ST. GEORGE HARBOR IMPROVEMENT FEASIBILITY STUDY

ENVIRONMENTAL ASSESSMENT

ST. GEORGE, ALASKA



May 2020



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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Alaska District (POA), Pacific Ocean Division (POD), has prepared this Environmental Assessment (EA), to evaluate the potential impacts of constructing a small boat harbor on the north side of Saint George Island, Alaska. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation ER 200-2-2. This EA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander, U.S. Army Corps of Engineers, POA District to make an informed decision on the appropriateness of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

1.1 Background

St. George is the southernmost island of the Pribilof Islands group. It is located in the southeastern Bering Sea and shares the name with the Island's only community (Figure 1). The Island was not inhabited prior to Russian expansion into Alaska. In 1787, the Russian fur-hunting companies established seasonal sealing camps along the coasts of St. George and conscripted labor from the Unangax population from a number of islands in the Aleutian chain, and resettled them on the Island (Eldridge 2016). The United States purchased the Pribilof Islands from Russia in 1867, after which St. George and the fur seal industry were managed by the Alaska Commercial Company (ACC) under the authority of the United States Treasury. Since the cessation of commercial seal harvesting in 1973, the community of St. George has been attempting to expand and diversify its economic base, concentrating on the groundfish and shellfish industries. Currently, a small boat harbor exists at Zapadni Bay on St. George Island; however, it is operationally limited. It has not enabled the St. George community to establish a viable fishery-based economy. The current conditions in the harbor are unsafe due to wave climate in the harbor entrance, seiche conditions within the inner basin, and degradation and overtopping of the existing breakwaters. These unsafe conditions limit the use of the harbor for potential users.

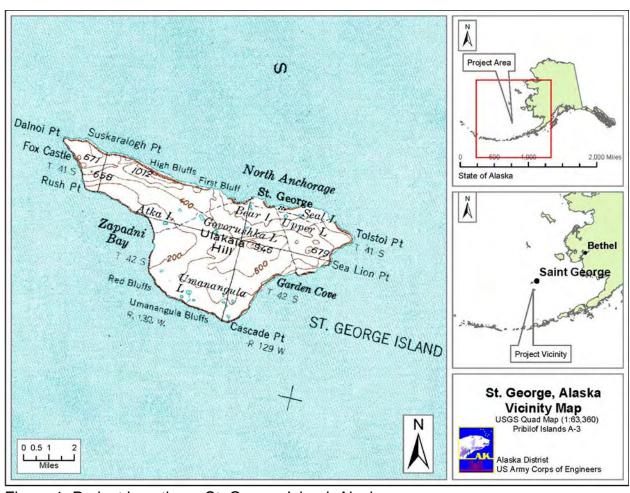


Figure 1. Project Location – St. George Island, Alaska

1.2 Purpose and Need for the Proposed Action

The purpose of the proposed action is to increase the safe accessibility of marine navigation to the community of St. George, Alaska. The need for the project is to reduce hazards to provide better safe navigation of subsistence vessels, fuel barges, cargo vessels, and a limited commercial fleet, all of which are critical to the long-term viability of the mixed subsistence-cash economy of St. George.

1.3 Authorizing Federal Laws, Executive Orders, and Supporting Agency Guidance

1.3.1 USACE Authorities

The General Investigations study to which this EA applies is being conducted under authority granted by Section 4010 of the Water Resources Development Act (WRDA) of 2007, Public Law 110-114 which authorizes a study to determine the feasibility of providing navigation improvements at St. George, Alaska.

The proposed action is justified by Section 2006 of WRDA, 2007, Remote and Subsistence Harbors, as modified by Section 2104 of the Water Resources Reform and Development

Act of 2014 (WRRDA 2014) and further modified by Section 1105 of WRDA 2016. The authority specifically states that in conducting a study of harbor and navigation improvements the Secretary may recommend a project without demonstrating that the improvements are justified solely by National Economic Development (NED) benefits, if the Secretary determines that the improvements meet specific criteria detailed in the authority.

Additionally, Section 1322 of the WRDA of 2016, (b)(2) Expedited Completion of Feasibility Studies, authorizes the Secretary to move directly into preconstruction engineering and design (PED) if the Secretary of the Army determines in a report that a project is justified. Implementation guidance was published on 12 February 2018.

2.0 ALTERNATIVES ANALYSIS

By September of 2018, USACE had identified ten alternatives to address navigation inefficiencies at St. George Island, with seven located at the existing Zapadni Bay harbor site and three at North Anchorage site (which does not have any existing marine infrastructure). The Zapadni Bay alternatives were removed from further analysis because none of the alternatives increased access days to the existing harbor. An additional alternative at the North Anchorage site (N-4) was added to the final array of alternatives later in the study. Based on a Cost Effectiveness / Incremental Cost Analysis, the Recommended Plan was identified as Alternative N-3, a new harbor at the North Anchorage site. These four action alternatives at the North Anchorage site, in addition to a No-Action Alternative, were considered as the final array. The North Anchorage alternatives are designed with different project depths as well as entrance and maneuvering channel alignments to accommodate differing portions of the vessel fleet anticipated to utilize the harbor. The proposed action area includes the footprint of breakwater and dredged channels, the dredged material placement site, and the in-water ensonified footprint (Figures 2 and 3). The in-water ensonified footprint is larger than the physical footprint and is defined by the ensonified and barge operational areas, drilling, confined underwater blasting, and material placement activities.

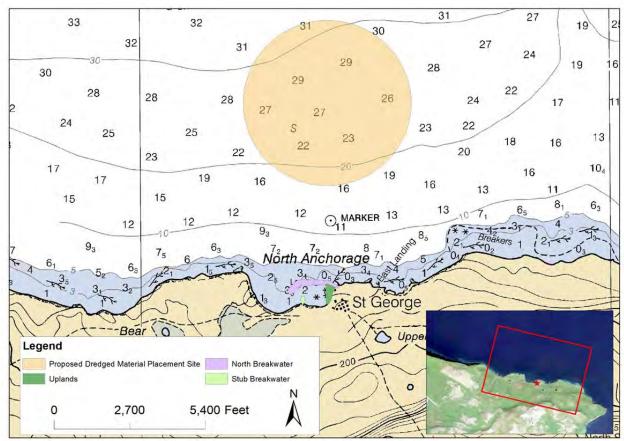


Figure 2. Project Element Footprints



Figure 3. In-water Ensonified Footprints

2.1 Alternative Descriptions

No-Action Alternative

Under the No-Action Alternative, a new harbor would not be constructed at the North Anchorage site. Use of the Zapadni Bay Harbor would continue (Figure 4.). Adverse wave and seiche conditions would continue to limit access to, and the utility of the existing harbor. Because fuel barge and cargo vessel access would remain at the current reduced levels, freight delivery costs would continue to be expensive. Similarly, harbor access by fishery fleet vessels would continue to be limited, and the existing conditions would limit the ability to safely operate an onshore fish processing facility at the harbor or a floating facility within the harbor. Furthermore, periodic damage to the breakwaters would likely continue. Without a safe harbor to support a viable marine-resource economy to support the local mixed, subsistence-cash economy, St. George residents would likely continue to choose to relocate to other communities, threatening the long-term viability of the community.

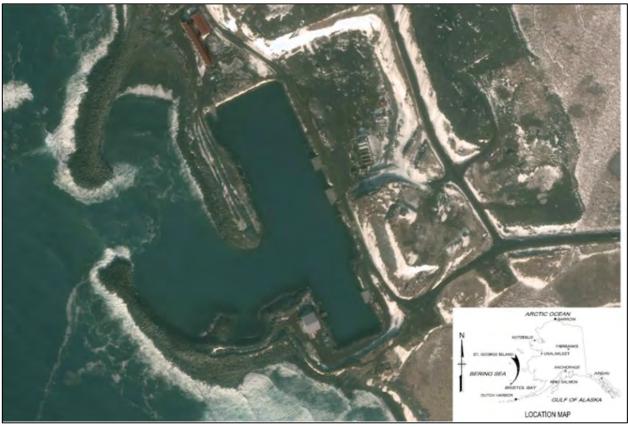


Figure 4. Existing Harbor Site, Zapadni Harbor, site of the No-Action Alternative

2.1.1 Action Alternative N-3: Fuel Barge, Freight, Subsistence, 85% Crabber Fleet (Agency's Preferred Alternative)

Alternative N-3, the proposed action, (Figure **5**) would consist of a 450-foot wide by 550-foot-long mooring basin dredged to -20 feet mean lower low water (MLLW) protected by a 1,731-foot-long north breakwater (Figures 5 and 6) and a 250-foot-long spur breakwater at the west edge of the basin. The basin connects to the Bering Sea with a 250-foot wide navigation channel dredged to -25 feet MLLW. Dredging the channel and basin for this alternative would require the removal of 353,052cubic yards of material. Inner harbor facilities would be created by filling an area to +10 feet MLLW, with a 300-foot-long pile-supported dock and a concrete boat launch ramp to -5 feet MLLW for full tide launching access. This alternative provides access for the subsistence fleet, the fuel barge, and approximately 85 percent of the commercial fishing fleet. Under this alternative, safe access and moorage days increased by 179 days.



Figure 5. Alternative N-3, All Vessels, 85% Crabber Fleet Schematic

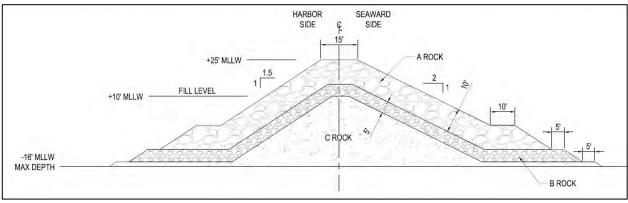


Figure 6. Typical Breakwater Cross Section for Alternatives N-1, N-2, N-3, and N-4. The breakwater would be incorporate three layers of consecutively smaller boulders to efficiently dissipate wave energy. The outer layer, A rock, would consist of multi-ton armorstone that would be subject to the majority of the wave energies. The second layer, B rock, would be comprised of slightly smaller boulders, adding a redundant layer of protection. The core of the breakwater would consist of C rock.

2.1.2 Action Alternative N-2: Fuel Barge, Freight, Subsistence, 25% Crabber Fleet

Alternative N-2 (Figure **7**) consists of a 450-foot wide by 550-foot-long mooring basin dredged to -16 feet MLLW protected by a 1,731-foot-long north breakwater and a 250-foot-long spur breakwater at the west edge of the basin. The basin connects to the Bering Sea with a 250-foot wide navigation channel dredged to -18 feet MLLW. Dredging the channel and basin for this alternative would require the removal of approximately 230,000 cubic yards of material. Inner harbor facilities would be created by filling an area to +10 feet MLLW, with a 300-foot-long pile-supported dock and a concrete boat launch ramp to -5 feet MLLW for full tide launching access. This alternative provides access for the subsistence fleet, the fuel barge, and approximately 25 percent of the commercial fishing fleet. Under this alternative, safe access and moorage days increased by 149 days.



Figure 7. Alternative N-2, Fuel Barge and 25% of Crabber Fleet Schematic

2.1.3 Action Alternative N-1: Subsistence Fleet

Alternative N-1 (Figure 8) is a subsistence vessel launch harbor with a 775-foot long breakwater, a 700-foot long entrance channel dredged to -10 feet MLLW, with a launch zone dredged to -8 feet MLLW. Dredging the channel for this alternative requires the removal of approximately 10,000 cubic yards of material. Subsistence vessels access the harbor through concrete launch ramp to -5 feet MLLW providing full tide access for launching. An inner harbor facilities area to support vessel preparation and launching operations would be created by filling to +10 feet MLLW. Under this alternative, safe access and moorage days increased by 38 days.



Figure 8. Alternative N-1, Local Subsistence Fleet Schematic

2.1.4 Action Alternative N-4: Fuel Barge, Subsistence

Alternative N-4 (Figure **9**) is a subsistence vessel launch harbor with a 1,100-foot long breakwater; entrance channel dredged to -18 feet MLLW, with a maneuvering basin dredged -16 feet MLLW. Dredging the channel and basin for this alternative would require the removal of approximately 150,000 cubic yards of material. Inner harbor facilities would be created by filling an area to +10 feet MLLW. Under this alternative, safe access and moorage days increased by 127 days.

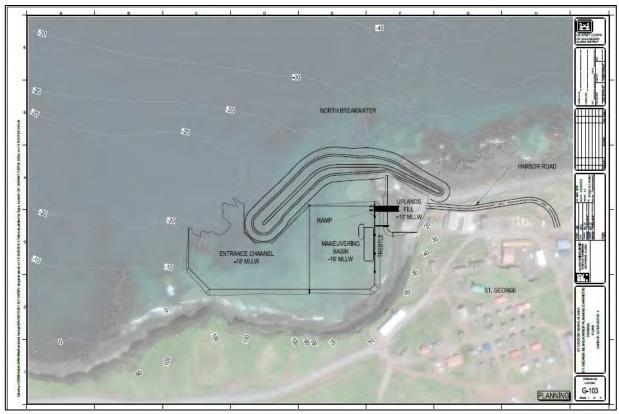


Figure 9. Alternative N-4, Subsistence and Fuel Barge Schematic

The Alaska District has evaluated the construction features and placement of dredged materials under the Clean Water Act 404(b)(1), Guidelines for Specification of Disposal Sites for Dredged or Fill Material for each alternative. Dredged material would be transported about one mile offshore and placed to construct a rocky reef offshore of St. George Island, with the intent to enhance blue king crab (BKC) habitat. Although, the beneficial use of the dredged material as evaluated under the Clean Water Act would not represent a disposal activity, there would be a temporary impact to fish and EFH as described in Section 4.2.2.1. The entire volume of dredged material would likely be used beneficially; however, a portion may be used as fill for the area to create inner harbor facilities (N-2, N-3, and N-4 up to 45,000 CY).

2.2 Alternatives Considered and Dismissed from Further Analysis

This section describes alternatives considered in the preliminary phases of the study and the rationale for eliminating them from further analysis. Alternatives were evaluated based on primarily two metrics: change in safe access days to the harbor by three-vessel classes (subsistence fleet, fishing fleet, and fuel barge) and change in days vessels could moor in the harbor. Discussion on these metrics can be found in section 5.6 of the Feasibility Report (FR).

2.2.1 Alternative Z-1

Alternative Z-1 includes constructing an 800 foot long extension to the existing south breakwater, a 500 foot jetty off the existing north breakwater, three 1,000 foot long submerged reefs, a new inner breakwater, a spending beach sloped at 10H:1V, a new navigation channel with a depth of -22 feet MLLW, and a new turning basin with a depth of -20 feet MLLW. This alternative re-routes vessel traffic to the north end of the harbor in an attempt to reduce the occurrence of storm waves entering the harbor from the southwest direction. Under this alternative, moorable days would decrease by more than 64 days from the existing harbor. There would be no increase in access days for any vessel class.

2.2.2 Alternative Z-2

Alternative Z-2 includes constructing a 1,050 foot long cap and extension to the existing south breakwater, a 400 foot jetty north of the new breakwater, a new navigation channel with a depth of -22 feet MLLW, and a new turning basin with a depth of -20 feet MLLW. The existing breakwater would be demolished in this alternative. Under this alternative moorable days would decrease by 31 days from the existing harbor. There would also be no increase in access days for any vessel class.

2.2.3 Alternative Z-3

Alternative Z-3 includes constructing a new 700 foot long by 500 foot wide mooring basin to the northeast of the existing harbor. The new basin would be connected to the existing harbor by a 200 foot wide navigation channel. A new mooring basin would be excavated at the north end of the existing inner basin, and the new inner basin would be sloped at 5H:1V. Excavation quantities for this alternative would be approximately 2 million cubic yards of material. The existing harbor breakwaters would remain in their existing condition, and the existing channel would be widened to a minimum of 200 feet at the head of the inner breakwater and dredged to a depth of -22 feet MLLW. Under this alternative, moorable days would increase by 13 days from the existing harbor, but there would be no increase in access days for any vessel class.

2.2.4 Alternative Z-4

Alternative Z-4 includes constructing 400 foot long jetties at the ends of the north and south existing breakwaters, a 500 foot inner north breakwater, and a north mooring basin with a depth of -10 feet MLLW. The existing harbor breakwaters would remain in their existing condition. Under this alternative, moorable days would decrease by five days from the existing harbor. There would also be no increase in access days for any vessel class.

2.2.5 Alternative Z-5

Alternative Z-5 includes demolishing the existing south breakwater and constructing a 3,000 foot long breakwater that would extend seaward (north) beyond existing north breakwater. A 300 foot long extension of the north breakwater would be constructed perpendicular to the new breakwater. New docks would be constructed on the inside of the new main breakwater with the entire basin enclosed by the new breakwaters being dredged to -22 feet MLLW. The back slope of the existing inner harbor would be filled at a 10H:1V slope to provide a spending beach in the new mooring basin. Under this alternative, moorable days would

increase by 30 days from the existing harbor, but there would be no increase in access days for any vessel class.

2.2.6 Alternative Z-6

Alternative Z-6 adapts the original berm breakwater design of St. George Harbor to the current shoreline. The design includes the original design locations for the breakwater using a berm cross-section. This would entail complete removal of both existing North and South breakwaters to allow for the new construction. The existing harbor geometry was modified by adding spending beaches at a 1V:10H slope to both ends of the inner harbor basin. Dredge areas for entrance and outer basin maneuvering are designed to -22 ft. MLLW and -18 ft. MLLW respectively. There would still be seiche conditions in the harbor and no increase in access days for any vessel class.

2.2.7 Alternative Z-7

Alternative Z-7 includes constructing a new 900 foot radius semi-circular mooring basin into the eastern edge of the existing inner harbor. The side slope of the new basin would be 10H:1V to reduce reflection in the mooring area. Excavation of the new mooring basin included excavation to construct a road around its perimeter to allow vehicles to traverse the perimeter of the harbor. Excavation quantities for this alternative are approximately 6 million cubic yards of material. The existing harbor breakwaters would remain in their existing condition, and the existing channel would be widened to a minimum of 200 feet at the head of the inner breakwater and dredged to a depth of -22 feet MLLW. Under this alternative, moorable days would increase by 26 days from the existing harbor, but there would be no increase in access days for any vessel class.

2.3 Comparison of Alternatives

2.3.1 Numerical Modeling Results Comparison

For moorage analysis, wave modeling results were used to find the duration of wave height threshold exceedance for each site and compared to the existing condition. Moorage analysis was based on the availability of dock space based on wave conditions in the harbor (Table 1). This table shows the wave height outside the harbor that caused unmoorable conditions at the dock. This wave height was compared to the offshore wave conditions and the duration of time this wave height was exceeded was found and expressed as a percentage of total time. All docks were compared to conditions at the existing fuel dock at Zapadni Bay, which has be best mooring conditions, and both the difference in available moorage duration and annual moorable days are shown. ROM cost estimates are representative of the construction cost for each alternative (Table 1).

Table 1. Numerical Modeling Results Comparison – Mooring Improvements by Alternative

	Wavemaker Wave To	Duration	Percent Duration Difference	Number of Increased
Location	Induce Threshold (m)	Threshold Exceeded	from Existing Fuel Dock	Moorable Days
Original Harbor				
Ice Dock	2.44	17.77%	-7.96%	-29.1
Fuel Dock	3.37	9.81%	0.00%	0.0
	Altered Navigation - \$160 M			
Ice Dock	Less than 2 m	Greater than 27.32%	< -17.5%	< - 63.9
Fuel Dock	Less than 2 m	Greater than 27.32%	< -17.5%	< - 63.9
Alternative Z-2 - N	North Overlap - \$100 M			
Ice Dock	2.39	18.37%	-8.56%	-31.2
Fuel Dock	Less than 2 m	Greater than 27.32%	< -17.5%	< - 63.9
Alternative Z-3 - I	nland Basin - \$70 M			
Ice Dock	2.71	14.54%	-4.73%	-17.3
Fuel Dock	3.28	10.38%	-0.57%	-2.1
Fishery Dock	4.14	6.26%	3.55%	13.0
Alternative Z-4 - 0	OHC - \$85 M			
Ice Dock	2.44	17.77%	-7.96%	-29.1
Fuel Dock	3.14	11.28%	-1.47%	-5.4
Alternative Z-5 - 0	Outer Breakwater - \$400 M			
Outer Dock	4.59	4.57%	5.24%	19.1
Inner Dock	6.90	1.49%	8.32%	30.4
Alternative Z-6 –	Berm Breakwater - \$180 M			
Outer Dock	Less than 2 m	Greater than 27.32%	< -17.5%	< - 63.9
Inner Dock	Less than 2 m	Greater than 27.32%	< -17.5%	< - 63.9
Alternative Z-7 - H	Half Moon Harbor - \$170 M			
Fishery Dock	5.49	2.63%	7.18%	26.2
Alternative N-1 S	ubsistence Fleet Launch - \$25N	П		
Launch (NEW)	NO MODEL RESULTS			
Alternative N-2 N	orth Barge Access - \$85M			
Dock (NEW)	3.41	7.43%	2.38%	8.7
Alternative N-3 N	orth Fishing Fleet Access - \$95	М		
Dock (NEW)	3.41			
Alternative N-4 S	ubsistence Fleet Launch -			•
Launch (NEW)	NO MODEL RESULTS			

The modeling results for the Zapadni Bay alternatives showed limited improvements in moorage conditions for some alternatives (Table 1). None of these alternatives improved harbor accessibility. Those alternatives that did improve mooring conditions did so marginally and at ROM construction costs between \$70 million (13 additional safe moorage days) and \$400 million (49 additional safe moorage days). Although Alternative Z-5 increased safe moorage by 49 days, harbor accessibility did not increase. Due to the high cost and no increase in harbor access days, Alternative Z-5 was screened from further consideration. Following this analysis, Alternatives Z-1, Z-2, Z-3, Z-4, Z-6, and Z-7 were also screened from further consideration.

2.3.2 Harbor Accessibility Analysis

The effectiveness of the alternatives were analyzed by comparing improvements in vessel access and opportunities to moor at the docks in each proposed harbor. Harbor access and moorage was determined by comparing the occurrence of wave heights exceeding the threshold for vessels in the fleet spectrum to operate. For access considerations, the offshore condition was analyzed to determine how often vessels in the fleet spectrum would be able to navigate to and into the harbor (Table 2).

Table 2. F	larbor /	Accessibility	Analysis
------------	----------	---------------	----------

			nual Harbo pility Durat			nual Harbo sibility Dur (days)	
Vessel	Wave Criteria (m)	South	North	Δ_{North}	South	North	Δ_{North}
Fuel Barge	1	48%	58%	10%	175	211	36
Subsistence Vessel	1.2	54%	62%	8%	197	226	29
Crabber	3	87%	89%	2%	316	324	9

2.3.3 Study Objectives and National Evaluation Criteria Comparison

Alternatives N-1 through N-4 in addition to the No Action (labeled NA in the table) were screened using the national evaluation criteria of acceptability, completeness, effectiveness, and efficiency against the study objectives (Table 3). The table screens the alternatives based on a metric of high (H), medium (M), and low (L) for meeting each of the four national evaluation criteria.

	Study Objectives																							
	Provide for safe maneuverability and protected								ed		Inc	reas	e tin	ne th	at h	arbo	or ca	n be	saf	ely				
Alts					I	moo	rage)		_							а	ссе	ssec	k				
Aits									Ν	latio	nal E	eval	uatic	n C	riteri	ia								
	Α	ссер	t.	Co	mple	ete.	Ef	fecti	ve.	E	fficie	ficien. Accept. Co		en. Accept. Co		Co	mple	ete.	Ef	fecti	ve.	Ef	fficie	n.
	Н	M	L	Η	M	L	Н	M	L	Н	M	Г	Н	M	L	Н	M	L	Н	M	L	Н	M	L
NA			X			X			X			X			X			X			X			X
N-1			X			X			X		X			X			X			X		X		
N-2		X		X			X			X			X			X				X			X	
N-3	X			X			X					X	X			X			X					X
N-4			X			X		X			X			X			X			X			Χ	

Table 3. Alternatives Screening for Study Objectives and National Evaluation Criteria

All of the remaining alternatives (N-1 to N-4 and the No Action) meet the national evaluation criteria and will be carried forward as the final array of alternatives (Table 3). The following paragraphs further explain the comparison of the alternatives against these criteria and why they were ranked high, medium or low for each item.

The No Action alternative would not provide the community with a project and therefore does not address the two study objectives. Although it ranked low among the four evaluation criteria, the No Action alternative gives us a basis for comparison and will be carried forward into the final array of alternatives.

Alternative N-1 allows for subsistence fleet launching and would provide increased access and safe maneuverability for these vessels only. It is also a cost effective option for providing increased harbor access for the subsistence fleet. This alternative would not provide increased moorage and was ranked low for this study objective when evaluating acceptability, completeness and effectiveness. It was ranked medium for efficiency because it would address some of the issues for the community in regards to the subsistence fleet and is more cost effective then some of the larger plans.

Alternative N-2 aims to address the subsistence fleet, barge access and about 25 percent of the crabber fleet, which ranked it high for completeness, effectiveness and efficiency for addressing safe maneuverability and protected moorage. This alternative would provide economic opportunities to the community with the added harbor depth and moorage to account for 25 percent of the crabber fleet, but more opportunity would come from N-3 with 85 percent of the crabber fleet so this alternative was ranked medium for acceptability based on protected moorage. Alternative N-2 increases access and moorage by 149 days and ranked high for completeness and acceptability based on increased harbor access. This alternative ranked medium for effectiveness and efficiency because it does alleviate part of the problem St. George faces, but more access for the crabber fleet would add additional economic opportunity. In addition, the increase in harbor depth, the need for blasting and the additional rock needed for a larger breakwater resulted in a high project cost and contingency.

Alternative N-3 addresses safe maneuverability, protect moorage and increased access for the subsistence fleet, fuel barge and 85 percent of the crabber fleet. The economic

opportunity of having 179 increased access and moorage days for these vessel classes is highly acceptable to the community and general public, and presents a complete and effective plan to meet the study objectives and support a cash-subsistence based economy and address community viability. However, this is the most costly plan due to the additional blasting and dredging required to accomplish the required harbor depth needed for 85 percent of the crabber fleet. Therefore, Alternative N-3 was ranked low for efficiency for both of the study objectives.

Alternative N-4 moderately addresses increased harbor access by providing the subsistence fleet and the fuel barge 127 increased moorage and access days. This alternative was ranked medium for all of the national evaluation criteria under the increased access study objective. It does allow for increased access and is cost effective for what it would provide the community, but it does not support a cash-subsistence base economy with the lack of crabber fleet access. Regarding increased moorage and safe maneuverability, Alternative N-4 was ranked medium for effectiveness and efficiency because the benefits of allowing the fuel barge to access the community on a more frequent basis would reduce delays and the resulting monetary impacts of time savings. However, this alternative does not address any percentage of the crabber fleet for safe maneuverability and moorage and therefore does not provide economic opportunity and community viability. Alternative N-4 was ranked low for acceptability and completeness because it does not address the problem of community viability.

2.4 Alternatives Carried Forward

Alternatives N-1, N-2, N-3, N-4 and the No-Action were carried forward for comparison and selection of the Recommended Plan. The ecological, cultural and aesthetic resources identified and evaluated for Alternatives N-1, N-2, N-3, N-4 and the No-Action can be found in Section 4.

2.5 National Economic Development (NED) Analysis

Benefit categories for the NED analysis are described below.

Infrastructure Damages. Infrastructure damages to the existing harbor at Zapadni Bay are expected to continue to occur from storms in the frequency and severity of the existing condition. Repairs by the Federal Emergency Management Agency (FEMA) are also expected to continue. The existing harbor at Zapadni Bay will continue to be severely underutilized, inaccessible with limited safe moorage days as described in the existing conditions for all vessel classes.

Vessel Damages. Damages to vessels calling on St. George are expected to continue without harbor improvements. Under future without-project conditions, average annual damages experienced by the barge fleet are estimated at \$4,400, but could be as high as the historical maximum of \$64,000.

Vessel Delays. Delays to fuel and freight vessels will continue at the rate they have been seen historically, with costs of fuel and supplies remaining prohibitively high.

Unrealized Revenues. The value of CDQ crab allocated to APICDA and intended for St George is estimated at approximately \$384,000 annually. Without a project, this will continue to be delivered to St. Paul for processing, leading to not only an unrealized economic opportunity for St. George but also higher transportation costs for crabbers that must deliver their catch to St. Paul. Given the remote and mixed subsistence-cash economy of St. George, this unrealized profit would continue to hamper the community's economy. Lack of economic opportunity in the community due to lack of a functioning harbor will continue to result in out-migration, leading to increased concerns about the long-term viability.

Subsistence Harvests. The opportunity to subsist will continue to be impacted under future without-project conditions. Following the historical trend, access the subsistence fleet has to resources will continue to be impacted. Given the high dependence of the community on subsistence resources, both culturally and economically, this will continue to be a major factor in long-term community viability.

2.5.1 With-Project Benefits

Net benefits and the benefit-cost ratio are determined using the average annual benefits and average annual costs for each alternative. Net benefits are determined by subtracting the average annual equivalent costs from the average annual benefits for each alternative; the benefit-cost ratio is determined by dividing average annual benefits by average annual costs. Project costs, benefits, and the benefit-cost ratio were summarized by alternative (Table 4).

Table 4. NED Summary

	No Action	N-1	N-2	N-3	N-4
Present Value Benefits	N/A	\$3,138,000	\$29,344,000	\$29,560,000	\$29,266,000
Average Annual Benefits	N/A	\$116,000	\$1,087,000	\$1,095,000	\$1,084,000
Present Value Costs	N/A	\$52,856,000	\$178,148,000	\$187,639,000	\$107,070,000
Average Annual Costs	N/A	\$1,958,000	\$6,599,000	\$6,950,000	\$3,966,000
Net Annual Benefits	N/A	(\$1,842,000)	(\$5,512,000)	(\$5,855,000)	(\$2,882,000)
Benefit-Cost Ratio	N/A	0.06	0.16	0.16	0.27

¹⁾ Alternative N-1 has the least negative net benefits, however there is no plan with positive net benefits so plan selection is determined through CE/ICA.

2) These numbers are based on the final iteration of costs for plan formulation and may not match the pertinent data table since the pertinent data table is based on the certified cost for Alternative N-3.

No NED plan was identified. Since no alternative has positive net benefits, plan selection is based on CE/ICA. While these values represent NED benefits resulting from navigation improvements at St. George, they do not represent the full scale of benefits that could be realized with implementation of a project. The next section discusses the CE/ICA summarizes results.

2.6 Cost Effectiveness/Incremental Cost Analysis

A plan justified solely by NED benefits could not be identified for St. George, therefore the plan selection is supported by a CE/ICA. Section 2006 provides an opportunity to consider the additional benefits in the RED, OSE, and EQ accounts through a CE/ICA. The CE/ICA metric for this study is increased safe access and moorage days. Increased vessel opportunity days for safe access and moorage allows for vessel-class specific evaluation of improved wave and seiche conditions in comparison to the existing entrance channel and the inner harbor. It also allows for the evaluation of vessel-class specific safe maneuverability and mooring of the anticipated fleet and the percentage of time (in days) that harbor facilities can be safely accessed. Therefore, this metric directly addresses the study's objectives.

2.6.1 CE/ICA Metric Calculation

The draft characteristics of the anticipated vessel fleet was used to develop the wave criteria for accessibility and moorage at St George. The wave criteria for safe access and moorage differ. The wave criteria for safe access ranged from 3 to 10 feet at the harbor entrance for the anticipated fleet (fuel and freight barge, subsistence, crabbing and water taxis). A separate wave criteria of 1.6 feet at the dock dictates safe moorage inside the harbor for all vessel classes. As such, access and moorage days are calculated separately and then combined into a single metric.

To calculate access days, the Alaska District Hydraulics & Hydrology (H&H) engineers modeled the annual accessibility of a harbor on the south side of the island at Zapadni Bay and on the north side of the island at the North Anchorage site. A comparison of access conditions between the two sites showed a higher percentage of accessibility at the North Anchorage site (Table 5). To determine annual access days, the percentage of accessibility is multiplied by 365 opportunity days.

Table 5. Accessibility Wave Criteria

Vessel Class	Wave Criteria (feet)	South Site	North Site	Δ North	Annual Opportunity Days	Access Days Gained at North Site
Fuel Barge	3.2	48%	58%	10%	365	36.0
Subsistence						
Vessel	4	54%	62%	8%	365	29.0
Crabber	10	87%	89%	2%	365	8.6
Water Taxi	10	87%	89%	2%	365	8.6

To calculate moorage days, H&H modeling determined conditions at the existing dock in Zapadni Bay would exceed the moorage threshold for the vessel fleet 27.3 days annually. The maximum access days gained (36 days) is assumed as the maximum opportunity days for moorage. Moorage days gained by each alternative is calculated as the difference between maximum opportunity moorage days and the days in which the moorage threshold is exceeded.

These access and moorage days are applied to each vessel class by alternative and range between a low of 38 days (Alternative N-1) to a high of 179 days (Alternative N-3). The analysis of safe access and moorage by alternative is then further refined by conducting the CE/ICA and comparing the vessel classes that are served as described in Section 2.6.2.

2.6.2 CE/ICA Results

The CE/ICA was performed in IWR Planning Suite. This analysis yielded four cost-effective plans, two of which are the best buy plans (Alternatives N-3 and N-4). Neither Alternative N-1 nor N-4 provide access for the crabbing fleet, which is a critical factor for community viability. While N-3 and N-4 are both best buy plans, N-3 increases access for 85% of the crabbing fleet, compared to 25% of the crabber fleet with N-2. The CE/ICA results for Alternatives N-1 to N-4 determined two best buy plans (

Table 6 and Figure 10).

Table 6. CE/ICA Summary

Alternative	Average Annual Cost	Days Gained	Cost Effective	Best Buy
N-1	\$1,958,000	38	Yes	No
N-4	\$3,966,000	127	Yes	Yes
N-2	\$6,599,000	149	Yes	No
N-3	\$6,950,000	179	Yes	Yes

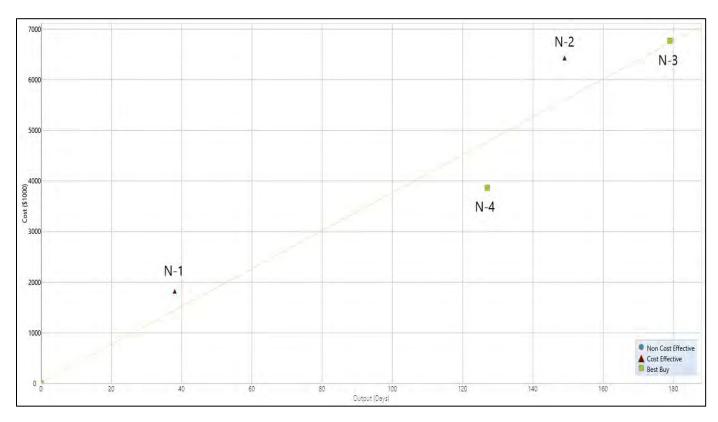


Figure 10. Cost Effectiveness Analysis: Increased Vessel Opportunity Days for Safe Access and Moorage

The best buy plans were compared by incremental cost per unit of output (vessel opportunity days for safe access and moorage) for Alternatives N-3 and N-4 (Table 7, Figure 11).

Table 7. Annual Incremental Cost vs. Output for Best Buy Alternatives.

Alternative	Incremental Days Gained	Incremental Cost	Incremental Cost Per Day Gained		
N-4	127	\$3,966,000	\$31,200		
N-3	52	\$2,984,000	\$57,300		

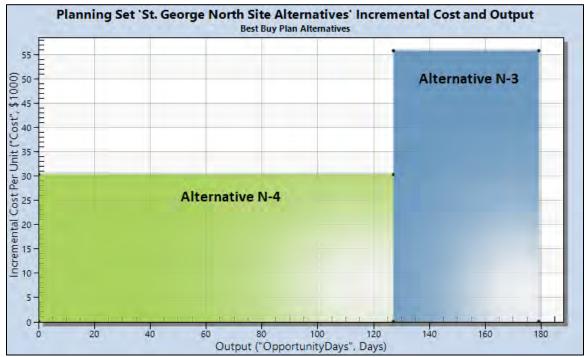


Figure 11. Incremental Cost Analysis: Increased Vessel Opportunity Days for Safe Access and Moorage

The selection of a Recommended Plan was further refined through analysis of the type of access and moorage provided by the two Best Buy plans. While Alternative N-4 provides a gain of 127 days of access when compared to the No Action Alternative, none of these days are associated with the crabbing (CDQ and IDQ) fleet. In comparison, Alternative N-3 provides 179 days of access, which includes 17 days of safe access and 17.4 days of safe moorage for the crabbing fleet. Based on the CE/ICA and given that the CDQ/IFQ crabbing fleet is a driver of community viability, Alternative N-3 is identified as the Agency's Preferred Alternative.

2.7 Alternative Comparison – Environmental Impact

The relative impact to the environment of the four alternatives (N-1, N-2, N-3, and N-4) was not a factor in determining which ones to carry forward. Additionally, environmental impact was not a factor in the selection of the Recommended Plan. Although the four alternatives that were carried forward have distinct differences in economic costs and benefits, they would have relatively similar environmental impacts. Each alternative would require the construction of a breakwater, dredging, and removal of dredged materials, varying primarily in the size of the project footprint and dredge depths. While these variations did translate into significant differences in project costs and benefits, they were variations in scale, not in kind. Specifically, all alternatives would require drilling, blasting, and dredging and thus have similar types of environmental impacts. The environmental impacts of the four alternatives have been fully analyzed in Section 4.0 to satisfy the requirements under NEPA.

3.0 AFFECTED ENVIRONMENT

St. George Island is the southernmost and second largest of a group of five inactive volcanic islands that compose the Pribilof Archipelago located in the southern Bering Sea, approximately 760 miles west of Anchorage and 220 miles north-northwest of Unalaska Island. St. George's position at the western margin of Alaska's continental shelf puts it in close proximity to the much deeper waters of the Bering Sea's abyssal plain. The abrupt change in seafloor elevation occurring at the continental slope facilitates natural upwelling processes; as a result, surface waters in the region are some of the most productive on the planet.

The Pribilofs are ecologically unique and colloquially referred to as "the Galapagos of the north" due to their rich fisheries, abundance of colonial seabirds, and northern Fur Seal Rookeries. St. George Island falls within the boundary of the Alaska Maritime National Wildlife Refuge; portions of its surface landmass are owned and managed by the U.S. Fish and Wildlife Service.

St. George Island occurs at the western margin of Alaska's continental shelf, where maximum depths do not regularly exceed 420 feet. However, approximately 75 miles to the west-southwest, the water depth is greater than 18,000 feet. National Oceanic and Atmospheric Administration's (NOAA) Chart 16380 describes the physical characteristics of St. George Island's nearshore areas as rocky, and gradually increasing in depth from the shoreline to 150 to 270 feet 3 miles from the shore. While some pyroclastic tuffaceous and glacial materials are surficially evident, St. George Island is primarily composed of lava flows and sills of basaltic olivine (Barth 1956). St. George's land mass consists of interspersed hills and valleys of varying steepness reaching a maximum elevation of 1,200 feet above sea level, relatively few planal areas, and is nearly circumscribed by steep oceanic cliffs. Areas of gradual, rocky beach-like shoreline to upland transition are uncommon. The Pribilof Islands are prone to regular seismic activity. St. George was struck by a 6.7 magnitude quake in 1991, and then again by a swarm of small >5.0 magnitude quakes in 2015. Davies (1981), predicts an 8.0 magnitude earthquake for the region based upon physical characteristics of the underlying geology and known seismic event history.

The climate at St. George Island is subarctic. St. George Island receives 29.5 inches of precipitation per year, and the average annual temperature is 36.3°F. The warmest month is August, with an average temperature of 48.7°F, and the coldest month is January with the average temperature of 26.8°F.

The nearest tidal station to St. George is on St. Paul Island, 50 miles to the north. Due to the similarity of the sites, tidal data from Saint Paul was used for this environmental assessment (Table 8).

Table 8. Published tidal data for Village Cove, St. Paul Island, Alaska.

Values in feet, Mean Lower Low Water.

Highest Observed Water Level	+5.26
(12/08/06)	

Highest Astronomical Tide (HAT)	+4.09
Mean Higher High Water (MHHW)	+3.30
Mean High Water (MHW)	+3.08
Mean Tide Level (MTL)	+2.03
Mean Tide Level (MSL)	+1.96
Mean Low Water (MLW)	+0.97
Mean Lower Low Water (MLLW)	0.00 (datum)
Lowest Astronomical Tide (LAT)	-1.50
Lowest Observed Water Level	-2.10
(12/06/10)	

Source: NOAA NOS, Tidal Epoch 1983-2001, published 12/12/11.

From the above data, the mean tide level (arithmetic average of the MHW and the MLW) is +2.03 foot. The mean tide range (the difference between MHW and MLW) is 2.11 feet.

St. George Island is located far enough south that it remains sea ice free in all but the harshest winters, as during the winter of 2012 when sea ice was observed at St. George Island for at least 79 days (National Weather Service 2012). A historical sea ice coverage assay was conducted through the sea ice atlas website, which utilizes various historical data to correlate sea ice presence, relative density, and timing in an area. Sea ice concentrations were investigated at 57.0°N, 169.5°W, approximately 25 miles north of USACE's proposed project. According to historical data generated by the Sea Ice Atlas website, sea ice presence at the north side of St. George Island is variable between years but appears to trend away from higher density occurrences over the observed timeframe. However, at the 30% concentration threshold, the period between 1978 to present closely resembles the preceding 1903 to 1953 period.

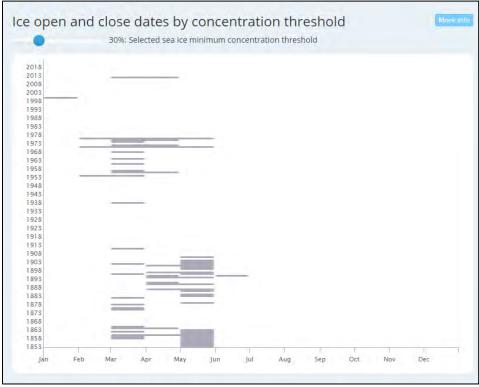


Figure 12. 30% sea ice minimum concentration historic presence

3.1 Environmental Resources Not Considered in Detail

Initial evaluation of the effects of the proposed project indicated that there would likely be little to no effect on several resources. This analysis also considers the No-Action Alternative, where the proposed action is not implemented. These resources are discussed below.

Table 9. Resources Not Considered in Detail.

Resources not considered in detail.			
Resource	Authority	Technically Important	Reason for Dismissal
Air Quality	Clean Air Act (CAA) of 1963, as amended; National Environmental Policy Act of 1970	Designed to control air pollution from listed criteria pollutants on a national level; promotes enhancement of the environment by evaluating the effects of government actions on a full suite of resource categories.	Due to insufficient air quality data to declare St. George as either "attainment or nonattainment," the appropriate category is considered "unclassifiable," according to the Alaska Department of Environmental Conservation (ADEC). As a result, the city is not in a CAA "non-attainment" area, and the "conformity determination" requirements of the CAA do not apply to the

			proposed project at this time. Air quality at St. George Island and in the greater Bering Sea region is very good due to rigorous atmospheric convection and negligible anthropogenic influencing factors. Air emissions resulting from transportation and construction elements of the project would be temporary in nature, and when considered collectively in the context of the ambient environmental conditions, do not warrant more than a negligible effect determination.
Climate Change and Sea Level Change	National Environmental Policy Act of 1970; EC- 1165-2-211;	Promotes enhancement of the environment by evaluating the effects of government actions on a full suite of resource categories. Incorporates physical effects of projected sea-level rise in planning, engineering, designing, constructing, operating, and maintaining USACE projects.	Short-term and long-term greenhouse gas emissions resulting from the implementation and operation of this project would be negligible. The Appendix A: Hydraulic Analysis of the Feasibility Report contains sea level rise planning and design analysis regarding this project
Terrestrial Natural Resources: birds, mammals, plants, etc.	National Environmental Policy Act of 1970	Promotes enhancement of the environment by evaluating the effects of government actions on a full suite of resource categories.	Impacts are not expected to extend to the inland environment. This assessment is supported by the findings in the appended Fish and Wildlife Coordination Act Report.
Hazardous, Toxic, and Radioactive Waste (HTRW)	USACE Regulation 1165-2-132, HTRW guidance for Civil works projects. 18 AAC75 (ADEC).	USACE defines roles and responsibilities of HTRW sites. ADEC provides regulations for management of such sites	No impacts to HTRW sites are expected. ADEC contaminated sites mapping tool utilized to verify no HTRW sites occur within USACE's project footprint, as proposed.
Floodplains & Wetlands	Executive Order 11990: Protection of Wetlands, 1977	Recognizes that wetlands have unique and significant public values and calls for protection of wetlands.	No terrestrial wetland areas are affected by this project. Impacts from project-related actions to in-water habitat areas are analyzed under the Clean water Act, Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection Act.

3.2 Relevant Resources

This section contains a description of relevant resources that could be impacted by the project. The resources described in this section are recognized by laws, executive orders, regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public (Table 10).

Table 10. Relevant Resources

Resource	Authority	Technically Important	Publically Important	
Non-Biological Resources				
Aesthetics	St. George and its national historic landmark represent a historically important viewshed.	Large structures could impair the natural and/or historic viewshed.	Conservation of historically relevant or uniquely natural viewsheds is important to the public.	
Cultural Resources	National Historic Preservation Act of 1966; National Environmental Policy Act of 1970; The Abandoned Shipwreck Act of 1988.	The Community of St. George is located within the Seal Islands Historic District National Historic Landmark.	Law and policy require that Federal actions are considerate of the protection and enhancement of cultural and historical resources.	
Environmental Justice	Executive Order 12898, 1994. Federal actions to address environmental justice in minority populations and low-income populations.	Identifies impacts to minority or low-income populations.	Executive Orders and policy require that federal actions consider the impacts of subsistence access and economic growth.	
Navigation	U.S. Code Title 33 – Navigation and Navigable Waters	Safe navigation must not be impeded by material placement strategy.	Safe navigation improves efficiency and reduces overall costs of goods and fuel to consumers	
Noise	Noise Pollution and Abatement Act of 1972	Designed to protect human health by minimizing annoyance of noise to the general public.	Ambient natural sounds at St. George are an effective attenuator of most noise; however, anthropogenic noise would be introduced into an area largely devoid of it.	
Protected Tribal Resources	Executive Memorandum on Government-to- Government Relations with Native American Tribal Governments of 1994; DOD American Indian and Alaska Native Policy of 1998; DOA memorandum on American Indian and	Assesses the impact that federal projects may have on protected tribal resources.	The majority of the population at St. George are members of the St. George Traditional Council, a Federally-recognized Tribe. Subsistence harvests are important to the identity and traditions of the Tribe.	

	Alaskan Native Policy of 2012.		
Public Infrastructure	National Environmental Policy Act of 1970	Promotes enhancement of the environment by evaluating the effects of government actions on a full suite of resource categories.	The community of St. George has limited Public Infrastructure. Project related elements could affect their overall capacity to reliably service the community.
Sediments	Clean Water Act of 1972 as amended, Section 404 (b)(1)	In-water placement of sediments must comply with Section 404 (b)(1) guidelines.	Law and policy require that Federal actions adhere to water quality protection laws.
Socio-economics	Executive Order 12898, 1994. Federal actions to address environmental justice in minority populations and low-income populations.	Federal agencies must take into account the socioeconomic status of the community potentially affected by their actions.	Executive Orders and policy support that no group of people, because of their socioeconomic or racial or ethnic composition should be disproportionately negatively affected by the execution and/or operation of federal, state, local, or tribal programs or policies.
Water Quality	Section 401 of the Clean Water Act of 1972, as amended. 404(b)(1) Magnuson Steven's Fishery Conservation and Management Act of 1976, as amended.	The nearshore waters of St. George Island are important habitat for fish and wildlife. All marine waters surrounding St. George Island are designated Essential Fish Habitat.	Law and policy require that Federal actions adhere to water quality protection laws.
	Biolog	gical Resources	
Fish and Essential Fish Habitat	Magnuson Stevens Fishery Conservation and Management Act of 1976, as amended. BSA Fisheries Management Plan. The Endangered Species Act of 1973 (ESA), as amended; the Marine Mammal Protection Act of 1972 (MMPA).	All marine waters surrounding St. George Island are designated Essential Fish Habitat. Section 305(b)(2) of the Magnuson-Stevens Act requires Federal action agencies to consult with National Oceanic and Atmospheric Administration (NOAA) NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.	Law and policy promotes the protection of fish populations and fish habitat to help ensure maximum sustainable yields from those commercially important stocks, which, in turn, guarantees employment opportunities.
Invasive Species	E.O. 13751: Safeguarding the Nation from the	Unique island biomes, like St. George, are sensitive to invasive species,	Law and policy requires that protecting indigenous natural resources

	Impacts of Invasive Species; E.O. 13112: Invasive Species.	specifically, rats. History is replete with the loss of indigenous biodiversity once rats colonized an island. St. George Island's importance to colonial cliffnesting seabirds is significant. Annually, hundreds of thousands of seabirds nest at St. George Island.	includes measures that prevent the establishment of competitive or destructive invasive species.
Marine Birds	FWCA Fish and Wildlife Coordination Act of 1934, as amended, Migratory Bird Treaty Act of 1918.	St. George Island's importance to colonial cliff-nesting seabirds is significant. Annually, hundreds of thousands of seabirds nest at St. George Island.	Law and policy recognize that migratory birds transcend geopolitical borders and that protection of their nesting, foraging, and resting habitats are important for the long-term conservation of avian resources.
Marine Invertebrates	Magnuson Stevens Fishery Conservation and Management Act of 1976, as amended.	Some marine invertebrates are commercially important, for instance, king and tanner crabs. Other species play integral roles in the food web of the Bering Sea ecoregion.	Law and policy recognizes the inherent nature of in-tact ecosystems, and that these systems are comprised of many parts.
Marine mammals, ESA-listed species, and critical habitat	The Endangered Species Act of 1973 (ESA), as amended; the Marine Mammal Protection Act of 1972 (MMPA).	All threatened and/or endangered species that occur within the nearshore waters of the Pribilof Islands are marine mammals. All marine mammals are protected under the MMPA. Marine mammals constitute a significant cultural and subsistence resource for Pribilof Island communities.	Law and policy supports the conservation and protection of marine mammals and of threatened and endangered species. Furthermore, federal actions are required to comply with federal laws regarding the conservation of such resources.

3.2.1 Non-Biological Resources

3.2.1.1 *Aesthetics*

The visual aesthetics of St. George Island have not been heavily impacted since the establishment of the community of St. George. There has been limited modification to the natural environment, with high cliffs supporting active bird communities, and the shorelines providing areas for seal rookeries. The historical significance of the community, including commercial infrastructure, provided the basis for its nomination as

part of a National Historic Landmark (NHL), which visually has had limited change from the U.S. commercial sealing operations of the 1870s.

3.2.1.2 Cultural Resources

The community of St. George is located within the Seal Islands Historic District National Historic Landmark (XPI-00002). The NHL covers nearly half the northern shoreline of St. George Island, in addition to part of neighboring St. Paul Island. On St. George, many of the structures and buildings are associated with the NHL. There are 68 buildings identified as contributing cultural resources within the city; however, only two specific structures occur within the proposed project footprint. These contributing cultural resources are the structures: the St. George Inside Landing (XPI-00195) and the St. George Outside Landing (XPI-00194). The exact date of their construction is unknown; the St. George Inside Landing was likely the location of the original dock for the community, and was damaged in a fire in 1950. It was rebuilt, and the St. George Outside Landing was then constructed to provide for better moorage and as a minor breakwater for the Inside Landing. Both of these structures have since lost much of their original configuration due to weathering and storm damage, however are still contributing the historical context of the NHL. Additional information on the cultural resources in and around the project area can be found in the National Historic Preservation Act (NHPA) Section 106 consultation documents between the USACE and the Alaska State Historic Preservation Officer (SHPO; Appendix E).

Databases of shipwrecks in the region's waters are maintained by the Bureau of Ocean Energy Management (BOEM) and the National Oceanic and Atmospheric Administration (NOAA). These databases were consulted to determine if any shipwrecks were known to occur within the proposed project footprint; none were documented. It is unlikely that there are any recent or historic shipwrecks that are unaccounted for that have not been listed. An underwater camera was used during nearshore surveys for biological resources in the project area. No cultural resources were identified during a review of the recordings, and the seafloor in the APE is bedrock with limited to no cover for any cultural materials to be buried.

3.2.1.3 Environmental Justice and the Protection of Children

The City of St. George is considered the affected population for the purposes of this analysis. The City of St. George is comprised of minority populations, low-income populations, and children that meet both criteria. As of the 2010 U.S. Census, St. George was approximately 88.24% American Indian and/or Alaska Native, with a further 1.96% being Alaska Native and one other ethnicity. Alaska Native populations are treated as minorities under E.O. 12898. Income data from the U.S. Census Bureau's 2006-2010 American Community Survey show an estimated 17.2% of the population was below the poverty line, regardless of minority status. Data from the U.S. Census indicate that, in 2010, approximately 12.80% of the population of the St. George was comprised of children (19 years old or younger) (DCCED 2019).

3.2.1.4 **Navigation**

Navigation on St. George primarily originates from the Zapadni Bay harbor (see 2.1 No-Action Alternative). Boat traffic in the North Anchorage area is minimal. The high energy

wave environment of the Bering Sea, in conjunction with the shallow rocky coast, hinders landings.

3.2.1.5 **Noise**

At the North Anchorage site, there is relatively little anthropogenically-generated noise. Other than an occasional pick-up truck or 4-wheeler passing along the road to the eastern margin of Village Cove, there are no intermittent or continually operating machines or noise-generating facilities in its immediate surrounding areas. Wave action and wind act in concert as the most attenuating sources of noise in the area. During the nesting season (spring and summer), the cacophony of thousands of colonial nesting seabirds flying overhead and echoing from the cliff faces combine with the nearshore breaking waves to compete with the attenuating effect of the constant wind for prevalence.

3.2.1.6 **Protected Tribal Resources**

The St. George Traditional Council is the Federally-recognized Tribe on St. George Island. There are no Tribal treaties in the State of Alaska, and, with the exception of the Annette Island Reservation, all Tribal land claims were extinguished by the Alaska Native Claims Settlement Act of 1971. There are multiple international treaties that impact protected tribal resources in Alaska, including: (1) the migratory bird treaties with Canada (1916), Mexico (1937), Japan (1974) and Russia (1976) implemented by the Migratory Bird Treaty Act of 1918, as amended; and (2) the International Whaling Convention (1946) implemented by the Whaling Convention Act of 1950. The Tribe has not identified any specific Protected Tribal Resources via Government-to-Government consultation with the USACE.

Subsistence harvests are likely to be considered protected tribal resources. The Tribe has used subsistence harvests to supply their community with food since its establishment. With limited access to commercial goods, subsistence resources supplement a large portion of their diet through hunting and gathering from the local environment. The community harvests fur seals (*Callorhinus ursinus*) annually for subsistence, in addition to other resources such as halibut (*Hippoglossus stenolepis*), reindeer (*Rangifer tarandus*), marine invertebrates, plants, and berries (ADFG 2011). The Federal government's trust responsibility, deriving from the Federal Trust Doctrine and other sources, for these Protected Tribal Resources is independent of their association with Tribal lands. USACE has identified protecting subsistence practices as a trust responsibility towards Protected Tribal Resources, which is discharged in the following analyses: Sections 3.2.1.2 (Cultural Resources), 3.2.1.3 (Environmental Justice and the Protection of Children), and Section 3.2.2 (Biological Resources).

3.2.1.7 **Public Infrastructure**

Public infrastructure on St. George is comprised of systems supporting transport (road, port, and aviation), energy delivery, public works, solid waste management, communication, and water distribution. St. George generates electricity for its community via diesel generator. There is no potable water supply at the existing harbor.

3.2.1.8 **Sediments**

Intertidal and subtidal sediments are primarily comprised of rocky cobble, much of which originates from the talus slides created by retrograding cliff faces. Marine sediments within the immediate vicinity of Village Cove are believed to be entirely rocky, presumably basaltic olivine bedrock, overlain in areas by sands, gravels, shell hash, cobbles, and boulders. Sediments in St. George's nearshore areas were observed via deep water camera and are comprised of vast reaches of sandy mud interspersed with areas of coarse shell hash and rocky-cobble. A 1950s survey (NOAA Chart 16380) supports this characterization.

3.2.1.9 **Socioeconomic Resources**

Population and Demographics – In 1880, the U.S. Census reported a human population of 92 on St. George Island. It reached a high of 264 in 1960. Since then, decadal assessments illustrate a consistent decline in population to the most recent estimate of 70 in 2018. There was an isolated instance of population increase from 138 in 1990 to 152 in 2000. The 2010 census reported a population of 102, with a male:female ratio of 59:43 compared to 73:79 in 2000. In 2010, 4 persons were in the 0-4 age bracket, 17 in the 5 to 17, 72 in the 18 to 64, and 9 in the 65 and over; whereas in 2000, 9 were in the 0-4 age bracket, 47 in the 5 to 17, 86 in the 18 to 64, and 10 in the 65 and over. According to the Alaska Department of Commerce, Community, and Economic Development, in 2018, the population of St. George was 70 persons.

Employment and Income - The City of St. George is an employer for residents; however, the local tax base is not sufficient to sustain employee pay or the City's expenses. The St. George Tanaq Corporation (an Alaska Native Claims Settlement Act village corporation), and St. George Tribal Council (Tribe) are other employers in the community. There were 14 halibut permit holders in 2016, but only six permit holders fished. An estimated 11 residents live below the poverty line. This number has held steady while the overall population has declined; thus, the percentage of residents below the poverty line has increased from 7.9% in 2000 to 17.2% in 2010. The Alaska Department of Commerce, Community, and Economic Development estimated that 24.2% were below the line in 2014.

3.2.1.10 *Water Quality*

Although naturally occurring freshwater lakes are scattered throughout the landmass of St. George Island, the community of St. George obtains freshwater through shallow-well groundwater extraction. Due to its recent history of volcanic activity, there has been little development of surface drainages (United States Geological Survey, 1976). Ocean waters surrounding St. George Island are considered to be of high quality, primarily due to the lack of development on St. George and great distance from any potential anthropogenic source of pollution. In compliance with the Clean Water Act 40 CFR Part 230, USACE has prepared a Section 404(b)(1) analysis; it is located in Appendix A of this assessment.

3.2.2 Biological Resources

3.2.2.1 Fish and Essential Fish Habitat

Essential Fish Habitat (EFH) is defined by the Magnuson-Stevens Fishery Conservation and Management Act as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity.

St. George Island does not have any anadromous waters or streams that would traditionally be associated with salmonids and their allies, as would be defined under AS 16.05.871(a). However, the marine waters surrounding St. George Island, from the shoreline outward, are designated as EFH under the Groundfish of the Bering Sea Aleutian Islands (BSAI) Fishery Management Plan (FMP), the FMP for Bering Sea/Aleutian Islands King and Tanner Crabs, and the FMP for the Salmon Fisheries in the Exclusive Economic Zone (EEZ) off Alaska. A complete list of those fish species occurring within the various habitat types occurring in the marine waters in close proximity to the Pribilof Islands has been derived from the NMFS EFH mapping tool and is included in Appendix B, USACE's EFH Analysis. Catch data are summarized in USACE's EFH Analysis, Appendix B.

In June of 2019, USACE and NMFS biologists conducted a comprehensive assessment of the existing environment. Beginning at the derelict small boat landing and traversing west to the small rocky cliff spur area that demarks both lobes of the cove, intertidal and subtidal vegetation observations were made and photographs taken. Observations stopped at the spur area because the cliff face showed signs of instability and recent slides, and the beach width at that point was also quite narrow. It was observed at that time that the intertidal zone of the western lobe of Village Cove was not as nearly as densely colonized by intertidal and subtidal submerged aquatic vegetation (SAV), as was the eastern lobe despite the two rocky shorelines appearing on the outset to be similar.

Dragon kelp (*Alaria fistulosa*) is the predominant epiphyte in Village Cove, occurring at medium to very high density from the lower intertidal to the shallow subtidal zones. Also common within the mid to low intertidal and shallow subtidal zone were intermittent bunches of sea fern fringe (*Hymenana ruthenica*). Interspersed amongst the mid to low intertidal zone were small clusters of sieve kelp (*Agarum clathratum*). The upper-most intertidal zone was primarily colonized intermittently by rockweed (*Fucus distichus subspecies evanenescens*) and Arctic sea moss (*Acrosiphona arcta*).

SAV, as observed from the shoreline (Figure 13), appeared to be restricted to the highest energy portion of the surf zone, and did not extend more than approximately 50 meters from the shoreline within the cove, and was predominantly comprised of dragon kelp. USACE biologists confirmed this observation with underwater videography taken at approximately the 30 foot depth contour of Village Cove. Large epiphytic species were entirely absent at this depth, replaced in low densities by what appeared to be a small calciferous epiphyte, not exceeding an estimated 15 centimeters in height.

In virtual habitat assays of the entirety of St. George's nearshore areas via Geographical Information Systems (GIS) satellite imagery, SAV was observed to be restricted to the intertidal and shallow sub-tidal zones closest to the shoreline.



Figure 13. Intertidal Submerged Aquatic Vegetation at Village Cove

3.2.2.2 Invasive Species

St. George is relatively free from non-native species. Domestic reindeer were introduced as a food source and are now established on St. George. Non-native plants are also known to occur on the island. However, neither the reindeer nor the plants are known to be invasive. The U.S. Fish and Wildlife Service works with the Tribe and the City to implement biosecurity measures to prevent the establishment of non-native rodents. No non-native marine species are known to occur in the St. George area. Non-native species have the potential to become established, and impact native and endemic island flora and fauna; it is critical to prevent introductions.

3.2.2.3 *Marine Invertebrates*

During surveys in June 2019 (Figure 14) the most commonly encountered marine invertebrate was the Oregon hairy triton (*Fusitriton oregonensis*), followed by common sunstar (*Crossaster papposus*), widehand hermit crab (*Elassochirus tenumanus*), and green urchin (*Strongylocentrotus droebachiensis*), respectively. No commercially

relevant species of marine invertebrate were encountered. Marine invertebrates that are commercially relevant or that are extended habitat protections under the BSAI FMP include blue king crab (*Paralithoides platypus*), red king crab (*Paralithoides camtschaticus*), tanner crab (*Chionoecetes bairdi*), and octopus (*Enteroctopus dofleini*).

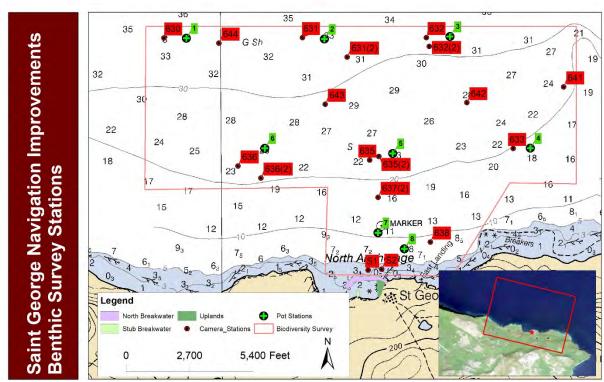


Figure 14. Underwater Video and Crab Pot Survey Stations

Benthic invertebrates were notably absent in areas that displayed rapidly moving currents and along the sand wave-type substratum. In places where the substrate was mud or sandy mud, tube worm casings were observed. Also observed along the sandy mud substrate were two varieties of giant plumose or white-plumes anemone (*Metridium farcimen*), and another species of anemone that was not identified to genus. Invertebrate diversity increased once the substrate began to transition to shell hash and rocky reef. Various hermit crabs, sponges, scallops, brittle stars, common sunstar, and chitons were observed. Video quality was not good enough to identify smaller organisms to species. Green urchins were particularly abundant at the 30 foot isobath, occurring in the hundreds.



Figure 15. Village Cove 30 ft Isobath, Green Urchins

3.2.2.4 *Marine Birds*

The avifauna of St. George numbers 189 species of birds, of which 26 are known to breed on the island (Guitart et al. 2018). According to USFWS's annual monitoring reports, ten species of seabirds and seaduck commonly occur in the project area (Table 11). Of these ten, the red-faced cormorant, thick-billed murre, red-legged kittiwake, and least auklet were identified during the Fish and Wildlife Coordination Act process as important and warranting further evaluation because the proximity of their habitat to the project footprint. Of these four species, the cormorant, murre, and kittiwake perch and nest on the cliffs surrounding the proposed project site. Each species normally lays its eggs on ledges with minimal to no actual nest built.

Table 11. Marine Bird Species

Species	Nesting Habitat	Foraging Habitat / Area	Occurrence	Breeding
Horned puffins (Fratercula corniculata)	Sea cliff	Open water, continental shelf, areas of surface upwelling	May to Sep	Jun to Aug
Tufted puffins (F. cirrhata)	Sea cliff	Open water, continental shelf, areas of surface upwelling	May to Oct	May to Aug
Thick-billed murres (<i>Uria lomvia</i>)	Sea cliff	Open water, near ice edge if present	May to Oct	May to Jul

Red-legged kittiwakes (<i>Rissa</i> brevirostris)	Sea cliff	Open water, continental shelf or deeper, areas of surface upwelling	May to Oct	May to Aug
Black-legged kittiwakes (<i>R. tridactyla</i>)	Sea cliff	Open water, continental shelf or deeper, areas of surface upwelling	Apr to Sep	Apr to Jul
Northern fulmars (Fulmarus glacialis)	Sea cliff	Open water, continental shelf or deeper, areas of surface upwelling	May to Oct	May to Jul
Red-faced cormorants (Phalacrocorax urile)	Sea cliff	Coastal and inshore waters	Apr to Sep	Apr to Sep
Least auklets (Aethia pusilla)	Inland	Stratified waters with strong thermoclines, areas of surface upwelling	May to Sep	May to Jul
Parakeet auklets (A. psittacula)	Coastline, large beach cobble and boulders, and coastal low cliffs	Open water, continental shelf, areas of surface upwelling	May to Sep	May to Jul
Harlequin ducks (Histrionicus histrionicus)	N/A	Rocky nearshore inter-and subtidal	Possibly year-round	N/A

3.2.2.5 Marine Mammals, Endangered Species, and Critical Habitat

All marine mammals are protected under the Marine Mammal Protection Act (MMPA), 1972. Based on NMFS's protected species mapping tool and available literature describing stocks of marine mammals in Alaska, 18 marine mammals have the potential to occur in the Pribilof region of the Bering Sea. These species include: harbor seal (Phoca vitulina), northern fur seal (Callorhinus ursinus), ribbon seal (Histriophoca fasciata), spotted seal (P. largha), beluga whale (Delphinapterus leucas), Dall's porpoise (Phocoenoides dalli), killer whale (Orcinus orca), minke whale (Balaenoptera acutorostrata), Stejneger's beaked whale (Mesoplodon stejnegeri), Steller sea lion (Eumetopias jubatus), fin whale (B. physalus), humpback whale (Megaptera novaeangliae), North Pacific right whale (Eubalaena japonica), sperm whale (Physeter macrocephalus), gray whale (Eschrictius robustus), bearded seal (Erignathus barbatus nauticus), ringed seal (Pusa hispidia hispidia), and Northern sea otter (Enhydra lutris kenyoni). The latter 9 of the above 18 species or Distinct Population Segments (DPS) are extended additional protections under the Endangered Species Act (ESA), 1973. Take (e.g., to harass, harm, kill) of species listed under the MMPA or ESA is prohibited without a permit.

Although stocks or individuals of the aforementioned species list are purported to occur in the Pribilof region of the Bering Sea, some are summarily dismissed from further discussion in the existing environment and from consideration in the subsequent effects

analysis because their likelihood, generally due to habitat preference, of being in proximity to the proposed project footprint, is so remote as to be discounted. Marine mammals not carried forward for analysis: ribbon seal, spotted seal, beluga whale, Dall's porpoise, Stejneger's beaked whale, North Pacific right whale, sperm whale, and gray whale. For some species brought forward for analysis, concise presence and absence timing data is somewhat unavailable.

Harbor seals inhabit the Pribilof Island region year-round at low densities, likely due to their high latitudes coinciding with the species' northern-most distribution. A 2010 stock abundance estimate of the Pribilof Islands harbor seal stock was 232 animals, which was also the number of individual animals observed during the July 2010 survey. Approximately 185 adults and 27 pups were observed on Otter Island plus an additional 20 other individuals on all the other islands combined (NOAA 2017).

Northern fur seals are regularly observed in great numbers in the nearshore waters of the Pribilof Islands, where it is estimated that greater than 70% of the global population aggregates around the summer breeding season, which occurs between June and August. On St. George, rookeries occur at beach areas where cliff faces do not preclude access to the gently sloping, grass-covered upland areas. One rookery, in particular, the North Rookery, exists approximately 1 kilometer to the west of USACE's proposed project area and produced approximately 6,200 of the Island's total 20,261 pups in 2016 (NOAA 2016).

