US Army Corps of Engineers

Draft Interim Integrated Feasibility Report,
Draft Environmental Assessment
And Draft Finding of No Significant Impact

Craig Navigation Improvements

Craig, Alaska, Alaska District, Pacific Ocean Division

January 2015
Status: DRAFT

Draft Interim Integrated Feasibility Report, Draft Environmental Assessment, and Draft Finding of No Significant Impact

Navigation Improvements
Craig, Alaska

Prepared by
U.S. Army Corps of Engineers
Alaska District

January 2015

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FINDING OF NO SIGNIFICANT IMPACT

In accordance with the National Environmental Policy Act of 1969, as amended, the U.S. Army Corps of Engineers, Alaska District (Corps), has assessed the environmental effects of the following action:

Navigation Improvements
Craig, Alaska

The recommended plan is a 10.1 acre mooring basin that can accommodate 145 vessels. Features of the harbor include approximately 1,933 feet of breakwaters with fish passage considerations included.

The Corps determined that the navigation improvements project will have no adverse effect on species protected under the Endangered Species Act or the Marine Mammals Protection Act, or on essential fish habitat. The Corps also has concurrence from the State Historic Preservation Officer under the National Historic Preservation Act.

The environmental assessment supports the conclusion that the navigation improvements at Craig, Alaska do not constitute a major Federal action significantly affecting human health and the environment. An environmental impact statement (EIS) is therefore not necessary for this project.

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Christopher D. Lestochi Date
Colonel, U.S. Army Corps of Engineers
District Commander

Executive Summary

This report examines the need for navigation improvements at Craig, Alaska and determines the feasibility of Federal participation in potential improvements.

Navigation-related problems at Craig stem from excessive surplus 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 fill as much demand as possible, but overcrowding leads to increased damages to vessels and harbor facilities and vessel delays.

A number of alternatives were evaluated over the course of this study. The Recommended Plan maximizes the net National Economic Development (NED) benefits and has been selected as the NED Plan. The local sponsor supports the NED plan which has been carried forward as the Recommended Plan. The Recommended Plan provides dual rubblemound breakwaters totaling approximately 1,933 feet in length. The breakwater will provide protection for a 10.1-acre mooring basin.

Multiple considerations were made to avoid environmental impacts wherever possible. These considerations include eliminating all dredging, siting the mooring basin to minimize impacts to eelgrass (*Zostera marina*) beds, and including a fish passage opening in the western side of the breakwater.

The features of the Recommended Plan that contribute to the NED plan have a construction cost of approximately $39 million (2014 price levels). The annual investment cost of the project, including the cost of operation and maintenance is $1.57 million with annual NED benefits of $2.56 million. The project's benefit-to-cost ratio is 1.63 with net annual benefits of $989,000.

The local sponsor, City of Craig, would be required to pay the non-Federal share of the costs of construction of general navigation features (GNF) as specified by Section 101 of the Water Resources Development Act of 1986 (Public Law 99-662). The sponsor must also pay the entire cost of the non-GNF, referred to as "local service facilities" (LSF). The estimated total non-Federal share of the project is $13.9 million which includes $6.3 million for GNF and $7.6 million for LSF. The Federal share of the project is $25.1 million, which includes $18,000 for navigation aids to be provided by the U.S. Coast Guard. The fully funded cost $39 million. When project cost is escalated to the mid-point of construction in July of 2017, the total project cost is $40.9 million.

Pertinent Data

Recommended Plan

Channel and Basin		Main Breakwater	
Entrance Channel	0 acres	Design Wave	
Mooring Basin	10.1 acres	Length, Total	1,933 feet
Maneuvering Basin	0 acres	Crest Elevation	
Mooring Basin		Crest Width	
Total	10.1 acres	Primary Armor	31,100 cy
Dredging Volume	0 cy	Secondary Armor	42,650 cy
		Core Rock	205,300 cy

Project Cost

Item	Federal ($)	Non-Federal ($)	Total ($)
General Navigation Features*	$28,205,000	$ 3,158,900	$31,363,900
Associated costs – local service facilities	$ 0	$ 7,571,000	$ 7,571,000
Lands, Easements, Rights of Way, Relocation, and Disposal (GNF)	$ 0	$ 27,600	$ 27,600
Navigation aids, U.S. Coast Guard	$ 18,316	$ 0	$ 18,316
NED Project Cost	$28,223,316	$10,757,500	$38,980,816
Annual cost, benefit, and benefit cost ratio based on a 2014 price level, 3½ percent, 50-year project life			
NED Investment Cost (Interest During Construction)			$ 1,190,000
Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement			$ 60,309
Total Annual NED Cost			$ 1,572,000
Annual NED Benefits			$ 2,561,000
Net Annual NED Benefits			$ 989,000
Benefit/Cost Ratio			1.63

*Cost sharing reflects provisions of the Water Resources Development Act of 1986, non-Federal initial share 10 percent of GNF minus LERRD credit and 10 percent GNF over time.

Conversion Table for SI (Metric) Units		
Multiply	By	To Obtain
Cubic Yards (cy)	0.7646	Cubic Meters
Acre (ac)	0.4049	Hectare
Feet	0.3048	Meters
Feet Per Second	0.3048	Meters Per Second
Inches	2.5400	Centimeters
Knots (international)	0.5144	Meters Per Second
Miles (U.S. Statute)	1.6093	Kilometers
Miles (Nautical)	1.8520	Kilometers
Miles Per Hour	1.6093	Kilometers Per Hour
Pounds (mass) (lb)	0.4536	Kilograms

List of Acronyms and Abbreviations

ADCRA	Alaska Division of Community and Regional Affairs
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ANCSA	Alaska Native Claims Settlement Act
ATS	Alaska Townsite Survey
AWC	Anadromous Waters Catalog
C	Celsius
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFEC	Commercial Fisheries Entry Commission
CFR	Code of Federal Regulations
COL	Colonel
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CY	Cubic Yards
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ER	Engineer Regulations
ESA	Endangered Species Act
etc.	Et Cetera
FAA	Federal Aviation Administration
F	Fahrenheit
FC	Full Compliance
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FR/EA	Feasibility Report and Environmental Assessment
FWCA	Fish and Wildlife Coordination Act
ft	feet
GNF	General Navigation Feature
IDC	Interest During Construction
kg	Kilograms
lbs	Pounds
LERR	Lands, Easements, Real Estate, and Rights-Of-Way
LERRD	Lands, Easements, Real Estate, Rights-Of-Way, and Disposals
LPP	Locally Preferred Plan
LSF	Local Service Facilities

mg	Milligrams
MBTA	Migratory Bird Treaty Act
MHHW	Mean Higher High Water
MHW	Mean High Water
MLLW	Mean Lower Low Water
MLW	Mean Low Water
MMPA	Marine Mammal Protection Act
MSL	Mean Sea Level
MTL	Mean Tide Level
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NED	National Economic Development
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
O&M	Operation and Maintenance
OCT	Opportunity Cost of Time
OMB	Office of Management and Budget
OMRRR	Operation, Maintenance, Repair, Replacement, and Rehabilitation
PC	Partial Compliance
PED	Preconstruction Engineering and Design
R	Republican
S&A	Supervision and Administration
SHPO	State Historic Preservation Officer
TSP	Tentatively Selected Plan
U.S.	United States
UDV	Unit Day Value
USC	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USS	United States Survey

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*- Indicates required NEPA sections

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1.0 INTRODUCTION

1.1 Authority

This feasibility study was conducted under authority granted by a resolution adopted on December 2, 1970, by the Committee on Public Works of the U.S. House of Representatives. The resolution states:

> *"Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on Rivers and Harbors in Alaska, published as House Document Numbered 414, 83rd Congress, 2nd Session; and other pertinent reports, with a view to determine whether any modifications of the recommendations contained therein are advisable at the present time."*

1.2 Scope of the Study

This study examines the feasibility and environmental effects of potential navigation improvements at Craig, Alaska. The City of Craig is located on the western coast of Prince of Wales Island, approximately 55 air miles west of Ketchikan. The project area is shown below in Figure 1.

The non-Federal sponsor for the feasibility study is the City of Craig. The study area is in the Alaska Congressional District, which has the following congressional delegation:

Senator Lisa Murkowski (R);
Senator Dan Sullivan (R);
Representative Don Young (R).

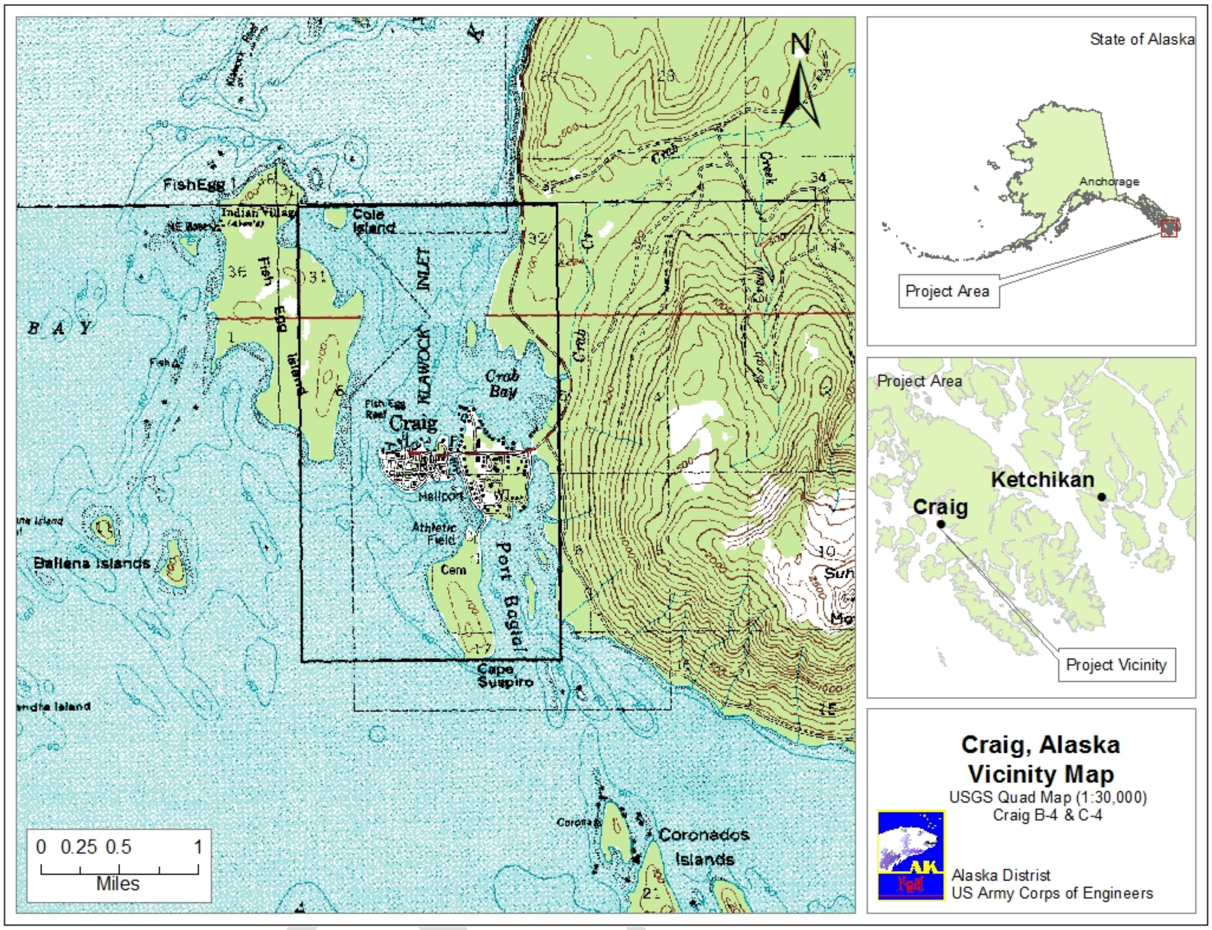

Figure 1: Study Area

Engineer Regulation 1105-2-100, "*Planning Guidance Notebook*" defines the contents of feasibility reports for navigation improvements. Engineer Regulation 200-2-2, "*Procedures for Implementing NEPA*", directs the contents of environmental assessments. This document presents the information required by both regulations as an integrated feasibility report and environmental assessment (FR/EA). It also complies with the requirements of the Council on Environmental Quality regulations for implementing the National Environmental Policy Act of 1969 (42 USC 4341 et seq.).

This draft FR/EA documents the studies and coordination conducted to determine whether the Federal Government should participate in navigation improvements at Craig, Alaska. Studies of potential navigation improvements considered a wide range of alternatives and the environmental consequences of those alternatives, but focused mainly on actions that would provide safe moorage for commercial fishing vessels. Commercial navigation is a high priority mission for the Corps and commercial vessel activity at Craig generates sufficient national economic development (NED) benefits to allow the Corps to recommend a project to Congress. The City of Craig has stated its intention to cost-share in a Federally-constructed harbor at Craig.

This partnership of Federal and non-Federal interests in navigation improvements helps ensure that those improvements will effectively serve both local and national needs.

1.3 Study Participants and Coordination

The Alaska District, U.S. Army Corps of Engineers was primarily responsible for conducting studies for navigation improvements at Craig. The studies that provide the basis for this report were conducted with the assistance of many individuals and agencies, including the City of Craig, the U.S. Fish and Wildlife Service (USFWS), the U.S. Coast Guard (USCG), the State of Alaska Department of Fish and Game (ADF&G), the State of Alaska Department of Environmental Conservation (ADEC), and many members of the interested public who contributed information and constructive criticism to improve the quality of this report.

1.4 Related Studies and Reports

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 (Jan 2003). The reconnaissance study evaluated various sites at Craig and recommended a feasibility analysis be conducted. The selected alternative was located at the Ward 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.

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.

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.

2.0 PLANNING CRITERIA/PURPOSE AND NEED FOR THE PROPOSED ACTION*

2.1 Problem Statement/Purpose and Need

The primary problem is current moorage demand at Craig, Alaska exceeds supply. The City of Craig and the surrounding area is heavily dependent upon access to protected moorage in order to safely and efficiently engage in commercial, recreational, and subsistence fishing activities.

While there are a number of existing facilities in the immediate and surrounding areas, they are inadequate to meet current and future moorage demand. This condition is contributing to inefficiencies and vessel damages. The purpose of this study is to determine the feasibility of constructing navigation improvements at Craig, Alaska to meet surplus demand and to evaluate the environmental impacts of constructing those improvements.

2.1.1 Existing Harbor Conditions

Historically, Craig's two existing harbors (see Figure 2) have been fully subscribed. Between fishing openers the existing harbors are filled to capacity with vessels mooring to every available dock and rafting to one another, sometimes as many as four deep with over a dozen other vessels anchoring offshore to avoid damage that occurs due to rafting. There are currently 78 vessels on the waiting list for permanent moorage and transient moorage is limited, when available at all. Transient vessels are forced to moor to unprotected facilities along the northern shore of Craig Island. One of these facilities is the Wards Cove Cannery dock, which is in a state of disrepair and unsuitable for regular use required of marine infrastructure. Vessels must raft to one another at these facilities, causing damage to each other and the infrastructure. Vessels that cannot moor to a dock or raft to another vessel are forced to anchor offshore in Klawock Inlet.

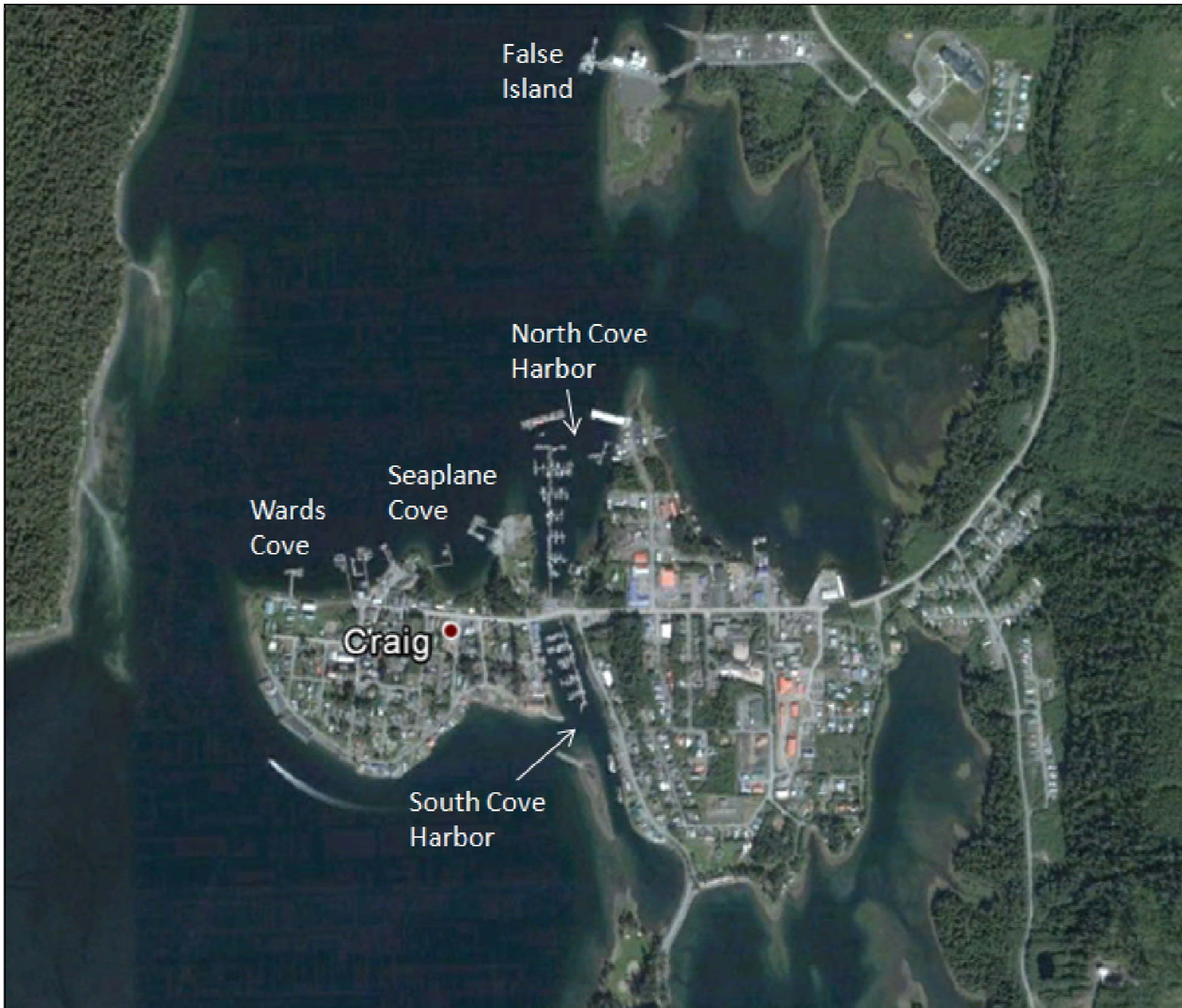

Figure 2: Existing Facilities

In 2010, a processing plant was constructed on False Island, north of downtown Craig. Construction of this facility brought the seine vessel fleet and associated vessels such as tenders to Craig for multiple fishing openings each year. This has exacerbated an already overcrowded situation and increased the need for permanent and transient moorage in the area.

Current conditions at Craig's small boat harbor facilities are marred by inefficiencies and damages due to overcrowding. Overcrowding in harbors often leads to vessel damages due to practices such as rafting (where two or more vessels are moored together), hot-berthing (where a vessel is placed in a dedicated slip when the normal vessel is away), or other operations that take place in a space-constrained harbor. The following sections discuss these damages and inefficiencies.

2.1.2 Vessel Damages

Overcrowding in the harbor often leads to vessel damages. In many cases, these damages occur due to rafting. As discussed above, rafted vessels tie together and can damage railings and fenders and break mooring lines. Other damages can occur when crewmembers from one vessel are forced to exit the raft by transporting gear through multiple other vessels. Survey results revealed an average of 5.6 vessel damages per year with an average repair cost per incident of $1,800 (2013 dollars).

2.1.3 Vessel Delays

Vessels are delayed due to rafting as vessel owners must wait for their vessel to be retrieved from a raft before they can depart. Delays also occur when entering or exiting Craig's overcrowded harbor. This can be incredibly problematic for commercial fishermen who are seeking to take advantage of a limited fishing opening. Delays in exiting the harbor lead to a decrease in available fishing time. Delays are also experienced when re-entering the harbor if a vessel is hot-berthed in a vessel's dedicated slip. Seventeen percent of survey respondents experienced at least one delay with an average length of delay of 5 hours. The longest average delay occurred when a vessel had to wait for another vessel to be moved from their dedicated stall (over 10 hours).

2.1.4 Travel Costs

Overcrowded conditions increases travel costs for vessels which would prefer to homeport at Craig but who are forced to seek moorage elsewhere due to a lack of space. A number of survey respondents indicated that they would seek permanent moorage at Craig if it were available. Thirty-six commercial fishing vessel respondents indicated that they currently homeport elsewhere but would prefer to homeport in Craig. These vessels currently homeport at facilities elsewhere in Alaska or the Pacific Northwest.

2.1.5 Damage to Existing Infrastructure

Harbor facilities can be damaged due to overuse associated with overcrowding. While some degradation in facility condition can be expected over time, overcrowding often leads to an increased rate of degradation, increasing the amount of maintenance needed to maintain a certain level of facility condition. This can occur due to many factors. Rafting can lead to damage of floats by overstressing float fingers, bullrails, cleats, and connections. Placing vessels in slips that are smaller than what is needed can cause damage to cleats and overstress connections.

2.1.6 Recreational Opportunity

Because recreational vessels are subject to the same delays and damages as commercial fishing vessels, their recreational experience is lessened. Recreation vessels suffer delays entering and exiting the harbor which diminishes the overall recreation experience.

2.2 Opportunities and Constraints

2.2.1 Opportunities

No specific planning opportunities exist for this study. However, enhanced marine infrastructure at Craig will encourage additional business opportunities for the region.

2.2.2 Constraints (Factors to avoid)

2.2.2.1 Eelgrass disturbance

Eelgrass contributes to the ecosystem as a food resource for fish, wildlife and invertebrates. It stabilizes habitat, cycles nutrients, provides spawning medium for fish and invertebrates, and acts as a protective nursery during rearing of fish and invertebrates. Any harbor development at Craig will seek to avoid eelgrass disturbance to the extent possible and to provide mitigation for disturbances that cannot be avoided.

2.2.2.2 Areas without sufficient upland support

Sufficient uplands are vital to the operation of a commercial harbor. Uplands provide parking areas for support vehicles, storage area for gear, and room to develop landside support functions. There shall be sufficient uplands at the chosen site.

2.2.2.3 Areas that are a great distance from existing utility connections

While it is reasonable to expect a certain amount of required infrastructure development around a harbor project, the chosen site shall not be a great distance from existing utility connections due to the high cost of installing new utilities.

2.2.2.4 Disturbing float plane operations

The Craig Seaplane Base is located just north of downtown Craig. It is a vital transportation asset for the community and is regulated by the Federal Aviation Administration (FAA). Sites that adversely impact seaplane operations shall be disqualified.

2.2.2.5 Projects that are not cost effective for the non-Federal sponsor

The City of Craig has limited resources with which to support construction of a harbor project. In the event that the NED plan is of such size that the sponsor cannot financially support its construction, an economically justified locally preferred plan (LPP) will be recommended consistent with policy.

2.2.2.6 Land use conflicts

Given that the City of Craig is fairly well-developed along its existing shoreline, there may be sites at which a harbor would conflict with current or planned uses such as residences, cemeteries, etc. Sites at which obvious land use conflicts will occur will not be selected.

2.2.2.7 User group conflicts (commercial fishing, charter, yachts)

Any harbor will accommodate the identified fleet without adversely burdening one user group.

2.2.2.8 Condemning land

Site selection will minimize condemnations of land due to the cost to the sponsor and the divisions it may cause within this small community. While no site will be eliminated purely based on this constraint, the number of condemnations required will be considered.

2.2.2.9 Crab Bay

Crab Bay is a very important ecological resource for many species and is highly valued as an environmental asset within the community. Impacts to this area will be avoided to the extent practicable and those impacts that cannot be avoided will be mitigated.

2.2.2.10 Shallow areas

As discussed above, the sponsor has limited financial resources to construct a harbor. This consideration extends to the operation and maintenance (O&M) of a project as well. Sites that are excessively shallow and likely to experience a great deal of sedimentation within a harbor basin will be avoided to minimize future dredging costs.

2.2.2.11 Excessively deep water

Similarly, areas with excessively deep water [in excess of -40 feet mean lower low water (MLLW)] will be avoided to minimize rock costs during construction.

