrangell.

The 2012 Craig Small Boat Harbor survey provided survey respondents with five possible reasons for vessel delays in the harbor: waiting for tide change, another boat having to be moved from a stall, harbor staff not available, having to wait for the rafted boat owner to return, and launching delays at the ramp. Respondents could also provide an “other” reason, but all could be categorized as either a congestion/overcrowding issue or due to ice in the harbor. According to the survey, 17 percent of respondents experienced at least one delay.

When asked, the staff at Craig Harbor affirmed the situation had stayed the same since the 2015 Feasibility Study; as the delays themselves are a result of the demand for harbor space, this assumption is supported by the current fleet information and waitlist. The longer waitlist than in 2013 indicates that overcrowding and demand for moorage space in Craig have remained high since the original analysis was conducted.

However, during the 2022 on-site engagement, many residents expressed that overcrowding, congestion, and rafting of vessels typically occurred during the peak commercial season, mid-July through mid-August. Most reported that this busy season lasts a few weeks to a month; otherwise, the harbor is accessible and often has empty slips. Many Craig Harbor users said that delay time during the peak season was less pronounced than what was reported in the 2015 Feasibility Study.

This led to a reevaluation of the survey data collected in 2012. When looking at the responses, it was clear that many of the number of delays and hours of delay responses resulted in heavily skewed distribution. For example, responses for the delay of “had to wait for rafted boat owners to return ranged from half an hour to forty-eight hours, with most responses between half an hour and two hours.

In the original analysis, the average wait time was extrapolated to the expected moorage demand to calculate the total hours of delay time. In some cases, since the data was heavily skewed, the average was much higher than many reported responses due to one or two reports of extremely long wait times. To control for this large skew in the data used, an @Risk pareto distribution was used with a 1000 iteration monte Carlo simulation to use a most likely wait time for any delay category with 3 or more responses. In categories with fewer than 3 responses, the average was used.

To convert delay times into a monetary benefit, vessel operating costs for the fleet in Craig were used to calculate FWOP delay costs, and later the benefits resulting from navigation improvements. Previous Alaska District studies provided the basis for the methodology and assumptions used to develop these vessel operating costs. The methodology was used in several recent Alaska District feasibility studies, including Port Lions (feasibility and Limited Reevaluation Report), Valdez, Homer, and Whittier. The basic framework used for those studies is applicable to Craig, with changes to the input data as was appropriate. A full break down of this methodology can be found in the Economic Appendix in the 2015 feasibility study. Table 9 shows the vessel delay times as a monetary benefit using 2022 dollars.

Table 9: Vessel Delay Costs

Vessel Delay Costs	Net Present Cost	Average Annual Cost
FWOP	$23,644,000	$834,000
FWP average	$10,059,000	$355,000

8.1.5.1 Other concerns about Vessel Delays

During the 2022 USACE on-site engagement many Craig Harbor users were concerned that the new breakwater at Cannery Point will cause narrowing of the channel between Cannery Point and Fish Egg Island. The narrowing of the channel caused the concern that vessels would be delayed at the breakwater waiting for other vessels, float planes or wildlife to pass through. The 2015 Feasibility Study assumed that two-way traffic would be possible, but traffic patterns were not analyzed. Future evaluation of this could be considered in a general reevaluation report (GRR).

8.1.6 Subsistence

In the 2015 Feasibility study, it was assumed that a significant contributing factor to the lower-than-average subsistence harvest for Craig than for the rest of Prince of Wales Island was due to lack of access to vessels and overcrowding and congestion at harbor facilities.

To develop a FWOP condition for subsistence harvest, the most recent year for which complete subsistence harvest information is available (1997) data was used. This reported Craig residents harvesting 230.66 pounds of subsistence resources per capita. However, subsistence harvest data is often limited, so this data was assumed to represent current conditions.

The monetary value of this subsistence harvest was then multiplied by subsistence replacement values. These subsistence replacement values were calculated by using an @Risk triangular distribution with parameters utilizing: a study conducted by ADF&G that found the replacement value of subsistence resources and updated to current dollars, a production cost method used for the Little Diomede feasibility study which considers that subsistence resources are worth at least as much as the harvesters invest in them through expenditures of cash and labor, and gathered replacement values for various proteins at three grocery stores in Craig in September 2014.