Adult male fur seals arrive at rookery beaches in May and stay until mid-August to stake their claim to the best breeding areas. The majority of pregnant females begin arriving mid-June, and the peak of pupping season occurs in early July. From their rookery areas, females make frequent foraging trips, lasting 3-10 days, and suckle their pup for one to two days in between. Weaning is abrupt, and pups begin to depart by early November. By December, the entirety of the herd has departed the rookery grounds and surrounding waters (NOAA 2019). Most northern fur seals overwinter in the north Pacific away from St. George.

Killer Whales are regularly observed in the waters of the Pribilof Islands. Little is understood about the population dynamics of these animals inhabiting the Bering Sea; however, a portion of the transient population spends time in the waters surrounding the Pribilof Islands during the fur seal breeding months (2016b).

Minke whales are known to occur throughout the entirety of the Bering Sea and into the Chukchi Sea. NMFS currently estimates their abundance along the eastern Bering Shelf at 389 individuals. However, this estimate is approximately ten years old. Minke whales are typically observed in small groups of two to three, but larger aggregations are common when food resources are abundant. Minke whales in Alaskan waters are migratory, but animals found south of the Gulf of Alaska are considered resident animals. (NOAA 2018c).

3.2.2.6 ESA-listed Species & their Critical Habitat

Steller sea lions (western DPS) range throughout the entirety of the Bering Sea and have known rookery and haulout sites throughout the Pribilof Islands. Steller sea lions once came ashore at St. George Island to breed and whelp in the thousands but were systematically extirpated from breeding grounds. Although no pups have been recorded on St. George since 1916 (NMFS 2008), locations of the historic rookeries are known. Steller sea lion haulout sites on St. George are also known. Steller sea lions are frequently observed transitioning through and foraging in the nearshore waters of Village Cove and the North fur seal rookery. Steller sea lions are dependent upon isolated haulouts and rookery areas. Although not technically migratory, Steller sea lions move about the entirety of their range as they pursue prey species' seasonal abundance. Overall, populations of Steller sea lions declined precipitously in the decades between the 1950s and 1980 and began to stabilize and slightly increase by the 2000s, but there are trends in either direction depending upon which portion of the species' overall range is sampled.

Critical Habitat has been designated for the Steller sea lion Western DPS and is defined as a 20 nautical mile buffer around all major haulout and rookeries with their associated terrestrial, air, and aquatic zones (Figure 16). All of St. George's surrounding waters fall under the critical habitat designation for Steller sea lion, Known haulouts are located southeast and west of Village Cove.



Figure 16. Steller Sea Lion Designated Critical Habitat: Pribilof Islands Upper Left, Aleutian Chain, Lower Right

Fin whales are seasonal migrants to the Bering and Chukchi Seas. There is not a lot of data on the North Pacific fin whale distribution; however, it is known that they are migratory, spending winter months in the warmer waters of the lower latitudes (NOAA 2018a). An acoustic study by Stafford and Mellinger (2009) recorded fin whale calls in the Bearing Sea for a full year in 2006-2007. This study detected the highest number of calls from August through December, with detections decreased drastically from March through August (Stafford and Mellinger, 2009). The detection of calls throughout the winter into spring is thought to be evidence that fin whales may be present in the Bering Sea year-round (Stafford and Mellinger, 2009). Fin whales are gregarious, often found in social groups of two to seven.

According to NMFS, there are no reliable estimates of the current and historical abundances for the entire Northeast Pacific fin whale stock. However, according to NMFS's stock report, relative densities of observed fin whales are greatest across the Bering Sea shelf break (200 meter isobaths) (NOAA 2018a).

Humpback whales in the Aleutian Islands, Bering, Chukchi, and Beaufort Seas are part of three recognized North Pacific DPSes: the Western North Pacific DPS, the Hawaii DPS, and the Mexico DPS. Humpback whales from the Western North Pacific DPS, which are listed as Federally endangered, are the least likely to be encountered in Alaskan waters, with an encounter probability of only 4.4 percent. Humpback whales from the Mexico DPS, which are listed as federally threatened, have a similarly low encounter probability at 11.3 percent. Humpback whales from the Hawaii DPS are not listed under the ESA; they are the most likely to be encountered in Alaskan waters, at 86.5 percent (NOAA 2016a). It should be noted that among these DPSes, individual whales do not exhibit physical traits that would allow for visual confirmation of population lineage.

Humpback whales are migratory, feeding in northern latitudes during summer and fall months and migrating to lower latitudes for breeding and calving. According to the (NOAA 2018b) Alaska Stock Assessment, humpback whales are consistently recorded by hydrophones north of the Bering Strait as late as early November. A study conducted by Stafford and Mellinger (2009) detected humpback whale calls year-round in the Bering Sea, with the highest number of calls occurring August through March. Humpback whales are known to traverse the Bering shelf and likely come within visual observation range of the landmass of St. George. Humpback whales are gregarious and often travel together or congregate at areas where food density is relatively high.

Ringed Seals are the smallest and most common Arctic seal; they exhibit a circumpolar distribution and are divided into five subspecies. There is one recognized stock of Arctic ringed seals in U.S. waters: the Alaska stock. The estimated population size for this stock is over 300,000 individuals. They are pagophilic and spend the majority of their time with the ice, relying upon it for pupping, nursing, resting, and molting. During the sea ice maximum, ringed seals are commonly observed in the northern Bering Sea, Norton and Kotzebue Sounds, and the Chukchi and Beaufort Seas. However, they are

typically not abundant south of Norton Sound, even in years of extensive ice coverage (NOAA 2016c).

Bearded Seals exhibit circumpolar distribution, and likely number over 500,000 worldwide. Bearded seals rely on the availability of suitable sea ice over relatively shallow waters for use as a haul-out platform for giving birth, nursing pups, molting, and resting; bearded seals rarely haul-out on land. Similarly, bearded seals typically migrate in concert with the pack ice at the sea ice's edge, with those animals overwintering in the Bering Sea migrating through the Bering Strait and over-summering in the waters of the Chukchi Sea until the sea ice reforms and migrate south back into the Bering Sea. The Okhotsk and Beringia DPSes of the Pacific sector are listed as threatened under the ESA (NOAA 2018).

Northern sea otters (Southwest Alaska DPS) in the St. George area are listed as a threatened. Otters are not abundant in the Pribilofs (Guitart et al. 2018; Michelle St. Martin, USFWS, Nov 2019 pers. comm.). They can use all coastal marine habitats within their range but are most commonly observed within a few kilometers of shore. Their seaward distributional limit is defined by their diving ability and is approximated by the 100 m depth contour. Sea otters may haulout on intertidal or supratidal shores.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 No-Action Alternative

4.1.1 Non-Biological Resources

4.1.1.1 *Aesthetics*

Under the No-Action Alternative, no harbor would be constructed, and the existing viewshed would likely not be impacted.

4.1.1.2 Cultural Resources

Under the No-Action Alternative, the impact on the visual features of the Seal Islands Historic District National Historic Landmark (XPI-00002) would not be incurred. The two historical landings, XPI-00194 and XPI-00195, will continue to degrade, likely leading to the eventual total loss of the structures through natural erosion.

4.1.1.3 Environmental Justice and the Protection of Children

Under the No-Action Alternative, no harbor would be constructed. Without a functioning harbor, the inefficiencies and safety concerns of the existing navigation infrastructure will continue, and food security will remain a concern for the entire community of St. George. This would likely negatively impact the long-term viability of the predominantly Alaska Native community.

4.1.1.4 **Navigation**

Under the No-Action Alternative, no harbor would be constructed, and safe navigation in the proposed site would likely not increase. Navigation at Zapadni Bay would likely continue under the current conditions.

4.1.1.5 *Noise*

Under the No-Action Alternative, no harbor would be constructed, and ambient noise would likely remain at the existing levels.

4.1.1.6 **Protected Tribal Resources**

Under the No-Action Alternative, no harbor would be constructed. Members of the St. George Traditional Council would likely experience the same opportunities to conduct terrestrially-based subsistence activities; however, opportunities for ocean-based subsistence activities would likely continue to decline. Subsistence patterns are likely to continue as they currently at the same rate; fur seal takes are conducted along the shores, while halibut and other marine resources would be accessible on weather-permitted days from fishing boats using the Zapadni Bay harbor. Other impacts to protected tribal resources are discussed in Section 4.1.1.2 (Cultural Resources), 4.1.1.3 (Environmental Justice and the Protection of Children), and Section 4.2.2 (Biological Resources).

4.1.1.7 Public Infrastructure

Under the No-Action Alternative, no harbor would be constructed, and the public infrastructure would likely not be impacted. Deterioration of the existing harbor facilities would be expected to continue. At a certain point, the fuel barge would no longer be able safely service the community.

4.1.1.8 **Socioeconomics**

Under the No-Action Alternative, no harbor would be constructed. Without a viable subsistence-cash economy, the human population on St. George is likely to continue to decline and increase in relative age. Similarly, without a viable economy, the percentage of the residents below the poverty line is likely to continue to increase.

4.1.1.9 **Sediments**

Under the No-Action Alternative, no harbor would be constructed, and sediments, and their natural decomposition and migration cycles would not be impacted.

4.1.1.10 *Water Quality*

Under the No-Action Alternative, no harbor would be constructed and water quality would likely remain in its current state.

4.1.2 Biological Resources

4.1.2.1 Fish and Essential Fish Habitat (EFH)

Under the No-Action Alternative, no harbor would be constructed, and fish and EFH would likely not be impacted.

4.1.2.2 Invasive Species

Under the No-Action Alternative, no harbor would be constructed, and the probability of inadvertent introduction of invasive species would likely not increase.

4.1.2.3 *Marine Birds*

Under the No-Action Alternative, no harbor would be constructed, and marine birds would likely not be impacted.

4.1.2.4 *Marine Invertebrates*

Under the No-Action Alternative, no harbor would be constructed, and marine invertebrates would likely not be impacted.

4.1.2.5 *Marine Mammals, Endangered Species, and Critical Habitat* Under the No-Action Alternative, no harbor would be constructed, and there would likely be no impact to marine mammals, endangered species, or their respective designated critical habitats.

4.2 Alternative N-3 (Agency's preferred alternative)

4.2.1 Non-Biological Resources

4.2.1.1 **Aesthetics**

Under Alternative N-3 (Proposed), impacts on the aesthetics of St. George would be unavoidable and permanent. Views of the high cliffs supporting active bird communities, and the shorelines providing areas for seal rookeries where no anthropogenic structures currently exist would be marred by the sight of a breakwater protected harbor. These impacts are more specifically addressed in the Cultural Resources section below (Section 4.2.1.2). Mitigation is explained in the signed Memorandum of Agreement (MOA) (Appendix E). However, implementation of these measures would not minimize the impact to the resource.

4.2.1.2 **Cultural Resources**

The construction of Alternative N-3 (Proposed) would have an adverse effect on The Seal Islands Historic District National Historic Landmark (XPI-00002) by permanently altering the viewshed. There would also be an adverse effect on two of the NHL's contributing structures, the St. George Inside Landing (XPI-00195) and the St. George Outside Landing (XPI-00194); these two structures would be removed or buried within the project area. No other historic property or cultural resource would be impacted by this alternative. The SHPO has concurred that any of the structural alternatives would have an adverse effect on historic properties; this information is explained in detail in the Section 106 consultation documents between the USACE and the SHPO (Appendix E). Per 36 CFR § 800.6, this adverse effect would be resolved through the implementation of mitigation identified in the *Memorandum of Agreement among the USACE, SHPO, and the City of St. George Regarding the St. George Navigation*

Improvements. The National Park Service (NPS) was also notified of the study through the SHPO coordination process, and was invited to participate in the MOA. The NPS agreed to participate as a consulting party.

The City of St. George (non-Federal Sponsor), USACE, and the SHPO are the signatories to the MOA. The Advisory Council on Historic Preservation was invited to participate for the MOA, and has declined; the NPS was also invited to participate in the MOA, and has accepted to consult on the MOA. Mitigation would not minimize the impact to the resource but instead would compensate for the adverse effect on historic properties. Mitigation is likely to include the creation of an artistic recreations of the landscape at the St. George North Anchorage viewshed during three periods of history: prior to the settlement of the community, the Russian Period, and the U.S. Territorial period. These depictions would likely be displayed from the vantage of the same North Anchorage viewshed, on a hill west of the community where a monument to the historic fur seal industry is already emplaced. The mitigation will address the adverse effects to both the viewshed of the NHL, as well as the destruction of the Inside and Outside Landings that are within the APE. The MOA was signed on 06 May 2020 and is included in Appendix E.

4.2.1.3 Environmental Justice and the Protection of Children Implementation of Alternative N-3 (Proposed) does not disproportionately negatively affect minority or low-income populations on St. George Island, the population of which is predominantly Alaska Native. Rather, the alternative seeks to reduce inefficiencies inherent to the existing navigation infrastructure, improve food security through increased subsistence access, and improve health and safety. Additionally, Alternative N-3 does not disproportionately negatively affect children. Children, as part of the community as a whole, are expected to benefit from the improved navigational safety and food security.

4.2.1.4 **Navigation**

Under alternative N-3 (Proposed), the cumulative effects of the proposed project would be beneficial to navigation in the region. The 8 to 12 local subsistence vessels currently using Zapadni Bay would be expected to transition their activity to the proposed harbor. Additionally, neighboring St. Paul Island registers 17 subsistence-class vessels. It is anticipated that 5 to 8 of these vessels would operate out of St. George periodically based on fish season openings. These 13 to 20 (local vessels and those anticipated from St. Paul) subsistence vessels would be anticipated to transit in and out of the harbor up to 37 days per year, and these transit days would occur primarily during the fishing openings. The number of vessels in St. George's crabber fleet would be expected to increase from 0 to 2 vessels; however, 84 commercial crabbing vessels operate in the region, and approximately 70 these would be expected to use the harbor. Crabbing vessels would be anticipated to transit in and out of the harbor 8 to 17 days per year during the crabbing season. It is also anticipated that an approximately 300foot-floating processor would operate inside the harbor and that additional vessels would transit to and from the harbor to deliver products. Freight and fuel barges currently using Zapadni Bay would be expected transition delivery to the proposed

harbor. The fuel barge would be expected to make deliveries 2 to 6 times per year at the new harbor; whereas, one freight delivery would be expected annually. Because there is little to no navigational traffic in the proposed project area, this increase in boat traffic would not likely affect existing navigation. Placement of dredged material between the 20 and 30-fathom isobath would not raise the elevation of the seafloor enough to impact navigation.

4.2.1.5 *Noise*

Under Alternative N-3 (Proposed), impacts from project-related noise would be moderate, and are best categorized as in-water and atmospheric. Certain point source entities are capable of generating nose that would impact both media at the same time, especially if they are operating at or near the atmospheric/in-water interface.

Short-term direct impacts on ambient atmospheric noise levels would occur at their highest intensity during the construction phase of the project, which could occur at least seasonally for three to five years. The operation of heavy equipment such as loaders, excavators, cranes, dump trucks, and impact pile drivers as the inner harbor facilities features and breakwater structure are constructed may occur at times in 24-hour shifts to take advantage of seasonal daylight periods. Concurrently, the operation of drilling and dredging barges, confined underwater blasting, active dredging, keying in armor stone (placement), and impact pile driving would contribute to the overall impact to the ambient atmospheric noise. Impacts on ambient atmospheric noise levels would also occur at the existing Zapadni Bay Harbor and along the roadway that connects that harbor and the town of St. George. Increased barge traffic ferrying equipment and raw construction materials would likewise require additional over-ground transport to the proposed project site that would periodically impact ambient noise levels.

Similar short-term direct impacts to ambient in-water noise levels would occur at their greatest intensity during construction of the maneuvering basin and navigational channel, and presumably somewhat less so during barge operation, pile driving, and breakwater construction activities. Impacts would likely be seasonal, but would not necessarily occur at the same time as area for the inner harbor facilities project features; project elements that generate in-water noise would likely be subject to specific windows of time or restrictions due to their propensity to potentially harass marine mammals.

Long-term impacts on atmospheric and in-water ambient noise levels as a result of the implementation of Alternative N-3 would likely be in the form of those noises produced as a result of increased vessel traffic and operation of attendant dock-side support equipment. As described in Section 4.2.1.4 Navigation, above, commercial and subsistence vessel traffic would be expected to increase as well, which would moderately affect the ambient baseline of the in-water and atmospheric noise profile at Village Cove.

Impacts to both atmospheric and in-water ambient noise levels would be most severe in the short-term; however, would abate over time as the largest construction features were completed. In the longer term, however, the acoustic baseline would come to resemble that of a small boat harbor. Conservation measures directing the specific timing of major construction elements would also likely reduce potential impacts to inwater ambient noise levels. Overall impacts on ambient noise at St. George would be moderate.

4.2.1.6 **Protected Tribal Resources**

Under Alternative N-3 (Proposed), there would be no adverse impacts to subsistence access in or around the community of St. George. Construction of the harbor would benefit the accessibility for subsistence practices, which are traditional to the local Unangax population; the proposed harbor would increase the available days for accessing marine resources for subsistence activities. Such activities include utilizing small watercraft to participate in the harvest of marine resources such as fishing and crabbing. The impact to subsistence gathering of shellfish and urchins would negligible; the footprint on the shoreline is small, and the community would still have access to the predominant beach area. The proposed project would also have no potential to cause effects on the local religious customs that could be identified. The impacts to cultural resources related to the history of the St. George Traditional Council is being addressed with the MOA identified in Section 4.2.1.2 (Cultural Resources, above), and the impacts to the marine resources that they subsistence hunt in Section 4.2.2 (Biological Resources, below).

4.2.1.7 **Public Infrastructure**

Under Alternative N-3 (Proposed), St. George's public infrastructure would be impacted by an increase in the number of personnel and type of equipment that would be utilizing it in order to implement the project. However, in its current state, the majority of St. George's existing public infrastructure is capable of handling an increase in utilization with only minor, temporary impact, including the existing harbor and facilities, road system, airfield, and St. George's solid waste management facilities.

St. George's existing harbor would be impacted by an increase in barge traffic, bringing construction-related equipment and raw materials to the island. However, these impacts would be temporary in nature and likely discountable because of its current state of underutilization.

St. George's main road from the existing harbor to the Village site, which is improved, but not paved, would be impacted by episodic increases in heavy equipment traffic, specifically when equipment and rock barges started arriving at the existing harbor and debarking their cargo for transference to the north side of the island. Some minor, yet temporary road repairs may be necessary as a result of the increased traffic, but they may not have as much impact on overall road quality as the annual weather regime does. These impacts would be temporary, but the added traffic could pose a collision hazard to local residents who frequently rely upon 4-wheelers as their preferred method of transportation around the local roads. Safe vehicle operation procedures such as the

observation of speed limits and operating with hazard lights on would reduce the potential collision hazard of heavy equipment sharing the roadway with 4-wheelers.

St. George's existing airfield is currently underutilized, receiving few commercial and private aircraft per week. An increase in air traffic as a result of project construction or full project implementation would be easily supported, and represent only a temporary impact, In the long-term, the erosive forces of the Bering Sea's climate would have a more pronounced physical impact upon the airfield than a slight-to-moderate increase in air traffic.

St. George's solid waste management facilities are currently underutilized and would be only temporarily impacted by an increase in the solid waste stream generated by the project's construction activities. Full implementation of the proposed project would require dedicated long-term solid waste management support, but this is not expected to impact the existing condition of solid waste management on St. George.

Existing electrical and water distribution systems may require supplemental capacity or expansion of infrastructure to support project-related functions at either the existing harbor, which currently has no running water, or at the Village Cove project site, which has neither water nor power. BMPs would be incorporated into the construction plan to ensure appropriate fueling and fuel storage procedures. Currently, there is no supporting data to suggest that existing water and electrical delivery systems would be overtaxed by project-related activities that they could be reasonably expected to support.

Long-term impacts on St. George's public infrastructure are most likely to be those associated with the requirements of the harbor itself, the water and electricity that it would draw, and the solid waste management support that it would require. The harbor would essentially become its own public infrastructure asset and would have to be addressed as such with maintenance and upkeep, incremental modernization, and constant monitoring.

Even after project implementation, impacts to the public infrastructure would not be expected to attain the same level intensity as while construction was actively occurring. The most recognizable direct effect to the existing public infrastructure would be the long-term demands and management of the new harbor. Indirect effects to public infrastructure may include increased air traffic, and an increase in overall traffic compared to the existing baseline. However, such increases would reasonably be expected to occur over an extended period of time. The weather and wave climate of the Bering Sea have traditionally stemmed travel and immigration to the Pribilof Islands and the implementation of Alternative N-3 would provide the community of St. George a reliable method of addressing increased demands upon their public infrastructure in an incremental and practical manner. Overall, impacts to St. George's public infrastructure are likely to be minor as a result of the implementation of Alternative N-3.

4.2.1.8 **Socioeconomics**

Under Alternative N-3 (Proposed), the socioeconomic paradigm within the community of St. George would be positively impacted. As such, impacts to the community's population and demographics, and employment and income would be likely to occur at some level in both the short- and long-term.

Facets of the community's population and demographics would be impacted by all aspects of the proposed project. An increase in transient laborers during construction, followed by more permanent-type positions during long-term harbor operations, would beget requirements for support services. These services would generate employment opportunities that may attract potential residents to St. George. Increased economic opportunity at St. George would likely impact the existing immigration to emigration ratio.

Significant portions of the construction work are likely to require heavy equipment operators, engineers, logistical specialists, and other well-paying positions. The project, as proposed, would possibly take as long as five years or more to complete. Long-term operation of the harbor and efforts that support maintenance and oversight of those facilities would also likely generate employment opportunities. Also, reliable, long-term operation of the harbor would be expected to reduce associated transportation costs applied to fuel and durable goods that borne by the community.

Long-term effects stemming from the implementation of Alternative N-3 may also include the stability that the harbor offers the community of St. George; fuel and durable goods could be reliably delivered, where in the past this was not guaranteed. Indirect impacts could vary in scale or scope but could include the establishment of ecotourism, fish processing, marine repair, or similar type business based at St. George.

4.2.1.9 **Sediments**

Under Alternative N-3 (Proposed), impacts to sediments would be short in duration but in some cases, disruptive. Marine sediments (353,052cubic yards) within the project footprint would be subject to drilling, blasting, dredging, compression, and hydraulic and atmospheric processes. It is likely that all of the dredge prism would be would be placed between the 20 and 30-fathom contours (Figure 2); however, a portion (up to 45,000 CY) may be used as fill for the area for inner harbor facilities. Exposed sediments in the Village Cove area next to the project features may also be impacted through exposure to weathering.

Initially, sediments would be fractured and pulverized during drilling and blasting, and these forces would also expose sediments to wave and current action, which may mobilize some sediments or cause others to fall out of suspension. Sediments would be compressed and compacted during dredging operations and the creation of area for inner harbor facilities features and placement at the beneficial utilization site. Sediments placed at the dredged material placement site (Figure 2) would be subject to the prevailing currents in the water column as they descend towards the bottom. Similarly,

disturbance of those bottom sediments would occur as each iteration of placement occurs. Some sediments in these areas would be mobilized by such disturbance and later redistributed by the prevailing current.

Sediments utilized as fill to create the area for the inner harbor facilities feature may be subject to atmospheric weathering processes that cause them to degrade further or cause smaller particulate sediments to mobilize back into the marine environment where they may generate a short-lived and localized plume of suspended sediments. Wave action is rigorous enough at the project site that suspended sediments would be dispersed effectively, or they would fall out of suspension and be incorporated into the littoral sediment budget. These processes would be expected to subside over time as the bank of finer sediments in the fill area diminished over time.

Newly exposed shoreline sediments may be indirectly affected over the long-term by implementation of the project and may experience reduced capacity for mobilization as the project's two breakwaters would be likely to reduce the wave energy allowed to come into contact with those sediments behind it. Similarly, those areas of protected waters behind the breakwater would likely facilitate sediments in suspension to fall out and accumulate.

Implementation of Alternative N-3 would likely have a disruptive impact on sediments in the short-term. However, these impacts would be expected to dissipate and ultimately result in a minimal overall and long-term impact.

4.2.1.10 *Water Quality*

Under alternative N-3 (Proposed), impacts to water quality would be moderate and likely come from increased turbidity as a function of construction and other project-related activities such as drilling, blasting, dredging, and placement of dredged material. Impacts on water quality may also be caused by project runoff and an increased probability of inadvertent release of environmentally persistent compounds over time.

Water quality at Village Cove would be impacted by increased turbidity levels associated with drilling, blasting, and dredging. These impacts would be most apparent during or immediately after each of these iterations before wave action, and sediment fallout would return water turbidity levels to ambient conditions. Sediment characteristics at the site suggest that due to its high energy and likely high percentage of bedrock, sediment fallout would be rapid. Despite multiple iterations of drilling, blasting, and dredging required to implement the proposed project, impacts to water quality as a result of turbidity would not be long-lived.

Water quality at the dredged material placement site would be impacted by increased turbidity. Each placement would release approximately 2,500 cubic yards of material from the dredge scow into the water column at the designated site. The mechanical action of sinking through the column would liberate finer particulate materials and set them adrift in the prevailing current, while those heavier sediments would impact the ocean floor and dislodge and expose finer sediments to the deep water current.

Approximately 150-170 individual scow trips would be required to transport the entire dredge prism to the placement site. Water quality would be expected to be temporarily impacted in each case; however, turbidity values would decrease rapidly, the impact would be highly localized, and the interval between placements longer than the time required for turbidity to return to ambient levels. In the context of the project's ability to impact the water quality of the Bering Sea or even the span of such that separates St. George and St. Paul Island, the impact would be negligible.

Runoff from disturbed and exposed ground in proximity to or associated with the proposed project site represents a more likely source of fine particulate material that could impact water quality due to turbidity. St. George's coastal wave climate and currents would effectively dilute impacts from this source of turbidity, but would not be necessary if an appropriate stormwater pollution prevention plan were implemented to reduce such impacts. Impacts from project-related runoff would be minor with the implementation of a comprehensive stormwater pollution prevention plan.

Indirectly, in-water construction actions, short- and long-term petroleum, oil, and lubricant utilization and storage, increased vessel activity; and increased anthropogenic activity would increase the probability of an inadvertent release of compounds that could negatively affect water quality. Impacts on water quality as a result of such a release would be lessened by an appropriate spill response plans (both on land and at sea), a hazardous materials management plan, and the enforcement of safe navigational procedures into and away from the project site. Such plans would be developed in coordination with resource agencies during the project's PED phase. Through appropriate planning and procedure, potential impacts to water quality through the inadvertent release of environmentally persistent compounds would be negligible.

Long-term impacts to water quality as a result implementation of Alternative N-3, specifically the emplacement of the breakwater structure would be expected to be negligible. St. George Island is quite isolated within the Bering Sea and exposed to hundreds of miles of fetch in all directions, resulting in a rigorous nearshore wave climate. Sea surface temperatures in the central Bering Sea are relatively cold year round (approximately 29 degrees Fahrenheit during the winter and less than 55 degrees Fahrenheit during the summertime). When considered in conjunction with the vigorous ambient wave and wind action, the cold nearshore waters are likely near saturation for dissolved oxygen (DO) at all times, particularly in the intertidal zone. DO saturated seawater is expected to diffuse through the porous breakwater structure into the mooring basin via continuous wave action. In a similar fashion, nearshore surface and sub-surface currents and St. George's diurnal tidal cycle would facilitate seawater circulation within the inner basin. Frequent storm activity, as generally occurs in the central Bering Sea would also influence the DO and rate of seawater exchange in the inner Basin. Short-term temporary impacts to water quality in the form of localized increased turbidity levels would be expected to occur as a result of the implementation of Alternative N-3. Implementation of best management practices regarding stormwater pollution prevention, safe material storage, and safe navigation practices would ensure that the potential impact on water quality would be reduced as much as practicable.

4.2.2 Biological Resources

4.2.2.1 Fish and Essential Fish Habitat

Under Alternative N-3 (Proposed), fish and their corresponding EFH would be moderately impacted by in-water construction-related activities: drilling, blasting and dredging of sediments, and the placement of not only the dredge sediments but also the breakwater structures. To achieve project depths, 353,052CY of material would be removed, these sediments would be placed approximately one mile to the north of the project in 120-180 feet of water, and the placement would be designed in such a way as to create rocky reef type habitat for BKC. Emplacement of the North breakwater would represent the loss of about 8.3-acres of poorly characterized subtidal habitat, replacing it with relatively steep, rocky subtidal, intertidal, and supratidal habitat. The spur breakwater would convert about 0.8-acres of rocky intertidal and sub-tidal habitat to a more vertically structured habitat like the North Breakwater. The area for the inner harbor facilities would convert about 4.0-acres. Overall, the conversion of these habitats represents a permanent increase in the complexity of the habitat. Overall, Implementation of Alternative N-3 would be expected to last approximately five years.

Drilling the bedrock in preparation for blasting would be a temporary mechanical and audible disturbance to fishes in the waters of Village Cove. Some fish may refuse to tolerate such disturbance and move to similar habitat within St. George's nearshore areas. However, some fishes may not be able to move to unaffected habitat due to size, habitat preference, lack of motility, or risk of predation, and would be subject to temporary audible and mechanical disturbance. Fishes unable to avoid exposure to drilling may suffer decreased fitness.

Confined underwater blasting would be a temporary, yet pervasive impact to fishes, likely resulting in the immediate death or mortal injury of those fishes within the highest energy blast radius. Similarly, fishes exposed to non-lethal blasting energy may alter their inherent behaviors associated with feeding, predator evasion and communication, or they may seek to avoid the waters of Village Cove entirely. Conversely, the effects of blasting, the mortality of some fishes, could serve as a nuisance attractant for other fishes. Physical characteristics of the submerged habitat at Village Cove would be permanently impacted as successive blasting iterations deepened and shaped the navigation features of Alternative N-3.

Village Cove's depth contours and epibenthic habitat features would be permanently impacted by dredging activities. Fishes that are in and amongst the substrate while dredging were occurring would be at risk of injury or mortality. However, some fishes may not tolerate acoustic and mechanical disturbance generated by the dredging actions and would move from the area to suitable adjacent habitat. Dredging would be temporary in nature, yet its effects upon the depth at Village Cove would be permanent.

Dredge material placement represents a temporary disruptive impact to fish and their habitat along the seafloor at the proposed placement area. Some fishes may be crushed by successive barge scow-loads of dredged material from the Village Cove area. Rocky and similar sediments would be expected to disturb some fish as they impacted the sea floor and liberated sediments into the water column. Some fishes may be displaced by the creation of the dredge material placement site because soft-bottom habitat would be replaced by rocky reef-type habitat. However, the creation of rocky reef-type habitat where none previously existed would be expected to be beneficial to juvenile BKC and other species that utilize interstitial spaces as a portion of their life history. Rocky substrate similarly facilitates colonization by invertebrates and marine algae.

Placement of the breakwater structures would be a permanent impact on fish and their habitat because it would reduce wave energy to the waters behind it. Some fishes may find advantages in such reduced energies, while others may migrate to more suitable habitat conditions nearby. The breakwater structures would also act as rocky reef habitat and provide an appropriate substrate for invertebrates and marine algae colonization. Similarly, interstitial spaces created by boulder-upon-boulder placement would be beneficial for fish species that utilize such habitat during any portion of their life history. Emplacement of the breakwater structures would be a temporary disruptive impact to fishes throughout the nearshore water column of Village Cove, and fishes may choose to abandon the area influenced by the disturbance for similar, undisturbed habitat nearby.

Potential impacts to EFH and EFH-managed species/species complexes are likely to be highly localized, temporary, and minimal, and not reduce the overall value of EFH in the Bering Sea. Mitigation measures have been developed as a function of the development of the EFH Analysis (Appendix B) and subsequent coordination with NMFS Alaska Region Habitat Division subject matter experts, and would be

implemented to reduce or offset the potential unavoidable impacts of USACE activity (see Section 6.2). The construction of a reef intended to provide habitat for BKC would represent a substantial beneficial impact of the project. Therefore, the USACE concludes that its Federal action may affect but is not likely to adversely affect EFH and EFH-managed species/species complexes for BSAI groundfish, crab, and Alaska stocks of Pacific salmon. Potential indirect effects to fish and EFH have not been identified; furthermore, a significant reduction of their habitat would likely not be expected to occur as the remaining 98% of St. George's nearshore habitat is unaffected by anthropogenic development.

4.2.2.2 Invasive Species

Under alternative N-3 (Proposed), a small boat harbor and its attendant features would be constructed. This would result in an overall increase in the air and sea traffic to St. George during the construction period and subsequent harbor operations timeframe. St. George Island is biogeographically isolated and unique, making it susceptible to colonization by invasive species, primarily invasive rodents.

During construction, heavy equipment, including barges, loaders, cranes, generators, etc., would be transported to St. George from elsewhere in Alaska. Similarly, the materials required for construction of the breakwater would be sourced off-island from sites in Alaska. The transportation of material and equipment sourced from off-island presents a potential vector for the introduction of invasive species that could be detrimental to St. George's existing natural resources. During construction, the influx of off-island support personnel and equipment would also pose a potential risk as a vector for the inadvertent introduction of invasive species to St. George. Post-construction, normal harbor operations pose a similar concern. Many of the vessels that would be expected to utilize the improved facilities would not originate from St. George and therefore could also serve as potential vectors for invasive species.

USACE coordinated with USFWS under the precepts of the Fish and Wildlife Coordination Act to identify resources of conservation importance and to develop avoidance and minimization measures to reduce impacts to them from project related activities. Because of St. George's susceptibility to invasive species, the development and implementation of a biosecurity plan prior to construction activities was identified as a key mitigation strategy early in the consultation process and is included in Section 6.0, Mitigation.

4.2.2.3 *Marine Birds*

Under Alternative N-3 (Proposed), Marine birds that nest along the ledges of the cliff face that comprises Village Cove's southern margin would likely be impacted by disturbances associated with the timing and intensity of construction activities, and again by the long-term operation of the harbor. Under Alternative N-3, no cliff face habitat would be destroyed to facilitate construction of the project.

Like their marine mammal counterparts, cliff-nesting marine birds would be present in, and in close proximity to, the proposed project area in high densities beginning in the

months of April and May, and lasting until October and November. During this period, cliff-nesting marine birds socialize, select nesting sites, stage in large numbers in the nearshore zone, make foraging trips out to sea, engage in courtship rituals, lay and incubate eggs, care for and fledge their young, and finally, linger until seasonal weather and food abundance patterns change, triggering migration to the open ocean. Cliffnesting marine birds are sensitive to anthropogenic disturbance regimes, such as the intensive construction actions required by Alternative N-3. Impacts associated with such disturbance would likely cause birds to startle off of their nest ledges, cause loss or abandonment of eggs or chicks, result in failure to establishing nests, and because of the cliff nesting marine bird density at St. George, relocation to a sub-optimal nesting habitat. Therefore, impacts associated with drilling, confined underwater blasting, proximal dredging and material placement, and construction of the spur breakwater during the period that coincides with the majority of the birds' nesting period would be avoided to the greatest extent practicable. Alternative N-3 is estimated to require three to five years to implement. The duration of the implementation is a function of such seasonal work windows that would most likely be applied to specific activities that would conflict with the conservation of marine mammals and of cliff-nesting marine birds.

Long-term impacts to marine birds that nested at the Village Cove cliff site would be unavoidable once the harbor became operational. However, the intensity of the impact would be much reduced from those impacts expected during the construction phase of the project. Intermittent vessel traffic, artificial lighting, tall structures, the sights and sounds of a functioning harbor, and an increased anthropogenic presence could make some birds abandon the nest sites at the Village Cove site or could impact birds through direct interaction such as disruption of nearshore staging behavior, collisions with equipment, and ingestion of refuse. However, these impacts would likely be reduced through the implementation of a harbor management plan that would make provisions for trash management, emergency spill response, and lighting discipline. Development and implementation of a harbor management plan would be the responsibility of the non-Federal Sponsor. Included in the harbor management plan would be the responsibility to continue the implementation of the biosecurity plan after construction of the harbor is completed. Conversely, some birds may acclimate to the disturbance over time and would not be as affected by harbor operations.

Indirect impacts to cliff-nesting marine birds as a result of construction and eventual harbor operation include the inadvertent release of invasive species, increased presence of plastic debris and trash, and a likely increase in the probability of inadvertent release of environmentally persistent compounds. However, these and some direct impacts to cliff nesting birds would be reduced through the application of avoidance and minimization actions that USACE coordinated with USFWS during the Fish and Wildlife Coordination Act process such as the development and preconstruction implementation of a biosecurity plan, no destruction of cliffside nesting habitat, and the observance of a 330' construction buffer. The cliffs at Village Cove represent less than 1% of available suitable nesting habitat on St. George Island. Mitigation measures that would offset the timing of major construction actions with the

majority presence of marine birds would result in only very minor impacts to marine birds.

4.2.2.4 *Marine Invertebrates*

Under Alternative N-3 (Proposed), long-term impacts on marine invertebrates would range from negligible to beneficial. Approximately 353.052CY of material will be removed to achieve targeted project depths, these sediments would be placed approximately one mile to the north of the project in 120-180 feet of water, and the placement would be designed in such a way as to create rocky reef type habitat for BKC. Emplacement of the North breakwater would represent the loss of about 8.3-acres of poorly characterized subtidal habitat, replacing it with relatively steep, rocky subtidal, intertidal, and supratidal habitat. The spur breakwater would convert about 0.8-acres of rocky intertidal and sub-tidal habitat to a more vertically structured habitat like the North Breakwater. The area for the inner harbor facilities would convert about 4.0-acres. Overall, the conversion of these habitats represents a permanent increase in the complexity of the habitat. Overall, implementation of Alternative N-3 would be expected to last approximately five years. Marine invertebrates would be temporarily impacted by in-water project-related actions that alter the geometry of, fracture, dislodge, crushtogether, cover, and bury the sediments and substrates that they use for attachment, cover, feeding, egg-laying, and breeding.

Impacts to marine invertebrates would occur during all phases of in-water construction: drilling, confined underwater blasting, dredging, dredged material placement, construction of the breakwater structures, and inner harbor facilities. Many invertebrates, with the exception of some cephalopods, lack the innate motility to extract themselves from acute disturbance quickly. As such, impacts from project-related inwater construction activities would pulverize, crush, dislodge, increase susceptibility to predation, and injure or kill invertebrates within the proposed project footprint. Construction-related impacts would be temporary, likely occurring seasonally over an approximately 5 year period.

Indirect impacts to marine invertebrates include those associated with the long-term operation of the harbor and the increased probability of inadvertent release of environmentally persistent compounds.

Permanent impacts on invertebrates resulting from the implementation of Alternative N-3 include decreased wave energy and increased depth in the harbor entrance channel and mooring basin behind the breakwater structure and an overall increase in the quantity of rocky reef-type substrate at the breakwater and dredged material placement areas. Despite their permanence, over time, these impacts would likely be beneficial to some marine invertebrate communities by providing suitable substrate and structure for colonization. Similarly, over time, and despite alterations to the existing habitat, invertebrate communities would recover to some degree of equilibrium in the inner basin and at the dredged material placement site. Organisms generally precluded from the surf and intertidal zones may find the deeper, calmer waters of the inner basin suitable for settlement, while at the material placement area, those species whose life

history is dependent upon rocky reef type habitat would be expected to colonize the habitat and eventually reach some degree of equilibrium. In total, USACE would expect invertebrate community compositions at the affected habitats to change over time following the implementation of the project. However, USACE acknowledges that its data concerning the intertidal and subtidal marine invertebrate community at the Village Cove site is limited and that the exact scenario and rate at which the affected habitats might become recolonized is not precisely known.

4.2.2.5 Marine Mammals, Endangered Species, and Critical Habitat Under alternative N-3 (Proposed), impacts to marine mammals would be moderate and would likely result in temporary exposure to sounds or equipment that may cause them to alter their natural behavior. Marine mammals, and threatened or endangered species would be impacted by construction activities, shipping, and logistical activities, and the long-term operational activities of the harbor itself. Marine mammals are seasonally abundant in the waters of St. George, but it is important to note that this abundance is largely due to the presence of northern fur seals near rookeries during late spring. summer and fall. Accordingly, most of the overall abundance around St. George is represented by a single species (fur seals) that primarily occur in localized areas (most near rookeries) and are present during only a portion of the year. Other marine mammals, such as humpback or minke whales, occur in far lower numbers within a much larger area and are most abundant during the summer. Ice seal (ringed, ribbon, spotted, and bearded seals) abundance and distribution near St. George is poorly understood, but is generally influenced by the seasonal extent of the ice edge and thus their potential exposure is influenced by the time of year, weather, and variable prey distribution patterns. While these seals are ice-associated, it is not uncommon for many of them to be found well south of the sea ice edge and thus be present, albeit likely in small numbers, near the project site during some portion of winter construction. Adverse modification of Steller sea lion critical habitat would not be expected to occur from project actions.

Under the MMPA, the harassment of marine mammals is both prohibited and plainly defined. "Harassment" means the act of pursuit, torment, or annoyance which (A), has the potential to injure a marine mammal or marine mammal stock in the wild; or, (B), has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. These definitions (A), and (B), are commonly referred to Level A and Level B harassment parameters, respectively, and are utilized by NMFS and USFWS as defining parameters for determining the severity of an impact to marine mammals or their stocks in the wild. NMFS has also published guidance concerning the sensitivity of marine mammals to explosive underwater sound pressure level exposure (Table 12). Potential impacts from this project would be limited to behavioral impacts in table 5 and the relevant radii are described in figure 15. NMFS utilizes known functional hearing groups among marine mammal species as its baseline for determining the severity of an exposure to specific sound pressure levels. Similar to humans, marine mammals may lose auditory sensitivity when exposed to intense sounds, which can be independent of exposure duration. The loss of such auditory

threshold sensitivity can be temporary or permanent depending upon the level of exposure. Temporary threshold shift (TTS) occurs when auditory sensitivity returns to baseline values in a period (hours to weeks) following exposure. Permanent threshold shift (PTS) occurs when a noise induced threshold shift persists after the period of recovery following exposure. Table 12 (below) presents the categorization of effects of sound pressure level exposure values upon functional hearing groups of marine mammals from the perspective of TTS or PTS, which coincide with the MMPA definitions for Level A (injury) and Level B (behavioral) harassment of marine mammals. It is important to note that Level B harassment has two subcategories; behavioral and TTS. Mitigation (e.g. shutdown distances) would be established so that marine mammals would potentially be exposed to behavioral impacts but not to TTS. There is a 5 dB difference in sound exposure levels (SEL) between behavioral disturbance (changes in breathing, feeding, sheltering) and TTS and the shutdown radii would be established to protect marine mammals from TTS (e.g. the greater distance of the two behavioral criteria in table 5).

Project mitigation, specifically marine mammal monitoring and shutdowns, would be implemented to ensure no marine mammals are exposed to Level A harassment. This would eliminate mortality and permanent injury to marine mammals and thus greatly reduces the overall impact of the project to marine mammals. The details of the monitoring plan and the size of the Level A and zones would be addressed in PED during the LOA application process and formal consultation under the ESA.

Level B impacts for this project would likely be confined to behavioral impacts to breathing, feeding, and sheltering. Shutdown distances, whose precise distances would be worked out in PED, would protect marine mammals from TTS. Confined underwater blasting and pile driving are the two construction noise sources most likely to cause Level B impacts. Marine mammals exposed to construction disturbance could exhibit a variety of behaviors ranging from no observable behavior change at all to fleeing the area. Fleeing the area, if done rapidly under distress could increase respiration and impose an energetic cost or it could be a slow and gradual movement away from project sound sources. Leaving an area could have additional energetic cost (i.e. in addition to locomotion) if they leave an area with an abundant food source to move to an area that is less productive for foraging. While sheltering changes are not typically an issue for whales, disturbance could change sheltering behavior for marine mammals that haul out on either land or sea ice (sea lions and seals). Sound pressure levels that do not exceed minimum Level B values would not be considered harassment under the MMPA definition.

Confined underwater blasting, followed closely by pile driving, has been determined to be the project elements that could have the greatest potential in-water sound pressure impact upon all marine mammals in the area (regardless of ESA status), followed by dredging, dredge material placement, and vessel/harbor operation. The sound sources with the greatest extent form what is commonly called the "action area" in ESA assessments. Underwater noise is the driving factor in the formation of the action area

boundaries. As such, the boundaries differ for various categories of marine mammals depending on their hearing abilities and sensitivities.

The action area for Alternative N-3 is broken into two distinct areas, north (Figure 15) and south (Figure 16). The north action area has zones of two, five or seven kilometers from the harbor site and is derived by the projected attenuation distance to the lowest Level B (behavioral) harassment value for different categories of marine mammals from sound pressure levels generated by confined underwater blasting assuming the largest charge size possible (100 kg/220 lbs.). For low and middle frequency whales (i.e. humpback whales and orca whales) this distance would be approximately 7 kilometers. For phocid seals such as harbor seals and ice seals, this distance would be approximately 5 kilometers. For otariid seals seals such as sea lions and fur seals, this distance would be approximately 2 kilometers. The effects analysis detailed in this proposed project's Draft Biological Assessment (Appendix C) assumes a maximum charge size of 110 lbs., but to be conservative in determining the action area, the larger zone for the 220 lb. charge is used. These distances, 7 km, 5km, and 2km are based on a recent modeling effort for a small blasting project in Valdez, Alaska using NMFS confined underwater blasting model. They are likely a realistic benchmark as similar charge sizes were modeled for Valdez, but these zones will likely be modified (slightly upwards or downwards) as additional construction details are developed and the model is run with project-specific inputs such as hole spacing and total shot size during PED.

The south action area (figure 16) is simple in that it only has a single distance (4 kilometers) and includes an area of potential impacts to all marine mammals from project related shipping for construction materials during construction.

USACE has determined that due to the extensive presence of northern fur seals in the proposed project's action area during the late spring to late fall timeframe, it would seek to avoid impacts through a conservative work window for its confined underwater blasting. Confined underwater blasting would be limited to the period from 1 November through 30 April. Although primarily concerned with reducing impacts on northern fur seals, conducting confined underwater blasting during winter months likely increases the probability of impacts to ice seals. Overall, due to habitat preference and close association with the sea ice, the potential impact to ice seals during the proposed work window would likely be far less than the impact on fur seals during the summer breeding season.



Figure 17. Northern action area zones for low and mid frequency whales (7 km), phocid seals (5 km) and otariid seals (2 km).

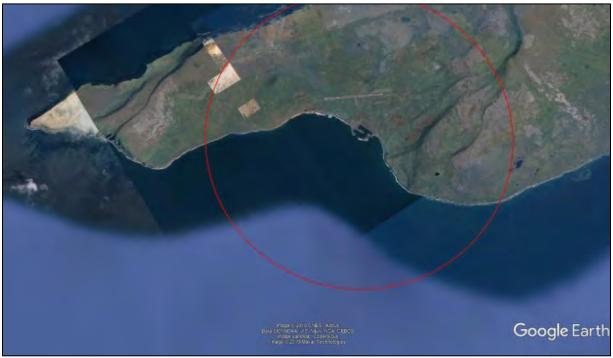


Figure 18. South action area map with 4 km action area zone indicated in red.

Table 12. Explosive Criteria for Marine Mammals

Group	Species	Behavior	Slight Injury	

		Behavioral (for ≥2 pulses/24 hours)	TTS	PTS	Gastro- Intestinal Tract	Lung	Mortalit y
Low- frequency Cetaceans	Mysticetes (e.g., humpback whale)	167 dB SEL (LF _{II})	dB SEL (LF _{II}) or 224 dB peak SPL	187 dB SEL (LF _{II}) or 230 dB peak SPL			
Mid- frequency Cetaceans	Most delphinids, medium and large toothed whales	167 dB SEL (MF _{II})	dB SEL (LF _{II}) or 224 dB peak SPL	187 dB SEL (MF _{II}) or 230 dB peak SPL	237 dB SPL or	$39.1 \text{ M}^{1/3}$ $(1+[D_{Rm}/10.0 \text{ 81}])^{1/2}$ $Pa\text{-sec}$ $Where: M =$	$91.4 \text{ M}^{1/3}$ $(1+[D_{Rm}/10$ $.081])^{1/2}$ Pa-sec Where: M
High- frequency Cetaceans	Porpoises and <i>Kogia</i> spp.	141 dB SEL (HF _{II})	146 dB SEL (HF _{II}) or 195 dB peak SPL	161 dB SEL (HF _{II}) or 201 dB peak SPL	104 psi	mass of the animals in kg $D_{Rm} = depth$ of the receiver (animal) in meters	= mass of the animals in kg D _{Rm} = depth of the receiver (animal) in meters
Phocidae	Hawaiian monk, elephant, and harbor seal	172 dB SEL (P _{WI})	177 dB SEL (Pwi) or 212 dB peak SPL	192 dB SEL (P _{WI}) or 218 dB peak SPL			

Otariidae	Sea lions and fur seals	195 dB SEL (Owi)	200 dB SEL (Owi) or 212 dB peak SPL	215 dB SEL (O _{WI}) or 218 dB peak SPL			
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Tables 6 through 8 below summarize the wide range of potential effects to marine mammals for all aspects of construction and harbor operation.

Table 13. Potential Impacts to Group Otariidae

Activity	Potential impact to Otariidae
Drilling (for	Sound levels are below in-water threshold levels for noise. Minor adverse effects for
blast holes)	disturbance due to the presence of the drill barge and associated traffic. Potential
	effects would be limited to the period of construction.
Blasting	Moderate effects due to disturbance from pressure waves in the Level B zone, no blasting would be allowed with animals in Level A zone. Disturbance from blasting could lead to displacement from the Level B zone for a short period of time. Potential effects would be limited to a short duration after the blast. Impacts to the Otariidae group would be reduced by the presence of protected species monitors and enforced shut-down radii for Level A effects.
Dredging	Dredging would take place after the area is drilled and blasted and would likely occur in blasted areas concurrent with drilling in other areas of the footprint. Underwater noise is anticipated to be audible, but not above regulatory thresholds for marine mammals. Dredging would likely be by clamshell or hydraulic extended-reach excavator.
Dredged	Moderate adverse effects during disposal due to vessel activity and temporary
Material	increases in turbidity. Beneficial effects are anticipated as fish and invertebrate
Placement	habitat complexity is expected to increase.
Pile Driving	Steller sea lions and northern fur seals could be exposed to Level B harassment from pile driving during construction. Additional details are necessary to determine the potential impacts of pile driving more accurately. Impacts would be reduced through the incorporation of protected species observers and enforced shut-down radii for Level A effects.
Harbor Operation	Harbor use would lead to increased vessel traffic in the action area, risk of impact due to vessel strike or anthropogenic interaction would be greatest during peak periods of group Otariidae presence.

Table 14. Potential Impacts to Groups Low and Mid-frequency Cetaceans

Activity	Potential impact to low and mid-frequency cetaceans.
Drilling (for	Sound levels are below in-water threshold levels for noise. Minor adverse effects for
blast holes)	disturbance due to the presence of the drill barge and associated traffic. Potential
	effects would be limited to the period of construction.
Blasting	Moderate effects due to disturbance from sound pressure levels in the Level B zone,
	no blasting would be allowed with animals in Level A zone. Disturbance from blasting
	could lead to displacement from the Level B zone for a short period of time. Impacts
	would be reduced through the implementation of protected species observers and
	the establishment of shut-down radii. Potential effects would be limited to a short

	duration after the blast. Disturbance could trigger responses ranging from leaving the area to no visible response at all.
Dredging	Dredging would take place after the area is drilled and blasted and would likely occur in blasted areas concurrent with drilling in other areas of the footprint. Underwater noise is anticipated to be audible, but not above regulatory thresholds for marine mammals. Dredging would likely be by clamshell or hydraulic extended-reach excavator.
Dredged Material	Moderate adverse effects during disposal due to vessel activity and temporary increases in turbidity. Beneficial effects are anticipated as fish and invertebrate
Placement	habitat complexity is expected to increase. While humpback whales would not forage on the reef directly, they could benefit from an overall enrichment in the area.
Pile Driving	Whales could be exposed to Level B harassment from pile driving during construction. Additional details are necessary to determine the potential impacts of pile driving more accurately. Impacts would be reduced through the incorporation of protected species observers and enforced shut-down radii for Level A effects.
Harbor Operation	Harbor use would lead to increased vessel traffic in the action area and may increase the probability of a ship strike or other anthropogenic interaction with low and mid-frequency cetaceans. However, safe vessel maneuvering practices and spill response plans would likely reduce these impacts. Low and mid frequency cetaceans would not be expected to occur within the inner harbor because of its shallow depth and proximity to shore.

Table 15. Potential Impacts to Group Phocidae

Activity	Potential impact to phocidae.
Drilling (for blast holes)	Sound levels are below in-water threshold levels for noise. Minor adverse effects for disturbance due to the presence of the drill barge and associated traffic. Potential effects would be limited to the period of construction.
Blasting	Moderate effects due to disturbance from sound pressure levels in the Level B zone, no blasting would be allowed with animals in Level A zone. Disturbance could trigger Level B behavioral responses to no visible response at all. Impacts would be reduced through the implementation of protected species observers and the establishment of shut-down radii for Level A effects. Potential effects would be limited to a short duration after the blast.
Dredging	Phocids may be exposed to underwater noise, but not above regulatory thresholds for marine mammals. Dredging would likely be by clamshell or hydraulic extended-reach excavator.
Dredged Material Placement	Moderate adverse effects during disposal due to vessel activity and temporary increases in turbidity. Beneficial effects are anticipated as fish and invertebrate habitat complexity is expected to increase.
Pile Driving	Phocid seals could be exposed to Level B harassment from pile driving during construction. Additional details are necessary to determine the potential impacts of pile driving more accurately because of phocid habitat preference. Impacts would be reduced through the incorporation of protected species observers and enforced shutdown radii to protect against Level A effects.
Harbor Operation	Harbor use would lead to increased vessel traffic in the action area, potentially increasing the probability of vessel strike or other anthropogenic interaction. Safe vessel maneuvering practices and spill response plans would likely reduce these potential impacts.

Because of the very low frequency of occurrence of Northern sea otters, USACE has determined that there would be no effect on this species from project-related activities.

Short-term direct impacts to marine mammals from construction-related noise or equipment presence could cause them to temporarily alter their natural behavior (foraging, surfacing for breath, diving, feeding of young, socializing, and transiting through an area). These types of effects are consistent with Level B harassment and approval for this level of harassment would be sought in the form of an LOA from NMFS. However, long-term direct impacts to marine mammals or their stocks, i.e., Level A harassment such as changes in seasonal distributions over a long period of time, or reduction of critical food resources, or barriers to migration or haul-out or rookery areas would not be likely as a result of the project because of its relatively small footprint within the greater region of the central Bering Sea and because of the proposed mitigation measures.

Indirect impacts to marine mammals may include those that occur as a result of emplacement of the breakwater structures. Some marine mammals would likely choose to haul-out on such structures. Reduced wave energies in the maneuvering basin could serve as an attractant for some marine mammals, particularly juvenile fur seals; this would expose or habituate these animals to the increased anthropogenic presence in the harbor itself leading to the possibility of acute impact if there were an inadvertent release of environmentally persistent compounds. Increased vessel traffic would also likely increase the probability of a vessel strike. Implementation of a spill response plan and guidelines for human/marine mammal interaction would reduce the severity of these potential impacts.

In summary, USACE expects to continue its coordination with NMFS throughout the LOA application process and formal ESA consultation process and expects that opportunities for creative implementation of avoidance and minimization measures would further lessen impacts to marine mammals resulting from the implementation of Alternative N-3. USACE further expects that through its collaborative coordination process with NMFS and USFWS, that through the implementation of avoidance and minimization measures and BMPs already identified, overall impacts to marine mammals would be moderate.

4.3 Alternative N-2

4.3.1 Non-Biological Resources

4.3.1.1 **Aesthetics**

Under Alternative N-2, impacts on aesthetics would likely be the same to the impacts described in Alternative N-3, Section 4.2.1.1. Alternative N-2 differs from N-3 in the depth of dredging (N-3 is deeper); however, the design of the breakwaters under N-2 and N-3 is the same and would have the same visual impact on the seaward and the landward viewsheds.

4.3.1.2 Cultural Resources

Under Alternative N-2, impacts to cultural resources would likely be the same as Alternative N-3, Section 4.2.1.2. The *Memorandum of Agreement among the USACE*,

SHPO, and the City of St. George Regarding the St. George Navigation Improvements would still be completed to address affects to the Seal Islands Historic District National Historic Landmark and the two contributing structures.

4.3.1.3 Environmental Justice and the Protection of Children

Under Alternative N-2, impacts to environmental justice and the protection of children would likely be similar to Alternative N-3, 4.2.1.3. Implementation of Alternative N-2 does not disproportionately negatively affect minority or low-income populations on St. George Island, the population of which is predominantly Alaska Native. Rather, the alternative seeks to reduce inefficiencies inherent to the existing navigation infrastructure, improve food security through increased subsistence access, and improve health and safety. Additionally, Alternative N-2 does not disproportionately negatively affect children. The community's children are expected to benefit from the improved navigational safety and food security.

4.3.1.4 *Navigation*

Under Alternative N-2, impacts to navigation would likely be similar to N-3, Section 4.2.1.4., except that this alternative would provide access to 25% of the commercial fishing fleet provided by Alternative N-3.

4.3.1.5 **Noise**

Under Alternative N-2, impacts to ambient atmospheric and in-water noise would likely be reduced compared to Alternative N-3, Section 4.2.1.5. Alternative N-2 would generate approximately 53% of the dredge materials compared to N-3 and would thus produce proportionally less noise From a long-term perspective, with no crabber fleet access, noise associated with harbor activities would likely be reduced.

4.3.1.6 Protected Tribal Resources

Under Alternative N-2, impacts to protected tribal resources would likely be the same as Alternative N-3, Section 4.2.1.6.

4.3.1.7 **Public Infrastructure**

Under Alternative N-2, impacts to public infrastructure would likely be similar to Alternative N-3, Section 4.2.1.7.

4.3.1.8 **Socioeconomics**

Under Alternative N-2, impacts to socioeconomics would likely be similar to Alternative N-3, Section 4.2.1.8., with the exception of the possibility of reduced long-term employment opportunity resulting from the inability of Alternative N-2 to support a greater proportion of the commercial fishing fleet.

4.3.1.9 **Sediments**

Under Alternative N-2, impacts to sediments would likely be similar to Alternative N-3, Section 4.2.1.9., with the exception of duration and overall quantity of sediments produced. Alternative N-2 would generate approximately 53% of the dredge material compared to N-3 and disturb approximately 66% of the area. This would proportionally reduce the amount of time required for blasting and dredging and would result in

proportionately less sediment generation. Additionally, it would result in a proportionally smaller quantity of material in-water placement as that for Alternative N-3.

4.3.1.10 *Water Quality*

Under Alternative N-2, impacts to water quality would likely be similar to Alternative N-3, Section 4.2.1.10., with the exception of a reduction in duration and the quantity of dredge material produced would be less (see Section 4.3.1.9 for details).

4.3.2 Biological Resources

4.3.2.1 Fish and Essential Fish Habitat

Under Alternative N-2, impacts to fish and essential habitat would likely be similar to Alternative N-3, Section 4.2.2.1. Impacts to fish would be less as the duration of activities to dredge would be reduced by approximately 53%. The areal impact to EFH would be 66% of that for N-3 and the amount of rocky reef-type habitat created would be reduced by approximately 53%.

4.3.2.2 Invasive Species

Under Alternative N-2, impacts from invasive species would likely be reduced compared Alternative N-3, Section 4.2.2.2. The reduced size and depths of N-2 compared to N-3 would result in a shorter duration of construction activities and less materials being transported to St. George. Also, with a reduction in the crabber fleet, fewer vessels would be docking. Combined these factors would translate into a reduced risk of species introduction.

4.3.2.3 *Marine Birds*

Under Alternative N-2, impacts to marine birds would likely be similar to Alternative N-3, Section 4.2.2.3., with the exception that construction activities related to dredging would be reduced by approximately 53%. Additionally, because N-2 would support a 25% smaller commercial fishing fleet, it would be likely that impacts related to the fleet would be proportionally smaller than for N-3.

4.3.2.4 *Marine Invertebrates*

Under Alternative N-2, impacts to marine invertebrates would likely be reduced compared to Alternative N-3, Section 4.2.2.4. The areal impact to EFH would be 66% of that for N-3 and the amount of rocky reef-type habitat created would be reduced by approximately 53%.

4.3.2.5 *Marine Mammals, Endangered Species, and Critical Habitat* Under Alternative N-2, impacts to marine mammals, endangered species, and critical habitat would likely be similar as Alternative N-3, Section 4.2.2.5., with the exception that construction activities related to dredging would be reduced by approximately 53%. Additionally, because N-2 would support a 25% smaller commercial fishing fleet, it would be likely that impacts related to the fleet would be proportionally smaller than for N-3.

4.4 Alternative N-1

4.4.1 Non-Biological Resources

4.4.1.1 *Aesthetics*

Under Alternative N-1, impacts to aesthetics would likely be similar to Alternative N-3, Section 4.2.1.1., but reduced in scale and scope. There would be no spur breakwater and the main breakwater would be approximately 45% the length of that proposed for N-3. The other components of the breakwater would be the same as for N-3, as such the impact to the viewshed would be reduced both from the seaward and landward sides.

4.4.1.2 *Cultural Resources*

Under Alternative N-1, impacts to cultural resources would likely be similar to Alternative N-3, Section 4.2.1.2, but reduced in scale and scope (see Section 4.4.1.1 for details). The *Memorandum of Agreement among the USACE, SHPO, and the City of St. George Regarding the St. George Navigation Improvements* would still be completed to address affects to the Seal Islands Historic District National Historic Landmark and the two contributing structures.

4.4.1.3 Environmental Justice and the Protection of Children

Under Alternative N-1, impacts to environmental justice and the protection of children would likely be similar to Alternative N-3, 4.2.1.3. Implementation of Alternative N-1 does not disproportionately negatively affect minority or low-income populations on St. George Island, the population of which is predominantly Alaska Native. Rather, the alternative seeks to reduce inefficiencies inherent to the existing navigation infrastructure, improve food security through increased subsistence access, and improve health and safety. Additionally, Alternative N-1 does not disproportionately negatively affect children. The community's children are expected to benefit from the improved navigational safety and food security.

4.4.1.4 **Navigation**

Under Alternative N-1, impacts to navigation would likely be reduced compared to Alternatives N-3, Section 4.2.1.4. N-1 would not support a commercial fleet or provided for barge access; thus, impacts to navigation would be reduced compared to N-3.

4.4.1.5 **Noise**

Under Alternative N-1, impacts to ambient atmospheric and in-water noise would likely be reduced compared to Alternative N-3, Section 4.2.1.5. N-1 would generate approximately 2% of the dredge material compared to N-3 and would thus produce proportionally less noise. From a long-term perspective, with no crabber fleet or barge access, noise associated with harbor activities would likely be reduced.

4.4.1.6 **Protected Tribal Resources**

Under Alternative N-1, impacts to protected tribal resources would likely be the same as Alternative N-3, Section 4.2.1.6.

4.4.1.7 **Public Infrastructure**

Under Alternative N-1, impacts to public infrastructure would likely be similar to Alternative N-3, Section 4.2.1.7., except that the overall duration of the project would likely be shorter because the 55% smaller breakwater and 98% reduction in dredging-related activities would require proportionally less construction activity. Also, without the development of a subsistence-cash economy it is unlikely that additional long-term public infrastructure would be required to support Alternative N-1.

4.4.1.8 Socioeconomics

Under Alternative N-1, impacts on socioeconomics would likely be the reduced relative to Alternative N-3. The harbor would not support barge access or a commercial fleet, which would result in continued higher prices for fuel and products and would not facilitate the development of a viable subsistence-cash economy. As a result, the human population on St. George would likely continue to decline and increase in relative age. Similarly, without a viable economy, the percentage of the residents below the poverty line would be likely to continue to increase.

4.4.1.9 **Sediments**

Under Alternative N-1, impacts to sediments would likely be reduced compared to Alternative N-3, Section 4.2.1.9. Alternative N-1 would generate approximately 2% of the dredge material compared to N-3 and disturb approximately 6% of the area. This would proportionally reduce the amount of time required for blasting and dredging and would result in proportionately less sediment generation. Additionally, there would likely be no need for in-water dredged material placement.

4.4.1.10 *Water Quality*

Under Alternative N-1, impacts to water quality would likely be reduced compared to Alternative N-3, Section 4.2.1.10. (see Section 4.4.1.9 for details). Also, there would be no need for in-water dredged material placement.

4.4.2 Biological Resources

4.4.2.1 Fish and Essential Fish Habitat

Under Alternative N-1, impacts to fish and essential fish habitat would likely be reduced compared to Alternative N-3, Section 4.1.2.1. Impacts to fish would likely be less as the duration of activities to dredge would be reduced by approximately 98%. The areal impact to EFH would be approximately 6% of that for N-3 and it is likely that no rocky reef-type habitat would be created by the in-water placement of dredge material and habitat creation from construction of the breakwater would be reduced by approximately 55%.

4.4.2.2 Invasive Species

Under Alternative N-1, impacts from invasive species would likely be reduced compared to Alternative N-3, Section 4.1.2.2. The reduced size and depths of N-2 compared to N-3 would result in a shorter duration of construction activities and less materials being transported to St. George. Also, with no crabber fleet or barge access fewer vessels

would be docking. Combined these factors would translate into a reduced risk of species introduction.

4.4.2.3 *Marine Birds*

Under Alternative N-1, impacts to marine birds would likely be similar to Alternative N-3, Section 4.1.2.3., with the exception that construction activities related to dredging would be reduced by approximately 98%. Additionally, because N-1 would only support a subsistence fleet, it would be likely that impacts related to the fleet would be proportionally smaller than for N-3.

4.4.2.4 *Marine Invertebrates*

Under Alternative N-1, impacts to marine invertebrates would likely be reduced compared to Alternative N-3, Section 4.1.2.4. The areal impact to EFH would be approximately 6% of that for N-3 and it is likely that no rocky reef-type habitat would be created by the in-water placement of dredge material and habitat creation from construction of the breakwater would be reduced by approximately 55%.

4.4.2.5 *Marine Mammals, Endangered Species, and Critical Habitat* Under Alternative N-1, impacts to marine mammals, endangered species, and critical habitat would likely be reduced compared to Alternative N-3, Section 4.1.2.5. The area requiring blasting and/or dredging would be approximately 6% of that for N-3 and the amount of dredge material would be approximately 2%. This would likely result in a reduced duration of impact.

4.5 Alternative N-4

4.5.1 Non-Biological Resources

4.5.1.1 **Aesthetics**

Under Alternative N-4, impacts to aesthetics would likely be similar Alternative N-3, Section 4.2.1.1., but reduced in scale and scope. There would be no spur breakwater and the main breakwater would be approximately 64% the length of that proposed for N-3. The other components of the breakwater would be the same as for N-3, as such the impact to the viewshed would be reduced both from the seaward and landward sides.

4.5.1.2 **Cultural Resources**

Under Alternative N-4, impacts to cultural resources would likely be similar to Alternative N-3, Section 4.2.1.2, but reduced in scale and scope (see Section 4.5.1.2 for details). The *Memorandum of Agreement among the USACE, SHPO, and the City of St. George Regarding the St. George Navigation Improvements* would still be completed to address affects to the Seal Islands Historic District National Historic Landmark and the two contributing structures.

4.5.1.3 *Environmental Justice and the Protection of Children*Alternative N-4, would likely negatively affect minority or low-income populations on St. George Island, the population of which is predominantly Alaska Native. While the alternative would increase access to the barge, it would not improve food security as the

subsistence fleet would still rely on the previous infrastructure. Alternative N-4 would not disproportionately affect children, as the community as a whole would receive the same impact.

4.5.1.4 *Navigation*

Under Alternative N-4, impacts to navigation would likely be reduced relative to Alternative N-1, Section 4.4.1.4 N-1 would not support a commercial fleet; thus, impacts to navigation would be reduced compared to N-3.

4.5.1.5 **Noise**

Under alternative N-4, impacts to ambient atmospheric and in-water noise would be reduced compared to Alternative N-3, Section 4.2.1.5., N-4 would generate approximately 35% of the dredge material compared to N-3 and would thus produce proportionally less noise. From a long-term perspective, with no barge access, noise associated with harbor activities would likely be reduced.

4.5.1.6 **Protected Tribal Resources**

Under Alternative N-4, impacts to protected tribal resources would be likely as there would be no increase of use by the subsistence fleet, as the N-4 Alternative would not be able to moor the local fleet used for subsistence fishing.

4.5.1.7 **Public Infrastructure**

Under Alternative N-4, impacts to public infrastructure would likely be similar to Alternative N-3, Section 4.2.1.7., except that the overall duration of the project would likely be shorter because the 36% smaller breakwater and 65% reduction in dredging related activities would require proportionally less construction activity. Also, it is unlikely that additional long-term public infrastructure would be required to support Alternative N-1. Also, without the development of a subsistence-cash economy it is unlikely that additional long-term public infrastructure would be required to support Alternative N-2.

4.5.1.8 **Socioeconomics**

Under Alternative N-4, impacts on socioeconomics would likely be reduced relative to Alternative N-3, Section 4.2.1.8. The harbor would not support a commercial fleet, which would not facilitate the development of a viable subsistence-cash economy. As a result, the human population on St. George is would likely to continue to decline and increase in relative age. Similarly, without a viable economy, the percentage of the residents below the poverty line is would be likely to continue to increase.