2.3 Objectives

2.3.1 National Objectives

The Federal objective of water and land resources planning is to contribute to NED in a manner consistent with protecting the nation's environment. NED features increase the net value of goods and services provided to the economy of the nation as a whole. Only benefits contributing to NED may be claimed for Federal economic justification of a project. For Craig navigation improvements, NED features include breakwaters, channels, basins, float systems, and uplands.

Water resource planning must be consistent with NED objectives and must consider engineering, economic, environmental, and social factors. The following objectives are guidelines for developing alternative plans and are used to evaluate those plans.

2.3.1.1 Federal Engineering Objectives

Plans formulated for navigation improvements at Craig should be adequately sized to accommodate user needs and provide for development of harbor-related facilities. They should protect against wind-generated waves and boat wakes. The U.S. Army Corps of Engineers, Alaska District generally plans and designs boat harbors to attenuate waves to no more than 1 foot in the moorage area. Information from a number of harbors protecting a range of vessels has shown that reducing waves to this height will allow little potential for wave damage to moored vessels. Adequate depths and entry channels are required for safe navigation. The plans must be feasible from an engineering standpoint and capable of being economically constructed.

2.3.1.2 Federal Economic Objectives

Principles and guidelines of Federal water resources planning require identification of a plan that would produce the greatest contribution to NED. The NED plan is defined as the environmentally acceptable plan providing the greatest net benefits. Net benefits are determined by subtracting annual costs from annual benefits. Corps of Engineers policy requires recommendation of the NED plan unless there is adequate justification to do otherwise.

All alternatives that would meet project needs must be presented and should be described in quantitative terms if possible. Benefits attributed to a plan must be expressed in terms of a time value of money and must exceed equivalent economic costs for the project. To be economically feasible, each separate portion or purpose of the plan must provide benefits at least equal to its cost. The scope of development must be such that benefits exceed project costs to the maximum extent possible. The economic evaluation of alternative plans is on a common basis of November 2014 prices, a period of analysis of 50 years, and the Federal Fiscal Year 2015 interest rate of 3.375 percent.

2.3.2 Study Objectives

2.3.2.1 Reduce damages and delays related to rafting and overcrowding

The majority of damages currently occurring at Craig are caused by overcrowded conditions. When overcrowding occurs in a harbor, vessels are delayed entering and exiting the harbor. Berths normally assigned to permanent moorage may be filled in a practice known as "hot berthing". When the assigned vessel returns, it may find its berth filled and be forced to wait for the space to open. In addition, rafting within a harbor can cause damages to vessels and accelerated wear on harbor facilities. This study seeks to reduce damages and delays caused by these overcrowded conditions.

2.3.2.2 Provide permanent and transient moorage

Currently there is surplus demand for permanent and transient moorage at Craig. This study seeks to accommodate as much demand for permanent and transient moorage as economically feasible over the 50-year study period.

2.3.2.3 Accommodate the associated features of a harbor

A well-functioning harbor provides space for and/or accommodates features that allow users to be efficient in their vessel-related operations. These features can include parking, storage, logical float configurations, etc. This study seeks a site that has adequate space for these features.

2.3.2.4 Avoid and minimize environmental impacts

Prince of Wales Island and the surrounding areas contain an abundance of environmental resources. To the extent practicable, this study will seek to formulate alternatives that avoid environmental impacts wherever possible and to mitigate for those impacts that are unavoidable.

2.4 Criteria

2.4.1 National Evaluation Criteria

Federal Principles and Guidelines establish four criteria for evaluation of water resources projects. Those criteria and their definitions are listed below.

2.4.1.1 Acceptability

Acceptability is defined as "the viability and appropriateness of an alternative from the perspective of the Nation's general public and consistency with existing Federal laws, authorities, and public policies. It does not include local or regional preferences for particular solutions or political expediency."

2.4.1.2 Completeness

Completeness is defined as "the extent to which an alternative provides and accounts for all features, investments, and/or other actions necessary to realize the planned effects, including any necessary actions by others. It does not necessarily mean that alternative actions need to be large in scope or scale."

2.4.1.3 Effectiveness

Effectiveness is defined as "the extent to which an alternative alleviates the specified problems and achieves the specified opportunities."

2.4.1.4 Efficiency

Efficiency is defined as "the extent to which an alternative alleviates the specified problems and realizes the specified opportunities at the least cost."

2.4.2 Study Specific Evaluation Criteria

A harbor that effectively serves both Federal and non-Federal interests must be sited, planned, and operated so that it safely and efficiently meets user needs. The following goals and objectives, based on the needs described in Section 2.3, are related to providing a harbor that is safe, usable, and maintainable.

2.4.2.1 Safety

The selected site and alternative should be safe from excessive hazards from avalanche, landslide, icing, severe wind, excessive currents, incompatible industry, unacceptably high waterborne traffic, and onshore traffic that would present undue hazards during operation due to either high volumes or dangerous activities. The site and alternative should allow for harbor activities to remain clear of roadways for safety and to minimize impacts to land-based transportation. The site and alternative should not expose harbor users to undue hazards from slope gradients, overhead operations, or other hazards. The site and alternative should allow for easy monitoring by the Harbormaster for safety and efficiency.

2.4.2.2 Compatibility

The selected site and alternative should be compatible with surrounding land uses including zoning with consideration for residential areas, hospitals, certain types of public use lands, and other public and private uses that could be adversely affected by noise and activities associated with an operating harbor.

2.4.2.3 Accessibility

Federally-authorized harbors are open to all potential users on an equal basis. The chosen site and alternative should be reasonably accessible to all potential users.

2.4.2.4 Supportable

The site and alternative should have access to sufficient uplands to allow for safe and efficient operation of the harbor. Upland areas are required for harbor facilities, access, staging for operations, parking, and other onshore activities normally required for effective operation of a commercial venture or public facility.

3.0 BASELINE CONDITIONS/AFFECTED ENVIRONMENT*

3.1 Community and People

3.1.1 History

Craig and surrounding areas have been used extensively by the Tlingit and Haida people for fish camps and village sites. Historically, Craig's townsite was called Fish Egg and was primarily utilized as a seasonal fishing camp for the gathering of herring eggs. Fish Egg Island (to the west of Craig Island) was an important burial site and was also used for seasonal food-gathering activities. (See Figure 3) Around 1907 Craig Miller and local Haida 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 City of Craig was incorporated in 1922 (ADCRA 2014, City of Craig 2006a). Excellent pink salmon runs and migration to Alaska as a result of the Depression contributed to growth in the late 1930's. Today, Craig's economy is dominated by fishing and fishing support activities.

3.1.2 Government and Tax Structure

The City of Craig is a first class city in the Prince of Wales-Hyder Census Area. The City operates under a mayor/council form of government with a mayor who is elected to a term of 2 years and 6 council members, all of whom are elected to 3-year terms. The City Administrator oversees day-to-day city operations. The City levies a 6.00 mill property tax, 5 percent sales tax, and 6 percent alcohol tax for total 2013 tax revenues of $2.34 million.

3.1.3 Demographics

The 2013 population of Craig was estimated to be 1,195, making it the largest community on Prince of Wales Island (AKDOL). Since 2000, the population has fluctuated between 1,100 and 1,400 people. The population is approximately 65 percent White, 20 percent American Indian and Alaska Native, and 13 percent of the population is two or more races in combination. Other small groups (less than 1 percent) include African Americans, Asians, and Pacific Islanders. The population is 55 percent male and 45 percent female. The median age of the population is 36.4 years.

The principle Alaska Native cultures in the area are Tlingit and Haida. Sealaska is the Alaska Native Claims Settlement Act (ANCSA) regional corporation for the Craig area and the majority of Southeast Alaska. The local tribal entity is Craig Tribal Association and the local ANCSA village corporation is Shaan-Seet, Inc. (ADCRA 2014).

3.1.4 Land Use

The land surrounding the project site is occupied by the now defunct Wards Cove Cannery immediately to the west of downtown Craig. The City owns the Wards Cove property which includes 5 acres of uplands and 5 acres of submerged and intertidal lands. Some of the cannery facilities were constructed in the early 1920s. At one time, the facilities included a fish processing plant, worker housing, bulk fuel storage, vessel storage, and vessel maintenance facilities. Some of the cannery buildings, (such as the web loft and administration building), are still in use today. The City has plans to renovate some of the buildings and redevelop the cannery site for commercial and public use (City of Craig 2006b).

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. Both of these structures are supported by wooden piles. According to the 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 atop the piles. A wooden beam boatway and haulout structure still exists in the intertidal zone to the east of the existing pier (City of Craig 2006b).

3.1.5 Socio-Economic Conditions

3.1.5.1 Employment and Income

Mean per capita income in Craig is approximately $28,100 with a median household income of $58,000 and a median family income of $73,100. Approximately 17 percent of local residents have incomes lower than the Federal poverty threshold (ADCRA 2014).

According to the AKDOL, 64 percent of resident workers were employed during 2012, (the last year for which statistics are available). The majority of local workers are employed in local government or trade, transportation, and utilities. A great number of workers are employed through commercial fishing and businesses that support that industry as 151 residents hold 121 commercial fishing permits (ADFGb). In 2013, local residents fished 193 permits, landing 11.4 million pounds of fish with estimated gross earnings of $10.4 million. Approximately 72 percent of the harvest was salmon with crab, halibut, herring, groundfish, shellfish, and sablefish making up the remainder of the harvest.

3.1.5.2 Fisheries

Fishing is a vital part of the local economy. Data on fisheries is drawn from many different sources. Some sources report results from only the Craig area whereas some aggregate results to Prince of Wales Island. Where data is available for Craig, it is presented. Where it is only available at the Prince of Wales Island level, it is noted.

3.1.5.2.1 Commercial Fisheries

Craig residents account for approximately 42 percent of the total Prince of Wales Island fishing harvest as well as 52 percent of fishing earnings. Total harvest (lbs) and earning have steadily increased since 2000 with a high of both harvest and earnings occurring in 2013. See Table 1.

Table 1: Historical Fisheries Harvests and Earnings (Craig Residents Only)

Year	Number of Active Fishermen	Total Harvest (lbs)	Est. Gross Earnings	Earnings per Fisherman	Earnings per Fisherman (2013$)
2000	124	3,344,382	$ 3,396,094	$27,388	$38,546
2001	116	4,795,555	$ 3,374,881	$29,094	$39,813
2002	115	3,918,228	$ 2,951,369	$25,664	$34,454
2003	113	4,212,357	$ 3,627,786	$32,104	$41,959
2004	122	6,513,013	$ 5,373,341	$44,044	$56,113
2005	115	4,095,305	$ 4,958,380	$43,116	$53,301
2006	116	3,297,933	$ 5,711,628	$49,238	$58,981
2007	106	4,436,204	$ 6,110,615	$57,647	$67,553
2008	119	4,771,762	$ 7,824,845	$65,755	$73,696
2009	121	5,388,789	$ 5,773,321	$47,713	$52,849
2010	115	5,573,720	$ 7,409,382	$64,429	$70,120
2011	108	7,175,298	$ 8,930,243	$82,687	$87,184
2012	120	6,103,817	$ 8,871,945	$73,933	$76,254
2013	121	11,412,585	$10,443,123	$86,307	$86,307

Note: 2009 and 2010 salmon harvests are understated due to confidentiality of data

There are seven separate fisheries active on Prince of Wales Island. As shown in Table 2, the vast majority of harvest and earnings come from salmon fisheries (all species).

Table 2: Harvest and Earnings by Fishery for Prince of Wales Island

Fishery	Percentage of Harvest (lbs)	Percentage of Earnings
Salmon	90.5	74.6
Herring	6.4	10.2
Other Shellfish	1.4	8.9
Halibut	0.6	3.2
Other Groundfish	0.3	0.6
Crab	0.1	0.5
Sablefish	0.0	0.0

The outlook for commercial fishing in the area is positive. Salmon stocks are generally healthy with some stocks increasing. Herring, sablefish, groundfish, and shellfish fisheries experience low participation with room for growth. The recent establishment of the Silver Bay Seafoods processor is expected to attract more commercial fishers to the region as it provides an efficient and convenient location to offload catch.

3.1.5.2.2 Sport Fisheries

The majority of sport fishing takes place in marine waters from late May through early September but there are significant freshwater fisheries as well. The most targeted species are halibut, Chinook Salmon, and Coho Salmon with a small Steelhead Trout run in the spring.

3.1.5.2.3 Subsistence Fisheries

Various fish species make up the majority of the local subsistence harvest followed by land mammals and marine invertebrates. Species targeted for subsistence consumption are similar to those of commercial, charter, and sport fisheries.

3.1.5.3 Cultural and Subsistence Activities

Hunting, fishing, and gathering of traditional foods are a priority for many Alaska Native residents of the Craig area as a way of maintaining their cultural heritage as well as a matter of economic necessity. A 1982 study found that all households in Craig, regardless of ethnicity, utilize subsistence resources for some portion of their diet. Fishing has traditionally been the most important subsistence activity and includes the harvesting of salmon and salmon eggs. This continues to be an essential activity for Craig residents beginning with the mid-June sockeye (*Oncorhynchus nerka*) run and extending into the early fall with pink (*Oncorhynchus gorbuscha*), chum (*Oncorhynchus keta*), and coho (*Oncorhynchus kisutch*) runs. Salmon and trout are harvested under subsistence permits with the exception of king salmon (*Oncohynchus tshawytscha*), coho salmon, rainbow/steelhead trout (*Oncorhynchus mykiss*). Salmon are often harvested by traditional methods such as spears, gaff hooks, fish traps, beach seines, and gill nets. Herring (*Clupea pallasii*) roe is a highly valued traditional food in Southeast Alaska and is collected from seaweed or hemlock boughs placed in the ocean where herring will spawn on them (City of Craig, 2006a).

The intertidal zone is also an important focus for the subsistence gathering of species such as clams, cockles, rock scallops (*Crassadoma gigantea*), sea urchins, and Dungeness crabs (*Metacarcinus magister*) (City of Craig 2006a).

3.1.5.4 Existing Infrastructure and Facilities

The City of Craig provides water and sewer services while electricity and telephone services are provided by Alaska Power and Telephone Company. The City has a number of businesses in town that provide goods and services. Commercial air services are provided via a seaplane base in Craig and a land-based airport in Klawock (10 road miles to the north).

Existing marine facilities include: South Cove Harbor, North Cove Harbor, the Craig Seaplane Base, and the J.T. Brown Marine Industrial Center which provides a dock, boat launch, and boat haulout services. Ferry service to Ketchikan is available from Hollis (30 road miles to the east). South Cove Harbor is a Corps-constructed harbor that was constructed in 1957 and has undergone multiple changes since then including expansion and addition of a breakwater.

In addition to North Cove and South Cove harbors, there is a small amount of other moorage available in Craig at various docks and a boat launch ramp at North Cove. Table 3 summarizes the amount of existing protected moorage at Craig.

Table 3: Existing Craig moorage capacity

Facility	Number of slips	Feet of transient moorage
North Cove Harbor	102	700
South Cove Harbor	120	125
City Dock		350
False Island Dock		223
Total	**222**	**1,398**

Source: City of Craig, Comprehensive Plan, 2000.

Current facilities are overcrowded and the harbormaster maintains a waitlist. The City of Craig's Comprehensive Plan from 2000 stated that Craig is the busiest port on Prince of Wales Island. This is likely still true as Craig has the largest population of all communities on Prince of Wales Island and has the largest harbor facilities.

Many of the wait-listed vessels are accommodated by rafting at the various docks along the north side of Craig Island with some rafting also occurring at the South Cove Harbor. Rafting increases the vessels' vulnerability to damage during storm events due to the vessels rubbing against one another, damaging fenders and the vessels themselves. Harbor infrastructure is also damaged due to overuse. In addition, rafting leads to overcrowded conditions, causing inefficiencies as vessels are not able to depart during critical fishing openings.

3.1.5.5 Fleet Characteristics

According the CFEC, there were 245 commercial fishing vessels permits for Prince of Wales Island residents in 2013 with 148 permitted to residents of Craig. Individual vessels can hold more than one permit. The vessels averaged 35 years in age and were closely split between aluminum hulls (40 percent) and fiberglass hulls (30 percent). The average vessel length was 33 feet but varied by hull material, as shown in Table 4.

Table 4: Vessel Length by Hull Material

Material	Average Length (feet)	Number of Vessels	Percentage of Total
Aluminum	21.9	44	29.7
Concrete	45.3	3	2.0
Fiberglass/Plastic	34.6	60	40.5
Iron/Steel/Ally	50.3	6	4.1
Rubber	11.0	1	0
Wood	41.1	34	23.0

The majority of the 148 vessels operated as fishing vessels with nine vessels acting as either tenders/packers or freezers/canners. Approximately two-thirds of the vessels have diesel engines with the rest operating on gasoline.

Gear types were varied with vessels often employing multiple gear types in order to participate in multiple seasons. This practice is common throughout Alaska. The gear types are shown in Table 5.

Table 5: Vessel Gear Types

Gear Type	Number of Vessels	Percentage of Total
Diving Gear	34	23
Gill Net - Drift	11	7.4
Gill Net - Herring	4	2.7
Longline	55	37.2
Mechanical Jig	8	5.4
Pot Gear	31	20.9
Ring Net	1	0.7
Seine - Purse Seine	15	10.1
Seine - Beach Seine	1	0.7
Trawl - Beam	2	1.4
Troll - Dinglebar	8	5.4
Troll - Hand	34	23.0
Troll - Power	62	41.9
Other Gear Types	25	16.9

In addition to commercial fishing vessels, other types of vessels are present at Craig. Charter vessels provide sport fishing and sightseeing opportunities. The majority of these vessels are 28 to 45 feet in length. Subsistence vessels assist residents in performance of subsistence hunting, fishing, and gathering activities. The majority of these vessels are less than 27 feet in length. Recreation vessels such as pleasure craft and yachts are also present. These vessels vary greatly in length from less than 20 feet to greater than 60 feet.

3.1.5.6 Moorage Demand

An Office of Management and Budget (OMB)-approved mail-out survey, personal interviews, and other research was conducted in order to ascertain the level of demand for moorage at Craig. The survey was the primary data-gathering tool with other methods supplementing survey results. The resulting information was used to inform the benefits model used to determine whether the project is justified from an economic perspective. The survey was mailed to 1,527 boat owners and permit holders in the region. There were 338 responses and 117 surveys returned as undeliverable for an overall response rate of 24 percent.

There are currently 222 slips available between South Cove Harbor and North Cove Harbor with more than 85 percent of the slips being filled on a permanent basis as of July 2013. Of the vessels with permanent moorage at Craig, 30 percent of them are currently in slips too small for their vessel length with the majority of these vessels currently occupying slips in the 37 to 45 foot and 46 to 60 foot range.

Craig maintains a list of vessels waiting for permanent moorage. Currently, there are 78 vessels on the waitlist. Wait times for moorage range from 1.10 years to 14.21 years, with the longest average wait times occurring for 21 to 27-foot slips (6.20 years). In addition to established demand for permanent moorage, there are many transient vessels utilizing facilities at Craig. In 2012, there were 467 transient vessels at Craig. The majority of these vessels (74 percent) were commercial in nature including fishing, tenders, tugs, and barges. The remaining vessels were either pleasure vessels (yachts) or sport fishing vessels. Survey results show that there currently exists surplus demand for moorage at Craig. This includes up to 94 vessels seeking permanent moorage and up to 385 vessels seeking transient moorage.[1] When added to those vessels currently utilizing Craig harbor facilities, total demand for moorage can be calculated (Table 6).

[1] See economic appendix for detailed discussion of all economic analyses

Table 6: Total Demand for Moorage at Craig

Description	0-20’	21-27’	28-36’	37-45’	46-60’	>60’	Total
Commercial Fishing Vessels							
Permanent	2	14	23	60	45	0	144
Transient	0	0	32	64	152	12	261
Boat Launch	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total Commercial Fishing	2	14	55	125	197	12	**405**
Charter Vessels							
Permanent	0	3	9	5	0	0	17
Transient	0	0	2	0	6	3	11
Boat Launch	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total Charter Vessels	0	3	11	5	6	3	**29**
Subsistence Vessels							
Permanent	4	6	2	0	0	0	12
Transient	0	2	0	0	0	0	2
Boat Launch	4	0	0	0	0	0	4
Other	0	0	0	0	0	0	0
Total Subsistence Vessels	8	8	2	0	0	0	**18**
Other Vessels (Recreation & Yachts)							
Permanent	13	38	20	6	4	3	85
Transient	22	16	27	37	49	19	169
Boat Launch	17	6	0	0	0	0	24
Other	0	0	0	0	0	0	0
Total Other Vessels	52	60	47	44	53	22	**278**
Total Vessels	**62**	**86**	**115**	**173**	**256**	**37**	**730**

3.2 Physical Environment

The City of Craig is located on Craig Island, which is connected to Prince of Wales Island via a small isthmus. Craig is 725 miles southeast of Anchorage at approximately 55°28.6’ north and 133°8.9’ west. Klawock Inlet is located to the north of Craig Island and Bucareli Bay is located to the south. Multiple islands lie between Craig and the Gulf of Alaska, approximately 25 miles to the west. The City of Craig occupies a portion of the western shore of Prince of Wales Island, and the entirety of both Craig and Cemetery Islands.

3.2.1 Climate

Prince of Wales Island generally experiences a marine climate with cool summers, mild winters, and substantial year-round precipitation. Summer temperatures range from +49°F to +63°F.

Winter temperatures range from +32°F to +42°F. Average annual precipitation is 120 inches, including 40 inches of snow. Moisture from the Pacific Ocean is released as precipitation as it meets colder continental air and higher terrain. Gale winds are common in fall and winter. Long term climate data is not available for Craig. The nearest long-term climate station is at Ketchikan, 60 miles to the east-southeast. This station shows an historical mean annual temperature of 45.7 °F and a mean annual precipitation of 156.06 inches (City of Craig 2006a, ADCRA 2014).

3.2.2 Geology/Topography

Soil borings drilled on Craig Island reveal native soil profiles of glacial till to depths of 7 feet below the surface, often overlain by beach sand and gravel. A layer of clay was encountered below 7 feet in some borings (City of Craig 2006a). Bedrock is highly metamorphosed volcanic and sedimentary rock with some igneous intrusions. Limestones and calcareous sandstones are found in the area. Quartz veins and pyritization are reportedly common in rocks around the intrusions. The topography of Craig Island is low relief and generally less than 70 feet above sea level. The surrounding area on Prince of Wales Island is mountainous with 2,000-foot Sunnahae Mountain overlooking Craig less than 2 miles to the east (City of Craig 2006a).

3.2.3 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.

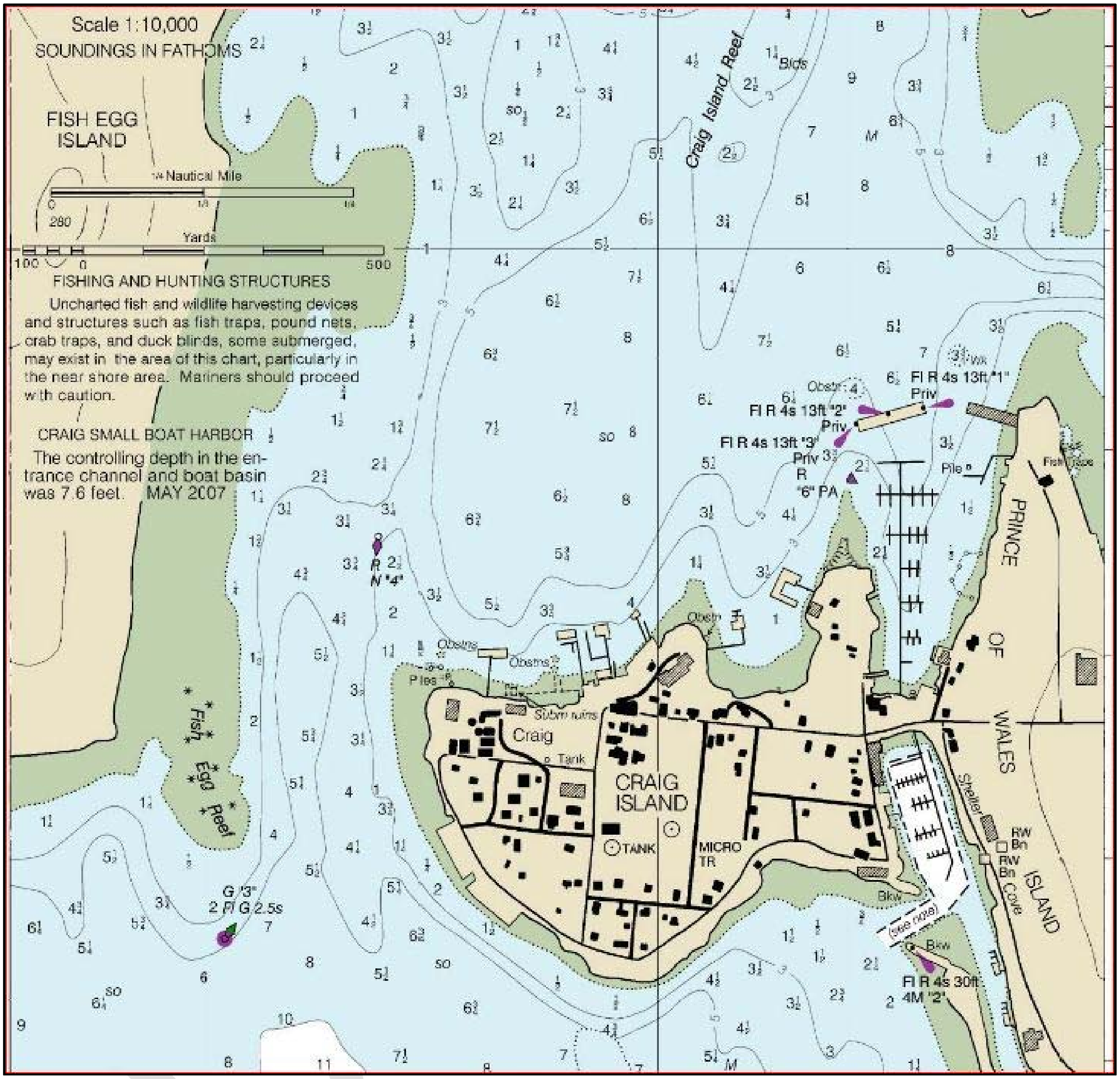

Figure 3: Inset of Craig Island & southern Klawock Inlet (from NOAA Chart 17405)

3.2.4 Ice Conditions

Craig is generally ice-free year round with some minor icing occurring during atypically cold stretches.