To develop a FWP condition, subsistence harvests of nearby communities were investigated. However, Prince of Wales Island's demographic and infrastructure data did not immediately indicate a community against which to compare Craig. Nevertheless, Prince of Wales Island communities was believed to be the representative. In addition, due to their relatively isolated location, communities near Craig will all be harvesting the same subsistence resources (animal and plant species).

Given the lack of a single community against which to compare Craig, the analysis examined the harvest levels of all other Prince of Wales Island communities. The average per capita subsistence harvest for Prince of Wales Island, not including Craig, was 302.75 pounds, or a 31.25 percent increase compared to Craig. Therefore, the analysis expected that the level of subsistence harvest increase related to navigation improvements would be less than or equal to 31.25 percent. To address the uncertainty associated with selecting this value, the analysis utilized an @Risk uniform distribution using 0 and 31.25 percent as parameters.

An @Risk simulation with 1,000 iterations was conducted to utilize this distribution of expected subsistence harvest increase. The analysis used the mean value of a 15.6 percent increase. This represented the expected subsistence harvest increase, assuming all overcrowding at Craig was alleviated.

To update the FWOP conditions, the harvest value is estimated using commercially available replacement protein, which was updated from the Feasibility Study using CPI. The CPI adjustments for Alaska are based on prices in urban areas, which may only partially capture the conditions in a small community off-the-road system. Still, they should serve as a decent approximation of the cost change throughout Alaska. To account for uncertainty in the value of subsistence protein, the value was chosen using the mean value of 1000 iterations in an @Risk simulation. The simulation results are shown in Figure 8.