4.5.1.9 **Sediments**

Under Alternative N-4, impacts on sediments would likely be reduced compared to Alternative N-3, Section 4.2.1.9. Alternative N-4 would generate approximately 35% of the dredge material compared to N-3 and disturb approximately 48% of the area. This would proportionally reduce the amount of time required for blasting and dredging and would result in proportionately less sediment generation. Additionally, the amount of dredge material available for in-water placement would be reduced compared to N-3.

4.5.1.10 *Water Quality*

Under Alternative N-4, impacts to water quality would likely be reduced compared to Alternative N-3, Section 4.2.1.10. (see Section 4.5.1.9 for details). Additionally, the amount of materials available for in-water dredged material placement would be reduced compared to N-3.

4.5.2 Biological Resources

4.5.2.1 Fish and Essential Fish Habitat

Under Alternative N-4, impacts to fish and essential fish habitat would likely be reduced compared to Alternative N-3, Section 4.2.2.1. Impacts to fish would likely be less as the duration of activities to dredge would be reduced by approximately 65%. The areal impact to EFH would be approximately 48% of that for N-3 and it is likely that the amount of rocky reef-type habitat created by the in-water placement of dredge material would be reduced by 65% and habitat creation from construction of the breakwater would be reduced by approximately 36%.

4.5.2.2 Invasive Species

Under Alternative N-4, impacts from invasive species would likely be reduced compared to Alternative N-3, Section 4.1.2.2. The reduced size and depths of N-2 compared to N-3 would result in a shorter duration of construction activities and less materials being transported to St. George. Also, with a reduction no crabber fleet fewer vessels would be docking. Combined these factors would translate into a reduced risk of species introduction.

4.5.2.3 *Marine Birds*

Under Alternative N-4, impacts to marine birds would likely be similar to Alternative N-3, Section 4.1.2.3., with the exception that construction activities related to dredging would be reduced by approximately 65%. Additionally, because N-4 would not support a crabber fleet, it would be likely that impacts related to the fleet would be proportionally smaller than for N-3.

4.5.2.4 *Marine Invertebrates*

Under Alternative N-4, impacts to marine invertebrates would likely be reduced compared to Alternative N-3, Section 4.1.2.4. The areal impact to EFH would be approximately 48% of that for N-3 and it is likely that the amount of rocky reef-type habitat created by the in-water placement of dredge material would be reduced by 65% and habitat creation from construction of the breakwater would be reduced by approximately 36%.

4.5.2.5 *Marine Mammals, Endangered Species, and Critical Habitat* Under Alternative N-4, impacts to marine mammals, endangered species, and critical habitat would likely be reduced compared to Alternative N-3, Section 4.2.2.5. The area requiring blasting and/or dredging would be approximately 48% of that for N-3 and the amount of dredge material would be approximately 35%. This would likely result in a reduced duration of impact.

4.6 Cumulative Effects

"Cumulative effects" are the impacts on the environment that result from the incremental impact of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from minor, but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Increased vessel access/traffic to St. George Island is the intended result of the implementation of USACE's project and would be expected to occur as a functional harbor made routine navigation more accessible for business interests, residents, and visitors. Determining the level of significance of this is difficult. The Central Bering Sea has difficult navigational conditions, and the initial wave of increased traffic to St. George may be limited to the local commercial fleet, then expanding to government researchers, fisheries observers, ecological tourists, and residents or resident's visitors. Once the operational harbor would begin to generate employment and economic opportunities, immigration to St. George would presumably become more attractive.

- There are no Federal projects of this same scale that are planned for the Central Bering or Pribilof region.
- Establishment of a National Marine Sanctuary is also possible given the current circumstances. The local community of St. George made a convincing argument in its July 1, 2016 resolution and formal request to NMFS' Office of National Marine Sanctuaries (ONMS) as to why the waters surrounding St. George should be designated as the St. George Unangan Heritage National Marine Sanctuary. In a January 27, 2017 response letter to St. George's formal request, ONMS informed the community that they had completed their detailed review of the nomination and had determined that "this nomination meets the national significance criteria and management considerations. Thus, we have added the nomination to the inventory of areas NOAA may consider in the future for national marine sanctuary designation." Establishment of a National Marine Sanctuary at St. George is supported the Audubon Alaska, Alaska Native Science Commission, and many more. Such an establishment may spur increased ecological tourism or new research interests in the region. Economic opportunity may increase for the community of St. George. Similarly, an increase in ecological tourism and research interests would not interfere with subsistence fisheries. It is unclear at this time how the establishment of a National Marine Sanctuary might affect commercial fisheries interests.
- Development of the existing St. George town site is likely as a result of the implementation of the harbor. However, given its existing infrastructure, development would be expected to be slow-paced and methodic.
- Increased vessel traffic/operations predictably increases the opportunity for the inadvertent release of environmentally persistent pollutants.

- Incremental degradation of the water and habitat quality at the boat harbor would occur if inadvertent releases of environmentally persistent pollutants were to occur with any frequency.
- Impacts to the natural environment as a result of increased vessel traffic/operations include not only an increased probability of vessel/marine mammal interactions but also an increased risk of inadvertent release of rats or mice upon St. George Island.

5.0 COORDINATION

Table 16. History of Environmental Coordination

Agency	Date	Coordination type			
ADEC	Dec-15	Participated in charrette			
ADEC	Oct-19	Coordinated review of 404(b)(1) Analysis			
ADEC	Jan-20	Receipt of Water Quality Certificate			
USEPA	Apr-19	Dredge material disposal methodology planning coordination			
NMFS	Dec-15	Participated in charrette			
NMFS	Jun-17	Coordination for on-island contacts for USACE site visit.			
NMFS	May-18	Presented TSP to Protected Marine Resources and Habitat Division personnel			
NMFS	Jun-19	Formal request and response of protected resources species list.			
NMFS	Apr-19 - Sep-19	Development of the FWCA Report. Site visit (Jun-19) to St. George with USFWS and NMFS Habitat Division.			
NMFS	Sep-19 - Present	EFH analysis and dredge material placement strategy development			
NMFS	Dec-19	Receipt of EFH coordination letter			
USFWS	Dec-15	Participated in charrette			
USFWS	Jun-17	Coordinated with Alaska Maritime National Wildlife Refuge personnel concerning cliff-nesting bird monitoring. Conducted site familiarization with USFWS monitors during June 2017 site visit.			
USFWS	Feb-18	USACE formally requested FWCA Report			
USFWS	July-19	FWCA Scope of Work finalized			
USFWS	May-19 - Sep-19	Development of the FWCA Report. Site visit (Jun-19) to St. George with USFWS and NMFS Habitat Division.			
USFWS	Oct-19	FWCA Report received			
Public Comment Period	Dec-19 – Jan 20	Draft EA and supporting appendices released for 30 day public comment period.			
USFWS	Jan-20	USFWS comments on Draft EA received			
USFWS	Feb-20	POA formal response to USFWS Draft EA comments.			

6.0 MITIGATION

Mitigation actions include those measures that would avoid, minimize, and implement best management practices that have been identified and refined as a function of the resource agency coordination processes for the purpose of conserving relative resources (Table 10). Mitigation concepts such as those that define the timing window for confined underwater blasting, the development of a spill response plan, placing limitations upon vessel speeds and maneuvering, and the development and implementation of a biosecurity plan prior to construction activities were included in the avoidance and minimization strategy of more than one interagency coordination process. Compensatory mitigation opportunities for unavoidable impacts to cliff nesting habitat have also been identified for both USACE and the non-Federal Sponsor through the FWCA coordination process (see Section 6.3).

Table 17. Mitigation Measures

MITIGATION, AVOIDANCE, MINIMIZATION, AND BMPS						
Specific Measure and Source	Draft BA	FWCA Report	EFH Analysis	404 (b)(1)	USACE Would Implement	Non-Federal Sponsor would Implement
Drilling and Confined Underwater Blasting Window 01 Nov - 30 April	X		X	X	X	
Biosecurity Plan *		Х			Х	X*
Cliff Nesting Marine Bird Monitors During Construction		X			X	
Establish a 330' Cliff Nesting Bird Buffer		X			X	
Marine Mammal / Protected Species Observers	Х			X	X	
Vessel Speed Limits	Х		Х		Х	
Project Related Vessels Not Permitted to Ground Unless for Emergency			Х		X	
Spill Prevention Plan			Х		X	
Vessels Must Avoid Steller's Sea Lion Haulout or Rookery			X		Х	
Barge Safe Loading Practices			Х		Х	
Post-Dredge Bathymetry Survey			X		X	
Establishment of Exclusion and Shut-Down Radii	Х			Х	Х	
Vessel Safe Operational Procedures	Х			Х	X	
Fuel Handling and Storage Procedures	X				X	

Establish BMPs to counter Sediment Escapement	X		X	
Ramp-up Procedures for Pile Driving	Х		X	
Periodic Monitoring Reports	Х		X	
Stemmed and Delayed Charges	Х		Х	
Develop and Implement a Harbor Operations Plan		X		Х
Avoid Removal of Cliffside Habitat		Х	X	
Lower Vertical Equipment at Night		X	X	
Maintain Good Light Discipline		Х	X	

^{*} After completion of the construction phase, responsibility transfers to the NFS.

6.1 Marine Mammals and Endangered Species

Measures derived from the Draft BA and USFWS' Coordination Act Report (CAR) primarily seek to avoid impacts to marine mammals and endangered species though avoidance. The timing of drilling and confined underwater blasting activities would be restricted so that they wouldn't coincide with peak densities of marine mammals. Similarly, shut-down radii would be observed and known haul-outs of endangered species would be avoided entirely.

Despite relatively conservative avoidance measures, USACE has determined in its Draft BA that the proposed action "may affect and is likely to adversely affect" ESA-listed marine mammals, and the formal ESA consultation procedures established by 50 CFR 402 et seq. are triggered, which would lead to the development of a Biological Opinion by NMFS. Section 7(b)(4)(C) of the ESA provides that if an endangered or threatened marine mammal is involved, the incidental taking (in this case, through harassment) must first be authorized by Section 101(a)(5) of the MMPA through a Letter of Authorization (LOA) or Incidental Harassment Authorization (IHA) prior to the issuance of a Biological Opinion.

USACE intends to collect the data required for to apply for an LOA during the project's PED phase, which would provide more detail regarding the specific impacts to marine mammals, including ESA-listed marine mammals. Well-reasoned and effective avoidance, minimization, and mitigation measures to reduce those impacts would also be developed, in consultation with NMFS, along with the predicted number of marine mammals that may be taken by harassment. The final mitigation measures for the proposed project cannot be presented prior to the development of the LOA.

6.2 Essential Fish Habitat and Water Quality

During the 404(b)(1) evaluation and the EFH Assessment consultation processes, avoidance and minimization measures for water quality and EFH were developed and adopted (Table 10).

6.3 Cliff Nesting Seabirds

The development of avoidance and minimization measures to protect cliff nesting seabirds was a collaborative effort between the Anchorage Office of the USFWS's Ecological Services Division, Alaska Maritime National Wildlife Refuge staff, and USACE biologists and project manager. Avoidance and minimization measures are presented in the CAR (Appendix D), and Table 17, above. Also presented within the CAR are compensatory mitigation recommendations for out-of-kind mitigation for unavoidable impacts to fish and wildlife resources by the proposed project. USFWS acknowledges that in order to implement these compensatory mitigation recommendations, entities other than USACE would be required to make commitments in order to facilitate their execution. As such, USACE would not commit to compensatory mitigation recommendations other than the development and implementation of a biosecurity plan that included a funding mechanism and maintenance and monitoring plans that would ensure ongoing rat prevention and control. However, USACE would only commit to this measure if cliff nesting habitat were destroyed as function of the project's construction process. Similarly, the NFS would have to willingly agree to USFWS' compensatory mitigation recommendations, which has not been coordinated to date.

- To increase habitat value and minimize hazards and potential sources of contaminants, remove old structures, heavy equipment, and buildings from around the existing harbor and the proposed new harbor site.
- To decrease the risk of deterioration and possible contamination of habitat, repurpose vacant buildings such as the Tanaq construction housing, possibly for seasonal work, so that buildings are maintained and the risk of deterioration and potential pollution is reduced.
- To decrease the risk of deterioration and possible contamination of habitat, explore uses for the currently closed buildings such as the school that belongs to the City, possibly as an extension location for marine studies in order to keep the building maintained.

6.4 Cultural Resources

Per 36 CFR § 800.6, the adverse effect on historic properties would be resolved through the implementation of mitigation identified in a *Memorandum of Agreement among the USACE, SHPO, and the City of St. George Regarding the St. George Navigation Improvements* (see Appendix E...). This mitigation to include the creation of an artistic rendering of the St. George North Anchorage viewshed during three periods of its history: prior to the settlement of the community, the Russian Period, and the U.S. Territorial period. These depictions would likely be displayed from the vantage of the same North Anchorage viewshed, on a hill west of the community where a monument to the historic Fur Seal Industry is already emplaced.

7.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Table 18. Environmental Compliance Table

Federal Statutory Authority	Compliance Status	Compliance Date/Comment
Clean Air Act	FC	This project is not reasonably expected to impact air quality negatively, nor is it in a non-attainment area. The USACE authorizes its own discharges under
Clean Water Act	FC	Section 404 of the CWA, applying all applicable substantive legal requirements. In compliance with Section 401 of the CWA, USACE has received a Certificate of Reasonable Assurance from the ADEC Water Quality Division dated 15 January 2020.
Coastal Zone Management Act	N/A	CZMA Federal consistency provision, section 307, no longer applies in Alaska
Endangered Species Act	PC	Draft Biological Assessment in development. Full compliance requires completion of MMPA consultation prior to receipt of a biological opinion.
Marine Mammal Protection Act	PC	A Letter of Authorization for incidental take is required for full compliance. Additional data and consultation required during PED.
Magnuson-Stevens Fishery Conservation and Management Act	FC	EFH Assessment concurrence correspondence received 06 Dec 2019.
Fish and Wildlife Coordination Act	FC	Final FWCA Report received in October 2019.
Marine Protection, Research, and Sanctuaries Act	N/A	MPRSA is not triggered by this project.
Migratory Bird Treaty Act	FC	Conservation Measures provided by USFWS in FWCA report will be applied.

National Historic Preservation Act	FC	USACE and SHPO have concurred on adverse effects to cultural resources. The signed MOA is included in Appendix E.
National Environmental Policy Act	PC	Pending completion of the EA/FONSI.
Executive Order 11990: Protection of Wetlands	FC	No wetlands are expected to be impacted by this project.
Executive Order 12898: Environmental Justice	FC	Project does not disproportionately negatively affect underserved communities.
Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks	FC	Does not disproportionately affect the health or wellbeing of children.
Executive Order 13112: Invasive Species	FC	Conservation measures will include anti-rodent provisions.
Executive Order 13186 Protection of Migratory Birds	FC	Conservation Measures provided by USFWS in FWCA report will be applied.

8.0 CONCLUSION

The proposed construction of a small boat harbor on St. George Island would increase safe accessibility of marine navigation to the community of St. George, Alaska, thus reducing hazards to navigation and providing increased safety for subsistence vessels, fuel barges, cargo vessels, and a limited commercial fleet. Providing safe navigation is critical to the long-term viability of the mixed subsistence-cash economy of St. George. This office has assessed the environmental impacts of the proposed action and has determined that the proposed action would likely have permanent adverse impacts upon aesthetics and cultural resources; moderate and temporary adverse impacts would be expected on noise and threatened and endangered species; moderate and temporary impacts would be expected to water quality, marine invertebrates, and EFH. Marine birds are only expected to experience minor and temporary impacts. Upon the findings of this EA, The recommendation is that an Environmental Impact Statement is not warranted, and to sign a Finding of No Significant Impact.

9.0 PREPARERS

Joseph Sparaga, MA, Archaeologist, USACE Alaska District
Kelly Eldridge, MA, Archaeologist, USACE Alaska District
Chris Hoffman, Biologist, USACE Alaska District
Reese Brand Phillips, PhD, Biologist/Project Manager, USACE Alaska District
Jenipher Cate, PhD, Marine Biologist, USACE Alaska District
Cindy Upah, Chief of Planning, USACE Alaska District
Mike Salyer, Chief of Environmental Resources, USACE Alaska District
Janice Scott, MeD, Technical Editor, USACE Alaska District
Eva Salā, Economist, USACE Alaska District

Environmental Assessment St. George Harbor Improvement, St. George, Alaska May 2020

Nathan Epps, Chief of Hydraulics and Hydrology, USACE Alaska Mike Rouse, Fisheries Biologist, USACE Alaska District

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ST. GEORGE HARBOR IMPROVEMENT FEASIBILITY STUDY

APPENDIX A: 404(B)(1) CLEAN WATER ACT EVALUATION

ST. GEORGE, ALASKA





EVALUATION UNDER

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

St. George Harbor Improvement Feasibility Study Saint George, Alaska

1.0 Project Description and Background

1.1 Location

Saint George Island is the southernmost, and second largest of a group of five historically volcanic islands that compose the Pribilof Archipelago, located approximately 760 miles west of Anchorage and 220 miles north by northwest of Unalaska Island in the southern Bering Sea. The nearest inhabitation to Saint George is the city of Saint Paul on Saint Paul Island, approximately 45 miles northwest of Saint George. Saint George's position at the western margin of Alaska's continental shelf puts it in close proximity to the much deeper waters of the Bering Sea's abyssal plain. The abrupt change in seafloor elevation occurring at the continental slope facilitates natural upwelling processes; as a result, surface waters in the region are some of the most productive on the planet.

The city of Saint George is in the Aleutians West Census Area and had a population of 102 at the 2010 census. The city is located in a small bight on the north shore of Saint George Island. The surrounding topography is fairly steep, rising to 200' within a half mile of the coast. A mile inland the elevation increases dramatically, going from 400' to 600' above sea level in just about 600 horizontal feet. Saint George Island is treeless, like most of the Aleutian and Pribilof Islands. The vegetation is dominated by plants in the heath family, which are well adapted for the poor acidic soils found in the Pribilof and Aleutian Islands. The climate of St. George is controlled by the cold waters of the Bering Sea. The maritime location results in cool weather year round, and a narrow range of mean temperatures varying from 24 to 52. Average precipitation is 23 inches, with 57 inches of snowfall. Cloudy, foggy weather is common during summer months.

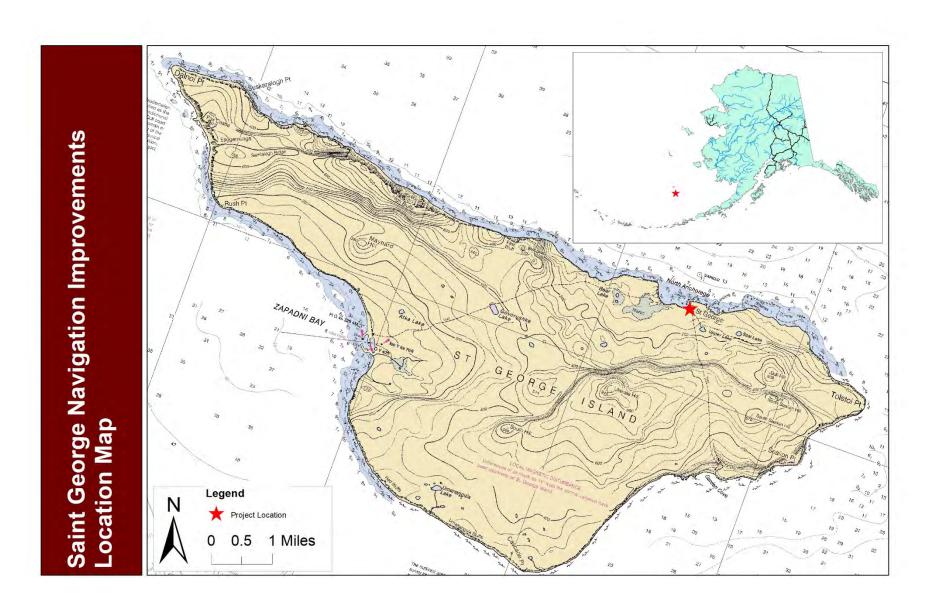


Figure 1. Map depicting the location of the Saint George Navigation Improvement Project in relation to Saint George Island and the State of Alaska (inset)

1.2 Project Description:

The Alaska District proposes to construct a port facility on the north side of Saint George Island. This project would consist of a 450-foot wide by 550-foot-long mooring basin dredged to -20 feet MLLW protected by a 1,731-foot-long north breakwater and a 250-foot-long stub breakwater at the west edge of the basin. Primary armor stone on the north breakwater has a median weight of 10 tons. The basin connects to the Bering Sea with a 250-foot wide navigation channel dredged to -25 feet MLLW. Inner harbor facilities include approximately 4.0-acres of backlands area filled to +10 feet MLLW with a 300-foot-long pile supported dock and a concrete boat launch ramp to -5 feet MLLW for full tide launching access. (Figure 2) The rubblemound breakwater structure would be constructed utilizing standard design, incorporating three layers of consecutively smaller boulders to efficiently dissipate wave energy. The outer layer, the A rock layer, consists of large multi-ton armorstone that would be subject to the majority of the wave energies. Second, a B rock layer, comprised of slightly smaller, yet substantial boulders adds a redundant layer of protection for the smaller innermost boulders that make up the C rock layer, or core of the breakwater structure

The north breakwater would require approximately 85,000 CY of armor stone, 54,000 CY of B rock and 80,000 CY of core rock. The stub breakwater would require approximately 9,000 CY of armor stone, 6,500 CY of B rock and 5,000 CY of core rock. The basin and navigation channel would require removal of 353,052 CY of material to reach the proposed maximum pay depths for the project. Backlands construction requires approximately 45,000 CY of fill. The sediments removed from the mooring basin and navigation channel would be placed in waters of the United States north of the project area for the purpose of constructing a habitat creation reef.

The material source for breakwater construction would be offsite from an established quarry such as Cape Nome or Granite Cove on Kodiak Island. Construction of the North Breakwater is most likely to be performed with land-based equipment. The breakwater core would be constructed to above the tide range to allow the placing equipment to drive the breakwater core and place B and A rock layers to protect the work in progress. Core rock would likely be transported and staged on the breakwater with off-road dump trucks, then shaped to the design prism by an excavator. Near the west end of the breakwater, an excavator on a barge may be required to shape the toe and benches of the breakwater where the seabed is deeper. Backlands would be constructed concurrently with the breakwater to build a staging area for breakwater material.

Dredging of course material could occur concurrently with stone production. Initial observations of the site indicate that blasting is likely to be required for dredging. Due to the proximity of the fur seal rookery and seabird colony, drilling and dredging would be confined to 1 November through 30 April. However, dredging would produce lower levels of impacts than blasting, considering appropriate mitigation measures, and could likely occur throughout the year. Some dredging of unconsolidated materials prior to constructing the breakwaters would provide access for construction barges to the breakwater sites. The total estimated duration of construction is three to five years.

The dredged material would be transported about one mile offshore and discharged in waters of the United States for the purpose of constructing a rocky reef intended to enhance blue king crab (BKC) habitat in the area.

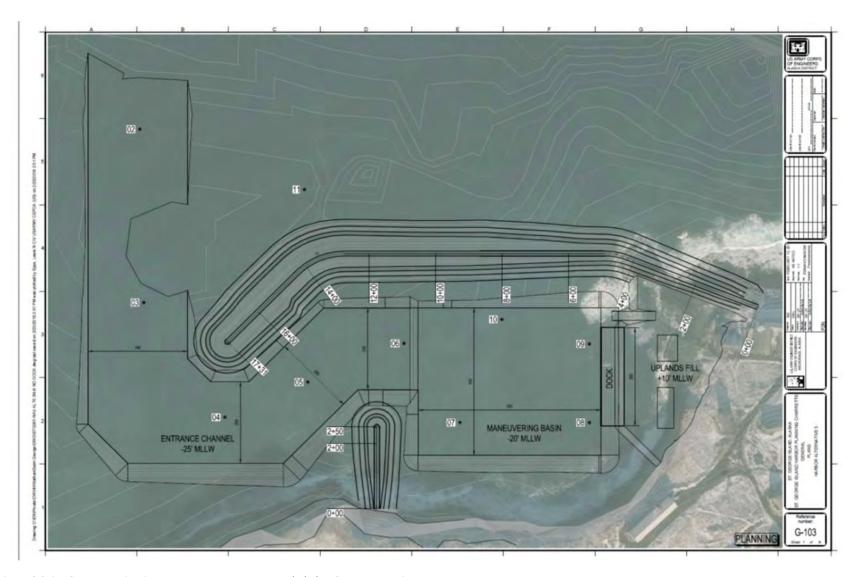


Figure 2 Saint George Navigation Improvements Recommended Plan Concept Drawing

1.3 Purpose and need:

The purpose of the project is to increase the safe accessibility of marine navigation to the community of Saint George, Alaska. The need for the project is to reduce hazards to better provide safe navigation of subsistence vessels, fuel barges, cargo vessels, and a limited commercial fleet; all of which are critical to the long term viability of the mixed subsistence-cash economy of Saint George.

1.4 Authority:

This General Investigations study is being conducted under authority granted by Section 4010 of the Water Resources Development Act (WRDA) of 2007, Public Law 110-114 which authorizes a study to determine the feasibility of providing navigation improvements at St. George, Alaska.

Additionally, Section 1322 of the WRDA of 2016, (b)(2) *Expedited Completion of Feasibility Studies*, authorizes the Secretary to move directly into preconstruction engineering and design (PED) if the project is justified. Implementation guidance was published 12 February 2018.

EXPEDITED COMPLETION OF FEASIBILITY STUDIES. The Secretary shall give priority funding and expedite completion of the reports for the following projects, and, if the Secretary determines that the project is justified in the completed report, proceed directly to project preconstruction, engineering, and design in accordance with section 910 Of the Water Resources Development Act of 1986 (33 U.S.C. 2287):

(A) The project for navigation, St. George Harbor, Alaska

The project is utilizing the authority of Section 2006 of WRDA, 2007, Remote and Subsistence Harbors, as modified by Section 2104 of the Water Resources Reform and Development Act of 2014 (WRRDA 2014) and further modified by Section 1105 of WRDA 2016. The authority specifically states that in conducting a study of harbor and navigation improvements the Secretary may recommend a project without demonstrating that the improvements are justified solely by National Economic Development (NED) benefits, if the Secretary determines that the improvements meet specific criteria detailed in the authority. Following are the criteria outlined in the authority along with a description of how this study satisfies them:

1. The community to be served by the improvements is at least 70 miles from the nearest surface accessible commercial port and has no direct rail or highway link to another community served by a surface accessible port or harbor; or the improvements would be located in the State of Hawaii or Alaska, the Commonwealth of Puerto Rico, Guam, the Commonwealth of the Northern Mariana Islands, the United States Virgin Islands; or American Samoa:

The project is in Alaska.

2. The harbor is economically critical such that over 80 percent of the goods transported through the harbor would be consumed within the region served by the harbor and navigation improvement as determined by the Secretary, including consideration of information provided by the non-Federal interest; and

Based upon their weight, commodities transported in the future with-project condition were analyzed to determine that more than 80 percent of the goods transported through the harbor would be consumed within the region. The community served by the project was determined to be the island of St. George and the immediately surrounding marine area (about a 25-mile radius).

To provide economic opportunities for the community, consistent with the authority, alternatives supporting fish and crab product exports from the island are considered. However, these exports were projected to weigh less than 20% of the total weight going through the harbor when considering market and institutional factors such as Community Development Quotas (CDQ) and prices. Total imports minus total exports was used in the projection. Imports included the weight of fuel, the weight of freight and construction materials, and the weight of raw fish. Exports included the weight of processed fish products leaving the island. Exports are estimated to make up 14.1% of harbor throughput on average, with a high estimate of 18.7%, and low estimate of 11.3%.

3. The long-term viability of the community in which the project is located, or the long-term viability of a community that is located in the region that is served by the project and that will rely on the project, would be threatened without the harbor and navigation improvement.

The cultural identity of Alaska Native Tribes is highly dependent upon subsistence activities tied to specific locations and deep historical knowledge of land and subsistence resources. Rural economies in Alaska, including that which exists on St. George, can be characterized as a mixed, subsistence-cash economy in which the subsistence and cash sectors are interdependent and mutually supportive. The ability to successfully participate in subsistence activities is highly dependent on the opportunity to earn some form of monetary income and access the resources needed to engage in subsistence activities. Without a safe and functioning harbor, economic opportunities in the community would continue to be hindered and the costs of basic essential goods required to support a subsistence lifestyle would remain prohibitively high, contributing to continued out-migration from St. George. When subsistence communities are forced to disband due to high costs of essential goods, including fuel, tribal identities and cultural communities are endangered. Reductions in costs of such basic essential goods are essential to community viability. In addition, a safe and functioning harbor would provide opportunities for development of a local economy based upon the marine resources of the region. Such economic opportunities are essential for supporting the mixed, subsistence-cash economies common throughout rural Alaska, combating outmigration, and helping to ensure the viability of the community of St. George.

While determining whether to recommend a project under the criteria above, the Secretary will consider the benefits of the project to the following:

- Public health and safety of the local community and communities that are located in the region to be served by the project and that will rely on the project, including access to facilities designed to protect public health and safety;
- Access to natural resources for subsistence purposes;
- Local and regional economic opportunities;
- Welfare of the local population; and
- Social and cultural value to the local community and communities that are located in the region to be served by the project and that will rely on the project.

As indicated above, navigation improvements at St. George meet all the above criteria to recommend a project. Compliance with the criteria of the authority were confirmed by the USACE Vertical Team during an In-Progress Review conducted on January 23, 2018.

1.5 General Description of Dredged or Fill Material:

The project components included in this analysis include the 1,731-foot long north breakwater, the 250-foot long stub breakwater, 4.0-acres of fill placed for the creation of backlands, and placement of dredged material into WOUS for the construction of a rock reef. Portions of the north breakwater (0.34-acres) are coincidental to the inner harbor facilities area, so the total area of fill would be slightly less than the sum of the four harbor features.

The north breakwater would include a cumulative volume of 219,000 cubic yards of armor stone, B rock, and core rock and cover approximately 8.3-acres. The stub breakwater would include a cumulative volume of 20,500 cubic yards of armor stone, B rock, and cover rock and cover approximately 0.8 acres. The backlands require 45,000 cubic yards of fill and would cover an approximate total of 4.0-acres, but only about 3.6-acres would be in addition to the North Breakwater fill. The total volume of fill for all harbor construction features included in this analysis is about 284,500 cubic yards and the area of fill is about 12.8 acres.

A small portion of the project components would be constructed in the terrestrial environment above the high tide line and would not be considered aquatic impacts. The Alaska District applied best professional judgment to conduct a remote-based delineation of aquatic and terrestrial distribution of project features in order to quantify impacts to waters of the United States for the purpose of this analysis document. In general, approximately 11.9 acres of the 12.8 acres would be constructed in waters of the United States. The remaining 0.9 acres would be constructed above the terrestrial area above the high tide line. (Figure 3)

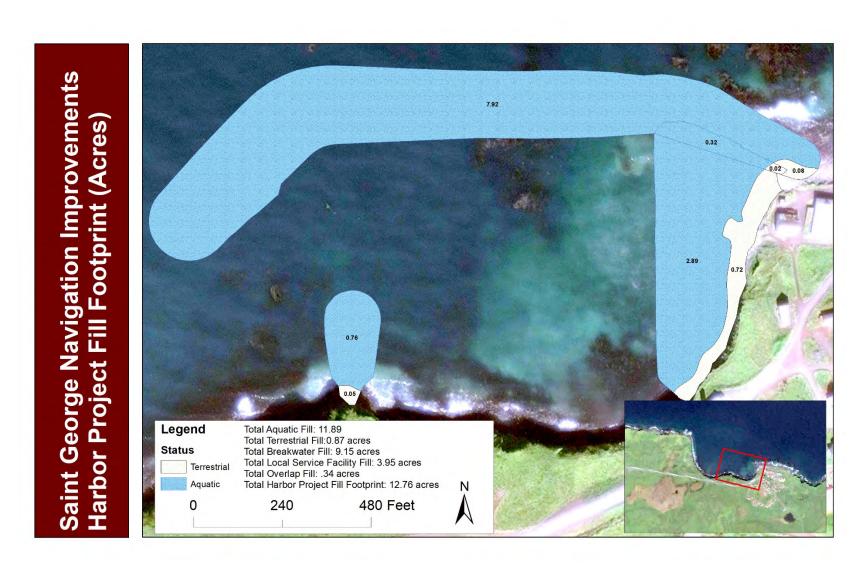


Figure 3 Harbor Fill Footprint with Respect to High Tide Line

The proposed North Anchorage Harbor entrance channel and maneuvering basin are planned to be dredged to a depth of -25 feet and -20 feet MLLW, respectively. The thickness of sediment and depth to bedrock is unknown within the proposed harbor entrance channel and maneuvering basin. For estimating purposes, the District anticipates bedrock would be encountered very near the surface, three feet or less, within the south side of the entrance channel and maneuvering basin. The thickness of surface sediment may gradually get thicker as the entrance channel moves north away for the shoreline. Drilling and controlled blasting of bedrock would be required within the navigation channel and harbor basin before material can be mechanically dredged by clamshell or long-reach excavator. Dredge cuts in the surface sediment can be assumed to be stable at slopes of 1.5 horizontal to 1 vertical. Dredge cuts in bedrock may be cut at slopes of 0.25 horizontal to 1 vertical.

The habitat creation reef would contain all of the dredged material generated from the transition dredging and subsequent maintenance dredging, 353,052 cubic yards of blasted igneous bedrock. All dredged material that would be placed on the reef is exempt from chemical testing and determined to be suitable for in-water placement. The sediment in the project area is believed to be uncontaminated by anthropogenic pollutants based on the site history and physical characteristics of the material. There are no known sources of contamination present in the project area; i.e., no industrial facilities, refueling stations, antifouling agent operations, pulp mills, or other risk factors have ever been sited near the proposed project location. The material that would be dredged is consolidated olivine that predates the Industrial Revolution and has never been exposed to pollutants. The substrate is not considered to be a carrier of contaminants because of it is predominantly coarse and contains little to no organic material.

1.6 Description of the proposed discharge site:

The Alaska District would collect more detailed information regarding the geotechnical and bathymetric conditions of the proposed discharge site during the Preliminary Engineering and Design (PED) phase of the project, if the project is selected to advance to that stage. In the absence of detailed information, this analysis will rely on remote sensing and form some assumptions regarding the generic conditions.

Saint George lies within the US Fish and Wildlife Service (USFWS) Alaska Maritime National Wildlife Refuge and portions of the island are owned and managed by the USFWS. The USFWS manages the land for the conservation, protection, and overall enhancement of the fish, wildlife, plants, and their habitats for the benefit of all Americans. Most of the remaining land on Saint George Island is owned by the local Native Corporation.

The North Breakwater, Stub Breakwater, backlands, and boat launch would be constructed in the bight forming the North Anchorage adjacent to the city of Saint George. The North Anchorage bight represents the most enclosed section of coastline on the north shore of Saint George Island, which is likely one of the primary reasons the city was established in that location. The marine sediments in the bight are presumably basaltic bedrock overlain by sands, gravels, shell hash, cobbles, and boulders. The presence of the bight forms an area of relative protection from wave energy, so the sediments in the bight are likely dominated by a smaller grain size than the

surrounding, more exposed area by virtue to the reduced energy allowing relatively fine grain material to be deposited. Aerial photography interpretation suggests the presence of the bight may allow the accretion of light colored sand in the project area. (Figure 4)

Bathymetric surveys have not been completed in the project location, but the nautical chart for the area indicates that water depths range from about 6' to about 22' in the areas where the breakwaters would be constructed. The backlands would be constructed in an area that is fouled with boulders and currently inaccessible to navigation. The low intertidal area is dominated by cobble and there are areas of sand in the back-beach. (Figure 5) The low intertidal and subtidal areas are colonized by various macrophytes including dragon kelp. There are no known areas of rooted aquatic vegetation.

The presence of the City of Saint George in its current location, even though the existing harbor and airport are on the other side of the island, suggest the proposed project area has unique and desirable attributes including natural protection from wave energy. If the preceding assumption is accepted, transitive logic demands the acceptance of the rarity of the functions and values of the waters of the United States located in the proposed project area.

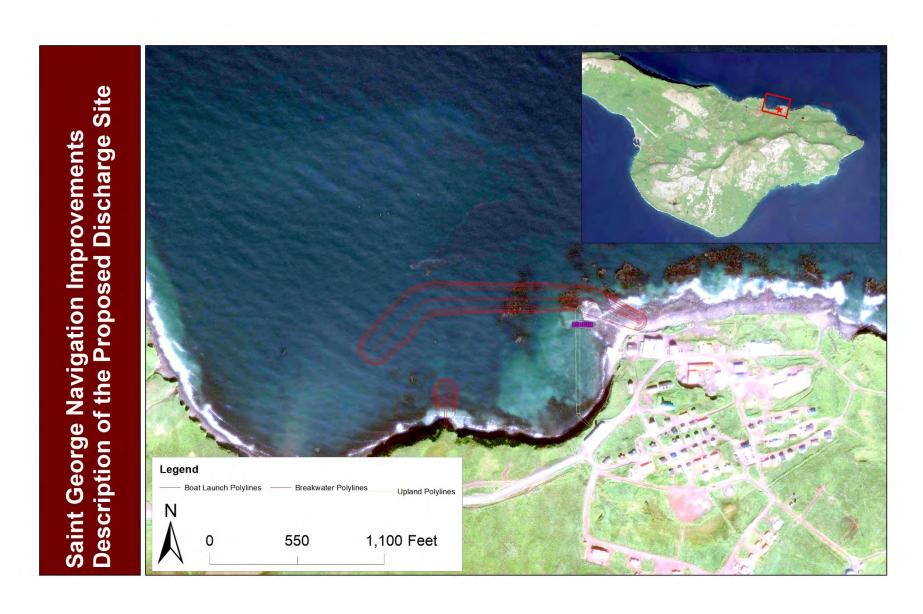


Figure 4 Configuration of the Proposed Discharge with Respect to Natural Features



Figure 5 Coastline in the Proposed Discharge Area

The habitat creation reef would be configured to optimize its utility to the target species, blue king crab (BKC). Habitat association from the Bering Sea-Aleutian Island (BSAI) Fishery Management Plan (FMP) indicate that BKC utilize waters and substrate between 40 meters and 200 meters in depth at various life stages. Considering the depth requirements of the design species, the Alaska District has identified a potential reef construction site close the proposed harbor site. (Figure 5) The center of the zone is approximately 1.25-miles from the project area.

Geotechnical data has not been collected for the dredged material placement area, but the USACE biodiversity survey in June 2019 included a substantial benthic videography component. The nature of the substrate from within the tentatively identified placement area is described as sand in nautical chart 1638. There are areas of gravel and shells identified on the chart outside of the bounds of the placement area. The descriptions from the nautical chart were corroborated by the USACE biodiversity survey.

Video from the June 2019 camera surveys indicate the majority of the substrate in the placement area is sand. The sand appears to be fairly dark in color and contains light-reflecting particles. Considering the properties of the sand in the video, it is likely that the olivine rock that forms the island of Saint George is the parent material and the sand was produced by the mechanical weathering of the rock over the course of several millennia since the island was thrust forth from the sea. The surface of the sand is configured in waves and appears to be dominated by fairly large-sized particles. There is no visible plume emanating from the impact of the camera on the seafloor, which indicates that small-sized particles have either been washed from the area by ocean currents or hydrodynamic conditions have never allowed the precipitation of small-sized particles.

Areas of variable shell litter density exist throughout the proposed placement area and there are areas with multiple sand dollars inside the field of view concurrently. In general, the area surveyed by the USACE benthic video team appears to be a relatively featureless expanse of gradually sloping subaqueous plains.

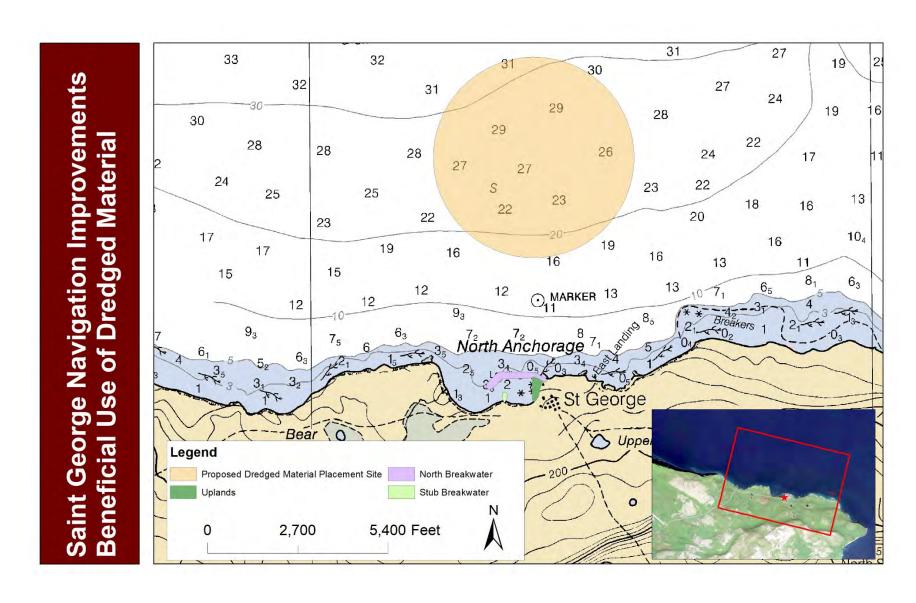


Figure 6 Proposed Habitat Creation Reef Location

1.7 Description of Proposed Discharge Method:

Major construction features for the Recommended Plan include rubble mound north and spur breakwaters, dredging, pile supported docks, and inner harbor facilities fill areas. (Figure 6) The material source for breakwater construction would be offsite from an established quarry such as Cape Nome or Granite Cove on Kodiak Island. The material source would most likely be far enough away from the site that rock production would need to significantly lead placement operations to ensure that the construction crew on site has enough material delivered to the site for a full season of work. Stone production in the quarry and delivery to the site would likely be the first project tasks undertaken.

Construction of the North Breakwater is most likely to be performed with land-based equipment. The breakwater core would be constructed to above the tide range to allow the placing equipment to drive the breakwater core and place B and A rock layers to protect the work in progress. Core rock would likely be transported and staged on the breakwater with off-road dump trucks, then shaped to the design prism by an excavator. Near the west end of the breakwater, an excavator on a barge may be required to shape the toe and benches of the breakwater where the seabed is deeper. Backlands would be constructed concurrently with the breakwater to build a staging area for breakwater material. The boat ramp would be designed and constructed by the local sponsor and the Alaska District does not have any specific information regarding the construction methodology or timing of that project feature.

Dredged material would be transported from the harbor location to the discharge site by barge and would dump the material at specified locations in order to construct the reef in accordance with the detailed plans developed in the PED stage of the project. The design scow has a 3,000 cubic yard capacity and would likely carry about 2,500 cubic yards per transit to the placement area; requiring approximately 172 transits to the placement area to transport the entire 353,052 cubic yards of dredged material expected to be generated over the course of the construction project.

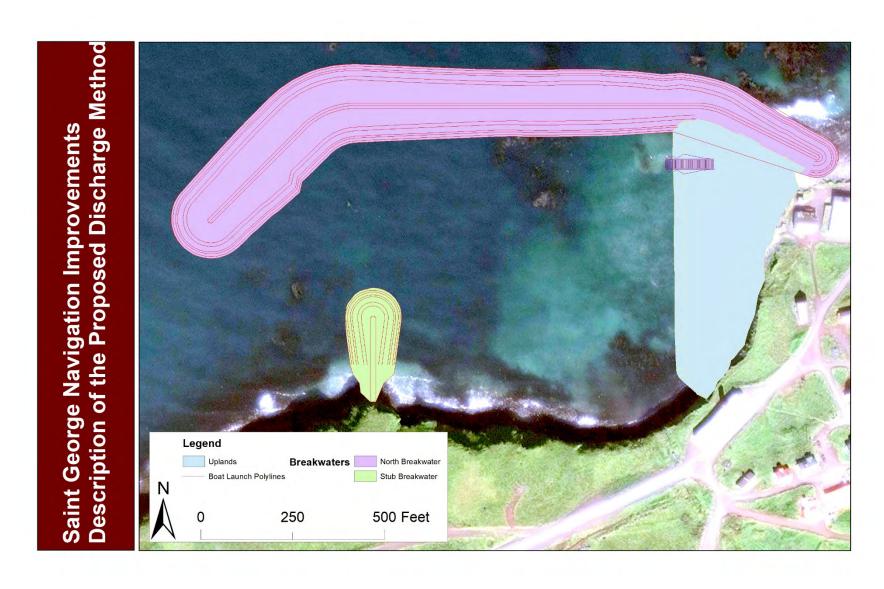


Figure 7. Saint George Navigation Improvements Project Features

2.0 Factual Determinations (40 CFR 230.11)

2.1 Physical Substrate Determination (40 CFR 230.11(a)):

In general, the Saint George Navigation Improvement project area is dominated by volcanic parent material weathered by glaciation. Soil development is likely retarded by the cool climate and relatively young age of the Pribilof Archipelago; the Pribilof area is thought to have built up during the late Pleistocene era. The area may have achieved relatively high elevation, but subsided though a combination of fissuring, faulting, and lava outpouring to its current elevation. The coastal sediments are likely of terrestrial origin, as there is no other source of sediments in the area.

The coast of Saint George Island is generally quite steep and almost completely ringed by cliffs; there are only a couple areas (including the proposed project area) on the island with shallow coastal gradients. Many large boulders are scattered along the water's edge. These boulders are likely composed of igneous rock generated by the volcanic birth of the island. The boulders create eddies and break up wave energy, allowing suspended sediment to precipitate in the interstitial leeward areas. The submerged areas have a relatively thin covering of boulders, cobbles, and sand over what is assumed to be intact bedrock. Initial site observations indicate blasting would be required to dislodge the rock prior to dredging.

The placement of fill material for the construction of the North and Stub Breakwaters would not present more than minor alterations to the physical substrate of the proposed project area. The Breakwaters would be armored with 10 ton rock, which would provide substantially similar rugosity and complexity of surficial material as the naturally occurring boulders in the area. The armor rock would provide the same basic physical properties as the naturally occurring rock, so it would be readily colonized by locally occurring macrophytes and invertebrates.

The construction of the 4.0-acre backland area would result in the permanent loss of 2.9-acres of protected subtidal land, converting it into a commercial/industrial type of terrestrial area. The area that would be converted is apparently quite rare in the vicinity, which includes all of Saint George Island. The loss of this area would be offset by the creation of a new, larger, protected submerged area formed by the construction of the breakwaters. The breakwaters would provide protection to nearly 16-acres of submerged lands. Sediment transport in the area is not well-understood, but the construction of a breakwater extending from the northeast headland could disrupt longshore sediment transport. Review of the aerial photography suggest the subtidal surficial sediments in the eastern portion of the project area may be dominated by sand. If this is true, the dredging would remove the sand and the construction of the breakwater would prevent sand from returning. East-west sediment transport is likely the dominant direction of drift due to the prevailing wave orientation, so the sand that had previously been moved into the eastern portion of the project area may be translocated to the region of the bight west of the breakwater.

The placement of 353,052 cubic yards of blasted bedrock for the construction of a reef would represent a significant alteration of the bathymetry off the north coast of Saint George Island. The ocean floor would become more complex and some smooth, sandy bottom habitat would be permanently lost. This loss would be offset by the creation of rocky reef habitat, which is rare in

the immediate area and has been identified by the Bering Sea-Aleutian Island crab Fishery Management Plan (FMP) as a requisite for blue king crab (BKC). Blue king crab are a species of concern in the Bering Sea and efforts are underway to improve the stock.

BKC are known to require the interface of vertical, rocky areas and flat, sandy or muddy areas. Large amounts of this physical habitat type would be create by the construction of a rocky reef extending away from St. George Island.

2.2 Water circulation, fluctuations, and salinity determinations (40 CFR 230.11(b)):

Water velocity would decrease in the area impacted by the construction of the breakwater by the interruption of wave energy. Saint George is very isolated and exposed to hundreds of miles of fetch in all directions, with the exception of the small amount of energy interruption provided by Saint Paul Island. The interruption of wave energy would be the intent of the project in order to provide safe moorage for vessels. The reduced water velocity inside the harbor could promote the precipitation of small grain sediments, but there is not a source of sediment in the immediate area so it is unclear how any fine material would come to be inside the harbor. There is no indication the changes water circulation patterns would have a measurable impact on dissolved oxygen in the harbor due to the relatively small size and shallow depth of the harbor.

The proposed project would have no effect on salinity or water level fluctuations induced by the tides.

2.3 Suspended particulate/turbidity determination (40 CFR 230.11(c)):

The construction of a breakwater could temporarily elevate turbidity levels through substrate disturbance from the placement of fill material and armor rock. The sediments in the project area are generally very coarse and not susceptible to suspension. Any sediments that were suspended would settle quickly and the unimpeded movement of ocean currents would quickly dilute apparent turbidity to below detectable limits.

Dredging and the placement of dredged material would suspend sediment from the excavation and discharge of marine sediments. The discharged dredged material would also suspend sediment from the seafloor in the placement area as the dredged material strikes the seafloor. Turbidity would temporarily increase in the vicinity of the placement area as the sediment is released from the scow; but the depth of the water, energetic nature of the hydrodynamic environment, and substantially similar nature of dredged material and placement area substrate ensure the turbidity impacts to water quality would be temporary and insignificant.

2.4 Contaminant determinations (40 CFR 230.11(d)):

The rock and gravel placed for the backfill will be clean material free of contaminants. The finished project will not introduce new contaminants. There is no known source of contamination at or near the project site that would be mobilized or exacerbated by this project. The dredged material is exempt from chemical analysis based on the site history and physical characteristics. There have been no known industrial-type activities with the potential to contaminate the dredged materials in the project area. The large grain-size, low concentration of organic material,

and high energy levels further support the assumption that the material is not a carrier of contaminants.

2.5 Aquatic ecosystems and organism determination (40 CFR 230.11(e)):

The total area of impacts to aquatic ecosystems is about 11.9-acres. The construction of the two breakwaters would impact about 9-acres, effectively converting the naturally occurring rocky sub-tidal habitat to a mix of engineered rocky sub-tidal, intertidal, and supratidal habitat. The rocky sub-tidal habitat that would be lost to the construction of the breakwaters is very abundant in the area and the conversion of 9-acres of rocky sub-tidal to an assemblage of more complex habitat types would not present a significant negative impact within the context of the Saint George Island coast. The breakwaters would have abundant vertical surfaces and hard substrate for the attachment of sessile animals like anemones and macrophyte assemblages. The large rock would create refugia in the interstitial voids for small fish and invertebrates. The construction of the breakwater would represent a permanent conversion of habitat and a temporary decrease in productivity in the area as the existing biota would be displaced or destroyed by the placement of the breakwater material. The area would quickly recover and is expected to come to rest at a higher productivity rate than the pre-project rate due to the additional complexity created by the breakwaters.

The construction of the backlands would result in the permanent loss of about 2.9-acres of relatively low energy sandy and rocky subtidal habitat, not including the overlapping 0.3 acres of aquatic habitat that would be lost to the construction of the North Breakwater. This habitat would be replaced by commercial/industrial backlands, likely a gravel parking area. The face seaward face of the backlands would be stabilized by armor rock, creating complex habitat in the same manner as the breakwaters. The construction of the breakwater would also provide protection for approximately 16-acres of subtidal habitat, offsetting the loss of the 2.9-acres of protected subtidal habitat lost to the backlands. The nature of the substrate would be permanently altered; aerial photography indicates the existing substrate in the area that would be impacted by the construction of the backlands is covered in light colored sand, but the dredging of the harbor would remove that sand and replace it with exposed bedrock. The construction of the breakwaters would prevent the basin from infilling, so the conversion from mixed sandy/rocky substrate to rock would be permanent. It is unknown how much alternate mixed sandy/rocky habitat is available in the vicinity, but the same imagery that supports the assumption the existing substrate contain some sand suggest there are abundant sandy area in along the north shore of Saint George Island. The impact to ecosystems and organisms would be minor.

The discharge of the dredged material would be configured so that new blue king crab habitat is created. Long term impacts associated with dredged material placement would be presented by the creation of a rocky reef extending perpendicular from the coast of St George Island. This reef would significantly alter the nature of the seabed by increasing the complexity of the area.

The District enlisted the USACE Engineering Research and Development Center (ERDC) to model the discharge using Short Term Fate of Dredged Material (STFATE) based on feasibility level information and assumptions. A distinct mound is predicted to be formed. The mound would approximate a truncated rectangular pyramid.

The height of the pyramid would be about 5 feet and the top area of the pyramid would approximate the area of the hopper of the dump scow, approximately 140 feet long and 35 feet wide. The side slopes of the pyramid would be about 1V: 10H. Therefore, the base of the pyramid would be a rectangle approximately 240 feet long and 135 feet wide. A few inches of fine rock would likely extend another 30 feet in all directions beyond the toe of the pyramid.

Greater detail regarding the precise configuration of the placement would be developed collaboratively with NMFS HCD and other stakeholders during the PED phase of the project. The District's feasibility level plans for placement include the discharge of dredged material by the scow-load, spaced approximately 100 feet apart. This would produce a reef at least 5 feet tall extending nearly 3 miles from the nearshore terminus.

Blue king crab require complex habitat for all demersal life stages. Sand, gravel, cobble, and rocks are necessary substrate types for mature, late juvenile, early juvenile, and egg life stages. Blue king crab (BKC) are associated with slumps, rockfalls, debris, channels, ledges, pinnacles, reefs, and vertical walls between 0 and 200 meters deep.

BKC generally spend the 3.5-4 months after hatching as pelagic larva in water between 40-60 meters deep before settling out into complex benthic habitat areas. The larvae are planktonic, as their limited ability to swim is greatly outweighed by the effects of ocean currents on their horizontal movements. There is some evidence BKC larvae intentionally move vertically through the water column on a daily basis. Because BKC larvae are pelagic plankton, the placement of dredged material to create habitat does not consider the larval life stage and no effort is made to create or enhance larval BKC habitat requirements beyond ensuring the benthic habitat is confined to the epipelagic zone in waters less than 200 meters deep.

2.6 Proposed disposal site determination (40 CFR 230.11(f)):

The construction of a port would require the dredging of 353,052-cubic yards of rock and other sediments. This material would be used to construct a reef offshore of Saint George Island. The use of the material beneficially is evaluated under the Clean Water Act. The entire volume of dredged material would be used beneficially; however, the placement of the dredged materials would have temporary and highly localized impacts to water quality.

2.7 Determination of cumulative effects on the aquatic ecosystem (40 CFR 230.11(g)):

The completed project will have negligible cumulative effects because there is a low likelihood of additional development projects in the area that would impact rocky intertidal and sub-tidal habitat. There are no known plans to construct any additional marine infrastructure in the vicinity of St. George. Given the extremely high construction costs and remoteness of the area, there is very low probability of independent project development; i.e., any prospective marine construction proposal would require outside (most likely government) investment. The requirement for public investment in projects of a similar type in the vicinity of St. George increases the visibility of potential cumulative impacts and supports the determination that cumulative effects on the aquatic ecosystem are negligible.

2.8 Determination of secondary effects on the aquatic ecosystem (40 CFR 230.11(h))

The presence of a port would result in additional vessels in the area and there would be a corresponding increase in the potential for oil spills and other sources of anthropogenic contamination. The port would translocate the vessel traffic that currently calls on Zapadni Bay to the proposed site near the city of Saint George, but is unlikely to recruit additional vessels. The establishment of an improved port on Saint George Island is expected to enable safer navigation and could reduce the potential for spills cause by the unintentional grounding of vessels from wave action; so there could be a net reduction of spills in the waters off Saint George Island.

3.0 Findings of Compliance or Non-Compliance with Restrictions on Discharge

3.1 Adaptation of the Section 404(b)(1) Guidelines to this evaluation:

The proposed activity complies with the requirements set forth in the Environmental Protection Agency's Guidelines for the Specification of Disposal Sites for Dredged or Fill Material, there were no adaptations.

3.2 Evaluation of availability of practicable alternatives to the proposed discharge site which would have less adverse impact on the aquatic ecosystem:

The principle discharge to waters of the U.S. proposed in this project is the placement of fill material for the construction of two breakwaters and backlands for the creation of a harbor near the city of Saint George. The purpose of the project is to increase the safe accessibility of marine navigation to the community of St. George, Alaska. The need for the project is to reduce hazards to better provide safe navigation of subsistence vessels, fuel barges, cargo vessels, and a limited commercial fleet; all of which are critical to the long term viability of the mixed subsistence-cash economy of St. George. The Alaska District's Feasibility Report and Environmental Assessment evaluates alternatives for meeting the project purpose. The Alaska District considered seven alternatives in Zapadni Bay and three alternatives in the North Anchorage, as well as the No Action Alternative. Alternatives were analyzed according to criteria specified in the USACE Engineering Regulation 1105-2-100 to determine the recommended plan. Environmental impact, in conjunction with project cost and benefits (i.e., practicability), is one of several criteria considered in the alternatives analysis process.

The seven Zapadni Bay alternatives were not carried forward for further consideration in the Feasibility Report because modeling results demonstrated that all of the proposed harbor configurations exacerbated dangerous conditions within the harbor and the alternatives that did improve mooring conditions, did so only marginally and at excessive construction costs. The four remaining alternatives (N-1, N-2, N-3, and N-4) at the North Anchorage were evaluated based on their respective cost effectiveness. Cost effectiveness is derived by analyzing the cost of an alternative relative to the benefits (moorage and access days). Of the four North Anchorage alternatives, N-3 (the Recommended Plan) would provide the greatest benefits relative to cost. N-4 would provide fewer benefits relative to cost compared to N-3, but more than N-2 and N-1. An analysis comparing the relative cost to benefit between N-2 and N-1 was not conducted. N-3

would have the greatest spatial (project footprint and the amount of dredge materials produced) and temporal (duration of construction activities) environmental impacts. N-2 would have similar, but lesser, spatial impacts compared to N-3. The breakwater dimensions and inner harbor facilities are the same, but the entrance channel and maneuvering basin would be dredge to a shallower depth and yield less dredge material (353,052 vs. 230,000 cubic yards). N-4 would have less spatial impacts compared to N-2 due to its smaller breakwater (1,731 vs. 1,100 feet long) and reduced dredging requirements for entrance channel and maneuvering basin. N-4 would yield 150,000 cubic yards. N-1 would have the smallest spatial impact with a breakwater of 775 feet and dredging requirements entrance channel and launch area yielding 10,000 cubic yards. The temporal impacts of the alternatives would correspond to the spatial impacts (in rank order N-3, N-2, N-4, and N-1) and would be due to the construction time required, especially the drilling and blasting. Although N-1 would have the least environmental impacts among the four North Anchorage alternatives, it was not a practicable alternative. N-1 is not a practicable alternative because it fails to provide access to the crabber fleet, cargo vessels, and fuel barge. Without a crabber fleet the community would be unable to develop a subsistence-cash economy and without access for the barge and cargo vessels, fuel and commodity prices would continue to be exceedingly high. Similarly, N-4 is not practicable either. While it does provide access for the barge and cargo vessels, it does not provide access for the crabber fleet, without which no viable economy can be established. Alternative N-2, does provide access for access for the barge, cargo vessels, and the crabber fleet. However, only about 25% of the crabber fleet would have access, which would be marginal to support a viable economy. Additionally, N-2 provides a fraction of the crabber fleet compared N-3 (85%) and roughly similar costs (N-2, \$166.5M; N-3, \$175.7M). Combined these factors greatly reduce the practicability of N-2. The District selected N-3 as the Recommended (and least environmentally damaging and practicable) Plan based on its potential to support a mixed subsistence-cash economy and reduce the cost of shipping goods to the community of St. George.

3.3 Compliance with applicable state water quality standards:

The proposed construction project would not be expected to have an appreciable adverse effect on water supplies, recreation, growth and propagation of fish, shellfish and other aquatic life, or wildlife. It would not be expected to introduce petroleum hydrocarbons, radioactive materials, residues, or other pollutants into the waters of the United States. The Alaska District has obtained a Certificate of Reasonable Assurance from the Alaska Department of Environmental Conservation Water Quality Division dated 15 January 2020.

3.4 Compliance with applicable toxic effluent standards or prohibition under Section 307 of the Clean Water Act:

No toxic effluents that would affect water quality are associated with the proposed project. Therefore, the project complies with the toxic effluent standards of Section 307 of the Clean Water Act.

3.5 Compliance with the Endangered Species Act of 1973:

Federally-threatened or endangered pinnipeds that are known to occur within and adjacent to the waters of the North Anchorage include the threatened bearded seal (*Erignathus barbatus*),

threatened ringed seal (*Phoca hispida*) arctic subspecies, and endangered Steller sea lion (*Eumetopias jubatus*) Western Distinct Population Segment (DPS), the latter of whose designated critical habitat includes all of the marine waters surrounding St. George Island.

Federally-endangered cetaceans commonly occur in St. George's offshore waters and include fin whale (*Balenoptera physalus*), humpback whale (*Megaptera novaeangliae*) Mexico DPS and western North Pacific DPS, north Pacific right whale (*Eubalaena japonica*), sperm whale (*Physeter macrocephalus*), and western north Pacific gray whale (*Eschrichtius robustus*).

Federally-threatened Northern sea otters (*Enhydra lutris kenyoni*) Southwest Alaska DPS are not abundant, but are known to occur within and adjacent to the waters of the North Anchorage.

The Alaska District will prepare a biological assessment to analyze the proposed project's impacts on ESA-listed species during the feasibility phase. The product of the biological assessment will be a determination of effects on ESA-listed species, which will dictate the consultation framework required for compliance with the ESA.

3.6 Compliance with specified protection measures for marine sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972:

No marine sanctuaries are present near the project site. However, the community of St. George has proposed the creation of the St. George Unangan Heritage National Marine Sanctuary which would include all of the waters surrounding St. George Island and has been in coordination with the National Oceanic and Atmospheric Administration's National Ocean Service Office of National Marine Sanctuaries. The community's proposal is being reviewed against similar proposals from different geographic regions.

3.7 Evaluation of extent of degradation of the waters of the United States:

The proposed activity could result in the loss or conversion of about 11.9-acres of coastal marine water of the United States. The remaining coastline of Saint George Island is relatively undeveloped and under very little development pressure. There would be no significant adverse impacts to plankton, fish, shellfish, or wildlife within the context of the waters of the United States in the vicinity of Saint George.

3.8 Appropriate and practicable steps taken to minimize potential adverse impacts of the discharge on the aquatic environment:

The Alaska Department of Environmental Conservation (ADEC) Water Quality Certificate of Reasonable Assurance includes the following best management practices to reduce the potential for negative impacts on water quality:

- 1. Reasonable precautions and controls must be used to prevent incidental and accidental discharge of petroleum products or other hazardous substances. Fuel storage and handling activities for equipment must be sited and conducted so there is no petroleum contamination of the ground, subsurface, or surface waterbodies.
- 2. During construction, spill response equipment and supplies such as sorbent pads shall be available and used immediately to contain and cleanup oil, fuel, hydraulic fluid,

antifreeze, or other pollutant spills. Any spill amount must be reported in accordance with Discharge Notification and Reporting Requirements (AS 46.03.755 and 18 AAC 75 Article 3). The applicant must contact by telephone the DEC Area Response Team for Northern Alaska at (907) 451-2121 during work hours or 1-800-478-9300 after hours. Also, the applicant must contact by telephone the National Response Center at 1-800-424-8802.

The Alaska District will complete formal consultation under Section 7 of the ESA during the PED phase to determine the proposed project's impacts to threatened and endangered species. The ESA consultation will result in mitigation measures to avoid and minimize the proposed project's impacts to threatened and endangered species. Mitigation measures will likely include:

- A work window that confines drilling and blasting to a period from 1 November through 30 April.
- Marine mammal observers to survey the action area during construction.
- Exclusion radii; inside of which marine mammals would trigger a work stoppage.
- Environmental windows to schedule work in less-impactful seasons
- Regular reports to the managing agency documenting the occurrence of shutdowns
- Other appropriate measures to be determined during the Section 7 consultation

3.9 Public interest determination:

On the basis of the guidelines the proposed site of the discharge of fill material is specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

FINDING OF COMPLIANCE

For the Construction of Navigation Improvements at Saint George, Alaska

- 1. No significant adaptations of the guidelines were made relative to this evaluation.
- 2. The principle discharge to waters of the U.S. proposed in this project is the construction of two breakwaters and supporting backlands for the proposed Navigation Improvements at Saint George. The harbor and entrance channel would be dredged and the dredged material would be used for the construction of a rocky reef to enhance blue king crab habitat
- 3. The planned discharge would not violate any applicable State water quality standards, or violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- 4. The proposed discharge will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be significantly adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values will not occur.
- 5. The proposed site of construction and discharge is specified as complying with the 40 CFR 230 Guidelines for the Specification of Disposal Sites for Dredged or Fill Material, when considered with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

ST. GEORGE HARBOR IMPROVEMENT FEASIBILITY STUDY

APPENDIX B: ESSENTIAL FISH HABITAT

ST. GEORGE, ALASKA





Prepared by:

DEPARTMENT OF THE ARMY U.S. ARMY ENGINEER DISTRICT, ALASKA P.O. BOX 6898 ELMENDORF AFB, ALASKA 99506-0898

November 2019

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List of Acronyms

EFH	Essential Fish Habitat
NMFS	National Marine Fisheries Service
USACE	United States Army Corps of Engineers
CFR	Code of Federal Regulations
WRDA	Water Resources Development Act
PED	Preconstruction Engineering and Design
USC	United States Code
MLLW	Mean Lower Low Water
CY	Cubic Yards
MPRSA	Marine Preservation, Research, and Sanctuaries Act
ВКС	Blue King Crab
NOAA	National Oceanic and Atmospheric Administration
USFWS	United States Fish and Wildlife Service
AMNWR	Alaska Maritime National Wildlife Refuge
SL	Source Level
hp	Horsepower
dB	decibel
ADFG	Alaska Department of Fish and Game
IFR	Integrated Feasibility Report
WOUS	Waters of the United States
FMP	Fishery Management Plan
kW	kilowatt

1.0 INTRODUCTION

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act set forth the essential fish habitat (EFH) provision to identify and protect important habitats of federally-managed marine and anadromous fish species. Federal agencies that fund, permit or undertake activities that may adversely affect EFH are required to consult with the National Marine Fisheries Service (NMFS) regarding the potential effects of their actions on EFH and respond in writing to NMFS recommendations.

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities.

Upon completing the U.S. Army Corps of Engineers' (Corps') EFH-coordination with the NMFS, the Corps will incorporate its EFH evaluation and findings and NMFS conservation recommendations (if any) into the project's environmental assessment.

In June 2019, the Alaska District organized a benthic survey to the project area to collect information on the nature of the substrate, benthic and demersal ecology, and water column in the dredged material placement area, breakwater footprint, and dredge prism. The data collected in the June 2019 biological surveys were incorporated into this analysis and the Integrated Feasibility Report (IFR) and used in conjunction with literature reviews and other remote data collection methods to draw conclusions regarding the potential impacts associated with the Alaska District's proposed action.

The Alaska District is evaluating the construction features and placement of dredged materials in waters of the United States (WOUS) under the Clean Water Act 404(b)1 Guidelines for Specification of Disposal Sites for Dredged or Fill Material. Additional information regarding the proposed project's impacts to WOUS are found in the 404(b)1 assessment appended to the IFR.

2.0 PROJECT PURPOSE

The purpose of the project is to increase the safe accessibility of marine navigation to the community of St. George, Alaska. The need for the project is to reduce hazards to provide safe navigation of subsistence vessels, fuel barges, cargo vessels, and a limited commercial fleet, all of which are critical to the long term viability of the mixed subsistence-cash economy of St. George.

Dangerous wave and seiche conditions at the existing harbor limits opportunities for safe access and moorage to the current fleet. Both these conditions reduce subsistence opportunities and impacts the delivery of goods to the community and imperils the long-term viability of the community. Since crab rationalization established individual fishing and harvesting quotas (enacted circa 2000 with full implementation by the 2005/2006 season), commercial fishing vessels all but abandoned St. George as an option to deliver catch due to it being cost-prohibitive compared with the risk of damages and delays. The community is legally entitled to a percentage of the CDQ from APICDA for crab; however, without a safe harbor, St. George is unable to realize that revenue benefit and the crab is delivered to neighboring St. Paul. The cost of fuel is exorbitant (>\$7/gallon on St. George vs. ~\$3/gallon on St. Paul) because of the necessary inclusion of anticipated delays and operating costs associated with delivering to St. George. Due to vessel delays and the risk of damages, consumables are flown into the community at a cost of \$1.58 more per pound than ocean-going vessels could deliver.

The cultural identity of Alaska Native Tribes is highly dependent upon subsistence activities tied to specific locations and deep historical knowledge of land and subsistence resources. Rural economies in Alaska, including that which exists on St. George, can be characterized as a mixed, subsistence-cash economy in which the subsistence and cash sectors are interdependent and mutually supportive. The ability to successfully participate in subsistence activities is highly dependent on the opportunity to earn monetary income and access the resources needed to engage in subsistence activities. The hindering of economic opportunities in the community would continue, and the costs of basic essential goods required to support a subsistence lifestyle would remain prohibitively high without a safe and functioning harbor.