3.2.5 Soils/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.

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.

3.2.6 Water Quality

While there is no specific data on marine water quality at the project site, there are multiple indicators of good water quality including high water clarity (prior to spring phytoplankton blooms) and the presence of eelgrass beds.

Fuel-contaminated groundwater was discovered at the Wards Cove Cannery site in 1987. These are legacy contaminants as a result of previous cannery operations and on-site fuel storage. Wards Cove Packing and Chevron conducted multiple site investigations and cleanup efforts. Subsequent to these efforts, further investigations found that petroleum-impacted soil and groundwater persisted at the site. The contaminants present at the site included benzene, lead, gasoline, and diesel and were found in both soil and groundwater. Due to the fact that the groundwater at or near the cannery is not presently or expected to become a source of drinking water, the Alaska Department of Environmental Conservation (ADEC) approved elevated cleanup levels for groundwater at the site equal to 10 times the default regulatory levels. Site remediation continued until 2005 at which time the ADEC issued a letter stating that no future remedial action would be required (City of Craig 2006b). The Corps believes that it is likely that groundwater contamination persists in the uplands of the harbor project site but primary and secondary sources of contamination have largely been removed under the guidance of ADEC.

The City of Craig draws its drinking water from North Fork Lake, approximately 10.5 miles from town. A primary wastewater treatment plant is located on the north shore of Cemetery Island. Effluent from the treatment plant is discharged into Bucareli Bay via a 12-inch diameter outfall line to a depth of 85 feet below MLLW. The plant treats between 155,000 and 196,000 gallons of wastewater per day. Sludge is dewatered and placed in a landfill at the Klawock Transfer Facility (City of Craig 2006a).

3.2.7 Air Quality

The area has good air quality because of the community's isolation, the small number of pollutant emission sources, and persistent air movement from the nearby ocean. The primary source of air pollutants are the community's electric plant, lumber processing plants, quarries, individual fuel oil or wood stoves, automobiles, and marine vessels. Individual wood burning stoves can create a notable haze over residential areas during cold weather. Under certain weather conditions, wildfires in western Canada can affect air quality and visibility in parts of Southeast Alaska. The State of Alaska issued an air quality advisory in July 2004 due to extensive wildfires in western Canada (USDA 2008). There is no established ambient air quality monitoring program at Craig and there is little existing data to compare with the National Ambient Air Quality Standards (NAAQS) established under the Clean Air Act (CAA). These air quality standards include concentration limits on "criteria pollutants" such as carbon monoxide, ozone, sulfur dioxide, nitrogen oxides, lead, and particulate matter. Craig is not in a CAA "non-attainment area" and the "conformity determination" requirements of the CAA would not apply to the proposed project at this time.

3.2.8 Noise

Specific noise data does not exist for this area but is likely comparable with other small coastal Alaskan communities. The project site is on the waterfront of a town of approximately 1,200 people. Ship and boat traffic, vehicles, construction equipment, and generators are the most likely sources of human-generated noise. Seaplanes land regularly in Klawock Inlet immediately north of the project site, and conventional aircraft often overfly the area on approach to the Klawock airport. Underwater noise comes primarily from the numerous commercial and recreational vessels transiting or mooring within Klawock Inlet.

3.2.9 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).

The nearest monitoring station is located north of Fish Egg Island, just outside of Klawock Inlet. Data collected from that station showed a highest predicted flood current of 1.5 knots and a highest predicted ebb current of 1.9 knots. Average current velocities are shown in Table 7.

Table 7: Average Current Velocities

Item	Reading					
Approximate Depth (feet)	5.4	15.3	25.1	34.9	44.8	54.6
Average Velocity (knots)	0.44	0.40	0.38	0.35	0.33	0.30

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 8 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 8: Tidal Parameters

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*

3.3 Biological Resources

3.3.1 Terrestrial Habitat

The project site is adjacent to the developed commercial district of Craig, which is densely occupied by structures and paved or unpaved roadways. Little usable terrestrial habitat exists in the project area or on the rest of Craig Island except for bird and small mammal species that are able to adapt to urban and suburban settings. Adjacent areas of Prince of Wales Island are far less heavily developed, except for several discrete industrial, school, and residential sites along the Craig-Klawock Highway which primarily runs along the coast. Fish Egg Island is currently uninhabited, undeveloped, and used primarily for subsistence activities.

The broader terrestrial landscape of Prince of Wales Island and the surrounding small islands is that of coastal temperate rainforest and Tongass National Forest. Most of the forest is composed of conifers, primarily Western Hemlock (*Tsuga heterophylla*) and Sitka Spruce (*Picea sitchensis*) with smaller populations of Mountain Hemlock (*Tsuga mertensiana*), Western Red Cedar (*Thuja plicata*), and Alaskan Yellow Cedar (*Cupressus nootkatensis*). Red Alder (*Alnus rubra*) and some willow species are common along streams, beach margins, and on land recently disturbed by forestry activities and landslides. Grass sedge meadows are found at low elevations, especially along the coast. Muskeg wetland communities dominated by sedges and mosses occur throughout the forest (USDA 2008).

Freshwater streams and lakes on Prince of Wales Island host sockeye, pink, chum, and coho salmon as well as steelhead and cutthroat trout (*Oncorhynchus clarki*) and Dolly Varden (*Salvelinus malma*). However, there is no freshwater aquatic habitat at the project site or on Craig Island. The nearest substantial freshwater body is Crab Creek, which discharges into Crab Bay 1 mile to the east-northeast of the project site (City of Craig 2006a). Crab Creek is an anadromous stream and is discussed in greater detail in various sections below.

3.3.2 Marine Habitat

Marine substrates and habitats in the waters off Craig Island typically range from coarse gravel and cobbles to sand and mud. The southwest shoreline is exposed to swells sweeping up Bucareli Bay from the open ocean, and consists of gravel and cobbles. More protected waters, such as the project site has finer sand and mud substrates in the nearshore area with more gravelly and cobble substrates further offshore.

3.3.2.1 Intertidal Zone

Corps personnel from the Alaska District Environmental Resources Section conducted a site examination of the intertidal environment on April 17, 2014. The examination consisted of a single transect beginning at the apparent upper limit of the intertidal zone and extending 240 feet to the waterline at the northwestern point of Craig Island.

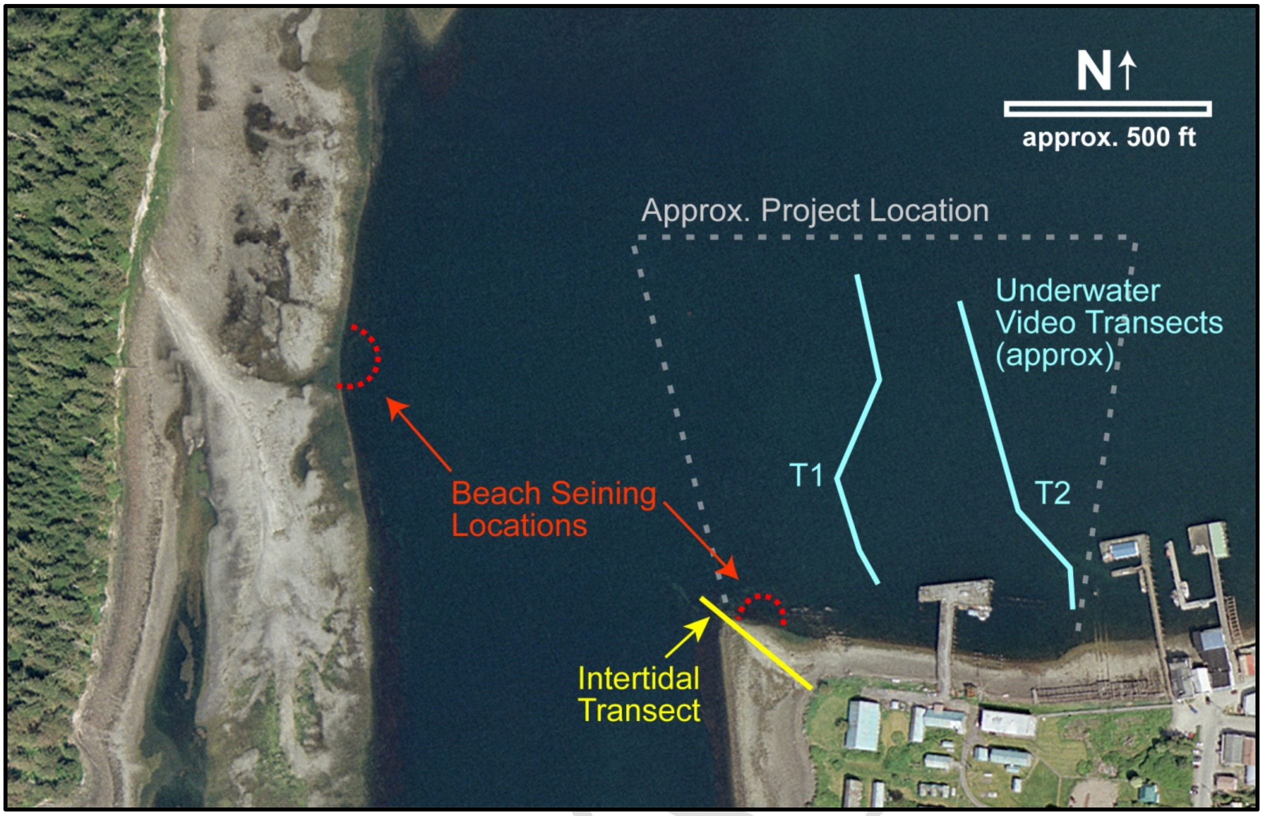

Figure 4. Field Examination Locations (examination occurred 16-17 April 2014)

This point is the site of the project's proposed western breakwater tie-in to shore under all alternatives and is therefore the intertidal area most directly affected under the with-project condition. The examination occurred from 8:30 am to 8:50 am with a -0.91 foot MLLW low tide occurring at 8:50 am. Table 9 shows results of the examination.

Table 9: Results of Intertidal Transect

Interval Distance from Transect Starting Point	Composition of substrate	Coverage of Visible Organisms
0-19 feet	*Start of transect: 55.4772° north, 133.1554° west.* 80% small cobble; 20% gravel.	Jetsam of dried *Fucus*; no live organisms visible
19-43 feet	80% cobble; 5% gravel; 15% coarse sand.	5% small barnacles; 5% *Fucus*
43-65 feet	20% cobble; 60% gravel; 20% coarse sand/shell.	50% *Fucus*; 5% small barnacles
65-110 feet	10% large cobble; 20% small cobble; 60% coarse gravel; 10% sand and shell fragments.	10% *Fucus*,5% mussels; limpets present (*Fucus* and mussel growth much heavier in areas adjacent to transect at same elevation).
110-165 feet	15% large cobble; 40% small cobble; 40% coarse gravel; 5% coarse sand.	80% *Fucus*: 65% small mussels
165-209 feet	30% large cobble; 40% small cobble; 20% coarse gravel; 10% coarse sand.	30% *Fucus*; 15% *Ulva*; < 5% *Acrosiphonia*; <5% *Blidingia*. Green algae start at 175 feet.
209-240 feet	20% large cobbles; 40% small cobbles; 20% coarse sand; 20% sand. *End of transect: 55.4776°N, 133.1564°W.*	25% *Fucus*; 30% *Ulva*; 5% *Acrosiphonia*; <5% *Microcladia*; <5% *Analipus*; <5% *Neorhodomela*

Fucus = *Fucus distichus* subsp. *evanescens*, a.k.a. rockweed (a brown alga)
Ulva = *Ulva intestinalis*, a.k.a sea hair (a tubular green alga)
Acrosiphonia = *Acrosiphnia arcta*, a.k.a. arctic sea moss (a filamentous green alga)
Blidingia = *Blidingia minima*, a.k.a. dwarf sea hair (a tubular green alga)
Microcladia = *Microcladia borealis*, a.k.a. coarse sea lace (a red alga)
Analipus = *Analipus japonicas*, a.k.a bottlebrush seaweed (a brown alga)
Neorhodomela = *Neorhodomela oregana*, a.k.a. Oregon pine (a red alga)
(Lindeberg & Lindstrom 2010).

The dominant marine organisms through much of the intertidal zone were rockweed (*Fucus distichus* susp. *Evanescens*), blue mussels (presumably *Mytilus edulis* or *M. trossulus*), and several species of barnacle. Because of the existence of cobbles and coarse gravel at the site no attempt was made to systematically examine the substrate for interstitial organisms. At lower elevations, there was a marked increase in diversity of marine algae. The exposed area at the northwestern point appeared to be a transition zone between high and low energy vegetation regimes with a small pocket of mixed eelgrass and kelp appearing just to the south of the transect.

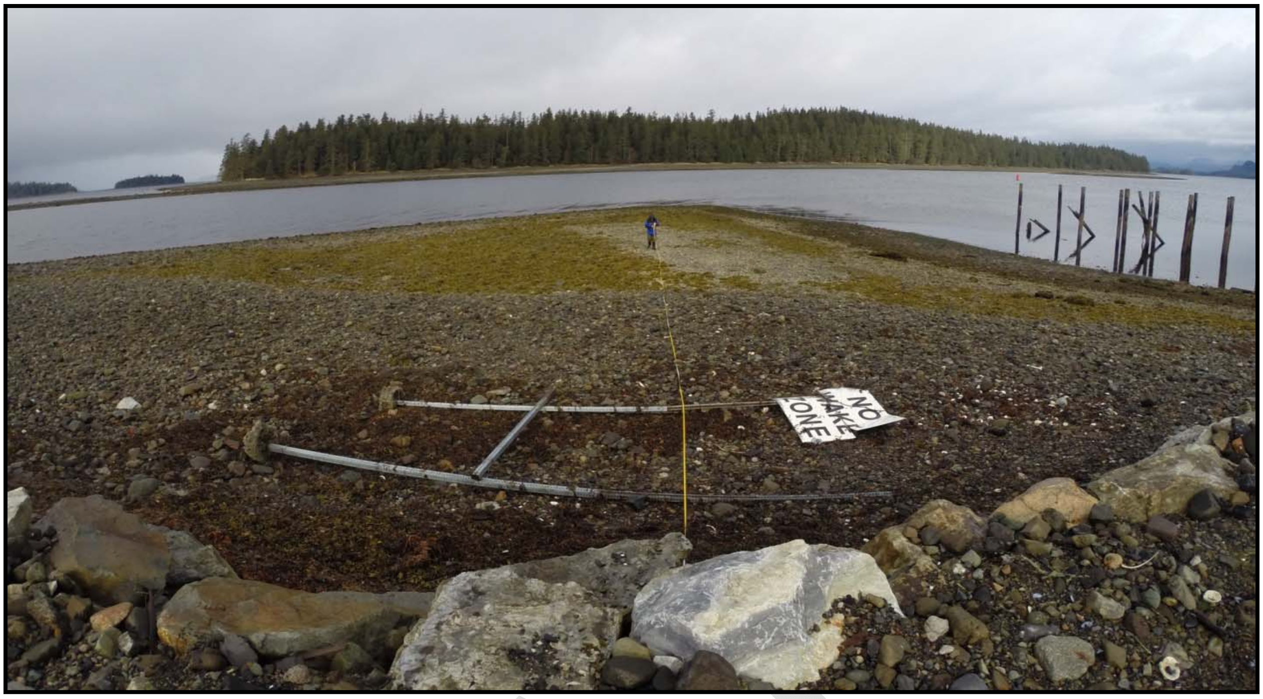

Figure 5: Intertidal transect, 17 April 2014 (looking to the northwest)

Figure 6: Mix of eelgrass, kelp, and other marine algae at the seaward end of the intertidal transect (roughly -0.9 feet MLLW)

The intertidal zone within the project area but east of the point was also examined but no transect was laid out. The upper beach along this stretch is much steeper and narrower, and littered with boulders and debris from the former cannery.

The distribution of *Fucus* and invertebrates was comparable with that seen along the transect but with less diversity of marine algae. The lower intertidal/upper subtidal zone parallel to the shoreline north of the cannery is dominated by a bed of eelgrass, which extends into the intertidal zone with a small portion exposed during some low tides, an occurrence that was observed during the examination. Numerous clam shells are found on the surface in the same sandy area as the eelgrass.

Figure 7: Course Intertidal sediment between the former cannery dock and boatway

3.3.2.2 Subtidal Zone

The marine substrates and habitats in the waters off Craig Island vary from rock to coarse gravel and cobbles, sand, and mud depending on the degree of protection from ocean waves. The southwest shoreline is exposed to swells from open water and consists of gravel and cobbles. The more protected waters of the project site have finer sand and mud substrates.

Corps personnel recorded video of the subtidal sea floor on April 17, 2014 using a towed underwater camera and a skiff borrowed from the City of Craig's Harbormaster's Office. Unfavorable weather conditions resulted in discontinuous video coverage and imprecise positioning of two attempted transects but a general picture of the seafloor in the proposed project area was obtained from near-shore to 750 feet from shore (240 meters as measured with a range-finder to the northern walls of the cannery).

Both transects were started as close to shore as pilings and debris would allow and moved offshore in a direction and speed largely determined by wind gusts. The more continuous of the two transects (T2) started 55 meters (180 feet) from the cannery buildings east of the old cannery dock in waters less than 10 feet (3 meters) deep. This location was within the expected eelgrass bed. However, the eelgrass bed transitioned abruptly to a dense bed of brown algae within 30 feet (10 meters) as the skiff drifted away from shore. The brown algae were broad-bladed kelp (thought to be *Saccharina latissima*, commonly known as sugar kelp). The kelp formed an uninterrupted carpet on the seafloor for a few hundred feet. At 157 meters (500 feet) from shore, the brown algae became discontinuous and bottom sediment of shell-rich sand became visible. As the transect moved further offshore, the algae gradually became more sparse, although algae were still visible when the transect ended 235 meters (750 feet) from shore in waters approximately 45 feet (14 meters) deep.

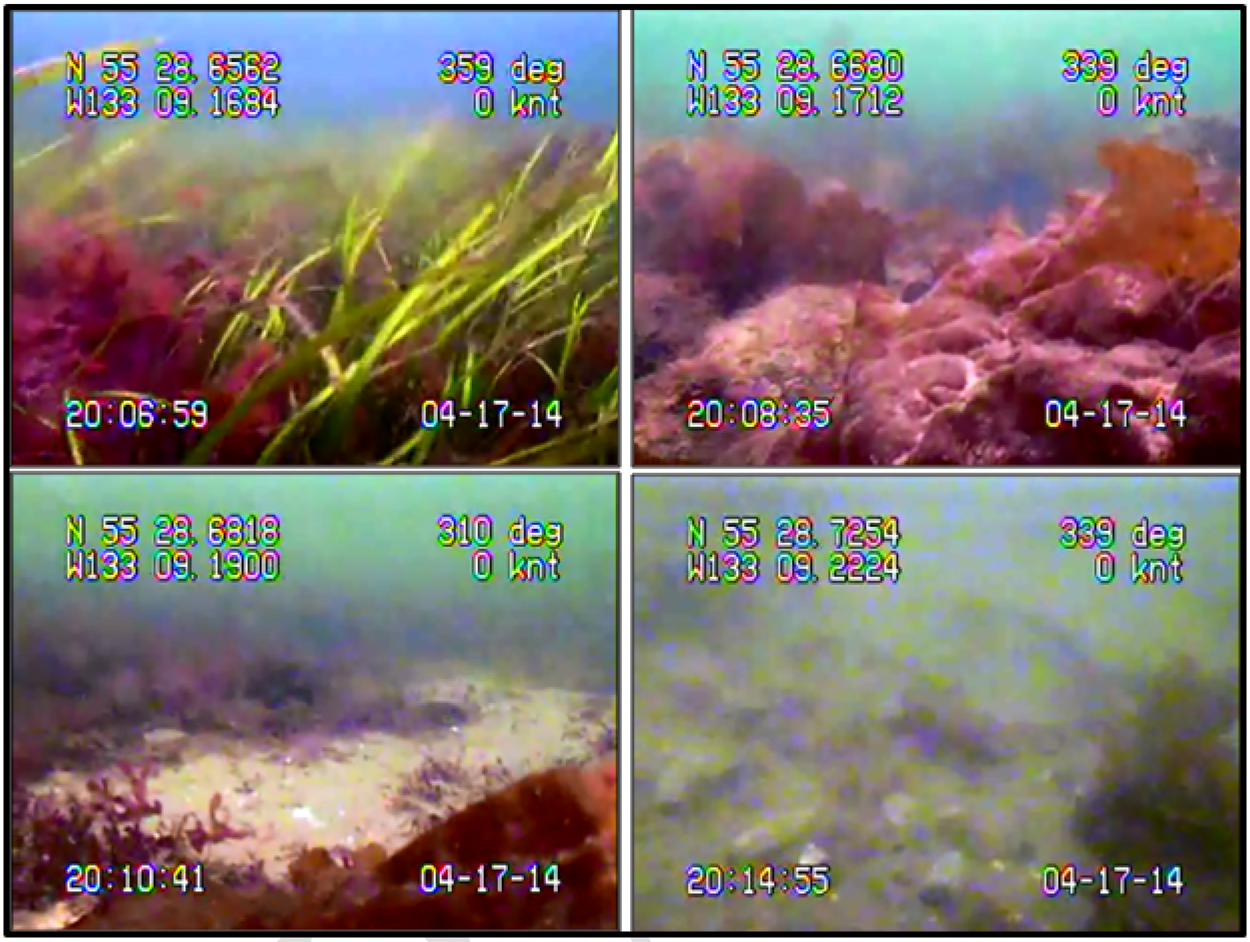

Figure 8: Screenshots from underwater video along transect T2 showing eelgrass (upper left), continuous brown algae (upper right), exposed patches of sediment with discontinuous brown and red algae (lower left), and mostly bare sediment with isolate clumps of algae (lower right).

Eelgrass is found throughout the waters offshore of Craig wherever a suitable substrate (generally fine material such as silt or sand) and adequate sunlight allow it to grow. Eelgrass beds are ecologically significant as they provide valuable rearing habitat for fish, act as a food source for marine invertebrates, fish, and waterfowl, and allow for sediment consolidation.

An estimated 80 to 90 percent of the developable coastline in the Craig area contains eelgrass (City of Craig 2006a). The City of Craig conducted an eelgrass survey in 1998 and mapped 214.8 acres of eelgrass beds within the Craig area. Figure 9 shows eelgrass beds identified by the 1998 survey as well as the approximate project location. The narrow band of eelgrass within the project area was confirmed to still be present during the Corps' site examination on April 17, 2014.