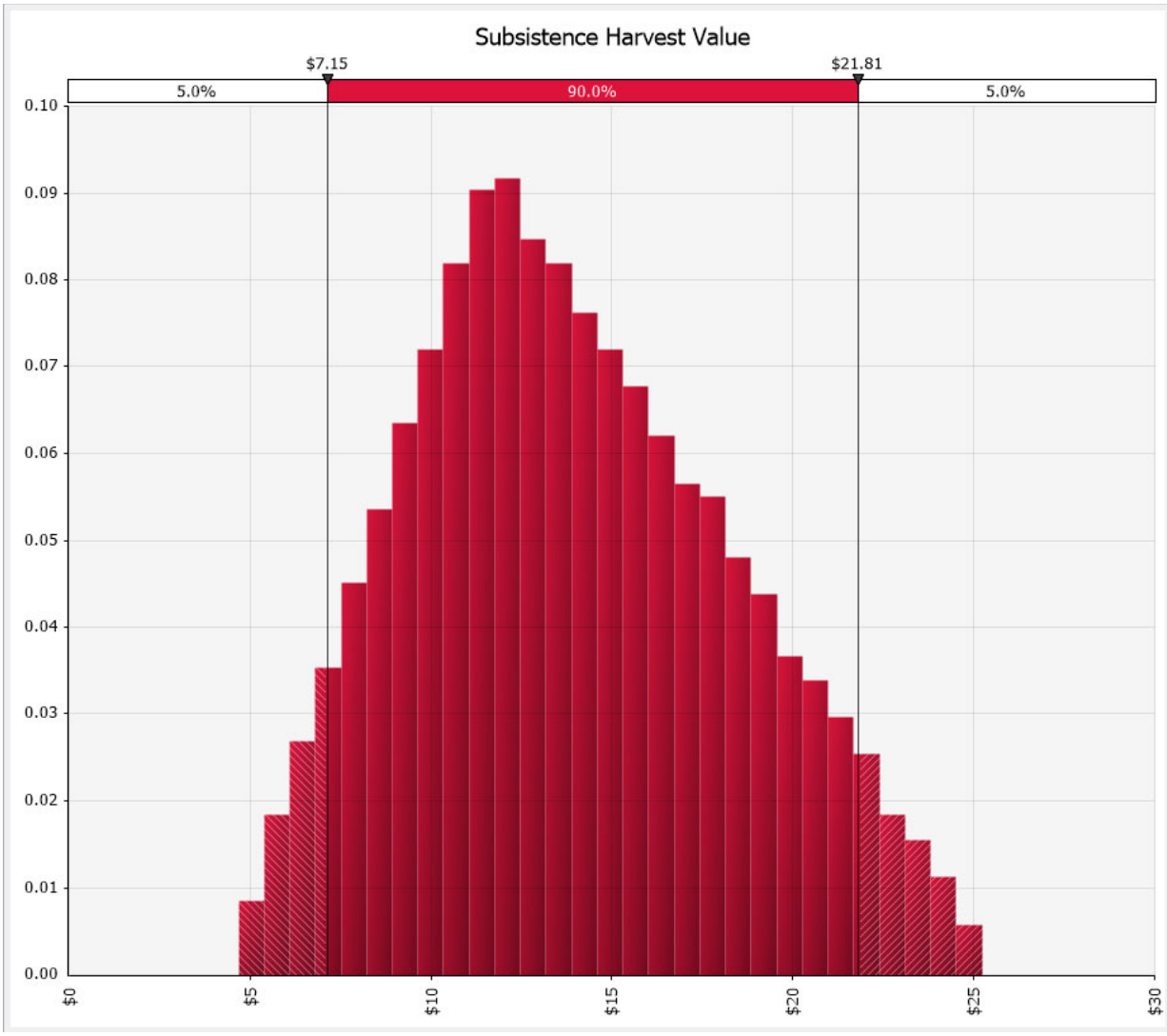

Figure 8: Simulation Results for Replacement Protein Value

However, this validation effort has led to the conclusion that a 15.6% increase in subsistence harvest is likely the best-case scenario. Subsistence harvest increases are likely to be disproportionate in the community, with those able to own boats and lease slips in the harbor being able to access the benefits more readily (see Section 5 for an in-depth description of subsistence activities). Community members who do not use the harbor will not see an increase in benefit to their subsistence harvest.

Subsistence resources in the community are reportedly becoming scarcer due to a growing fleet of charter operators in the area, forcing subsistence users to travel farther to fulfill their harvests. However, traveling further for the same resources increases vessel operator costs, such as time, fuel, and wear and tear on vessels.

Due to this uneven and uncertain access to increased subsistence benefits, a scenario of no subsistence benefits ranging to a 15.6 percent increase is presented (Table 10).

Table 10: Subsistence Benefits

Subsistence Benefit	Net Present Benefit	Average Annual Value
FWOP	$84,509,000	$2,980,000
FWP- 15.6% increase	$97,693,000	$3,444,000
FWP- No increase	$84,509,000	$2,980,000

8.1.7 Travel Costs

Currently there a are number of vessels that would make Craig their homeport if sufficient permanent moorage for their craft was available, but instead must travel from other places routinely to access commercial fishing opportunities there. Utilization of permanent moorage at Craig would represent a reduction in these boaters' transportation costs. This reevaluation, as in the 2015 feasibility study, utilizes responses from the Craig Small Boat Harbor survey to find the proportion of Craig vessels which would relocate to Craig were their adequate facilities. Vessel owners and operators incur excess costs from labor and fuel while in transit between their homeport and Craig. These costs are a function of the current wages for captains and crew, which are updated by Alaska Department of Labor and Workforce Development; the variable costs of vessel operation, mainly marine fuel, updated to FY23 by averaging prices from nearby ports in Southeast Alaska; and the amount of time in transit, held constant to findings from the Small Boat Harbor survey. Table 11 shows the cost that would be saved by vessel operators if they were able to homeport in Craig.

Table 11: Travel Costs

Vessel Travel Costs	Net Present Cost	Average Annual Cost
FWOP	$9,750,000	$344,000
FWP	$0	$0

8.1.8 Infrastructure Damage

The calculations of infrastructure damage costs in the 2015 IFREA for the FWP condition are the same as the FWOP condition. The primary difference in calculation is that this analysis assumes that FWP infrastructure repairs must be conducted at 40-year intervals based on USACE projections for float repairs. This is in comparison to 20-year intervals in the FWOP condition. This assumption was based on input from the Craig Harbormaster and Alaska District Engineering staff and has been validated based on 2022 conversation with the harbormaster.

This analysis assumes that existing float infrastructure at both North Cove and South Cove will need to be replaced less frequently in the future with-project condition. The basis for this assumption is that new moorage facilities at the new Wards Cove site will

reduce the overcrowding currently faced at both North Cove and South Cove. Since overcrowding and congestion causes increased wear-and-tear to existing facilities, reducing overcrowding will alleviate these types of damages. Also, some of the reduced life of floats at North Cove is due to the wave climate. The existing docks adjacent to the Wards Cove site are also subject to damages from wave action. The new breakwater proposed at the Wards Cove site is expected to reduce the wave climate for North Cove and for the existing docks adjacent to Wards Cove. This reduction in wave climate is also expected to alleviate damage to infrastructure and contribute to the decreased frequency of replacement. Table 12 shows the reduction in cost of infrastructure damage to the harbor.