Oppressive economic conditions contribute to continued out-migration from St. George. Inadequate attendance resulted in closure of the school following the 2016/2017 school year when enrollment fell below minimum thresholds for State funding. Similar phenomena have recently occurred in the remote Alaskan communities of Adak, Rampart, and Clarks Point. St. George has taken steps including implementing a distance learning program for children remaining on the island, assuming upkeep and maintenance of the school, and recruitment of families to the island to ensure that the school is in position to reopen if enrollment again surpasses that minimum threshold. Economic opportunities that a safe and functioning harbor could provide continues to be the missing component.

3.0 PROJECT AUTHORITY

This General Investigations study is being conducted under authority granted by Section 4010 of the Water Resources Development Act (WRDA) of 2007, Public Law 110-114 which authorizes a study to determine the feasibility of providing navigation improvements at St. George, Alaska.

Additionally, Section 1322 of the WRDA of 2016, (b)(2) *Expedited Completion of Feasibility Studies*, authorizes the Secretary to move directly into preconstruction engineering and design (PED) if the project is justified. Implementation guidance was published 12 February 2018.

EXPEDITED COMPLETION OF FEASIBILITY STUDIES. The Secretary shall give priority funding and expedite completion of the reports for the following projects, and, if the Secretary determines that the project is justified in the completed report, proceed directly to project preconstruction, engineering, and design in accordance with section 910 Of the Water Resources Development Act of 1986 (33 U.S.C. 2287):

(A) The project for navigation, St. George Harbor, Alaska

4.0 PROJECT AREA

St. George Island is the southernmost and second largest of a group of five historically volcanic islands that compose the Pribilof Archipelago, located approximately 760 miles west of Anchorage and 220 miles north by northwest of Unalaska Island in the southern Bering Sea. St. George's position at the western margin of Alaska's continental shelf puts it near the much deeper waters of the Bering Sea's abyssal plain. The abrupt change in seafloor elevation occurring at the continental slope facilitates natural upwelling processes; as a result, surface waters in the region are some of the most productive on the planet.

While St. George Island and its slightly larger northern neighbor, St. Paul Island, are currently inhabited, Otter, Walrus, and Sea Lion Rock Islands are not. As a group, as well as independently, the islands are ecologically significant and are known as "the Galapagos of the north" due to their rich fisheries, abundance of colonial seabirds, and Steller sea lion and northern fur seal rookeries.

St. George Island falls within the overarching boundary of the Alaska Maritime National Wildlife Refuge; portions of its surface landmass are owned and managed by the U.S. Fish and Wildlife Service for conservation, protection, and the overall enhancement of fish, wildlife, plants, and their habitats for the continuing benefit of the American people. St. George Island is difficult to access by airplane or boat due to the wave, wind, and fog climate of the central Bering Sea.

The city of St. George is in the Aleutians West Census Area and had a population of 102 at the 2010 census. The city's location is in a small bight on the north shore of St. George Island. The surrounding topography is fairly steep, rising to 200' within a half-mile of the coast. A mile inland the elevation increases dramatically, going from 400' to 600' above sea level in just about 600 horizontal feet. St. George Island is treeless, like most of the Aleutian and Pribilof Islands. The vegetation is dominated by plants in the heath family, which are well adapted for the poor acidic soils found in the Pribilof and Aleutian Islands. The cold waters of the Bering Sea control the climate of St. George.

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The maritime location results in cool weather year-round, and a narrow range of mean temperatures varying from 24 to 52. Average precipitation is 23 inches, with 57 inches of snowfall. Cloudy, foggy weather is common during summer months.

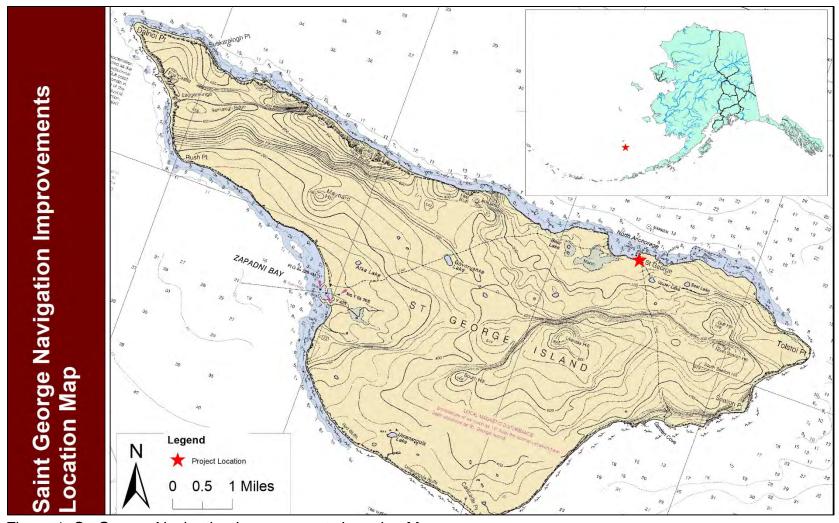


Figure 1. St. George Navigation Improvements Location Map

5.0 PROJECT DESCRIPTION

The Alaska District (District) proposes to construct a port facility on the north side of St. George Island. This project would consist of a 450-foot wide by 550-foot-long mooring basin dredged to -20 feet mean lower low water (MLLW) protected by a 1,731-foot-long north breakwater and a 250-foot-long spur breakwater at the west edge of the basin. Primary armor stone on the north breakwater has a median weight of 10 tons. The basin connects to the Bering Sea with a 250-foot wide navigation channel dredged to -25 feet MLLW. Inner harbor facilities would be created by filling an area to +10 feet MLLW, with a 300-foot-long pile-supported dock and a concrete boat launch ramp to -5 feet MLLW for full tide launching access. (Figure 2). The rubblemound breakwater structure would be constructed utilizing standard design, incorporating three layers of consecutively smaller boulders to efficiently dissipate wave energy. The outer layer, the A rock layer, consists of large multi-ton armorstone that would be subject to the brunt of the wave energies. Second, a B rock layer, comprised of slightly smaller, yet substantial boulders adds a redundant layer of protection for the smaller innermost boulders that make up the C rock layer, or core of the breakwater structure

The north breakwater would require approximately 85,000 cubic yards (CY) of armor stone, 54,000 CY of B rock and 80,000 CY of core rock. The stub breakwater would require approximately 9,000 CY of armor stone, 6,500 CY of B rock, and 5,000 CY of core rock. The basin and navigation channel would require the removal of 353,052 CY of material to reach the proposed maximum pay depths for the project. Construction of the area for inner harbor facilities would require approximately 45,000 CY of fill. The sediments removed from the mooring basin and navigation channel would be placed in ocean waters north of the project area. The placement would be designed to create habitat for blue king crab. The District has identified a suitable dredged material placement location approximately 1 mile offshore (Figure 3).

The material source for breakwater construction would be offsite from an established quarry such as Cape Nome or Granite Cove on Kodiak Island. Construction of the North Breakwater is most likely to be performed with land-based equipment. The breakwater core would be constructed to above the tide range to allow the placing equipment to drive the breakwater core and place B and A rock layers to protect the work in progress. Core rock would likely be transported and staged on the breakwater with off-road dump trucks, then shaped to the design prism by an excavator. Near the west end of the breakwater, an excavator on a barge may be required to shape the toe and benches of the breakwater where the seabed is deeper. The area for inner harbor facilities would be constructed concurrently with the breakwater to build a staging area for breakwater material.

Dredging could occur concurrently with stone production. Initial observations of the site indicated that blasting is likely to be required for dredging; this may require special scheduling considerations due to the proximity of the fur seal rookery. Scheduled delays could be incurred due to the presence of marine mammals near the blasting zone

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during dredging operations. Dredging would produce relatively low levels of impacts, considering appropriate mitigation measures, than blasting and could likely occur throughout the year. Some dredging prior to constructing the breakwaters would provide access for construction barges to the breakwater sites. The total estimated duration of construction is three to five years.



Figure 2. St. George Navigation Improvements Project Features Concept Drawing

The District assumes the breakwater foundations located at the North Anchorage Harbor site would most likely consist of relatively thin layers of medium dense to dense sediments consisting of coarse-grained soils with cobbles and boulders. The depth to bedrock may vary greatly, but for evaluation purposes it was assumed bedrock would be within 10-feet of the seafloor since the proposed breakwater alignments are close to shore.

The proposed North Anchorage Harbor entrance channel and maneuvering basin are planned to be dredged to a depth of -25 feet and -20 feet MLLW, respectively. The thickness of sediment and depth to bedrock is unknown within the proposed harbor entrance channel and maneuvering basin. For estimating purposes, the District anticipates bedrock would be encountered near the surface, three feet or less, within the south side of the entrance channel and maneuvering basin. The thickness of surface sediment may gradually get thicker as the entrance channel moves north away for the shoreline. Drilling and controlled blasting of bedrock would be required within the navigation channel and harbor basin before material can be mechanically dredged by clamshell or long-reach excavator. Dredge cuts in the surface sediment can be assumed to be stable at slopes of 1.5 horizontal to 1 vertical. Dredge cuts in bedrock may be cut at slopes of 0.25 horizontal to 1 vertical.

The weather would strongly influence timing of the dredging and marine construction. The exposure of the site and Pribilof Islands in general places seasonal constraints on constructability. Winter construction is currently considered infeasible due to weather, leaving the summer and shoulder seasons as the only realistic times of the year for marine construction.

Environmental windows to reduce the proposed project's impacts on marine mammals would further restrict the construction timing. The District's Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) consultation would develop the final work avoidance windows; but given the proximity to fur seal rookeries and the abundance of marine mammal usage in the area, a prohibition on blasting between mid-August and November is likely to be imposed as mitigation. Additional windows to protect nesting birds may be incorporated into the final project design. Seabird nesting in cliffs and burrow colonies occurs between 15 May and 15 September in the Pribilof Islands

The construction material would likely be delivered to St. George Island in the summer before construction to avoid the worst part of the year for weather impacts. The blasting would be conducted before the environmental windows to minimize impacts to biological resources. Drilling is expected to last 488 days, and blasting is expected to last 369 days. These durations would be distributed across the five-year construction schedule.

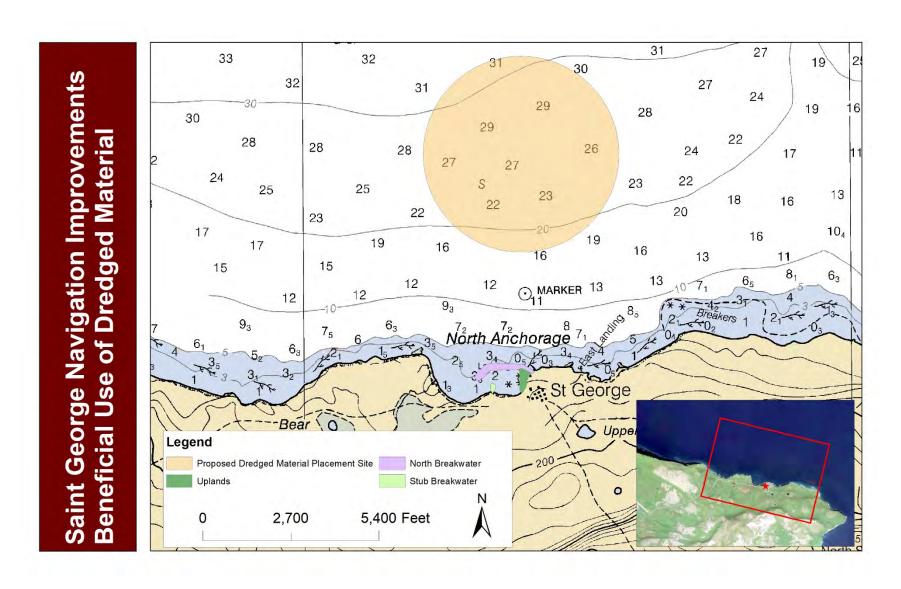


Figure 3. St. George Navigation Improvements Project Features with Respect to Habitat Creation Reef Site

6.0 ESSENTIAL FISH HABITAT

6.1 Federally Managed Species in the Project Area

EFH is defined by the Magnuson-Stevens Fishery Conservation and Management Act as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. Section 305(b)(2) of the Magnuson-Stevens Act requires Federal action agencies to consult with National Oceanic and Atmospheric Administration (NOAA) NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

St. George Island does not exhibit any anadromous waters or streams that would traditionally be associated with salmonids and their allies, as would be defined under AS 16.05.871(a). However, the marine waters surrounding St. George Island, from the shoreline outward, are designated as EFH for blue king crab, tanner crab, rex sole, walleye pollock, snow crab, Alaska plaice, Greenland turbot, arrowtooth flounder, rock sole, flathead sole, sculpin, Pacific cod, skate, chum salmon, pink salmon, coho salmon, sockeye salmon, and king salmon.

The species list generated by the National Marine Fisheries Service's essential fish habitat (EFH) mapping tool for the Pribilof region was used to generalize marine fish diversity in the nearshore waters of St. George Island. USACE conducted vessel-based fisheries surveys in June of 2019 utilizing crab pots and underwater video collection methodologies, seas at that time were too rough to attempt trawl surveys. Figure 4 depicts the survey stations with respect to depth and the bounds of the survey area. USACE biologists identified the zone of dredged material placement siting feasibility by considering the economically viable transport distance, sensitive habitat areas, nature of the substrate, bathymetry, intensity of vessel traffic, and other factors. Pot survey stations were distributed within the zone of siting feasibility in order to capture relevant data from a representative range of depths and substrate types.

The USACE also collected benthic video from the survey area to contribute to the body of knowledge regarding the local benthos. The video revealed very low habitat complexity and biotic diversity. Some areas were home to a handful of sand dollars and hermit crabs, and there was evidence of marine snail habitation (egg cases);otherwise, the area appears desolate.

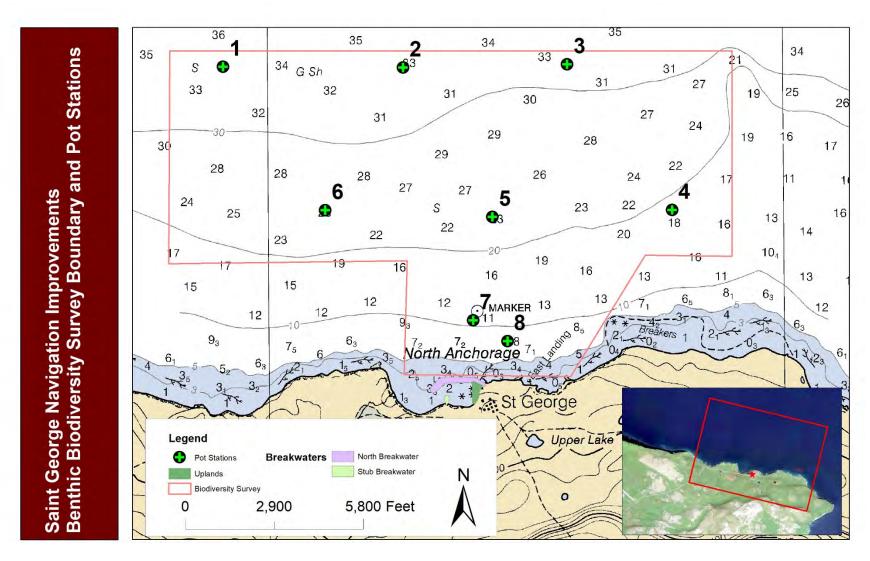


Figure 4. June 2019 USACE Biodiversity Survey Pot Stations

USACE's pot surveys proved to be indeterminate; only a single species of finfish was encountered in the crab pots and again captured on video, the yellow Irish lord (*Hemilepidotus jordani*), sculpin common to the region. The results of the pot sampling are displayed in Figures 5 and 6. USACE biologists also did not conduct seine surveys at the beach areas of Village Cove, as the substrate is far too rocky to sample effectively. While conducting intertidal habitat observations in early June2019, USACE biologists encountered two deceased smooth lumpsuckers (*Aptocyclus ventricosus*) in the wrack near the high tide line on the sandy beach areas of Village Cove.

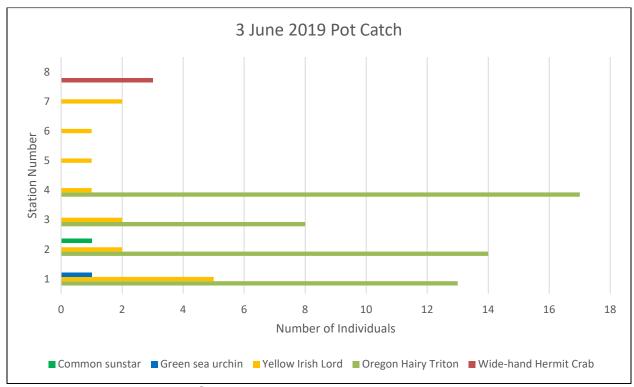


Figure 5. 3 June 2019 Pot Catch Results

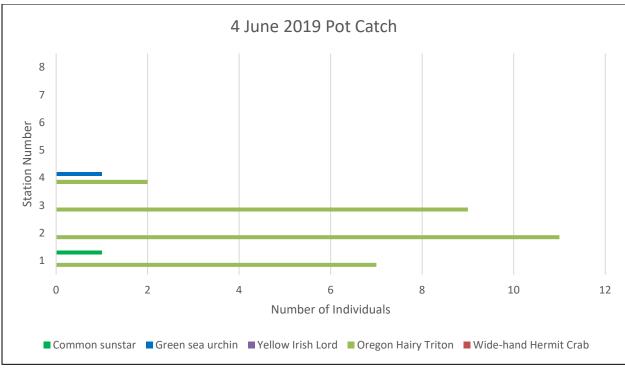


Figure 6. 4 June 2019 Pot Catch Results

According to the NMFS EFH habitat mapping tool, the following marine fish species are managed under the Groundfish of the Bering Sea Aleutian Islands (BSAI) Fishery Management Plan (FMP), the FMP for the Salmon Fisheries in the EEZ Off Alaska and are indicated as potentially occurring within the various habitat types occurring in the marine waters in close proximity to the Pribilof Islands:

- Alaska plaice (Pleuronectes quadrituberculatus)
- Alaska skate (Bathyraja parmifera)
- Aleutian skate (Bathyraja aleutica)
- Arrowtooth flounder (Atheresthes stomias)
- Atka mackerel (Pleurogrammus monopterygius)
- Bigmouth sculpin (Hemitripterus bolini)
- Dover sole (Microstomus pacificus)
- Dusky rockfish (Sebastes ciliatus)
- Flathead sole (Hippoglossoides elassodon)
- Great sculpin (Myoxocephalus polyacanthocephalus)
- Kamchatka flounder (Atheresthes evermanni)
- Northern rock sole (*Lepidopsetta polyxystra*)
- Northern rockfish (Sebastes polyspinis)
- Pacific cod (Gadus macrocephalus)
- Pacific ocean perch (Sebastes alutus)

- Rex sole (Glyptocephalus zachirus)
- Rougheye rockfish (Sebastes aleutianus)
- Sablefish (Anoplopoma fimbria)
- Southern rock sole (*Lepidopsetta bilineata*)
- Walleye Pollock (Gadus chalcogrammus)
- Yellow Irish lord (Hemilepidotus jordani)
- Yellowfin sole (*Limanda aspera*)
- Greenland Turbot (Reinhardtius hippoglossoides)
- Chinook salmon (Oncorhynchus tshawytscha)
- Chum salmon (Oncorhynchus keta)
- Pink salmon (Oncorhynchus gorbuscha)
- Sockeye salmon (*Oncorhynchus nerka*)
- Coho salmon (*Oncorhynchus kisutch*)

USACE conducted nearshore subtidal and nearshore inter-tidal surveys for marine invertebrates in early June of 2019. Nearshore subtidal surveys were conducted via vessel deployed crab pots and underwater videography. Nearshore intertidal surveys were conducted on foot at low tide along the beach areas of Village Cove. Eight individual crab pots were baited, deployed, and allowed to fish for approximately twenty hours. After twenty hours, the recovered crab pots had its contents processed, rebaited, and redeployed. The crab pots were allowed to fish for another approximate twentyhour period. At which point the recovered crab pots had their contents processed and then stowed on deck. Four species encountered while employing crab pot sampling methodology were marine invertebrate. The most commonly encountered marine invertebrate was the Oregon hairy triton (Fusitriton oregonensis) n=64, followed by common Sunstar (Crossaster papposus) n=3, Widehand hermit crab (Elassochirus tenumanus) n=3, and green urchin n=2, respectively. No encounters of commercially relevant species of marine invertebrate while employing crab pot sampling methodology occurred. Marine invertebrates that are commercially relevant or that derive habitat protections under the BSAI FMP include blue king crab (Paralithoides platypus), red king crab (Paralithoides camtschaticus), tanner crab (Chionoecetes bairdi), and octopus (Enteroctopus dofleini).

Benthic invertebrates were notably absent in areas that displayed rapidly moving currents and along the sand wave-type substratum. There were tube worm casings in places where the substrate was mud or sandy mud. Also observed along the sandy mud substrate were two varieties of anemones (*Metridium farcimen*) and another variety not identified to genus. Invertebrate diversity increased once the substrate began to transition to shell hash and rocky reef. Also, there were various hermit crabs, sponges, scallops, green urchins, common Sunstar, and chitons. Video quality was not robust enough to identify smaller organisms to species.

Intertidal marine invertebrates observed during USACE's survey included blue mussels (family *Mytilidae*), limpets, chitons, various small snails, green urchins, giant green anemone (*Anthopleura xanthogrammica*), and barnacles.

6.2 Nature of the Substrate in the Project Area

The Alaska District will collect more detailed information regarding the geotechnical and bathymetric conditions of the proposed discharge site during the Preliminary Engineering and Design (PED) phase of the project if the project is selected to advance to that stage. In the absence of detailed information, this analysis will rely on remote sensing and form some assumptions regarding the generic conditions.

The North Breakwater, Stub Breakwater, the area for inner harbor facilities, and boat launch would be constructed in the bight forming North Anchorage next to the city of St. George. One of the primary reasons of city's establishment in this location is due to the North Anchorage bight being the most enclosed section of coastline on the north shore of St. George Island. The marine sediments in the bight are presumably basaltic bedrock overlain by sands, gravels, shell hash, cobbles, and boulders. The presence of the bight forms an area of relative protection from wave energy, so the sediments in the bight are likely dominated by a smaller grain size than the surrounding, more exposed area by virtue to the reduced energy allowing relatively fine grain material to be deposited (Figure 7).

Bathymetric surveys have not been completed in the project location, but the nautical chart for the area indicates that water depths range from about 6' to about 22' in the areas where the breakwaters would be constructed. The area designated for construction of inner harbor facilities would be an area that is fouled with boulders and currently inaccessible to navigation. Cobble dominates the low intertidal area, and there are areas of sand in the back-beach (Figure 5). Various macrophytes, including dragon kelp, colonize the low intertidal and subtidal areas. There are no known areas of rooted aquatic vegetation.

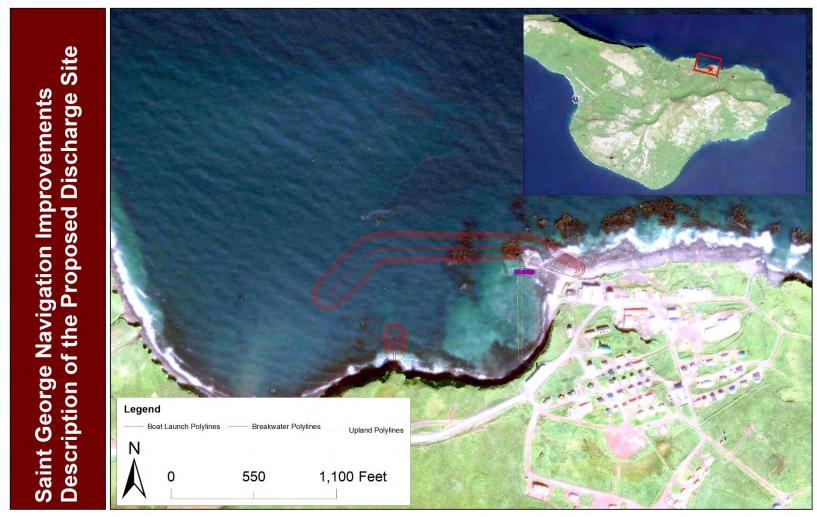


Figure 7. Description of the Proposed Discharge Site

6.3 Nature of the Substrate in the Placement Area

Geotechnical data has not been collected for the dredged material placement area, but the USACE biodiversity survey in June 2019 included a substantial benthic videography component. Nautical chart of 1638 describes the nature of the substrate from within the tentatively identified placement area as sandy. There are areas of gravel and shells identified on the chart outside of the bounds of the placement area. The USACE biodiversity survey corroborated the descriptions from the nautical chart.

Video from the June 2019 camera surveys indicate the majority of the substrate in the placement area is sand. The sand appears to be fairly dark in color and contains light-reflecting particles. Considering the properties of the sand in the video, it is likely that the olivine rock that forms the island of St. George is the parent material, and the mechanical weathering of the rock produced the sand throughout several millennia since the island was thrust forth from the sea. The surface of the sand is configured in waves and appears to be dominated by fairly large-sized particles. There is no visible plume emanating from the impact of the camera on the seafloor, which indicates that small-sized particles have been washed from the area by ocean currents or hydrodynamic conditions have never allowed the precipitation of small-sized particles.

Areas of variable shell litter density exist throughout the proposed placement area, and there are areas with multiple sand dollars inside the field of view concurrently. In general, the area surveyed by the USACE benthic video team appears to be a relatively featureless expanse of gradually sloping subaqueous plains.

7.0 ASSESSMENT OF POTENTIAL PROJECT IMPACT ON ESSENTIAL FISH HABITAT

Per the 1996 amendments to the MSFCMA, USACE has initiated consultation and coordination with the NMFS regarding the potential effects of the recommended plan action on EFH. Impacts from implementation of project alternatives would result in short-term or minor alterations of EFH for marine species and species such as rockfish, flatfish, gadids, salmonids, and crabs. These alterations would include temporary increases in turbidity in the future harbor location during dredging and in the placement area during discharge, as well as noise and elevated anthropogenic activity levels related to construction.

Substantial permanent impacts would also be realized from the dredging and placement of dredged material in the placement area. The bottom composition in the placement area would become more complex due to the placement of cobble and boulders, creating refuge and additional habitat for forage species. The bottom composition in the harbor area would become homogenized as the dredging creates uniform basins at the project design depth. The construction of the breakwaters would alter hydrodynamic conditions and increase the vertical surface area.

The types of impacts that would possibly affect EFH species/species complexes (five Pacific salmon species, the sculpin complex, flatfish, rockfish, crabs, and forage fish) known or highly likely to occur within the project area are described as discrete project components and separated into short-term and long- term impacts.

7.1 Transitional Dredging

Transitional dredging would have little direct effect on mature fish inhabiting the project area, as their mobility allows them to avoid construction activities (e.g., mechanical dredging, generated turbidity, vessel movements, and underwater construction noise). No long-shore movements of juvenile fish would be disrupted by maintenance dredging.

7.1.1 Short-term impacts

Short-term impacts include: direct mortality to some sessile organisms, or those without the means to evade, through smothering or crushing; water quality impacts in the form of temporarily increased levels of turbidity resulting from dredging; noise disturbance from operation of heavy equipment, cranes, or barges; disturbance from increased construction-related workboat traffic in the project area and along supply routes; and a temporary increase in waterborne noise from the excavation of harbor sediments and operation of equipment including boats, barges, and support vessels.

Direct Mortality. Transitional dredging has the potential to entrain, displace, injure, smother, and kill demersal and benthic organisms. The probability of injury, impact, or death is inversely related to the affected taxon's mobility; i.e., a sessile animal is more likely to be impacted than a motile organism because the sessile organism lacks the ability to move away from the dredge or placement area as the disturbance occurs. Crabs and, to a lesser extent, shrimp would be more susceptible to impact than flatfishes, which would, in turn, be more vulnerable than demersal fishes like sculpin and cod.

The construction project area is likely sparsely populated with some sea urchins and anemone, which would almost certainly be killed by the dredge; but otherwise mostly devoid of marine life. The project area is considered to be very poor in terms of fish/shellfish productivity by the local populace, and the results of the June 2019 research pot fishing event corroborate that characterization. Results from the June biodiversity survey are displayed in Figures 5 and 6. The immediate direct impact on FMP species from dredging is negligible, but there would likely be a short term impact on the forage taxa of FMP species.

Water Quality Impacts. Transitional dredging would result in temporarily elevated concentrations of suspended sediment as fine-grained particles are disturbed by the dredge and released as the bucket is drawn up through the water column. The sediment in the project area is believed to be uncontaminated by anthropogenic pollutants based on the site history and physical characteristics of the material. There are no known sources of contamination present in the project area; i.e., no industrial facilities, refueling stations, antifouling agent operations, pulp mills, or other risk factors have ever

been sited near the proposed project location. The material that would be dredged is consolidated olivine that predates the Industrial Revolution and has never been exposed to pollutants. The substrate is not considered to be a carrier of contaminants because it is predominantly coarse and contains little to no organic material.

The sole water quality consideration is the temporary elevation of turbidity in the immediate project area, but the water velocity in the area is great enough that any increases in turbidity would be quickly diluted to below perceptible levels. There are no vegetated shallows or other sensitive habitat areas in the vicinity that would be negatively impacted by the ephemeral increase in localized apparent turbidity.

Juvenile salmon have been shown to avoid areas of high turbidities (Servizi 1988), although they may seek out areas of moderate turbidity (10 to 80 NTU), presumably as refuge against predation (Cyrus and Blaber 1987a and 1987b). Feeding efficiency of juveniles is impaired by turbidities in excess of 70 NTU, well below sublethal stress levels (Bisson and Bilby 1982). Reduced preference by adult salmon homing to spawning areas has been demonstrated where turbidities exceed 30 NTU (20 mg/L suspended sediments). However, Chinook salmon exposed to 650 mg/L of suspended volcanic ash were still able to find their natal water (Whitman et al. 1982).

Based on these data, it is unlikely that short-term (measured in hours based on tidal exchange frequency), and localized elevated turbidities generated by the proposed action would directly affect EFH juvenile or adult salmonids and EFH groundfish, such as flatfish, sculpins, and rockfish that may be present. Potential impacts would be further minimized by conducting all in-water work within approved regulatory.

Elevated Activity and Noise. Transitional dredging would result in temporary increases in the amount of anthropogenic activity and underwater noise in the project area during construction and after construction is completed, due to the presence of a harbor where there had previously been a semi-enclosed bight and austere landing area.

The USACE would employ a mechanical dredge, likely a clamshell dredge, to excavate virgin sediment to the project depth of -25 feet MLLW for the entrance channel and -20 feet MLLW for the turning basin. The dredged material from these navigation features would be placed in the nearshore region north of the project location for the construction of the BKC reef, requiring the operation of a tug and scow to transport dredged material from the project location to the placement area.

Mechanical dredges are relatively stationary, so the noise source would not move around during dredging. The dredge plant would excavate sediment and place the material on a barge for transportation to the placement location. The barge would only be capable of traveling about 8 knots, which would produce a relatively constant, low-frequency noise.

Bucket dredging noise can be delineated into six distinct events to complete a single cycle. These events are repeated every time the bucket is deployed and retrieved. The

first event is winch noise as the boom and bucket are swung into position, and the bucket is lowered. The bucket striking the water surface creates a splash noise detectable at short distances. The second event is the noise of the bucket striking the sediment surface. This is followed by the noise of the bucket closing and capturing the dredged material. The fourth event is the noise of the bucket jaws contacting each other. The bucket is raised by the winch, creating the fifth noise. The sixth and final noise of the cycle is the sound of the material being dumped into the scow. The amplitude of the second, third, and sixth event are strongly influenced by the granularity of the sediment that is being excavated. Coarse material produces for powerful sounds than fine material. Winching noise is produced at a higher frequency than the other event noises, so it attenuates more quickly. Bucket dredging is classified as a repetitive class of sound, rather than continuous.

Clark, et al., recorded the clamshell dredge Viking dredging sand and gravel from Cook Inlet in 2001. The Viking is a 1,475 hp clamshell dredge with an 11.5-cubic meter bucket. Clark recorded sounds digging sounds between 113-107 dB at distances of 158-464 meters from the source, respectively. Assuming a transmission loss coefficient of 15 for the practical spreading calculation, a received level of 113 dB at a range of 158 meters indicates an SL of 146 dB. The same calculation using a received level of 107 dB at a range of 464 meters indicates an SL of 147 dB.

The equipment used to dredge the St. George Harbor navigation channel and turning basin would be similar in scale to the Viking and could be assumed to generate noise of a similar amplitude. The St. George dredging would likely produce more powerful sounds due to the coarser grain-size sediment that would be excavated, but it would be difficult to predict how much more powerful the sounds would be. Therefore, it is appropriate to state that the amplitude of the sounds produced by dredging near St. George would be equal to or greater than the amplitude of the sounds produced by the Viking dredging in Cook Inlet.

Assuming a source level (SL) of between 146-147 dB, the dredging noise would be below 180 dB at the source, which is below the Alaska Department of Fish and Game (ADFG) reporting threshold for hydroacoustic monitoring in fish-bearing waters. The sound would attenuate to 120 dB between 54-63 meters from the source. The area inside the 120 dB isopleth is thought to be of low-quality fish habitat based on the Corps' June biodiversity survey, and the impacts of underwater noise on FMP species from dredging is negligible. The transportation of dredged material to the placement location would produce sounds of similar amplitude and would also result in negligible impacts on FMP species.

7.1.2 Long-term impacts

The dredging of the entrance channel and turning basin would create a relatively uniform depth within the dredge prism and uncover in-situ bedrock. This would present a permanent alteration of the habitat inside the dredge prism, changing the areas with sandy substrate to bare rock. The presence of a breakwater would likely prevent sand from infilling the basin, so the alteration of the nature of the substrate is expected to be

permanent. The dredging would facilitate consistent vessel access to the new harbor and increase the amount of anthropogenic activity in the area.

Substrate Alteration. The areas within the entrance channel and turning basin dredge prism appear to be mixed sandy and rocky substrate types (Figure 8). Nearshore sandy areas may provide habitat for flatfishes, sculpins, and the forage fish complex. The conversion of these sandy areas to bare rock may reduce the suitable habitat for taxa adapted for life in sandy environs, but increase the habitat available for invertebrates requiring hard attachment substrate and finfish that require crevices and bare rock.

Increased Activity. The presence of a harbor on the north shore of St. George Island would increase the amount of general disturbance to the aquatic environment due to an increase in the number and size of the vessels that call on the area. There would likely be refueling and boat maintenance activities in the harbor area as well, which would increase the potential for fuel, oil, and other hazardous material spills. There are no known sensitive habitat areas that would be exposed to the impacts of increased activity in the immediate vicinity. The operation of the harbor would be subject to best management practices associated with spill prevention and cleanup, reducing the likelihood and impacts of a potential spill.

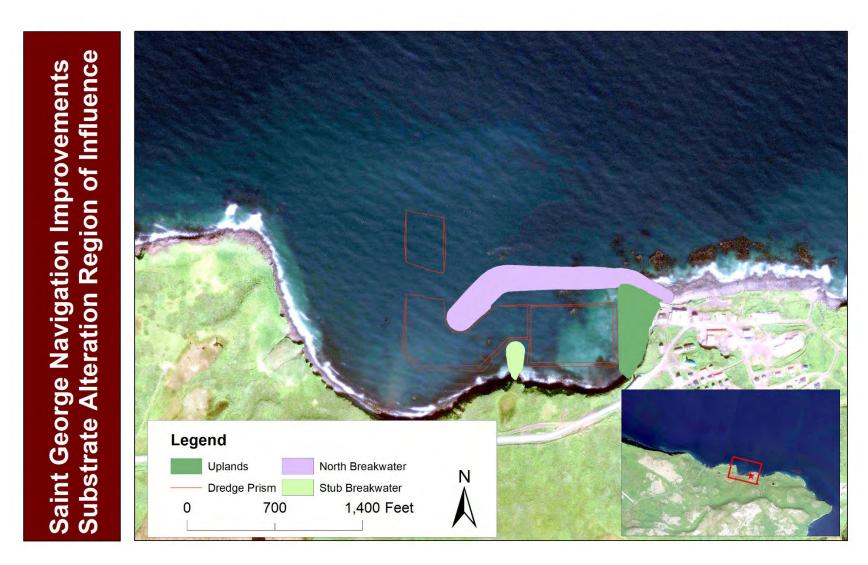


Figure 8. Substrate Alteration Region of Influence

7.2 Dredged Material Placement

Fine-grain material released from the dredge scow would be dispersed and have no measurable impact on the bottom habitat. The sediment plume disturbed by the impact of the cobble and boulder material would be of the same nature as the surrounding area. There would also be short-term impacts on forage fish that are important prey for species with designated EFH. Permanent impacts on the nature of the substrate offshore would be presented by the placement of dredged material.

7.2.1 Short-term impacts

Direct Mortality. The placement of dredged material has the potential to entrain, displace, injure, smother, and kill demersal and benthic organisms. The probability of injury, impact, or death is inversely related to the affected taxon's mobility; i.e., a sessile animal is more likely to be impacted than a motile organism because the sessile organism lacks the ability to move away from the placement area as the disturbance occurs. Crabs and, to a lesser extent, shrimp would be more susceptible to impact than flatfishes, which would, in turn, be more vulnerable than demersal fishes like sculpin and cod.

The placement area is sparsely populated with marine snails, sculpins, and some urchins, some of which would almost certainly be killed by the placement. The placement area is considered to be very poor in terms of fish/shellfish productivity by the local populace, and the results of the June 2019 research pot fishing event corroborate that characterization. Results from the June biodiversity survey are displayed in Figures 5 and 6. The immediate direct impact on FMP species from placement is negligible, but there would likely be a short term impact on the forage taxa of FMP species.

Water Quality. Turbidity would temporarily increase in the vicinity of the placement area as the sediment is released from the scow; but the depth of the water, energetic nature of the hydrodynamic environment, and substantially similar nature of dredged material and placement area substrate ensure the turbidity impacts to water quality would be temporary and insignificant. All dredged material that would be placed on the reef is exempt from chemical testing and determined to be suitable for in-water placement in accordance with the Alaska District's 404(b)1 analysis. The Alaska Department of Environmental Conservation has determined that an Anti-Degradation Analysis for the proposed project is not warranted due to the low level of potential impact to water quality.

Waterborne Noise. Waterborne noise would result from construction activities, such as the noise generated directly by work vessels (propulsion, power generators, on-board cranes, etc.) or by activities conducted by those vessels (e.g., clamshell dredging and placing material into the barge).

Underwater noise or sound pressure from construction activities can have a variety of impacts on marine biota, especially fish and marine mammals. The most adverse impacts are associated with activities like underwater explosions and impact pile driving that produce a sharp sound through the water column (Hastings and Popper, 2005). However, in-water activities associated with the Corps' proposed dredging (e.g., work vessel traffic and operation) do not have the potential to generate the type and intensity of sound pressures that would result in adverse impacts to fish. At levels of sound resulting from the work activities anticipated, the primary reaction of EFH fish species/species complexes is expected to be simply a movement away from the work area. Groundfish species such as flatfish, rockfish, and sculpins may be present year-round so that they may move out of the area during the construction period as well.

7.2.2 Long-term impacts

The discharge of the dredged material would be configured so that new blue king crab habitat is created. Long term impacts associated with dredged material placement would be presented by the creation of a rocky reef extending perpendicular from the coast of St George Island. This reef would significantly alter the nature of the seabed by increasing the complexity of the area.

The District enlisted the USACE Engineering Research and Development Center (ERDC) to model the discharge using Short Term Fate of Dredged Material (STFATE) based on feasibility level information and assumptions. A distinct mound is predicted to be formed. The mound would approximate a truncated rectangular pyramid.

The height of the pyramid would be about 5 feet, and the top area of the pyramid would approximate the area of the hopper of the dump scow, approximately 140 feet long and 35 feet wide. The side slopes of the pyramid would be about 1V:10H. Therefore, the base of the pyramid would be a rectangle approximately 240 feet long and 135 feet wide. A few inches of fine rock would likely extend another 30 feet in all directions beyond the toe of the pyramid.

Greater detail regarding the precise configuration of the placement would be developed collaboratively with NMFS HCD and other stakeholders during the PED phase of the project. The District's feasibility level plans for placement include the discharge of dredged material by the scow-load, spaced approximately 100 feet apart. This would produce a reef at least 5 feet tall, extending nearly 3 miles from the nearshore terminus.

Blue king crab requires complex habitat for all demersal life stages. Sand, gravel, cobble, and rocks are necessary substrate types for mature, late juvenile, early juvenile, and egg life stages. Blue king crabs (BKC) are associated with slumps, rockfalls, debris, channels, ledges, pinnacles, reefs, and vertical walls between 0 and 200 meters deep.

BKC generally spend the 3.5-4 months after hatching as pelagic larva in water between 40-60 meters deep before settling out into complex benthic habitat areas. The larvae are planktonic, as their limited ability to swim is greatly outweighed by the effects of ocean currents on their horizontal movements. There is some evidence BKC larvae

intentionally move vertically through the water column on a daily basis. Because BKC larvae are pelagic plankton, the placement of dredged material to create habitat does not consider the larval life stage, and no effort is made to create or enhance larval BKC habitat requirements beyond ensuring the benthic habitat is confined to the epipelagic zone in waters less than 200 meters deep.

Considering what is known about the existing conditions in the placement area (gently sloping featureless expanses of sand mixed with shell litter), the introduction of a rocky reef would create ideal BKC habitat. BKC are known to prefer the interface of complex rocky, vertical structure, and areas of sand, mud, and shell liter. The presence of sand dollars and marine snails (known BKC prey item) confirms nominal forage base exists in the placement area. Low capture during the June 2019 pot surveys indicate few natural BKC predators are present in the area. The placement site is not known to be productive for trawling or any other types of fishing, so the District has no reason to anticipate adverse impacts to competing user groups.

7.3 Maintenance Dredging

Maintenance dredging is expected to be required on a ten-year interval. Sand and gravel would fill in the dredge prism at a rate of approximately 1,000 cubic yards per year until the authorized project depth is no longer available, at which time a mechanical dredge would remove the material and place it on the reef (Figure 3). The maintenance dredging would create short and long term effects similar to transition dredging, except the magnitude of the effect would be much less due to the volume of material and intensity of the dredging effort.

7.4 Marine Construction

The construction of the two breakwaters and area for inner harbor facilities would convert nearshore subtidal habitat to dry land and vertical structure. There would be short term impacts from the construction and long-term impacts from the habitat alteration.

7.4.1 Short Term Impacts

Direct Mortality. The placement of rock for the construction of the two breakwaters and the inner harbor facilities infrastructure has the potential to crush, smother, kill, or injure aquatic organisms in the project area. The potential for harm is inversely related to mobility; i.e., animals with greater mobility (such as finfish) are less likely to be harmed by the construction than animals with lower mobility (like anemones or urchins).

Water Quality Impacts. The marine construction would have the potential to increase the turbidity in the immediate project area by introducing entrained fine-grained sediments into the water column from the rock used for construction. The placement of rock on the seafloor may also suspend local sediments, contributing to temporarily elevated turbidity. The sediment that may be suspended by construction is not a carrier of contaminants due to the site history and physical characteristics of the material, and

the only negative water quality impact that may be caused by the marine construction is temporarily elevated turbidity. The turbidity would return to ambient levels within a short radius of the construction activities due to the large size of the particles and the great hydrodynamic energy.

Increased Activity and Noise Levels. The construction of two breakwaters and the marine infrastructure would increase the amount of noise and human activity in the project area for a period of up to five years. The amplitude of the noise is not expected to be great enough to cause damage to fish or other aquatic resources, but the presence of additional humans may cause disturbance. The project area is naturally energetic, and the action of the surf may act to mask the additional disturbance.

7.4.2 Long-Term Impacts

Habitat Alteration. The construction of the full navigation improvement project would include the 1,731-foot long north breakwater, the 250-foot long stub breakwater, approximately 4.0 acres of fill placed for the creation of area for inner harbor facilities, and 0.1-acre concrete boat ramp. Portions of the boat ramp (0.08-acres) and north breakwater (0.34-acres) are coincidental to the inner harbor facilities area, so the total area of fill would be slightly less than the sum of the four features.

The north breakwater would include a cumulative volume of 219,000 cubic yards of armor stone, B rock, and core rock and cover approximately 8.3-acres. The stub breakwater would include a cumulative volume of 20,500 cubic yards of armor stone, B rock, and cover rock and cover approximately 0.8 acres. The area for the inner harbor facilities would require 45,000 cubic yards of fill and would cover a total of 4.0-acres, but only about 3.6-acres would be in addition to the North Breakwater fill. The concrete boat ramp would be mostly contained within the area for the inner harbor facilities fill footprint, but a small portion consisting of 0.02 acres would extend beyond the west margin of the fill. The total volume of fill for all features is about 284,500 cubic yards, and the area of fill is about 12.8 acres.

The North breakwater would represent the loss of about 8.3-acres of poorly characterized subtidal habitat, replacing it with relatively steep, rocky subtidal, intertidal, and supratidal habitat. The Stub breakwater would convert about 0.8-acres, and the area for the inner harbor facilities would convert about 4.0-acres. The conversion of these habitats would be a permanent increase in the complexity of the area.

Increased Activity and Noise Levels. The presence of a harbor facility where there had previously been a semi-enclosed bight would increase the amount of human activity in the area, by design. The amplitude of the noise is not expected to present meaningful impacts to EFH. The additional human activity in the area increases the amount of fuel, oil, and other hazardous material usage, which presents a corresponding increase in the potential for hazardous material spills.

7.5 Drilling and Blasting

The project description includes the drilling and blasting of submerged bedrock to dislodge the material and allow it to be removed by the mechanical dredge. Drilling for the placement of charges is expected to last for 488 non-consecutive days, and blasting is expected to occur on 369 non-consecutive days. These days would be distributed throughout the five-year construction duration.

7.5.1 Short-term Impacts

Underwater noise would be produced by the drill rig. Precise information regarding the source sound pressure produced by drilling is not available, but a 120 kW drill with 83 mm drill bit operating at 1500 RPM was measured producing, 145 dB at frequencies between 30 and 2000 Hz. (Erbe and McPherson, 2017) The amplitude of drilling noise is not sufficient to present meaningful impacts to EFH or FMP species. The intact bedrock inside the dredge prism would have to be blasted to enable dredging to occur. Impacts on marine fish as a result of underwater explosions are dependent upon a variety of factors: animal size and depth, charge size and depth, depth of the water column, and distance between the animal and the charge. Gas-containing organs, the (swim bladders), are most vulnerable to blast injury. Severe injury to these organs is presumed to lead to mortality. Data on blast injury to marine fish is limited because those factors which determine the extent of an injury may not be known at the time that the potential exposure occurred. Aside from the immediate death and recovery of an animal, an animal could sustain injury and never be observed or recovered.

Mortalities from the blasting may be mitigated to an unknown degree by drilling activities that would be a prerequisite; i.e., the noise from drilling may deter fish from entering the immediate area or cause fish in the area to leave for proximal alternative habitats. Fish that remained or entered the shockwave radii and are killed by the blast could attract other fish and detritivorous benthic invertebrates like crabs into the area to be exposed to subsequent blasts. The Alaska District does not possess adequate data regarding the precise configuration of the blasting or the fish assemblages that would be exposed to the blast to quantify the effects of blasting on FMP species.

7.5.2 Long-term Impacts

The Alaska District does not expect the drilling and blasting to present any long-term impacts beyond those described in the dredging section; 7.1.2.

8.0 MITIGATION

Mitigation Measures. "Mitigation" is the process used to avoid, minimize, and compensate for the environmental consequences of an action. Incorporating the following mitigation measures and conservation measures into the recommended corrective action will help to ensure that no significant adverse impacts would occur to EFH and EFH-managed species/species complexes and other fish and wildlife resources in the project area.

- The proposed action shall confine blasting and drilling to periods between 1
 November through 30 April, which is outside peak seabird nesting, marine
 mammal whelping, rearing, and abundance is expected to be greatest in the
 project area.
- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g., less than 8 knots) shall be imposed on vessels moving in and around the project area.
- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tide periods unless there is a human safety issue requiring it.
- A construction oil spill prevention plan shall be prepared.
- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion or fur seal critical habitat (haulouts or rookeries).
- The Corps will conduct post-dredge bathymetry surveys to ensure that only the material identified to be dredged was removed to the authorized depth.
- A scow barge will be loaded so that enough of the freeboard remains to allow for safe movement of the barge and its material on the route to the offloading site to be identified.

9.0 CONCLUSIONS AND DETERMINATION OF EFFECT

The project actions described above have the potential to affect the EFH for several BSAI groundfish species (e.g., rockfish, sculpin, and flatfish), crab, and for Alaska stocks of Pacific salmon.

Some FMP species individuals and forage base for FMP species would be temporarily lost through direct mortality from dredging, the placement of dredged material, marine construction, and blasting, but these effects would be localized and temporary. Short-term effects in the form of avoidance because of noise disturbances, boat traffic, and turbidity would be intermittent and low level. No significant negative long-term effects are expected.

The potential effects of turbidity would be intermittent and low level. No adverse impacts related to circulation and harbor-flushing is expected. Year-round resident EFH species such as rockfish, flatfish, and sculpins would likely respond by temporarily moving out of work areas during construction.

The proposed construction would likely occur over a period of five years and within an anticipated in-water work window. Seasonal work restrictions would minimize any impacts to nesting birds and marine mammals.

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Potential impacts to EFH and EFH-managed species/species complexes are likely to be highly localized, temporary, and minimal, and not reduce the overall value of EFH in the Bering Sea. The aforementioned mitigation measures would be implemented to offset the potential unavoidable impacts of the Corps' activity. The construction of a reef intended to provide habitat for BKC would represent a substantial beneficial impact of the project. Therefore, the Corps concludes that its Federal action may affect but is not likely to adversely affect EFH and EFH-managed species/species complexes for BSAI groundfish, crab, and Alaska stocks of Pacific salmon.

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ATTACHMENT 1

Description of Essential Fish Habitat (EFH) for the Groundfish Resources of the Bering Sea-Aleutian Island Management Area

Walleye Pollock

Eggs: EFH for walleye pollock eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) throughout the BSAI

Larvae: EFH for larval walleye pollock is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1,000 m) throughout the BSAI

Early Juveniles: EFH for early juvenile walleye pollock is the habitat-related density area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI. Relative abundance of age 1 pollock is used as an early indicator of year-class strength and is highly variable (presumably due to survival factors and differential availability between years).

Late Juveniles: EFH for late juvenile walleye pollock is the habitat-related density area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI. Substrate preferences, if they exist, are unknown.

Adults: EFH for adult walleye pollock is the habitat-related density area for this life stage, located in the lower and middle portion of the water column along the entire shelf (~10 to 200 m) and slope (200 to 1,000 m) throughout the BSAI. Substrate preferences, if they exist, are unknown.

Pacific Cod

Eggs: No EFH description determined. Insufficient information is available. Pacific cod eggs, which are demersal, are rarely encountered during surveys in the BSAI.

Larvae: EFH for larval Pacific cod is the habitat-related density area for this life stage, located in epipelagic waters along much of the middle (50 to 100 m) and outer (100 to 200 m) Eastern Bering Sea (EBS) shelf, with hotspots in the vicinity of the middle shelf north of Unimak Pass and the Pribilof Islands. The habitat-related density area of larval Pacific cod in the Aleutian Islands (AI) is unknown.

Early Juveniles: EFH for early juvenile Pacific cod is the habitat-related density area for this life stage, centered over the middle (50 to 100 m) EBS shelf between the Pribilof Islands and the Alaska Peninsula and broadly similar to the habitat-related density area

for larval Pacific cod, but not extending as far north. The habitat-related density area of early juvenile Pacific cod in the AI is unknown.

Late Juveniles: EFH for late juvenile Pacific cod is the habitat-related density area for this life stage, including nearly all of the EBS shelf (0 to 200 m) and upper slope (200 to 500 m), with highest abundances in the inshore portions of the central and southern domains of the EBS shelf, and broadly throughout the AI at depths up to 500 m.

Adults: EFH for adult Pacific cod is the habitat-related density area for this life stage, including nearly all of the EBS shelf and slope, with highest abundances in the central and northern domains over the middle (50 to 100 m) and outer (100 to 200 m) shelf, and broadly throughout the AI at depths up to 500 m.

Sablefish

Eggs: No EFH description determined. Insufficient information is available. Scientific information notes the rare occurrence of sablefish eggs in the BSAI.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: No EFH description determined. Information is insufficient. Early juveniles have generally been observed in inshore water, bays, and passes, and on shallow shelf pelagic and demersal habitat.

Late Juveniles: EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI.

Adults: EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI.

Yellowfin Sole

Eggs: EFH for yellowfin sole eggs is the general distribution area for this life stage, found to the limits of inshore ichthyoplankton sampling over a widespread area, to at least as far north as Nunivak Island.

Larvae: EFH for yellowfin sole larvae is the general distribution area for this life stage. Larvae have been found to the limits of inshore ichthyoplankton sampling over a widespread area, to at least as far north as Nunivak Island.

Early Juveniles: EFH for early juvenile yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf

throughout the BSAI wherever there are soft substrates consisting mainly of sand. Upon settlement in nearshore areas, juveniles preferentially select sediment suitable for feeding on meiofaunal prey and burrowing for protection. Juveniles are separate from the adult population, remaining in shallow areas until they reach approximately 15 cm. Most likely are habitat generalists on abundant physical habitat.

Late Juveniles: EFH for late juvenile yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand.

Adults: EFH for adult yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand.

Greenland Turbot

Eggs: No EFH description determined. Insufficient information is available. Larvae: EFH for larval Greenland turbot is the general distribution area for this life stage, located principally in benthypelagic waters along the outer shelf (100 to 200 m) and slope (200 to 3,000 m) throughout the BSAI and seasonally abundant in the spring.

Early Juveniles: EFH for early juvenile Greenland turbot is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of mud and sandy mud.

Late Juveniles: EFH for late juvenile Greenland turbot is the habitat-related density area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of mud and sandy mud.

Adults: EFH for late adult Greenland turbot is the habitat-related density area for this life stage, located in the lower and middle portion of the water column along the outer shelf (100 to 200 m), upper slope (200 to 500 m), and lower slope (500 to 1,000 m) throughout the BSAI wherever there are softer substrates consisting of mud and sandy mud..

Arrowtooth Flounder

Eggs: No EFH description determined. Insufficient information is available.

Larvae: EFH for larval arrowtooth flounder is the general distribution area for this life stage, found in epipelagic waters located in a demersal habitat throughout the shelf (0 to 200 m) and upper slope (200 to 500 m).

Early Juveniles: EFH for early juvenile arrowtooth flounder is the general distribution area for this life stage, located in a demersal habitat of the inner (0 to 50 m) and middle (50 to 100 m) shelf.

Late Juveniles: EFH for late juvenile arrowtooth flounder is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud.

Adults: EFH for adult arrowtooth flounder is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50), middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud.

Kamchatka Flounder

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile Kamchatka flounder is the general distribution area for this life stage, located in a demersal habitat of the middle (50 to 100 m) and outer (100 to 200 m) shelf.

Late Juveniles: EFH for late juvenile Kamchatka flounder is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud.

Adults: EFH for adult Kamchatka flounder is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m), and outer (100 to 200 m) shelf and slope waters down to 600 m throughout the BSAI wherever there are softer substrates consisting of gravel, sand, and mud.

Northern Rock Sole

Eggs: No EFH description determined. Insufficient information is available.

Larvae: EFH for larval northern rock sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 1,000 m) throughout the BSAI.

Early Juveniles: EFH for early juvenile northern rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble. Upon settlement in nearshore areas from 1-40 m deep, juveniles preferentially select sediment suitable for feeding on meiofaunal prey and burrowing for protection but may be prevented from settling inshore by the seasonal inner front. Juveniles are separate from the adult population, remaining in shallow areas until they reach approximately 15-20 cm. Most likely are habitat generalists on abundant physical habitat.

Late Juveniles: EFH for late juvenile northern rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble.

Adults: EFH for adult northern rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble.

Southern Rock Sole

Eggs: No EFH description determined. Insufficient information is available.

Larvae: EFH for Southern rock sole larvae is the general distribution area for this life stage. Larvae are located in the pelagic waters along the entire shelf (0 to 200m) and upper slope (200 to 1,000m) throughout the BSAI.

Early Juveniles: EFH for early juvenile Southern rock sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand.

Late Juveniles: EFH for late juvenile Southern rock sole is the general distribution area for this life stage, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand.

Adults: EFH for adult Southern rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand, gravel, and cobble.

Alaska Plaice

Eggs: EFH for Alaska plaice eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout the BSAI in the spring.

Larvae: EFH for Alaska plaice larvae is the general distribution area for this life stage. Pelagic larvae are primarily collected from depths greater than 200 m, with the majority occurring over bottom depths ranging from 50 to 100 m. Densities of preflexion stage larvae are concentrated at depths 10 to 20 m.

Early Juveniles: No EFH description determined. Insufficient information is available.

Late Juveniles: No EFH description determined. Insufficient information is available.

Adults: EFH for adult Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud.

Rex Sole

Eggs: EFH for rex sole eggs is the general distribution area for this life stage, located in epipelagic waters throughout the shelf (0 to 200 m) and upper slope (200 to 300 m).

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile rex sole is the general distribution area for this life stage, located in a demersal habitat of the inner (0 to 50 m) and middle (50 to 100 m) shelf.

Late Juveniles: EFH for late juvenile rex sole is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are substrates consisting of gravel, sand, and mud.

Adults: EFH for adult rex sole is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are substrates consisting of gravel, sand, and mud.

Dover Sole

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile Dover sole is the general distribution area for this life stage, located in a demersal habitat of the inner (0 to 50 m) and middle (50 to 100 m) shelf.

Late Juveniles: EFH for late juvenile Dover sole is the habitat-related density area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m), and outer (100 to 200 m) shelf and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of sand and mud.

Adults: EFH for adult Dover sole is the habitat-related density area for this life stage, located in the lower portion of the water column along the middle (50 to 100 m) and outer (100 to 200 m) shelf, and upper (200 to 500 m) and intermediate (500 to 1000 m) slope throughout the BSAI wherever there are substrates consisting of sand and mud.

Flathead Sole

Eggs: EFH for flathead sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI in the spring.

Larvae: EFH for larval flathead sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI.

Early Juveniles: EFH for early juvenile flathead sole is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m) and middle (50 to 100 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud.

Late Juveniles: EFH for late juvenile flathead sole is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud.

Adults: EFH for adult flathead sole is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud.

Pacific Ocean Perch

Eggs: No EFH description determined. Insufficient information is available.

Larvae: EFH for larval Pacific ocean perch is the general distribution area for this life stage, located in pelagic waters along the middle and outer shelf (50 to 200 m) and slope (200 to 3,000 m) throughout the BSAI.

Early Juveniles: EFH for early juvenile Pacific ocean perch is the general distribution area for this life stage, located throughout the water column along the entire shelf (0 to 200 m).

Late Juveniles: EFH for late juvenile Pacific ocean perch is the habitat-related density area for this life stage, located in the middle to lower portion of the water column along middle shelf (50 to 100 m), outer shelf (100 to 200 m), and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of boulders, cobble, gravel, mud, sandy mud, or muddy sand.

Adults: EFH for adult Pacific ocean perch is the habitat-related density area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand.

Northern Rockfish

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile northern rockfish is the general distribution area for this life stage, located throughout the water column along the entire shelf (0 to 200 m.

Late Juveniles: EFH for late juvenile northern rockfish is the habitat-related density area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) throughout the BSAI.

Adults: EFH for adult northern rockfish is the habitat-related density area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates of cobble and rock.

Shortraker Rockfish

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile shortraker rockfish is the general distribution area for this life stage, located in pelagic waters throughout the middle and outer (50 to 200 m) shelf and slope (200 to 3,000 m).

Late Juveniles: EFH for late juvenile shortraker rockfish is the habitat-related density area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel.

Adults: EFH for adult shortraker rockfish is the habitat-related density area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel.

Blackspotted Rockfishes

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile blackspotted/rougheye rockfish is the general distribution area for this life stage, located in pelagic waters throughout the middle and outer (50 to 200 m) shelf and slope (200 to 3,000 m).

Late Juveniles: EFH for late juvenile blackspotted/rougheye rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel.

Adults: EFH for adult blackspotted/rougheye rockfish is the habitat-related density area for this life stage, located in the lower portion of the water column along the upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel.

Rougheve Rockfishes

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile blackspotted/rougheye rockfish is the general distribution area for this life stage, located in pelagic waters throughout the middle and outer (50 to 200 m) shelf and slope (200 to 3,000 m).

Late Juveniles: EFH for late juvenile blackspotted/rougheye rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel.

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Adults: EFH for adult blackspotted/rougheye rockfish is the habitat-related density area for this life stage, located in the lower portion of the water column along the upper slope (200 to 500 m) regions throughout the BSAI wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel.

Yelloweve Rockfish

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: No EFH description determined. Insufficient information is available.

Late Juveniles: No EFH description determined. Insufficient information is available.

Adults: No EFH description determined. Insufficient information is available.

Dusky Rockfish

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile dusky rockfish is the general distribution area for this life stage, located in the pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI.

Late Juveniles: EFH for late juvenile dusky rockfish is the habitat-related density area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of cobble, rock, and gravel.

Adults: EFH for adult dusky rockfish is the habitat-related density area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 m) and upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of cobble, rock, and gravel.

Thornyhead Rockfish (Shortspine)

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: EFH for early juvenile thornyhead rockfish is the habitat-related density area for this life stage, located in epipelagic waters along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the BSAI.

Late Juveniles: EFH for late juvenile thornyhead rockfish is the habitat-related density area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel.

Adults: EFH for adult thornyhead rockfish is the habitat-related density area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 m) and upper to lower slope (200 to 1,000 m) throughout the BSAI wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel.

Atka Mackerel

Eggs: EFH for Atka mackerel eggs is the general distribution area for this life stage, located in a demersal habitat along the shelf (0 to 200 m). There are widespread observations of nesting sites throughout the Aleutian Islands; however, observations are not complete for the entire area.

Larvae: EFH for larval Atka mackerel is the general distribution area for this life stage, located in epipelagic waters along the shelf (0 to 200 m), upper slope (200 to 500 m), and intermediate slope (500 to 1000 m) throughout the BSAI.

Early Juveniles: No EFH description determined. Insufficient information is available.

Late Juveniles: EFH for late juvenile Atka mackerel is the general distribution area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates of gravel and rock and in vegetated areas of kelp.

Adults: EFH for adult Atka mackerel is the habitat-related density area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates of gravel and rock and in vegetated areas of kelp. Habitat related densities of Atka mackerel are available, usually at depths less than 200 m and generally over rough, rocky, and uneven bottom near areas where tidal currents are swift.

Biamouth Sculpins

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Juveniles: EFH for juvenile bigmouth sculpin is the habitat-related density area for this life stage, located in the deeper waters offshore (100 and 300m) in the Bering Sea and Aleutian Islands.

Adults: EFH for adult bigmouth sculpins is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m, and outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud.

Great Sculpins

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Juveniles: EFH for juvenile great sculpin is the habitat-related density area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) wherever there are substrates of sand and muddy/sand bottoms.

Adults: EFH for adult great sculpins is the habitat-related density area for this life stage, located in the lower portion of the water column along the inner (0 to 50 m), middle (50 to 100 m, and outer shelf (100 to 200 m) and portions of the upper slope (200 to 500 m) throughout the BSAI wherever there are substrates of rock, sand, mud, cobble, and sandy mud.

Alaska Skate

Eggs: No EFH description determined. Insufficient information is available.

Larvae: Not applicable, skates emerge from egg fully formed.

Early Juveniles: EFH for early juvenile skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Late Juveniles: EFH for late juvenile skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Adults: EFH for adult skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Aleutian Skate

Eggs: No EFH description determined. Insufficient information is available.

Larvae: Not applicable, skates emerge from egg fully formed.

Early Juveniles: EFH for early juvenile skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Late Juveniles: EFH for late juvenile skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Adults: EFH for adult skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Bering Skate

Eggs: No EFH description determined. Insufficient information is available.

Larvae: Not applicable, skates emerge from egg fully formed.

Early Juveniles: EFH for early juvenile skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Late Juveniles: EFH for late juvenile skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Adults: EFH for adult skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Mud Skate

Eggs: No EFH description determined. Insufficient information is available.

Larvae: Not applicable, skates emerge from egg fully formed.

Early Juveniles: EFH for early juvenile skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Late Juveniles: EFH for late juvenile skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Adults: EFH for adult skates is the habitat-related density area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 m) and the upper slope (200 to 500 m) throughout the BSAI wherever there are of substrates of mud, sand, gravel, and rock.

Octopus

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Early Juveniles: No EFH description determined. Insufficient information is available.

Late Juveniles: No EFH description determined. Insufficient information is available.

Adults: EFH for adult octopus is the habitat-related density area for this life stage, located in demersal habitat throughout the intertidal, subtidal, shelf (0 to 200 m), and slope (200 to 2,000 m).

Yellow Irish Lord

Eggs: No EFH description determined. Insufficient information is available.

Larvae: No EFH description determined. Insufficient information is available.

Juveniles: EFH for juvenile yellow Irish lord is the habitat-related density area for this life stage, located from the subtidal areas near shore to the edge of the continental shelf (0 to 200 m) throughout the BSAI.

Adults: EFH for adult yellow Irish lord is the habitat-related density area for this life stage, located from the subtidal areas near shore to the edge of the continental shelf (0 to 200 m) throughout the BSAI.

ATTACHMENT 2

Description of Essential Fish Habitat (EFH) for the Crab Resources of the Bering Sea-Aleutian Island Management Area

Red King Crab

Eggs: Essential fish habitat of the red king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae: No EFH Description Determined. Insufficient information is available.

Early Juveniles: No EFH Description Determined. Insufficient information is available.

Late Juveniles: EFH for late juvenile red king crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of rock, cobble, and gravel and biogenic structures such as boltenia, bryozoans, ascidians, and shell hash.

Adults: EFH for adult red king crab is the general distribution area for this life stage, located in bottom habitats along the nearshore (spawning aggregations) and the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of sand, mud, cobble, and gravel.

Blue King Crab

Eggs: Essential fish habitat of the blue king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae: No EFH Description Determined. Insufficient information is available.

Early Juveniles: No EFH Description Determined. Insufficient information is available.

Late Juveniles: EFH for late juvenile blue king crab is the general distribution area for this life stage, located in bottom habitats along the nearshore where there are rocky areas with shell hash and the inner (0 to 50), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of rock, cobble, and gravel.

Adults: EFH for adult blue king crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting of sand and mud adjacent to rockier areas and areas of shell hash.

Golden King Crab

Eggs: Essential fish habitat of golden king crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae: No EFH Description Determined. Insufficient information is available.

Early Juveniles: No EFH Description Determined. Insufficient information is available.

Late Juveniles: EFH for late juvenile golden king crab is the general distribution area for this life stage, located in bottom habitats along the along the upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high-relief living habitats, such as coral, and vertical substrates, such as boulders, vertical walls, ledges, and deep water pinnacles.

Adults: EFH for adult golden king crab is the general distribution area for this life stage, located in bottom habitats along the along the outer shelf (100 to 200 m), upper slope (200 to 500 m), intermediate slope (500 to 1,000 m), lower slope (1,000 to 3,000 m), and basins (more than 3,000 m) of the BSAI where there are high relief living habitats, such as coral, and vertical substrates such as boulders, vertical walls, ledges, and deep water pinnacles.

Tanner Crab

Eggs: Essential fish habitat of Tanner crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae: No EFH Description Determined. Insufficient information is available.

Early Juveniles: No EFH Description Determined. Insufficient information is available.

Late Juveniles: EFH for late juvenile Tanner crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud.

Adults: EFH for adult Tanner crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud.

Snow Crab

Eggs: Essential fish habitat of snow crab eggs is inferred from the general distribution of egg-bearing female crab. (See also Adults.)

Larvae: No EFH Description Determined. Insufficient information is available.

Early Juveniles: No EFH Description Determined. Insufficient information is available. **Late Juveniles:** EFH for late juvenile snow crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud.

Adults: EFH for adult snow crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m), middle (50 to 100 m), and outer shelf (100 to 200 m) throughout the BSAI wherever there are substrates consisting mainly of mud.

Colonel Phillip J. Borders U.S. Army Corps of Engineers P.O. Box 6898 JBER, Alaska, 99506-0898

Re: Essential Fish Habitat Assessment for St. George Navigation Improvements

Dear Colonel Borders:

The National Marine Fisheries Service (NMFS) has reviewed the U.S. Army Corps of Engineers' (USACE) Essential Fish Habitat (EFH) Assessment for Navigation Improvements on the island of St. George, Alaska. The purpose of the proposed project is to increase the safe accessibility of marine navigation for subsistence vessels, fuel barges, cargo vessels, and a limited commercial fishing fleet. The navigation improvements are considered critical to the long-term viability of the mixed subsistence-cash economy of the community of St. George. The proposed project is a newly constructed port facility on the northern shore of St. George Island, consisting of a dredged mooring basin protected by a north breakwater and a stub breakwater at the west edge of the basin and connected to the Bering Sea by a dredged navigation channel. The establishment of the breakwaters will result in the loss of 12 acres of subtidal habitat. Inner harbor facilities would include 2.6 acres of filled uplands area with a pile-supported dock and a concrete boat launch ramp dredged for full tide small boat launch access.