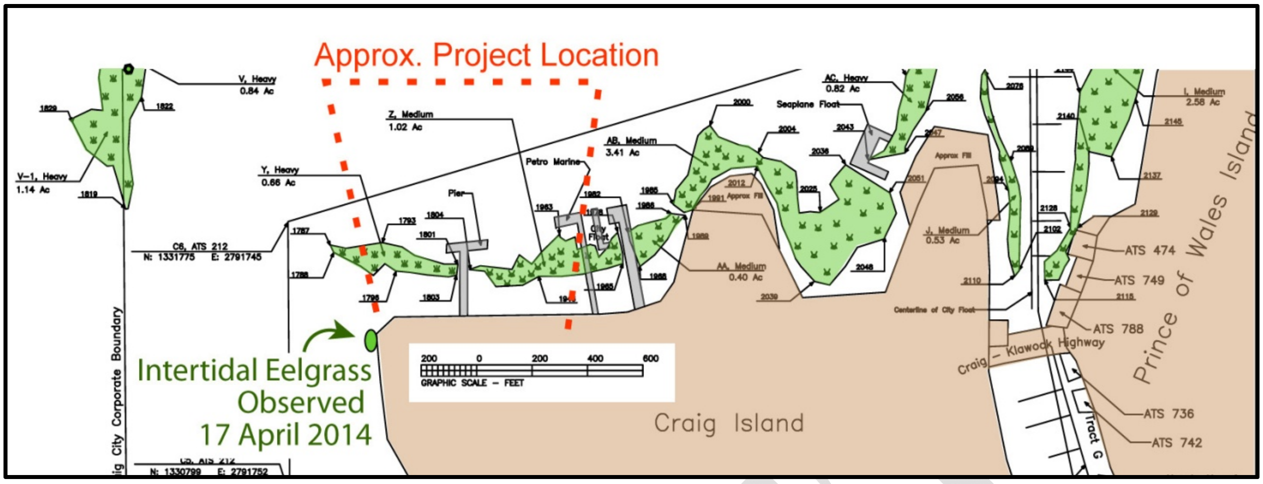

Figure 9: Surveyed Eelgrass beds along the north shore of Craig Island, 1998 (adapted from City of Craig 2006a)

The April 2014 underwater video survey was not able to confirm the western extent of eelgrass present within the project area. However, observations of site conditions suggest that the western extent of the eelgrass bed is similar to what was found by the 1998 survey. A reef extends from the northwestern point toward the channel between Craig and Fish Egg Islands. The reef is vegetated with large kelp, (likely *Macrocystis pyrifera*). The heavy growth of kelp indicates very coarse sediment exists along the reef, which would not be suitable substrate for eelgrass (Figure 10).

Figure 10: Large Kelp on reef northwest of Craig Island

3.3.2.3 Marine Birds

The waters of Klawock Inlet are relatively sheltered and ice-free and provide diverse habitat for resident and migratory birds. The area is part of the Pacific Flyway for waterfowl and shorebirds migrating to and from northerly breeding grounds. Resting and feeding habitat is provided in the Crab Bay estuary and the waters around Cemetery Island. Observations from 2011 through 2014 estimated that 5,000 to 10,000 shorebirds of 19 different species use the area each spring from mid-April to mid-May. Twenty different species of loons, geese, cormorants, dabbling ducks, diving ducks, sea ducks, mergansers, herons, scavenging gulls, crows, and eagles also commonly use the estuarine area. Bald eagles (*Haliaeetus leucocephalus*) are common and nest in large trees in the coastal forest but are not normally seen in the urbanized area near the project area. The eagles feed primarily on herring, waterfowl, seabirds, small mammals, sea urchins, clams, crabs, and carrion. Crows and ravens also feed on dead salmon and scavenge tidal flats and beaches (City of Craig 2006a).

During an April 2014 site visit few seabirds or waterfowl were noted in the project area. The only birds observed intensively using the project site were a flock of several dozen presumably feral domestic pigeons, which were seen roosting within the structure of the old cannery dock. Common goldeneyes (*Bucephala clangula*) and red-breasted mergansers (*Mergus serrator*) were observed working the eelgrass beds along the southern and eastern shore of Fish Egg Island. Loons and red-necked grebes (*Podiceps grisegena*) were observed in offshore areas north of the reef. A large group of gulls, assumed to be black-legged kittiwakes (*Rissa tridactyla*) and glaucous-winged gulls (*Larus glaucescens*), were continuously present at the southern tip of Fish Egg Island. Numerous waterfowl, shorebirds, and terns were seen flying northward over the project site.

3.3.2.4 Marine Fish and Invertebrates

Marine fish in the waters around Craig include a variety of pelagic and demersal (bottom dwelling) species. Although most bottomfish species spawn and feed in deep offshore waters, the nearshore zone is an important nursery region. Juvenile fish dominate the shallow waters seeking protection from predators and finding food in kelp forests, eelgrass, and rocky reefs that fringe most of the shoreline. The use of these areas by juveniles is highly seasonal, extending from summer through early fall. By late fall most of the major species have shifted into slightly deeper waters and usage declines sharply with the onset of winter. Lingcod (*Ophiodon elongatus*) are an exception to this pattern as they spawn and guard their eggs in shallow waters during winter. Catch and permit data from ADFG and NMFS indicate that the most abundant commercially important bottomfish species are: pollock (*Theragra chalcogramma*), Pacific halibut (*Hippoglossus stenolepis*), Pacific Ocean perch (*Sebastes alutus*), sablefish (*Gadus macrocephalus*), arrowtooth flounder (*Atheresthes stomias*), flathead sole (*Hippoglossoides elassodon*), and other rockfish species (City of Craig 2006a).

Pacific Herring are a vital commercial and subsistence resource and are a critical link in many food chains. From egg through adult stages, herring are preyed upon by a variety of waterfowl, seabirds, Bald Eagles, salmon, halibut, and marine mammals. Herring spawning occurs on rockweed, eelgrass and kelp in the intertidal and subtidal zones between +12 feet and -30 feet MLLW. Spawning areas surround Cemetery Island along the west side of Craig Island, in Crab Bay, and on the seaward shore of Fish Egg Island. Adult herring form large winter concentrations in certain bays. Concentrations are known to occur in the entrance to Trocadero Bay but smaller concentrations also occur in the aforementioned spawning areas. Winter bait fish are caught off the shoreline of Fish Egg Island (City of Craig 2006a). Herring seem to avoid the developed northern shore of Craig Island but spawn in the kelp beds on the western shore immediately to the south of the project area (Walker 2014).

Anadromous fish occurring in the Craig area include: Pink Salmon, Chum Salmon, Coho Salmon, Sockeye Salmon, Steelhead Trout, Cutthroat Trout, and Dolly Varden Char. King Salmon migrate through the coastal waters but do not spawn in area streams. Pink Salmon are the most abundant anadromous fish, followed by chum salmon. Pink Salmon begin spawning in August in short coastal streams and intertidal areas at stream mouths. Chum Salmon spawn from late summer through early winter and utilize most of the streams in the region for spawning, preferring gravel riffle areas with upwelling waters. Coho Salmon spawn between September and January but utilize fewer streams and are less abundant than Pink Salmon and Chum Salmon. Sockeye Salmon spawn from late July to early October. Sockeye runs are small in the Craig area because of the limited number and size of lakes necessary for rearing their offspring. Crab Creek has recorded peak escapements of 10,000 Pink Salmon, 2,500 Chum Salmon, and 1,500 Coho Salmon. These fish and others from streams throughout the area rear in intertidal areas of Crab Bay during the first months of their life in saltwater. Seagoing Rainbow Trout, known as Steelhead, rear 2 to 4 years before migrating out to sea from April through June. Steelheads reenter their home stream in the fall and overwinter before spawning between March and May. Outmigration into the marine waters follows spawning. Steelheads occur in approximately three-fourths of Crab Creek's alignment. (City of Craig 2006a).

Mollusks in the area are important for commercial and subsistence harvest. Hard-shell clams and mussels are abundant in the mixed-sediment beaches. Little neck clams (*Leukoma staminea*) can be found a few feet above the zero tide level with butter clams (*Saxidomus gigantea*) somewhat lower and horse clams (*Tresus capax*) burrowing at minus tide levels. These clams primarily feed on drifting plankton and detritus. Dungeness Crabs move about the shores of Crab Bay during high water in order to feed on detritus then burrow into the sediment or hide under boulders at low tide. Dungeness and King Crabs (*Paralithodes camtschaticus*) are present throughout Port St. Nicholas. Other intertidal zone fauna include: octopus, Purple Urchins (*Strongylocentrotus purpuratus*), Sea Cucumbers, Giant Gumboot Chitons (*Cryptochiton* *stelleri*), periwinkles, and abalone. Abalones are commercially harvested offshore of Craig and Cemetery Islands (City of Craig 2006a).

On April 16, 2014 Corps personnel and the City of Craig Harbormaster used a beach seine to capture and examine near-shore fish at two locations in or near the project location. The seine was 37 meters (120 feet) long and composed of tapering panels with mesh sizes ranging from 32mm (1.3 inches) in the outer panels to 3.2mm (0.13 inches) at the center. The net was deployed by holding one end on shore while using a skiff to unfurl the net out away from the beach, then bring the other end back to shore about 60 feet (18 meters) away from the starting point. The two ends of the seine were then carefully hauled in to shore, trapping fish and other organisms within the net. The captured fish and other organisms were quickly transferred to aerated buckets of seawater for examination.

The existing pilings and debris within the project area greatly limited the locations within the project area where the seine could be utilized. Therefore, the two locations utilized were the northwest point of Craig Island and the eastern shore of Fish Egg Island. The habitat at the Craig Island location was a mix of eelgrass and small brown algae. The Fish Egg Island location was predominantly eelgrass. The results of this effort are shown in Table 10.

Table 10: Results of Beach Seining

Northwest Point of Craig Island – Species	**Number and Size Range Caught**
Kelp perch (*Brachyistius fenatus*)	4 (67-116 mm)
Tube-snout (*Aulorhynchus flavidus*)	5 (123-154 mm)
Pipefish	3 (130-289 mm)
Pink salmon, juvenile	6 (28-42 mm)
Chum salmon, juvenile	1 (45 mm)
Penpoint Gunnel (*Apodichthys favidus*)	1 (310 mm)
Sculpin sp.	6 (17-69 mm)
Hair Crab (*Erimacrus isenbeckii*)	3 (17-80 mm)
Unidentified crab	1 (8 mm)
Shrimp (Mysid)	~ 100 (~10-25 mm)
Amphipod	numerous
Fish Egg Island Location – Species	
Pink salmon, juvenile	1 (35 mm)
Chum salmon, juvenile	2 (40-42 mm)
Tube-snout	5 (125-254 mm)
Silverspotted sculpin (*Blepsias cirrhosus*)	4 (22-110 mm)
Shrimp (Mysid)	numerous (~10-25 mm)

The seine snagged on a rock at Fish Egg Island, delaying the collection of the captured fish and may have resulted in a lower catch. The species collected at the Craig Island site reflected its mixed-habitat with kelp-associated species such as Kelp Perch collected in similar numbers as eelgrass-associated species such as tubesnout and pipefish.

Figure 11: Kelp Perch (left) and Pipefish (right) caught at the project site

A larger-scale beach seining study was performed in 2000 by NMFS fishery biologists working from several locations in Klawock Inlet. The seine hauls for that study captured many of the same species seen at the project site in 2014 but yielded greater numbers and diversity of species than those caught at the project site. Species caught during those efforts included juvenile rockfish and flatfish. The NMFS study compared seine catches at sites with eelgrass versus sites with kelp or filamentous algae and concluded that eelgrass and kelp habitats were both important habitat with comparable species richness, but appeared to host fish at different life stages. The youngest salmon and rockfish juveniles appeared to prefer eelgrass but larger juveniles moved into deeper waters and other habitats such as kelp forests. The study concluded it is possible that very young juvenile fish prefer eelgrass because of lower currents and wave action rather than the eelgrass itself.

3.3.2.5 Marine Mammals

Many species of marine mammals can be present in Klawock Inlet including: Humpback Whales (*Megaptera novaeangliae*), Gray whales (*Eschrichtius tobustus*), Killer Whales (*Orcinus orca*), Minke Whales (*Balaenoptera acutorostrata*), Pacific White-Sided Dolphins (*Lagenorhynchus obliquidens*), Dall's Porpoises (*Phocoenoides dalli*), Harbor Porpoises (*Phocoena phocoena*), Harbor Seals (*Phoca vitulina*), Steller Sea Lions (*Eumetopias jubatus*), and Northern Sea Otters (*Enhydra lutris kenyoni*). All of these species may be found in waters near Craig throughout the year. However, seasonal migration patterns bring greater numbers of Humpback and Gray Whales to the area during the summer and fall. Marine mammals will also congregate in certain areas during salmon runs and herring spawns. All of these species are protected under the Marine Mammal Protection Act.

3.3.3 Federal and State Threatened and Endangered Species

The only species currently listed under the Endangered Species Act (ESA) whose range includes the project area is the Humpback Whale (NMFS 2014a). Humpback Whales are listed as “endangered” throughout their range, though the North Pacific population is under consideration for delisting from the ESA (NMFS 2014b). Humpback Whales migrate seasonally, and while individuals may be found in Alaskan waters at any time of year, the great majority of the central North Pacific population uses Alaska as a summer feeding range from May through November, wintering offshore of the Hawaiian Islands through the rest of the year (ADFG 2014a). There is no critical habitat designated for this species (NMFS 2014a).

The Eastern distinct population segment (DPS) of the Steller Sea Lion, formerly listed as “threatened” under the ESA, was delisted in November 2013 (NMFS 2013). This includes the Craig area, which at 133°W longitude is well east of the 144°W longitude that is the demarcation line between eastern and western population segments. Individuals from the endangered Western DPS commonly range east of 144°W. However, NMFS has stated that Steller sea lions are rarely found south of Sumner Strait, 60 miles north of Craig (NMFS 2013b) and that it will not require ESA consultation for Steller sea lions at Craig (NMFS 2014c).

NMFS also noted that the endangered leatherback sea turtle (*Dermochelys coriacea*) is uncommon but recorded in the Gulf of Alaska and that several ESA-listed stocks of Pacific salmon and other fish can be found in Alaskan waters. These fish include Upper Columbia River Spring Chinook Salmon, Snake River Sockeye Salmon, Snake River Fall Chinook Salmon, Snake River Spring Chinook Salmon, Lower Columbia River Chinook Salmon, Upper Willamette River Chinook Salmon, Lower Columbia River Coho Salmon, Lower Columbia River Steelhead, Middle Columbia River Steelhead, Upper Columbia River Steelhead, Puget Sound Chinook Salmon, Snake River Basin Steelhead, Upper Willamette River Steelhead, and Green Sturgeon (*Acipenser medirostris*) (NMFS 2014c).

Northern Sea Otters in the Craig area are not protected under the ESA. Only the Southwest Alaska DPS is listed under the ESA and therefore fall under the jurisdiction of USFWS. (USFWS 2014a). This area is generally defined as Kodiak Island and westward.

The yellow-billed loon (*Gavia adamsii*) may be present in marine waters near Craig. This species is a candidate for protection under the ESA. These birds nest on arctic tundra but winter in ice-free coastal waters, such as those in the Craig area. Non-breeding individuals may remain in coastal waters year-round.

3.3.4 Special Aquatic Sites

The U.S. Environmental Protection Agency (EPA) identifies six categories of special aquatic sites in their Clean Water Act Section 404 (b)(i) guidelines: Sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle and pool complexes. Eelgrass beds in the study area are an example of "vegetated shallows".

Vegetated shallows, in the form of eelgrass beds, exist at the project site. A narrow band of eelgrass extending across the project area was surveyed in 1998 and documented in 2014. Within the general project area, the 1998 survey plotted the eelgrass as two polygons on either side of the old cannery pier: a 0.66-acre bed to the west and a 1.02-acre bed to the east.

The project site has not undergone wetland delineation. The project site is primarily marine in nature. The adjacent onshore areas were developed with roads and buildings as early as the 1920s and are presumed to have been repeatedly filled and modified. The USFWS National Wetlands Inventory classifies the intertidal zone in the project area as E2USN or "Estuarine, Intertidal, Unconsolidated Shore, Regularly Flood" with the offshore areas classified as E1UBL or "Estuarine, Subtidal, Unconsolidated Bottom, Permanently Flooded" (USFWS 2014b).

3.3.5 Essential Fish Habitat

The southern end of Klawock Inlet is designated by NMFS as essential fish habitat (EFH) for all five species of Pacific Salmon (Chinook, Coho, Sockeye, Pink, and Chum) at all life stages (NMFS 2014b).

Several anadromous streams enter Klawock Inlet in the Craig area, all to the east of Crab Bay. No anadromous streams exist on Fish Egg Island. The largest anadromous stream in the area is Crab Creek, stream 103-60-10500 in the State of Alaska Anadromous Waters Catalog (AWC). Crab Creek is noted as having all five species of Pacific Salmon present but not known to spawn or rear there. However, some short tributaries of Crab Creek are designated as providing spawning or rearing habitat for Coho Salmon. In addition to Crab Creek, the AWC lists six small area streams as providing rearing habitat for Coho Salmon including:

- 103-60-10492
- 103-60-10495
- 103-60-10501
- 103-60-10502
- 103-60-10503
- 103-60-10504

Streams 10501 and 10504 also provide spawning habitat for Pink Salmon (ADFG 2014a).

3.4 Historical and Cultural Resources

Historic structures within the proposed Federal project's area of potential effect include the wood pile-supported pier (CRG-722) and the boat haulout (CRG-723). At a minimum, survey of the site is needed prior to construction. At this time, a determination of eligibility has been completed. The Wards Cove cannery site was found to be eligible for the National Register.

AKSHPO concurred with these findings. Consultation with the Alaska State Historic Preservation Office and the Advisory Council of Historic Preservation will continue.

4.0 FUTURE WITHOUT-PROJECT CONDITIONS

This section provides an analysis of conditions that are expected to persist at Craig in the absence of Federal construction of navigation improvements. The purpose of this section is to estimate how existing conditions will change over the course of time and to estimate the economic costs of those conditions. Wherever possible, these costs have been assigned monetary values. In the case that this is not possible, the costs are described qualitatively. This projection provides a benchmark for comparison of future economic costs under each of the analyzed alternatives. For the purposes of this analysis, the Federal Fiscal Year 2015 discount rate of 3.375 percent and a 2014 price level is used. The analysis utilizes a 50-year project period of analysis with a base year of 2017, (the year in which it is expected benefits will begin to accrue).

4.1 Economic Conditions

Several critical assumptions were made when conducting the future without-project economic analysis. Chief among them is that the existing fishery will continue to support the fleet. This is a critical assumption supported by the fact that all fisheries present in the Craig area are highly regulated in order to assure future viability of the resource. That is not to say that factors beyond what is reasonably assured cannot occur.

4.1.1 Fleet Composition

Because of the inherent uncertainty surrounding the forecast of any growth in fisheries and related marine resources, a conservative "no growth" approach was taken in determining the future fleet at Craig. Conversely, there is no evidence that demand for moorage at Craig will decrease over time. Therefore, it is assumed that the fleet identified in Section 3.1.5 remains stable throughout the 50-year period of analysis.

4.1.2 Moorage Facilities

At this time, there is no evidence that the City of Craig or another entity has the financial wherewithal or political will to construct navigation improvements on the scale analyzed in this study. Corps policy states that any infrastructure improvements that are assumed to be constructed over the period of analysis must be supported in writing by the project proponent. No such evidence exists in this case. It is likely that local entities will maintain and rehabilitate existing moorage facilities at Craig and there should not be a decrease in the availability of moorage over the period of analysis.

4.1.3 Damages

Given the stated assumptions, absent Federal investment, it is assumed that damages and inefficiencies will continue to occur at Craig. The sections below discuss the expected future levels of these damages and inefficiencies in detail. See the Economics Appendix to this report for additional details.

4.1.3.1 Vessel Damages

In the future, vessel damages will continue to occur at Craig. Survey results showed that vessel damages range from a minimum of $273 to a maximum of $4,704. To address this wide range of potential damages, a triangular distribution was applied to the 85 potential vessel damages annually. Using this approach, the present value of vessel damages caused by congestion and overcrowding are $4.61 million over the 50-year period of analysis with an average annual value of $192,000.

4.1.3.2 Vessel Delays

In addition, vessels will continue to be delayed entering/exiting Craig's existing harbors. These delays are due to multiple reasons listed in survey responses including: waiting for tide change, waiting for a boat to be moved from their stall, harbor staff being unavailable, waiting for a rafted boat owner to return, launching delays are the boat ramp, overcrowding/congestions, and ice in the harbor.

Table 11: Total Annual Future Without-Project Vessel Delay Times (Hours)

Vessel Type	0-20'	21-27'	28-36'	37-45'	46-60'	>60'	Total
Commercial Fishing Vessel Delays	34.04	241.12	519.46	1,299.21	1,423.28	54.13	**3,571.23**
Charter Vessel Delays	0.00	12.96	41.93	21.36	11.59	5.80	**93.63**
Subsistence Vessel Delays	8.07	0.00	0.00	0.00	0.00	0.00	**8.07**

The costs of delays are multi-faceted and include both increased vessel operating expenses and opportunity costs of time to the captain and crew. Total operating hours and number of crew per vessel vary with vessel size, vessel type, and fishing seasons in which the vessel participates. Through consideration of increased vessel operating costs and lost opportunity cost of time, total vessel delay costs were calculated and are shown below in Table 12.

Table 12: Average Annual Vessel Delay Costs

Delay Category	0-20'	21-27'	28-36'	37-45'	46-60'	>60'	Total
Vessel Operating Costs	$2,300	$14,600	$ 36,500	$151,500	$187,000	$11,000	$ 403,000
Opportunity Cost of Time	$6,300	$36,300	$117,700	$388,500	$425,300	$16,400	$ 990,000
Total Delay Costs	$8,600	$50,900	$154,200	$540,000	$612,300	$27,400	$1,393,000

The present value of total vessel delays costs over the 50-year period of analysis is $33.5 million with an average annual value of $1.4 million.

4.1.3.3 Foregone Subsistence Harvests

Congestion and overcrowding at Craig also contributes to a decrease in subsistence harvests due to reduced access to fishing, hunting, and gathering grounds. This reduced harvest level is expected to persist in the future. The residents of Craig harvest approximately 275,600 pounds of subsistence resources on an annual basis, or about 231 pounds per person per year. This is approximately 8 percent lower than the surrounding communities of Klawock and Thorne Bay which harvest an average of 250 pounds per person per year. Klawock and Thorne Bay have similar access to fishing, hunting, and gathering grounds and a similar number of opportunities. Therefore, it is assumed that absent delays caused by suboptimal conditions at Craig's harbors, the community would harvest approximately the same number of pounds per person as the surrounding communities, or approximately 295,000 pounds per year. Through studies by ADFG and the Corps of Engineers, it was found that the value per pound of subsistence resources range from $3.81 per pound to $24.12 per pound. Given this, the total present value of forgone subsistence harvests due to congestion is the difference between what is currently harvested and what could be harvested with a project, or $4.028 million versus $3.484 million over the 50-year period of analysis with an average annual value of $544,000 (ADFGc, Tetra Tech).

4.1.3.4 Increased Travel Costs

Survey results show that 36 vessels would prefer to permanently moor at Craig but cannot due to a lack of available moorage. Because of this, these vessels find moorage elsewhere on Prince of Wales Island, elsewhere in Southeast Alaska, or in the Lower 48 in the Pacific Northwest. These vessels make at least one annual roundtrip between their current homeport and Craig. This roundtrip ranges from 160 miles to 1,432 miles, taking between 8 and 183 hours per roundtrip. Taking into account increased vessel operating costs and opportunity cost of time, increased costs due to a lack of permanent moorage at Craig have a present value of $14.1 million over the 50-year period of analysis with an average annual value of $589,000.

4.1.3.5 Increased Infrastructure Damages

As described in Section 2.1.5, existing facilities are subject to accelerated wear and tear due to overuse. Specifically, this includes a decreased useful life of floats, leading to an accelerated replacement schedule in which the floats at Craig's harbors must be replaced every 20 years, giving a present value of infrastructure replacement of $19 million over the 50-year period of analysis with an average annual value of $792,000.

4.1.3.6 Recreational Opportunities

Under future without-project conditions, the recreational experience of harbor users is decreased due to congestion and overcrowding, leading to a decrease in the Unit Day Value (UDV) of each visit. The recreational experience at Craig is valued at $50.1 million over the 50-year period of analysis with average annual value of $2.09 million. The present value of recreational opportunity cost of time in Craig over the 50-year period of analysis is $32,000 with an average annual value of $1,000.

4.1.3.7 Existing Threat to Other Facilities

Under future without-project conditions, the City Dock, the adjacent private dock, and the seaplane dock will be subject to wave action from the west and northwest.

4.1.4 Summary of Without-Project Conditions

Absent Federal action to provide navigation improvements at Craig, the above-detailed damages will continue to accrue. A summary of these damages is provided in Table 13.