Table 12: Infrastructure Damage Costs

Infrastructure Damage Costs	Net Present Cost	Average Annual Cost
FWOP	$27,664,000	$975,000
FWP	$19,149,000	$675,000

8.1.9 Recreation

Recreational boaters using Craig Harbor facilities are comprised of three categories: sport/recreational fishing, charter boat passengers (both fishing and sightseeing), and independent travelers. Recreational use of Craig Harbor facilities is expected to change in future conditions, and the underlying assumptions that informed the feasibility study recreation analysis are carried forward into this update. Primary data inputs for this reanalysis are population and unit day values (UDV), which were updated as discussed below.

This report uses UDV method to value recreational opportunity at Craig Harbor. The method is used as described in Corps Economic Guidance Memorandum (EGM 21-03) for fiscal year 2023 to estimate the value of recreational use of Craig Harbor. The EGM presents guidelines for assigning point values to recreation activities and provides a table showing the range of daily values that correspond to point value scores. Points are awarded based on five criteria that address the quality of the site, the number and types of activities enjoyed at the site, and the availability of substitutes. The UDV method then uses this point system to determine day values for recreation (Table 13).

The UDV point values in the 2015 study were assigned in 2014 by a focus group of recreational boaters from Craig. The point values have been held constant for this analysis, with the assumption being that general quality of the recreation experience has not changed.

Table 13: Unit Day Values Without- and With-Project Conditions, Craig

Criteria	Point Range	Points Without -Project	Points With-Project	Rationale
Recreation Experience	0-30	8.2	15.3	Harbor weekend and holiday use is crowded due to close proximity to fishing grounds and commercial fish processor in town. Moderate use during weekdays. Decision based on numerous factors such as high quality of the fishing experience and willingness of charter clients to pay for the opportunity to fish along with airfare for out-of-town recreation users. Non-fishing recreation customers pay for the sightseeing and water taxi opportunities. Recreation destination will be enhanced with project.
Availability of Opportunity	0-18	11.7	9.2	No comparable opportunities within two-hours travel time, although recreational opportunities abound in Alaska.
Carrying Capacity	0-14	7.3	10.3	Prince of Wales Island and surrounding area fisheries are well managed but not overcrowded. Only limitations on carrying capacity might be in the form of reaching maximum commercial and sport fishing quotas.
Accessibility	0-18	9.2	15.3	Remote access, good roads on island within site although parking is an expressed concern. Assume with-project conditions will relieve overcrowded parking condition.
Environmental	0-20	12.2	15.2	Above average aesthetic quality; any limiting factors can be reasonably rectified. Limiting factor for aesthetic quality concerns the crowded conditions at the harbor and launch ramp. Additional aesthetic concerns are the visions of the clearcut areas on the island from the timber industry activity. Overcrowded conditions are significantly improved with project. Clearcut areas of the surrounding mountains will not be changed under with-project conditions.
Total Points	**100**	**48.5**	**65.3**	

Source: USACE Economic Guidance Memorandum 21-02, Unit Day Values for Recreation for Fiscal Year 2023, and average of responses from Craig focus group, September 2014.

The advantage of the UDV method is that it provides an accurate way to convert the point into dollar values. The value of each UDV changes annually and the values shown in Table 14 have been updated according to EGM 23-03 for purposes of this report.

Table 14: Recreation Benefits

Recreation Benefit	Net Present Cost	Average Annual Value
FWOP	$83,992,000	$2,961,000
FWP	$95,127,000	$3,354,000

8.2 Benefit-Cost Ratio Update

Error! Reference source not found. presents the average costs annualized together with the sum of the average annual benefits for all six NED benefit categories listed above. The table provides a best-case and a worst-case scenario based on the large uncertainty pertaining to the subsistence benefits of the residents of Craig. The benefits and costs were used to calculate the BCR and the Net Benefits. The table also provides a BCR and annual benefits at a 7% discount rate in accordance with USACE policy.