Essential Fish Habitat

The project area is identified as EFH for blue king crab (BKC), *Lithodes aequispinus*, red king crab (RKC), *Paralithodes camtshaticus*, and groundfish species as noted in USACE's EFH Assessment. In the Bering Sea, BKC exist in discrete populations around the Pribilof Islands as well as other areas like St. Matthew and St. Lawrence Islands. NMFS and the State of Alaska cooperatively managed BKC stocks in the Bering Sea through the North Pacific Fishery Management Council's (NPFMC) Fishery Management Plan for the Bering Sea/Aleutian Islands King and Tanner Crabs. The Pribilof Islands BKC supported a pot fishery from the 1970's until 1998 when the fishery was closed due to low stock abundance. The stock is considered 'overfished' by the NPFMC and NMFS.

Avoidance, Minimization, and Mitigation

The proposed action may affect adversely affect EFH. However, USACE proposes to minimize the project's impacts by incorporating many mitigation measures into the project design from early coordination with NMFS. Efforts to minimize impacts to EFH include in-work windows, work vessel restriction timing, and best management practices to reduce the likelihood of oil spills. In addition, USACE intends to mitigate the permanent loss of benthic habitat by creating new complex vertical habitat, which will come in two forms: 1) new breakwater structures in the harbor and 2) dredged material placed in the disposal area.



The dredged material will establish three miles of rocky reef intended to create new BKC habitat, extending perpendicular from the coast, at an average height of approximately five feet above the seafloor. NMFS notes this reef would alter the existing seafloor and should increase marine species complexity of the area; however, the benefit to BKC via the creation of this new habitat complexity is not assured.

Similar to RKC, BKC is considered a shallow water species. Adult male BKC may be found at depths near 70 m and some adult crab are observed at depths up to 200 m. BKC juveniles are also known to settle on rocky substrate, however, data suggests shell-hash habitat is also particularly important and preferred over rocky substrate, unlike RKC. This suggests the new rocky habitat structures could benefit RKC more than BKC. Complex habitat is not a requirement for late juvenile or mature crabs, which are most often found on soft bottoms.

Additionally, NMFS recognizes the low density of predators in the project area currently; however, predators will likely recruit to this habitat along with any crabs. Moreover, data suggests RKC and BKC are likely limited by larval supply and not constrained by habitat in the Pribilof Islands. Thus, due to a lack of selection for rocky habitat, a likely increase in predators, and limited larval supply, an increase in the availability of complex vertical structures would represent an overall minimal net increase in benthic productivity. Thus, any habitat complexity provided by this project is unlikely to provide any significant increase in the BKC population. However, long-term monitoring of vertical habitat structure could inform future EFH consultations and enhance mitigation measures in the region.

NMFS does not anticipate any negative interactions with fishing activities at the proposed disposal site (rocky reef). Further, subsistence and commercial halibut fishing occur on the other side of the island and interactions are highly unlikely. Bottom trawling is also prohibited in marine waters surrounding the Pribilof Islands.

Conclusions

NMFS looks forward to continued coordination with USACE as the Alaska District initiates the Preliminary Engineering and Design (PED) phase of the proposed project. The lack of detail regarding geotechnical and bathymetric conditions limits the USACE's ability to determine the likelihood of adverse impacts to EFH. Should the new data collected during the PED phase cause the Corps to revisit its determination of affect, or modify the project significantly from the current preferred alternative, please inform NMFS of any such changes in order to reassess our determination. If you have any questions regarding our comments on this project, please contact Seanbob Kelly at seanbob.kelly@noaa.gov or (907) 271-5195 or Lydia Ames at lydia.ames@noaa.gov or (907) 271-5002.

Sincerely,

James W. Balsiger, Ph.D.
Administrator, Alaska Region

cc:

Hoffman, Christopher A CIV USARMY CEPOA, christopher-A.Hoffman@usace.army.mil
Rouse, Michael B CIV USARMY CEPOA, Michael.B.Rouse@usace.army.mil
Salyer, Michael R CIV USARMY CEPOA, Michael.R.Salyer@usace.army.mil
Phillips, Reese B (Brand) CIV, Reese.B.Phillips@usace.army.mil
Upah, Cynthia S CIV USARMY CEPOA, Cynthia.S.Upah@usace.army.mil
Sexauer, Bruce R CIV USARMY CEPOA, Bruce.R.Sexauer@usace.army.mil

ST. GEORGE HARBOR IMPROVEMENT FEASIBILITY STUDY

APPENDIX C: DRAFT BIOLOGICAL ASSESSMENT

ST. GEORGE, ALASKA





EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE), Alaska District proposes to construct a small boat harbor facility on the north side of Saint George Island. The purpose of the project is to increase safe navigational access. USACE's project is needed to reduce existing hazards and better facilitate the safe navigation of subsistence vessels, fuel barges, cargo vessels, and a limited commercial fleet; all of which are critical to the long term viability of the mixed subsistence-cash economy of Saint George. This project would consist of a 450-foot wide by 550-foot-long mooring basin dredged to -20 feet MLLW protected by a 1,731-foot-long north breakwater and a 250-foot-long stub breakwater at the west edge of the basin. Primary armor stone on the north breakwater has a median weight of 10 tons. The basin connects to the Bering Sea with a 250-foot wide navigation channel dredged to -25 feet MLLW. Inner harbor facilities include 3.55 acres of inner harbor facilities area filled to +10 feet MLLW with a 300-foot-long pile supported dock and a concrete boat launch ramp to -5 feet MLLW for full tide launching access. The construction of the project has the potential to impact several species listed under the Endangered Species Act. The species, listing status, managing agency, and effects determination are included in Table ES-1.

Common Name	Species Name	Listing Status	Managing Agency	Effects Determination	
Steller Sea Lion	Eumetopias jubatus	Endangered - Western DPS	NMFS	May affect, likely to adversely affect	
Steller Sea Lion Critical Habitat	N/A	N/A	NMFS	May affect, not likely to adversely modify	
Humpback Whale	Megaptera novaeangliae	Endangered - Western North Pacific DPS	NMFS	May affect, likely to adversely affect	
Humpback Whale	Megaptera novaeangliae	Threatened - Mexico DPS	NMFS	May affect, likely to adversely affect	
Northern Sea Otter	Enhydra lutris kenyoni	Threatened – Southwest Alaska DPS	USFWS	No effect	
Fin Whale	Balaenoptera physalus	Endangered	NMFS	No effect	

North Pacific Right Whale	Eubalena japonica	Endangered	NMFS	No effect
Sperm Whale	Physeter macrocephalus	Endangered	NMFS	No effect
Gray Whale	Eschrichtius robustus	Endangered	NMFS	No effect
Ringed Seal	Phoca hispida	Threatened - Arctic subspecies	NMFS	May affect, likely to adversely affect
Bearded Seal	Erignathus barbatus	Threatened - Beringia DPS	NMFS	May affect, likely to adversely affect

Table ES-1. Executive Summary Effects Determination

LIST OF ACRONYMS AND ABBREVIATIONS

°F degrees Fahrenheit

ADFG Alaska Department of Fish and Game

BA Biological Assessment
BMP best management practice
CFR Code of Federal Regulations

CY cubic yard dB decibels

dBA A-weighted decibels

DOT&PF Alaska Department of Transportation and Public Facilities

DPS Distinct Population Segment

EBS Eastern Bering Sea

EEZ Exclusive Economic Zone

EIS Environmental Impact Statement

ESA Endangered Species Act

FAA Federal Aviation Administration

GOA Gulf of Alaska HP horsepower

IHA Incidental Harassment Authorization

km kilometer

LOA Letter of Authorization

MMPA Marine Mammal Protection Act

MLW mean low water

MLLW mean lower low water

NEPA National Environmental Policy Act

nm nautical mile

NOAA National Oceanic and Atmospheric Administration

NOAA Fisheries NOAA's National Marine Fisheries Service

NOI Notice of Intent

PTS permanent threshold shift temporary threshold shift

USACE U.S. Army Corps of Engineers

USEPA U.S. Environmental Protection Agency

USFWS U.S. Fish and Wildlife Service USGS U.S. Geological Survey

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1.0 INTRODUCTION

The purpose of this Biological Assessment (BA) is to review a proposed navigation improvement project at Saint George, Alaska in sufficient detail to determine whether the project might affect species protected under the Endangered Species Act (ESA). This assessment is required because there exists the potential for impacts to fish and wildlife habitats within the project area that may be caused by the construction and/or use of a navigation channel, local service facilities, and attendant project features. Concurrently, the U.S. Army Corps of Engineers (USACE) has prepared an analysis in accordance with Section 404(b)(1) of the Clean Water Act (CWA), and the project must fulfill National Environmental Policy Act (NEPA) requirements. This document is prepared consistent with legal requirements set forth under Section 7 of the Endangered Species Act (19 U.S.C. 1536 (c)).

An Incidental Take Authorization in the form of a Letter of Authorization (LOA) under the Marine Mammal Protection Act (MMPA) to take marine mammals by Level B (Behavioral) harassment, primarily due to impacts of confined underwater blasting and the drilling, excavation, and placement of those materials in marine waters, would be necessary for this project, as USACE has determined that the project will affect marine mammals, including ESA-listed marine mammals. A project involving a single year of work would require an Incidental Harassment Authorization (IHA), but an LOA would be more appropriate for projects that will take place over a period of up to five years.

This Draft BA lays out the rationale for which ESA species are considered and the rationale for the preliminary likely effect determinations. Since USACE, has through its analysis, determined that its action "may affect, and is likely to adversely affect" ESA-listed species (which for this project are marine mammals), the formal ESA consultation procedures established by 50 CFR 402 et seq. are triggered, which will lead to the development of a Biological Opinion (BO) by the National Marine Fisheries Service (NMFS). Section 7(b)(4)(C) of the ESA further provides that if an endangered or threatened marine mammal is involved, the taking must first be authorized by Section 101(a)(5) of the Marine Mammal Protection Act (MMPA). Since northern fur seals (marine mammals entitled to protection under the MMPA) are not ESA listed, they will not be discussed in this BA other than to state here that they would be part of the LOA application package prepared in Preconstruction, Engineering, and Design phase of the St. George Navigation Improvements Project. Critical project construction details, primarily a detailed blasting plan, will not be available until further analysis in PED. These details would inform the LOA application to help determine estimated take

numbers for marine mammals and serve to advance this BA from a draft to a final version.

1.1 Purpose and Need

The purpose of the project is to increase the safe accessibility of marine navigation to the community of St. George, Alaska. The need for the project is to reduce existing hazards to safe navigation of subsistence vessels, fuel barges, cargo vessels, and a limited commercial fleet; all of which are critical to the long term viability of the mixed subsistence-cash economy of St. George.

Currently, dangerous wave and seiche conditions at St. George's existing Zapadni Bay harbor, which was constructed during the 1980s, limit the opportunities for safe access and moorage to the existing fleet. This reduces subsistence opportunities and impacts delivery of goods to the community and imperils the long-term viability of the community. Since crab rationalization established individual fishing and harvesting quotas (enacted circa 2000 with full implementation by the 2005/2006 season), commercial fishing vessels have abandoned St. George as an option to deliver catch due to it being cost prohibitive compared with the risk of damages and delays. The community is legally entitled to a percentage of the Community Development Quota from the Aleutian Pribilof Island Community Development Association for crab; however, without a safe access to a harbor, St. George is unable to realize that revenue benefit, and crab is delivered to neighboring St. Paul. Due to vessel delays and the risk of damages, consumables are flown into the community at a cost \$1.58 more per pound than ocean going vessels could deliver.

In 1973, after 110 years of using Alaska Aleut Natives on St. George Island to harvest and skin fur seals and their pelts for profit, the Federal Government, acting through the Department of Commerce, National Marine Fisheries Service (NMFS), stopped commercial fur sealing on St. George Island. This was done as a matter of Federal wildlife conservation policy. In the early 1980s, the Department of Commerce proposed that Congress change the Fur Seal Act and permit NMFS to withdraw from property ownership and municipal management of St. George Island. Congress, the State of Alaska, and all concerned parties recognized that, without a boat harbor, this Federal phase out would cause an effective "termination" of the Native community. Lacking harbor infrastructure to support commercial fishing, indigenous peoples would need to resume commercial fur sealing, contrary to Federal policy. Therefore, a goal of harbor construction has long been to transform the local economy from being dependent upon the government managed seal harvest to a self-sustaining economy that could benefit from the abundant marine resources of the Bering Sea. The commitments of the

Federal Government to construct a harbor at St. George were included in the Fur Seal Act Amendments of 1983, P.L. 98-129.

An aerial photograph of St. George's existing harbor at Zapadni Bay, which was constructed in the early 1980s with the intent to meet the goal of transforming the modest local economy to a marine based economy is shown in Figure 1. However, due to problems experienced with the harbor's geometry as constructed, the residents of St. George have not attained a stable and sustainable marine resource economy sufficient to support their mixed, subsistence-cash economy. The survival of the community is dependent upon a more accessible harbor as there can be no viable long-term economy on St. George without it.



Figure 1. Aerial Image of the Existing Harbor

USACE proposes to alleviate St. George's existing navigational inefficiencies through the implementation of a new breakwater-protected small boat harbor located on the north side of St. George Island. The new breakwater protected harbor is designed to support the Bering Sea crabber fleet, with a 1,730 foot long north breakwater that would protect a 550 foot by 450 foot maneuvering basin dredged to -20 feet MLLW. Based upon envisioned environmental windows and logistic challenges that are inherent with

construction projects in the Bering Sea, the total estimated performance period for construction of the project is a minimum of 3 years, but likely would be up to 5 years.

2.0 PROJECT DESCRIPTION

2.1 Location

St. George Island is the southernmost, and second largest of a group of five historically volcanic islands that compose the Pribilof Archipelago, located approximately 760 miles west of Anchorage and 220 miles north by northwest of Unalaska Island in the southern Bering Sea (Figure 2).

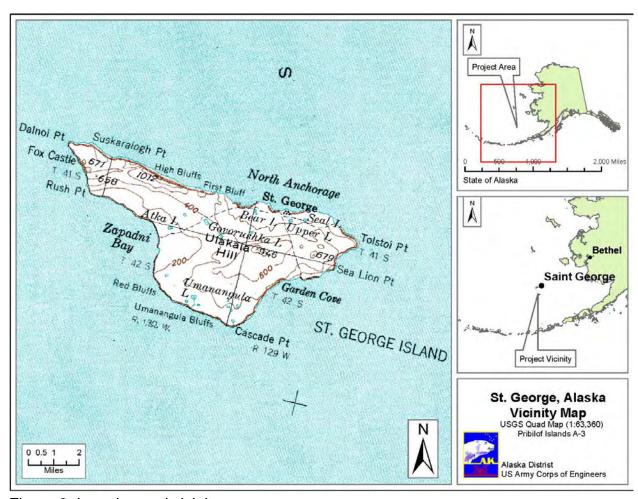


Figure 2. Location and vicinity map.

St. George's position along the western margin of Alaska's continental shelf puts it in close proximity to the much deeper waters of the Bering Sea's abyssal plain. The abrupt change in seafloor elevation occurring at the continental shelf facilitates natural

upwelling processes. Ocean depths in the waters surrounding St. George do not regularly exceed 70 fathoms. However, some 75 miles to the west-southwest, the water depth is greater than 3,000 fathoms. National Oceanic and Atmospheric Administration's (NOAA) Chart 16380 describes the physical characteristics of St. George Island's nearshore areas as rocky, and gradually increasing in depth from the shoreline to 25 to 45 fathoms 3 miles from the shore (Figure 3).

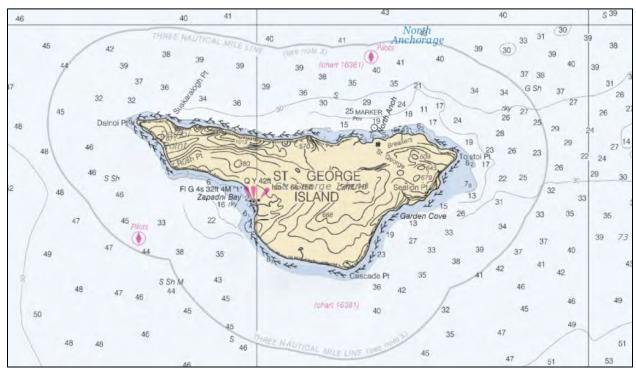


Figure 3. NOAA chart for Saint George Island marine waters.

The City of St. George is situated on the northeast shore of St. George Island. USACE's proposed project location lies immediately west of the village of St. George (Figure 4). Village Cove, as it is commonly referenced, had once supported the village's primary export, fur seal skins, and incorporated an improved small boat landing facility. Today, the improved landing area lies derelict and is not used for any type of vessel operations (Figure 5).



Figure 4. Inner portion of Village Cove that would be part of the new inner harbor.



Figure 5. St. George's derelict small boat landing area.

2.2 Definition of Action Area

The "action area" includes all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (i.e. the project footprint). The action area is usually larger than the project footprint and extends out to a point where no measurable effects from the project occur. The action area for this project is broken into two distinct areas (Figure 6). The north action area (Figure 7) is a radius of seven kilometers from the harbor site and is based on the projected distance of Level B (behavioral) disturbance for low frequency cetaceans from confined underwater blasting assuming the largest size possible (100 kg/220 lbs.). The effects analysis assume a maximum charge size of 110 lbs. but to be conservative in determining the action area the larger zone for the 220 lb. charge is used. This is the greatest distance calculated for any construction noise and also encapsulates the zone of increased vessel traffic from the new harbor. Beyond this zone, marine traffic is considered to be indistinguishable from existing vessel traffic.

Another action area is located on the south side of Saint George Island (Figure 8). This one is due to increased vessel traffic from barge traffic bringing in rock and other material and equipment for the project. At least 100 barge loads of material would be required for this project, although it is not possible to determine if they would mostly show up in one season or spread out over several. It is also not possible to determine where the material would come from. It could come in from the north (Nome) or from the south (Dutch Harbor or beyond).



Figure 6. North and south action area boundaries. Red star represent the project site and the yellow star is the existing harbor in Zapadni Bay.

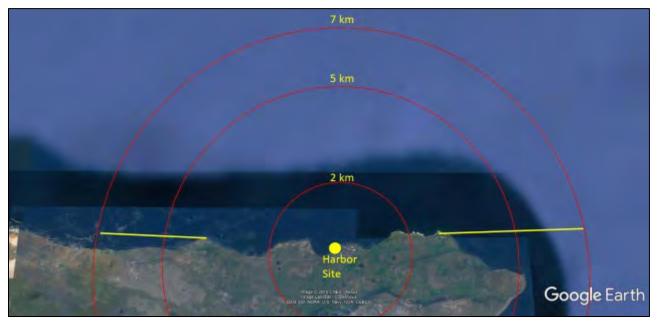


Figure 7. North action area detail.

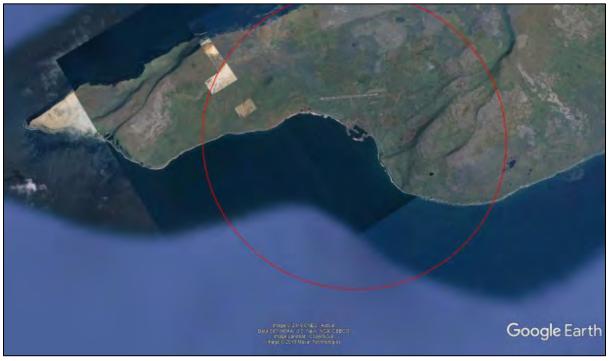


Figure 8. South action area detail. Four kilometer action area zone around the harbor in Zapadni Bay due to vessel traffic from material deliveries.

2.3 Proposed Action

2.3.1 Project Details

USACE's proposed project is designed to realize maximum economic benefit by being able to support vessel classes of the existing Bearing Sea crabber fleet. However, the overall design includes a protected boat launch and recovery area for the local subsistence fleet. A new 1,731 foot long North Breakwater with 10 ton armor stone and a crest elevation of +25 feet MLLW would protect a new 550 foot by 450 foot maneuvering basin, a 300 foot dock and concrete launch ramp (Figure 9). A 250 foot long Spur Breakwater with 10 ton armor stone and a crest height of +20 feet would be constructed inside the North Breakwater from the base of the cliffs along the south edge of the harbor to filter waves diffracted around the nose of the North Breakwater. The rubblemound breakwater structure would be constructed utilizing standard design. incorporating three layers of consecutively smaller boulders to efficiently dissipate wave energy. The outer layer, the A rock layer, would consist of large multi-ton armorstone that would be subject to the majority of the wave energies. Second, a B rock layer, comprised of slightly smaller, yet substantial boulders adds a redundant layer of protection for the smaller innermost boulders that make up the C rock layer, or core of the breakwater structure. The maneuvering basin would be dredged to -20 feet MLLW with a transition zone and an entrance channel dredged to -25 feet MLLW. The entrance channel maintains a 300 foot width from deep water to the end of the breakwater and includes widened turning section outside the breakwater nose. The channel narrows to 250 feet wide at the breakwater nose.



Figure 9. New harbor design.

The new breakwater would be subject to storm waves from the north and use a design wave height of 15 feet. This results in an average armor stone weight of 10 tons when constructed at a 2H:1V slope. The inner slopes of the breakwater would be constructed at 1.5H:1V except at the breakwater nose where the 2H:1V slope is wrapped around and carried through for 50 feet. Where inner harbor facilities abut the breakwater, the A rock extends over the crest for the full width but is omitted from the harbor side slope. This results in the inner harbor facilities fill being placed against B rock.

The launch ramp will be a precast concrete structure constructed at a 13% slope with vertical curves meeting highway design guidance to allow vehicular launching and recovery operations.

The 300-foot-long pile supported dock is planned as a concrete deck on steel piles with a marine fender system. The deck would be precast and post-tensioned in place to minimize the volume of concrete and grout required to be cast in place on site. Inner harbor facilities include 3.55 acres of inner harbor facilities area filled to +10 feet MLLW.

Breakwater construction would typically be performed under a USACE administered contract to ensure that minimum construction requirements are met during construction. The breakwater would use several layers of stone armor to achieve wave protection and filtering criteria. All material used in the construction of these project features would be of a self-compacting nature consisting of rock spalls or dredged tailings that can be placed underwater by excavator bucket, skip box, or dump scow. Fill prisms and "C" rock layers would be randomly placed and controlled by construction survey to assure that design elevations and layer thicknesses were met. Larger stone, typically "B" rock and "A" rock layers would be placed selectively by an excavator with an articulated thumb or crane with rock tongs to achieve minimum stone to stone contact requirements. Placement of stone would likely be performed by equipment mounted on a barge until the breakwaters were built up above the tide range, then placement would be with an excavator on the top of the breakwater.

The underlying material at all proposed dredge sites is assumed to be bedrock and would require preparatory drilling and confined underwater blasting followed by mechanical dredging to reach design depths. Dredging features typically include a 2 foot allowance for overdredge to ensure that the minimum required depth is met. Blasting also requires a minimum 2 foot depth allowance to ensure that minimum depth is achieved, so blasting patterns would need to be established to loosen material to 4 feet below the minimum required depths designed for the selected plan. The dredge machinery would load a scow, which would deliver the dredged material to an offshore beneficial utilization placement site. Multiple scows may be used to provide for continuous dredging operations.

Confined underwater blasting is the recommended pretreatment for what is currently assumed to be igneous, olivine bedrock that underlays the project design depths. Geotechnical borings and subsequent unconfined compressive strength tests will inform the blasting plan (drill hole depths, spacing, and charge weight per delay). Drilling and charge placement will likely be accomplished via spud barge, but the precise details of this project element are unknown at this time. "Confined" blasting is the practice of stemming the explosive charge with crushed gravel or similarly angular-edged substance so that blast energies are confined to the underlying rock bed and explosive gasses are not allowed to escape.

The blasting plan for this project would be developed in PED, but a reasonable scenario for this project for planning and evaluating environmental impacts involves drilling boreholes for confined underwater blasting in a 12-foot by 12-foot grid pattern over the dredge prism. This would result in approximately 5,000 bore holes drilled to between - 21 and -26 MLLW. Drilling to two feet over the target depth would ensure that

everything down to the design depth is completely fractured. Drilling would likely take place from a barge with a drilling template and a production rate of 40 holes per day, with one blast of those 40 holes daily. This would allow the entire drilling and blasting operation to theoretically take place over about 125 days for the 5,000 holes and likely require three years to complete. This is because work windows would be confined to the period from 1 November to 30 April to conform to mitigation measures. However, relatively calm weather is needed for drilling and blasting and the open work window corresponds to the periods when the weather is the worst and the north side of the island and completely unprotected during wind with any northerly component. The short period of daylight in the winter is an additional limiting factor as blasting would have to occur during daylight hours for overall safety and to be able to observe marine mammals. The hours of daylight during construction would need to be estimated in order to account for additional labor hours, potential shutdown, and additional costs associated with any additional stipulations for blasting. The 40 holes in each shot would be separated by at least 15 milliseconds so that for fish and marine mammal impact assessment purposes each hole would be treated individually. The blasting plan would have a safety plan communicated to local mariners to cover associated signals and restricted access periods.

USACE assumes that the Local Service Facilities (LSF) would be constructed under the same contract for the Federal features of the project. The LSF include the non-Federal dredging areas, docks, fender systems, mooring dolphins and bollards, launch ramps, utilities, fuel tanks, access roads, and road bed surfaces. The non-Federal dredging portions of the project are represented by the area adjacent to the proposed dock faces out to an offset distance of approximately two vessel beams in width. Staging and laydown areas are also considered LSF. These would be constructed concurrently with the harbor project.

As part of the construction of the project, concrete navigation marker bases would be constructed at the heads of the new breakwaters. Coordination with the U.S. Coast Guard Aids to Navigation Office will be conducted to ensure that necessary marking of the new entrance channel is considered.

The material source for A and B rock would be offsite from an established quarry such as Cape Nome or Granite Cove on Kodiak Island. The material source would most likely be far enough away from the site that rock production would need to significantly lead placement operations to ensure that the construction crew on site has enough material delivered to the site for continuous or seasonal work. Stone production in the quarry and delivery to the site would likely be the first project tasks undertaken.

Construction of the North Breakwater would most likely to be performed with land based equipment. The breakwater core would be constructed to above the tide range to allow the placing equipment to drive the breakwater core and place B and A rock layers to protect the work in progress. Core rock would likely be transported and staged on the breakwater with off-road dump trucks, then shaped to the design prism by an excavator. Near the west end of the breakwater, an excavator on a barge may be required to shape the toe and benches of the breakwater where the seabed is deeper. Inner harbor facilities would be constructed concurrently with the breakwater to build staging areas for breakwater material.

Dredging could occur concurrently with stone production; initial dredging and blasting would occur between late fall and spring to protect nearby fur seal rookeries. Dredging opportunities during these months are limited due to adverse weather and the blasting program could take three or more years to complete. Some preparatory dredging prior to constructing the breakwaters would provide access for construction barges to the breakwater sites. The total estimated performance period for construction the project is a minimum of 3 years and likely would be 5 1/2 years.

The local sponsor would be responsible for operation and maintenance of the completed mooring areas and LSF portion of the project. The Federal Government would be responsible for maintenance of the breakwaters (except for the road prism and surfaces, and docks and other local service facilities) and the general navigation features (GNF) of the project.

The breakwaters have been designed to be stable for the 50-year predicted wave conditions. Therefore, no significant loss of stone from the rubblemound structures is expected over the life of the project. It is estimated that at the worst case, 2.5 percent of the armor stone would need to be replaced every 25 years. Because stone quality would be strictly specified in the project construction contracts, little to no armor stone degradation would be anticipated. A quantity of 2,100 CY of A-Rock would be required for replacement on the North and Spur Breakwaters at year 25.

Maintenance dredging would be conducted on an estimated 10-year cycle. The entrance channel and maneuvering area would require dredging of approximately 10,000 CY. A dredged material management plan would be developed for the project in which a long-term beneficial utilization option would be identified. For purposes of this study, it is assumed that the entrance channel and maneuvering area material would be disposed of in the beneficial use placement area approximately 1 mile north of the project location. Clamshell bucket dredging equipment with a scow barge would likely be used for maintenance dredging. Dredged material characteristics should be easier

to remove than construction dredging of the area as blasting would not be required for maintenance.

Features associated with the proposed project are divided into two broad categories based on the responsibility for construction and maintenance; GNF and LSF. USACE would be responsible for the construction and maintenance of the GNF and the non-Federal sponsor would be responsible for the construction and maintenance of the LSF. Because both categories of features would be required for a functional project, the impacts of both categories are considered in this Biological Assessment.

GNF:

- Drill, confined blast, and dredge navigation channel to -27ft MLLW (includes 2 ft of overdepth).
- o Drill, confined blast, and dredge maneuvering basin to -22ft MLLW.
- Maneuvering basin and navigation channel estimated dredge volume: 353,052
 CY.
- Placement of dredged sediments at the beneficial use placement site.
- Emplacement of North Breakwater: Approximately 219,000 CY of rock.
- o Emplacement of Spur Breakwater: Approximately 20,500 CY of rock.
- o Inner harbor facilities: Approximately 45,000 CY of dredge material may be used as fill for inner harbor facilities.

LSF features:

- Non-Federal dredging areas; the areas adjacent to the proposed dock faces out to an offset distance of approximately two vessel beams in width (to be conducted concurrently with GNF dredging).
- o Pile driving, installation of docks, fender systems, mooring dolphins, and bollards, launch ramp, utilities, access roads, and road bed surfaces.
- Project laydown and staging areas.

St. George Island is accessible only by air and sea, and even then, only when environmental conditions permit. Barge and supporting vessels would have to navigate the Bering Sea to the existing harbor before debarking any construction related equipment and materials. Once ashore, a single road connects the village of St. George to the existing harbor; it runs approximately 5 miles in either direction. Laydown areas would be emplaced at the discretion of the local sponsor and staging actions would commence shortly afterward.

2.3.2 Conservation Measures

Confined underwater blasting would be limited to the period from 1 November through 30 April to minimize impacts to northern fur seals (an MMPA species, not ESA listed). Saint George Island has numerous fur seal rookeries and these seals are abundant in the project area from May through October. This timing window conservation measure is primarily for fur seals, but it does shift the confined underwater blasting to winter where it could means a greater impact on ice seals. These ice seals would normally be minimally impacted with normal summer construction, but this timing will shift some potential impact to them. Overall, the potential magnitude of the impact on ice seals will likely be far less than the impact on the abundant fur seals during breeding season.

2.3.3 Mitigation Measures

The USACE is required by the Planning and Guidance Notebook (ER 1105-2-100) to consider mitigation throughout the planning process and each alternative plan shall include mitigation as determined appropriate. According to Appendix C of the Planning and Guidance Notebook (PGN):

- (12) Mitigation. Mitigation includes:
 - (a) Avoiding the impact altogether by not taking a certain action or part of an action;
 - (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
 - (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
 - (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
 - (e) Compensating for the impact by replacing or providing substitute resources or environments. "Replacing" means the replacement of fish and wildlife resources in-kind. "Substitute" means the replacement of fish and wildlife resources out-of-kind. Substitute resources, on balance, shall be at least equal in value and significance as the resources lost.

The USACE began developing mitigation objectives in the early stages of plan formulation and coordinated with the managing agencies for the respective species that may be affected by the proposed project in order to reduce impacts through avoidance and minimization. The proposed project would include provisions for aquatic organism

passage to reduce potential impacts of a perpendicular-to-shore structure to migration. Consideration of the local sediment maintenance was included in dredged material disposition planning, contributing to the decision to place the material in the near-shore region in order to mitigate coastal erosion.

Because USACE has determined that the action "may affect, and is likely to adversely affect" ESA-listed marine mammals, the formal ESA consultation procedures established by 50 CFR 402 et seq. are triggered, which will lead to the development of a Biological Opinion by NMFS. Section 7(b)(4)(C) of the ESA provides that if an endangered or threatened marine mammal is involved, the incidental taking (in this case, through harassment) must first be authorized by Section 101(a)(5) of the MMPA through a LOA or Incidental Harassment Authorization (IHA) prior to the issuance of a Biological Opinion.

The USACE intends to collect the data required to apply for the LOA during the PED phase of the project, which will provide more detail regarding the specific impacts to marine mammals, including ESA-listed marine mammals. Well-reasoned and effective mitigations to reduce those impacts will also be developed, in consultation with NMFS, along with the predicted number of marine mammals that may be taken by harassment. The final mitigation measures for the proposed project cannot be presented prior to the development of the LOA, but the USACE would likely incorporate the following generic mitigation measures in the construction of the project to reduce specific temporary construction impacts on discrete natural resources:

Mitigation measures for dredging

Marine Mammals

To minimize the risk of harm to listed marine species from dredging, vessel strikes, and dredged material disposal the Corps would agree to implement the following mitigation measures:

- 1. The Corps will stop work when a protected species is observed approaching or within the 164 ft. (50 m) exclusion zone of the project operations.
- 2. If a protected species enters or appears likely to enter the exclusion zone, project vessels will stop work as soon as practicable in order to prevent exposing protected species to sounds capable of causing harassment. Project vessels and operators will not compromise human safety when determining the practicability of shutting down equipment; i.e., tidal, current, and weather conditions may make it impossible to safely shut-down operation immediately.

- 3. In the event of a shutdown caused by protected species entering the exclusion zone, work will not restart until the protected species are observed leaving the exclusion zone or an appropriate time (15 minutes for pinnipeds and 30 minutes for whales) has passed from the last protected species sighting within the exclusion zone has elapsed.
- 4. The Corps will ensure that project vessels do not exceed 13 knots in order to minimize exposure of protected species to vessel strike hazards.
- 5. Vessels will avoid multiple changes in direction and speed when within 900 ft (274 m) of whales and also operate the vessel(s) to avoid causing a whale to make multiple changes in direction.

Water Quality

- Reasonable precautions and controls must be used to prevent incidental and accidental discharge of petroleum products or other hazardous substances. Fuel storage and handling activities for equipment must be sited and conducted so there is no petroleum contamination of the ground, subsurface, or surface waterbodies.
- 2. During construction, spill response equipment and supplies such as sorbent pads shall be available and used immediately to contain and cleanup oil, fuel, hydraulic fluid, antifreeze, or other pollutant spills. Any spill amount must be reported in accordance with Discharge Notification and Reporting Requirements (AS 46.03.755 and 18 AAC 75 Article 3).
- 3. All dredging shall be conducted so as to minimize the amount of dredge material and suspended sediments that enter the water column. Appropriate Best Management Practices (BMPs) will be employed to minimize sediment loss and turbidity generation during dredging. BMPs may include, but are not limited to, the following:
- Eliminating multiple bites while the bucket is on the seafloor
- No stockpiling of dredged material on the seafloor

Mitigation measures for pile-driving

To minimize the risk of harm to listed marine species from pile driving, the USACE would agree to implement the following mitigation measures:

1. One or more protected species observers (PSOs), able to accurately identify and distinguish species of Alaska marine mammals, will be present before and during all in-water construction activities.

- 2. Prior to in-water construction activities, an exclusion (i.e., shut-down) zone will be established. For this project, the exclusion zone includes all marine waters within 50 meters of the sound source.
- 3. Pile-driving will not be conducted unless all waters within and adjacent to the exclusion zone are clearly visible.
- 4. The PSO(s) will be positioned such that the entire exclusion zone is visible to them (e.g., situated on a platform, elevated promontory, boat or aircraft).
- 5. The PSO(s) will have the following to aid in determining the location of observed listed species, to take action if listed species enter the exclusion zone, and to record these events:
- 6. Binoculars
- 7. Two-way radio communication with construction foreman/superintendent
- A log book of all activities which will be made available to USACE and NMFS upon request
- 9. The PSO(s) will have no other primary duty than to watch for and report on events related to marine mammals.
- 10. The PSO(s) will be in direct communication with on-site project lead and will have shutdown authority.
- 11. The PSO(s) will scan the exclusion zone for the presence of listed species for 30 min before any pile-driving or removal activities take place.
- 12. If any listed species are present within the exclusion zone, pile-driving and removal activities will not begin until the animal(s) has left the exclusion zone or no listed species have been observed in the exclusion zone for 15 min (for pinnipeds) or 30 min (for cetaceans).
- 13. Throughout all pile-driving activity, the PSO(s) will continuously scan the exclusion zone to ensure that listed species do not enter it.
- 14. If any listed species enter, or appear likely to enter, the exclusion zone during pile-driving or removal activities, all pile-driving activity will cease immediately. Pile-driving activities may resume when the animal(s) has been observed leaving the area on its own accord. If the animal(s) is not observed leaving the area, pile-driving activity may begin 15 min (for pinnipeds) or 30 min (for cetaceans) after the animal is last observed in the area. Note: If a marine mammal is first observed within the exclusion zone during construction operations, the PSO will notify NMFS immediately after ordering a shut-down of operations.
- 15. Ramp-up (soft start) procedures will be applied prior to beginning pile-driving activities each day and/or when pile-driving hammers have been idle for more than 30 min:
- 16. For impact pile-driving, contractors will be required to provide an initial set of three strikes from the hammer at 40 percent energy, followed by a 30-sec waiting

- period. This procedure shall be repeated two additional times prior to operational impact pile driving.
- 17. Monthly PSO reports and a final PSO report will be provided to NMFS.
- a) The reporting period for each monthly PSO report will be the entire calendar month, and reports will be submitted by close of business on the fifth day of the month following the end of the reporting period.
- b) PSO report data will also include the following for each listed marine mammal observation or "sighting event" if repeated sightings are made of the same animal(s):
- i. Species, date, and time for each sighting event.
- ii. Number of animals per sighting event; and number of adults/juveniles/calves per sighting event.
- iii. Primary, and, if observed, secondary behaviors of the marine mammals in each sighting event.
- iv. Geographic coordinates for the observed animals, with the position recorded by using the most precise coordinates practicable (coordinates must be recorded in decimal degrees, or similar standard, and defined coordinate system).
- v. Time of the most recent pile-driving or other project activity prior to marine mammal observation.
- vi. Environmental conditions as they existed during each sighting event, including Beaufort Sea state, weather conditions, visibility (km/mi), lighting conditions, and percent ice cover.
 - c) A final technical report will be submitted to NMFS within 90 days after the final pile has been driven for the project. The report will summarize all activities associated with the proposed action, and results of marine mammal monitoring conducted during the in-water project activities. The final technical report will include items from the list above as well as the following:
- i. Summaries of monitoring efforts including total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors that affect visibility and detectability of marine mammals.
- ii. Analyses on the effects from various factors that may have influenced detectability of marine mammals (e.g., sea state, number of observers, fog, glare, and other factors as determined by the PSOs).
- iii. Species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover.
- iv. Effects analyses of the project activities on listed marine mammals.

- v. Number of marine mammals observed (by species) during periods with and without project activities (and other variables that could affect detectability), such as:
 - 1. Initial marine mammal sighting distances versus project activity at time of sighting.
 - 2. Observed marine mammal behaviors and movement types versus project activity at time of sighting.
 - 3. Numbers of marine mammal sightings/individuals seen versus project activity at time of sighting.
 - 4. Distribution of marine mammals around the action area versus project activity at time of sighting.

Mitigation measures for confined underwater blasting

- a) USACE would agree to implement the following mitigation measures:
- b) For in-water construction, heavy machinery activities other than blasting (e.g., dredging), if a marine mammal comes within 50 meters (m), the Corps must safely cease operations and/or reduce vessel speed to the minimum level required to maintain steerage and safe working conditions. If an operation requires completion due to safety reasons, that operation may be completed. The monitoring of this 50-m shutdown zone may be conducted by construction personnel as they perform their other duties.
- c) The Corps must conduct briefings for blasting supervisors and crews, the monitoring team, and the Corps staff each day prior to the start of all blasting activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.
- d) The Corps must establish shutdown zones.
- e) The Corps must establish Level B harassment monitoring zones.
- f) Marine mammal monitoring must take place from 30 minutes prior to a scheduled blast through 1 hour post-blast. A blast must not occur until observers have declared the shutdown zone clear of marine mammals.
- g) In the event of a delay or shutdown of activity resulting from marine mammals in the shutdown zone, animals must be allowed to remain in the shutdown zone (i.e., must leave of their own volition) and their behavior must be monitored and documented. If a marine mammal is observed within an established shutdown zone, blasting must be delayed. Blasting must not occur until the animal has voluntarily left and been visually confirmed beyond the shutdown zone, or 30

- minutes have passed without subsequent detection of the marine mammal, or up until 1 hour before sunset (to accommodate post-blast monitoring).
- h) If blasting is delayed for a reason other than marine mammal presence, and this delay will be greater than 30 minutes, marine mammal monitoring does not need to occur during the delay. However, if monitoring is halted, a new period of the 30-minute pre-blast monitoring must occur before the rescheduled blast. 3
- i) Blasting must not occur if the established shutdown zones cannot be entirely monitored and cleared, due to weather conditions or other obstructions.
- j) If a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone, a blast must not occur. Activities must not resume until the animal has been confirmed to have left the area or the observation time period has elapsed, as indicated in condition 4(f) above, has elapsed.
- k) The Corps must conduct blasting only during daylight hours, no earlier than 30 minutes after sunrise and no later than 1 hour before sunset. Non-blasting activities may occur outside of these time windows.
- I) Blasting Measures
- a) Stemming procedures must be used for blasting.
- b) The Corps individual daily blasts must be composed of no more than 60 delayed charges.
- c) Charges must be no closer than 4 feet from other charges.
- d) The weight of explosive per delayed charge must not exceed 200 pounds.

5. Monitoring Measures

USACE would agree to abide by the following marine mammal and acoustic monitoring measures:

- (a) Marine mammal monitoring must be conducted in accordance with the final Marine Mammal Monitoring Plan.
- i. During blasting, there must be a minimum of two land-based PSOs and one PSO on the barge used for blasting operations, with no duties other than monitoring.
- ii. The monitoring position of the observers must identified in consideration of the following characteristics:
 - 1. Unobstructed view of blasting area;
 - 2. Unobstructed view of all water within the shutdown zone;

- 3. Clear view of operator or construction foreman in the event of radio failure (lead biologist); and
- 4. Safe distance from activities in the construction area.
- (b) Marine mammal monitoring during blasting must be conducted by PSOs in a manner consistent with the following:
 - i. PSOs will have no other assigned tasks during monitoring periods.
 - ii. At least one PSO must have prior experience working as a marine mammal observer during construction activities.
- iii. Other PSOs may substitute education (degree in biological science or related field) or training for experience.
- iv. Where a team of three or more PSOs are required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience working as a marine mammal observer during construction.
- (c) PSOs must have the following additional qualifications:
 - i. Ability to conduct field observations and collect data according to assigned protocols.
 - ii. Experience or training in the field identification of marine mammals, including the identification of behaviors.
- iii. Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations.
- iv. Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior.
- v. Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.
- (d) Acoustic and overpressure monitoring of the test blast and at least one production blast must be conducted. The following data, at minimum, must be collected during acoustic monitoring and reported:
 - i. Hydrophone/pressure transducer equipment and methods: model and make of recording device, frequency response and sensitivity of the hydrophone(s), signal gain, sampling rate, distance of the recording devices from the blasts where recordings were made; depth of recording devices.

- ii. Number of charges and the weight of each charge detonated during the blasts.
- iii. Representative spectra (in power spectral density format dB re 1 μ Pa2 /Hz) and waveform of blasts.

3.0 DESCRIPTION OF SPECIES AND THEIR HABITATS

This section provides a description of the species and their habitat that may be affected by the Saint George harbor project. Species listed in Executive Summary table ES-1 that have a "no effect" determination next to them are not discussed further in this section or in subsequent sections. "No effect" determinations are commonly made by the action agency when species have a very low or no chance of being in the action area due to either geographic constraints, seasonal timing, very low abundance, or a combination of some or all of these factors. The resource agency, NMFS in this case, is not obligated to concur or comment on "no effect" determinations made by an action agency.

3.1 Steller Sea Lion

Steller sea lions (Eumetopias jubatus) occur in two Distinct Population Segments (DPSs) in Alaska. An eastern U.S. DPS, including animals east of Cape Suckling, Alaska (144°W), was listed as threatened under the ESA until recently being de-listed, and a western U.S. DPS listed as endangered, including sea lions at and west of Cape Suckling (including Unalaska Island and the associated project area) (62 CFR 30772, June 5, 1997, and 78 CFR 66140, November 4, 2013).

Steller sea lions range throughout the entirety of the Bering Sea and have known rookery and haulout sites throughout the Pribilof Islands. They were first listed as endangered under the Endangered Species Act in 1990. Steller sea lions once came ashore at St. George Island to breed and whelp in the thousands, but were systematically extirpated from breeding grounds by local hunters who valued their skins and meat, and also later by Federal policies aimed at reducing competition to the fur seals. Although no pups have been recorded on St. George since 1916 (NMFS 2008), locations of the historic rookeries are known. Steller sea lion haul out sites on St. George are shown in Figure 10.

Steller sea lions are large, sexually dimorphic otarrids, with males attaining 11 feet in length and 2,500 pounds, and females 9.5 feet and 800 pounds. They are frequently observed transitioning through and foraging in the nearshore waters of Village Cove and the North fur seal rookery. Steller sea lions are dependent upon isolated haulouts and

rookery areas, they do not tolerate disturbance in these areas. Although not technically migratory, Steller sea lions move about the entirety of their range as they pursue prey species' seasonal abundances. Steller sea lions are not known to migrate, but individuals disperse widely outside the breeding season (late May to early July). At sea, Steller sea lions commonly occur near the 656-foot (200-meter) depth contour, but have been seen from near shore to well beyond the continental shelf (Kajimura and Loughlin, 1988). Steller sea lions are opportunistic predators, feeding primarily on a wide variety of fishes and cephalopods, including walleye pollock (*Theragra chalcogramma*), Atka mackerel (*Pleurogrammus monopterygius*), Pacific herring (*Clupea pallasi*), capelin (Mallotus villosus), Pacific sand lance (Ammodytes hexapterus), Pacific cod (Gadus macrocephalus), and salmon (Oncorhynchus spp.) (Pitcher, 1981; Merrick et al., 1997). On rare occasions, Steller sea lions prey on seals, and possibly sea otter pups. Overall, populations of Steller sea lions declined precipitously in the decades between the 1950s and 1980s, and began to stabilize and slightly increase by the 2000s, but there are trends in either direction depending upon which portion of the species' overall range is sampled. It is likely that Steller sea lion will remain endangered for the foreseeable future.

3.2 Steller Sea Lion Critical Habitat

Critical habitat has been designated for Steller sea lion Western DPS, and is defined as a 20-nautical mile buffer around all major haul-out and rookeries with their associated terrestrial, air, and aquatic zones. It also includes three large offshore foraging areas near Shelikof Strait, Bogoslof, and Seguam Pass. All of St. George's surrounding waters fall under the critical habitat designation for Steller sea lion. Known haulouts are located at Danloi Point and South Rookery and are shown in Figure 9. Designated critical habitat exists in a 20-nautical mile zone around these two haulouts and is shown as the shaded area in Figure 10.

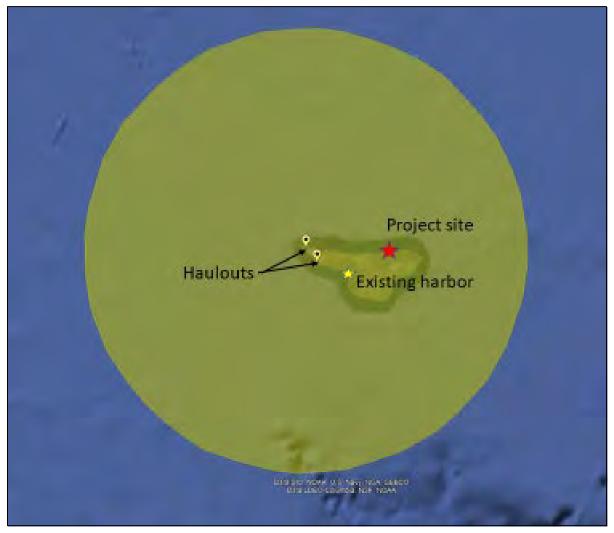


Figure 10. Steller sea lion critical habitat (yellow shaded zone) 20-nautical mile zones around the two haulouts. The project site and existing harbor are also noted.

3.3 Humpback Whales

Humpback whales are either threatened, endangered, or delisted under the Endangered Species Act depending upon which DPS they derive from. According to NMFS guidance, humpback whales observed in the Aleutian Islands, Bering, Chukchi, and Beaufort Seas are part of three recognized North Pacific DPSes: the Western North Pacific DPS, the Hawaii DPS, and the Mexico DPS. Humpback whales from the Western North Pacific DPS, which are listed as Federally endangered, are the least likely to be encountered in Alaskan waters, with an encounter probability of only 4.4 percent. Humpback whales from the Mexico DPS, which are listed as federally threatened, have a similarly low encounter probability at 11.3 percent. Humpback whales from the Hawaii DPS are not listed under the Endangered Species Act; they are

the most likely to be encountered in Alaskan waters, at 86.5 percent. It should be noted that among these DPSes, individual whales do not exhibit physical traits that would allow for visual confirmation of population lineage (NMFS 2016).

Humpback whales are migratory, spending the summer feeding in the cold waters of the northern seas and migrating to lower latitudes for breeding and calving. They feed by lunging, open-mouthed, through swarms of small fish and invertebrates and forcing the water through their baleen plates to filter separate the food from the water. Humpback whales are known to traverse the Bering shelf and likely come within visual observation range of the landmass of St. George. Humpback whales are gregarious, and often travel together or congregate at areas where food density is relatively high. They are distinguishable among other whales by not only their physical characteristics, large pectoral fins and humped dorsal fin, but they also display frequent rounds of breaching, and fin- and tail-slapping the water's surface.

3.4 Ringed Seal

Ringed seals exhibit a circumpolar distribution and are found in all seasonally ice covered seas in the Northern Hemisphere. The ringed seal Arctic subspecies is listed as threatened under the Endangered Species Act. According to NMFS distribution maps, the nearshore waters of the Pribilof Islands appear to be the species' southern-most range extent. Ringed seals are closely associated with sea ice, they use it for hauling out, pupping, nursing and molting, they follow its recession north in the springtime. Currently, a reliable population estimate of Alaska's stock is unavailable, and the data utilized in past estimates is over ten years old.

Despite their typically strong association with sea ice, they have been observed several hundred miles south in the eastern Aleutian Islands in small numbers. In spring 2018, over 50 were observed in Unalaska; a clear indication that they can be found well south of the sea ice edge and could therefore be present around Saint George during winter or spring confined underwater blasting.

Ringed seals have a small head; a short cat-like snout; and a plump body. Their coat is dark with light-colored rings on their back and sides, and a light-colored belly. Their small foreflippers have thick, strong claws that are used to maintain breathing holes through 6 feet or more of ice.

Ringed seals grow to an average length of 4 to 4.5 feet with weights ranging from 110 to 150 pounds. The average weight of a ringed seal pup at birth is about 10 pounds.

Ringed seals eat a wide variety of mostly small prey. They rarely prey on more than 10 to 15 species in any specific geographic location, and not more than two to four of these species are considered important prey. Despite regional and seasonal variations in the diet of ringed seals, fishes of the cod family tend to dominate the diet in many areas from late autumn through spring. Crustaceans appear to become more important in many areas during the open-water season and often dominate the diet of young seals. While foraging, ringed seals dive to depths of up to 150 feet or more.

Ringed seals can live in areas that are completely covered with ice. They use their sharp claws to make and maintain their own breathing holes through the ice, which may be 6 feet or more in thickness. In winter through early spring, they also carve out lairs in snowdrifts over their breathing holes. As the temperatures warm and the snow covering their lairs melts during spring, ringed seals transition from lair use to basking on the surface of the ice near breathing holes, lairs, or cracks in the ice as they undergo their annual molt. Ringed seals do not live in large groups and are usually found alone, but they may occur in large groups during the molting season, gathered around cracks or breathing holes in the ice.

3.5 Bearded Seal

Bearded seals exhibit circumpolar distribution and are closely associated with the presence of sea ice, they utilize it for hauling out, pupping, nursing, and molting in the spring and early summer. Bearded seal Beringia DPS is listed as threatened under the Endangered Species Act. NMFS distribution maps for bearded seal show their southern-most range extent to be the Bering shelf and nearshore waters of the Pribilof Islands. Reliable population abundance data on bearded seals is unavailable. While Saint George is near the fringe of their range during years where the pack ice extends far to the south, there is a moderate likelihood that at least some bearded seals could be in the action area during winter blasting where they could exposed to Level B harassment. It is difficult to distinguish seal species in open water unless they are very close to the observer, so bearded seals are included in this BA since they would be part of an LOA application package in the future. Their inclusion in an LOA application is based on the fact that they could be in the area (the multi-kilometer action area for blasting) and remain undetected and thus exposed to Level B harassment.

Bearded seals are the largest species of Arctic seal. They grow to lengths of about 7 to 8 feet and range from about 575 to 800 pounds. In some regions, females appear to be slightly larger than males. Bearded seals have generally unpatterned gray to brown coats, large bodies, and small square fore flippers. They have a short snout with thick, long white whiskers, which gives this species its "beard."

Bearded seals primarily feed on or near the sea bottom on a variety of invertebrates (e.g., shrimps, crabs, clams, and welks) and some fish (e.g., cod and sculpin). While foraging, they typically dive to depths of less than 325 feet. They do not like deep water and prefer to forage in waters less than 650 feet deep where they can reach the ocean floor. Still, adult bearded seals have been known to dive to depths greater than 1,600 feet.

Bearded seals tend to prefer sea ice with natural openings, though they can make breathing holes in thin ice using their heads and/or claws. Sea ice provides the bearded seal and its young some protection from predators, such as polar bears, during whelping and nursing. Sea ice also provides bearded seals a haul-out platform for molting and resting. Bearded seals are solitary creatures and can be seen resting on ice floes with their heads facing downward into the water. This allows them to quickly escape into the sea if pursued by a predator. Bearded seals also have been seen sleeping vertically in open water with their heads on the water surface.

Bearded seals are extremely vocal, and males use elaborate songs to advertise breeding condition or establish aquatic territories. These vocalizations, which are individually distinct, predominantly consist of several variations of trills, moans, and groans. Some trills can be heard for up to 12 miles and can last as long as 3 minutes.

4.0 ENVIRONMENTAL BASELINE

"Environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline. (50 CFR § 402.02).

4.1 Steller Sea Lion

The western DPS includes all Steller sea lions originating from rookeries west of Cape Suckling (144° west longitude). The western stock of Steller sea lions decreased from an estimated 220,000 to 265,000 animals in the late 1970s to less than 50,000 in 2000.

While the western population has been increasing slowly overall since about 2003, it is still declining quickly in large areas of its range. Steller sea lions are exposed to a variety of human-caused and natural threats. Some of the most pressing ones are discussed below.

Effects of Fisheries on Prey

Cumulative and annual commercial fishery removals may result in temporal and seasonal changes in distribution and abundance of primary prey, prey reduction, and changes in prey size; they may also cause ecosystem effects. All of these may affect Steller sea lions' ability to reliably access sufficient prey to sustain the health, reproduction, and survival of individuals and support sustained increase and eventual recovery of the population.

Climate Change

Global climate change is expected to have profound impacts on arctic and sub-arctic marine ecosystems. This may affect the composition, spatial and temporal distribution, and abundance of prey available to Steller sea lions.

Predation

The primary predators of Steller sea lions are killer whales and humans. Sharks also prey on them in some locations.

Toxic Substances

Contaminants enter ocean waters from many sources, such as oil and gas development, wastewater discharges, runoff, and other industrial processes. Once in the environment, these substances move up the food chain and accumulate in top predators. They can harm Steller sea lions' immune and reproductive systems.

Human-Caused Injuries

Steller sea lions may be disturbed by vessels approaching from the water, by aircraft, and by approach from the land. When disturbed, they may flee toward the water—sometimes in mass stampedes, during which pups and other smaller animals may be crushed or injured by larger ones. In addition, they can fall victim to retaliation (such as shooting) by frustrated boaters and fishermen.

Vessel Strikes

Inadvertent vessel strikes can injure or kill Steller sea lions. Vessel strikes are likeliest in areas where Steller sea lions are concentrated for feeding or rafting, or near large haulouts or rookeries from which large numbers of animals will be in transit.

Entanglement

Entanglement and ingestion of fishing gear and marine debris is known to contribute to Steller sea lion injury and mortality. Steller sea lions can become entangled in fishing gear, either swimming off with the gear attached or becoming anchored. Once entangled, sea lions may drag and swim with attached gear for long distances, ultimately suffering fatigue, compromised feeding ability, or severe injury that may lead to reduced reproductive success and death.

Current data indicate entanglement rates are greater in Southeast Alaska than in areas west of 144° west longitude. West of the regulatory boundary, entanglement is rarely observed during research cruises or reported by the public. However, not all entangled animals strand (e.g., they may drown) and not all stranded animals are found or reported. This is true especially in the most remote parts of the range of this species.

Illegal Feeding

Feeding of sea lions is illegal and can lead to close interactions between humans and sea lions that pose risks to both. Feeding-related problems include changes in sea lion behavior; habituation; aggression toward humans; negative impacts to fisheries; and entanglement, injury, and death of animals.

4.2 Humpback Whale

Humpback whales are exposed to a variety of human-caused and natural threats. Some of the most pressing ones are discussed below.

Vessel Strikes

Inadvertent vessel strikes can injure or kill humpback whales. Humpback whales are vulnerable to vessel strikes throughout their range, but the risk is much higher in some coastal areas with heavy ship traffic. The occurrence of vessel strikes around Saint George is unknown.

Entanglement

Humpback whales can become entangled by many different gear types including moorings, traps, pots, or gillnets. Once entangled, if they are able to move the gear, the whale may drag and swim with attached gear for long distances, ultimately resulting in fatigue, compromised feeding ability, or severe injury, which may lead to reduced reproductive success and death. There is evidence to suggest that most humpback whales experience entanglement over the course of their lives, but are often able to shed the gear on their own. However, the portion of whales that become entangled and

do not survive is unknown. The occurrence of entanglements around Saint George is unknown.

Vessel-Based Harassment

Whale watching vessels, recreational boats, and other vessels may cause stress and behavioral changes in humpback whales. Because humpback whales are often found close to shore and active near the surface, they tend to be popular whale watching attractions. There are several areas where U.S.-managed stocks of humpback whales are the center of whale watching industries, including: The Gulf of Maine (particularly within the Stellwagen Bank National Marine Sanctuary), the southeastern U.S. and West Indies, California, Alaska (particularly southeast Alaska), and the Hawaiian Islands. There are no commercial whale watching operations within hundreds of miles of Saint George or in the entirety of the Bering Sea.

4.3 Ringed Seal

The Arctic ringed seal is the most abundant of the five ringed seal subspecies. Although no accurate estimate exists, there are probably more than 2 million Arctic ringed seals worldwide.

There is one recognized stock of (Arctic) ringed seals in U.S. waters: the Alaska stock. The estimated population size for this stock is over 300,000 individuals.

Although subsistence harvest of Arctic ringed seals occurs in some parts of this subspecies' range, harvest levels appear to be sustainable. While the United States does not allow commercial harvest of marine mammals, such harvests are permitted in other portions of the species' range. This has caused population declines in some regions in the past but have generally been restricted since then.

Climate Change Effects on Sea Ice and Snow

Many aspects of the ringed seal's life cycle depend directly on the species' sea ice habitat. As such, the ongoing and anticipated reductions in the extent and timing of ice cover, especially on-ice snow cover, stemming from climate change (warming) poses a significant threat to this species.

Entanglement in Fishing Gear

Arctic ringed seals are seldom caught in fishing gear because their distribution does not coincide with intensive fisheries in most areas. Bycatch likely occurs on some level in the Sea of Okhotsk. Drowning in fishing gear is a significant source of mortality for

Saimaa ringed seals (which occur in Lake Saimaa, Finland) and Ladoga ringed seals (which occur in Lake Ladoga, Russia).

Additional Factors of Potential Concern

The continuing decline in summer sea ice in recent years has renewed interest in using the Arctic Ocean as a potential waterway for coastal, regional, and trans-Arctic marine operations, which pose varying levels of threat to Arctic ringed seals depending on the type and intensity of the shipping activity and its degree of spatial and temporal overlap with the seals. Offshore oil and gas exploration and development could also impact ringed seals. The most significant risk that these activities pose is accidentally or illegally discharging oil or other toxic substances, which would have immediate and potentially long-term effects. Ringed seals could also be directly affected by noise and physical disturbance of habitat associated with such activities.

4.4 Bearded Seal

There is no accurate population count at this time, but it is estimated that there are probably over 500,000 bearded seals worldwide. Although subsistence harvest of bearded seals occurs in some parts of the species' range, there is little or no evidence that these harvests currently have or are likely to pose a significant threat. While the United States does not allow commercial harvest of marine mammals, such harvests are permitted in some other portions of the species' range; however, there is currently no significant commercial harvest of bearded seals and significant harvests seem unlikely in the foreseeable future.

Climate Change Effects on Sea Ice

Bearded seals rely on the availability of suitable sea ice over relatively shallow waters for use as a haul-out platform for giving birth, nursing pups, molting, and resting. As such, ongoing and anticipated reductions in the extent and timing of ice cover stemming from climate change (warming) pose a significant threat to this species.

Additional Factors of Potential Concern

The continuing decline in summer sea ice in recent years has renewed interest in using the Arctic Ocean as a potential waterway for coastal, regional, and trans-Arctic marine operations, which pose varying levels of threat to bearded seals depending on the type and intensity of the shipping activity and its degree of spatial and temporal overlap with the seals. Offshore oil and gas exploration and development could also potentially impact bearded seals. The most significant risk posed by these activities is the accidental or illegal discharge of oil or other toxic substances because of their

immediate and potentially long-term effects. Noise and physical disturbance of habitat associated with such activities could also directly affect bearded seals.

5.0 EFFECTS ANALYSIS

"Effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (50 CFR § 402.02).

The proposed activities of primary concern to ESA-listed species considered in this assessment include exposure to sounds from confined underwater blasting, pile driving and dredging, general disturbance from the elevated anthropogenic activities associated with construction and operation of the proposed project, and vessel strikes from the new marine traffic patterns that would develop as a direct result of the proposed project. Inner harbor facilities project features are ill-defined and would have discountable effects on the ESA-listed marine mammals in the action area, so the effects of those inner harbor facilities features will not be discussed in this section. In analyzing effects to species, we consider the action's timing, duration, nature of effect, and the frequency, intensity, and severity of disturbance.

5.1 Ice Considerations

Ice extent is a major factor in the effects analysis for this project because two of the species in this assessment, ringed and bearded seals, are ice-associated and the confined underwater blasting portion of this project would occur in the winter/spring to avoid impacts to the abundant northern fur seals that are present during the summer and fall.

An historical sea ice coverage assay was conducted through the sea ice atlas website, which utilizes various historic data to correlate sea ice presence, relative density, and timing in an area (Figures 11-13). This assay was performed to determine the likelihood of sea ice coverage at the north side of St. George Island that it might be used as a surrogate for the presence of ice-associated marine mammals that utilize sea ice as an integral part of their life history. Sea ice concentrations were investigated at 57.0°N, 169.5°W, approximately 25 miles north of USACE's proposed project as the sea ice atlas analysis tool does not allow for a finer scale analysis.

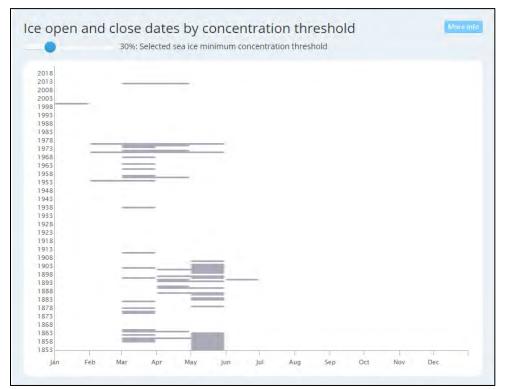


Figure 11. 30% ice coverage historical data

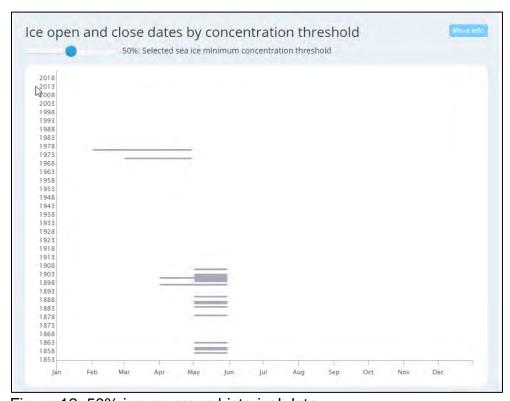


Figure 12. 50% ice coverage historical data



Figure 13. 75% ice coverage historical data

Sea ice would impact winter construction activities at the north site for blasting and dredging, discussed later in this assessment. To account for the presence of ice sheets at St. George, a 60% ice coverage criteria was used. Two events were noted in March and April in 1970 and 1976 and eight May events were noted from 1859 to 1906. Over the 165 year period of record, there were ten occurrences of ice concentration which roughly corresponds to a 6% occurrence of pack ice at the north site. Impacts of these occurrences, were they to occur during construction of this project, would likely to represent delays to project construction of up to two months. While winter construction is possible, construction with sea ice present is not possible.

Overall, there is a very low chance that sea ice would be present during construction. The absence of a nearby sea ice edge certainly diminishes the likelihood of encountering ringed and bearded seals, but it does not eliminate the chance of affecting these seals with behavioral disturbance from confined underwater blasting that would occur in winter or early spring. For this reason, these two species of ice seals are included in this assessment.

5.2 Confined Underwater Blasting Considerations Common to All Marine Mammals

Confined underwater blasting has the potential to affect marine mammals due to inwater shock waves. Because blasting would occur during winter, there is a possibility of affecting ice seals to some unknown extent due to confined underwater blasting. Steller sea lions can be present around Saint George at any time of the year, thought their seasonal abundance is not understood and makes an effects analysis difficult at this point in terms of magnitude of the impact. Humpback whales have a near zero probability of being in the action area in winter, but could be present if blasting continued into spring. Overall, the likelihood of humpbacks whales in the action area for blasting is very low. Humpbacks have a greater likelihood of being affected by other project construction and utilization factors.

As shown in Table 1, explosions can have effects to marine mammals ranging from behavioral disturbance, through temporary or permanent threshold shift and other physical injury to mortality. As with sound waves, potential effects to marine mammals depend on the distance of the animal from the source. The NMFS regulatory threshold for confined underwater blasting for sea lions is 195 dB re 1µpa.

Table 1. Explosive Criteria for Marine Mammals

		Behavior		Slight Injury					
Group	Species	Behavioral (for ≥2 pulses/24 hours)	ттѕ	PTS	Gastro- Intestinal Tract	Lung	Mortality		
Low- frequency Cetaceans	Mysticetes (e.g. humpback whale)	167 dB SEL (LF _{II})	172 dB SEL (LF _{II}) or 224 dB peak SPL	187 dB SEL (LF _{II}) or 230 dB peak SPL	237 dB SPL or 104 psi				
Mid- frequency Cetaceans	Most delphinids, medium and large toothed whales	167 dB SEL (MFո)	172 dB SEL (LF _{II}) or 224 dB peak SPL	187 dB SEL (MF _{II}) or 230 dB peak SPL		$39.1 \text{ M}^{1/3}$ $(1+[D_{Rm}/10.08 \ 1])^{1/2}$ Pa-sec Where: M = mass of the animals in kg D_{Rm} = depth of the receiver	91.4 M ^{1/3} (1+[D _{Rm} /10. 081]) ^{1/2} Pa-sec Where: M = mass of the animals in kg D _{Rm} = depth of the receiver		
High- frequency Cetaceans	Porpoises and <i>Kogia</i> spp.	141 dB SEL (HF _{II})	146 dB SEL (HF _{II}) or 195 dB peak SPL	161 dB SEL (HF _{II}) or 201 dB peak SPL					
Phocidae	Hawaiian monk, elephant, and harbor seal	172 dB SEL (Pwi)	177 dB SEL (Pwi) or 212 dB peak SPL	192 dB SEL (Pwi) or 218 dB peak SPL		(animal) in meters	(animal) in meters		
Otariidae	Sea lions and fur seals	195 dB SEL (Owi)	200 dB SEL (Owi) or 212 dB peak SPL	215 dB SEL (Owi) or 218 dB peak SPL					

Source: Finneran and Jenkins 2012

Confined blasts have up to a 60-90 percent decrease in the strength of the shock wave released to the water compared to open water blasts of the same charge weight (Nedwell and Thandavamoorthy, 1992; Hempen *et al.*, 2007).