Table 13: Summary of Future Without-Project Condition Damages

Category:	Net Present Value	Average Annual
Vessel damages	$4,613,000	$192,000
Vessel delays	$33,482,000	$1,395,000
Subsistence	$83,590,000	$3,484,000
Travel Cost	$14,129,000	$589,000
Infrastructure Damage	$19,009,000	$792,000
Recreation UDV	$50,076,000	$2,087,000
Recreation OCT	$32,000	$1,000
Total	**$204,931,000**	**$8,540,000**

5.0 FORMULATION AND EVALUATION OF ALTERNATIVE PLANS*

5.1 Plan Formulation Rationale

Plan formulation is the process of building alternative plans that meet planning objectives and avoid planning constraints. Alternatives are a set of one or more management measures functioning together to address one or more planning objectives. A management measure is a feature or activity that can be implemented at a specific geographic location to address one or more planning objectives. A feature is a "structural" element that requires construction or assembly on-site whereas an activity is defined as a "nonstructural" action. Each alternative plan shall be formulated in consideration of criteria stated in Section 2.4.

5.2 Management Measures

A list of management measures is listed below. After going through a screening process based on listed criteria, all of the listed measures were carried forward for consideration.

5.2.1 Protection

This measure would be a rubblemound or floating breakwater that would be constructed in order to provide permanent and transient moorage over the 50-year study period.

5.2.2 Dredging

This measure would include removal of bottom material in order to provide adequate depths for navigation and/or moorage. Under this measure, a disposal area would be identified.

5.2.3 Upland Improvements

Upland improvements include such items as docks, haulouts, grids, fish cleaning stations, parking, restrooms, storage, and cranes. The improvements provide access to moorage and associated harbor features and reduce damages related to overcrowding.

5.2.4 Mitigation Features

Mitigation features may include benches along breakwaters, fish passage openings, and other measures that would offset the environmental impacts of a project.

5.3 Preliminary Alternative Plans

5.3.1 No Action Plan

The No Action Plan would not construct any navigation improvements at Craig, Alaska. Public concerns, issues, and environmental welfare would remain unchanged unless a non-Federal entity elected to construct improvements. The identified purpose and need would not be met. Moorage facilities at Craig, Alaska would continue to experience shortened usable life due to overuse. Damages to vessels and docking facilities due to overcrowded conditions would continue. Economic benefits to the fleet from improved access to harbor facilities would not be achieved. Vessels unable to secure moorage at Craig would seek refuge at other ports, often traveling long distances to homeports.

5.3.2 Sites Considered

The initial consideration in alternative formulation was project siting. Multiple sites in the Craig area could have been utilized to increase the amount of moorage available to the fleet. The ten sites that were considered are shown in Figure 12 and discussed below.

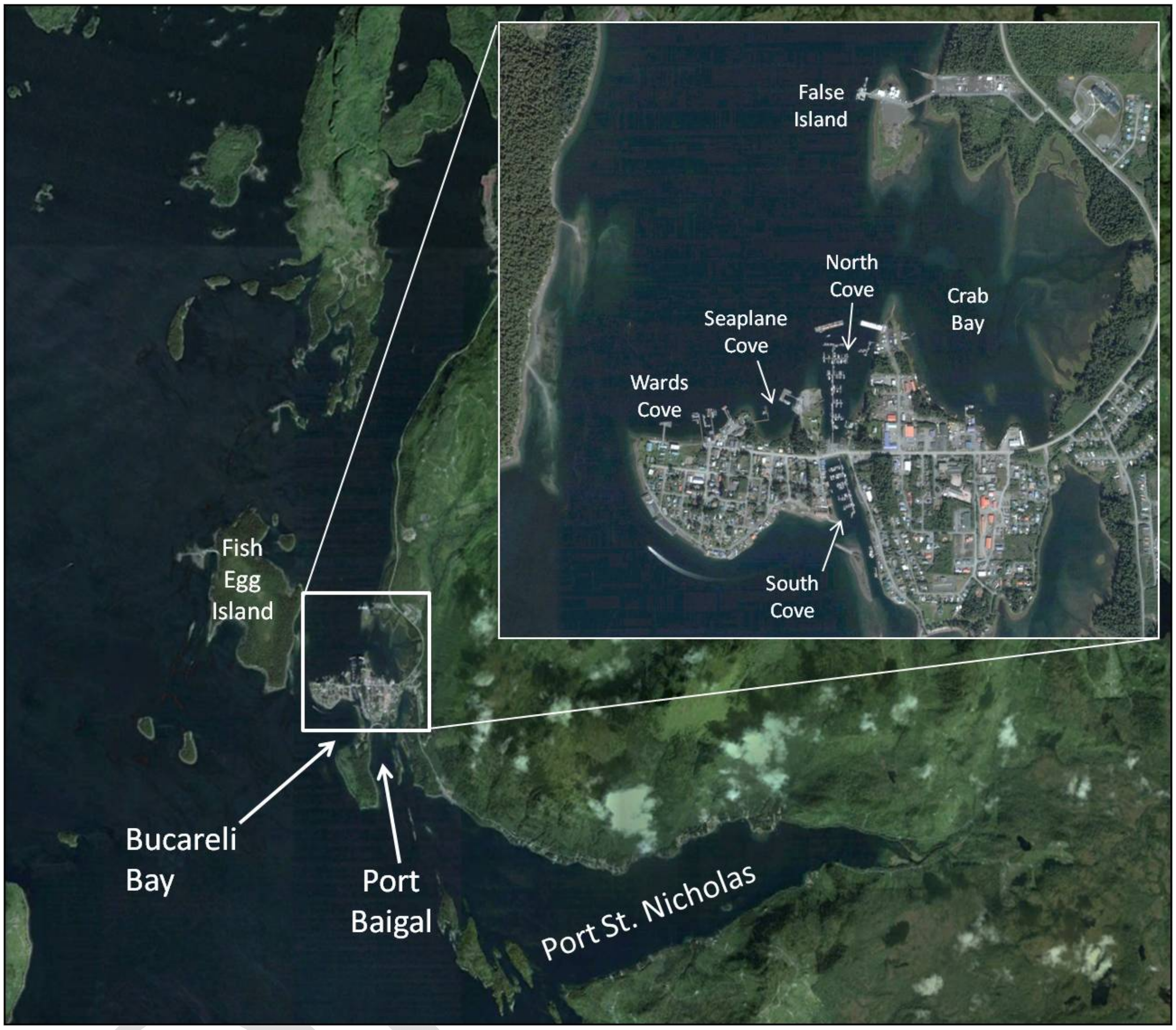

Figure 12: Overview of Potential Harbor Sites
Source: Google Earth with Corps Amendments

5.3.2.1 Fish Egg Island

Fish Egg Island is a large island on the western side of Klawock Inlet approximately 1,500 feet from downtown Craig. Several natural features could be utilized to house a harbor. The main channel allowing access into the southern portion of Klawock Inlet passes by the eastern shore of Fish Egg Island, potentially making the island a desirable place to develop a harbor. In addition, since it is separated from downtown, it could be a desirable place for transient boats that generally use the area for the sole purpose of delivering fish. While this site meets all of the study objectives, it also violates a number of the study constraints. The island supports eelgrass beds, there are no utility connections available, development of this site would require condemnation of land, there are no intermodal connections, and shallow waters surround the island. Because of these factors, this site was not carried forward for further consideration.

5.3.2.2 Seaplane Cove

This site is located in downtown Craig to the east of the Wards Cove Cannery site. It currently houses the Craig Seaplane Base and a dock. This site does not possess the needed lands for upland development and would displace the Craig Seaplane Base, a vital transportation asset. Because this site did not meet study objectives and violated study constraints, it was not carried forward for further consideration.

5.3.2.3 Crab Bay

Crab Bay is located to the north of Craig on the eastern shore of Klawock Inlet. It is a relatively well-protected area. However, large beds of eelgrass are present, the area is used by multiple species of fish for spawning and rearing, and its shores support a large crab population. Because of this, environmental mitigation would be a large part of any project at this site. While this site meets all of the study objectives, it is located in a very environmentally sensitive area with shallow water, making dredging and costly mitigation likely. In addition, the community does not support development in this area. Because of these factors, this site was not carried forward for further consideration.

5.3.2.4 Port Baigal

Port Baigal is a bay to the south of Craig that lies between Cemetery Island and Port St. Nicholas Road. However, development of uplands on Cemetery Island is not desirable given its current use as a cemetery and park area. Development of uplands along Port St. Nicholas Road would be difficult due to the area’s residential zoning. While this site meets all of the study objectives, the water is shallow and supports eelgrass beds. Because of these factors, this site was not carried forward for further consideration.

5.3.2.5 Port St. Nicholas

Port St. Nicholas is a bay to the southeast of Craig. The area is largely residential with development on many of the shorefront lots. While this site meets all of the study objectives, it is residential in nature and heavily developed. It also has shallow water depths that support eelgrass beds. There is also a lack of utility connections in the area, making the site costly to develop. Because of these factors, this site was not carried forward for further consideration.

5.3.2.6 False Island

False Island is the site of the J.T. Brown Marine Industrial Center that houses an existing boat launch and dock. Much of the island has been developed for use by the marine industrial center. There is approximately 3 acres of undeveloped land on the southern portion of the island. While this site meets all the study objectives, it is in an environmentally sensitive area adjacent to Crab Bay, has shallow water depths, and would likely require condemnation of land. Because of these factors, this site was not carried forward for further consideration.

5.3.2.7 Bucareli Bay

Bucareli Bay is a body of water fronting the southern coast of Craig Island along Beach Road. The area is residential in nature and mostly developed. While this site meets all of the study objectives, it is in an area that supports eelgrass beds and due to heavy residential development any harbor would require the condemnation of a large amount of land and demolition of associated structures. Because of these factors, this site was not carried forward for further consideration.

5.3.2.8 South Cove

South Cove is the site of an existing harbor. There is very little room for expansion due to existing development on the west, the highway to the north, Hamilton Road to the east, and a private harbor development to the south. While this site meets study objectives, it is considered to be a fully developed site with no room for expansion. Because of these factors, this site was not carried forward for further consideration.

5.3.2.9 North Cove

North Cove is the site of an existing harbor. It is protected by a floating breakwater to the north but is susceptible to wave action from the west. There is very little room for expansion due to existing development to the west and east and the highway to the south. Expanding the harbor to the north would be problematic due to required float configuration and the breakwater configuration that would be required to mitigate exposure to wave action from the north and west. While this site meets study objectives, it is considered to be a fully developed site with no room for expansion. Because of these factors, this site was not carried forward for further consideration.

5.3.2.10 Wards Cove Cannery

This property is the site of the now defunct Wards Cove Cannery. The site is owned by the City of Craig. An existing dock and multiple pilings are in a state of disrepair and would require removal should this site be chosen. This site meets all study objectives. However, it supports small eelgrass beds and lies just to the south of the FAA-designated seaplane landing zone. Therefore, any harbor configuration at this site would need to take into account seaplane operations landing and taking off to the north. A number of factors combined to make Wards Cove the most desirable site for harbor development. While eelgrass beds are present, they are relatively small compared to the other sites. This met the study's objective to avoid and minimize environmental impacts that would occur in the with-project condition. In addition, it is possible to configure a harbor at this site that would not interfere with seaplane operations. The City of Craig already owns the Wards Cove site, greatly simplifying the real estate process and avoiding the need to condemn land as part of a harbor development project. The site is already zoned for marine uses and has supported the fleet in the past. Redevelopment of a previously-used area can be advantageous from an environmental standpoint. Because of previous cannery and vessel maintenance operations at this site, it is likely that there are legacy contaminants in the sediments. Redeveloping this area for industrial use would therefore be preferable to developing an environmentally pristine site. Because of these factors, this site was carried forward for further consideration.

5.3.3 Alternatives Considered

Once the Wards Cove Cannery site was chosen, multiple alternatives were formulated that would provide protection for vessels.

5.3.3.1 Initial Designs Considered

In addition to the No Action Plan, four alternatives were initially designed, each of which would have different capacities but similar breakwater layouts with protection on the western and northern boundaries of the mooring basins. After further information was gathered, additional layouts were formulated.

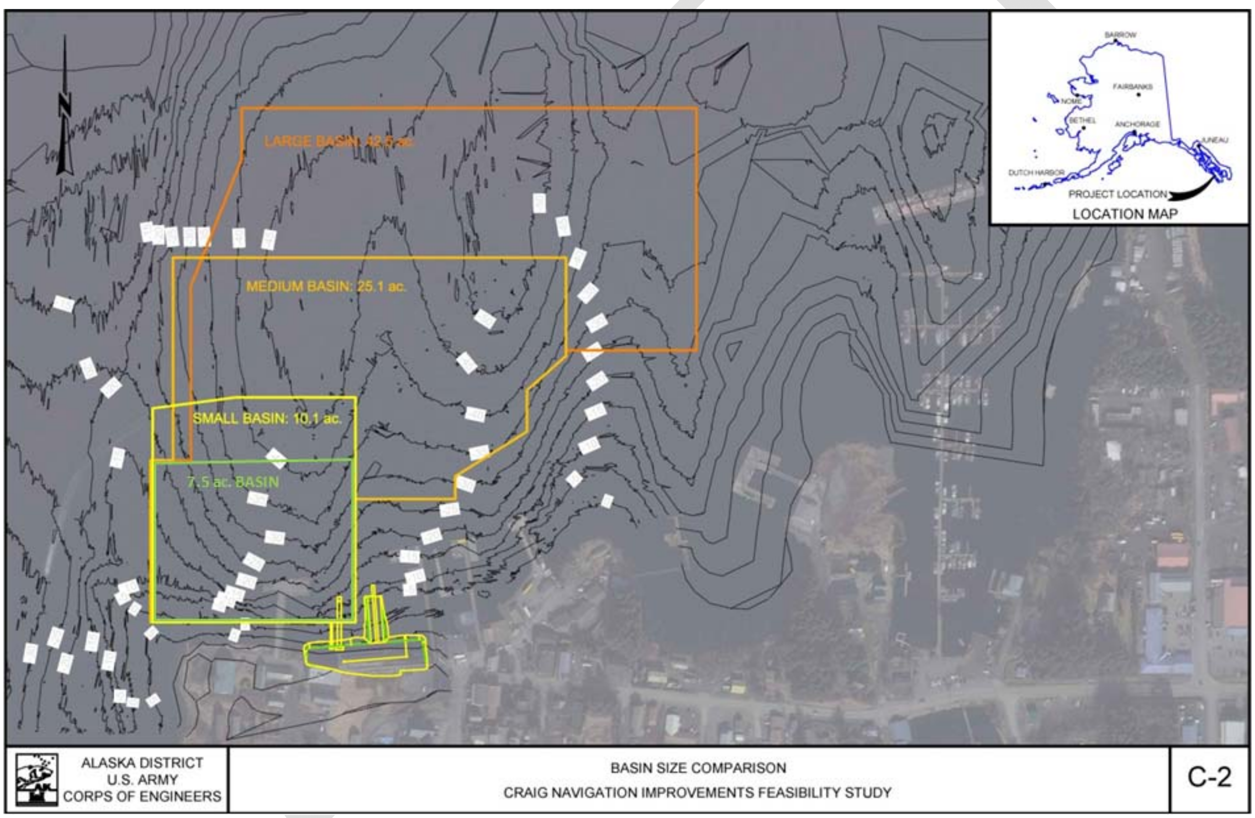

Figure 13: Basin Sizes Considered

The four basin sizes were formulated in order to provide moorage at different levels of demand. The smallest basin size, shown in green in Figure 13, is 7.5 acres in size and would be approximately the size of each of the two existing harbors, providing moorage for approximately 105 vessels. The next basin size, shown in yellow in Figure 13, is 10.1 acres in size and would provide moorage for 145 vessels. The third basin size, shown in orange in Figure 13, is 25.1 acres in size and would provide moorage for approximately 303 vessels. The final and largest of the basins is shown in red in Figure 13. This basin is 42.5 acres in size and would provide moorage for approximately 530 vessels. The alternatives developed from an investigation of these different basin sizes follows.

5.3.3.1.1 Alternative 1

This alternative would consist of a mooring basin approximately 7.5 acres in size and would be able to accommodate 105 vessels if configured as shown in Table 14 . Fish passage was incorporated into the design. This alternative is estimated to have a total project cost of $35.4 million. The proposed layout of Alternative 1 is shown in Figure 14.

Table 14: Alternative 1 Configuration

Berth Length	Number of Berths
20	12
28	20
36	30
46	18
60	24
75	0
120	1

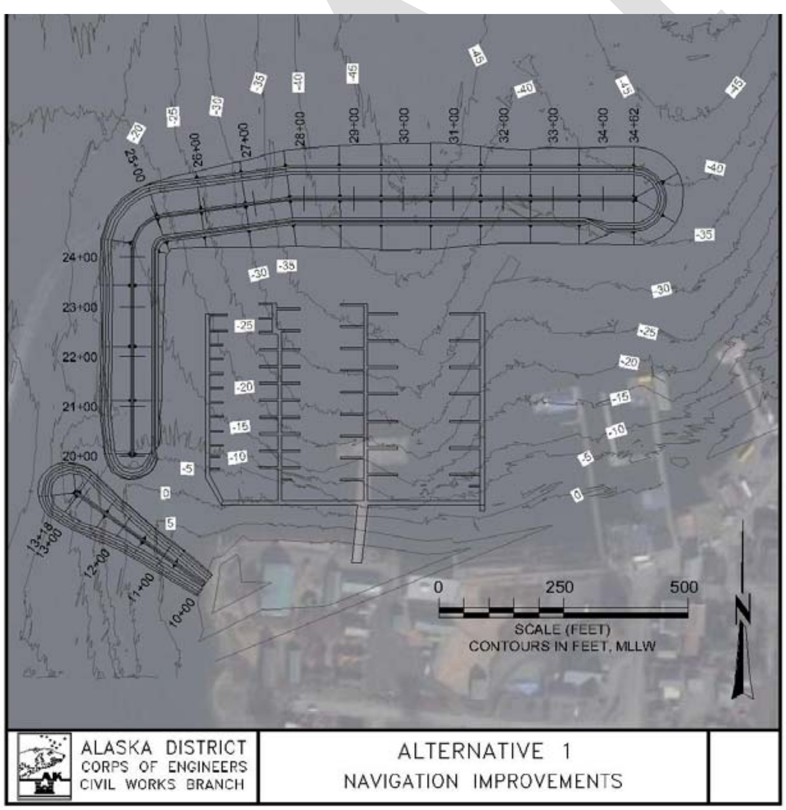

Figure 14: Alternative 1 Layout

Note: Float design depicted here is for planning purposes only. Final float design is the responsibility of the non-Federal sponsor.

5.3.3.1.2 Alternative 2

Alternative 2 would consist of a 10.1-acre basin protected by a 650-foot long western breakwater in a north-south alignment and an 850-foot long northern breakwater in an east-west alignment. There would be an opening to the west allowing for vessel ingress and egress to both the east and west. This alternative would be able to accommodate 145 vessels if configured as shown in Table 15 and has an initial project cost of $33.6 million. The proposed layout of Alternative 2 is shown in Figure 15.

Table 15: Alternative 2 Configuration

Berth Length	Number of Berths
20	12
28	28
36	38
46	30
60	36
75	0
120	1

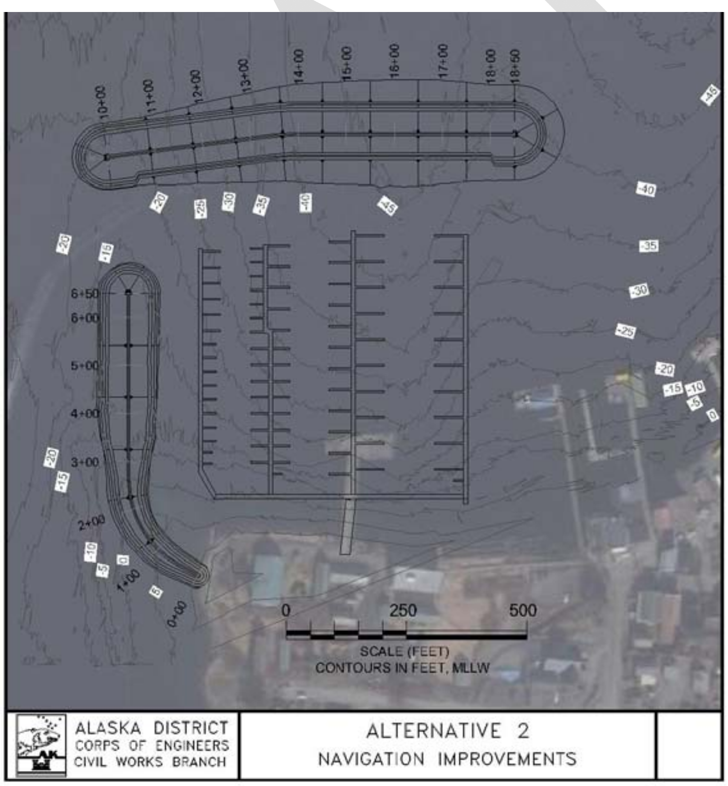

Figure 15: Alternative 2 Layout

Note: Float design depicted here is for planning purposes only. Final float design is the responsibility of the non-Federal sponsor.

At a February 2014 meeting with the community, concerns were raised about a 2-foot swell that enters Klawock Inlet from the southwest. The community was concerned about the swell entering the harbor's western opening and reflecting into the moorage basin, causing damage to vessels. Due to this new information, any design with an opening to the west such as that shown in Figure 15 would be considered an incomplete design.

5.3.3.1.2.1 Alternative 2a

This alternative would consist of a 10.1-acre basin protected by a 960-foot long western breakwater in a general north-south alignment and a 960-foot long northern breakwater in a general east-west alignment. The western breakwater was modified to allow for vessel ingress and egress from the northwest while simultaneously addressing concerns about a southwesterly swell entering the harbor. This alternative could accommodate 145 vessels if configured as shown in Table 16 and would have an estimated total project cost of $44.8 million. The proposed layout of the harbor is shown in Figure 16.

Table 16: Alternative 2a Configuration

Berth Length	Number of Berths
20	12
28	28
36	38
46	30
60	36
75	0
120	1

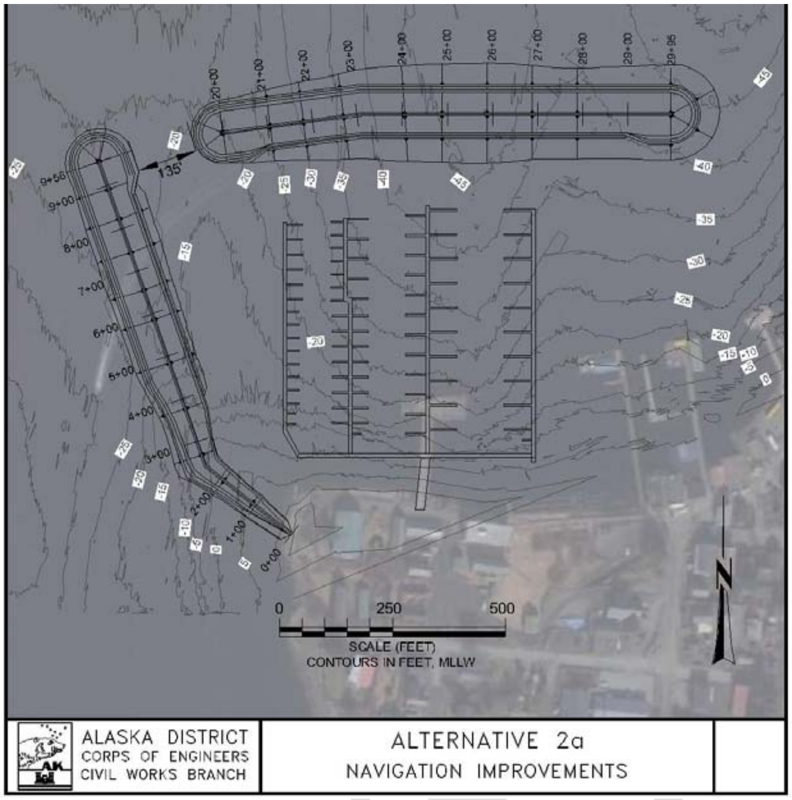

Figure 16: Alternative 2a Layout

Note: Float design depicted here is for planning purposes only. Final float design is the responsibility of the non-Federal sponsor.

5.3.3.1.2.2 Alternative 2b

This alternative would consist of a 10.1-acre basin protected by an "L-shape" breakwater that is approximately 1,933 feet in length. This design mostly eliminates the western opening completely except for an overlapping gap in the western alignment to provide for fish passage. This design provides protection against waves from all westerly and northerly directions. This basin would be able to accommodate 145 vessels if configured as shown in Table 17 and has an estimated total project cost of $37.9 million. Alternative 2b layout is shown in Figure 17.