Table 15: Calculation of BCR and Net Benefits

Scenario	Average Annual Benefits	Average Annual Costs	Benefit to Cost Ratio	Net Annual NED Benefits	Benefit Cost Ratio at 7%	Net Annual Benefits at 7%
Best Case	**$2,056,000**	$1,959,000	1.05	$97,000	0.50	-$2,050,000
Worst Case	**$1,380,000**	$1,959,000	0.70	-$579,000	0.33	-$2,739,000

The remaining benefit and remaining cost ratio was calculated using the certified cost estimate which reported that $1,500,000 has been spent thru 1-Oct-2022 on the planning, engineering and design phase of the project, which is a sunk cost. This cost was deflated and would not be considered for interest during construction. No benefits to the projects have been realized to date, therefore all benefits to the project remain. Table 16 presents the RBRCR and Remaining Net Benefits at the current price level and at a 7% discount rate in accordance with USACE policy.

Table 16: Calculation of RBRCR and Remaining Net Benefits

Scenario	Average Annual Benefits	Average Annual Costs	Benefit to Cost Ratio	Net Annual NED Benefits	Benefit Cost Ratio at 7%	Net Annual Benefits at 7%
Best Case	**$2,056,000**	$1,906,000	1.08	$150,000	0.49	-$2,095,000
Worst Case	**$1,380,000**	$1,906,000	0.72	-$526,000	0.34	-$2,630,000

8.3 Other Economic Accounts

USACE planning guidance establishes four accounts to facilitate and display effects of recommended plans. Previous studies have relied primarily on the use of the National Economic Development (NED) account showing the changes in the economic value of the national output of goods and services. A benefit/cost ratio and an indication of the change in net benefits is the output of the NED evaluation.

The other three accounts included as part of this study are evaluation of the Regional Economic Development (RED) effects, Environmental Quality (EQ) and the Other Social Effects (OSE) accounts. The specifics of the four benefit accounts are detailed in the remainder of this section. A summary of the four accounts evaluation in the 2015 IFREA and Validation Study is presented in Table *17* below.

Table *17*: Four Accounts Evaluation Summary

	Net Annual NED Benefits (B/C Ratio)	EQ	RED	OSE
2015 IFREA Analysis	$361,000 (1.24)	Positive Effects	Increased employment and income for the region and state	Beneficial
Validation Study	(-$579,000) to $97,000 (0.70-1.05)	Mixed Effects	Increased employment and income for the region and state	Adverse

8.3.1 Regional Economic Development

The underlying assumptions regarding regional transfers that were included in the feasibility report remain valid.

Economic benefits that accrue to the region but not necessarily the nation include the shifting of vessels from outside of the region to Craig. These vessels currently moor as far away as the Pacific Northwest. Their permanent relocation to Craig would provide several benefits to the region. These vessels would bring revenue to the region in the form of moorage fees, additional sales tax revenues on purchases of fuel and groceries for the vessel, additional corporate income taxes to the State of Alaska, crew patronage of local businesses, and fares on local air carriers between Prince of Wales Island and the crews' homes.

Additionally, utilizing the USACE certified Regional Economic Systems (RECONS) model, we have estimated the effect of the construction of this project on the regional economy of Prince of Wales Island.

The expenditures associated with All Work Activities at Prince of Wales-Hyder Census Area (AK) are estimated to be $44,484,197. Of this total expenditure, $25,811,677 will be captured within the local impact area. The remainder of the expenditures will be captured within the state impact area and the nation. These direct expenditures generate additional economic activity, often called secondary or multiplier effects. The direct and secondary impacts are measured in output, jobs, labor income, and gross regional product (value added) as summarized in the following tables. The regional economic effects are shown for the local, state, and national impact areas.

In summary, the expenditures $44,484,197 support a total of 338.2 full-time equivalent jobs, $20,036,991 in labor income, $19,029,288 in the gross regional product, and $34,559,642 in economic output in the local impact area. More broadly, these expenditures support 769.0 full-time equivalent jobs, $53,025,620 in labor income, $66,510,626 in the gross regional product, and $121,257,293 in economic output in the nation.

8.3.2 Environmental Quality

The recommended plan's reduction in fossil fuel usage stated in the 2015 IFREA is still expected. However, the original reports statement of EQ did not specify that eel grass, salmonids, and herring spawn would be negatively affected within the project footprint.