USACE used a recently utilized an "confined underwater blasting effects" model (Goldstein *et al.* 2015) to determine effects of blasting associated with a harbor project in Valdez, Alaska. The same criteria for the model are planned for the Saint George project, so the model outputs from that project provide a good indication of what can be expected when blasting in Saint George for this dredging project. This model is specifically designed to calculate safety radii for shock waves from confined underwater explosives with sequential delays -- the identical blasting scenario proposed in Saint George. As well as considering confined charges, the new model takes into account the number of charges in a shot (a shot is all of the charges strung together with delays between each charge), the timing separation (delays) between the charges (~15ms for this project), the physical separation distance between charges (12 foot by 12 foot borehole spacing), and the maximum potential total charge weight in a shot (weight of each charge times the number of charges). The model produces an output for a single charge as well as an output for a shot with multiple charges with delays.

The model was run with four charge sizes (22, 55, 110, and 220 lbs.) with a number of sequential charges, up to a total shot weight of approximately 5000 lb., with15 millisecond delays between each charge on a 12 foot by 12 foot grid pattern. The resulting radii, out to the behavioral threshold decibel levels for humpback whales, Steller sea lions, and phocid seals (167dB, 195dB and 172 dB SEL respectively) were used to calculate potential effects on marine mammals for this project. The anticipated charge size for the confined underwater blasting in Saint George is approximately 110 lbs.

The survey and potential impact assessment approach used in this project is very different from the manner used for most other marine construction projects. For example, a project that involved in-water pile driving would typically take the number of a marine mammal species observed over perhaps 100 hours of observation effort in a month (e.g. 10 sea lions) and then multiply that number by 3 since there would be 300 hours of pile driving in a month. The result would be 30 sea lions exposed to underwater noise from pile driving. Confined underwater blasting is a completely different scenario; the effects of a single shot might last 1 second, so even 30 individual shots in a month would only lead to 30 seconds of exposure. If we treated underwater blasting like pile driving, we would have to assume that 10 sea lions observed in 100 hours of observation would equate to 0.0008 sea lions exposed in 30 seconds of blasting. This is

clearly not a realistic approach since it means the action would essentially impact zero marine mammals no matter when blasting occurs.

Field surveys for marine mammals covered in this assessment have not been conducted to date, but will occur in PED. When survey data are collected, Corps biologists will approach the survey data in a very conservative manner in terms of potential impacts by assuming the maximum number of each species observed at any one time in each month would be present for each shot during that month. Each shot would involve 40 boreholes with 15 milliseconds between each hole. This would appear as one blast, but the temporal separation between holes means that the impact to marine mammals from the charge is not additive. At this point, it is uncertain how many shots may be possible per month. The number will likely hinge on whether given the exposed conditions at the site, winter drilling and blasting, and limited daylight to work in the winter months. Confined underwater blasting will take place during winter over a few- year period due to the low production rates of blasted rock and potential shutdown days that are likely.

5.3 Effects to Species from all Impact Categories

Steller Sea Lions and their Critical Habitat

For confined underwater blasting, the model output for Steller sea lion regulatory threshold (187-dB threshold) for a single 110 lb. charge is 313 meters. When delays are used between charges, the 187-dB threshold for forty 110 lb. charges (with 15 millisecond delays) is only 519 meters. This measurement is the projected extent of the behavioral effects (Level B) zone for this project for Steller sea lions using the anticipated blasting scenario.

The likely Level B zone for Steller sea lions for this project is approximately 519 meters. One hundred twenty total shots are planned for this project, with 42 shots over the winter period each winter for three years. There are no survey data for Steller sea lion in winter and spring, so it is not possible to calculate the number that would be impacted by blasting. A worst case scenario is assumed that would place three Steller sea lions in the 519-meter radius for each blast. Given the 519-meter radius from the project site and the worst-case scenario for sea lions, approximately 375 sea lions would be exposed to Level B harassment from confined underwater blasting assuming a total of approximately 125 shots over three years. This number is likely very conservative and it is likely that many of these exposures would be re-exposures of the same sea lions. No blasting would be allowed when sea lions are present in the Level A zone. The size of this zone has not been calculated at this time, but it would be much smaller than the 519-meter Level B zone.

For sea lions that use benthic habitat at the dredging site for foraging, there would be a period after dredging when this area would likely be unproductive. This period might last for a year or two until the area recolonizes with fish and invertebrates.

Pile driving for this project would occur inside the harbor footprint after the breakwater is constructed, this greatly reducing the sound exposure to the area seaward of the entrance channel. Sufficient details do not exist for this project to determine the actual zone that would be ensonified by Level A and Level B harassment for pile driving, but it is typical for these zones to extend between four and 7 kilometers from the source. Without species abundance data, it is not possible to determine the number of sea lions that would be impacted, by since the breakwater would be constructed first and the exposure pathway would be very narrow, it is likely that the number of sea lions exposed would be low.

The anticipated potential impacts from the proposed project are presented in Table 2.

Table 2. Potential Project Impacts to Steller Sea Lions

Activity	Potential Impact Level
Drilling (for blast holes)	Sound levels are below in-water threshold levels for noise. Moderate adverse effects for disturbance due to the presence of the drill barge and associated traffic. Potential effects would be limited to the period of construction.
Blasting	Moderate effects due to disturbance from pressure waves in the Level B zone, no blasting allowed in with animals in Level A zone. Disturbance from blasting could lead to displacement from the Level B zone for a short period of time. Potential effects are limited to a short duration after the blast. Up to 375 Steller sea lions could be disturbed over a roughly two-month period, though the actual number is likely far lower. Disturbance could trigger responses ranging from leaving the area to no visible response at all.
Dredging	Dredging would take place after the area is drilled and blasted and would likely occur in blasted areas concurrent with drilling in other areas of the footprint. Underwater noise is anticipated to be audible, but not above regulatory thresholds for marine mammals. Dredging would likely be by clamshell or hydraulic extended-reach excavator.

Dredged Material Placement	Moderate adverse effects during disposal due to vessel activity and temporary increases in turbidity. Beneficial effects as the area is used by fish and invertebrates with the benefits increasing over time.
Pile Driving	Low numbers of Steller sea lions would be exposed to Level B harassment from pile driving during construction. Additional details are necessary to more accurately determine the potential impacts from pile driving.
Harbor Operation	Harbor use would lead to increased vessel traffic in the action area, but given timing of commercial seasons, disturbance and increased risk of vessel strikes would be limited to time periods surrounding seasonal openings and closures when most vessels are transiting through the area.

Overall, the greatest potential impacts to Steller sea lions from this action are moderate and limited to the time period of construction. Beneficial impacts from the placement of the dredged material are likely to increase over time as the material colonizes with fish and invertebrates. The project area is within the extent of the 20 nautical mile distance from major haulouts and that is considered critical habitat, but the two haulouts are between eight and ten nautical miles away from the project site and are on the opposite side of the island. Changes in the habitat at the project site and potential impacts during construction would have minimal effects on designated critical habitat. Mitigation includes stemmed charges, delays between charges, and observed shutdown radii to ensure blast do not occur when marine mammals are within a distance that would cause mortality or permanent injury.

Humpback whales

For confined underwater blasting, the model output for the humpback regulatory threshold (167-dB re 1µPa threshold) for a single 110 lb. charge is 3,130 meters. When delays are used between charges, the 187-dB threshold for forty 110 lb. charges (with 15 millisecond delays) is 5,185 meters. This distance is the projected extent of the behavioral effects (Level B) zone for this project for humpback whales using the anticipated blasting scenario in Saint George.

The likely Level B zone for humpback whales for this project is approximately 5,185 meters. Approximately one hundred twenty five shots are planned for this project, with 42 shots over the winter period each winter for three years. There are no survey data for humpback whales in winter and spring, so it is not possible to calculate the number that

would be impacted by blasting. A worst case scenario is assumed that would place one humpback whale in the 5,185 meter radius for a total of 20 of the 125 blasts over three years. The reason for this low assumption is that there are likely few humpback whales in this area and their presence only overlaps for a small portion of the blasting season (i.e. spring). No blasting would be allowed when whales are present in the Level A zone. The size of this zone has not been calculated at this time, but it would be much smaller than the 5,185-meter Level B zone.

Humpback whales do not forage on the bottom, so alterations to the benthic habitat at the dredge and dredged material placement site are not relevant considerations for humpback whales.

Pile driving for this project would occur inside the harbor footprint after the breakwater is constructed, this greatly reducing the sound exposure to the area seaward of the entrance channel. Sufficient details do not exist for this project to determine the actual zone that would be ensonified by Level A and Level B harassment for pile driving, but it is typical for these zones to extend between four and 7 kilometers from the source. Without species abundance data, it is not possible to determine the number of whales that would be impacted, by since the breakwater would be constructed first and the exposure pathway would be very narrow, it is likely that the number of whales exposed would be low.

The anticipated potential impacts from the proposed project are presented in Table 3.

Table 3. Potential Project Impacts to Humpback Whales

Activity	Potential Impact Level
Drilling (for blast holes)	Sound levels are below in-water threshold levels for noise. Moderate adverse effects for disturbance due to the presence of the drill barge and associated traffic. Potential effects would be limited to the period of construction.
Blasting	Moderate effects due to disturbance from pressure waves in the Level B zone, no blasting allowed in with animals in Level A zone. Disturbance from blasting could lead to displacement from the Level B zone for a short period of time. Potential effects are limited to a short duration after the blast. Up to 20 humpback whales could be disturbed over the three years of blasting, thought the actual number is likely far

	lower. Disturbance could trigger responses ranging from leaving the area to no visible response at all.
Dredging	Dredging would take place after the area is drilled and blasted and would likely occur in blasted areas concurrent with drilling in other areas of the footprint. Underwater noise is anticipated to be audible, but not above regulatory thresholds for marine mammals. Dredging would likely be by clamshell or hydraulic extended-reach excavator.
Dredged Material Placement	Moderate adverse effects during disposal due to vessel activity and temporary increases in turbidity. Beneficial effects as the area is used by fish and invertebrates with the benefits increasing over time. While humpback whales would not forage on the reef directly, they could benefit by an overall enrichment in the area.
Pile Driving	Low numbers of humpback whales would be exposed to Level B harassment from pile driving during construction. Additional details are necessary to more accurately determine the potential impacts from pile driving.
Harbor Operation	Harbor use would lead to increased vessel traffic in the action area, but given timing of commercial seasons, disturbance and increased risk of vessel strikes would be limited to time periods surrounding seasonal openings and closures when most vessels are transiting through the area.

Overall, the potential impacts to humpback whales from this action are moderate and limited to the time period of construction. The proportion of whales that might be impacted by this project (which is very conservatively estimated) is only a small portion of the overall number or humpback whales that forage throughout the much larger area of Pribilof Islands. Additionally, of the conservatively estimated 20 whales exposed to exposed to Level B harassment, only about 15 percent of the humpback whales in the Pribilofs are listed as threatened or endangered under the Endangered Species Act. Accordingly, only 3 listed whales might be exposed to Level B harassment, although all 20 are protected under the Marine Mammal Protection Act. Mitigation includes stemmed charges, delays between charges, and observed shutdown radii to ensure blast do not occur when marine mammals are within a distance that would cause mortality or permanent injury.

Ringed Seals and Bearded Seals

Ringed seals and bearded seals are both phocid seals and are grouped together for this effects analysis since they have the same functional hearing group and are both ice-associated seals that could be present during winter or spring blasting. These seals would not be present in the action area during dredging, material placement, or pile driving.

For confined underwater blasting, the model output for phocid seal regulatory threshold (172-dB threshold) for a single 110 lb. charge is 1,760 meters. When delays are used between charges, the 172-dB threshold for forty 110 lb. charges (with 15 millisecond delays) is only 2,916 meters. 2,916 meters is the projected extent of the behavioral effects (Level B) zone for this project for phocid seal using the anticipated blasting scenario.

The likely Level B zone for phocid seals for this project is approximately 2,916 meters. One hundred twenty total shots are planned for this project, with 42 shots over the winter period each winter for three years. There are no survey data for either of these seals in winter and spring, so it is not possible to calculate the number that would be impacted by blasting. A worst case scenario is assumed that would place seven phocid seals of each species (i.e. seven ringed and seven bearded) in the 2,916-meter radius for each blast. Given the 2,916-meter radius from the project site and the worst-case scenario for each seal, approximately 875 ringed seals and 875 bearded seals would be exposed to Level B harassment from confined underwater blasting assuming a total of approximately 125 shots over three years. This number is likely very conservative and it is likely that many of these exposures would be re-exposures of the same seals. No blasting would be allowed when seals are present in the Level A zone. The size of this zone has not been calculated at this time, but it would be much smaller than the 2,916-meter Level B zone.

For seals that use benthic habitat at the dredging site for foraging, there would be a period after dredging when this area would likely be unproductive. This period might last for a year or two until the area recolonizes with fish and invertebrates. The dredged material placement site would likely be a productive foraging site for these two species of ice seals as it colonizes over time.

Pile driving for this project would occur inside the harbor footprint after the breakwater is constructed, this greatly reducing the sound exposure to the area seaward of the entrance channel. Pile driving would also occur in the summer when these two species of seals are hundreds of miles north of the action area. Pile driving for this project would have no impact on ringed or bearded seals.

The anticipated potential impacts from the proposed project are presented in Table 4.

Table 4. Potential Project Impacts to ringed and bearded seals

Activity	Potential Impact Level
Drilling (for blast holes)	Sound levels are below in-water threshold levels for noise. Moderate adverse effects for disturbance due to the presence of the drill barge and associated traffic. Potential effects would be limited to the period of construction.
Blasting	Moderate effects due to disturbance from pressure waves in the Level B zone, no blasting allowed in with animals in Level A zone. Disturbance from blasting could lead to displacement from the Level B zone for a short period of time. Potential effects are limited to a short duration after the blast. Up to 875 ringed seals and 875 bearded seals could be disturbed over a roughly three-year period, thought the actual number is likely far lower. Disturbance could trigger responses ranging from leaving the area to no visible response at all.
Dredging	None. Seals would not be in the area during dredging due to seasonal migration.
Dredged Material Placement	Beneficial effects as the area is used by fish and invertebrates with the benefits increasing over time.
Pile Driving	None. Seals would not be in the area during dredging due to seasonal migration.
Harbor Operation	Harbor use would lead to increased vessel traffic in the action area, but given timing of commercial seasons, disturbance and increased risk of vessel strikes would be limited to time periods surrounding seasonal openings and closures when most vessels are transiting through the area.

Overall, the greatest potential impacts to ice seals from this action are moderate and limited to the time period of construction. Beneficial impacts from the placement of the dredged material are likely to increase over time as the material colonizes with fish and invertebrates. Mitigation includes stemmed charges, delays between charges, and observed shutdown radii to ensure blast do not occur when marine mammals are within a distance that would cause mortality or permanent injury.

6.0 DETERMINATION OF EFFECTS

6.1 Steller Sea Lion

The project *May Affect* Steller sea lions due to:

- Acoustic harassment from confined underwater blasting.
- Acoustic harassment from vibratory pile driving.
- · Acoustic harassment from dredging.
- Additional harassment from harbor operation.

The project is *Likely to Adversely Affect* Steller sea lions because:

 The timing of confined underwater blasting, dredging, pile driving and Steller sea lion presence will likely overlap. It is possible that Steller sea lions will be present in the Level B zone and experience behavioral harassment from confined underwater blasting, dredging, and pile driving. This would be limited to Level B (Behavioral) harassment.

6.1.1 Steller Sea Lion Critical Habitat

The project would *Not Likely Adversely Modify* Steller sea lion critical habitat because:

 Only a very small portion of designated Critical Habitat will be modified by construction (habitat alteration) and impacts to habitat during construction (disturbance) will be small scale and temporary.

6.2 Humpback Whale

The project *May Affect* humpback whales because:

- Acoustic harassment from confined underwater blasting.
- Acoustic harassment from vibratory pile driving.
- · Acoustic harassment from dredging.
- Additional harassment from harbor operation.

The project is *Likely to Adversely Affect* humpback whales because:

 The timing of confined underwater blasting, dredging, pile driving and humpback whale presence will likely overlap. It is possible that humpback whales will be present in the Level B zone and experience behavioral harassment from confined underwater blasting, dredging, and pile driving.

6.3 Ringed Seal

The project *May Affect* ringed seals because:

Acoustic harassment from confined underwater blasting.

The project is *Likely to Adversely Affect* ringed seals because:

 The timing of confined underwater blasting and ringed seal presence will likely overlap. It is possible that ringed seals will be present in the Level B zone and experience behavioral harassment from confined underwater blasting. This would be limited to Level B (Behavioral) harassment.

6.4 Bearded Seal

The project *May Affect* bearded seals because:

Acoustic harassment from confined underwater blasting.

The project is *Likely to Adversely Affect* bearded seals because:

 The timing of confined underwater blasting and bearded seal presence will likely overlap. It is possible that bearded seals will be present in the Level B zone and experience behavioral harassment from confined underwater blasting. This would be limited to Level B (Behavioral) harassment.

7.0 LIST OF PREPARERS

Chris Hoffman, Biologist, U.S. Army Corps of Engineers, Alaska District Michael Rouse, Biologist, U.S. Army Corps of Engineers, Alaska District

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ST. GEORGE HARBOR IMPROVEMENT FEASIBILITY STUDY

APPENDIX D: FISH AND WILDLIFE COORDINATION ACT REPORT AND ENVIRONMENTAL CORRESPONDENCE

ST. GEORGE, ALASKA







DEPARTMENT OF THE ARMY ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS P.O. BOX 6898 JOINT BASE ELMENDORF-RICHARDSON, AK 99506-0898

Douglass Cooper Conservation Planning Assistance Anchorage Fish & Wildlife Field Office 4700 BLM Road Anchorage, AK 99507

Dear Mr. Cooper,

The U.S. Army Corps of Engineers (USACE) respectfully requests your formal collaboration under the Fish and Wildlife Coordination Act in the identification, characterization, or development of either alternatives or mitigation strategies associated with a USACE feasibility assessment of potential navigation improvements at St, George Harbor, Alaska.

USACE's feasibility study is being conducted under authority granted by Section 4010 of the Water Resources Development Act of 2007 (P.L. 110-114):

SEC. 4010. ST. GEORGE HARBOR, ALASKA.

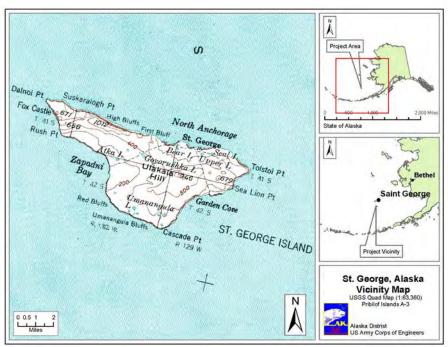
The Secretary shall conduct a study to determine the feasibility of providing navigation improvements at St. George Harbor, Alaska.

St. George Harbor, located on the southeast side of Zapadni Bay, along the western-central edge of St. George Island, was constructed by the City of St. George in 1987. Since then, two separate USACE contracted dredging attempts occurring in 1989 and 1995, failed to reach proper project depths required for safe navigation within the harbor and its entrance channel. Because project depths at the entrance channel were never fully attained, an omnipresent wave break at the harbor entrance channel generates dangerous rafting conditions for vessels attempting to maneuver into the harbor basin. Once inside the breakwater entrance, a one-meter seiche (an oscillating, standing wave) commonly occurs within the inner mooring basin, rendering shoreside facilities and services difficult for vessels to utilize.

Compounding efforts to implement a safe navigational climate at St. George Harbor are the harbor's specific geometry and southwestern orientation that subjects its rubble mound breakwaters to the majority direction of the Bering Sea's wave climate. Shoreline erosion following a six-day major storm event in October of 2004 along the north margin of the harbor facility threatened Delta Western's fuel tank storage facility and simultaneously degraded the functionality of the harbor's south breakwater arm. The Federal Emergency Management Agency (FEMA) along with the Alaska Division of Homeland Security & Emergency Management funded and coordinated repairs to the damaged portions of the breakwaters. In 2015, the south breakwater suffered similar reductions in structural integrity when an unusually intense and long-lived winter storm pummeled it with overtopping waves estimated by eye witnesses at 35-40 feet. FEMA was again engaged for emergency repair funding and coordination. FEMA contractors concluded south breakwater repairs in July of 2017.

As a result of these aforementioned circumstances, opportunities to develop a sustainable marine resources-based economy for the population of St. George have not been realized. Currently, the economy

on St. George Island languishes as it is beset by inefficiencies in its fuel and durable goods deliveries, reduced subsistence and commercial fisheries opportunities, and relative lack of immigration. It is critically important for the viability of the St. George community that improvements to navigation are implemented.

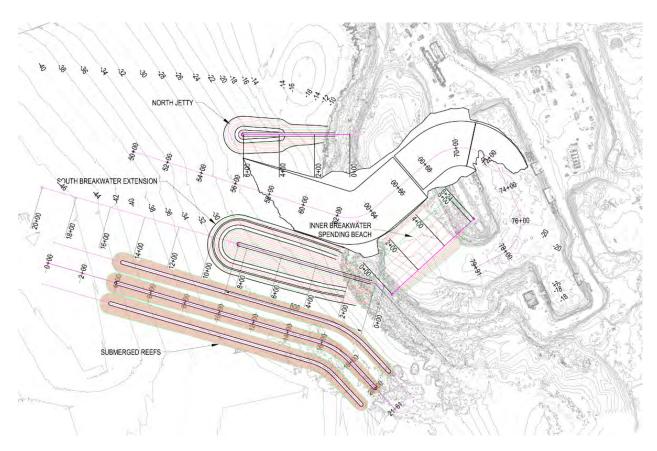


Over the course of a three-day planning charette held January of 2016, USACE, the City of St. George, St. George Traditional Council, St. George Tanaq Corporation, Aleutian Pribolof Island Community Development Association, and various federal and state regulatory agencies agreed that the focus of USACE's feasibility study should evaluate enhancements to the existing harbor and breakwater structures located at Zapadni Bay. More specifically, whether a different harbor geometry was capable of reducing the navigational hazards associated with its use.

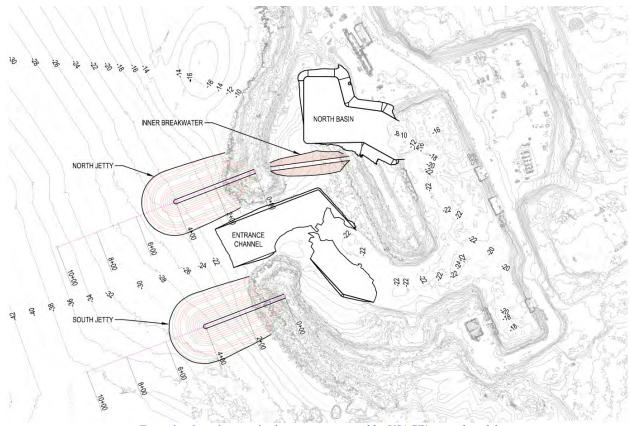


St. George Harbor at Zapadni Ba

USACE economists and hydraulic engineers identified fuel barges and crabbing vessels as the project accommodation design vessels, drafting 10ft and 16ft, respectively. Months of wave and current profiling data collection from the nearshore and existing harbor basin ensued. These data were incorporated into a three stage nested model that predicted wave activity from the open ocean, the nearshore zone, and within the harbor basin itself. Once validated, USACE hydraulic engineers then utilized the predictive model to evaluate an array of different breakwater and harbor geometries. In all, eight different harbor geometries were evaluated by the model, including the existing harbor design.



Example of an alternate harbor geometry tested by USACE's nested model



Example of an alternate harbor geometry tested by USACE's nested model

Despite an inventive array of breakwater geometries and harbor configurations, many that were modeled after existing structures operating in similar wave environments, USACE's modeling efforts consistently identified St. George harbor's orientation to the majority wave climate of the south Bering Sea to be the primary culprit of model run failures. That being said, only practical alternatives were utilized in these model runs; some theoretical geometries that may have satisfied USACE's parameters for safe navigation would have been so expensive as to never have been seriously considered for implementation.

USACE's realization that revitalization or redesign of St. George's Zapadni Bay harbor was impractical led its engineers to reevaluate the St. George Village Cove site as a means of alleviating navigational inefficiencies for the community. Village Cove, located immediately west of St. George Village, served as a natural harbor during the height of the Island's fur sealing enterprise. Skin boats would lighter barrels of salted fur seal pelts from shore to waiting ships. There exists a small but dilapidated dock face at the end of the road that terminates at Village Cove that helped facilitate the transfer of furs and supplies to and from small vessels during calm conditions.



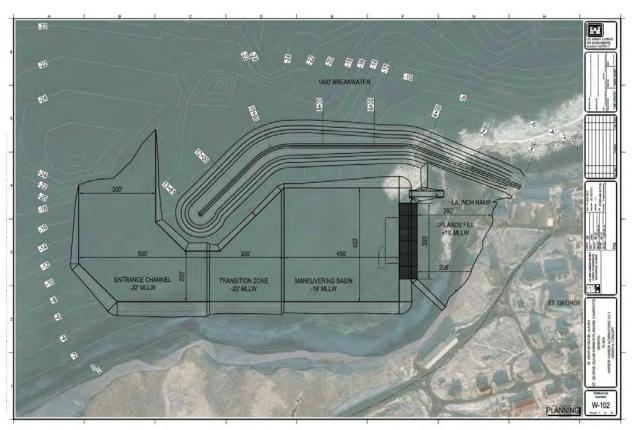
Village Cove site

During the January 2016 planning charette, Village Cove was eliminated from consideration as a viable project site, specifically because of the existing infrastructure at the Zapadni Bay harbor made it a much more probable project location. Building upon the existing breakwater and harbor structures was originally expected to recognize the greatest cost savings and represented the least environmentally damaging alternative. Upon receipt of USACE's harbor geometry modeling results, the St. George City Council held a vote and granted USACE authorization to investigate the previously discounted Village Cove site for its capacity to alleviate St. George's navigation problems. Conceivably, Village Cove is suitable for investigation, its immediately adjacent waters are deep, it is more proximally located to the village, and because it is located on the north side of St. George Island, Village Cove is not subject to the same wave climate that the Zapadni Bay harbor is.

Conversely, the cliffs that surround and naturally define Village Cove serve as nesting habitat for a great diversity of seabirds: thick-billed and common murres, red-faced cormorants, horned and tufted puffins, and black and red-legged kittiwakes are commonly observed at the Village Cove cliffs. From the dilapidated dock face, large groups of least and parakeet auklets can be observed flying overhead as they depart for and return from their foraging locations in the nearshore waters.

A northern fur seal rookery exists approximately 2.5 kilometers to the west of Village Cove where the coastal cliffs give way to rocky beaches. During the summer months, the waters of Village Cove are teeming with northern fur seals as they make their foraging rounds to and from the rookery grounds. Federally endangered western Distinct Population Segment (DPS) Steller sea lions are commonly observed in the waters of Village cove, although in greatly diminished numbers compared to their historical contingent. Northern sea otter are not frequently observed in Village Cove or its immediately adjoining waters. Transient killer whales are known to take northern fur seals and Steller sea lions in Village Cove's nearshore waters. Similarly, during summer months, a variety of other whales and porpoises are known to be present in, or transiting through St. George's nearshore waters.

The waters surrounding St. George Island, to include those of Village Cove, are designated as Essential Fish Habitat (EFH). Both the Fishery Management Plans for the Salmon Fisheries in the Exclusive Economic Zone off Alaska and the Groundfish of the Bering Sea Aleutian Island management area define the attributes of species specific critical habitat elements that are encapsulated in the overall designation of EFH for the nearshore waters of St. George Island. The substrate at Village Cove is primarily composed of biologically encrusted igneous cobbles and boulders with very few areas of fines and sand. Kelp stands are present at Village Cove's northern margin and to the east of the northern point that defines the cove itself.



Alternative developed for wave modeling at Village Cove site



Village Cove, as viewed from the east

Currently, USACE's hydraulic engineers are modeling potential Village Cove harbor geometries that would satisfy the navigational requirements of the aforementioned project design vessels. USACE biologists have been coordinating with National Marine Fisheries Service's office of protected resources and division of fish habitat, and also with USFWS' Alaska Maritime National Wildlife Refuge personnel concerning the potential impacts to the physical and biological resources at the Village Cove site. Under its NEPA and project planning guidance, USACE is preparing an Environmental Assessment for this feasibility assessment and seeks to include USFWS coordination in the identification, characterization, or development of either alternatives or mitigation strategies. Precision data and schematics of proposed alternatives do not exist at this stage of the project development process. However, USACE is resolved to share all existing and pertinent data related to its navigational improvement feasibility assessment at St. George with USFWS in the spirit of satisfying the precepts of the Fish and Wildlife Coordination Act.

Please direct any questions or considerations that you may have to Mr. Michael Rouse, Fisheries Biologist / NEPA Coordinator, U.S. Army Corps of Engineers, Alaska District, 907-753-2743, or at Michael.B.Rouse@usace.army.mil

Michael Rouse

Fisheries Biologist / NEPA Coordinator

U.S. Army Corps of Engineers

From: Rouse, Michael B CIV USARMY CEPOA (USA)

To: Spegon, Jennifer

Subject: RE: [Non-DoD Source] Re: St. George Non-Corps Passengers

Thursday, May 9, 2019 12:34:00 PM Date:

Jennie,

I'm back from a couple days of training. I'll get the information you need and call you this afternoon.

Cheers,

Mike Rouse Fisheries Biologist / NEPA Coordinator Alaska District US Army Corps of Engineers (907) 753-2743

----Original Message-----

From: Spegon, Jennifer [mailto:jennifer j spegon@fws.gov]

Sent: Wednesday, May 08, 2019 2:23 PM

To: Rouse, Michael B CIV USARMY CEPOA (USA) < Michael.B.Rouse@usace.army.mil>

Subject: [Non-DoD Source] Re: St. George Non-Corps Passengers

Hi Mike

I left you a phone message requesting you give me a call to discuss options for the St George trip.

In the meantime, could you provide the name of the commercial flight contractor you'd be using, I'll need to provide this to our folks.

Thank you, Jennie

Jennifer Spegon **Ecological Services** Anchorage Fish and Wildlife Field Office U.S. Fish and Wildlife Service 4700 BLM Road Anchorage, AK 99507 Phone: (907) 271-2768

FAX: (907) 271-2786

jennifer_j_spegon@fws.gov < mailto:jennifer_j_spegon@fws.gov >

To expedite requests for U.S. Fish and Wildlife Service consultations and project reviews, send new requests to our central mailbox at: ak fisheries@fws.gov <mailto:ak fisheries@fws.gov> and copy douglass cooper@fws.gov < mailto:douglass cooper@fws.gov >

On Tue, May 7, 2019 at 3:22 PM Spegon, Jennifer <jennifer_j_spegon@fws.gov <<u>mailto:jennifer_j_spegon@fws.gov</u>>> wrote:

Hi Mike

So far, Marc Romano can only make it for the dates he is already scheduled to be on the island May 19 to 23rd. Catherine Yeargan cannot make it for the proposed dates June 2-5 or for those for which Marc is already out there. That leaves me, and potentially Leah Kenney who has Alaska bird ID experience. She returns from annual leave tomorrow.

I will check Leah's availability and get back to you tomorrow.

Jennie

Jennifer Spegon Ecological Services Anchorage Fish and Wildlife Field Office U.S. Fish and Wildlife Service 4700 BLM Road Anchorage, AK 99507 Phone: (907) 271-2768 FAX: (907) 271-2786

To expedite requests for U.S. Fish and Wildlife Service consultations and project reviews, send new requests to our central mailbox at: ak_fisheries@fws.gov < mailto:ak_fisheries@fws.gov > and copy

jennifer j spegon@fws.gov <mailto:jennifer j spegon@fws.gov>

douglass_cooper@fws.gov < mailto:douglass_cooper@fws.gov >

On Mon, May 6, 2019 at 2:46 PM Spegon, Jennifer <jennifer_j_spegon@fws.gov <mailto:jennifer_j_spegon@fws.gov>> wrote:

Mike

I have an email out to Marc. I will forward the dates to you when I hear back.

Jennie

Jennifer Spegon Ecological Services Anchorage Fish and Wildlife Field Office U.S. Fish and Wildlife Service 4700 BLM Road Anchorage, AK 99507 Phone: (907) 271-2768 FAX: (907) 271-2786

jennifer j spegon@fws.gov < mailto:jennifer j spegon@fws.gov >

To expedite requests for U.S. Fish and Wildlife Service consultations and project reviews, send new requests to our central mailbox at: ak_fisheries@fws.gov < mailto:ak_fisheries@fws.gov > and copy douglass_cooper@fws.gov < mailto:douglass_cooper@fws.gov >

----- Forwarded message -----

From: Spegon, Jennifer < jennifer _ j_spegon@fws.gov

<mailto:jennifer j spegon@fws.gov>>

Date: Mon, May 6, 2019 at 2:01 PM

Subject: Fwd: [EXTERNAL] FW: St. George Non-Corps Passengers (UNCLASSIFIED)

To: Marc Romano <marc_romano@fws.gov <mailto:marc_romano@fws.gov>>

Hi Marc

Mike is checking into changing the dates. I have the dates that you'll already be out there on May 19-23rd.

What were the dates in June that you are available?

Thank you
Jennie
Jennifer Spegon
Ecological Services
Anchorage Fish and Wildlife Field Office
U.S. Fish and Wildlife Service
4700 BLM Road
Anchorage, AK 99507

Phone: (907) 271-2768 FAX: (907) 271-2786

jennifer_j_spegon@fws.gov <<u>mailto:jennifer_j_spegon@fws.gov</u>>

To expedite requests for U.S. Fish and Wildlife Service consultations and project reviews, send new requests to our central mailbox at: ak_fisheries@fws.gov < mailto:ak_fisheries@fws.gov > and copy douglass cooper@fws.gov < mailto:douglass cooper@fws.gov >

----- Forwarded message -----

From: Rouse, Michael B CIV USARMY CEPOA (USA)

<Michael.B.Rouse@usace.army.mil <<u>mailto:Michael.B.Rouse@usace.army.mil</u>>>

Date: Mon, May 6, 2019 at 1:27 PM

Subject: [EXTERNAL] FW: St. George Non-Corps Passengers (UNCLASSIFIED)

To: Lydia Ames - NOAA Federal <lydia.ames@noaa.gov

<mailto:lydia.ames@noaa.gov>>

Cc: Spegon, Jennifer < jennifer _j_spegon@fws.gov

<mailto:jennifer j spegon@fws.gov>>

Lydia,

Glad to hear you will be joining us, pending your big boss' authorization. Please schedule your own lodging using the below information, we will figure out how to reimburse you for it.

Mike Rouse Fisheries Biologist / NEPA Coordinator Alaska District US Army Corps of Engineers (907) 753-2743

----Original Message-----

From: Phillips, Reese B (Brand) CIV (US) Sent: Thursday, May 02, 2019 1:59 PM

To: Rouse, Michael B CIV USARMY CEPOA (US) < Michael.B.Rouse@usace.army.mil

<mailto:Michael.B.Rouse@usace.army.mil>>

Subject: RE: St. George Non-Corps Passengers (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Mike,

Would you please contact Jennie, Marc, and the NOAA person (if she is going) and have them contact Annette with the Tanaq Corporation (907-272-9886 in Anchorage) to make their St. George Hotel Reservations? We are making reservations for the nights of June 2, 3, 4, & 5. They will need to provide their govt. credit card information and will reimburse them later through a MIPR.

Thanks,

Brand

-----Original Message-----

From: Rouse, Michael B CIV USARMY CEPOA (US)

Sent: Wednesday, May 1, 2019 9:53 AM

To: Phillips, Reese B (Brand) CIV (US) < Reese.B.Phillips@usace.army.mil

<mailto:Reese.B.Phillips@usace.army.mil>>

Subject: RE: St. George Non-Corps Passengers (UNCLASSIFIED)

These are the for sure passengers right now:

Jennie Spegon Marc Romano

They are both USFWS

Mike Rouse

Fisheries Biologist / NEPA Coordinator Alaska District US Army Corps of Engineers (907) 753-2743

-----Original Message-----

From: Phillips, Reese B (Brand) CIV (US) Sent: Wednesday, May 01, 2019 9:50 AM

To: Rouse, Michael B CIV USARMY CEPOA (US) < Michael.B.Rouse@usace.army.mil

<mailto:Michael.B.Rouse@usace.army.mil>>

Subject: St. George Non-Corps Passengers (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Mike,

Would you please provide me with a list of the passengers from USFWS and NOAA?

Thanks,

Brand

Reese Brand Phillips, PhD Biologist / Project Manager Civil Project Management Branch USACE Alaska District (907) 753-2539

CLASSIFICATION: UNCLASSIFIED CLASSIFICATION: UNCLASSIFIED



DEPARTMENT OF THE ARMY

ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS P.O. BOX 6898 JOINT BASE ELMENDORF-RICHARDSON, AK 99506-0898

June 14, 2019

Mr. Greg Balogh NOAA Fisheries Protected Resources Division 222 West 7th Avenue, Box 43 Anchorage, AK 99513

RE: Request for Concurrence of NMFS Status Species List, Feasibility Assessment, St. George Navigational Improvements, St. George Island, Alaska.

Dear Mr. Balogh,

The U.S. Army Corps of Engineers (USACE), Alaska District is conducting a feasibility assessment of navigational improvements proposed for the Pribilof Island community of St. George. Under the provisions set forth for interagency consultation and coordination under Section 7 of the Endangered Species Act (ESA), and of the National Environmental Policy Act (NEPA), USACE has compiled a status species list derived from the Alaska Protected Resources Division's Species Distribution Mapper for your interpretation and approval moving forward.

ESA Status Species

Steller sea lion (Eumetopias jubatus) Western DPS

Fin whale (Balaenoptera physalus)

Humpback whale (Megaptera novaeangliae) Western North Pacific and Mexico DPS

North Pacific right whale (Eubalaena japonica)

Sperm whale (Physeter macrocephalus)

Western North Pacific gray whale (Eschrichtius robustus)

Marine Mammal Protection Act Status Species

Harbor seal (*Phoca vitulina*)

Ribbon seal (Histriophoca fasciata)

Spotted seal (*Phoca largha*)

Northern fur seal (Callorhinus ursinus)

Beluga whale (Delphinapterus leucas)

Dall's porpoise (*Phocoenoides dalli*)

Humpback whale (Megaptera novaeangliae) Hawaii DPS

Minke whale (Balaenoptera acutorostrata)

Steineger's beaked whale (Mesoplodon steinegeri)

Killer whale (Orcinus orca)

Gray whale (Eschrichtius robustus)

USACE currently envisions its navigational improvements manifest in the construction of a harbor on the north side of St. George Island, immediately adjacent to the village of St. George at Village Cove. USACE's preferred harbor design consists of a 450-foot wide by 550-foot-long mooring basin dredged to -20 feet MLLW protected by a 1,731-foot-long north breakwater and a 250-foot-long stub breakwater at the west edge of the basin. The basin connects to the Bering Sea with a 250-foot wide navigation channel dredged to -25 feet MLLW. Dredging the channel and basin for this particular design will require removal of approximately 430,000 cubic yards of material. Inner harbor facilities include 2.6 acres of uplands area filled to +10 feet MLLW with a 300foot-long pile supported dock and a concrete boat launch ramp to -5 feet MLLW for full tide launching access. USACE expects the underlying sediments of the project area to be comprised almost entirely of bedrock, requiring preparatory fracturing prior to excavation through confined underwater blasting. The volume of dredged material is also expected to vastly exceed any capacity for upland placement or beneficial terrestrial utilization, and would therefore be placed in the nearshore waters of St. George, possibly as deep as the 30 fathom depth contour.

USACE appreciates NMFS' helpful coordination in determining an appropriate species list for consideration in forthcoming analyses.

Sincerely,

Mike Rouse

Fisheries Biologist

U.S. Army Corps of Engineers

Alaska District

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2	Cite the F	Cite the FWS Reimbursable Program Authority used: Economy Act of 1932 as amend. 31 U.S.C. 1535									
tic	Fund:	XXXF1611NR	WBS:		020770350	Cost Cente	er: FF07CAAN00				
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DEPARTMENT OF THE ARMY

ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS P.O. BOX 6898 JOINT BASE ELMENDORF-RICHARDSON, AK 99506-0898

MEMORANDUM OF AGREEMENT BETWEEN ALASKA DISTRICT, CIVIL WORKS BRANCH, AND U.S. FISH AND WILDLIFE SERVICE, ANCHORAGE FISH AND WILDLIFE CONSERVATION FIELD OFFICE

SUBJECT: Agreement to the Scope of Work provided by the U.S Fish and Wildlife Service (USFWS), and the subsequent intent to provide funding by the Alaska District in compliance with the Fish and Wildlife Coordination Act.

- 1. The U.S. Army Corps of Engineers (USACE), Alaska District is conducting a feasibility assessment of navigational improvements proposed for the Pribilof Island community of St. George. Under the provisions set forth directing interagency coordination under the Fish and Wildlife Coordination Act, USACE requested that USFWS develop a Scope of Work (SOW) in which the final product would be a Coordination Act Report.
- 2. USACE Alaska District agrees with the proposed expenditures and schedule provided in USFWS' SOW dated July 8, 2019 and shall enact funds transfer through Military Interdepartmental Purchase Request (MIPR) in the amount of \$41,345.
- 3. USFWS shall complete all necessary fieldwork, research, and external agency coordination that may be required to provide USACE with a completed Coordination Act Report by September 31, 2019.

Michael R. Salyer Michael R. Salver

POA-ER-C-ER, Chief

Mary Colligan

May 11

Assistant Regional Director Fisheries and Ecological Services

U.S. Fish and Wildlife Service

Alaska Region

Scope of Work Fiscal Year 2019 U.S. Fish and Wildlife Service Anchorage Fish and Wildlife Conservation Field Office July 8, 2019

- 1. Name of Study: St. George Island, Alaska Navigation Improvement Project
- 2. Location: St. George Island is one of five Pribilof Islands in the Bearing Sea, located approximately 250 miles northwest of Unalaska and 47 miles southeast of St. Paul Island. The City of St. George is located on the north side of the island.
- 3. Project Purpose: The U.S. Army Corps of Engineers (Corps) is evaluating environmental impacts and potential mitigation for navigation improvements on St. George Island, Alaska. The current harbor location at Zapadni Bay on the west side of the island has dangerous wave and seiche conditions (oscillating, standing waves), which limit the number of safe access and moorage days for the fleet. This limits subsistence opportunities, delivery of goods to the community, and jeopardizes the long-term viability of the small community on St. George Island.
- 4. Authorities: The U.S. Fish and Wildlife Service (USFWS) enters into this reimbursable agreement under the financial authority of the Economy Act of 1932 as amended (31 U.S.C. 1535) funds will be transferred from the Corps to the USFWS through the Intra-governmental Payment and Collection (IPAC) system. Assistance is provided by the USFWS under the following authorities: Fish and Wildlife Coordination Act (FWCA, 16 U.S.C. 661 et seq. 48 Stat. 401), Clean Water Act of 1977 (CWA, 933 U.S.C 1251 et seq. 62 Stat. 1155), Water Resources Development Act of 2007 (WRDA, Section 4010, Public Law 110-114), Endangered Species Act of 1973 (ESA, 16 U.S.C. Section 1531 et seq.), Marine Mammals Protection Act of 1972 (MMPA, 16 USC 1361-1407), Migratory Bird Treaty Act of 1918 (MBTA, 16 U.S.C. 703-712), National Invasive Species Act (NISA) as appended by the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA), and the National Environmental Policy Act of 1969 (NEPA, 42 U.S.C 4321 et seq. and clarifying regulations 40 CFR Parts 1500-1508).
- 5. Status of the Corps Studies: In October 2002, the Corps approved a reconnaissance study report for harbor improvements on St. George Island. The report recommended further research; however, the Corps did not initiate that research through to the feasibility phase of the study due to the lack of matching funds from a local sponsor at that time. In July 2004, the Corps determined removing pinnacles in the entrance of the existing channel would not be the optimal tactic without addressing other dangerous issues at the existing location. In October 2015, the Corps provided a synopsis report that outlined ongoing efforts that were underway including collecting baseline information and engineering designs to aid in the development of alternatives. In January 2016, the Corps held a planning charrette to provide updates and get input from stakeholders including the USFWS. While initial efforts focused on improving the existing harbor at Zapadni Bay, modeling results indicated minimal opportunities would be available to improve and provide safe access at this location. Based on this information, the Corps adjusted the scope of the study to consider other locations for a harbor alternative. In September 2018, the Corps' preliminary draft feasibility report outlined three locations: one at

the existing harbor location, another on the west side of the island, and a third on the north side in Village Cove adjacent to the City of St. George, known at the North Harbor site. The Corps' Tentatively Selected Plan (TSP) is to construct a new harbor at the North Harbor site. The Corps' revised Integrated Feasibility Report for is scheduled for public review in late 2019 and will include an environmental assessment and potential mitigation measures.

- 6. Project Description: The Corps' TSP at the North Harbor site (engineered alternative N-3), consists of dredging the high energy nearshore benthic environment for construction, operations and maintenance of a protective breakwater, mooring basin, entrance channel, a dock, and a boat launch, specifically:
 - Construction of the breakwater would include an upland area for staging breakwater
 materials, construction of the breakwater with land-based equipment, and a barge excavator
 to shape the toe and benches of the breakwater. Construction of the breakwater core would
 occur above the tide range to allow equipment to drive the breakwater core to place initial
 rock layers. Transportation for delivery of construction materials from an offsite established
 quarry location, such as from Cape Nome or Granite Cove on Kodiak Island.
 - Construction would occur over a 3 to 5-year period.
 - Dredging would occur concurrently with stone production and prior to breakwater construction to provide access to the construction barges.
 - Dredging for operations and maintenance would occur at 10-year intervals.
 - Replacement of about 2.5 percent of the armor stone would occur every 25 years.
- 7. Agency Coordination: As authorized by the FWCA, the USFWS is submitting this scope of work to the Corps to receive reimbursable funding to participate in project meetings, teleconferences, site visits, and to provide expertise to review and interpret potential biological impacts and mitigation measures for wildlife resources within the analysis area.
- 8. Data Needs: More site-specific data needs to be collected for the TSP for further environmental analysis in order to differentiate between alternatives, and the associated impacts and mitigation opportunities. A better understanding of seabird habitat and species composition is necessary to determine where unique habitat exists, identify potential disturbance to habitat and wildlife, and to develop the appropriate avoidance and minimization measures to reduce impacts to USFWS trust resources.

9. The Corps of Engineers will provide the following:

- Continued coordination including project engineering maps and other information necessary to conduct analysis of studies, reviews, and evaluations to formulate USFWS recommendations
- Coordination during alternatives formulation, and as necessary and requested by the USFWS
- The Corps will promptly notify the USFWS of any project changes, such as project scheduling, alternative and design modifications, etc., so that appropriate adjustments may be made to USFWS activities and report schedules

10. The USFWS will provide the following to the Corps:

- Review of the draft and final environmental reports
- Participation in meetings with the Corps and other agencies
- Participate in field visits
- · Review descriptions of flora, fauna, threatened and endangered species, and habitat in the

- areas that could be affected by actions resulting from various alternatives under consideration
- Prepare a Coordination Act Report (CAR) to include wildlife agency coordination, resource concerns, a description of wildlife impacts with and without the project, mitigation measures, an evaluation of the project with mitigation, and a summary of the position of the USFWS

Information may be transferred by informal communication, where appropriate.

11. Deliverable Schedule: The USFWS recognizes the time constraints of the Corps' tentative schedule and as such must divert staff time from other worthwhile projects to assess impacts to the vast amount of natural resources within the project area. The USFWS has been working with the Corps on this project since January 2016. The following table details activities by the Corps and the USFWS from October 1, 2018 to September 31, 2019.

Date	Agency	Task
Oct. 2018 to Sept. 2019	USFWS	Ongoing, attend planning meetings and calls with Corps and other agency representatives, review all completed Corps studies, and provide technical assistance to Corps
Oct. 2018 to May 2019	USFWS	Ongoing, review of original project documents and create draft and final Statement of Work
Dec. 2018	Corps	Ongoing, provide detailed descriptions of alternatives
Nov. 2018 to Sept. 2019	Corps	Ongoing, work with resources agencies to determine potential effects and mitigation measures
Jan. 2019	USFWS	Provide relevant previous studies
May 2019 to June 2019	USFWS	Ongoing, meet the Corps and other USFWS Biologists onsite to evaluate the potential impacts on the biotic environment from the project and develop mitigation alternatives.
June 2019 to July 2019	USFWS	Ongoing, identify potential wildlife and habitat effects and mitigation measures
July 2019 to Aug. 2019	Corps & USFWS	Identify additional mitigation and restoration opportunities for project impacts
Aug. 2019 to Sept. 2019	Corps	Provide draft environmental assessment with mitigation measures and draft Biological Assessment (timeframes may vary for consultations under the ESA)
Sept. 2019	USFWS	Provide Corps with draft CAR for review and comment; complete coordination with NOAA/NMFS and ADF&G
Sept. 2019	USFWS	Provide Corps with final CAR

12. Cost Estimate for FY 2018 to 2019 Activities:

Item	Quantity	Totals
Person Days	30 days@ \$846/day	\$25,380
Hotel and Transportation for Onsite Visits	Hotel \$220/pp/night	\$ 3,080
Materials	Field equipment, food, and supplies	\$ 1,500
Subtotal		\$29,960
Overhead	38% overhead	\$11,385
Total		\$41,345

13. Contact Information:

U.S. Fish and Wildlife Service

Jennifer Spegon (Technical Point of Contact)
USFWS Anchorage Fish and Wildlife Conservation Office
4700 BLM Road
Anchorage, AK 99507-2456
Jennifer J Spegon@fws.gov
(907) 271-2768

U.S. Fish and Wildlife Service (Financial Information)

Gary Goldberg (Administrative Point of Contact)
U.S. Fish and Wildlife Service
1011 East Tudor Rd
Anchorage, AK 99503
(907) 786-3813
Gary Goldberg@fws.gov

Business Event Type Code: COLL BPN Number (DUNS #): 151157950 Agency Location Code: 14-16-0006

The Interior Business Center (Location issuing IPAC Billing)

IBC IPAC / GRANTS 7401 W. Mansfield Avenue, M/S D-2770 Lakewood, CO 80235

U.S. Army Corps of Engineers

Mike Rouse, Fisheries Biologist Alaska District US Army Corps of Engineers Joint Base Elmendorf-Richardson, Alaska 99506-0898 Michael.B.Rouse@usace.army.mil (907) 753-2743

NOAA National Marine Fisheries Service

Seanbob Kelly, Alaska Region Habitat Division 222 West 7th Ave, Box 43, Room 552 Anchorage, Alaska 99513 Seanbob.Kelly@noaa.gov (907) 271-5195

14. Modification, Dispute, and Termination Procedures (264 FW 2)

Alternate Dispute Resolution: If a disagreement arises on the interpretation of the provisions of this agreement, or amendments or revisions to the agreement that the parties cannot resolve at the operational level, each party must state in writing the area(s) of disagreement and give the statement to the other party for consideration. If the parties do not reach agreement on the interpretation within 30 days, they must send the written description of the disagreement to their respective higher officials for appropriate resolution.

Modification: Either party may propose modifications to this agreement. Requests for extension of the period of performance must be sent to the buying agency (Corps) 30 days before the last day of the period of performance. After the agreement expires, the buying agency may not grant requests for extension. This agreement is binding when the representatives for each agency sign the attached memorandum of agreement.

Termination: This agreement may be terminated by either party upon 30-days written notice. If the buyer cancels the agreement, the seller (Service) may collect costs incurred prior to the cancellation of the agreement plus any termination costs, costs claimed by the seller would be itemized and furnished to the buyer.



United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE Anchorage Fish and Wildlife Conservation Office 4700 BLM Road Anchorage, Alaska 99507-2546



IN REPLY REFER TO: FWS/R11/AFES/AFWCO

October 1, 2019

Mr. Michael R. Salyer Chief of Environmental Resources United States Army Corps of Engineers P.O. Box 6898 Joint Base Elmendorf-Richardson, Alaska 99506

Subject: St. George Island Harbor Improvement Project Pribilof Islands, Alaska

(07CAAN00-2018-CPA-0200)

Dear Mr. Salyer:

The U.S. Fish and Wildlife Service (Service) has prepared a Final Fish and Wildlife Coordination Act (FWCA) report on the St. George Island Harbor Improvement Project. This report is provided in accordance with the requirements of section 2(b) of the FWCA of 1934 [16 USC 661 et seq; 48 Stat. 401], as amended. The purpose of the report is to document the existing fish and wildlife resources at the proposed project site and to ensure that fish and wildlife conservation receives equal consideration with other proposed project objectives as required under the FWCA. The report includes an assessment of the significant fish and wildlife resources at the proposed project site, an evaluation of potential impacts associated with the proposed project design alternatives, and recommendations for fish and wildlife mitigation measures.

We appreciate the opportunity to coordinate with the U.S. Army Corps of Engineers on the proposed project. If you have any questions regarding this report, please contact Ms. Jennifer Spegon at 907-271-2768 or at jennifer_j_spegon@fws.gov and refer to project number 07CAAN00-2018-CPA-0200.

Sincerely,

Stewart Cogswell

Field Supervisor



Department of Interior

FISH AND WILDLIFE COORDINATION ACT REPORT

Saint George Island Harbor Improvement Project Pribilof Islands, Alaska

Spegon, Jennifer 9-30-2019



FISH AND WILDLIFE COORDINATION ACT REPORT

St. George Island Harbor Improvement Project Pribilof Islands, Alaska

Prepared by:
Jennifer Spegon
U.S. Department of the Interior
Fish and Wildlife Service
Anchorage Fish and Wildlife Conservation Office
Anchorage, Alaska

Prepared for
U.S. Army Corps of Engineers
Alaska District
Joint Base Elmendorf-Richardson
Draft September 30, 2019

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PURPOSE, SCOPE, AND AUTHORITY

This is the U.S. Fish and Wildlife Service's (USFWS) draft report on plans by the U.S. Army Corps of Engineers (Corps) to implement a harbor improvement project on St. George Island, one of the Pribilof Islands of Alaska. This report has been prepared under the authority of the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 et seg.; 48 Stat. 401], as amended (FWCA), and other authorities mandating Department of the Interior concern for environmental values. This report is also consistent with the National Environmental Policy Act of 1969 [42 U.S.C. 4321 et seg.; 83 Stat. 852], as amended (NEPA).

The purpose of this report is to document the existing fish and wildlife resources at the proposed project site and to ensure that fish and wildlife conservation receives equal consideration with other proposed project objectives as required under the FWCA. The report includes an assessment of the significant fish and wildlife resources at the proposed project site, an evaluation of potential impacts associated with the proposed project design alternatives, and recommendations for fish and wildlife mitigation measures. The Corps' purpose for reviewing the project is to reduce navigational hazards to improve the viability of the community of St. George. Inefficiencies related to delivering necessary fuel and goods to the island have increased the cost of living on St. George Island.

Harbor improvements are necessary to improve deliveries, increase subsistence and commercial fishery opportunities, and reduce the trend of emigration as community members relocate from the island to places with greater economic opportunities and lower cost of living. The conditions in the current harbor on the south side of the island are such that navigation to, from, and within the harbor are unsafe due to wave conditions at the harbor entrance, seiche conditions within the inner basin, and degradation and overtopping of the existing breakwaters. Storms in the Bering Sea produce extreme wave action on the south side of the island; breakwaters are damaged frequently such that the Federal Emergency Management Agency has provided funds on multiple occasions for repairs.

Modeling by the Corps indicates minimal opportunities to improve upon the dangerous conditions at the current harbor location without incurring extremely high costs. The Corps' tentatively selected plan (TSP) is to develop a new harbor facility on the north side of St. George Island, adjacent to the Village, where the wave action is not as extreme. The Corps designed the TSP to support the subsistence vessel fleet, fuel barge fleet, cargo vessels, and approximately 85 percent of the existing crabber fleet of St. George.

The USFWS biologists have discussed the proposed project with the National Marine Fisheries Service (NMFS) and the Alaska Department of Fish and Game (ADF&G). Concerns relative to the protection and conservation of important fish and wildlife resources on St. George expressed by these entities were incorporated into this report and copies of the report will be provided to them.

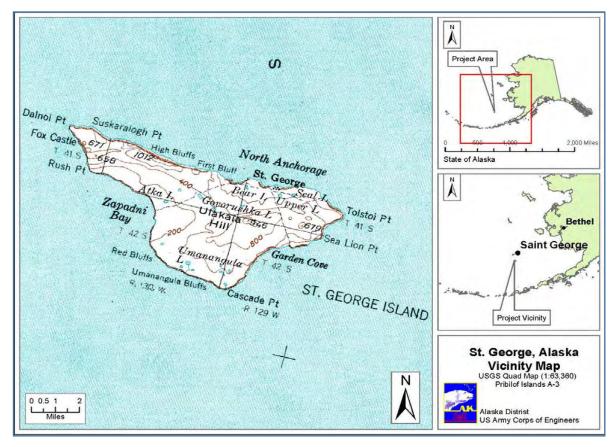


Figure 1. St. George Island (Corps 2018)

PREVIOUS REPORTS AND STUDIES

January 2016 – The USFWS staff participated in the Corps' Charette, planning meeting.

September 2018 – The USFWS staff reviewed the Corps' Preliminary Draft Feasibility Report.

November 2018 – The USFWS met with the Corps and NMFS staff to discuss known resource concerns, existing data, data gaps, and potential for additional studies, and the USFWS submitted the first draft of the Scope of Work (SOW) to the Corps to conduct studies for the proposed project.

April 2019 – The Corps invited the USFWS and NMFS staff to join them for a joint field visits during the 2019 field season to gather baseline data.

May 2019 – The USFWS revised the draft SOW to facilitate staff coordination on St. George in May. The costs of a longer-term field study were reduced and replaced with two shorter field sites and lower overall costs.

May and June 2019 – The USFWS staff conducted FWCA field investigations with the Corps and NMFS staff.

July 2019 – The USFWS provided a final SOW to the Corps, who provided a signed MOU.

August 2019 – The USFWS participated in meetings with NMFS and Corps staff concerning potential mitigation and actions that could serve as compensatory mitigation for unavoidable impacts to fish and wildlife resources as a result of the proposed project.

September 9 – The USFWS released the Draft FWCA 2(b) report for review and comment.

September 15 – The USFWS and Corps discussed the Draft FWCA 2(b) report and exchanged information.

September 30 – The USFWS and Corps agreed to finalize the FWCA 2(b) report for the proposed project

AREA SETTING/DESCRIPTION OF STUDY AREA

Project Location, Pribilof Islands

The Pribilof Islands are five small islands located between Russia and mainland Alaska, north of the Aleutian Islands (Figure 1). St. Paul Island is the largest island, St. George Island the second largest, Sea Lion Rock is more of a rocky outcrop, and Otter Island and Walrus Island are small rocky islets (NOAA 2017). Native Alaskan communities exist on St. George and St. Paul Islands, the others are uninhabited.

The Pribilof Islands are part of a larger ecosystem surrounding the Bearing Sea shelf slope that is highly productive. Shelf breaks and deep-sea canyons in proximity to the islands provide unique nutrient filled habitats including nearshore habitat, coastal wetlands, and sea cliff habitat for seabirds, fish, invertebrates, and marine mammals (NOAA 2017, Guitart et.al 2018). The ADF&G estimates the Pribilof Islands support habitat for approximately 3 million seabirds (ADF&G 2006). These islands also support terrestrial habitat for a significant portion of the northern fur seal (*Callorhinus ursinus*) through summer breeding into fall (NOAA 2017).

St. George is about 45 miles south of St. Paul Island and is just 60 miles north of the continental shelf, where constant wave action and churning provide abundant upwelling and nutrients, which attracts numerous seabirds. These seabirds nest on cliffs that surround the islands. The Alaska Maritime National Wildlife Refuge (NWR) purchased land with numerous seabird-nesting areas on St. George Island in the 1980s (Figure 2). Most of these areas include high cliffs that surround the island with the exception of one inland area, unique to nesting auklets.

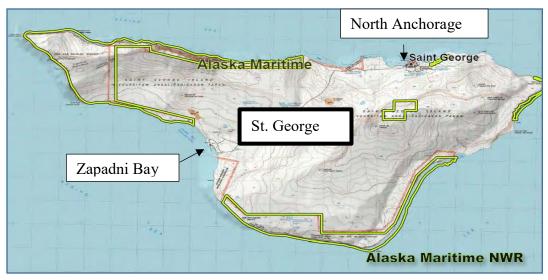


Figure 2. St. George Island map indicating current harbor location Zapadni Bay and TSP location at North Anchorage overlain by NWR managed land in green.

The Tanaq Corporation manages other portions of the island including the introduced caribou herd, which roams large portions of the island, and the St. George Hotel, which is located in the City of St. George on the north side of the island near the North Anchorage Alternative site. The community has approximately 50 to 100 year-round residents. The residents of the community live a mixed subsistence and cash economy. They fish, hunt, and share subsistence foods and use a cash economy to pay for utilities, power, heat, fuel, construction goods, and travel (Corps 2018).

After the fur seal trade economy ended in the mid-1900s, many residents moved from St. George Island to St. Paul Island, mainland Alaska, and other places. Some kept their ties with the community on the island and return on a seasonal basis. Travel and access, however, is unpredictable due to extreme weather conditions with the high winds, fog, and wave action associated with the central Bering Sea (Corps 2018).

Description of the Study Area, St. George Island

St. George Island covers an area of approximately 22,150 acres (ADF&G 2006). It is an ancient volcanic island comprised of volcanic rock, gravel, sand, and marine deposits. Weathering, wind, and waves have long eroded the volcanic slopes. Today they are steep cliffs that drop almost vertically to the coast in some places. The cliffs, up to 1,200-feet in elevation, border the majority of the island as they rise and fall from rare beaches and rocky areas (Figure 3). The interior of the island is mostly rocks covered by tundra, grasses, and small brush where rolling hills lead to the few small lakes and wetlands in lower elevations.



Figure 3. Steep cliffs surround most of the island (Photo: J. Spegon)

Due to its location in the middle of the Bering Sea, St. George Island provides unique terrestrial and marine habitat. It provides stopover and nesting habitat for seabirds and the surrounding marine environments provide productive feeding and staging areas. Marine mammals frequently occupy the surrounding marine habitat and use the lower laying grassy and rocky areas of the island as rookeries.

Long-term biological studies have occurred on St. George Island since 1975. The Minerals Management Service funded studies from 1975 and 1984 to monitor population trends and productivity of ledge-nesting seabirds in the Pribilof Islands. Studies began in response to concerns over potential offshore oil development along the continental shelf. Annual monitoring has continued since 1985, conducted by Alaska Maritime NWR. St. George Island is one of eight sites throughout southwest Alaska where the Alaska Maritime NWR conducts annual monitoring to collect baseline status and trend information for a suite of seabird species (Guitart et.al. 2018).

The NMFS conducts ongoing fur seal studies in the Pribilof Islands. Annually NMFS counts adult male fur seals in July as an index of abundance. Every 2 years, in August, NMFS estimates the number of pups born on the Pribilof Islands. The NMFS surveys the population on an annual basis by observing and photographing surviving fur seals that were tagged as pups, and tags pups in September and October to examine cohort survival in subsequent years. The NMFS uses satellite, GPS, and VHF to examine northern fur seal foraging and migratory behavior during the summer and fall.

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES

The island provides productive areas occupied by a suite of avian and marine species. Although not an inclusive list of all potential species on St. George Island, a list of the more common species is provided in Appendix A. The remainder of this report focuses on **potential project-related** loss of habitat for which fish and wildlife resources would be of specific concern, habitat

that provides unique value or is relatively scarce, and species for which habitat is relatively unique.

The USFWS' planning objectives are to maintain existing habitat values in the proposed project area. Habitat that could be impacted includes intact cliff nesting, nearshore, and marine habitat. Due to the wide variety of species that occupy these areas, the USFWS, NOAA, and the Corps identified five representative species that occupy this habitat for further evaluation: North Pacific fur seal (*Callorhinus ursinus*), red-faced cormorant (*Phalacrocorax urile*), thick-billed murre (*Uria lomvia*), red-legged kittiwakes (*Rissa brevirostris*), and least auklet (*Ametria pusilla*), Figure 3. A broad description of the each of these species including range, food, prey, breeding, nesting, and potential threats is provided below. A more site-specific description is provided under the section titled, *Fish and Wildlife Resources With and Without the Project*.

Evaluation Species in the Project Area

Red-faced cormorants occur in the North Pacific, from Japan through the Aleutian Islands and coasts of southwest Alaska to Prince William Sound into the southeastern Gulf of Alaska. Cormorants range far out to sea near continental shelves and occur in coastal and nearshore marine habitat. They feed underwater on fish and crustaceans such as pollock, crab, shrimp, and amphipods (Causey 2002). They nest remotely, away from human activity. Nesting can begin as early as April and lasts into September (pers. com. Marc Romano). Nests are generally used in subsequent years. Incubation lasts from 30 to 35 days, young fledge at 50 to 60 days, for a total of about 3 months (Kaufmann 1996). They are particularly sensitive to human presence and nearshore activities. Mass departures of adults in nesting colonies, in response to predators or human disturbance, can displace eggs and chicks. Departures, such as this, may occur more readily at the beginning of nesting season (Siegel-Causey, D. and N. M. Litvinenko 1993). Red-faced cormorants are also vulnerable to petroleum spills, and chemical and plastic contamination (Causey 2002).

Thick-billed murres occur in arctic water from the North Pacific to northern areas of the Atlantic. They prefer very cold, deep water near pack ice. They dive underwater to feed, eat mostly fish and feed fish to young in summer, they also eat marine worms, squid, shrimp, amphipods, mysids, and copepods. They often forage miles from nests, which are built on steep ledges with other seabirds. Incubation lasts from 30 to 35 days, young fledge at 15 to 30 days, for a total of about 2 months (Kaufmann 1996). Threats include rats, oil spills, and changes in the prey availability due to increased sea temperature, fishing gear, human disturbance, and subsistence harvest of eggs (ADF&G 2006).

Red-legged kittiwakes occur in the Bering Sea and northern portions of the Gulf of Alaska (ADF&G 2006). They forage the sea surface in flocks often together with black-legged kittiwakes (*Rissa tridactyla*), mostly over deep water and near continental shelves. They feed on small fish and crustaceans such as amphipods and squid. They nest on narrow ledges on steep cliffs with other seabirds; nest can be reused in subsequent years. Incubation lasts about 30 days; young fledge from 30 to 40 days, for a total of a little over 2 months (Kaufmann 1996). Threats include rats, oil spills, prey abundance, contaminants, and changes in land use and management (ADF&G 2006).



Figure 4. Representative species in the project area.

Left to right and top to bottom: red-faced cormorant nesting (Photo: C. Hoffman), red-faced cormorant perching, red-legged kittiwakes, least auklets, thick-billed murres, and fur seals (Photos: M. Burns).

Least auklets fly in large flocks. They stage in bays and on beaches near nesting colonies. They forage under water both near and far from shore. They feed on very small fish and cold water marine invertebrates including amphipoda, copepods, decapoda, euphausiacea, and gastropoda (Guitart et.al. 2018). They nest in colonies located in rock piles with abundant small rock crevices for nest sites; nest sites can be reused in subsequent years. Incubation lasts from 25 to 40 days, young fledge at 25 to 35 days, for a total of about 2 to 2.5 months. Eggs are laid on bare rock, and nests are very susceptible to predation by foxes and rats (Kaufmann 1996).

Northern fur seals range from Japan north into the Bering Sea and California. They spend winter and spring at sea. The majority of the population spends summer and fall in the Pribilof Islands. They use grassy coastlines and rocky beaches for breeding and resting, and forage in the surrounding marine environments. Fur seals have high rates of site fidelity. The National Oceanic and Atmospheric Administration (NOAA 2017) estimates, "90 percent of breeding females return to the site where they were born to breed." They eat mainly fish and squid. Threats include marine debris and interactions with fishing gear.

EVALUATION METHODOLOGY

The evaluation process includes obtaining basic biological data for the proposed project sites, analyzing the resources with and without the proposed alternatives, evaluating impacts on fish and wildlife species and their habitats, and identifying and recommending mitigation measures that reduce project related negative impacts to fish and wildlife resources. Mitigation measures include avoidance of unnecessary impacts, minimization of unavoidable impacts, and compensation for unavoidable negative impacts consistent with the FWCA and the USFWS's 1981 Mitigation Policy.

The USFWS's Mitigation Policy (USFWS 1981) outlines internal guidance for evaluating impacts that may affect fish and wildlife resources. The Mitigation Policy complements the USFWS's participation under NEPA and the FWCA. The USFWS's Mitigation Policy was formulated with the intent of protecting and conserving the most important fish and wildlife resources while facilitating balanced development of this nation's natural resource, and the degree of mitigation correspond to the value and scarcity of the habitat at risk. The policy focuses primarily on habitat values and identifies the following four resource categories and mitigation guidelines:

Resource Category 1: Habitat potentially impacted is of high value for the evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section. The mitigation goal is no loss of existing habitat value.

Resource Category 2: Habitat potentially impacted is of high value for the evaluation species and is relatively scarce or becoming scarce on a national basis on in the ecoregion section. The mitigation goal is no net loss of in-kind habitat value.

Resource Category 3: Habitat potentially impacted is of high to medium value for the evaluation species and is relatively abundant on a national basis. The mitigation goal is no net loss of habitat value while minimizing loss of in-kind habitat value.

Resource Category 4: Habitat potentially impacted is of medium to low value for the evaluation species. The mitigation goal is minimizing loss of habitat value.