Table 17: Alternative 2b Configuration

Berth Length	Number of Berths
20	12
28	28
36	38
46	30
60	36
75	0
120	1

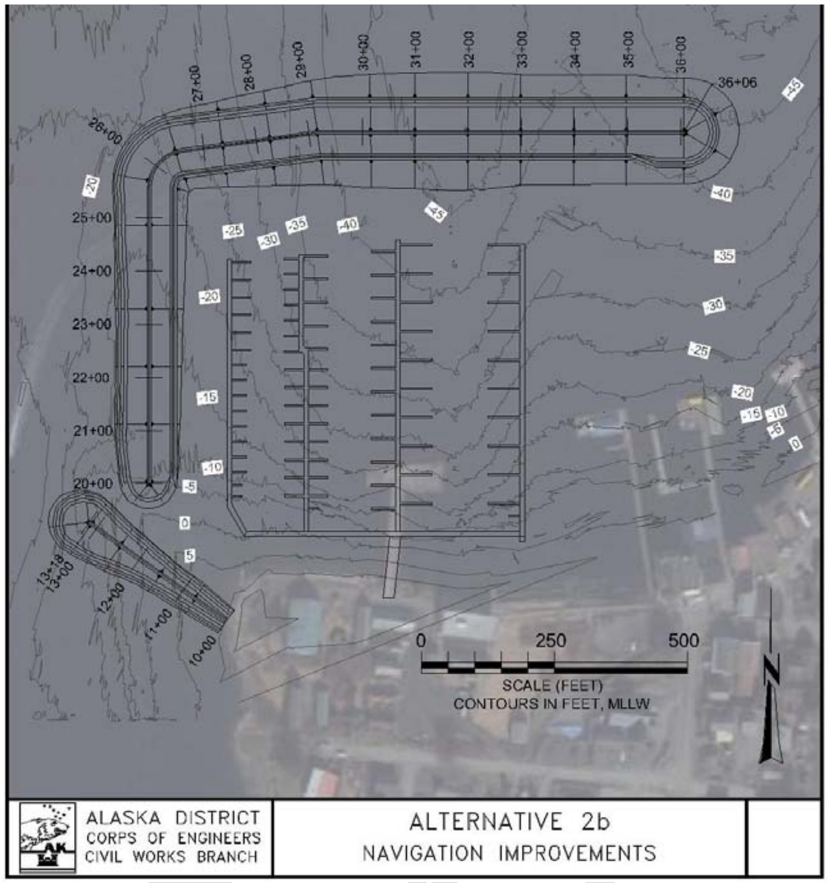

Figure 17: Alternative 2b Layout

Note: Float design depicted here is for planning purposes only. Final float design is the responsibility of the non-Federal sponsor.

5.3.3.1.3 Alternative 3

This alternative would consist of a 25.1-acre basin protected by a 650-foot long western breakwater in a north-south alignment and a 1,450-foot long northern breakwater in an east-west alignment. This basin would be able to accommodate 303 vessels if configured as shown in Table 18. This alternative is estimated to have a total project cost of $54.3 million. The proposed layout of Alternative 3 is shown in Figure 18. It should be noted that this alternative has the same western opening that cause Alternative 2 to be eliminated. However, it is carried forward for comparison purposes. Should this alternative prove competitive, the breakwater configuration would need to be adjusted.

Table 18: Alternative 3 Configuration

Berth Length	Number of Berths
20	8
28	0
36	72
46	73
60	142
75	7
120	1

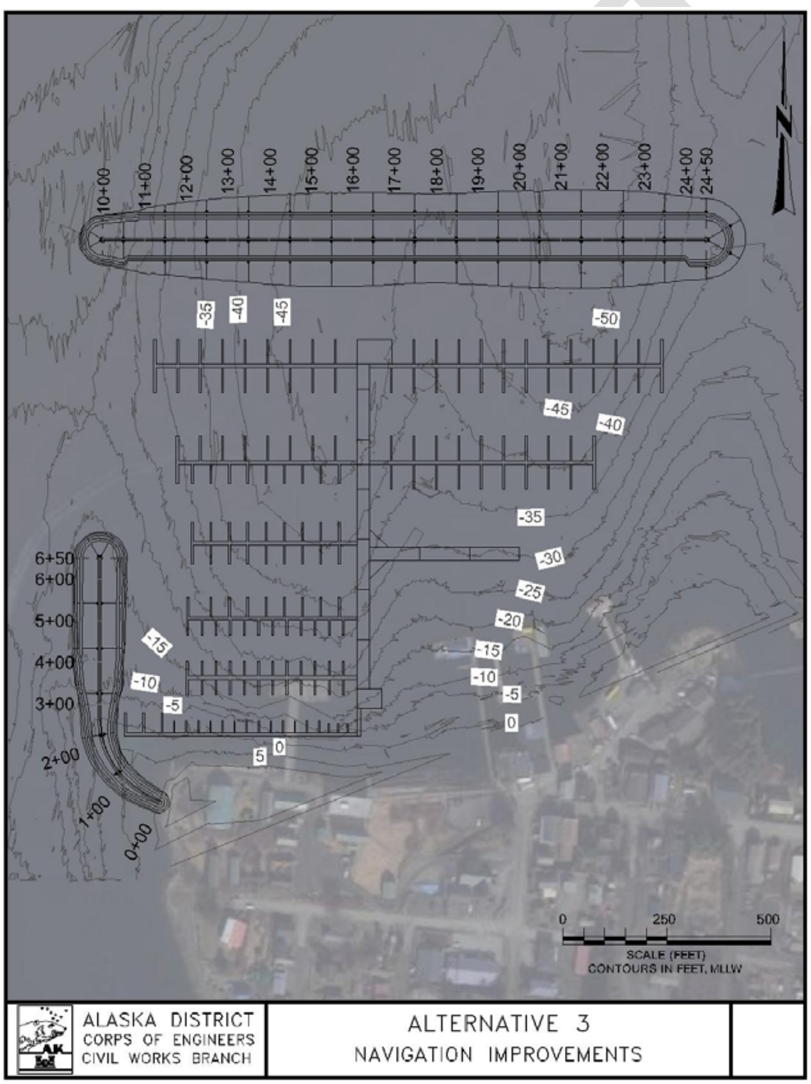

Figure 18: Alternative 3 Layout

Note: Float design depicted here is for planning purposes only. Final float design is the responsibility of the non-Federal sponsor.

5.3.3.1.4 Alternative 4

This alternative would consist of a 42.5-acre basin protected by a 650-foot long western breakwater in a north-south alignment and a 1,600-foot long northern breakwater in an east-west alignment. This basin would be able to accommodate 530 vessels if configured as shown in Table 19 and has an estimated total project cost of $61.7 million. The proposed layout of Alternative 4 is shown in Figure 19. It should be noted that this alternative has the same western opening that cause Alternative 2 to be eliminated. However, it is carried forward for comparison purposes. Should this alternative prove competitive, the breakwater configuration would need to be adjusted.

Table 19: Alternative 4 Configuration

Berth Length	Number of Berths
20	10
28	29
36	101
46	132
60	245
75	12
120	1

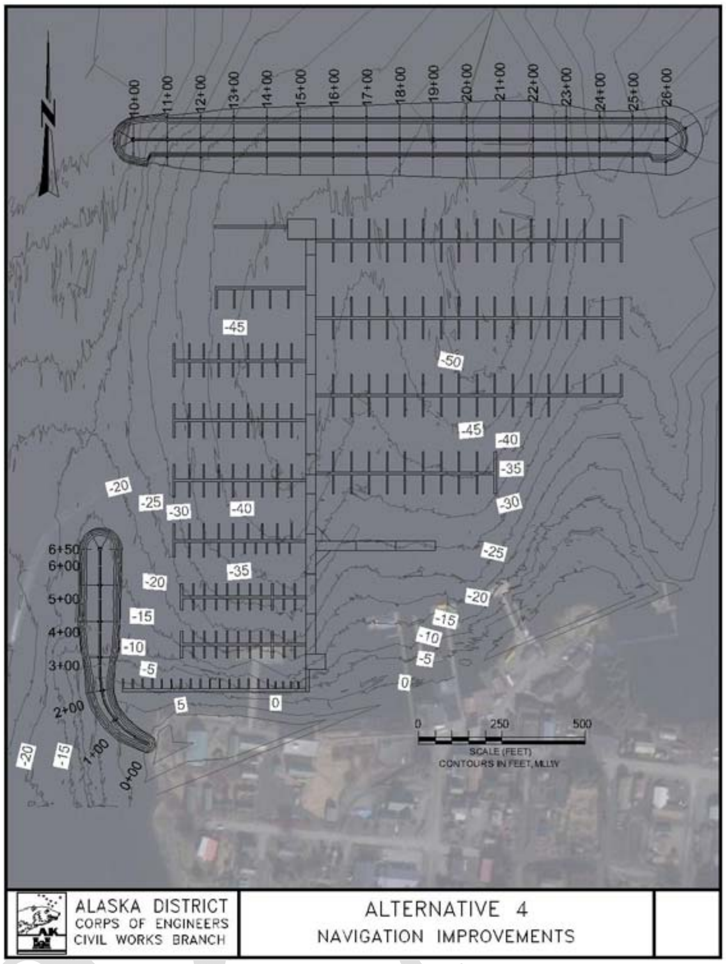

Figure 19: Alternative 4 Layout

Note: Float design depicted here is for planning purposes only. Final float design is the responsibility of the non-Federal sponsor.

6.0 COMPARISON AND SELECTION OF PLANS*

6.1 With-Project Condition

The alternatives were designed to meet the planning objectives and criteria and were evaluated based on environmental, economic, and engineering considerations. Regardless of the selected alternative, under the with-project condition, there would be a marked decline in damages and inefficiencies.

6.2 Alternative Plan Costs

Costs of the alternatives including those to construct and maintain the facilities are shown in Table 20. Costs are current as of April 2014. Interest during construction (IDC) assumes a 2-year construction window. Operations, Maintenance, Repair, Rehabilitation, and Replacement

(OMRRR) assumes that 5 percent of armor rock is replaced every 25 years and anodes are replaced every 15 years.

Table 20: Summary of Costs by Alternative

Alternative	Construction Costs	IDC	OMRR&R	Present Value	Avg. Annual Value
1	$32,639,000	$1,107,000	$1,444,000	$35,190,000	$1,467,000
2a	$40,935,000	$1,388,000	$2,280,000	$44,603,000	$1,859,000
2b	$35,087,000	$1,190,000	$1,447,000	$37,724,000	$1,572,000
3	$50,121,000	$1,701,000	$2,441,000	$54,263,000	$2,262,000
4	$56,141,000	$1,905,000	$3,625,000	$61,672,000	$2,570,000

Note: Alternatives 2a and 2b are modifications of the original Alternative 2 which was dropped from consideration.

6.3 With-Project Benefits

Each alternative provides a certain amount of relief from existing and expected future damages and inefficiencies. The differences between the expected level of damages and inefficiencies absent Federal action (without-project condition) and those that will occur under the various with-project conditions are benefits that accrue to the project and form the basis for selecting a recommended plan.

6.3.1 Moorage Demand Met

The alternatives have been formulated to meet a certain amount of surplus demand for moorage at Craig. Benefits accrue to small boat harbors in a logical manner that depends on the percentage of demand met and the amount of overcrowding alleviated. Once overcrowding is addressed, external demand for moorage, (that portion of demand from vessels that either haul out or moor elsewhere), can be met.

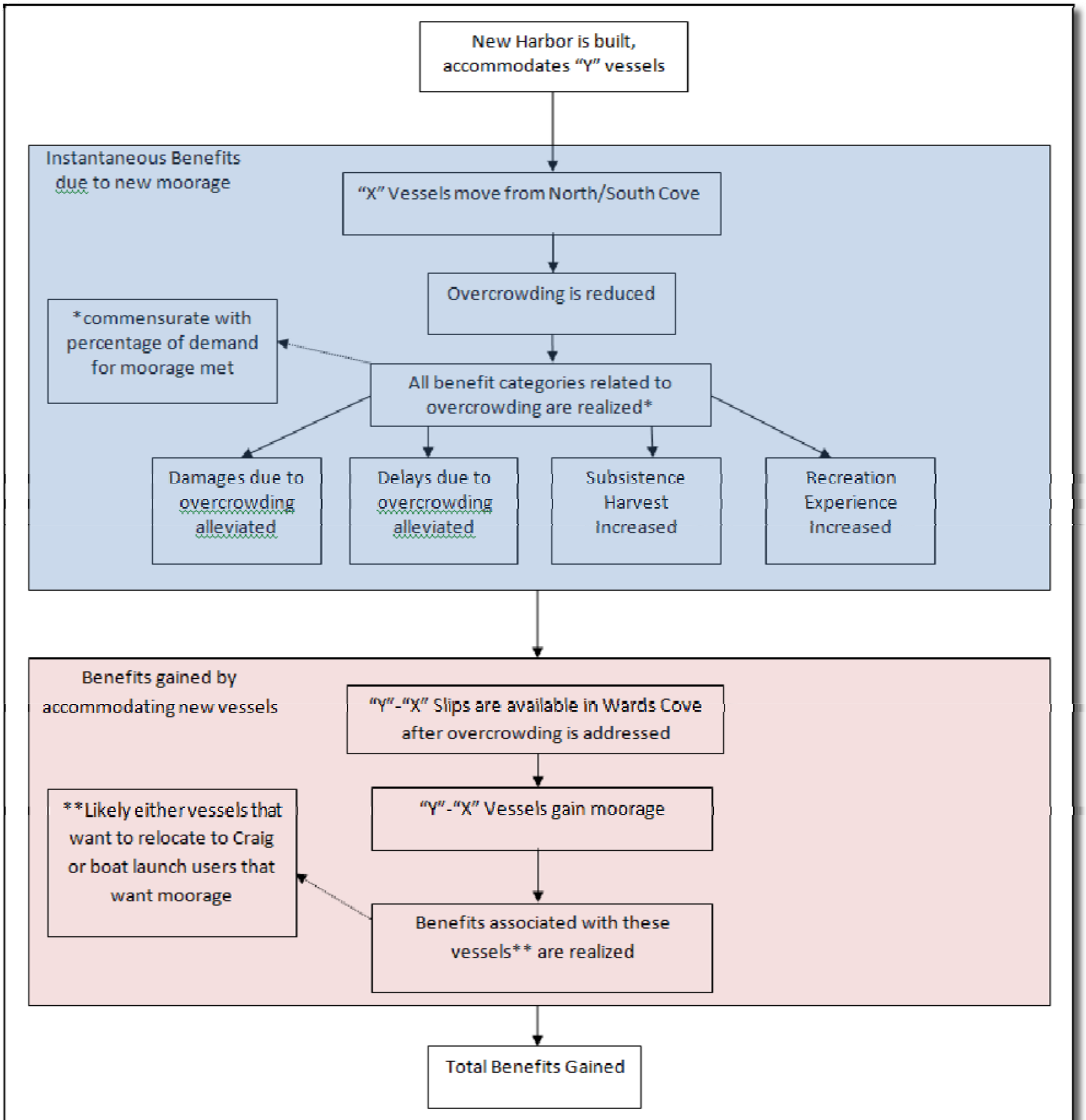

Figure 20: Chronological Realization of Benefits Due to New Harbor Construction

6.3.2 Avoided Vessel Damages

In the with-project condition, a portion of existing and expected future damages will be alleviated. These avoided damages are those that occur due to overcrowding and include damaged fenders and vessels, broken mooring lines, etc. Damages due to things such as theft, electrolysis, vandalism, and freeze damage will still occur. Table 21 shows the total vessel damages decreased by each alternative.

Table 21: Avoided Vessel Damages, by Alternative

Alternative	Average Annual Benefits
Alternative 1	$105,000
Alternative 2a	$126,000
Alternative 2b	$126,000
Alternative 3	$188,000
Alternative 4	$188,000

6.3.3 Avoided Vessel Delays

Similarly, there are a number of vessel delays that would not occur under the with-project condition. As discussed in Section 4.1.3.2, there were seven delay categories listed by vessel owners in the surveys. Under the with-project condition, delays due to several categories will be completely eliminated including: wait times while another boat is moved from a vessel's dedicated stall, delays due to waiting for another vessel's owner to return, and delays due to congestion and overcrowding. In addition, delays due to waiting for the tide to change would be reduced by 50 percent. These delays are not completely eliminated because while the recommended site would not be tide-limited, it is reasonable to assume that a portion of vessel owners currently experiencing tide delays would either choose to stay in their current harbor or would not be able to procure a slip in the new harbor.

Some delays would continue to occur at Craig. These include situations where harbor staff are not available, delays at the launch ramp, and delays due to ice in the harbor. Total delays reduced by the various alternatives are shown in Table 22.

Table 22: Avoided Vessel Delays, by Alternative

Alternative:	Average Annual Value
Alternative 1	$711,000
Alternative 2a	$795,000
Alternative 2b	$795,000
Alternative 3	$1,044,000
Alternative 4	$1,044,000

6.3.4 Increased Subsistence Harvests

Given the 8 percent disparity between the amount of subsistence harvest per person at Craig and those at nearby villages, it is reasonable to assume that a portion of this disparity occurs due to delays associated with vessel use. Subsistence activities are largely an investment of time. Therefore, any delay that occurs due to existing harbor conditions increases the amount of effort (economic cost) required to harvest subsistence resources. A decrease in those delays makes subsistence activities less expensive in the non-monetary sense and would likely lead to an increase in subsistence harvests at Craig closer to what is experienced by surrounding villages. The values of increased subsistence harvests for each alternative are shown in Table 23.

Table 23: Increase Subsistence Harvests, by Alternative

Alternative:	Average Annual Value
Alternative 1	$456,000
Alternative 2a	$544,000
Alternative 2b	$544,000
Alternative 3	$544,000
Alternative 4	$544,000

6.3.5 Decreased Travel Costs

With an increase in available moorage, vessel owners that currently moor elsewhere and travel to Craig for fishing openings would save on the cost of roundtrip travel between their current homeport and Craig. The expected decreases in travel costs by alternative are shown in Table 24.

Table 24: Decreased Travel Costs, by Alternative

Alternative:	Average Annual Value
Alternative 1	$589,000
Alternative 2a	$589,000
Alternative 2b	$589,000
Alternative 3	$589,000
Alternative 4	$589,000

6.3.6 Decreased Infrastructure Damage

With a reduction in congestion and overcrowding, (which leads to overuse), there is a corresponding decrease in infrastructure damage. Instead of degrading at an accelerated rate, floats and related structures degrade at a slower rate, increasing useful life. The current useful life of floats at Craig's harbors is 20 years. Under the with-project condition, it is expected to increase to 30 years. The benefit of this extension of useful life is shown in Table 25.

Table 25: Decreased Infrastructure Damage, by Alternative

Alternative:	Average Annual Value
Alternative 1	$229,000
Alternative 2a	$229,000
Alternative 2b	$229,000
Alternative 3	$229,000
Alternative 4	$229,000

6.3.7 Recreational Opportunity – Unit Day Values

With a reduction in congestion and overcrowding, there is a corresponding increase in the recreational experience of harbor users. The value of recreational experience is expressed in Unit Day Values. Unit Day Value is made up of five criteria:

- Recreation Experience (overall experience)
- Availability of Opportunity (proximity of project to similar recreation facilities)
- Carrying Capacity (congestion)
- Accessibility (land-side access)
- Environmental (aesthetic quality)

The benefit of the increase in Unit Day Value is shown in Table 26.

Table 26: Increased Unit Day Values, by Alternative

Alternative:	Average Annual Value
Alternative 1	$277,000
Alternative 2a	$277,000
Alternative 2b	$277,000
Alternative 3	$277,000
Alternative 4	$277,000

6.3.8 Recreational Opportunity – Opportunity Cost of Time

With a reduction in congestion in overcrowding, there are decreases in the amount of time recreational boaters spend in transit between the harbor and their recreational destinations. That time savings has a direct benefit expressed in the opportunity cost of time. The benefit of the saved opportunity cost of time is shown in Table 27.

Table 27: Saved Opportunity Cost of Time for Recreational Boaters, by Alternative

Alternative:	Average Annual Value
Alternative 1	$1,000
Alternative 2a	$1,000
Alternative 2b	$1,000
Alternative 3	$1,000
Alternative 4	$1,000

6.4 Net Benefits of Alternative Plans

Given the quantified benefits discussed above, the net annual benefits of each alternative are shown in Table 28.

Table 28: Summary of With-Project Benefits

Criteria	Alt. 1	Alt. 2a	Alt. 2b	Alt. 3	Alt. 4
Vessel Damages	$105,000	$126,000	$126,000	$188,000	$188,000
Vessel Delays	$711,000	$795,000	$795,000	$1,044,000	$1,044,000
Subsistence	$456,000	$544,000	$544,000	$544,000	$544,000
Travel Cost	$589,000	$589,000	$589,000	$589,000	$589,000
Infrastructure Damage	$229,000	$229,000	$229,000	$229,000	$229,000
Recreation UDV	$277,000	$277,000	$277,000	$277,000	$277,000
Recreation OCT	$1,000	$1,000	$1,000	$1,000	$1,000
Total Net Annual Benefits	**$2,368,000**	**$2,561,000**	**$2,561,000**	**$2,872,000**	**$2,872,000**

6.5 Summary of Accounts and Plan Comparison

The physical characteristics of the alternatives are shown in Table 29. A comparison of the NED costs and benefits associated with the various alternatives is shown in Table 30. Interest during construction (IDC) was added to the initial cost to account for the opportunity cost incurred during the time after the funds have been spent, but before the benefits begin to accrue. Preconstruction, engineering, and design (PED) was assumed to take nine months and construction assumed to take 24 months.

Table 29: Comparison of Alternatives: Physical Characteristics

Feature/Alternative	Alt. 1		Alt. 2a	Alt. 2b	Alt. 3	Alt. 4
Western Breakwater						
Length (ft)	-		960	-	650	650
Armor Rock (cy)	-		14,303	-	9,682	9,682
B Rock (cy)	-		11,740	-	5,823	5,823
Core Rock (cy)	-		43,670	-	14,588	14,588
Northern Breakwater						
Length (ft)	-		960	-	1,450	1,600
Armor Rock (cy)	-		21,000	-	26,685	28,984
B Rock (cy)	-		35,300	-	48,957	48,962
Core Rock (cy)	-		176,000	-	295,510	298,689
Combined Breakwater						
Length (ft)	1,780		-	1,933	-	-
Armor Rock (cy)	31,400		-	31,100	-	-
B Rock (cy)	37,600		-	42,650	-	-
Core Rock (cy)	181,000		-	205,300	-	-

Note: “(cy)” equals “cubic yards” and “ft” equals “linear feet”.

Table 30: Comparison of Alternatives: Costs and Benefits

Item	Alt. 1	Alt. 2a	Alt. 2b	Alt. 3	Alt. 4
Mobilization & Demobilization	$901,400	$901,400	$901,400	$870,000	$870,000
Surveys	$162,175	$195,973	$195,973	$143,000	$143,000
Demolition	$302,180	$302,180	$302,180	$210,000	$210,000
Breakwaters	$16,965,580	$20,240,989	$18,566,352	$28,557,000	$29,025,000
Inner Harbor Development	$6,764,295	$9,854,055	$6,767,505	$9,025,000	$13,225,000
Navigation Aids	18,315	18,315	18,315	48,000	48,000
Construction Contract Cost	$25,969,000	$31,512,911	$26,736,773	$38,854,000	$43,520,000
Contingency	$5,344,672	$6,696,648	$6,047,100	$7,771,000	$8,704,000
Construction Management	$2,153,211	$2,697,882	$2,275,797	$3,497,000	$3,917,000
Subtotal	$7,497,883	$9,394,530	$8,322,897	$11,267,000	$12,621,000
Project Cost	$33,466,883	$40,907,441	$35,059,670	$50,121,000	$56,141,000
Interest During Construction	$1,107,000	$1,388,000	$1,190,000	$1,701,000	$1,905,000
NED Investment Cost	$34,573,883	$42,295,441	$36,249,670	$51,822,000	$58,047,000
Annual OMRRR	$60,173	$95,013	$60,309	$102,000	$151,000
Total Annual NED Cost (50 years at 3.375%)	$1,467,000	$1,859,000	$1,572,000	$2,262,000	$2,570,000
Annual Benefits	$2,368,000	$2,561,000	$2,561,000	$2,872,000	$2,872,000
Average Annual Net Benefits	$901,000	$702,000	**$989,000**	$610,000	$302,000
Benefits to Cost Ratio	1.61	1.38	**1.63**	1.27	1.12
Rank by NED Benefits	2	3	**1**	4	5

As shown in Table 30, Alternatives 3 and 4 are not competitive with the other alternatives and would be even less so if the western opening were closed with additional sections of breakwater. Environmental impacts were also considered. As discussed in Section 5.3, the siting of the harbor explicitly considered possible environmental impacts which led to the selection of the Wards Cove Cannery site. The environmental impacts and benefits associated with each of these alternatives are fairly similar with breakwater footprints covering existing bottom habitat but providing additional habitat in the process.