8.3.3 Other Social Effects

The categories of effects in the Other Social Effects (OSE) account include urban and community effects; life, health, and safety factors; displacement; long-term productivity; and energy requirements and energy conservation. OSE can be either beneficial or adverse (positive/negative) depending on the standard being measured.

Subsistence benefits are highly variable. Some Craig residents believe that their ability to subsist will be greatly adversely impacted due to the breakwater and harbor being constructed in an area used regularly for king salmon trolling and herring spawn harvesting. The cannery point area is a location visited by elders, non-boaters, or lower

income individuals who use this area due to its proximity to shore as well as it being an economical option. Residents who utilize the harbor and subsistence areas not impacted by the footprint of the project will likely benefit from an increase in their ability to subsist due to less time to launch vessels, and a decrease in wear and tear on vessels.

Construction of this project in Craig supports the local economy and provides income to a small community. This injection of income to the City of Craig allows the provision of social services to the community, increasing community viability and quality of life. Enhanced revenue to local businesses provides incentive to hire additional personnel, providing income stability to more of the local citizenry.

9.0 RISK AND UNCERTAINTY

As in any planning process, some of the assumptions and input data used in this report are subject to complex social, economic, and natural variables. Any risks and uncertainty from the original study exist in this reevaluation, as well as new sources. This section serves to highlight these unpredictable elements and provide insight on how to interpret them.

9.1 Schedule Risk

Because of their complex and intricate nature, ongoing negotiations between the CTA, ACHP, SHPO, and the City of Craig regarding the development and execution of the Section 106 Memorandum of Agreement represent a potential schedule risk.

9.2 Economic Uncertainty

The economic reassessment has found a potential BCR range of 0.70-1.05. However, there are additional uncertainties that could further impact the BCR.

Uncertainty in moorage demand was present in the 2015 Feasibility Study. As there is no additional cost to vessel owners for remaining on the waitlist, it is possible there are vessels on the list that no longer desire moorage at Craig. On the other hand, the updated Craig Harbor slip list provided by the City of Craig was from September of 2021, which is outside of the peak of summer seasonal demand when commercial fishing and tourist vessels would have greatest need for transient space in the harbor. In summation, moorage demand presented should be considered a low estimate of the total demand for moorage in Craig.

The population modeling conducted by the state has been revised down since the Feasibility Study. Current population as of 2020 is lower than original projections. The city stated that they are not worried about population levels and that housing demand has continued to remain strong. The pandemic has further complicated population projections. Should population decrease it would lead to an overestimation of benefits.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Major updated findings from the IFREA are broken out by section and summarized in Table 18.

Table *18*: Summary of Significant Findings

Section	Finding
Environmental Justice	• Subsistence users regularly utilize project site for subsistence activities. • Project would negatively impact navigational access to other subsistence fishing areas adjacent to project footprint.
Engineering	• Project cost has increased by $16.1 million to $52.5 million. The increase from the original estimate is due primarily to significant increases in the cost of rock, material, fuel, and labor.
Economic	• Due to disproportionate and uncertain FWP subsistence conditions, subsistence benefits are now represented as a range from no increase to 15.6% increase. • OSE were reevaluated and determined to be adverse rather than beneficial due to disproportionate negative impacts on subsistence users who are elders, non-boaters, and lower income • Likely BCR updated to .88 due to changes in cost and subsistence benefits.

10.1 Conclusions

The findings of this validation study indicate that not all conclusions in the 2015 IFREA and FONSI are verifiable. Validated conclusions include current velocity, marine habitat, marine birds, marine mammals, engineering conditions. Several sections in this report include updated information and analysis but do not have a significant effect on findings from the IFREA or further influence the USACE recommendations. However, the updates to the project impact on subsistence users is significant. Additionally, changes to the estimated cost of the project as well as calculated subsistence benefits has resulted in a BCR with a range including values under 1, which would make the project not justified under NED.

The data used for the 2015 IFREA did not identify the prevalence of subsistence users in the project site or how the authorized project would disproportionally affect older and low-income subsistence users. Community engagement revealed a trend that subsistence users tended to believe that the authorized project would hurt rather than benefit them.

After updating project costs estimates to current 2023 levels the project first cost increased from $36.4 million to $52.5 million. The subsistence benefits have also been updated to reflect concerns that the original benefits calculated in the IFREA represent the maximum of a range of economic outcomes. The cost and benefit updates change the IFREA finding of a BCR of 1.24 to a range of 0.70 to 1.05 with a most likely BCR of 0.88.