The USFWS conducted field assessments with the Corps and NMFS during May and June of 2019. The following analysis incorporates information gathered during field visits, the long-term biological studies conducted by the Alaska Maritime NWR, literature reviews, and best professional judgment.

DESCRIPTION OF TENTATIVELY SELECTED PLAN AND OTHER ALTERNATIVES

Zapadni Bay

The current boat harbor at Zapadni Bay is a 30-acre boat basin, enclosed by two rubble mound breakwaters, an inner breakwater arm, and entrance channel with a depth from 26 to 18 feet below mean low lower water with shallow areas consisting of rock pinnacles (Corps 2015). The Corps considered options to remove the pinnacles in the entrance channel along with modifications and realignments of the breakwaters, entrance channel, and inner harbor basin to reduce shoaling, wave overtopping, damage to the breakwaters, and adverse wave and seiche conditions in the harbor.



Figure 5. Existing Harbor at Zapadni Bay

However, due to the wave action outside of the harbor they determined navigational improvements at Zapadni Bay would not significantly improve the ability for vessels to enter or exit the harbor. According to the Corps (2018), this alternative would not significantly increase safe access and moorage days and, therefore, would only provide negligible change in harbor

access realized for large expenditures. The Corps does not consider the existing harbor at Zapadni Bay a viable aAlternative.

Tentatively Selected Plan (TSP) Alternative N-3, the North Anchorage Site

The Corps' TSP is to construct a new harbor on the north side of the island in Village Cove, away from the long periods of storm waves originating from the southwest (Corps 2018). The North Anchorage site is adjacent to the community of St. George. It would be accessible to the subsistence fleet, fuel barges, and approximately 85 percent of the commercial fishing fleet. The Corps predicts design Alternative N-3 would produce an additional 179 vessel opportunity days for safe access and moorage for the anticipated fleet. This would increase harvest of subsistence resources and increase use of the harbor by the crabbing fleet. The new harbor would be used for delivery of fuel and goods to the nearby community. The Corps and project sponsor expect reductions in costs of essential goods and expanded economic opportunities may contribute to the long-term viability local economy of St. George (Corps 2018).

The design would incorporate the existing structure of an existing pier that was used during the fur seal trade. The design, Alternative N-3, consists of a 450-foot wide by 550-foot long mooring basin, dredged to 20 feet below mean low water, a 1,731-foot long north breakwater, and a 250-foot long stub breakwater at the west edge of the basin. The basin would connect to the Bering Sea with a 250-foot wide navigation channel dredged to 25 feet below mean low water.

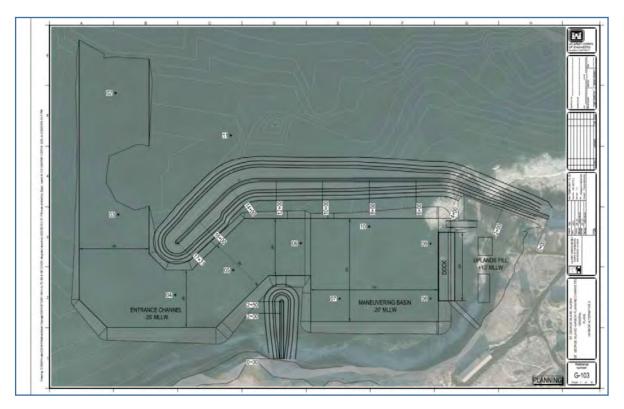


Figure 6. The Corps' tentatively selected plan, design Alternative N-3 (Corps 2018)

Dredging would remove approximately 430,000 cubic yards of material. The area between the maneuvering basin and the existing pier would utilize some of the dredged material. This area would convert approximately 3.9 acres to uplands to be filled to 10 feet above mean low water with a 300-foot long pile supported dock, and a concrete boat launch ramp built to 5 feet below mean low water. The remainder of the dredged material would be discharged into the marine area to the northeast of the breakwater.

Major construction features include building a rubble mound to the north and spur breakwaters, dredging, pile supported docks, and an upland fill area. The stub breakwater, which connects to the cliffs, would not be constructed from land. The north breakwater would be constructed with land-based equipment. The breakwater core would be constructed to above the tide range to allow the equipment to drive on the breakwater core subsequent rock layers. Core rock would be transported and staged on the breakwater with off-road dump trucks, then shaped by an excavator. A barge excavator would be used to shape the toe and benches of the breakwater on the west side where waters are deeper. Some dredging prior to constructing the breakwaters would be necessary to provide access for construction barges to the breakwater sites.

Upland staging areas for the breakwater material would be constructed concurrently with the breakwater. The breakwater building material would be shipped in from places other than St. George Island to the existing harbor at Zapadni Bay. Enough material would be delivered to the island for a full season of work. Two staging areas are proposed, one at the existing harbor at Zapadni Bay and the other near the North Anchorage site. The staging area at Zapadni Bay would be located in an existing disturbance area adjacent to the existing fuel storage area. The staging area at the North Anchorage site would be on the eastern most side of the village homes, north of the city buildings, and south of the cemetery. An existing trail and vegetation buffers the proposed staging area on the south from the cliffs on the north shore.

The harbor would require 3 to 5 years for construction. The Corps proposes to work throughout the majority of a calendar year, depending on the terms and conditions of the Incidental Harassment Authorizations, pursuant to the Marine Mammals Protection Act, with NMFS (Corps 2018).

FISH AND WILDLIFE RESOURCES WITH & WITHOUT THE PROJECT

St. George Island provides habitat to over 80 percent of the world population of red-legged kittiwakes. Red-legged kittiwakes are one of the most abundant breeding birds on island. They nest along the cliff faces on most of the perimeter of the island together with many other species of seabirds including black-legged kittiwakes and thick-billed murres. St. George Island has the largest population of thick-billed murres in Alaska. Least auklets nest throughout the island in rocky crevices. They forage in the surrounding marine environments and stage in the hundreds in the bays and harbors before coming inland from feeding. Red-faced cormorants nest on deeper ledges in more limited locations on St. George Island.

Several species of marine mammals inhabit the waters of the Bering Sea surrounding St. George Island. Most notable, are the northern fur seal. St. George Island provides habitat for six fur seal rookeries with a combined population of approximately 100,000 individuals that occupy the

coastline of St. George Island seasonally for resting, reproduction, nursing, and molting. Fur seals also depend on the surrounding open ocean for feeding.

Zapadni Bay Existing Harbor

The existing harbor is located in Zapadni Bay. Even with an operational harbor, the marine and shoreline environments at Zapadni Bay provide marine, nearshore, and cliff habitat. A fur sea rookery borders the harbor footprint on the east within sight of the harbor.

This area hosts a full suite of seabirds. Least auklets frequently occur in large numbers at Zapadni Bay. If the existing harbor were left in its current condition, no change would be expected without the project. If the existing harbor were improved at the Zapadni Bay site, far fewer seabirds would be displaced than what may occur at the North Anchorage alternative. The topography surrounding existing harbor is at Zapadni Bay is much gentler; cliff-nesting habitat on each side of the harbor is much further away than the cliffs near North Anchorage site (Figure 7). There are fewer cliff-nesting birds in the disturbance area.

Effects on fur seals due to improvement of the existing harbor would be less than those for construction of a new harbor on the north side of the island, due to the limited nature or need for underwater blasting at the existing harbor. Approximately one-third of the St. George Island fur seal population resides on the south side of the island near the harbor, and their daily foraging movements from those breeding areas are generally south, and not in close proximity to the existing harbor. Whereas two-thirds of the St. George Island fur seal population resides on the north side of the island and their daily foraging movements are east and west along the north shore prior to heading to the south of the island. Thus, seals residing on the north side would generally pass construction activities at the TSP, North Anchorage Alternative.



Figure 7. Topography at the Existing Harbor Location at Zapadni Bay (Photo: J. Spegon)

Proposed New Harbor, North Anchorage Alternative

The cliffs at the North Anchorage site form the boarder of the coast where the proposed harbor is located (Figure 8). The cliffs are full of nesting seabirds during spring and summer. The cliffs habitat currently (without the project) provides important nesting habitat for red-faced cormorants and more common nesting habitat for thick-billed murres, and kittiwakes, as well as many other species of seabirds. Least auklets stage in large numbers in the marine area. This area on the north coast accounts for approximately two-thirds of northern fur seal population of St. George Island, with about 30 percent found at the North Rookery, closest to the new harbor, and the other 30 percent at the East Rookery, which a portion make daily movements past or through the new harbor area.





Figure 8. TSP Location North Anchorage Site (Photo: M. Burns)

POTENTIAL EFFECTS (ADVERSE AND BENEFICIAL)

Construction Related Effects – Construction related effects include modification of habitat, dredging, underwater blasting, lighting, increased human presence on and offshore, rats and other invasive species (zebra mussels, terrestrial plants, and animals), and increased sewage, all of which could impact birds, fur seals, and their habitat.

Operational Effects – Operational related effects include modification of the marine and nearshore habitat as well as loss of habitat due to 3.9 acres of fill in the nearshore habitat below the cliffs. Connected actions include staging areas, a potential new tank farm, spill risk, rats and other invasive species risk, increased human presence, and increased tourism, which could result in increased sewage and loss of habitat that could affect birds, fur seals, and their habitat.

Effects on Wildlife – Construction activities could deter seabirds from nesting in the cliff habitat and may affect fur seals. Blasting underwater could harm fur seals and diving birds. Modification of marine habitat by dredging and disposal of dredged material would modify habitat and reduce prey availability. Increasing the depth of the harbor may eliminate nearshore habitat for some species. Lighting could attract birds, which in bad weather could increase collision risk with vertical structures such as construction equipment. Increased marine transport, access to the island, and increased human presence could result in reduction of habitat

value, harassment of wildlife, increased subsistence, unorganized trails and multiple footpaths, which use could impact wildlife.

Invasive Species – The wildlife on the island are extremely vulnerable to introduction of invasive species, especially predation and disease transferred by rats. Currently, the island has no rats. If rats were introduced to the island, they could threaten critically important seasonal areas for wildlife including fur seals and sea birds. Because St. George Island hosts 80 percent of the world's red-legged kittiwake nesting population, if a rat infestation occurred here it could decimate this species (Fritts 2007). Effective prevention of invasive species incorporates outreach and education with prevention, control, and monitoring (Gotthardt et. al. 2016)

EVALUATION SUMMARY

St. George Island is located in the southeastern Bering Sea near the continental shelf between Russia and Alaska in an area of rich in nutrients that create some of the highest areas of ocean productivity in the world, which in turn creates some of the highest densities of seabirds (Guitart 2018). The resources of concern near the North Anchorage Alternative include potential impacts to seabird colonies perhaps in globally significant numbers through the removal and degradation of cliff nesting, nearshore, and marine habitats that surround the project area from blasting, dredging, discharge, increased human activity, and increased risk of invasive species.

While tolerance to noise, human presence, and disturbance varies by species, individuals, and breeding pairs, most of the evaluation species have strong nest and breeding site fidelity. Some individuals or pairs are expected to have such a strong attachment to the site that they will continue nesting through construction and operations. The percent that would remain and breed successfully through blasting and construction equipment nearby is unknown. Individuals that will not tolerate these activities may initiate breeding and subsequently abandon the site, losing that season's opportunity. Finally, some individuals, pairs, and species, such as the red-faced cormorant, are more sensitive to human presence. For those more sensitive, this habitat may no longer be suitable even after construction for future nesting. Some may breed elsewhere on the island, if there is suitable habitat available. However, available habitat may be less desirable or more prone to predators such as foxes.

Seabirds and fur seals at the North and East Rookeries near the North Anchorage site would be impacted. Possible impacts include harassment, behavioral change, displacement, alteration of daily movement patterns, and alteration of terrestrial or marine habitat use. Harbor improvements and increased use of this area would introduce greater threats from oil and chemical spills, potential introduction of rats, and other invasive or predatory species. Risks from chemical and plastic contamination would increase. Oil and debris would increase with increased use and may accumulate from vessels in the harbor and during fuel transfers. These contaminants reduce habitat quality and can directly impact wildlife through ingestion and entanglement. Entanglement with fishing gear and risk of collision by fishing vessel would also increase. Both short term and long term modification of habitat is possible. Vegetation and prey could be removed through dredging and disposal of material.

Resource Category of Habitat Impacts

The potentially impacted habitat at the North Anchorage site is a Resource Category 2 of high value for fur seals and red-faced cormorants, and is a Resource Category 3 of medium to high value for red-legged kittiwakes, thick-billed murres, and least auklets. According the USFWS' mitigation policy, the goal for resource category 2 is no net loss of in-kind habitat value, and for resource category 3 it is no net loss of habitat value while minimizing loss of in-kind habitat value.

The USFWS and the NMFS identified modifications to avoid, minimize, and reduce adverse impacts, where it was possible. For those impacts that would be unavoidable, measures to compensate are provided. Compensatory mitigation for impacts is achieved through replacing or providing substitute resources or environments, such as increasing the habitat value of existing areas, or restoring or rehabilitating previously altered habitats. The cliff nesting and marine habitat surrounding the island is fully functioning; there are no options for in-kind compensation measures on St. George Island. Out-of-kind mitigation allows for habitats that may be physically and biologically different from the resources lost. Compensatory mitigation is accomplished through management of habitat where there is the potential for increasing its value.

RECOMMENDATIONS AND CONSERVATION MEASURES

The USFWS worked with the NMFS and the Corps to develop mitigation measures relevant to habitat for seabirds and marine resources to minimize short-term construction effects and identify temporal windows when species are not present, less abundant, or are less sensitive. These included identifying measures to reduce noise exposure from sources such as blasting and dredging. The mitigation included cooperation from all parties. For example, the USFWS proposed a construction buffer of 660 feet to protect cliff-nesting birds; this was reduced to 300 feet with a timing window to allow for a reduced proximity of the construction equipment in the bay during nesting. In addition, mitigation measures were developed to minimize long-term chronic effects related to handling, transferring, storing, and disposing of petroleum products, end-of-life fishing gear, vessel waste, and prevention of rats and other invasive species on St. George Island.

Avoidance, Reduction, and Minimization Measures

We recommend measures below to avoid and minimize impacts to fish and wildlife resources as identified in this report be incorporated into the project plans.

- Develop and require a bio-security and response plan to provide for ongoing prevention of invasive species including rats.
- Develop and require a harbor operations plan, which addresses management of trash, solid waste, bio-security, spills, spill response plans, and equipment.
- Develop and require a recreational use plan with the input from the Alaska Maritime NWR and NMFS to include reconstructing of the blind at the rookery, and management and improvement of walking trails such around the cliffs to accommodate increased use by recreationalists and birders.

- To ensure that harbor related impacts do not exceed the level of impacts anticipated during the planning phase of this project, monitor cliff-nesting and rookery habitat during construction
- To minimize exposure of pregnant or lactating adult female fur seals and their dependent pups, incorporate fur seal timing windows complete blasting prior to July 1. Avoid all blasting activities near rookeries from mid-August through November.
- To protect nearby seabird nesting colonies, avoid all blasting activities near seabird nesting areas from early April to mid-September. Complete blasting from mid-September to April 1. If these activities must occur into the nesting season, begin as early as possible in late winter and spring to deter nest initiation and allow opportunities for breeding success in alternative locations. Given the site fidelity, it is better not to haze to allow for breeding-pair bonding and allow birds to attend and defend long-term nest sites for future nesting seasons.
- Avoid direct removal of cliff nesting habitat and rookery habitat.
- Use a 330-foot construction distance buffer to avoid disturbance of cliff nesting birds during nesting season. If construction must occur closer than 330 feet, such as during the construction of the stub breakwater, construct in last fall, over winter from late September to April.
- To reduce avian risk of collision with vertical equipment, lower vertical equipment for overnight storage or when not in use.
- To avoid impacts with birds drawn to lights and subsequent collision risk during bad weather, reduce unnecessary lighting during construction and operations. Direct lights down, hood lights, and consider using motion detectors for permanent lights at the harbor and associated facilities.

Compensatory Mitigation

We recommend development of a compensatory mitigation plan to offset anticipated unavoidable impacts to fish and wildlife resources by the proposed project. Due to the fully functioning cliff nesting and marine habitat surrounding the island, there are few to no options for in-kind compensation measures on St. George Island. Therefore, out-of-kind mitigation opportunities are provided below; these options require commitment by entities other than the Corps, including the Sponsor, which is the City of St. George, and possibly with the cooperation of the Tanaq Corporation, NMFS, and USFWS:

- To prevent rats from being introduced to the island and infesting seabird habitat, develop and implement a robust, long-term biosecurity plan, including a funding mechanism and maintenance and monitoring plans, to ensure ongoing rat prevention and control.
- To increase habitat value and minimize hazards and potential sources of contaminants, remove old structures, heavy equipment, and buildings from around the existing harbor and at the proposed new harbor site.
- To decrease risk of deterioration and possible contamination of habitat, repurpose vacant buildings such as the Tanaq construction housing, possibly for seasonal work, so that buildings are maintained and the risk of deterioration and potential pollution is reduced.
- To decrease risk of deterioration and possible contamination of habitat, explore uses for the currently closed buildings such as the school that belongs to the City, possibly as an extension location for marine studies in order to keep the building maintained.

We realize the Corps will work with the Sponsor and contactors to ensure all plans to avoid, minimize, or compensate for project-related impacts are finalized prior to implementation of project construction activities. Therefore, if any requested changes are proposed to the plan or to these recommendations, the USFWS requests coordination.

SUMMARY OF POSITION

The following is the position of the USFWS regarding what it would support, oppose, or not oppose under above specified conditions. The USFWS would support harbor improvements at the existing Zapadni Bay harbor location. Given this location already has the majority of the necessary infrastructure, such as a fuel tank farm and storage areas for fishing equipment. This location would have less impacts on species and habitats. However, this Alternative is no longer under consideration by the Corps.

The USFWS does not oppose the North Anchorage Alternative, provided cliff nesting and rookery habitat are left intact and the above mitigation measures are incorporated. However, it should be emphasized that a rat infestation on the island could decimate the sea bird colonies. Therefore, if the avoidance, reduction, and minimization recommendations listed above are not incorporated or if compensatory mitigation is not implemented to protect and maintain existing habitat, the Corps will work with the USFWS to reassess the project.

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Appendix A. Common species observed at St. George Island, Alaska.

Emperor goose (Anser canagicus)	Rare migrant
Greater white-fronted goose (Anser albifrons)	Irregular vagrant
Cackling goose (Branta hutchinsii)	Rare vagrant
Aleutian cackling goose (Branta hutchinsii leucopareia)	Uncommon vagrant
Northern shoveler (Spatula lypeata)	Irregular vagrant
Eurasian wigeon (Mareca penelope)	Uncommon migrant
American wigeon (Mareca americana)	Irregular vagrant
Mallard (Anas platyrhynchos)	Uncommon vagrant
Northern pintail (Anas acuta)	Abundant migrant/breeder
Eurasian green-winged teal (Anas crecca crecca)	Abundant migrant/breeder
Tufted duck (Aythya fuligula)	Irregular vagrant
Greater scaup (Aythya marila)	Common migrant
King eider (Somateria spectabilis)	Uncommon migrant/
	probable resident non-
	breeder
Common eider (Somateria mollissima)	Uncommon vagrant
Harlequin duck (Histrionicus histrionicus)	Abundant resident non-
,	breeder
Surf scoter (Melanitta perspicillata)	Accidental vagrant
White-winged scoter (Melanitta fusca)	Uncommon vagrant
Long-tailed duck (Clangula hyemalis)	Rare breeder
Bufflehead (Bucephala albeola)	Rare migrant
Common goldeneye (Bucephala clangula)	Irregular migrant
Red-breasted merganser (Mergus serrator)	Irregular vagrant
Red-necked grebe (Podiceps grisegena)	Common migrant
Black oystercatcher (Haematopus bachmani)	Casual vagrant
American golden-plover (Pluvialis dominica)	Accidental vagrant
Pacific golden-plover (Pluvialis fulva)	Common migrant
Semipalmated plover (Charadrius semipalmatus)	Common breeder
Whimbrel (Numenius phaeopus)	Uncommon migrant
Far Eastern curlew (Numenius madagascariensis)	Accidental vagrant
Bar-tailed godwit (<i>Limosa lapponica</i>)	Common migrant
Ruddy turnstone (<i>Arenaria interpres</i>)	Abundant migrant
Ruff (Calidris pugnax)	Irregular vagrant
Sharp-tailed sandpiper (Calidris acuminate)	Common migrant
Red-necked stint (<i>Calidris ruficollis</i>)	Irregular vagrant
Sanderling (Calidris alba)	Irregular vagrant
Dunlin (Calidris alpine)	Irregular vagrant
Pribilof rock sandpiper (Calidris ptilocnemis ptilocnemis)	Abundant breeder
Baird's sandpiper (Calidris bairdii)	Accidental vagrant
Little stint (Calidris minuta)	Accidental vagrant
Least sandpiper (Calidris minutilla)	Common breeder
Buff-breasted sandpiper (Calidris subruficollis)	Casual vagrant
Dan orange sanapiper (Canara suorajiconis)	Cabaai vagiani

Pectoral sandpiper (Calidris melanotos)	Rare migrant
Semipalmated sandpiper (Calidris pusilla)	Uncommon vagrant
Western sandpiper (Calidris mauri)	Common migrant
Short-billed dowitcher (<i>Limnodromus griseus</i>)	Accidental vagrant
Long-billed dowitcher (Limnodromus scolopaceus)	Rare migrant
Common snipe (Gallinago gallinago)	Accidental vagrant
Terek sandpiper (Xenus cinereus)	Casual vagrant
Gray-tailed tattler (Heteroscelus brevipes)	Uncommon vagrant
Wandering tattler (<i>Tringa incana</i>)	Common migrant
Common greenshank (Tringa nebularia)	Rare vagrant
Wood sandpiper (<i>Tringa glareola</i>)	Irregular migrant
Red-necked phalarope (Phalaropus lobatus)	Common breeder
Red phalarope (<i>Phalaropus fulicarius</i>)	Abundant migrant
Pomarine jaeger (Stercorarius pomarinus)	Rare migrant
Parasitic jaeger (Stercorarius parasiticus)	Uncommon migrant
Long-tailed jaeger (Stercorarius longicaudus)	Uncommon migrant
Common murre (<i>Uria aalge</i>)	Very abundant breeder
Thick-billed murre (<i>Uria lomvia</i>)	Very abundant breeder
Pigeon guillemot (Cepphus columba)	Casual vagrant
Marbled murrelet (Brachyramphus marmoratus)	Accidental vagrant
Ancient murrelet (Synthliboramphus antiquus)	Irregular migrant
Cassin's auklet (Ptychoramphus aleuticus)	Casual vagrant
Parakeet auklet (Aethia psittacula)	Abundant breeder
Least auklet (Aethia pusilla)	Abundant breeder
Crested auklet (Aethia cristatella)	Common breeder
Rhinoceros auklet (Cerorhinca monocerata)	Casual vagrant
Horned puffin (Fratercula corniculata)	Common breeder
Tufted puffin (Fratercula cirrhata)	Common breeder
Black-legged kittiwake (Rissa tridactyla)	Abundant breeder
Red-legged kittiwake (Rissa brevirostris)	Abundant breeder
Sabine's gull (Xema sabini)	Casual migrant
Black-headed gull (Larus ridibundus)	Rare vagrant
Herring gull (Larus argentatus)	Casual vagrant
Slaty-backed gull (Larus schistisagus)	Irregular migrant
Glaucous-winged gull (Larus glaucescens)	Common resident/
	probable breeder
Glaucous gull (Larus hyperboreus)	Uncommon resident
Pacific loon (Gavia pacifica)	Casual vagrant
Common loon (Gavia immer)	Irregular vagrant
Yellow-billed loon (Gavia adamsii)	Casual vagrant
Laysan albatross (Phoebastria immutabilis)	Accidental migrant
Northern fulmar (Fulmarus glacialis)	Abundant breeder
Mottled petrel (Pterodroma inexpectata)	Accidental migrant
Short-tailed shearwater (Puffinus tenuirostris)	Uncommon migrant
Fork-tailed storm-petrel (Oceanodroma furcata)	Accidental migrant

Double-crested cormorant (Phalacrocorax auritus)	Irregular vagrant
Red-faced cormorant (Phalacrocorax urile)	Abundant breeder
Pelagic cormorant (Phalacrocorax pelagicus)	Common migrant/resident
Bald eagle (Haliaeetus leucocephalus)	Irregular vagrant
Short-eared owl (Asio flammeus)	Casual vagrant
Peregrine falcon (Falco peregrinus)	Uncommon migrant
Eastern kingbird (Tyrannus tyrannus)	Accidental vagrant
Common raven (Corvus corax)	Uncommon migrant
Bank swallow (Riparia riparia)	Rare vagrant
Barn swallow (Hirundo rustica)	Common vagrant
Common house-martin (Delichon urbicum)	Accidental vagrant
Pacific wren (Troglodytes pacificus)	Abundant breeder
Arctic warbler (<i>Phylloscopus borealis</i>)	Casual vagrant
Gray-streaked flycatcher (Muscicapa griseisticta)	Accidental vagrant
Northern wheatear (<i>Oenanthe oenanthe</i>)	Irregular migrant
Gray-cheeked thrush (Catharus minimus)	Irregular vagrant
Hermit thrush (Catharus guttatus)	Casual vagrant
Eyebrowed thrush (<i>Turdus obscurus</i>)	Casual vagrant
Eastern yellow wagtail (Motacilla tschutschensis)	Casual migrant
Gray wagtail (Motacilla cinerea)	Accidental vagrant
White wagtail (Motacilla alba)	Accidental vagrant
Olive-backed pipit (Anthus hodgsoni)	Casual vagrant
Red-thoated pipit (Anthus cervinus)	Accidental vagrant
American pipit (Anthus rubescens)	Common migrant
Brambling (Fringilla montifringilla)	Irregular vagrant
Hawfinch (Coccothraustes coccothraustes)	Casual vagrant
Gray-crowned rosy-finch (Leucosticte tephrocotis)	Abundant breeder
Common redpoll (Acanthis flammea)	Rare migrant
Hoary redpoll (Acanthis hornemanni)	Rare migrant
Lapland longspur (Calcarius lapponicus)	Abundant breeder
Snow bunting (Plectrophenax nivalis)	Abundant breeder
McKay's bunting (Plectrophenax hyperboreus)	Casual migrant
Savannah sparrow (Passerculus sandwichensis)	Irregular migrant
Fox sparrow (Passerella iliaca)	Irregular migrant
Lincoln's sparrow (Melospiza lincolnii)	Accidental vagrant
White-crowned sparrow (Zonotrichia leucophrys)	Irregular migrant
Golden-crowned sparrow (Zonotrichia atricapilla)	Irregular migrant
Brewer's blackbird (Euphagus cyanocephalus)	Accidental vagrant
Northern waterthrush (Parkesia noveboracensis)	Accidental vagrant
Orange-crowned warbler (Oreothlypis celata)	Casual vagrant
Yellow warbler (Setophaga petechia)	Casual vagrant
Wilson's warbler (Cardellina pusilla)	Casual migrant
Nearctic brown lemming (Lemmus trimucronatus)	Common breeder
Arctic fox (Vulpes lagopus)	Abundant breeder
Northern fur seal (Callorhinus ursinus)	Abundant breeder

Steller sea lion (Eumetopias jubatus)	Common non-breeder
Harbor seal (Phoca vitulina)	Common non-breeder
Reindeer (Rangifer tarandus)	Abundant breeder
Minke whale (Balaenoptera acutorostrata)	Casual migrant
Fin whale (Balaenoptera physalus)	Casual migrant
Orca (Orcinus orca)	Rare migrant

(Guitart et.al 2018)

From: Rouse, Michael B CIV USARMY CEPOA (US)

To: "douglass cooper@fws.gov"

Subject: FWCA Coordination Request Letter for St. George Navigation Improvements Feasibility Assessment

 Date:
 Wednesday, February 14, 2018 4:38:00 PM

 Attachments:
 Saint George FWCA Letter-signed.pdf

Good Afternoon, Doug,

As promised per our phone conversation earlier today, here is a FWCA coordination request letter for a USACE feasibility assessment at St. George Island. USACE is evaluating harbor placement, orientation, and various geometries in order to alleviate navigational inefficiencies for the St. George community, which is in dire need of some form of economic improvement, this may just be it.

Although USACE does not anticipate significant impacts to the human or natural environment, we do envision implementing this project under strict timing windows to avoid impacts to marine mammals and sea birds.

Please review the attached letter and provide thoughts and concerns for moving forward.

Sincerely,

Mike Rouse Fisheries Biologist / NEPA Coordinator Alaska District US Army Corps of Engineers (907) 753-2743 From: <u>Google Calendar</u> on behalf of <u>michael.williams@noaa.gov</u>

Rouse, Michael B CIV USARMY CEPOA (US) To:

Subject: [Non-DoD Source] Accepted: St. George TSP Presentation to NMFS @ Mon May 14, 2018 1pm - 2:30pm (AKDT)

(Rouse, Michael B CIV USARMY CEPOA (US))

Start: Monday, May 14, 2018 1:00:00 PM Monday, May 14, 2018 2:30:00 PM Fnd:

Location: , Anchorage Attachments: invite.ics

michael.williams@noaa.gov has accepted this invitation.

St. George TSP Presentation to NMFS

When Mon May 14, 2018 1pm – 2:30pm Alaska Time

Where , Anchorage (map <Blockedhttps://maps.google.com/maps?q=,+Anchorage&hl=en>)
Calendar Rouse, Michael B CIV USARMY CEPOA (US)

Who • Rouse, Michael B CIV USARMY CEPOA (US) - organizer

- michael.williams@noaa.gov creator
- Seanbob Kelly NOAA Federal
- Hoffman, Christopher A CIV USARMY CEPOA (US)

Invitation from Google Calendar < Blockedhttps://www.google.com/calendar/>

You are receiving this courtesy email at the account michael.b.rouse@usace.army.mil because you are an attendee of this event.

To stop receiving future updates for this event, decline this event. Alternatively you can sign up for a Google account at

Blockedhttps://www.google.com/calendar/ and control your notification settings for your entire calendar.

Forwarding this invitation could allow any recipient to modify your RSVP response. Learn More

<Blockedhttps://support.google.com/calendar/answer/37135#forwarding>.

From: <u>Greg Balogh - NOAA Federal</u>

To: Rouse, Michael B CIV USARMY CEPOA (USA)

Subject: [Non-DoD Source] Re: Species List Confirmation Request

Date: Friday, June 14, 2019 11:57:08 AM

Hi Mike,

If an informal response works for you, then here goes: Your list looks pretty good in terms of inclusion of species. You should add ringed seal and bearded seal to your list of T&E species. Also missing is inclusion of designated critical habitat, specifically, Steller sea lion critical habitat around St. George and St. Paul. Call or write with questions.

On Fri, Jun 14, 2019 at 10:37 AM Rouse, Michael B CIV USARMY CEPOA (USA) <Michael.B.Rouse@usace.army.mil <mailto:Michael.B.Rouse@usace.army.mil>> wrote:

Greg,

Please review and respond to the Corps' request for a protected species list confirmation for our feasibility assessment for navigational improvements at St. George.

Thanks and have a great weekend,

Mike Rouse Fisheries Biologist / NEPA Coordinator Alaska District US Army Corps of Engineers (907) 753-2743

--

Greg Balogh

AKR PRD ANC Field Office Supervisor NOAA Fisheries 222 W 7th Ave Rm 552, Box 43 Anchorage, AK 99513 907-271-3023 (w) 907-306-1895 (c)

To report a stranded or entangled marine mammal, contact the Stranding Network at 1-877-925-7773 <tel: (877)%20925-7773>

From: Rouse, Michael B CIV USARMY CEPOA (US)

To: Romano, Marc

Subject: RE: [Non-DoD Source] Re: [EXTERNAL] Re: Trip to Saint George

Date: Tuesday, July 25, 2017 9:13:00 AM

Hey Marc,

I'm just back in the office after a week in Kotzebue. I'll have a look for that report today, I can't guarantee that it would be available electronically.

Mike

Mike Rouse Fisheries Biologist / NEPA Coordinator Alaska District US Army Corps of Engineers (907) 753-2743

----Original Message----

From: Romano, Marc [mailto:marc romano@fws.gov]

Sent: Wednesday, July 19, 2017 2:18 PM

To: Rouse, Michael B CIV USARMY CEPOA (US) < Michael.B.Rouse@usace.army.mil>

Subject: Re: [Non-DoD Source] Re: [EXTERNAL] Re: Trip to Saint George

Hello Mike,

Would you happen to have a copy of the USACE Harbor Dredging Report for St. George from 1988 that you could share?

Cheers, Marc

Marc Romano - Wildlife Biologist
Alaska Maritime NWR
Bering Sea Unit
95 Sterling Hwy., Suite 1
Homer, AK 99603
(907) 226-4608 - phone; (907) 235-7783 - fax
Marc_Romano@fws.gov <mailto:Marc_Romano@fws.gov>

On Fri, Jun 16, 2017 at 11:41 AM, Rouse, Michael B CIV USARMY CEPOA (US) <Michael.B.Rouse@usace.army.mil <mailto:Michael.B.Rouse@usace.army.mil> > wrote:

Thanks for the introduction, Marc.

It is very much appreciated.

Hello Emily,

If everything goes according to plan, our Army Corps team will be on St George the afternoon of Wednesday,

the 21st. Our intent is to give a presentation to the community concerning the progress of our feasibility study to make navigational improvements to St. George's harbor and breakwater jetties. The presentation is scheduled for Thursday evening, and the rest of my time will be spent conducting site visits, taking photographs, and recording biological observations that will help me to characterize the ecological processes at work as we move forward with our project. I would be grateful if you could spare some of your valuable time and impart some of your first-hand knowledge on me.

I won't be in the office on Monday or Tuesday, so if you wouldn't mind responding to my civilian email: Ragingbull261@yahoo.com < mailto: Ragingbull261@yahoo.com or calling (if possible) my cell is 907-782-5088.

Thanks a bunch.

Mike Rouse Fisheries Biologist / NEPA Coordinator Alaska District US Army Corps of Engineers (907) 753-2743

----Original Message----

From: Romano, Marc [mailto:marc_romano@fws.gov < mailto:marc_romano@fws.gov >]

Sent: Friday, June 16, 2017 11:12 AM

To: Rouse, Michael B CIV USARMY CEPOA (US) <Michael.B.Rouse@usace.army.mil <mailto:Michael.B.Rouse@usace.army.mil> >; Emily Pollom <EMILY.POLLOM@gmail.com <mailto:EMILY.POLLOM@gmail.com> >

Subject: Re: [Non-DoD Source] Re: [EXTERNAL] Re: Trip to Saint George

Hello Mike and Emily,

Mike, I'll let you explain your work to Emily and arrange a time for her to show you around.

Emily, Mike is working on a potential project for the Army Corps of Engineers and he is going to be conducting a site visit to get acquainted with the biological resources on St. George. It would be great if you could spend some time with him while he is on-island.

Cheers. Marc Marc Romano - Wildlife Biologist Alaska Maritime NWR Bering Sea Unit 95 Sterling Hwv., Suite 1 Homer, AK 99603 (907) 226-4608 - phone; (907) 235-7783 - fax Marc_Romano@fws.gov < mailto:Marc_Romano@fws.gov > < mailto:Marc_Romano@fws.gov > > On Mon, Jun 12, 2017 at 4:12 PM, Michael Williams - NOAA Federal <michael.williams@noaa.gov <mailto:michael.williams@noaa.gov> <mailto:michael.williams@noaa.gov >>> wrote: dennis lekanof can be reached via email: dj_lekanof@hotmail.com <mailto:dj_lekanof@hotmail.com> <mailto:di_lekanof@hotmail.com >> His office number is 859-2447 The FWS will have their seasonal folks on island. I'm not sure how valuable they will be to your needs. Marc Romano is my counterpart over at the Maritime Refuge: marc romano@fws.gov

 $\underline{<} mailto: marc_romano@fws.gov> < Blockedhttp://fws.gov < Blockedhttp://fws.gov>>. He was on St. George recently, but I am not sure how long he will be there, or if he is still there.$

m...

On Mon, Jun 12, 2017 at 4:02 PM, Rouse, Michael B C <michael.b.rouse@usace.army.mil <<u="">mailto:Michael.B.Rouse@ <<u>mailto:Michael.B.Rouse@usace.army.mil</u> > > > wrote:</michael.b.rouse@usace.army.mil>	
<u></u>	
Absolutely, sir. When it is ready, I'll get it to you.	
Do you by chance have some contact info for Den	nis Lekanof?
Also, do you know if there will there be any USF could maybe meet up with?	WS bird folks out there that I
Mike Rouse	
Fisheries Biologist / NEPA Coordinator	
Alaska District US Army Corps of Engineers	
(907) 753-2743 <tel:%28907%29%20753-2743></tel:%28907%29%20753-2743>	
<u>—</u>	
<u> </u>	
Original Message	
From: Michael Williams - NOAA Federal [mailto	
<mailto:michael.williams@noaa.gov> <mailto:michael.williams< td=""><td>s@noaa.gov >>]</td></mailto:michael.williams<></mailto:michael.williams@noaa.gov>	s@noaa.gov >>]
Sent: Monday, June 05, 2017 9:26 AM Tay Royce Michael B. CIV, US A PMY, CEROA (I	(C) Michael D Douge Queen a community
To: Rouse, Michael B CIV USARMY CEPOA (Usarmy: Michael B.Rouse@usace.army.mil> < mailto:Michael B.Rouse.army.mil> < mailto:	·
Subject: Re: [Non-DoD Source] Re: [EXTERNA]	•
Subject. Re. [Non-Dod Source] Re. [EATERVAL	27 Re. Trip to Saint George
Mike,	
If there is an opportunity, I would be very interest	ed in seeing the
presentation at some point.	
Second I would make sure that you visit with Den	nis Lekanof and that you walk
towards Zapadni rookery from the harbor along th	•
seals, and also visit the end of the Zapadni rooker	•
you to hike up around the rookery to the hill that i	s between Zapadni and
South rookeries. These two rookeries represent al	bout 1/3 of all the fur seals
breeding and resting on St. George.	
<u></u>	
Good luck on your trip. I will touch base with De	nnis so that he knows.
<u>m</u>	
<u></u>	
On Fri, Jun 2, 2017 at 8:43 AM, Rouse, Michael F	
Micles.Rouse@usace.army.mil mailto:Micles.Rouse@usace.army.mil Micles.Rouse@usace.army.mil mailto:Micles.Rouse@usace.army.mil mailto:Micles.Rouse@usace.army.mil Micles.Rouse@usace.army.mil mailto:Micles.Rouse@usace.army.mil Micles.Rouse@usace.army.mil mailto:Micles.Rouse@usace.army.mil Micles.Rouse@usace.army.mil Micles.Rouse@usace.army.mil Micles.Rouse@usace.army.mil Micles.Rouse.army.mil Micles.Micles.Micles.Micles.Micles.Micles.Micles.Mic	•
<mailto:michael.b.rouse@usace.army.mil>> <mailto:michael< td=""><td>I.B.Rouse@usace.army.mil ></td></mailto:michael<></mailto:michael.b.rouse@usace.army.mil>	I.B.Rouse@usace.army.mil >
<mailto:michael.b.rouse@usace.army.mil>>>></mailto:michael.b.rouse@usace.army.mil>	
wrote:	
	
Mike,	
I've already locked in some travel plans that	nave me headed out to St George
with a few more folks from our Project Deve	1
giving some presentations to the community	on the progress of our project.

	We've got some good modeling completed on some of the breakwater structure alternatives. Our travel dates are 21-23 June, so I'll just miss you by a
bit.	
UIL.	real to the second seco
	If there's anything you think I ought to see please pass it along and I'll do
	my best to check it out.
	Mike Rouse
	Fisheries Biologist / NEPA Coordinator
	Alaska District US Army Corps of Engineers
	(907) 753-2743 <tel:%28907%29%20753-2743> <tel:%28907%29%20753-2743></tel:%28907%29%20753-2743></tel:%28907%29%20753-2743>
	0.11
	Original Message
	From: Michael Williams - NOAA Federal [mailto:michael.williams@noaa.gov
<mailto:michael.w< td=""><td>illiams@noaa.gov> <mailto:michael.williams@noaa.gov>></mailto:michael.williams@noaa.gov></td></mailto:michael.w<>	illiams@noaa.gov> <mailto:michael.williams@noaa.gov>></mailto:michael.williams@noaa.gov>
	ailto:michael.williams@noaa.gov > <mailto:michael.williams@noaa.gov>> >]</mailto:michael.williams@noaa.gov>
- CITI	
	Sent: Thursday, June 01, 2017 4:39 PM
	To: Rouse, Michael B CIV USARMY CEPOA (US) < Michael.B.Rouse@usace.army.mil
<mailto:michael.b< td=""><td>.Rouse@usace.army.mil> < mailto:Michael.B.Rouse@usace.army.mil >></td></mailto:michael.b<>	.Rouse@usace.army.mil> < mailto:Michael.B.Rouse@usace.army.mil >>
	ailto:Michael.B.Rouse@usace.army.mil > <mailto:michael.b.rouse@usace.army.mil>>>></mailto:michael.b.rouse@usace.army.mil>
	Subject: [Non-DoD Source] Re: [EXTERNAL] Re: Trip to Saint George
	Subject. [Noil-DOD Source] Re. [EATEKNAL] Re. 111p to Saint George
	<u>Hi Mike,</u>
	I'm currently planning to be on St. George starting on July 5 through 12, but
	may delay until the 7th depending on a few things that I hope to hear about
hu	may delay and the ran depending on a rew timings that I hope to hear deout
<u>by</u>	
	next week.
	lets chat next week about what is happeningif anythingI'm off tomorrow
	M
	- Van
	On Thu, Mar 30, 2017 at 3:26 PM, Rouse, Michael B CIV USARMY CEPOA (US)
	<michael.b.rouse@usace.armv.mil <="" mailto:michael.b.rouse@usace.armv.mil=""></michael.b.rouse@usace.armv.mil>
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>>	
	wrote:
	wide.
	Mike,
	If it's not too much trouble for you I'd like to coordinate my travel
plan	
	with your intended dates (perhaps only 4 days, and not all 10).
Plea	ase give
	me
-	
	a ring when you get back from leave so we can discuss some of the
logi	stics.
	Thanks,
	Mil D
	Mike Rouse
	Fisheries Biologist / NEPA Coordinator
	Alaska District US Army Corps of Engineers

<mailto:Michael.B.Rouse@usace.army.mil > <mailto:Michael.B.Rouse@usace.army.mil > >>

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<u> </u>	
>>	
wro	ote:
	Mike,
	Our project development team is looking at potential dates
for a trip	
out to	
	St. George. I'd like to know when you are planning on being
out there	• 1 5
SO	
	that you might be able to familiarize me with the marine and
avian	•
	resources. I can't imagine that we'd be out there for more
than three	
or	
	four days, maybe less.
	Have those St. Paul harbor docs been of any use to you?
	Thoughts?
	Mike Rouse
	Fisheries Biologist / NEPA Coordinator
	Alaska District US Army Corps of Engineers
	(907) 753-2743 <tel:%28907%29%20753-2743> <tel:%28907%29%20753-2743></tel:%28907%29%20753-2743></tel:%28907%29%20753-2743>
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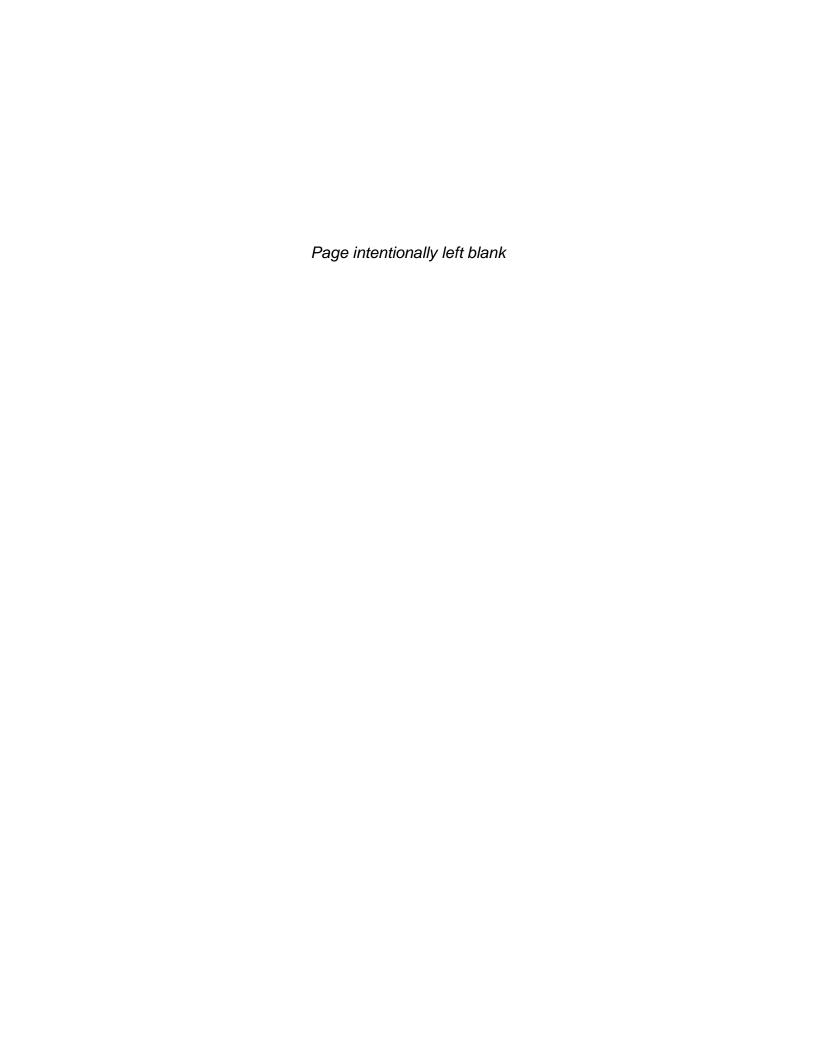
ST. GEORGE HARBOR IMPROVEMENT FEASIBILITY STUDY

APPENDIX E: NHPA SECTION 106 DOCUMENTATION

ST. GEORGE, ALASKA









DEPARTMENT OF THE ARMY ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS P.O. BOX 6898 JBER, AK 99506-0898

Ms. Judith Bittner
State Historic Preservation Officer
Office of History and Archaeology
550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

JUL 0 2 2018

Dear Ms. Bittner,

The United States Army Corps of Engineers (USACE), under the Civil Works (CW) Program, is planning to develop a harbor on the north side of Saint George Island, Pribilof Islands (Figure 1; Section 28, T41S, R129W, USGS Pribilof Islands A-3, Seward Meridian). The project is being conducted in conjunction with the City of St. George under Section 107 of the 1960 River and Harbor Act, as amended, which "allows the USACE to study, plan, and construct small navigations projects such as boat harbors." In compliance with Section 106 of the National Historic Preservation Act of 1966 [36 CFR § 800.2(a)(4)], the purpose of this letter is to notify you of a Federal undertaking and to seek your concurrence on an assessment of effect.

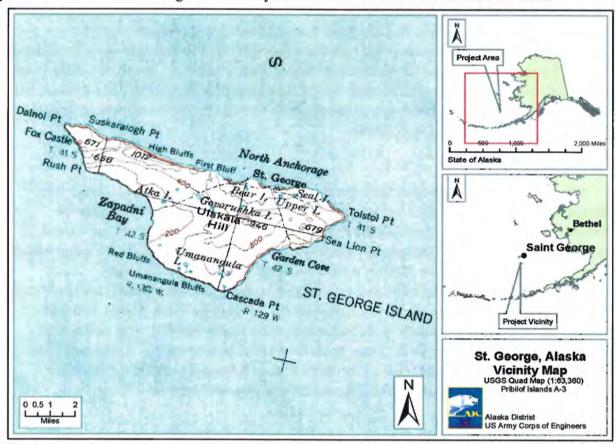


Figure 1: Project area is at the City of St. George on the northern side of the island.

Context

Russian Period

Saint George Island is part of the Pribilof Island group located in the Bering Sea, approximately 250 miles north of the Islands of Four Mountains in the Aleutian archipelago and 300 miles west of the mainland of Alaska. Russian fur-hunting crews had actively sought these island since at least 1768, as they knew that the northern fur seals (*Callorhinus ursinus*) they had observed and hunted in the passes of the eastern Aleutians must have breeding grounds somewhere to the north. On June 25, 1786, St. George Island was discovered by the crew of *Sv. Georgii Pobedonosets* (*St. George the Victorious*), commanded by Gavriil Loginovich Pribylov of the Lebedev-Lastochkin Company. Upon finding no safe harbor, Pribylov left a party of 40 men to winter there and returned to Unalaska Island for supplies. While the crew was on Saint George, they spotted another island to the northwest. Once Pribylov returned the following summer, they sailed to this new island and named it Saint Peter and Saint Paul Island for the Saints' day on which they landed. This island's name has since been shorted to Saint Paul Island (Eldridge 2016).

Although the Pribilof Islands were uninhabited when the *St. George the Victorious* arrived, Unangan oral history holds that they had known of these island for some time before their documentation by the Russians (Black 2004; Elliott 1882; Jochelson 2003; Osgood et al. 1915; Torrey 1980; Veniaminov 1984). In 1787, rival Russian fur-hunting companies quickly established seasonal sealing camps around the coasts of both Saint George and Saint Paul Islands to harvest the valuable northern fur seal pelts. Unangan from Unalaska, Umnak, and Atka Islands were brought to the islands to provide labor for the Russians (Eldridge 2016). They constructed traditional semi-subterranean barabaras on the southern shore and a permanent village on the north of Saint George Island (Etnier 2004).

Alaska Territory Period

After the Treaty of Cession in 1867 by which the United States purchased Alaska from Russia, administers and management from the Alaska Commercial Company became the governing authorities on the island (Faulkner *et al.* 1987). Under the authority of the United States Treasury, the Alaska Commercial Company took over operations on Saint George Island. The company razed many of the Russian period buildings, including the Unangan semisubterranean houses, and constructed wood-frame housing and a number of new commercial buildings on the north shore of the island. Construction included the Great Martyr Orthodox Church, completed in 1936, as well as the old administrative core building with staff housing overlooking the dock from the cliffs. There were six rows of houses that ran southeast of the church, with a community center. The commercial district is located near the old dock and consists of fourteen buildings. Portions of the waterfront was destroyed by a fire in 1950 (Faulkner *et al.* 1987).

Treatment of the local Unangan population also changed with the advent of the Alaska Commercial Company's control of St. George. From Cession to the U.S. involvement in World War II, the Company changed its treatment and attitudes toward the Unangan workforce from

what could be considered a reasonably paid citizen of the United States to a form of servitude, where wages, lifestyle, and conditions were all controlled by the Company. These conditions persisted and then deteriorated even more during World War II when the Pribilof Islands were evacuated and the population was sent to Southeast Alaska for the duration of the war. On June 14, 1942, the residents of St. George were ordered to pack their belongings for evacuation of the island due to threat of Japanese attack. On June 16, 1942, 294 Unangan and 15 non-Unangan U.S. Fish & Wildlife Service employees were evacuated from St. George aboard the U.S. Army Transport (U.S.A.T.) Delarof (Commission 1983). As a result of a hasty evacuation, many personal belongings and government property was left on the island (Jones 1980; Torrey 1980).

Project Description

St. George's southern breakwater is eroding affecting the usability of the harbor, as a result storms have been causing damage to vessels in the harbor. The USACE is proposing to construct a new harbor that would replace the existing remains of the historic north harbor. Construction would involve deepening the existing bay and developing a breakwater to protect it from the weather. Plans also include a small boat pull-out protected from the breakwater, and a temporary footpad for the project along the northern shoreline directly to the east of the project area. As a cost-effective solution to the failing southern breakwater harbor, this project would significantly increase operational use of the harbor throughout the year. The benefits of this development also include increasing public health and safety, increasing access to subsistence resources, alleviating economic stresses on the community, and protecting social and cultural values in the community.

Initial review of the Alaska Heritage Resources Survey (AHRS) concluded that the construction would involve removing or covering two existing cultural resources, two "buildings" which are actually docks listed as XPI-194 and XPI-195. All current design proposals for the harbor would involve building a breakwater over site XPI-194, as well as the construction of a small boat pullout at the site XPI-195 (Figure 2).



Figure 2: Proposed APE for the northern harbor in the orange polygon, XPI-194 and XPI-195 circled in green.

Historic Properties

Saint George Island has a number of known cultural resources. These are associated with both the Russian and American fur trades; a large portion of the northern shore has been registered as a National Historic Landmark (NHL). The Seal Islands Historic District NHL (XPI-002) occupies both Saint Paul Island and Saint George Island (Figure 3). In total, there are 68 known sites and one NHL listed in the Alaska Heritage Resources Survey (AHRS) within the boundaries of the City of St. George; the vast majority of the resources being associated "buildings" to the Seal Island Historic District NHL (Tables 1 and 2).



Figure 3: Seal Islands Historic District NHL on Saint George Island (AHRS 2018).

In its entirety, the Seal Islands Historic District NHL includes 106 contributing buildings, two contributing structures, 12 historic sites (the northern fur seal rookeries) and nine archaeological sites. The NHL consists of a combination of Russian-era buildings and structures that were not destroyed by the Alaska Commercial Company, as well as American structures, of which many replaced Russian buildings to allow for continued seal harvesting into the 20th century. Of the 68 identified sites on the AHRS, only four sites in addition to the NHL have a specific site name and any DOEs conducted for them (Table 1). There are 65 contributing "buildings" within the NHL that are in the vicinity of the APE; however, they have not been adequately described or evaluated for their eligibility to the National Register of Historic Places (NRHP) (Table 2).

Table 1: Prominent known cultural resources in the general vicinity of the APE (AHRS 2018).

Site Number	Site Name	NRHP Status	In APE
XPI-002	Seal Islands Historic District	NHL	Yes
XPI-004	Great Martyr Orthodox Church	Listed on the Register	No
XPI-018	St. George Seal Skin Plant	Eligible	No
XPI-019	St. George Cottage	Unknown	No
XPI-116	St. George School	Not Eligible	No

Table 2: List of sites within the NHL in the general vicinity of the APE.

Site Number	Site Type	NRHP Status	In APE
XPI-089	Building	Unknown	No
XPI-090	Building	Unknown	No
XPI-091	Building	Unknown	No
XPI-092	Building	Unknown	No
XPI-093	Building	Unknown	No
XPI-094	Building	Unknown	No
XPI-095	Building	Unknown	No
XPI-096	Building	Unknown	No
XPI-097	Building	Unknown	No
XPI-098	Building	Unknown	No
XPI-099	Building	Unknown	No
XPI-100	Building	Unknown	No
XPI-101	Building	Unknown	No
XPI-102	Building	Unknown	No
XPI-103	Building	Unknown	No
XPI-104	Building	Unknown	No
XPI-105	Building	Unknown	No
XPI-106	Building	Unknown	No
XPI-107	Building	Unknown	No
XPI-108	Building	Unknown	No
XPI-109	Building	Unknown	No
XPI-110	Building	Unknown	No
XPI-111	Building	Unknown	No
XPI-112	Building	Unknown	No
XPI-113	Building	Unknown	No
XPI-114	Building	Unknown	No
XPI-115	Building	Unknown	No
XPI-117	Building	Unknown	No
XPI-118	Building	Unknown	No
XPI-119	Building	Unknown	No
XPI-120	Building	Unknown	No
XPI-121	Building	Unknown	No
XPI-122	Building	Unknown	No
XPI-123	Building	Unknown	No
XPI-124	Building	Unknown	No
XPI-125	Building	Unknown	No
XPI-126	Building	Unknown	No
XPI-127	Building	Unknown	No
XPI-128	Building	Unknown	No
XPI-129	Building	Unknown	No
XPI-130	Building	Unknown	No
XPI-131	Building	Unknown	No
XPI-133	Building	Unknown	No

XPI-134	Building	Unknown	No
XPI-135	Building	Unknown	No
XPI-136	Building	Unknown	No
XPI-144	Building	Unknown	No
XPI-145	Building	Unknown	No
XPI-146	Building	Unknown	No
XPI-147	Building	Unknown	No
XPI-193	Building	Unknown	No
XPI-194	Building (Large Dock)	Unknown	Yes
XPI-195	Building (Small Dock)	Unknown	Yes
XPI-196	Building	Unknown	No
XPI-197	Building	Unknown	No
XPI-198	Building	Unknown	No
XPI-199	Building	Unknown	No
XPI-200	Building	Unknown	No
XPI-202	Building	Unknown	No
XPI-203	Building	Unknown	No
XPI-204	Building	Unknown	No
XPI-205	Building	Unknown	No
XPI-206	Building	Unknown	No
XPI-207	Building	Unknown	No

Prior to the development of the harbor at Zapadni Bay on the southern shore in 1984, St. George relied on the old docks (XPI-194, XPI-195) located on the north shore at the bight on the west side of town. All commercial activities, subsistence activities, and transportation, including transferring seal and fox pelts, were conducted off of these docks (Isto 2012). While still in use until the Zapadni Bay harbor's construction, the old docks (XPI-195) remained significantly dangerous due to unsatisfactory environmental conditions (Figures 4 and 5). Eliot's (1881:16) description of the harbor at St. George paint a bleak and dangerous picture of the area:

"Lack of Harbors: Anchorages. – The total absence of a harbor at the Pribylov islands is much to be regretted... At St. George matters are still worse, for the prevailing northerly, westerly, and easterly winds drive the boats away from the village roadstead, and weeks often pass at either island, but more frequently at the latter, ere a cargo is landed at its destination. Under the very best of circumstances, it is both hazardous and trying to load and unload ship at any of these places... At St. George, however, the bold, abrupt, bluffy coast everywhere all around, with its circling girdle of flying water-birds far out to sea, looms up quite prominently, even in the fog; or, in other words, the navigator can notice it before he is hard aground or struggling to haul to windward from the breakers under his lee. There are no reefs making out from St. George worthy of notice... At St. George the steamer comes, wind permitting, directly to the village on the north shore, close in, and finds her anchorage in ten fathoms of water, in poor holding-ground; but it is only when three or four days have passed free from northerly, westerly, or easterly winds, that she can make the first attempt to safely unload. The landing here is a very bad one, surf

breaking most violently upon the rocks from one end of the year to the other (Elliot 1881:16)."



Figure 4: View of the dock (XPI-194) at St. George looking northwest.



Figure 5: XPI-195 in view from the bluffs to the southwest. Rocky shoreline continues out with the structure.

There are a number of shipwrecks in the immediate vicinity of Saint George Island that correspond with Elliot's description of the navigation dangers. While the National Oceanic and Atmospheric Agency's (NOAA) shipwreck map is absent of nearby wrecks, the Bureau of Ocean Energy Management (BOEM) lists a number of shipwrecks associated with Saint George Island (BOEM 2011; NOAA 2018). These include the Russian ship the Sv. Ioann Pretecha, which is noted to have shipwrecked in 1792 "on the island." The Maweema sunk in 1915, five miles from St. George village, however no direction is given. The Amatuli sunk 45 miles off Saint George Island in 1987, and the Belair sunk in 1994 on the south side of the island. There is also the steamer known as the Laurada, which wrecked off "Zapadni Point" of St. George in 1899. However, there is no Zapadni Point on St. George; likely there is an error in the BOEM database and it is located at the Zapadni Point on St. Paul Island. If the shipwreck is in Zapadni Bay, that is located on the southern shore of St. George and outside the APE and NHL (BOEM 2011). In August 2018, the USACE is planning on having members from the Environmental Resource team to conduct an underwater survey of the north harbor area. While the primary purpose of this survey is for collecting underwater environmental data, the archaeologist will have access to the ROV, and will do a survey of the APE for any sunken cultural resources which have not been identified by BOEM or NOAA.

A second, smaller dock (XPI-195), was identified directly south of XPI-194. XPI-195 does not extend out into the bight, but instead sticks next to the shoreline. The historic purpose of this second dock is unknown; however, it would have required boats with small drafts (Figures 4 and 5). Assumptions can be made that it either was a secondary dock, or possibly part of the processing stations for seal and fish to allow disposal into the bay.



Figure 4: View of St. George Village from XPI-194. The smaller dock, XPI-195 is on the right in the orange outline.



Figure 7: A closer view of XPI-195. The base of a small crane is on the right side.



Figure 8: Historic photo of the small dock (XPI-195), date unknown, catalog number RG22-95-ADMC-2863 (NARA 2018).

Assessment of Effect

Two known cultural resources will be directly affected by the proposed undertaking (XPI-194 and XPI-195). These two docks are both listed in the AHRS as contributing features to the Seal Islands Historic District NHL (XPI-002), but remain unevaluated individually for listing on the National Register of Historic Places (NRHP). The proposed project will have an **Adverse Effect** on XPI-194 and XPI-195, as defined by 36 CFR § 800.5(a)(1) adverse effects occur:

When an undertaking may alter, directly or indirectly, and of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be further removed in distance or be cumulative.

Conclusion

The proposed breakwater will be constructed on top of XPI-194, and it is likely that the city will construct a small boat ramp at XPI-195. A Memorandum of Agreement is anticipated; please expect an invitation to participate per 36 CFR § 800.6(a) in the near future. The lead time required for awarding contracts and coordinating planning documents in advance of the actual field work for this undertaking is significant. Importantly, the historic value within a NHL creates added challenges per 36 CFR § 65.2(c)(2), which require "the responsible Federal agency to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark." The USACE has determined the proposed undertaking will have an Adverse Effect on local cultural resources, per 36 CFR § 800.5(d)(2). If you have any questions about this project, please contact me by phone at 907.753.2640, or by email at joseph.e.sparaga@usace.army.mil.

Sincerely,

Joseph E. Sparaga

Archaeologist

Environmental Resources

Cc:

Thomas Mack, President & CEO of Aleut Corporation
Dimitri Philemonof, President & CEO of Aleutian Pribilof Islands Association, Incorporated
Christopher Merculief, President of Saint George Traditional Council
Nathan McCowan, President of St. George Tanaq Corporation
Patrick Pletnikoff, Mayor of City of St. George
Larry Cotter, CEO of Aleutian Pribilof Island Community Development Association

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Department of Natural Resources

DIVISION OF PARKS & OUTDOOR RECREATION
Office of History & Archaeology

550 West 7th Ave., Suite 1310 Anchorage, Alaska 99501-3565 Main 907.269.8721 http://dnr.alaska.gov/parks/pha

August 1, 2018

File No.:

3130-1R COE / 2018-0831

Joseph E. Sparaga U.S. Army Corps of Engineers Alaska District CEPOA-PM-C-ER P.O. Box 6898 JBER, AK 99506-0898

Subject:

St. George Harbor Project

Dear Mr. Sparaga:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence concerning the subject project on July 5, 2018. Our office has reviewed the undertaking pursuant Section 106 of the National Historic Preservation Act and offer the following comments for your consideration.

A proposed area of potential effects (APE) was presented in Figure 2, but was not accompanied by a discussion of what components of the project are encompassed by the APE or what types of effects were taken into account with the proposed APE. Common project elements discussed in a project description and/or APE section include material sources, laydown areas, construction camps, and access routes. Our office is uncertain whether these aspects of the project are included in the APE as they were not discussed and welcome additional information in the future. We are also concerned about effects the project may have on the Seal Islands Historic District National Historic Landmark (NHL) and request USACE consider broadening the APE to include potential indirect and cumulative effects the project may have on the NHL.

USACE identified three known cultural resources within the APE: the NHL (XPI-00002), a Large Dock (XPI-00194), and a Small Dock (XPI-00195). The NHL is split between St. Paul and St. George Islands and it is our office's understanding that a project to re-examine the contributing features and integrity of the St. George portion of the NHL was initiated, but never completed. The information reported to the AHRS from this project, including XPI-00194 and XPI-00195, is minimal and only states that the resources are within the boundary of the NHL. Given what is known about the docks, they are associated with fur seal industry and could be contributing features to the NHL, but they were not mentioned in the nomination and our office does not have on file any record of a formal evaluation of their eligibility status, even as contributing elements to the NHL. Our office encourages USACE to formally evaluate XPI-00194 and XPI-00195 for National Register of Historic Places eligibility, as well as evaluating their ability to contribute to the NHL.

Our office concurs that an agreement document should developed to implement and/or resolve effects for the St. George Harbor project. As the project is in the early development stages and there are a number of unknowns, we recommend that USACE consider a programmatic agreement rather than a memorandum of agreement (MOA). For a MOA to move forward, we would either need to agree that the project will have an adverse effect on the NHL or agree to defer formal evaluations for XPI-00194 and XPI-00195 and treat them as eligible for the purposes of this project.

Thank you for the opportunity to comment and we look forward to continued consultation concerning the project. Please contact Sarah Meitl at 269-8720 or sarah.meitl@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner

State Historic Preservation Officer

JEB:sjm

IN REPLY REFER TO:

1.B. (AKRO-CR) August 6, 2018

United States Department of the Interior

NATIONAL PARK SERVICE

Alaska Region 240 West 5th Avenue, Room 114 Anchorage, Alaska 99501

VIA ELECTRONIC MAIL - NO HARD COPY TO FOLLOW

Joseph E. Sparaga Department of the Army Alaska District, U.S. Army Corps of Engineers P.O. Box 6898 JBER, AK 99506-0898

Subject: St. George Harbor Development

Dear Mr. Sparaga:

Thank you for providing us with a copy of your July 2, 2018 letter to the Alaska State Historic Preservation Officer, on July 30th, regarding the United States Army Corps of Engineers (USACE) plan to develop a harbor on the north side of Saint George Island, Pribilof Islands.

The National Park Service (NPS) administers the National Historic Landmarks (NHL) program for the Secretary of the Interior. Federal agencies undertaking a project within a NHL must be in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. The project is located within the boundaries of the Seal Islands NHL, with historic districts on both St. George and St. Paul islands. The NPS serves as an interested party throughout the Section 106 process to ensure the integrity of the NHL.

We look forward to continued consultation with USACE, including additional information about AHRS Site numbers XPI-00194 and XPI-00195, as well as consulting during the development of an agreement document to mitigate the adverse effects of the project. Janet Clemens, Historian, will continue to serve as NPS contact for this Section 106 review and is available at 907-644-3461 or janet clemens@nps.gov.

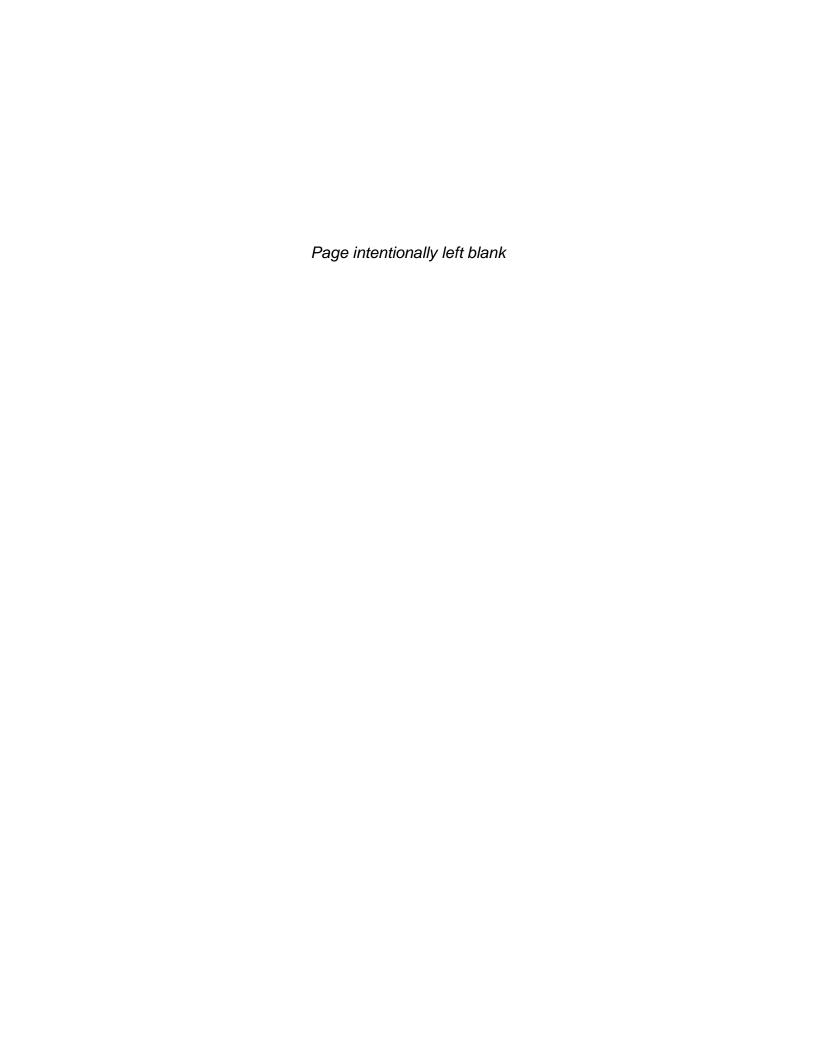
Sincerely,

Jennifer Pederson Weinberger

Cultural Resources Program Manager

nnita Pederson Weinberger

cc: Sarah Meitl, Review & Compliance Coordinator, AK State Historic Preservation Office (sarah.meitl@alaska.gov)





DEPARTMENT OF THE ARMY U.S. ARMY CORPS OF ENGINEERS, ALASKA DISTRICT P.O. BOX 6898 JBER, AK 99506-0898

Ms. Judith Bittner
State Historic Preservation Officer
Office of History and Archaeology
550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

MAR 2 5 2019

Dear Ms. Bittner,

The U.S. Army Corps of Engineers (USACE), under the Civil Works (CW) Program, is in the planning phase of a Feasibility Study to construct a small boat harbor on St. George Island, Alaska. The project is being conducted in conjunction with the City of St. George under Section 107 of the 1960 Rivers and Harbor Act, as amended, which allows the USACE to study, plan, and construct small navigations projects such as boat harbors. The enclosed document is a report of an archaeological survey conducted by a USACE archaeologist, and which includes the evaluation of two cultural resources within the proposed Area of Potential Effect (APE) for their eligibility for the National Register of Historic Places. The report concludes that both St. George Outside Landing (XPI-194) and St. George Inside Landing (XPI 195) were found eligible for inclusion on the National Register under Criterion A.