7.0 TENTATIVELY SELECTED PLAN*

7.1 Description of Tentatively Selected Plan

The tentatively selected plan (TSP) is Alternative 2b, shown in Figure 17. This plan maximized net NED benefits and was selected as the NED Plan. The plan is acceptable to the local sponsor and became the Recommended Plan. Major construction items include: removal of the existing pilings and dock, construction of a rubblemound breakwater, and construction of a moorage float system. No dredging would be required to construct the project.

7.1.1 Plan Components

7.1.1.1 Rubblemound Breakwater

This feature consists of dual rubblemound breakwaters approximately 1,933 feet in length that combine to extend northward from the northwest point of Craig Island for approximately 700 feet, then extends to the east for approximately 1,200 feet. A stub breakwater extends northwest from the northwest tip of Craig Island along the north-south alignment to allow for fish passage.

7.1.1.2 Entrance Channel and Moorage Basin

The 10-acre moorage basin would be accessed from the east. While depths within the basin extend to -45 feet MLLW, all maneuvering areas will have an authorized controlling depth of -20 feet MLLW. Minimal sedimentation within the basin would depend on storm conditions but dredging is expected to be infrequent if necessary at all.

7.1.1.3 Inner Harbor Facilities

A float system will be constructed by the non-Federal partner.

7.1.2 Plan Costs and Benefits

As shown in Table 30, the Recommended Plan provides annual navigation benefits of $2,561,000. The annual cost is $1,572,000 with net annual benefits of $989,000 and a benefit to cost ratio of 1.63. Economic analyses are based on 2014 price levels, a 50-year period of analysis, and the fiscal year 2015 Federal discount rate of 3.375 percent.

7.1.3 Construction

7.1.3.1 Federal

The U.S. Army Corps of Engineers will be responsible for construction of the breakwaters. The U.S. Coast Guard will be responsible for installing aids to navigation.

7.1.3.2 Non-Federal

The City of Craig will be responsible for construction of the float system and providing all lands easements, rights-of-way, and relocations necessary for the project. The City will also be responsible for providing utility service to the harbor and for funding its share of the general navigation features.

7.1.4 Financial Analysis

The non-federal partner's capability to provide funding is largely dependent on legislative appropriations from the State of Alaska. However, the sponsor has shown the ability to secure the necessary appropriations to move this project forward and has submitted a request for design and construction funding for the next State of Alaska legislative session.

7.1.5 Dredging and Disposal

The recommended plan has been formulated to avoid dredging in order to minimize environmental impacts. The existing piling and dock structures will be removed and disposed of in the city landfill. The pilings will be cut at grade instead of extracted in order to avoid disturbing sediments.

7.1.6 Operations, Maintenance, Repair, Replacement, and Rehabilitation (OMRRR)

Total present value OMRRR costs for the recommended plan over the 50-year period of analysis are $1.78 million. A brief discussion of Federal and non-Federal responsibilities is included below.

7.1.6.1 Federal

The Corps of Engineers will be responsible for maintenance of the breakwaters. Although extremely unlikely, occasional dredging may be required to maintain authorized entrance depths. Should dredging become necessary, a disposal site would need to be identified and measures taken to ensure that contaminated soils are handled in a proper manner. The City of Craig has identified its landfill as a possible upland disposal site in the event that maintenance dredging is required.

The U.S. Coast Guard will maintain navigational aids.

7.1.6.2 Non-Federal

Although unlikely, the City of Craig will perform maintenance dredging of the mooring basin, if necessary. The City of Craig will also maintain the float, utilities, etc. and operate the completed project.

7.1.7 Mitigation

Environmental impacts have been avoided to the extent possible through avoidance of dredging, choosing a site with the least environmental impacts, and providing for fish passage. A United States Forest Service archaeologist will monitor the removal of the existing piling and dock structures in order to provide mitigation under Section 106 of the NHPA.

7.2 Integration of Environmental Operating Principles

Environmental operating principles have been integrated into the planning process wherever possible. Specific considerations are included below.

Foster sustainability as a way of life throughout the organization: This project seeks to protect the subsistence lifestyle of the citizens of rural Alaska. This lifestyle relies on striking a balance between humans and their surrounding environment, taking only what is needed. In addition, this project will support the Alaskan fishing fleet. Alaska's fisheries are carefully managed to provide sustainable yields.

Proactively consider environmental consequences of all Corps activities and act accordingly: Environmental consequences were considered throughout the planning process and every effort has been made to avoid, minimize, or mitigate all anticipated impacts. These actions included eliminating dredging from consideration early on to avoid disturbing contaminated sediments, siting the harbor in an area that would minimize impacts to eelgrass and other resources, and providing for fish passage through a gap in the recommended plan's breakwater.

Create mutually supporting economic and environmentally sustainable solutions: The recommended plan is the NED plan and therefore provides the maximum amount of benefits to the nation. The project was formulated in a way that makes it lasting, requiring very little in maintenance, and avoids long term environmental impacts wherever possible.

Continue to meet our corporate responsibility and accountability under the law for activities undertaken by the Corps which may impact human and natural environments: A full environmental assessment was conducted as required by the National Environmental Policy Act. In addition, the principles of avoidance, minimization, and mitigation were enacted to the extent possible.

Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs: For this study, a systems approach was utilized to examine the interaction between marine, estuarine, and freshwater habitat units and to formulate the recommended project in a way that avoided impacts that would sever or otherwise disrupt those relationships. The project eliminated dredging in order to minimize the risk of disturbing contaminated sediments, both during construction and during subsequent operation and maintenance activities.

Leverage scientific, economic and social knowledge to understand the environmental context and effects of Corps actions in a collaborative manner: The Corps attended several meetings with the community and actively sought out local and institutional knowledge about the human and natural environments that would be affected, both positively and negatively, by action and inaction. Community feedback has been integral to proper formulation of alternatives.

Employ an open, transparent process that respects the views of individuals and groups interested in Corps activities: The Corps has followed all guidelines for public involvement and made every effort to be responsive to stakeholder concerns. Public input has been solicited throughout the study and used for both environmental and economic analysis purposes.

7.3 Real Estate Considerations

The project lies within Section 6, Township 74 South, Range 81 East, USS 1429A and ATS 212, Copper River Meridian. All submerged lands necessary for construction, operation, and maintenance of the proposed project are subject to navigational servitude. Lands, easements, relocations, and rights-of-way (LERRs) required for construction include those listed below in Table 31.

Table 31: LERRs Requirements

Features	Owner(s)	Acres	Interest	GNF/LSF
Entrance Channel, Breakwater (Portions Below MHW)	City of Craig and State of Alaska	8.4	Navigational Servitude	GNF
Breakwater (Portions Above MHW)	City of Craig	0.05	Fee Simple	GNF
Mooring Basin (Below MHW)	City of Craig and State of Alaska	10.1	Navigational Servitude	GNF
Temporary Staging	City of Craig	0.75	Temporary Work Area Easement	LSF

As shown above, all uplands necessary for construction, operation, and maintenance of the proposed project are currently owned by the City of Craig.

7.4 Summary of Accounts

7.4.1 National Economic Development

The recommended plan is the NED plan and provides the greatest amount of net annual benefits to the nation. It is the most effective plan at reducing damages and inefficiencies due to overcrowding and congestion at Craig's harbors.

7.4.2 Regional Economic Development

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 a number of 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.

7.4.3 Environmental Quality

Qualitative enhancements to the environment include a reduction in fossil fuel usage and emissions due to decreased travel for vessels permanently relocating to Craig from other homeports.

7.4.4 Other Social Effects

Construction of this project 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.

7.5 Risk and Uncertainty

As in any planning process, some of the estimates made in this report are uncertain. Elements of risk and uncertainty could affect the design and performance of the project, cost, and benefits. An ongoing effort to address risk has been made throughout the study process. Possible effects are detailed below.

7.5.1 Fleet Characteristics

The fleet associated with any one community is fluid in nature and subject to change. Surplus demand for moorage can often be determined by examination of a port's waitlist. However, there are no funds required to remain on Craig's waitlist and therefore vessels on the waitlist may not currently require moorage. This may be due to a cease in operations, change in geographic location, or acquisition of moorage in another location. Consequences to the study could include overestimation of surplus demand for moorage, and therefore construction of a project larger than what is needed. To mitigate this risk, a survey of vessel owners was completed. It is believed that this risk has been mitigated to the extent possible.

7.5.2 Wind and Wave Data

For this study, wind and wave data from NOAA was utilized in place of a detailed wind and wave analysis, which would have been cost and time-prohibitive. If the existing wave climate is greater than 4 feet, 4 seconds, a floating breakwater would not be possible. However, without evidence of a wave climate to this extent, cheaper floating breakwaters may be eliminated in favor of more expensive rubblemound breakwaters. The City of Craig was able to produce video of waves that appeared to be in excess of 4-feet, 4-seconds and there is local knowledge of a 2 foot southwesterly swell. Because of this, floating breakwaters were eliminated in favor of rubblemound breakwaters. It is believed that this risk has been mitigated to the extent possible.

7.5.3 Contaminated Soils

Because of the project area's historical uses and the former presence of contaminated soils in the uplands, it is assumed that there is contamination in the in-water sediments as well. Failure to fully account for contaminated soils could result in escalation of costs related to disposal of dredged materials, a longer construction process, and additional real estate requirements. To mitigate this risk, contamination of in-water sediments was assumed to be present and dredging was completely avoided. Dredging and disposal of dredged material would have proven to be costly, timely, and unnecessary. Eliminating dredging did not significantly affect the ability of the harbor to meet local moorage demand. In addition, it is believed that the majority of the contaminated sediments are located in the area immediately surrounding the existing boatway. This area does not lie within the footprint of the proposed breakwater alignment. Therefore, placing rock would not suspend contaminated soils in the water column. To any degree that sediments are suspended in the water column, it would likely be for a very short time as the substrates offshore are larger gravels and cobbles and expected to resettle very quickly. It is believed that this risk has been mitigated to the extent possible.

7.5.4 Sediment Properties

For the feasibility phase of this study, geotechnical borings were not conducted. Instead, it was assumed that the sediments within the breakwater footprint are diamicton soils. Diamicton soils are a very hard soil that is resistant to settling and are commonly found throughout Southeast Alaska. If softer soils were discovered during design, more material would be needed in the breakwater to account for settling, leading to higher project costs. However, the only sediment sources in the area are the creeks that flow into Crab Bay, nearly 1 mile to the east, and topographical alignments make it unlikely that these creeks contribute sediment directly to the project site. In addition, an underwater camera was used to examine the bottom materials at the project site. Evidence from this investigation suggests that soft soils are not present. Because of these factors, this risk was tolerated.

7.5.5 Fish Passage

Fish passage was incorporated into the final design of the recommended plan in concert with the study's goal of avoiding or minimizing environmental impacts to the extent possible. The passage opening was configured with input from USFWS. Given a known southwesterly swell that occurs during some storm events, it is possible that swell and waves could enter the protected area through this opening. This uncertainty has been mitigated to the extent possible through appropriate design. The Alaska District has an abundance of experience in including fish passage into breakwater designs. Because of these factors, this risk was tolerated.

7.5.6 Implementation of Recommended Plan

The Recommended Plan would meet the planning objectives in a number of ways. The construction of the breakwater would reduce damages to commercial fishing vessels, recreational vessels, subsistence vessels, and harbor infrastructure that result from overcrowding. It would reduce delays to vessels as a result of overcrowding at existing facilities. It would contribute to efficiencies by reducing travel times to the area by vessels currently homeported elsewhere. It would maintain nearshore fish passage and it would avoid disturbing contaminated soils.

There is not much uncertainty surrounding construction activities. The Alaska District has more than adequate experience in the design and construction of small boat harbors. This project has multiple local rock sources that could provide material to the project. The non-Federal partner is experienced in constructing, operating, and maintaining small boat harbors.

7.6 Implementation

7.6.1 Schedule

Item	Milestone	Date
Chief's Report	CW270	May 2016
Feasibility Report to Congress	CW180	August 2016
Sign PED Agreement	CW300	October 2017
Final Plans and Specifications	CW330	June 2018
Contract Award/Notice to Proceed	CW440	October 2018
Notice of Completion/Assumption of OMRRR	CW480	October 2020

7.6.2 Cost Sharing

7.6.2.1 Cost Apportionment

Construction of the project will be apportioned in accordance with the Water Resources Development Act of 1986, as amended. The fully funded cost apportionment for the project features is summarized in Table 32.

Table 32: Construction Cost Apportionment

	Cost Contribution (%)	
Portion of Project	**Federal**	**Non-Federal**
General Navigation Features (breakwater)	80	20
Local Service Facilities (floats)	0	100
Aids to Navigation (provided by USCG)	100	0

7.6.2.2 Cost Allocation

Table 33: Federal/Non-Federal Initial Cost Apportionment for Recommended Plan

Items	Total Project Costs	Implementation Costs			
		Federal	%	Non-Federal	%
General Navigation Features (GNF):					
Mobilization/Demobilization	$1,057,368	$951,631	90	$105,737	10
Breakwaters	$23,741,402	$21,367,262	90	$2,374,140	10
Preconstruction, Engineering, & Design	$4,264,327	$3,837,894	90	$426,433	10
Construction Management (S&A)	$2,275,797	$2,048,217	90	$227,580	10
LERRD (GNF) Administration Costs	$25,000	$0	0	$25,000	100
Subtotal GNF	$31,363,894	$28,205,005	90	$3,158,889	10
Additional Funding Requirement					
10% of GNF		($3,136,389)		$3,136,389	
GNF LERRD Credit		$0		$0	
Adjustment for GNF LERRD credit		($3,136,389)		$3,136,389	
Relocations (GNF not creditable)					
Subtotal of GNF Related Items	$31,363,894	$25,068,615		$6,295,279	
LERRD (GNF) Acquisition Credit	$0	$0	0	$0	100
Aids to Navigation	$18,316	$18,316	100	$0	0
Local Service Facilities (LSF):	$7,570,992	$0	0	$7,570,992	100
Final Initial Cost Requirements	$38,953,202	$25,086,931	64%	$13,866,271	36%

Note: May not equal previous tables due to differing calculations in PED, OMRR&R, and land acquisition costs.

The initial construction cost of the general navigation features is 90 percent for the initial Federal investment and 10 percent for the initial local share because there is no dredging greater than 20 feet. The non-Federal sponsor must also contribute an additional 10 percent, plus interest, during a period not to exceed 30 years after completion of the general navigation features. The sponsor will be credited toward this 10-percent cost with the value of LERRD necessary for construction, operation, and maintenance of the general navigation features. This post construction contribution is current estimated at $3,136,389 as shown below.

Table 34: Non-Federal Post Construction Contribution

Total GNF	10% of GNF	LERRD Credit	Non-Federal post-construction contribution
$31,363,894	$3,136,389	$0	$3,136,389

8.0 ENVIRONMENTAL CONSEQUENCES*

8.1 Physical Environment

8.1.1 Bathymetry, Currents, and Tides

Alternatives were specifically formulated to avoid dredging. Therefore there are no changes in sea floor profile outside of the footprint of the breakwater. The purpose of a breakwater is to alter currents and wave patterns in order to create a sheltered area for vessel moorage. Therefore, there is expected to be some localized changes to nearshore currents along the northwest shore of Craig Island. The area protected by the breakwater would experience reduced current velocities, potentially leading to an increased rate of sedimentation. However, construction and operation of the harbor would not impact existing area-wide currents and circulation patterns.

8.1.2 Water Quality

Impacts to the waters of the United States are expected to be less than significant. During the removal of the existing piles and construction of the new breakwater, there is likely to be a temporary increased concentration of suspended sediment within the water column in nearshore areas with finer substrates. Placement of the breakwater's base rock will loft finer sediments into the water column and residual fines on the surface of core and armor rock will also contribute to temporary localized increases in turbidity. However, given the poor condition of the existing piles, it is possible that they could simply be cut or broken at the seabed rather than being extracted. This could reduce the amount of sediment disturbed during removal. Since the existing pilings nearest to the shore are located in an area conservatively assumed to contain contaminated sediments, minimization of sediment disturbance during demolition of these particular piles is a significant consideration.

8.1.3 Air Quality

Air quality in the immediate project area would be affected by emissions from the harbor. Equipment used during the construction process will likely be diesel-powered. This will include both equipment used to haul rock to the project site and equipment used to place the rock once it is at the project site. Dust emissions will likely be minimized through the wet working conditions associated with harbor construction and prevailing weather patterns in the area. Construction-related emissions would be intermittent, occurring only during work hours. They would also be temporary in nature as they would end at the completion of construction. Vessels transiting to and from the newly-constructed mooring basin would be the primary source of air pollutants once construction ended. Pollutants generally found at harbors are nitrogen oxides, carbon monoxide, sulfur dioxide, and particulate matter less than 10 microns in diameter related to fuel combustion.

Air quality in the Craig area is not expected to be significantly impacted by construction or operation of a new harbor. New permanent emission sources will be limited to vessels relocating from other communities seeking permanent moorage at a newly constructed harbor. There is also likely to be a number of transient vessels seeking temporary moorage during various fishing seasons. Because of the limited number of new emission sources and strong meteorological influences in the area, National Ambient Air Quality Standards are not likely to be exceeded.

8.1.4 Noise

Construction of the new harbor will generate noise both above and below the water surface. Water-propagated noise and its effects on marine life are discussed in subsequent section. Air-propagated noise above typical levels will be present during the operation of construction machinery and vessels during transportation and placement of rock and fill material. The nearest residential buildings to the project site are located several hundred feet from the closest on-shore construction activities, (staging of vehicles and stockpiling of materials). This should help minimize disturbances to the community during construction. The Corps will work with the community to devise work schedules and heavy equipment traffic patterns that minimize noise and disruption within the community.

8.2 Biological Resources

8.2.1 Terrestrial Habitat

Adverse impacts to terrestrial habitat will be negligible as most construction activity will be offshore and the adjacent uplands have been commercially developed for a number of years. Onshore activity will mostly consist of staging and lay-down of construction equipment and material within open areas. Any urban-acclimated wildlife living within the existing cannery property may be displaced by increased noise and activity and move into similar habitat in adjacent areas.

8.2.2 Marine Habitat

8.2.2.1 Intertidal Zone

A portion of the west breakwater will be placed between MHW and MLW. This portion of the breakwater will cover less than 1 acre of intertidal zone, replacing the existing flat gravel and cobble habitat in that area will large rock surfaces. The new large rock surfaces are expected to be colonized by the same marine algae and invertebrate species observed growing on existing cobbles.

8.2.2.2 Subtidal Zone

The placement of rock for the breakwaters would significantly alter the subtidal habitat in the project area, replacing the existing flat sand and gravel substrate with large vertical and horizontal rock surfaces and introducing vertical structure were very little currently exists. The breakwaters would eliminate less than one-half acre of eelgrass beds, a portion of the dense

Saccharina community along the north shore of Craig Island, and an unknown but small extent of *Macrocystis* perennial kelp off the west shore.

The rock surfaces of the breakwater will likely rapidly recruit new growths of marine algae. A study of new rubblemound breakwaters at Sitka, Alaska, (130 miles north of Craig), evaluated the development of herring spawning habitat, (specifically the growth of suitable marine algae), over the 10 years following completion of the breakwaters in 1995 (Brockman and Grossman 2005). The study found that the breakwaters recruited algae and other marine organisms rapidly over the first several years, steadily increasing in density and diversity of species. After 5 years, algae had become well established on the seaward side of the breakwaters and were continuing to colonize the harbor side of the breakwaters at a slower rate. Heavy and extensive herring spawn was noted on the seaward side of the breakwaters. The report found that for the 5-year study period, overall herring spawn had decreased within the harbor basin when compared to areas outside the harbor basin with decreased water circulation and related sedimentation identified as likely causes. However, 10 years after construction, both the seaward and harbor sides showed robust stands of macro-algae including species of kelp that provide good substrate for herring spawn (*Saccharina latissima* and *Agarum fimbriatum*). The primary difference between the inside and outside of the Sitka breakwaters after 10 years was the presence of perennial kelp (*Macrocystis pyrifera*) outside the breakwaters but absent inside. Perennial kelp provides highly productive herring spawn substrate due to its large leaf area. It was unclear why perennial kelp was largely absent on the harbor side of the Sitka breakwaters.

The subtidal environment along the north shore of Craig Island is known to be an area of relatively low herring spawn activity compared with nearby areas along the west shore of Craig Island and Fish Egg Island. The beds of sugar kelp growing on the bottom of much of the project area are suitable for herring, but the density of sugar kelp beds throughout the greater area, a lack of perennial kelp along the north shore of Craig Island, and a lack of protection near the project site may reduce its attractiveness to spawning herring.

Based on the existing subtidal environment at Craig and the observations of algae recruitment at Sitka, it is reasonable to expect that the breakwater constructed at Craig would result in a net increase in quality herring spawning habitat and general marine organism diversity in the project area. A small area of perennial kelp would be buried under the western arm of the breakwater but this effect would be mitigated to a great degree by the creation of substrate for a diverse community of kelp and other marine algae. The north arm of the breakwater would create an entirely new platform for algae growth in deep waters that currently offer very little in the way of algae habitat.

Most of the eelgrass bed extending across the project site would not be directly affected. The western arm of the breakwater is likely to bury a small area at the extreme west end of the eelgrass bed. However, the reduced current velocities within the new harbor basin may encourage a slight expansion of the eelgrass bed. Extensive bands of eelgrass are present all along the waterfront and within North Cove harbor. The development of a new harbor is unlikely to have an obvious adverse effect on the existing beds of eelgrass outside of the breakwater's footprint.

Several construction projects on Prince of Wales Island have reportedly led to environmental problems due to the use of gravel made from acid-generating, high-sulfide rock. The Corps will bear this in mind in the selection of rock sources for constructing the breakwaters or placing fill in the marine environment. Sources of rock that are currently under consideration include limestone from a quarry on Wadleigh Island at the north end of Klawock Inlet and greywacke from a quarry on San Jan Bautiste Island to the southwest. Both types of rock have a minimal risk of generating acid leachate when exposed to air and water. Standard tests such as the Net Neutralizing Potential test can determine the acid-generating potential of mine tailings and waste rock but it is not clear how appropriate these tests would be for large rock placed in the marine environment.

8.2.2.3 Marine Birds

During construction activities the few marine birds using the project area would quickly move to similar or superior habit available elsewhere in Klawock Inlet. The removal of the existing piles and dock would result in the loss of roosting habitat for gulls and shorebirds. However, those species are likely to rapidly make use of the new breakwaters as roosting and foraging habitat. Therefore no net loss of marine bird habitat will result from construction of the harbor. The only bird species that may experience a permanent loss of habitat is a flock of feral pigeons roosting and possibly nesting in the existing dock. The pigeons would likely move to other structures or buildings in the nearby waterfront area. No mitigation is proposed for the loss of pigeon habitat.

8.2.2.4 Marine Fish and Invertebrates

Breakwater construction would eliminate approximately 7 acres of existing submerged habitat consisting of a combination of deep-water benthic communities and shallower kelp beds. The breakwater would permanently replace existing habitat with rocky substrate extending from the seabed to the surface, introducing structure and vertical relief where none currently exists.

As discussed previously, marine algae and invertebrates that are characteristic of rocky intertidal and subtidal habitats can be expected to rapidly colonize the breakwaters, adding diversity of species to the area. The new species can be expected to include stalked marine algae such as *Fucus* as well as kelps, barnacles, mussels, anemones, and sea stars. The growth of sessile organisms on the breakwater surface would provide food and cover for shrimp and fish. Based on studies of rubblemound breakwaters installed in a similar setting in Sitka, Alaska, once the breakwater at Craig is vegetated, there will be spawning and rearing habitat for Pacific Herring that is superior to what currently exists at the project site.

8.2.2.5 Marine Mammals

Marine mammals may avoid the area or be temporarily displaced as a result of in-water construction and project vessel movements. No blasting or pile-driving is anticipated as part of the Federal project so injurious high-amplitude underwater noise should not result from construction. The placement of rock in the water for the creation of the breakwaters would generate relatively low-amplitude underwater noise likely to cause marine mammals to temporarily move away from the construction site. The noise generated by barges and tugs in transit to and from the work area would be similar to that generated by routine small vessel traffic in the shipping lanes. Low levels of turbidity generated by fill and rock placement may cause marine mammals to avoid the area until turbidity levels returned to background levels. The completed project would not result in the loss of habitat valuable to marine mammals. Conversely, rubblemound breakwaters can be expected to provide additional spawning and rearing habitat for Pacific herring and other forage species.