Under the current economic and environmental findings, the authorized project is not within the Chief's authority to implement. A more thorough assessment of alternatives, mitigation measures, and economic analysis is warranted to address these issues.

10.2 Recommendations

Given the significant findings of this study, USACE recommends a General Reevaluation Report (GRR). Under a GRR an authorized plan can be reformulated or modified which is outside the scope of a validation study. If the GRR determines the recommended project has changed sufficiently, the current project construction authorization may require reauthorization.

11.0 REFERENCES

Advisory Council on Historic Preservation (ACHP).
2015. Letter from ACHP (Raymond Wallace) to USACE (Shona Pierce) re: Proposed Construction of Small Boat Harbor at Ward's Cove, Craig. 3 January.
2022. Letter from ACHP (Reid Nelson) to USACE (Michael Conner, ASA[CW]) re: Craig Harbor Navigation Improvements Project. 28 June.

Alaska Department of Fish and Game (ADFG)
1997. Subsistence Hunting & Fishing, Harvest Data & Reports, CSIS, Harvest Information for Community, Craig. http://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=harvInfo.harvest Accessed January 2023.

CoastView
2022. Lindenberger Cannery, Craig Island. Electronic document, https://coastview.org/articles/2022/07/07/craig-cannery-klawock-inlet/, published July 7, 2022. Accessed January 2023.

Dixon, E. James
1999. *Bones, Boats, and Bison: Archaeology and the First Colonization of Western North America.* University of New Mexico Press.

Langdon, Steve J.
1979. Comparative Tlingit and Haida Adaptation to the West Coat of the Prince of Wales Archipelago. *Ethnology* 18(2):101-119.
2006. Tidal Pulse Fishing: Selective Traditional Tlingit Salmon Fishing Techniques on the West Coast of the Prince of Wales Archipelago. In: *Traditional Ecological Knowledge and Natural Resource Management*. C. R. Menzies, ed. Pp. 21–46. University of Nebraska Press.

National Marine Fisheries Service (NMFS)
2021. Alaska Region. Occurrence of Endangered Species Act (ESA) Listed Humpback Whales off Alaska. Revised August 6, 2021.Alaska Region. Electronic document, https://media.fisheries.noaa.gov/2021-12/Guidance-Humpbacks-Alaska.pdf. Accessed December 2022.

Shaan Seet, Incorporated (Shaan Seet)
2021. History of Shaan Seet. Electronic document, https://www.shaanseet.com/. Accessed January 2023.

State Historic Preservation Officer (SHPO)
2014. Letter from SHPO (Judith Bittner) to USACE (Chris Floyd) re: Craig Harbor Project. 3130-1R COE. 23 December.

2015. Letter from SHPO (Judith Bittner) to USACE (Shona Pierce) re: Pier at Wards Cove Cannery and Craig Harbor Project. 3130-1R COE/2015-00267. 11 March.

U.S. Army Corps of Engineers (USACE)
2014a. Letter from USACE (Shona Pierce) to SHPO (Judith Bittner) re: Craig Harbor Project. 23 October.
2014b. Letter from USACE (Shona Pierce) to SHPO (Judith Bittner) re: Craig Harbor Project. 28 November.
2014c. Letter from USACE (Shona Pierce) to ACHP (Reid Nelson) re: Craig Harbor Project. 30 December.
2015. Letter from USACE (Shona Pierce) to SHPO (Judith Bittner) re: Pier at Wards Cove Cannery and Craig Harbor Project. 11 February.
2020. Letter from USACE (Joseph Sparaga) to SHPO (Judith Bittner) re: Invitation to Develop MOA for Craig Harbor Project. 15 January.
2022. e106 Submittal from USACE (Joseph Sparaga) to ACHP (Chris Daniel) re: Craig Harbor Navigation Improvements Project. 3 June.

U.S. Forest Service (USFS)
2020. Prince of Wales Island, Alaska, and Vicinity: Prehistory As Seen Through the Archaeological Record. Tongass National Forest, R10-MR-062.

U.S. Fish and Wildlife Service (USFWS)
2014. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Yellow-billed Loon as an Endangered or Threatened Species. 79 FR 59195. 01 October 2014. Pages 53195-59204.