The USACE submitted a finding of adverse effect in a previous assessment letter submitted on July 2 (USACE 2018). Your office responded on August 1, that the re-examination of the contributing features to the NHL was never completed, and that there is insufficient information regarding on XPI-194 and XPI-195 (SHPO 2018). Your office recommended considering a programmatic agreement, or that a memorandum of agreement (MOA) would either need our offices to agree on adverse effect or to defer formal evaluations for XPI-194 and XPI-195 and treat the sites as eligible (SHPO 2018). USACE determined to evaluate the two properties for the purposes of the project. The results of the survey, as stated previously, found both sites eligible under Criterion A; per the USACE's 2018 finding of effect (USACE 2018), and following 36 CFR § 800.5(d)(2), the USACE seeks your concurrence on the determination that the proposed undertaking will result in an adverse effect on historic properties, and with a more developed project footprint (Attached 1), believe that an MOA would be the appropriate path forward if your office concurs with our finding. If you have any questions about this project, please contact Joseph Sparaga by phone at 907-753-2640, or by email at joseph.e.sparaga@usace.army.mil.

Sincerely,

Joseph E. Sparaga

Archaeologist

Environmental Resources Section

References

State Historic Preservation Office (SHPO)

2018. Letter to USACE (Joseph Sparaga) from SHPO (Judith Bittner) re: CW St. George Harbor Project. August 1, 2018.

United States Army Corps of Engineers (USACE)

2018. Letter to SHPO (Judith Bittner) from USACE (Joseph Sparaga): re: St. George Harbor Project Letter of Assessment. July 2, 2018.



Civil Works Program Site Investigation and Survey Results

Cultural Resources Survey of the St. George Outside Landing (XPI-194) and the St. George Inside Landing (XPI-195) within the Seal Rookeries National Historic District, St. George, Alaska



February 2019

Statement of Confidentiality

To protect fragile, vulnerable, or threatened cultural sites from disturbance, access to site-specific information from the Alaska Heritage Resources Survey is restricted or confidential. Distribution of those portions of this report that identify the location of cultural resources is to be limited to those with a legitimate need to know, such as appropriate personnel from the U.S. Army Corps of Engineers, Alaska State Historic Preservation Office, tribal entities, and other authorized researchers. Restricted or confidential information is withheld from public records disclosure per Alaska state law (AS 40.25.110) and the Federal Freedom of Information Act (PL 89-554). Information about site inventory may be restricted pursuant to AS 40.25.120(a)(4), Alaska State Parks Policy and Procedure No. 50200, the National Historic Preservation Act (PL 89-665; 54 USC 300101), and the Archaeological Resources Protection Act (PL 96-95)."

Executive Summary

This report describes the results of a cultural resources survey associated with the St. George Navigation Improvements Feasibility Study for a small boat harbor on Saint George Island, Alaska. The proposed small boat harbor would directly impact two contributing features of the Seal Islands National Historic Landmark (NHL): the St. George Outside Landing (XPI-194) and the St. George Inside Landing (XPI-195). A U.S. Army Corps of Engineers (USACE), Alaska District archaeologist conducted a pedestrian survey of the two landings in August 2018. The sites are in close proximity to each other on the northwest shoreline of the city of St. George. The purpose of the survey was to document the current conditions of these two contributing features of the NHL and assess the potential effects of the proposed undertakings on historic properties.

The eligibility of the St. George Outside and Inside Landings for the National Register of Historic Places (NRHP) was evaluated as a result of the survey. While both sites have lost significant physical integrity due to time, use, and weathering, as integral structures of the fur seal industry operating out of Saint George Island they are both significant under National Register Criterion A and retain sufficient integrity to be eligible for listing on the NRHP. The USACE has determined that the St. George Outside Landing (XPI-194) is eligible for the NRHP under Criterion A and the St. George Inside Landing (XPI-194) is eligible for the NRHP under Criterion A. This report has been prepared to support project planning and provide relevant cultural resources documentation for future undertakings.

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1.0 Introduction

Saint George Island is part of the Pribilof Island group located within the Bering Sea, 45 miles southeast of Saint Paul Island, and 220 miles northwest of Unalaska Island (Figure 1). The community of St. George, located on the northern side of the island, has been occupied since the Russians relocated Unangax hunters to the island in the late 18th century to hunt and process fur seals. By the 1820s, St. George was the only permanent settlement on the island. Historically, the primary economy on the island was based off of the fur seal industry; the community also subsisted off of seal meat as a primary food source. Due to the nature of the industry, all structures associated with maritime transport played a significant role. The community of St. George relied on the harbor for its economy, subsistence, and communication with the rest of the world.

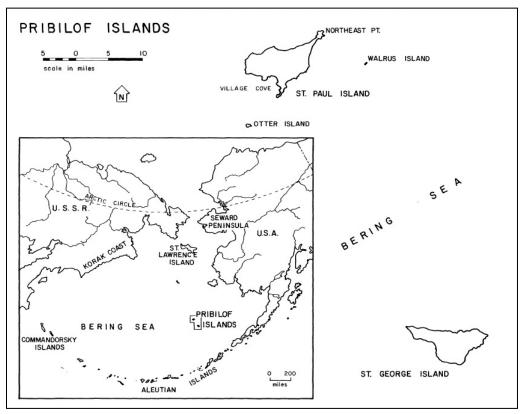


Figure 1. The Pribilof Islands in relation to the State of Alaska, the Aleutian Islands, and Russia (Faulkner 1986:40).

The City of St. George originally had two docks located along its northwestern shoreline (Figure 2). These docks were the primary artery for the community until a harbor was constructed at Zapadni Bay on the southern shore in 1984 (Figure 3). In 1988, large sections of the northern shore of Saint George was nominated for the National Register for Historic Places (NRHP) as the Seal Islands National Historic Landmark (NHL) for its period of significance from 1786-1959 (Faulkner 1986). The entire community of St. George was subsumed within this designated NHL and, as such, many of the buildings and structures are considered to be contributing features to the landmark.



Figure 2. The two historic docks at St. George. The St. George Outside Landing (XPI-195) is stretching out into the Bearing Sea, while the Inside Landing (XPI-194) is the square feature along the shore upon which USACE personnel is standing.

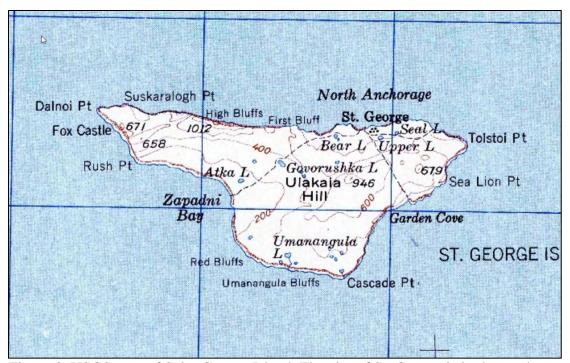


Figure 3. USGS map of Saint George Island. The city of St. George is in the northeast, while Zapadni Bay is to the southwest.

2.0 Historical Context

2.1 Russian Period

Saint George Island is part of the Pribilof Island group located in the Bering Sea, approximately 250 miles north of the Islands of Four Mountains in the Aleutian archipelago and 300 miles west of the mainland of Alaska. Russian fur-hunting crews, known as *promyshlenniki*, had actively sought these island since at least 1768, as they knew that the northern fur seals (*Callorhinus ursinus*) they had observed and hunted in the eastern Aleutians must have breeding grounds somewhere to the north. On June 25, 1786, St. George Island was discovered by the crew of *Sv. Georgii Pobedonosets* (*St. George the Victorious*), commanded by Gavriil Loginovich Pribylov of the Lebedev-Lastochkin Company. Upon finding no safe harbor, Pribylov left a party of 40 men to winter there and returned to Unalaska Island for supplies. While the crew was on Saint George, they spotted another island to the northwest. Once Pribylov returned the following summer, they sailed to this new island and named it Saint Peter and Saint Paul Island. This name has since been shorted to Saint Paul Island (Eldridge 2016).

Although the Pribilof Islands were uninhabited when the *St. George the Victorious* arrived, Unangan oral history holds that they had known of these island for some time before their documentation by the Russians (Black 2004; Elliott 1881; Jochelson 2003; Osgood et al. 1915; Torrey 1980; Veniaminov 1984). In 1787, rival Russian fur-hunting companies quickly established seasonal sealing camps around the coasts of both Saint George and Saint Paul Islands to harvest the valuable northern fur seal pelts. Unangax from Unalaska, Umnak, and Atka Islands were brought to the islands to provide labor for the Russians (Eldridge 2016). They constructed traditional semi-subterranean barabaras near the shores of easily accessible areas along the southeastern shore near Garden cove, and southwestern shore of Zapadni Bay, but ended up developing a permanent village on the north of Saint George Island (Etnier 2004; NOAA 2010a).

2.2 American Period

After the Treaty of Cession in 1867 by which the United States purchased Alaska from Russia, administers and management from the Alaska Commercial Company became the governing authorities on the island. Under the authority of the United States Treasury, the Alaska Commercial Company took over the fur seal harvesting operations on Saint George Island (Figure 4). The company razed many of the Russian-period buildings, including the Unangax barabaras, and constructed wood-frame housing and a number of new commercial buildings on the north shore of the island. Construction included the Great Martyr Orthodox Church, completed in 1936, as well as the administrative core building with staff housing overlooking the dock from the cliffs. There were six rows of houses that ran southeast of the church, with a community center. The commercial district is located near the old dock and consists of fourteen buildings. Portions of the waterfront were destroyed by a fire in 1950 (Faulkner *et al.* 1987).



Figure 4. Processed seal skins in barrels, waiting to be loaded onto the Navy transport USS *Thuban* in 1948 (Alaska Digital Archives UAF-1970-11-100).

Treatment of the local Unangax population also changed when the Alaska Commercial Company (ACC) assumed control of St. George. From the Treaty of Cession to the U.S. involvement in World War II, the ACC changed its management and attitudes toward the Unangax workforce from what could be considered a reasonably paid citizen of the United States to a form of servitude, where wages, lifestyle, and conditions were all controlled by ACC. These conditions persisted and then deteriorated even more during World War II when the Pribilof Islands were evacuated and the population was sent to Southeast Alaska for the duration of the war. On June 14, 1942, the residents of St. George were ordered to pack their belongings for evacuation of the island due to threat of Japanese attack. On June 16, 1942, 294 Unangax and 15 non-Unangax U.S. Fish & Wildlife Service employees were evacuated from St. George aboard the U.S. Army Transport (USAT) *Delarof* (Commission 1983). As a result of a hasty evacuation, many personal belongings and government property was left on the island (Jones 1980; Torrey 1980).

The Unangax populations from the Pribilof Islands were not housed with other displaced Aleutian communities during the World War II Aleutian Campaign. Instead, the Unangax from St. George and St. Paul were sent to an abandoned cannery and mine camp at Funter Bay. After they were allowed to return to St. George Island, the communities successfully pushed the U.S.

Congress to pass the Aleut Restitution Act of 1988, which recognized the government's fault in the treatment of the Unangax in their internment camps. In 1973, the U.S. Congress passed the Fur Seal Act Amendments, which ended industrial seal harvesting in the Pribilof Islands. Since that time, residents have pursued commercial fishing and tourism, while relying on an allotted subsistence catch of fur seals (NOAA 2010b).

3.0 Historic Properties

Saint George Island has a number of known cultural resources. These are associated with both the Russian and American fur trades; a large portion of the northern shore of Saint George has been registered as a National Historic Landmark (NHL; Figure 5). The Seal Islands Historic District NHL (XPI-002) is located on both Saint Paul and Saint George Islands. In its entirety, the Seal Islands Historic District NHL includes 106 contributing buildings, two contributing structures, 12 historic sites, and nine archaeological sites. There are 68 known cultural resources and one NHL listed in the Alaska Heritage Resources Survey (AHRS) within the boundaries of the City of St. George; the vast majority of the resources are "buildings" associated with the Seal Island Historic District NHL; it is important to note that, although identified as such, many of the structures are not actually buildings (Tables 1 and 2).



Figure 5. Seal Islands Historic District NHL on Saint George Island (AHRS 2018).

Within the City of St. George, the NHL consists of a combination of Russian-period buildings and structures that were not destroyed by the ACC, as well as American structures, of which many replaced Russian buildings to allow for continued seal harvesting into the 20th century. Of the 68 identified sites on the AHRS, only four sites other than the NHL have had determinations of eligibility (DOE) conducted (Table 1). There are 65 contributing "buildings" within the NHL on the north shore of Saint George Island; however, they have not been adequately described or evaluated for their eligibility to the NRHP (Table 2).

Table 1: Sites that have DOE's completed (AHRS 2018).

AHRS No.	Site Name	NRHP Status
XPI-002	Seal Islands Historic District	NHL
XPI-004	Great Martyr Orthodox Church	Listed
XPI-018	St. George Seal Skin Plant	Eligible
XPI-116	St. George School	Non-Contributing, Not Eligible

Table 2: Known cultural resources within the NHL which have been unevaluated.

AHRS No.	Site Type	NRHP Status
XPI-019	St. George Employee Cottage C	Contributing to NHL, no DOE
XPI-089	Company House	No DOE
XPI-090	Employee Cottage A	Contributing to NHL, no DOE
XPI-091	Employee Cottage D	Contributing to NHL, no DOE
XPI-092	Firehouse	Contributing to NHL, no DOE
XPI-093	Abandoned Pump House	Contributing to NHL, no DOE
XPI-094	Winch House	Contributing to NHL, no DOE
XPI-095	Machine Shop	Contributing to NHL, no DOE
XPI-096	Coal Shed	Contributing to NHL, no DOE
XPI-097	Aleutian Bunkhouse	Contributing to NHL, no DOE
XPI-098	Priest's House	Contributing to NHL, no DOE
XPI-099	Aleut Labor Housing (ALH) 2	Contributing to NHL, no DOE
XPI-100	ALH 4	Contributing to NHL, no DOE
XPI-101	ALH 5	Contributing to NHL, no DOE
XPI-102	ALH 8	Contributing to NHL, no DOE
XPI-103	ALH 9	Contributing to NHL, no DOE
XPI-104	ALH 10	Contributing to NHL, no DOE
XPI-105	ALH 11	Contributing to NHL, no DOE
XPI-106	ALH 12	Contributing to NHL, no DOE
XPI-107	ALH 13	Contributing to NHL, no DOE
XPI-108	ALH 14	Contributing to NHL, no DOE
XPI-109	ALH 15	Contributing to NHL, no DOE
XPI-110	ALH 16	Contributing to NHL, no DOE
XPI-111	ALH 17	Contributing to NHL, no DOE
XPI-112	ALH (Unknown)	No DOE
XPI-113	ALH 19	Contributing to NHL, no DOE
XPI-114	ALH 20	Contributing to NHL, no DOE
XPI-115	ALH 21	Contributing to NHL, no DOE
XPI-117	ALH 23	Contributing to NHL, no DOE
XPI-118	ALH 24	Contributing to NHL, no DOE
XPI-119	ALH 6	Contributing to NHL, no DOE
XPI-120	ALH 22	Contributing to NHL, no DOE
XPI-121	ALH 31	Contributing to NHL, no DOE
XPI-122	ALH 32	Contributing to NHL, no DOE
XPI-123	ALH 34	Contributing to NHL, no DOE
XPI-124	ALH 35	Contributing to NHL, no DOE
XPI-125	ALH 36	Contributing to NHL, no DOE
XPI-126	Community Hall	Contributing to NHL, no DOE
XPI-127	Plumbing and Electrical Shop	Contributing to NHL, no DOE

XPI-128	Old Power Plant	Contributing to NHL, no DOE
XPI-129	Community Store	Contributing to NHL, no DOE
XPI-130	Hospital	Non-Contributing, no DOE
XPI-131	Carpenter Shop	Contributing to NHL, no DOE
XPI-132	ALH 37	Contributing to NHL, no DOE
XPI-133	ALH 38	Contributing to NHL, no DOE
XPI-134	ALH 39	Contributing to NHL, no DOE
XPI-135	ALH 43	Contributing to NHL, no DOE
XPI-136	ALH 42	Contributing to NHL, no DOE
XPI-144	ALH 40	Contributing to NHL, no DOE
XPI-145	ALH 41	Contributing to NHL, no DOE
XPI-146	City Office Building	Contributing to NHL, no DOE
XPI-147	Second Pump House	Contributing to NHL, no DOE
XPI-193	St. George Cemetery	Contributing to NHL, no DOE
XPI-194	St. George Outside Landing	Contributing to NHL, no DOE
XPI-195	St. George Inside Landing	Contributing to NHL, no DOE
XPI-196	Equipment Storage / Fish Plant	Non-Contributing, no DOE
XPI-197	New Power Plant	Non-Contributing, no DOE
XPI-198	ALH	Non-Contributing, no DOE
XPI-199	ALH	Non-Contributing, no DOE
XPI-200	ALH	Non-Contributing, no DOE
XPI-202	ALH	Non-Contributing, no DOE
XPI-203	ALH	Non-Contributing, no DOE
XPI-204	ALH	Non-Contributing, no DOE
XPI-205	ALH	Non-Contributing, no DOE
XPI-206	Employee Cottage E	Contributing to NHL, no DOE
XPI-207	Prib Kafe	Non-Contributing, no DOE

Prior to the development of the Zapadni Bay harbor on the southern shore in 1984 (Figure 5), St. George relied on their old docks (XPI-194, XPI-195) located on the northwestern shore of the bight which the town overlooks. The Inside Landing was constructed first, however the original date is unknown; however it was refurbished in 1822, while the Outside landing had been finished and was useable in 1957 (NOAA 2010a). Historically, all commercial activities, subsistence activities, and transportation, including the transferring seal and fox pelts, were conducted off of these docks (Isto 2012). While still in use until the Zapadni Bay harbor's construction, the old docks (XPI-195) remained dangerous due to environmental conditions (Figures 6 and 7). Elliot's (1881) description of the harbor at St. George paint a bleak and dangerous picture of the area:

"Lack of Harbors: Anchorages. – The total absence of a harbor at the Pribylov islands is much to be regretted... At St. George matters are still worse, for the prevailing northerly, westerly, and easterly winds drive the boats away from the village roadstead, and weeks often pass at either island, but more frequently at the latter, ere a cargo is landed at its destination. Under the very best of circumstances, it is both hazardous and trying to load and unload ship at any of these places... At St. George, however, the bold, abrupt, bluffy coast everywhere all around, with its circling girdle of flying water-birds far out to

sea, looms up quite prominently, even in the fog; or, in other words, the navigator can notice it before he is hard aground or struggling to haul to windward from the breakers under his lee. There are no reefs making out from St. George worthy of notice... At St. George the steamer comes, wind permitting, directly to the village on the north shore, close in, and finds her anchorage in ten fathoms of water, in poor holding-ground; but it is only when three or four days have passed free from northerly, westerly, or easterly winds, that she can make the first attempt to safely unload. The landing here is a very bad one, surf breaking most violently upon the rocks from one end of the year to the other (Elliot 1881:16)."



Figure 6. View of the outside landing (XPI-194) at St. George from the bluffs to the southwest (Sparaga 2018).



Figure 7.View of the outside landing (XPI-194) at St. George, looking northwest (Sparaga 2018).

There are a number of shipwrecks in the vicinity of Saint George Island that corroborate Elliot's description of the navigation dangers. While the National Oceanic and Atmospheric Agency's (NOAA) shipwreck map is absent of nearby wrecks, the Bureau of Ocean Energy Management (BOEM) lists a number of shipwrecks associated with Saint George Island (BOEM 2011; NOAA 2018). These include the Russian ship the *Sv. Ioann Pretecha*, which is noted to have shipwrecked in 1792 "on the island." In 1915, the *Maweema* sunk 5 miles from the St. George village. The *Amatuli* sunk 45 miles off Saint George Island in 1987, and the *Belair* sunk on the south side of the island in 1994. The steamer *Laurada* is noted as having been wrecked off "Zapadni Point" of Saint George in 1899; however, there is no Zapadni Point on St. George. It is likely that the *Laurada* sunk off of Zapadni Point on Saint Paul Island (BOEM 2011).

The original dock for the community of St. George, the St. George Inside Landing (XPI-195), is directly south of the St. George Outside Landing (XPI-194). XPI-195 does not extend out into the bight, but instead was constructed along the shoreline. This dock was used primarily for offloading the seal carcasses from hunting around the rookeries and community goods, and for loading barrels of processed seal skins onto boats with shallow drafts (Figures 8 and 9). The original construction of this dock is unknown; historic documents note that it was damaged from weathering and from a fire, and then repaired (NOAA 2010a:16). Historic photographs also show rigging for lever booms to assist in moving goods from dock to boat and back (Figure 10).



Figure 8.View of St. George Village from XPI-194. The inside landing (XPI-195) is on the right in the orange outline. The Seal Skin Plant (XPI-018) is the large white building on the left, while the Great Martyr Orthodox Church (XPI-004) is uphill near the center (Sparaga 2018).



Figure 9.A closer view of XPI-195. The base of a small crane is on the right side. The old Community Store of the Swalling Construction Company (XPI-129) is in the top left, while the Second Pump House (XPI-147) is visible behind and upland of the two sites (Sparaga 2018).



Figure 10.Historic photo of the St. George Inside Landing (XPI-195), date unknown, catalog number RG22-95-ADMC-2863 (NARA 2018).

4.0 Archaeological Field Survey

On 27 August 2018, USACE Archaeologist Joseph Sparaga visited St. George with several USACE personnel for a public meeting to discuss options with the community for a prospective harbor. While a number of construction alternatives had been identified, preliminary studies recognized that the northern shore of the island has significant advantages as a location for a harbor; the island itself acts as a buffer from extreme weather conditions from the southern Bering Sea. The community agreed that the north harbor proposal was in their best interest, acknowledging a number of advantages the community would have with the docks being constructed on the same side of the island as the city. While on the island, Sparaga surveyed the two historic docks in the bight in front of the St. George community in order to identify current conditions and their association with the fur seal industry on the island.

4.1 St. George Inside Landing (XPI-195)

The St. George Inside Landing (XPI-195) is the older dock, which was built prior to 1922 (NOAA 2010a). There is no specific date known for the original installation of the dock. It was heavily refurbished in 1922 after a storm destroyed most of the dock. During this reconstruction, the bight was blasted with dynamite and dredged to remove 18 inches of rock from the sea floor, from the shoreline to 30 feet out from shore (NOAA 2010a). The St. George Inside Landing was also damaged during a fire in 1950; it was likely repaired afterward. Over the last 70 years, the inner dock has been worn away and damaged; today the exposed rebar from its reinforced

concrete is exposed (Figures 11 and 12). The identifiable concrete dimensions of the St. George Inside Landing is approximately 30 feet (ft) by 50 ft. Historic photographs indicate that the dock may have originally been slightly wider; however the dock to the non-concrete sections of the dock are no longer present. Historic photographs show that there wooden boards covered the floor of the structure, and met up with wooden walkways heading into town (Figure 13 and 14). The 2018 survey found that both the Inside and Outside landings were made with a combination of local stone and concrete, in addition to reinforced concrete. The local cobble and concrete mixture appears to provide the base structure of the Outside Landings walkway and the fill for the Inside Landing, while the reinforced concrete consists of the walls and horizontal sections of the Landings. Reinforcing concrete with rebar was a common building method by the 20th century (Moussard et al. 2017).



Figure 11. The weathered reinforced concrete on the St. George Inside Landing (XPI-195). Interior sections of the dock are exposed and show substantial concrete degradation and loss of fill.



Figure 12. A 1948 photograph of the St. George Inside Landing (XPI-195) with a row boat lightering supplies to the dock (Alaska Digital Archives UAF-1970-11-96).



Figure $\overline{13}$. Community members docking a baidar at the St. George Inside Landing (XPI-195) in 1954 (Swalley 2018).

4.2 St. George Outside Landing (XPI-194)

The St. George Outside Landing (XPI-194) was constructed in 1957 to improve access to the community by increasing usable docking days. In 2018, the dock was approximately 260 ft by 20 ft for the length of the entire dock and the width of the ramp, with an octagonal dock at the end which was 30 ft across (Figure 16). This dock was constructed with a reinforced concrete surface and heavy concrete retaining walls, overlaid on a natural outcrop and local scoria fill. Metal structures indicate that this dock, similar to the St. George Inside Landing, had a wooden crane at the end to move cargo between the docks and the boats (Figures 17 and 18). The outer dock had two benefits over the first dock: it was usable at low tide, and it created a wave barrier for the inner harbor during rough weather. Presently, the St. George Outside Landing has suffered from considerable weathering; the concrete slabs which lined the walkway have been moved from their original location, with portions of the concrete walkway strewn across the beach, and the reinforced concrete has weathered to expose rebar and other set metal parts.



Figure 14. The St. George Outside Landing (XPI-194); view from the base of the dock on the shore (Sparaga 2018). The orange arrows are where Figure 10 (left) and Figure 11 (right) are located.



Figure 15. Concrete and metal object at the end of the St. George Outside Landing (XPI-194); this would likely have supported a boom lever attached to unload supplies from boats (Sparaga 2018).



Figure 16. An exposed metal base for a wooden lever joist is located just off the St. George Outside Landing (XPI-194) near where the dock connects to the shoreline (Sparaga 2018).

In 2018, there were remnants of large metal winch debris at the base of the St. George Outside Landing. These may have been part of a machine system used to assist the movement of goods between the shore and the end of the dock; however, there are no photos of the Outside Landing that show any use of this equipment. The shoreline between both docks contains intermittent rusted metal debris likely associated with the use of the docks and earlier sealing industry. Fragments of the reinforced concrete slabs that originally covered the outer dock can be identified along the beach as well. At this time, neither docks are usable. Additionally, they present a hazard for human and animal well-being due to exposed sharp metal debris such as weathered rebar. During the 2018 pedestrian survey, a resident was seen collecting sea urchins and other tidewater subsistence foods that are growing between the rocks in the area.

5.0 Determinations of Eligibility for the National Register of Historic Places

Cultural properties (districts, sites, buildings, structures, or objects) may be eligible for the National Register of Historic Places (NRHP) if they meet one or more of the National Register Criteria for Evaluation. The criteria listed in 36 CFR § 60.4 are:

- A. *Events*. Association with events that have made a significant contribution to the broad patterns of history.
- B. Persons. Association with the lives of persons significant in the past.
- C. *Design or Construction*. Embodies the distinctive characteristic of a type, period, or method of construction, representing the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.
- D. *Information potential*. Yielded or is likely to yield information important in prehistory or history.

If a property is significant under Criterion A, it should retain the essential physical features "that made up its character or appearance during the period of its association with the important event" (NPS 1997:46). And while design and workmanship may not be as vital, the integrity of location, setting, materials, feeling, and association should ideally be retained (NPS 1997:48).

If a property is significant under Criterion B, the property should retain features "that made up its character or appearance during the period of its association with the important person(s)" (NPS 1997:46). Eligible sites under Criteria B must be in overall good condition with excellent preservation of features, artifact, and spatial relationships that the extent that these remain are able to convey important associations with persons (NPS 1997:46).

If a property is significant under Criterion C, the structure "must retain most of the physical features that constitute that style or technique" (NPS 1997:46). If it has lost the majority of the features that characterized its style, then the property is not eligible. Under Criterion C, the integrity of design, workmanship, and materials are usually more important than location, setting, feeling, and association (NPS 1997:48).

If a property is significant under Criterion D, the integrity of the structure "is based upon the property's potential to yield specific data that addresses important research questions" (NPS 1997:46). For "properties eligible under Criterion D, including archeological sites and standing structures studied for their information potential, less attention is given to their overall condition, than if they were being considered under Criteria A, B, or C" (NPS 1997:46). NPS (1997:46) recommends that the evaluation of integrity under Criterion D focus "primarily on the location, design, materials, and perhaps workmanship" of the site.

5.1 XPI-194 St. George Outside Landing.

Criterion A: Associated with Significant Events.

To be considered for listing under Criterion A, a property "must be associated with one or more events important in the defined historical contact" (NPS 1997:12). And while design and workmanship may not be as vital, the integrity of location, setting, materials, feeling, and association should ideally be retained (NPS 1997:48). The St. George Outside Landing is associated with the fur sealing industry for which the community of St. George was established until the commercial sealing ended in 1973. While it is not the first dock for the industry, between 1957 and 1984 it served the dual purpose of supplying the community with offloaded resources as well as loading the barreled seal skins when boats could not make it to the inner dock. The St. George Outside Landing also served as a wave break for the inner dock during rough seas. The St. George Outside Landing (XPI-194) is eligible for listing on the NRHP under Criterion A.

Criterion B: Association with Significant Persons.

Properties eligible for the NRHP under Criterion B are usually associated with a person's productive life, reflecting the time period when he or she achieved significance. A property is not eligible if its only justification for significance is that it was owned or used by a person who is a member of an identifiable profession, class, or social or ethnic group. It must be shown that the person gained importance within his or her profession or group at that location (NPS 1997:15). There are no persons of known significance related to the St. George Outside Landing. The St. George Outside Landing (XPI-194), is <u>not</u> eligible for listing on the NRHP under Criterion B.

Criterion C: Association with Significant Design/Construction.

If a property is eligible for the NRHP under Criterion C, the structure "must retain most of the physical features that constitute that style or technique" (NPS 1997:46). If it has lost the majority of the features that characterize its style, then the property is not eligible. Under Criterion C, the integrity of design, workmanship, and materials are usually more important than the location, setting, feeling, and association (NPS 1997:48). The St. George Outside Landing was constructed with reinforced concrete and some use of the local rock supply. The dock supported a number of built-in cranes which have been removed or lost to large storm events. There is no discernable significance in the St. George Outside Landings' construction, and the literature does not note any exceptional design modifications for the dock. The St. George Outside Landings (XPI-194) is not eligible for listing on the NRHP under Criterion C.

Criterion D: Association of Information Potential.

If a property is eligible for the NRHP under Criterion D, the significance of the structure "is based upon the property's potential to yield specific data that addresses important research questions" (NPS 1997:46). For "properties eligible under Criterion D, including archaeological sites and standing structures studied for their information potential, less attention is given to their overall condition, than if they were being considered under Criterion A, B, or C" (NPS 1997:46). The NPS (1997:49) recommends that evaluation of integrity under Criterion D focus "primarily on the location, design, materials, and perhaps workmanship" of the site. The St. George Outside Landing has sustained substantial weathering, however the structure is still located within its original location. The structure has been photographed, GPS-marked at all corners, and the outline of the structure has been tracked. The collection of this data concludes that XPI-194 no longer has potential to yield specific data other than what is already known. As such, the St. George Outside Landing (XPI-194) is not eligible for the NRHP under Criterion D.

5.2 St. George Inside Landing (XPI-195).

Criterion A: Association with Significant Events.

To be considered for listing under Criterion A, a property "must be associated with one or more events important in the defined historic context" (NPS 1997:12). And while design and workmanship may not be as vital, the integrity of location, setting, materials, feeling, and association should ideally be retained (NPS 1997:48). The St. George Inside Landing was the first dock known to be constructed for the community of St. George; it was used for offloading supplies to the community as well as loading on barrels of seal skins for shipment back to the continental U.S. until the commercial sealing ended in 1973. It was of primary importance to the economy of St. George, and integral to the processing and movement of seal products within the industry. Due to this, the St. George Inside Landing (XPI-195) structure **is eligible for listing on the NRHP under Criterion A**.

Criterion B: Association with significant persons.

Properties eligible for the NRHP under Criterion B are usually associated with a person's productive life, reflecting the time period when he or she achieved significance. A property is not eligible if its only justification for significance is that it was owned or used by a person who is a member of an identifiable profession, class, or social or ethnic group. It must be shown that the person gained importance within his or her profession or group at that location (NPS 1997:15). There are no persons of known historical significance related to the St. George Inside Landing; as such, the St. George Inside Landing (XPI-195), is <u>not</u> eligible for listing on the NRHP under Criterion B.

Criterion C: Association with Significant Design/Construction.

If a property is eligible for the NRHP under Criterion C, the structure "must retain most of the physical features that constitute that style or technique" (NPS 1997:46). If it has lost the

majority of the features that characterize its style, then the property is not significant. Under Criterion C, the integrity of design, workmanship, and materials are usually more important than the location, setting, feeling, and association (NPS 1997:48). The St. George Inside Landing was not designed or constructed with any specialized or unique plan, but with a combination of reinforced concrete and concrete slabs which were placed over exposed local rock. There were no original blueprints or documents found to determine if the purpose of the dock was constructed for the community and used by the fur seal industry, or if the dock was built specifically for the fur seal industry. After reviewing historic photos and a field survey, it is apparent that the St. George Inside Landing was not constructed in any manner unique to the fur seal industry. While heavily weathered, the dock appears to be built using a portion of local resources with cement, as well as the reinforced concrete common with construction around the same period. As such, the St. George Inside Landing (XPI-195) is <u>not</u> eligible for listing on the NRHP under Criterion C.

Criterion D: Association of Information Potential.

If a property is eligible for the NRHP under Criterion D, the significance of the structure "is based upon the property's potential to yield specific data that addresses important research questions" (NPS 1997:46). For "properties eligible under Criterion D, including archaeological sites and standing structures studied for their information potential, less attention is given to their overall condition, than if they were being considered under Criterion A, B, or C" (NPS 1997:46). The NPS (1997:49) recommends that evaluation of integrity under Criterion D focus "primarily on the location, design, materials, and perhaps workmanship" of the site. While the St. George Inside Landing has sustained substantial storm damage, the majority of the structure is still located within its original location and setting. The structure has been photographed, GPS-marked at all corners, and GPS-tracked along its outer edges, as no original blueprints or plans could be identified. With the collection of this data, there is no longer a potential to yield additional specific information. As such, the St. George Inside Landing (XPI-195) is <u>not</u> eligible for listing on the NRHP under Criterion D.

6.0 Consideration of Integrity

In order to be considered eligible for the NRHP, a property must retain sufficient integrity to convey its significance in American history, architecture, archaeology, engineering, or culture (NPS 1997:44). There are seven aspects of integrity – location, design, setting, materials, workmanship, feeling, and association. The property must also convey its historic identity through retention of essential physical features (Table 3 and 4). Essential physical features enable the property to convey its historic identity; the features represent *why* and *when* a property was significant.

Table 3: Integrity criteria of the Outside Landing (XPI-194).

Criterion	Essential Physical Feature	Vital Aspects of Integrity
A	Must retain:	Location, Setting, Association
	Evidence of Seal Industry	

Table 4: Integrity criteria of the Inside Landing (XPI-195).

Criterion	Essential Physical Feature	Vital Aspects of Integrity
A	Must retain:	Location, Setting, Association
	Evidence of Seal Industry	

6.1 St. George Outside Landing (XPI-194)

To retain integrity of *location*, a property must be located where it was originally constructed or where the historic event occurred (NPS 1997:44). The St. George Outside Landing is a large stone and reinforced concrete structure that extends out from the shoreline into the ocean. While the large and powerful storms of the Bering Sea have damaged and removed portions of the site, the primary structure of the dock is still in its original place. Any machinery that assisted with the use of the dock has been either removed or has been destroyed by the weathering. As the primary physical features of the St. George Outside Landing, including the concrete foundations of the dock, are still present, the feature **retains integrity of location**.

To retain integrity of *design*, a property must have its original "form, plan, space, structure, and style" (NPS 1997:44). The St. George Outside Landing was built to facilitate better access between transport ships and St. George. It extends out to a slightly deeper water where larger boats can tie up, approximately 260 ft away from the shoreline; while the outside landing extended farther out from shore, the gain in draft depth was still limited and was a benefit during lower tides. The St. George Outside Landing had the additional benefit of creating a small breakwater for the St. George Inside Landing. The integrated hoist posts that were still present were designed to load and unload baidars and other cargo boats to transport between St. George and anchored vessels offshore. There is still a concrete outline of the structure, much of the nonconcrete sections of the dock, including the beachfront facilities are now missing. There have been no plans or photographs of how the structure originally looked or what materials were in the final design, making the integrity of its original structure difficult to ascertain. As such, the St. George Outside Landing **retains integrity of design**.

To retain integrity of *setting*, the character of the physical environment and the surroundings "in which the property played its historic role" must be maintained (NPS 1997:45). The St. George Outside Landing was essential for supplying the community of St. George with goods from ships, as well as sending out fur seal products for transport. The dock was an important conduit between the St. George Seal Skin Plant and ship transportation, and also as a breakwater for the St. George Inside Landing. The Seal Skin Plant, and many of the fur seal industry buildings in St. George constructed by the ACC, are either still standing or have been renovated; as such, these structures that were historically associated with the dock are still present. Because of this, the St. George Outside Landing **retains integrity of setting**.

To retain integrity of *materials*, a property "must retain the key exterior materials dating from the period of its historic significance" (NPS 1997:45). The St. George Outside Landing was constructed out of a number of different materials. These include local scoria rock, cement, and reinforced concrete. There are also a number of partial machinery components that likely were part of a system to help load and offload boats. The lack of historic photos of the outside landing make it difficult to determine all of the materials that were used for its construction; however

photos of the inside landing have indicated that wooden planks were used to cover the dock, and the Outside Landing also had wooden and metal cranes that was used to move cargo to and from boats. The original locations of these cranes are still identifiable, as their bases were embedded into the concrete. The St. George Outside Landing has lost much of its original materials outside of its base structure, and so it **does <u>not</u> retain integrity of materials**.

To retain integrity of *workmanships*, a property "has the evidence of artisans' labor and skill in constructing or altering a building, structure, object or site" (NPS 1997:45). The St. George Outside Landing was constructed with a combination of concrete, reinforced concrete, and local cobbles; while no historical photos of the completed dock showed how it originally looked, it is likely to be similar to the hardwood top and railings from the photos of the other landing. Currently, the weathering and lack of use of resulted in damaging the overall structure and hiding any workmanship that may have made the docks unique. As such, the St. George Outside Landing **does not retain integrity of workmanship**.

To retain integrity of *feeling*, a property "must express an aesthetic or historic sense of a particular period of time" (NPS 1997:45). The St. George Outside Landing is associated with the fur seal harvesting industry at St. George, and the role it filled as a lifeline between the island community and ships bringing and taking cargo. The Outside Landing is next to both the Inside Landing and the Seal Skin Plant, where the final stages of fur processing took place. Portions of the structure have been lost, as well as the associated ramps and stairs to the landing from weathering. As the Outside Landing has not been the primary moorage since 1984, much of the features that support a feeling of a dock, or its use historically, are no longer present. The condition of the dock has not affected the historic sense of the feature, and as such the St. George Outside Landing does <u>not</u> retain integrity of feeling.

To retain integrity of *association*, a property must have a "direct link between an important historic event or person and a historic property" (NPS 1997:45). The St. George Outside Landing was an integral part of the community of St. George's supply and distribution link off-island. It provided better access to shore during low tides, served as a breakwater, and was an addition to the total infrastructure for the sealing industry on St. George, especially with such limited natural resources for construction. The St. George Outside Landing is still situated in relation to many of the original seal industry buildings; there has been no relocation of any of these structures. As such, the St. George Outside Landing **retains integrity of association**.

Table 5: The St. George Outside Landing's retention of integrity.

Fur Sealing	Location	Design	Setting	Materials	Workmanship	Feeling	Association
Character							
Yes	Yes	Yes	Yes	No	No	No	Yes

The St. George Outside Landing (XPI-194) is **eligible for listing on the NRHP under Evaluation Criterion A**. The St. George Outside Landing was constructed in 1957 in order to facilitate use by deeper draft vessels. It served a dual purpose as both a dock and a protective breakwater for the Inside Landing. Similar to the Inside Landing, the Outside Landing has suffered considerable degradation of its physical features. However, it is still physically in its

original location and maintains its association with the fur sealing industry. It retains sufficient aspects of integrity (location, setting, association) to be considered eligible for the NRHP.

6.2 St. George Inside Landing (XPI-195)

To retain integrity of *location*, a property must be located where it was originally constructed or where the historic event occurred (NPS 1997:44). The St. George Inside Landing is within the bight alongside the community of St. George, where it was originally constructed. Although heavily weathered, it has not been demolished or removed. The remains of the dock, which consist of more than half of the original structure, are still standing. As such, the St. George Inside Landing (XPI-195) **retains integrity of location**.

To retain integrity of *design*, a property must have its original "form, plan, space, structure, and style" (NPS 1997:44). The St. George Inside Landing has lost much of its original design, and historic photos show that the dock was originally connected to the shoreline facilities via a wooden boardwalk. These photographs also show some dock features, such as the small cargo cranes and levers, are no longer present. Historic documents indicate that the dock was heavily impacted by a fire in 1950; some design modifications likely occurred in order to repair the dock. As such, the St. George Inside Landing (XPI-195) **does <u>not</u> retain integrity of design**.

To retain integrity of *setting*, the character of the physical environment and the surroundings "in which the property played its historic role" must be maintained (NPS 1997:45). The St. George Inside Landing was constructed within a natural bight along the northern shoreline of Saint George, next to the community of St. George. It is unknown when the original dock was constructed; however, historic documents suggest that it was built soon after the community was settled. The 2018 survey showed that while the primary material was reinforced concrete, local rock material, including scoria, was mixed in with cement to form the base structure. The physical location of the site has remained the same. During the 1950 repairs, the bight was dynamited in order to increase the basin depth by approximately 18 inches; however, this only had a limited visible impact on the overall environment. The St. George Inside Landing (XPI-195) **retains integrity of setting**.

To retain integrity of *materials*, a property "must retain the key exterior materials dating from the period of its historic significance" (NPS 1997:45). The St. George Inside Landing was constructed of reinforced concrete slabs and walls. Much of this concrete has degraded; rebar is now exposed. It appears that the interior of the dock may have been a combination of local scoria and other rock material intermixed with cement, but much of it has eroded away. Any wooden construction on the dock is no longer present, and exposed metal is rusted and degraded. The levers used to move goods between the dock and boats are also missing; only their metal bases located within the concrete remain. Compared with historical photographs, the dock itself has lost much of its associated materials. As such, the St. George Inside Landing (XPI-195) **does not retain integrity of materials**.

To retain integrity of *workmanships*, a property "has the evidence of artisans' labor and skill in constructing or altering a building, structure, object or site" (NPS 1997:45). The St. George Inside Landing was constructed with reinforced concrete and filled with a combination

of local boulders and concrete; historical photos show some form of hardwood top with railings and a lever boom. The weathering and lack of use of resulted in damaging the overall structure and hiding any workmanship that may have made the docks unique. As such, the St. George Inside Landing does <u>not</u> retain integrity of workmanship.

To retain integrity of *feeling*, a property "must express an aesthetic or historic sense of a particular period of time (NPS 1997:45). The St. George Inside Landing is still located within the area of its original use, near the Seal Processing Plant, the St. George Outside Landing, and many of the other associated fur seal industry structures. The environment that existed at the time of the fur seal industry has changed only slightly. However, the industry that operated from the harbor at Saint George no longer operates, and the landings are no longer used for their purpose for mooring boats. Fishing and birding boats do not moor here, unless storms have forced them to the side of the island to wait it out. As such, the St. George Inside Landing (XPI-195) **does not retain integrity of feeling**.

To retain integrity of *association*, a property must have a "direct link between an important historic event or person and a historic property" (NPS 1997:45). The St. George Inside Landing still retains its physical link and association with structures and buildings that were constructed specifically for the fur seal industry. As such, the St. George Inside Landing (XPI-195) **retains integrity of association**.

Table 6: The St. George Inside Landing's retention of integrity.

Fur Sealing Character	Location	Design	Setting	Materials	Workmanship	Feeling	Association
Yes	Yes	No	Yes	No	No	No	Yes

The St. George Inside Landing (XPI-195) is **eligible for listing on the NRHP under Evaluation Criterion A**. The dock was pivotal for the survival of the early community of St. George, as well as part of the key infrastructure for the seal harvesting industry. While the structure has been heavily weathered and is no longer used in any capacity, the dock still exists within its original context of the fur seal industry on Saint George Island and retains sufficient aspects of integrity (location, setting, feeling, association) to be considered eligible for the NRHP.

7.0 Conclusion

This report describes the results of an archaeological survey of the APE associated with proposed navigation improvements at St. George on Saint George Island. The survey was conducted in August 2018 by a USACE Alaska District archaeologist who meets the Secretary of the Interior's Professional Qualification Standards. The USACE has evaluated the eligibility of two historic structures for listing on the NRHP. Both structures are identified as contributing properties to the Seal Islands Historic District NHL. The USACE has found that both the St. George Outside Landing (XPI-194) and the St. George Inside Landing (XPI-194) are eligible for the NRHP. Both structures meet National Register Criterion for Evaluation A, and retain the essential physical characteristics and sufficient integrity for listing. The USACE **requests concurrence** from the SHPO that the St. George Outside Landing (XPI-194) and the St. George Inside Landing (XPI-195) are eligible for listing on the NRHP.

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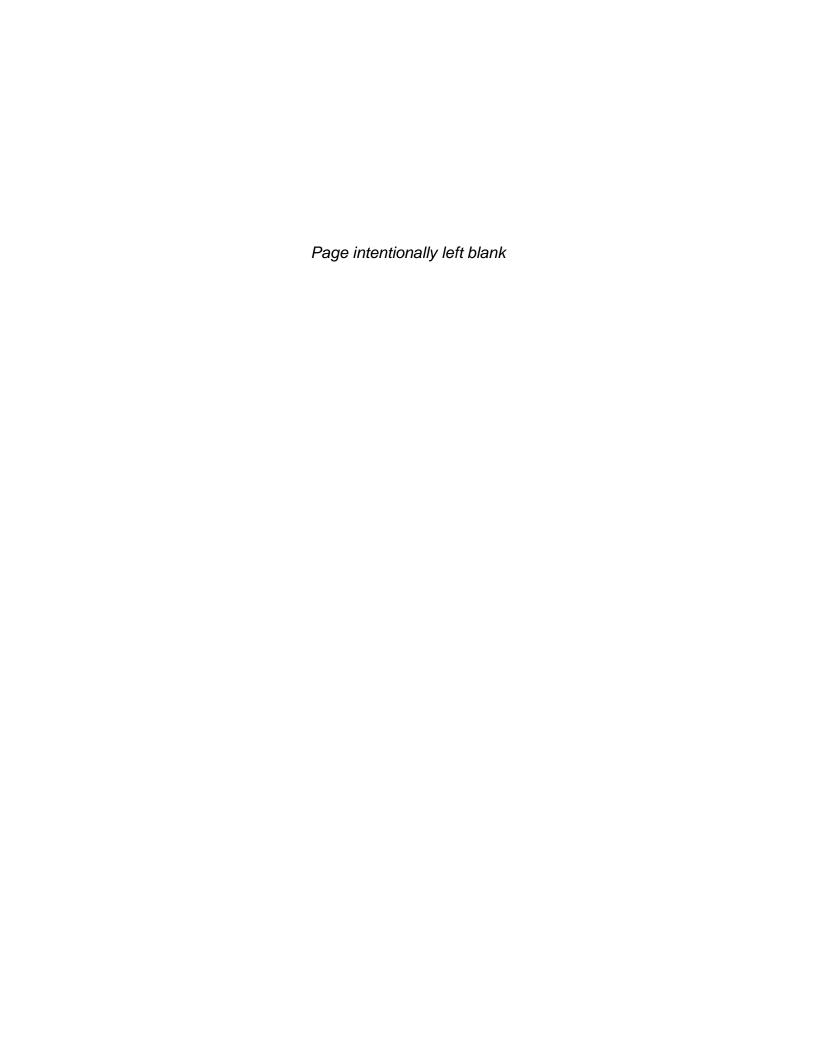
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Department of Natural Resources

DIVISION OF PARKS & OUTDOOR RECREATION Office of History & Archaeology

> 550 West 7th Avenue, Suite 1310 Anchorage, AK 99501-3561 907.269-8700 http://dnr.alaska.gov/parks/oha

File No.:

3130-1R COE-E / 2018-0831

Joseph E. Sparaga U.S. Army Corps of Engineers Alaska District CEPOA-PM-C-ER P.O. Box 6898 JBER, AK 99506-0898

Subject:

St. George Harbor Project

Dear Mr. Sparaga:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated March 25, 2019) concerning the subject project on April 4, 2019. Our office has reviewed the undertaking pursuant Section 106 of the National Historic Preservation Act and offer the following comments for your consideration.

It is our office's understanding that the St. George Outside Landing (XPI-00194) and the St. George Inside Landing (XPI-00195) were not inventoried as cultural resources until 2007 and neither structure had been evaluated for their potential to contribute to the Seal Islands Historic District (Fur Seal Rookeries) National Historic Landmark (NHL) (XPI-00002). Our office recommends revising your documentation to reflect the contributing features for the district as found in the AHRS or providing our office with source information to update the AHRS.

After review of the provided documentation, our office concurs that the St. George Outside Landing (XPI-00194) and the St. George Inside Landing (XPI-00195) contribute to the Seal Islands Historic District. As such, we concur that a finding of adverse effect is appropriate for the proposed undertaking.

We look forward to continuing consultation to develop a Memorandum of Agreement for the proposed project. Additionally, we recommend USACE considers potential indirect and cumulative effects the project may have on the NHL as your agency refines the area of potential effects based on the more developed project footprint provided with your documentation.

Thank you for the opportunity to review and comment. Please contact Sarah Meitl at 269-8720 or sarah.meitl@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner

Jean al. Antonson.

Mp State Historic Preservation Officer

JEB:sim

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICE REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

- 1 WHEREAS, the U.S. Army Corps of Engineers (USACE) and City of St. George (CoSG) propose under the authority of Section 4010 of the Water Resources Development Act of 2007 (P.L. 110-114) to construct a small boat harbor along the North Anchorage site of St. George, Alaska as part of the St. George Navigation Improvements study (the Undertaking); and
- 2 WHEREAS, the preferred Undertaking design is identified as "the agency's preferred alternative" within the integrated Feasibility Report/Environmental Assessment St. George Navigational Improvements Feasibility Study; and
- 3 WHEREAS, the USACE has identified the Undertaking's area of potential effects (APE), as defined at 36 CFR 800.16(d), along the North Anchorage site of St. George and along the northwestern beach of the city (Appendix A), as well as Zapadni Bay harbor for staging materials, and the road connecting Zapadni Bay to the new harbor location; and
- 4 WHEREAS, the USACE has determined that the Seal Islands Historic District National Historic Landmark (NHL; XPI-00002), encompasses the entirety of the Area of Potential Effect (APE), and that the project directly affects two contributing structures to the NHL: the St. George Outside Landing (XPI-00194) and the St. George Inside Landing (XPI-00195); and
- 5 WHEREAS, the USACE has found that the Undertaking will have an adverse effect on the physical aspects of XPI-00194 and XPI-00195, as well as the visual aspects of the NHL XPI-00002, and the Alaska State Historic Preservation Office (SHPO) concurred on 2 May 2019; and
- 6 WHEREAS, the USACE consulted with the SHPO in accordance with Section 106 of the National Historic Preservation Act [54 U.S.C. 306108] and its implementing regulations [36 CFR 800 et seq.] to resolve the adverse effect of the Undertaking on XPI-00002, XPI-00194, and XPI-00195; and
- 7 WHEREAS, XPI-00194 and XPI-00195 are structures on land owned by the CoSG; and
- 8 WHEREAS, the NHL XPI-00002 includes much of the shoreline and the associated structures of the entirety of the CoSG and the APE; and
- 9 WHEREAS, in accordance with 36 CFR § 800.6(a)(1), USACE has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect

- determination with specified documentation, and the ACHP has chosen *not to* participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and
- 10 WHEREAS, the CoSG, the local governing body and non-Federal sponsor to the Feasibility study, has been invited to be an invited signatory to this MOA and has accepted; and
- 11 WHEREAS, the National Park Service (NPS), has participated as a consulting party in this Section 106 review in consideration of the adverse effects to the NHL, pursuant to 36 C.F.R. Section 800.10(c) and has been invited to be a concurring party to this MOA and has accepted; and
- 12 WHEREAS, USACE has consulted with the St. George Traditional Council (SGTC), for which has cultural significance to the NHL, and has been invited to be a concurring party to this MOA and has accepted; and
- 13 WHEREAS, USACE has consulted with the St. George Tanaq Corporation (Tanaq), regarding the effects of the undertaking on historic properties and has been invited to be a concurring party to this MOA and has accepted; and
- 14 WHEREAS, USACE has consulted with the Aleut Corporation (AC), regarding the effects of the undertaking on historic properties and has been invited to be a concurring party to this MOA and has accepted; and
- 15 WHEREAS, USACE has consulted with the Aleutian Pribilof Islands Association (APIA), regarding the effects of the undertaking on historic properties and has been invited to be a concurring party to this MOA and has accepted; and
- 16 WHEREAS, USACE has consulted with the Aleutian Pribilof Island Community Development Association (APICDA), regarding the effects of the undertaking on historic properties and has been invited to be a concurring party to this MOA and has accepted; and
- 17 NOW, THEREFORE, USACE and the SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to mitigate the effect of the Undertaking on historic properties.

STIPULATIONS

USACE shall ensure that the following stipulations are implemented:

I. ARTISTIC DEPICTION

- A. The USACE shall ensure that the mitigation for the adverse effect to the viewshed of NHL (XPI-00002), and the removal of the St. George Inside Landing (XPI-00195) and St. George Outside Landing (XPI-00194), will include an artist's depiction showing three different time periods of the community's location on St. George Island placed within three displays installed at St. George.
 - 1. During the Planning, Engineering, and Design (PED) phase of the St. George Navigational Improvements project the USACE shall consult with CoSG, to identify an art style, methods, and a local artist or Alaskan artist with experience producing landscape depictions that would be appropriate for the project, as well as a secondary artist if the first cannot or will not create the depictions.
 - a) The identified art styles, methods, and artist choices that are being considered will be sent to all parties in this MOA for the opportunity to comments or suggestions, and will have 30 days to respond to USACE.
 - b) When the USACE and the CoSG have come to an agreement, USACE shall notify all signatories and concurring parties on the selection and style.
 - 2. After construction has been authorized and appropriated, the USACE shall contract the artist to develop three depictions of the community from the same vantage point (Appendix B), to include:
 - a) The location prior to the founding of St. George (pre-1786 C.E.),
 - b) The community during the Russian Period (1787-1866 C.E.),
 - c) The community during the U.S. Territorial Period to the end of commercial fur seal practices (1867 1973 C.E.).

- 3. If the depictions are done on canvas, or other surface medium, the depictions will be digitized in high-resolution by the artist as part of their agreement for use on the display. The physical versions shall be the property of the CoSG as will the rights to reproduce digital versions.
- 4. After the art has been installed onto the display and the construction phase has been completed, ownership of the digital copies of the art will be transferred to the CoSG.
 - a) The CoSG shall allow use of the digital copies by the other parties who have signed this agreement upon request.
- B. The imagery created shall replicate, with a draft version of a historical narrative outlined in Stipulation II(B)(1)(b) and available photographs, the landscape and community of St. George under the specified time periods outlined in Stipulation I(A)(2).
- C. The artist's depictions shall be created at identical sizes and scale.
- D. The size of the artistic depictions shall match the display area outlined in Stipulation II(A).

II. DISPLAY

- A. There will be three displays, each holding a separate artistic depiction, which will follow the style of displays known as the National Park Service "Reverse Angle Assembly" as described in the NPS UniGuide Program (Appendix C). This design is also known as a Low-Profile Wayside. The layout will be either:
 - 1. 42 inches wide by 24 inches high variant, or
 - 2. 36 inches wide by 24 inches high variant.
- B. The USACE shall consult with the CoSG and the SHPO on the details of the display design during PED with the decision being made prior to the end of the PED phase by the CoSG.
 - 1. This consultation will include:

- a) The design and location for the placement of the depictions title, the time period it represents, and artist's name.
- b) A brief historical narrative of each time period for each depiction.
- 2. The USACE shall notify the concurring parties on the layout for the title, time period, artist name as well as the historical narratives that will be used on each depiction.
- C. The CoSG shall acquire, through right-of-way or easement, access to the hill directly west of the community overlooking the St. George landing area and community for the installation of the three displays.
 - 1. The displays and artist depictions shall be installed at the same location, with all three depictions facing the community.
 - 2. The location of the displays shall not affect the view of any statues or plaques present at the hillside.
- D. The USACE shall construct and install the display as construction funding has been authorized and appropriated, and after the artist has completed the depictions as stated in Stipulation III(A)(3).

III. TIMING AND SUBMITTALS

- A. As stated in Stipulation II(1)(A), the USACE and the CoSG shall identify a potential artist in the PED phase.
 - 1. The USACE shall formally contact the artist after the Construction Phase is authorized and appropriated. The USACE shall inform the signatories and concurring parties on artists expected timeline, which will not exceed the life of the project.
 - 2. Electronic copies of the three draft depictions shall be submitted to signatories and concurring parties by the USACE for a 30-day review. USACE shall take into consideration timely comments received and contact the artist and inform them of changes requested for historic accuracy. The USACE shall forward responses to the signatories and concurring parties.

- a) The USACE shall notify the signatories and concurring parties on the artist's timeline for revisions, not to exceed the life of the project.
- b) The USACE shall submit the revised depictions for a second 30-day review, after which any comments will be responded to. USACE shall then finalize the depictions with the artist.
- 3. Digital versions of the artist's depictions shall be distributed to signatories and concurring parties when the depictions are complete by the USACE.
 - a) When the USACE has completed the initial display design that will house copies of the art depictions, the design and placement will be sent to the signatories and concurring parties for a 30-day review and comment period. The USACE shall take into consideration timely comments received and direct appropriate revisions, as necessary.
 - b) If the display design is revised based on comments, the USACE shall allow a second 30-day review. If no comments are received USACE shall finalize the display design.
- B. After the displays are installed on St. George, the USACE shall write a brief report describing the completed status of the installed displays, including the artist's depictions and photographs of the installed displays. USACE will send the report to signatories and concurring parties within 3 months after the display installation is complete to notify the conclusion of the mitigation responsibilities.

IV. Dispute Resolution

- A. If any signatory to this agreement objects to any actions conducted during the term of this MOA or to the manner in which the terms of this MOA are implemented, the USACE shall consult with such party to resolve the objection. If the USACE determines that such objection(s) cannot be resolved, the USACE will:
 - 1. Forward all documentation relevant to the dispute, including the USACE proposed resolution, to the ACHP. The ACHP shall provide the USACE with its advice on the resolution of the objection within 30

calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories, and concurring parties and provide them with a copy of this written response. The USACE will then proceed according to its final decision.

- 2. If the ACHP does not provide its advice regarding the dispute within the 30-day time period, the USACE may make a final decision regarding the dispute and proceed accordingly. Prior to reaching a final decision, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.
- 3. The USACE's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

V. PROFESSIONAL STANDARDS

A. All work pursuant to this MOA will be developed by or under the direct supervision of a person or persons meeting the minimal professional qualifications as appropriate, listed in the Secretary of the Interior's (SOI) Historic Preservation Professional Qualification Standards [62 FR 33708].

VI. AMENDMENT

A. The USACE, the SHPO, or CoSG may request that other signatories consider amending it, whereupon the parties will consult to consider such amendments. Amendments will be executed in the same manner as the original MOA. No amendment will be effective unless all signatories to the MOA have agreed to it in writing. The amendment will be effective on the date a copy signed by all the Signatories is filed with the ACHP.

VII. PUBLIC OBJECTION

A. If at any time during implementation of the measures stipulated in this MOA, should any objection to any such measure or its implementation be raised by a member of the public, the USACE will take the objection into account and consult as needed with the objecting party, the signatories, and concurring parties to resolve the objection. If the USACE, in consultation with the SHPO and

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CoSG, agree that the objection should be resolved, then the USACE shall proceed according to Dispute Resolution, Stipulation IV to resolve the objection.

VIII. ANTI-DEFICIENCY ACT

- A. All requirements set forth in this MOA requiring the expenditure of USACE funds are expressly subject to the availability of appropriations and the requirements of the Anti-Deficiency Act [31 U.S.C. 1341]. No obligation undertaken by the USACE under the terms of this MOA will required or be interpreted to require a commitment to expend funds not obligated for a particular purpose.
 - 1. If the USACE cannot perform any obligations set forth in the MOA due to the unavailability of funds, the parties to this MOA intend the remainder of the agreement to be executed.

IX. MUTUAL AGREEMENTS AND UNDERSTANDINGS

- A. Nothing contained in this MOA shall be construed or interpreted in any way so as to waive the sovereign immunity of any party.
- B. Points of Contact for signatories and concurring parties are listed in Appendix D.
- C. Electronic mail (email) will serve as the official correspondence method for all communications regarding this agreement and its provisions. Contact information in Appendix D may be updated as needed without an amendment to this agreement. It is the responsibility of each signatory and concurring party to immediately inform the USACE of any change in name, address, email address, or phone number of any point-of-contact. The USACE will forward this information to all signatories and concurring parties by email.
- D. This MOA may be executed in counterparts, with a separate page for each signatory, invited signatory, and concurring party.

X. DURATION

A. This MOA will expire if its terms are not carried out within ten (10) years from the date of its execution or termination in accordance to Stipulation XI. Prior to such time, USACE may coordinate with the other signatories to reconsider the terms of the MOA and amend it in according with Stipulation VI.

XI. TERMINATION

- A. If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other signatories to attempt to develop an amendment per Stipulation VI, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification of the other signatories.
- B. Once the MOA is terminated, and prior to work continuing on the undertaking, USACE must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. USACE shall notify the signatories as to the course of action it will pursue.
- C. Execution of this MOA by the USACE and SHPO and implementation of its terms evidence that USACE has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICER REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

SUBJECT: Resolution of Adverse Effects to the Seal Islands Historic District National Historic Landmark (NHL; XPI-00002), and two contributing structures to the NHL: the St. George Outside Landing (XPI-00194) and the St. George Inside Landing (XPI-00195) at St. George, Alaska.

SIGNATORY PARTY:

U.S. ARMY CORPS OF ENGINEERS

David R. Hibner

Colonel, U.S. Army Corps of Engineers District Commander, Alaska District

ay 6, 2020

Date

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SIGNATORY PARTY:

ALASKA STATE HISTORIC PRESERVATION OFFICER

Judith Bittner

Alaska State Historic Preservation Officer

State of Alaska

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INVITED SIGNATORY PARTY:

CITY OF ST. GEORGE, ALASKA

Patrick Pletnikoff City of St. George

Mayor

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CONCURRING PARTY:

NATIONAL PARK SERVICE, INTERIOR REGION 11 ALASKA

DONALD STRIKER STRIKER

Digitally signed by DONALD STRIKER

Date: 2020.04.21 13:39:45 -08'00'

Don Striker
Acting Regional Director
National Park Service, Interior Region 11 Alaska

Date

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mach

CONCURRING PARTY:

ALEUT CORPORATION

Thomas Mack

President & CEO

Aleut Corporation

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICER REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

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CONCURRING PARTY:

ALEUTIAN PRIBILOF ISLANDS ASSOCIATION, INCORPORATED

Dimitri Philemonof
President & CEO
Aleutian Pribilof Islands Association, Inc.

Date

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICER REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

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CONCURRING PARTY:

SAINT GEORGE TRADITIONAL COUNCIL

Christopher Merculief

President

Saint George Traditional Council

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICER REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

SUBJECT: Resolution of Adverse Effects to the Seal Islands Historic District National Historic Landmark (NHL; XPI-00002), and two contributing structures to the NHL: the St. George Outside Landing (XPI-00194) and the St. George Inside Landing (XPI-00195) at St. George, Alaska.

C.	ON	ICI	IRE	SIN	G	РΔ	RT\	7.

ST. GEORGE TANAQ CORPORATION

Nathan McCowan
President
St. George Tanaq Corporation

Date

MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICER REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

SUBJECT: Resolution of Adverse Effects to the Seal Islands Historic District National Historic Landmark (NHL; XPI-00002), and two contributing structures to the NHL: the St. George Outside Landing (XPI-00194) and the St. George Inside Landing (XPI-00195) at St. George, Alaska.

CONCURRING PARTY:

ALEUTIAN PRIBILOF ISLAND COMMUNITY DEVELOPMENT ASSOCATION

Angel Drobnica
Director of Fisheries and Government Affairs
Aleutian Pribilof Island Community Development Association

Date

APPENDIX A - AREA OF POTENTIAL EFFECT

Area of Potential Effects for the proposed project. The road is outlined in orange for visual ease, and is not the actual use area.



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MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICER REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

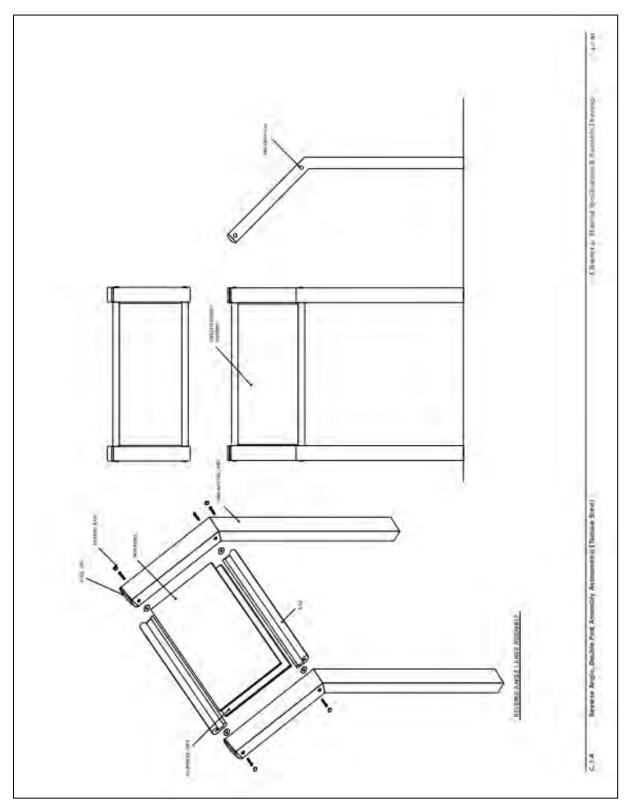
APPENDIX B – PERSEPCTIVE FOR ART Location and expected perspective of the community that the art depiction will show.



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MEMORANDUM OF AGREEMENT BETWEEN THE U.S. ARMY CORPS OF ENGINEERS AND THE ALASKA STATE HISTORIC PRESERVATION OFFICER REGARDING THE ST. GEORGE NAVIGATION IMPROVEMENTS STUDY

APPENDIX C - DISPLAY DESIGN

Pre-design of the displays that will be installed and have the artwork placed in.



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APPENDIX D - CONTACT LIST

Joseph Sparaga CEPOA-PM-C-ER U.S. Army Corps of Engineers, Alaska District P.O. Box 6898 JBER, Alaska 99506-0898 (907) 753-2640 Joseph.e.sparaga@usace.army.mil

Ms. Judith Bittner
State Historic Preservation Officer
Office of History and Archaeology
550 West 7th Ave, Suite 1310
Anchorage, AK 99501
(907) 269-8700
oha.revcomp@alaska.gov

Patrick Pletnikoff Mayor City of St. George P.O. Box 929 St. George Island, AK 995910940 (907) 444-8862 Patplet714@gmail.com

Don Striker
Acting Regional Director
National Park Service
Interior Region 11 – Alaska
240 W. 5th Ave
Anchorage, AK 99501
Don_striker@nps.gov

Janet Clemens
Historian/Regional 106 Coordinator
National Park Service
240 W. 5th Ave
Anchorage, AK 99501
Janet_clemens@nps.gov

Christopher Merculief
President
Saint George Traditional Council
P.O. Box 940
St. George Island, AK 995910940
stgtribe@aci.net

Nathan McCowan
President
St. George Tanaq Corporation
701 Sesame St #200
Anchorage, AK 99503
nmccowan@tanaq.com
(907) 272-9886

Thomas Mack
President & CEO
Aleut Corporation
4000 Old Seward Hwy, Suite 300
Anchorage, AK 99503-6087
msmith@aleutrealestate.com

Dimitri Philemonof President & CEO Aleutian Pribilof Islands Association, Incorporated 1131 E. International Airport Rd Anchorage, AK 99518 dimitrip@apiai.org

Angel Drobnica
Director of Fisheries and
Government Affairs
Aleutian Pribilof Island Community
Development Association
302 Gold St, Suite 202
Juneau, Alaska 99801
(907) 586-0161 x318
adrobnica@apicda.com