Marine mammals present in the project area that are not protected under the ESA are protected under the MMPA. The mitigatory steps to be implemented for ESA species will also be applied to species protected under the MMPA.

8.2.3 Federal and State Threatened and Endangered Species

8.2.3.1 Present Species

The ESA-listed species under consideration is the humpback whale. The expected project effects on humpback whales are the same as those described for marine mammals in the preceding section. The Corps made a determination that the project “may affect, but not adversely affect” humpback whales in a letter to NMFS on June 13, 2014. NMFS concurred with this determination in a letter dated July 9, 2014, which stated that humpback whales were not likely to be adversely affected by the project (NMFS 2014d). This letter reiterated that ESA-listed Western DPS Steller sea lions are unlikely to be found in the Craig area and that consultation for that species is not required for this project.

8.2.3.2 Proposed Mitigation

To minimize the risk of harm to listed and protected marine species including: ESA-listed Humpback Whales, species protected by the MMPA, Yellow-Billed Loons, and marine turtles, the Corps proposes the following mitigation measures:

- Project vessels will be limited to a speed of 8 knots to reduce the risk of collisions with protected species.
- Workers conducting in-water construction will be instructed to watch for marine animals and cease work if a marine mammal approaches within 50 meters of their activity.
- In-water work will be avoided between 15 March and 15 June in order to avoid the peak herring spawn and juvenile salmon out-migration periods as well as the period when

humpback whales and other marine mammals are most likely to be present in the project area.

- The selected contractor will include an Oil Spill Prevention and Control Plan in its Environmental Protection Plan, which will be submitted to the Corps for review and approval.

The Corps does not know of a specific means of detecting or protecting ESA-listed fish that may incidentally enter the project area. Sound environmental practices intended to protect fish in general, such as implementation of an Oil Spill Prevention and Control Plan, restrictions on grounding project vessels, etc., will serve to limit risk to individual adults from ESA-listed fish stocks that may enter the project area.

8.2.3.3 Determination

With the provision of the mitigation steps outlined above, the Corps determines that the project activities are "not likely to adversely affect" humpback whales and seeks concurrence with this determination from NMFS. In accordance with the Endangered Species Act, the proposed project will have no effect upon the continued existence of any Federally-listed threatened or endangered species or designated critical habitat, and therefore does not require formal Section 7 consultation.

8.2.4 Special Aquatic Sites

The band of eelgrass extending through the project area constitutes a special aquatic site under the Clean Water Act Section 404(b)(1) guidelines. Within the general project area, the 1998 survey plotted the eelgrass as two polygons on either side of the old cannery pier including a 0.66-acre bed to the west and a 1.02-acre bed to the east (as shown in Figure 9).

The westernmost extent of this eelgrass bed is not precisely known, but it most likely ends at the reef upon which the western alignment of the breakwater will be built. The western alignment of the breakwater may encroach upon a very small portion of the area thought to contain eelgrass with total eelgrass affected expected to be approximately 0.3 acres.

No mitigation is proposed for the potential loss of this small area of eelgrass. The surrounding areas contain widespread and abundant beds of eelgrass. Transplantation of the eelgrass to another nearby location would have little value since all habitat that is suitable for eelgrass growth already contains eelgrass. North Cove Harbor and other high-use areas along the Craig waterfront host eelgrass beds, so construction of the recommended plan would not in and of itself necessarily affect existing eelgrass. The float system to be constructed by the non-Federal sponsor outside of the Federal action may affect existing eelgrass to some degree through shading. However, these effects can be minimized through utilizing light-permeable materials in float construction.

8.2.5 Essential Fish Habitat

NMFS has designated the southern end of Klawock Inlet as essential fish habitat for all five species of Pacific salmon, at all life stages (NMFS 2014b). The project area does not contain spawning habitat and has limited value as juvenile rearing habitat. It is most likely to be used as a migration corridor to and from Crab Creek and other anadromous streams in the region as the shallow nearshore waters may serve as protection from predators. The proposed breakwater has the potential to negatively affect salmon movement through the nearshore environment by diverting salmon into deeper waters, which increases predation, and lengthening the distance traveled through the area. The recommended plan includes a fish passage gap in the breakwater to minimize impacts on fish movements. The Corps has collaborated with USFWS, ADFG, and NMFS regarding fish passage design requirements that allow proper passage while simultaneously preserving breakwater functionality.

8.3 Cultural and Subsistence Activities

The project site has not served as an important area for subsistence activities in recent history due to its proximity to the cannery site. The existing pilings and debris in the water make the site difficult to approach via water, and contamination at the cannery has no doubt discouraged subsistence gathering along the shore. The relatively small size and low productivity of the project site, especially when juxtaposed with an abundance of highly productive surrounding areas, also reduces the value of the project site for subsistence purposes.

The completed project would improve access to subsistence resources in the region by creating additional boat moorage space for the community.

8.4 Coastal Zone Resource Management

Alaska's Coastal Zone Management Program expired on June 30, 2011. Project proponents are no longer required to evaluate projects for consistency with enforceable standards of coastal management plans. Those plans do, however, offer useful criteria for evaluating projects in the coastal zone.

The project is consistent with the coastal management plan's general goals of protecting and prioritizing subsistence and recreation uses, and limiting impacts on coastal resources and processes. If the former Alaska Coastal Zone Management Program is reinstituted prior to construction of this project, the project would be submitted to the State of Alaska for coastal consistency review.

8.5 Historical and Cultural Resources

Coordination with the State of Alaska State Historical Preservation Officer under Section 106 of the National Historic Preservation Act (NHPA) has commenced regarding removal of the piles and dock that are slated for removal as part of the tentatively selected plan. A U.S. Forest

Service archaeologist will be present to monitor the removal and disposal of the piles and dock in accordance with Section 106 of NHPA.

8.6 Environmental Justice and Protection of Children

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”, requires Federal agencies to identify and address any disproportionately high and adverse human health effects of its programs and activities on minority and low-income populations. The proposed project is not expected to adversely impact these populations.

8.7 Unavoidable Adverse Impacts

Any impacts as a result of construction of this project are expected to be less than significant and temporary in nature. The principle unavoidable impact of breakwater construction will likely be the permanent alteration of subtidal habitat within the breakwater footprint. However, the habitat created by breakwater construction is likely to be at least as productive as the existing habitat and the adverse impacts would be localized to the immediate habitat and organisms eliminated by placement of stone during breakwater construction.

8.8 Cumulative and Long-term Impacts

Federal law (33 CFR 230 et seq.) requires that NEPA documents assess cumulative effects, which are the impact on the environment resulting from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions.

Construction of the recommended plan will substantially increase available vessel moorage capacity along the Craig waterfront, which increases the risk of fuel spills and long term environmental degradation that can occur with development. However, the fact that the project area has already been affected by long term commercial use limits the environmental impacts that the project will cause within the immediate area. Marginal impacts to this already impacted site are less than would occur if a more pristine, undeveloped site were chosen for construction of a harbor.

Most of the northern shore of Craig Island has already been developed to some extent for marine transportation and other commercial uses. Future development beyond the scope of the recommended plan would likely consist of replacement or repurposing of existing facilities. Rehabilitation of the Ward Cove Cannery property has been proposed by the City of Craig. This action in concert with construction of the recommended plan would greatly increase the level of human activity at the northwest corner of Craig Island. The level of vessel traffic may increase but to a certain degree, the vessels that would moor inside a new harbor already visit the area. Some vessels are assumed to relocate to Craig from other areas but their level of activity (fishing) is not expected to increase. Any increase in vessel traffic is not expected to adversely impact marine life.

8.9 Summary of Mitigation Measures

The following measures are being included in the recommended plan in order to avoid or reduce environmental impacts.

The project will not include dredging of the harbor basin in order to preserve the eelgrass beds present within the project area and to avoid disturbing contaminated sediments present from previous commercial activity within the project site. During pile removal, the piles will be cut at grade instead of extracted in order to minimize sediment mobilization.

The breakwater design will incorporate fish passage in order to limit the effects of the breakwater on nearshore fish movements.

To the extent practicable, work below the high tide line will be limited to low tidal stages to reduce turbidity.

Project vessels will be limited to a speed of 8 knots in order to reduce the risk of collisions with protected species.

Workers conducting in-water construction will be instructed to watch for marine mammals and to cease work if an animal approaches within 50 meters.

In-water work will be avoided between March 15th and June 15th. This period coincides with the peak herring spawning season, juvenile salmon out-migration, and the time in which humpback whales and other marine mammals are most likely to be present in the project area.

The selected contractor will include an Oil Spill Prevention and Control Plan in its Environmental Protection Plan. This plan will be submitted to the Corps for review and approval.

9.0 PUBLIC AND AGENCY INVOLVEMENT*

9.1 Public/Scoping Meetings

A charette was held in November 2012. Officials from the City of Craig, a number of local fishermen, other stakeholders, and representatives from the U.S. Army Corps of Engineers, Alaska District, Pacific Ocean Division, and Headquarters were present. During this meeting, various sites and alternatives were discussed including the positive and negative potential effects of each.

A public presentation was made at the February 2014 City Council meeting. During this presentation, the Corps presented an update on study progress and enumerated remaining tasks and risks. An additional presentation was made at the November 2014 annual Craig Tribal

Council meeting which provided more information on the study progress and expected release of the draft report.

9.2 Federal and State Agency Coordination

9.2.1 Relationship to Environmental Laws and Compliance

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

This Act requires that environmental consequences and project alternatives be considered before a decision is made to implement a Federal project. NEPA established the requirements for preparation of an Environmental Impact Statement (EIS) for projects potentially having significant environmental impacts and an Environmental Assessment (EA) for projects with no significant environmental impacts. This EA has been prepared to address impacts and propose avoidance and minimization steps for the proposed project, as discussed in the CEQ regulations on implementing NEPA (40 CFR 1500 et seq.). This document presents sufficient information regarding the generic impacts of the proposed construction activities at the proposed Little Diomede project to guide future studies and is intended to satisfy all NEPA requirements.

In accordance with NEPA and Corps regulations and policies, the EA and Finding of No Significant Impact (FONSI) will be circulated for public and agency review, and the EA will be made available on the Alaska District website to the interested public prior to the implementation of this proposed action.

9.2.1.2 Clean Water Act Of 1972 (33 USC 1251 et seq.)

The objective of the Federal Water Pollution Control Act of 1972, as amended by the Clean Water Act (CWA) of 1977 (Public Law 92-500), is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Specific sections of the CWA control the discharge of pollutants and wastes into aquatic and marine environments.

The specific sections of the CWA that apply to the proposed project are Section 404, addressing the discharge of fill material to waters of the United States, and Section 401, which requires certification that the permitted project complies with the State Water Quality Standards for actions within State waters. The enforcement agency for Section 404 is the U.S. Army Corps of Engineers; the Corps does not issue permits to itself, but will prepare an evaluation of the effects of its proposed discharge under Section 404(b)(1), available in Appendix 1.

The Corps will comply with Section 401 by applying for water quality certification from the State of Alaska Department of Environmental Conservation. The major action of the project invoking this regulation is the placement of rock into nearshore waters to create the breakwaters although other actions with the potential to affect water quality (e.g. disturbance of sediment during removal of the existing offshore structures) are also considered in the 404(b)(1) evaluation.

9.2.1.3 Rivers and Harbors Act of 1899 (33 USC 403 et seq.)

Section 10 of this Act prohibits the obstruction or alteration of navigable waters of the U.S. without a permit from the U.S. Army Corps of Engineers. The Corps does not issue permits to itself, so no specific permit is required under this act.

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

The Endangered Species Act (ESA) protects threatened and endangered species by prohibiting Federal actions that would jeopardize continued existence of such species or result in destruction or adverse modification of any critical habitat of such species. The Corps is required to coordinate with both the USFWS and NMFS to identify what ESA-listed species under those agencies respective jurisdictions may be present in the project area. The Corps then assesses how the proposed Federal action may impact listed species and makes one of several determinations including: "No Effect", "May Affect but Not Adversely Affect", and "May Affect and Likely to Adversely Affect". If the determination is "No Effect" then the action may proceed without consultation with NMFS. However, ESA Section 9 prohibitions will apply if unanticipated take to a listed species occurs.

If the determination is "May Affect but Not Likely to Adversely Affect", NMFS must be consulted. During consultation NMFS will review the Biological Assessment (if prepared by the Corps) and either concur with the determination, end the consultation process and allowing the project to proceed, or not concurring and recommending changes or mitigation measures to remove any adverse effects and ending formal consultation.

If the determination is "May Affect and Likely to Adversely Affect", the Corps would need to enter into formal consultation with NMFS. The action may not proceed as designed until formal consultation is complete. During formal consultation NMFS will review the Biological Assessment and prepare a Biological Opinion.

The Corps has determined in this document that the recommended project will have "No Affect" on ESA-listed species under USFWS jurisdiction as no such species are present in the project area. The Corps made a determination to NMFS that the recommended project "May Affect but Not Likely to Adversely Affect" humpback whales. NMFS concurred in a letter dated 9 July 2014.

9.2.1.5 Fish and Wildlife Coordination Act (16 USC 661 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires the Corps to consult with the USFWS whenever the waters of any stream or other body of water are proposed to be impounded, diverted, or otherwise modified. The act authorizes USFWS to take the lead in consultation, to conduct surveys and investigations to determine the possible damages of proposed actions on wildlife resources, and to make recommendations to the Corps regarding measures to prevent the loss or damage to wildlife resources, as well as the development and improvement of such resources. The Corps is authorized to transfer fund to USFWS to carry out these investigations. The Corps shall give full consideration to the reports and recommendations of the wildlife agencies and include such justifiable means and measures for wildlife mitigation or enhancement as the Corps finds should be adopted to obtain maximum overall project benefits.

The Corps invited USFWS, NMFS, and ADFG to engage in FWCA coordination in its initial round of correspondence and received a Planning Aid Letter from USFWS. Findings and recommendations included in the Planning Aid Letter were taken into consideration and included in project design where appropriate.

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

The Magnuson-Stevens Fishery Conservation and Management Act provides for the conservation and management of all fishery resources between 3 and 200 nautical miles offshore. The 1996 amendments to this act require regional fisheries management councils, with assistance from the NMFS, to delineate Essential Fish Habitat (EFH) in Fishery Management Plans (FMPs) for all managed species. EFH is defined as an area that consists of "waters and substrate necessary for spawning, breeding, feeding or growth to maturity" for certain fish species. Federal action agencies that carry out activities that may adversely impact EFH are required to consult with the NMFS regarding potential adverse effects of their actions on EFH. An EFH assessment is provided as an appendix to this report.

The Corps has coordinated with NMFS and received general recommendations to avoid and minimize impacts to EFH. The Corps has adopted many of these recommendations and is continuing to develop practicable fish passage options for the project in order to minimize impacts to juvenile salmon and herring.

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

The Marine Mammal Protection Act (MMPA) provides protection to marine mammals in both State waters (within 3 nautical miles from the coastline) and the ocean waters beyond. As specified in the MMPA, USFWS is responsible for the management of polar bears, walrus, and sea otters; NMFS is responsible for all other marine mammals such as whales, porpoises, and seals. The Corps is required to coordinate with these agencies on potential impacts to species covered by this act and must address these agencies' concerns and recommendations.

Corps coordination with NMFS included discussions of MMPA species. The measures adopted to avoid and minimize potential harm to the ESA-listed humpback whale will also be applied to any marine mammals encountered at the project site during construction.

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

The essential provision of the Migratory Bird Treaty Act makes it unlawful, except as permitted by regulations, "to pursue, hunt, take, capture, kill…any migratory bird, any part, nest or egg," or any product of any bird species protected by the convention. The Corps is required to avoid a taking under this act during construction of a project. Avoidance often takes the form of construction during windows that limit brush clearing or ground preparation to periods outside of typical nesting periods for protected birds or discouraging birds from nesting within the construction area using exclusion or scare devices.

No birds protected under the MBTA are known to nest on the limited upland area that will be affected by the project, (Feral Pigeons roosting in the old cannery pier are not protected under the MBTA). The Corps will assess construction access and laydown areas once those are identified by the contractor for their potential as bird nesting habitat and apply timing windows or exclusion methods where applicable.

9.2.1.9 National Historic Preservation Act of 1966, as amended (16 USC 470 et seq)

The purpose of the NHPA is to preserve and protect historic and prehistoric resources that may be damaged, destroyed, or made less available by a project. Under this Act, Federal agencies are required to identify cultural or historic resources that may be affected by a project and to consult with the State Historic Preservation Officer (SHPO) when a Federal action may affect cultural resources.

The Alaska District archaeologist has identified the old cannery pier and boat haulout as historic structures within the area of potential effect but noted that a future survey was needed to determine the age, construction type, historical significance, and integrity of the pier and haulout before a determination of eligibility could be made. These determinations have been made in a letter to the SHPO on July 16, 2014.

9.2.1.10 EO 12898 – Environmental Justice and Protection of Children

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" requires the Corps to identify and address any disproportionately high and adverse human health effects of its programs and activities on minority and low-income populations.

The recommended project is not immediately adjacent to any low-income or minority residential areas. The harbor should be an asset to the community that improves subsistence and coastal resources access for all of the area's residents. The Corps does not foresee that construction of the recommended plan would create disproportionate adverse effects on the more vulnerable elements of the community.

9.2.1.11 EO 13112 – Invasive Species

Executive Order 13112, "Invasive Species" requires the Corps to prevent the introduction of invasive species to project construction sites.

The project is expected to involve locally quarried rock and locally contracted heavy machinery and barge. Therefore, the risk of introducing invasive species to the site is minimal.

9.2.2 Status of Project Coordination

As of December 2014, coordination activities with major resource agencies were ongoing and described in the sections below.

9.2.2.1 Alaska Department of Fish and Game

The Corps notified ADFG of the proposed project in a letter dated 7 March 2014, addressed to Mark Minnillo at the ADFG office in Craig. The Corps followed up with emails and an attempted personal visit to the Craig office in April 2014. The Corps received an email response from ADFG biologist Scott Walker on 30 May 2014 in which he described his field experience in the project area. Mr. Walker stated that the project area is used by out-migrating pink salmon but avoided by spawning herring which prefer the large kelp beds immediately south of the project area. He recommended a gap in the breakwater for juvenile salmon and herring passage but thought that the breakwater would eventually provide new spawning habitat for herring.

Mark Minnillo provided recommendations in an email dated 22 July 2014 responding to an email discussion on fish passage between the Corps, USFWS, and ADFG. Mr. Minnillo's recommendations are:

"The opening in the breakwater does not appear to be substantial enough to actually provide any benefit to rearing salmonids moving through the area. The opening in the breakwater should be deeper to allow flow for more than 1 foot for 1 hour per day. Perhaps the opening could be such that, referring to the map, the end of the shorter part of the breakwater could extend beyond and to the outside of the larger part of the breakwater."

"As it is drawn, the proposed dock would be located over the eelgrass bed. The entire dock facility should be moved seaward toward deeper water to avoid the eelgrass bed."

"All rock used for the breakwater should be tested to determine that it is not toxic or acid-generating in order to avoid impacts to marine life."

In response to Mr. Minnillo's recommendations, the Corps has revisited the design of the breakwater gap using criteria obtained from USFWS (email dated 24 July 2014) and has investigated the best methods of avoiding the use of acid-generating rock. The float design to which Mr. Minnillo referred was conceptual. The actual layout is the responsibility of the City of Craig. All ADFG recommendations have been implemented to the extent practicable.

9.2.2.2 Alaska Department of Natural Resources, Office of History and Archaeology

The Alaska District archaeologist Erin Laughlin prepared a letter to SHPO dated 16 July 2014 in which she outlined the known history of the site and existence of documented historic properties. The archaeologist identified the old cannery pier and boat haulout as historic structures within the area of potential effect but noted that further survey was needed to determine the age, construction type, historical significance, and integrity of the structures before a determination of eligibility could be made.

9.3 Status of Environmental Compliance (Compliance Table)

Table 35: Summary of Relevant Federal Statutory Authorities

Federal Statutory Authority	Compliance Status
Clean Air Act, as amended	FC
Clean Water Act of 1977, as amended	PC
Coastal Zone Management Act of 1982	N/A
Endangered Species Act of 1973, as amended*	FC
Fish and Wildlife Coordination Act, as amended	FC
Marine Mammal Protection Act	FC
Marine Protection, Research, and Sanctuaries Act of 1972	FC
Migratory Bird Treaty Act of 1918*	FC
Magnuson-Stevens Fishery Conservation and Management Act*	FC
National Environmental Policy Act of 1969, as amended*	PC
National Historic Preservation Act of 1966, as amended*	PC
Protection of Wetlands (Executive Order 11990)	FC
Rivers and Harbors Act of 1899	FC

PC = Partial Compliance, FC = Full Compliance
**- Full compliance will be attained upon completion of the public review process and/or further coordination with responsible agencies*
Note: This list is not exhaustive.

9.4 Views of the Sponsor

The City of Craig has expressed ongoing, enthusiastic support for the recommended plan and is seeking funding opportunities that would allow for a smooth transition into both the design and construction phases of the project.

10.0 CONCLUSIONS AND RECOMMENDATIONS*

10.1 Conclusions

The proposed construction of a new harbor as discussed in this document would have minor but largely controllable short term environmental impacts. However, in the long term it would help improve the overall quality of the human environment. This assessment supports the conclusion that the proposed project does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, a finding of no significant impact will be prepared.

10.2 Recommendations

I recommend that the navigational improvements at Craig, Alaska be constructed generally in accordance with the plan herein, and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable at an estimated total Federal cost of $25.1 million and $60,300 annually for Federal maintenance provided that prior to construction the local sponsor agrees to the following:

a. Provide, during the period of design, 10 percent of design costs allocated by the Government to commercial navigation in accordance with the terms of a design agreement entered into prior to commencement of design work for the project; and provide, during the first year of construction, any additional funds necessary to pay the full non-Federal share of design costs allocated to the Government to commercial navigation in accordance with the cost sharing as set out in paragraph b., below;

b. Provide, during construction, 10 percent of the total cost of construction of the general navigation features attributable to dredging to a depth not in excess of 20 feet; plus 25 percent of the total cost of construction of the general navigation features attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet; plus 50 percent of the total cost of construction of the general navigation features attributable to dredging to a depth in excess of 45 feet;

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, up to an additional 10 percent of the total cost of construction of the general navigation features. The value of lands, easements, rights-of-way, and relocations provided by the non-Federal sponsor for the general navigation features, described below, may be credited toward this required payment. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-Federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of-way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

d. Provide all lands, easements, and rights-of-way, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction or operation and maintenance of the general navigation features (including all lands, easements, and right-of-way, and relocations necessary for dredged material disposal facilities);

e. Accomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government;

f. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, the local service facilities consisting of the existing float system and additional floats added to accommodate the fleet designed for the recommended project in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government.

g. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share thereof, to meet any of the non-Federal obligations for the project unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;

h. Shall prepare and implement a harbor management plan that incorporates best management practices to control water pollution at the project site and to coordinate such plan with local interests;

i. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Par 24, in acquiring lands, easements, and rights-of-way required for construction or operation and maintenance of the general navigation features and the local service facilities, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

j. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of operating and maintaining the general navigation features;

k. Hold and save the United States free from all damages arising from the construction or operation and maintenance of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

l. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total costs of construction of the general navigation features, and in accordance with the standards for financial management systems et forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 CFR Section 33.20;

m. Comply with all applicable Federal and State laws and regulations, including, but not limit to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7 entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*) the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);

n. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-520, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction or operation and maintenance of the general navigation features. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

o. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction or operation and maintenance of the general navigation features;

p. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA; and

q. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 101(e) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2211), which provides that the Secretary of the Army shall not commence the construction of any water resources project, or separable element thereof, until each non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element.

The recommendations for implementation of navigation improvements at Craig, Alaska reflect the policies governing formulation of individual projects and the information available at this time. They do not necessarily reflect the program and budgeting priorities inherent in the local and State programs or the formulation of a national civil works water resources program.

Consequently, the recommendations may be changed at higher review levels of the executive branch outside Alaska before they are used to support funding.

Date: ______________________

____
COL Christopher D. Lestochi
Commander
Corps of Engineers, Alaska District

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Appendix A

Section 404(b)(1) Evaluation

Appendix B

Essential Fish Habitat Assessment

Appendix C

Hydraulics and Hydrology

Appendix D

Economics

Appendix E

Geotechnical Evaluation

Appendix F

Cost Engineering

Appendix G

Real Estate