NAVFAC
Naval Facilities Engineering Command
NAVFAC NORTHWEST

LETTER OF TRANSMITTAL

Date: 1/2/13

To: Guy Warren
Remedial Project Manager
Alaska Department of
Environmental Conservation
555 Cordova Street
Anchorage, Alaska 99501

From: Justin Peach
Remedial Project Manager
NAVFAC NW
1101 Tautog Circle, Suite
201
Silverdale, WA, 98315

Subject: Final Adak OU B-2 Essential Fish Habitat Assessment, Former Adak Naval Complex, Adak, Alaska

Transmitting:
__ Included
__ Under Separate Cover

The Following:
__ Correspondence
__ Report
__ CD/Disk
__ Survey
__ Work Plan
__ Assessment
__ Decision Document
__ Site Closure
__ Public Information
__ Memorandum
__ Graphic
__ Construction Drawing
__ Specification
__ Shop Drawing
__ Letter
__ Public Press Release
__ Comments/Response to Comments
__ Document for Restoration Advisory Board

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Guy-
Attached for your use is the Final Adak OU B-2 Essential Fish Habitat Assessment, Former Adak Naval Complex, Adak, Alaska.

Please let me know if you have any questions or comments concerning the document.

Justin Peach

NAVFAC
Naval Facilities Engineering Command
NAVFAC NORTHWEST

LETTER OF TRANSMITTAL

Date: 1/2/13

To: Christopher Cora
Remedial Project Manager
U.S. Environmental Protection Agency
1200 6th Ave, ECL-115
Seattle, WA 98107

From: Justin Peach
Remedial Project Manager
NAVFAC NW
1101 Tautog Circle, Suite 201
Silverdale, WA, 98315

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Chris-
Attached for your use is the Final Adak OU B-2 Essential Fish Habitat Assessment, Former Adak Naval Complex, Adak, Alaska.

Please let me know if you have any questions or comments concerning the document.

Justin Peach

NAVFAC
Naval Facilities Engineering Command
NAVFAC NORTHWEST

LETTER OF TRANSMITTAL

Date: 1/2/13

To: Tony Cange, President
Aleut Real Estate, LLC
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From: Justin Peach
Remedial Project Manager
NAVFAC NW
1101 Tautog Circle, Suite 201
Silverdale, WA, 98315

Subject: Final Adak OU B-2 Essential Fish Habitat Assessment, Former Adak Naval Complex, Adak, Alaska

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Tony-
Attached for your use is the Final Adak OU B-2 Essential Fish Habitat Assessment, Former Adak Naval Complex, Adak, Alaska.

Please let me know if you have any questions or comments concerning the document.

Justin Peach

NAVFAC
Naval Facilities Engineering Command
NAVFAC NORTHWEST

LETTER OF TRANSMITTAL

Date: 1/2/13

To: Merry Maxwell
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Homer, AK 99603

From: Justin Peach
Remedial Project Manager
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Silverdale, WA, 98315

Subject: Final Adak OU B-2 Essential Fish Habitat Assessment, Former Adak Naval Complex, Adak, Alaska

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Number of Copies: Sets ____	**Sheets** ____	**Documents** ____

Merry-
Attached for your use are two copies of the Final Adak OU B-2 Essential Fish Habitat Assessment, Former Adak Naval Complex, Adak, Alaska.

Please let me know if you have any questions or comments concerning the document.

Justin Peach

FINAL
19 October 2012

OU B-2 Essential Fish Habitat Assessment

Former Adak Naval Complex
Adak, Alaska

Department of the Navy
Naval Facilities Engineering Command Northwest
1101 Tautog Circle
Silverdale, WA 98315

FINAL
OU B-2 ESSENTIAL FISH HABITAT ASSESSMENT
FORMER ADAK NAVAL COMPLEX
ADAK ISLAND, ALASKA

Prepared by
URS Group, Inc.
Seattle, Washington

Prepared for
Naval Facilities Engineering Command Northwest
Silverdale, Washington

U.S. Navy Contract No. N44255-09-D-4001
Delivery Order 0041

October 19, 2012

EXECUTIVE SUMMARY

The Sustainable Fisheries Act of 1996 (Public Law 104-297) amended the Magnuson-Stevens Fishery Conservation and Management Act (now called the Magnuson-Stevens Act) to require federal agencies to consult with National Oceanic and Atmospheric Agency Fisheries on activities that may adversely affect Essential Fish Habitat (EFH). This report provides an assessment of the proposed remediation of munitions and explosives of concern at Operable Unit B-2 on Adak, Alaska, and its potential effect on EFH. EFH is present within the project sites, and the project may adversely affect EFH for Pacific salmon. Furthermore, the report discusses conservation measures recommended for minimizing the effect of the project on EFH. Conservation measures will include best management practices aimed at preventing fuel and other pollutants from entering waterways, minimizing the release of sediment, and revegetating any disturbed ground with native vegetation.

DOCUMENT IDENTIFICATION

Document Title:	Final OU B-2 Essential Fish Habitat Assessment
Site Name/Location:	Former Adak Naval Complex, Adak Island, Alaska
Delivery Order No.:	0041
Document Control No.:	1012.508 33762056.R-3
Document Coverage:	This document reports the results of an essential fish habitat assessment at Operable Unit B-2 sites on Adak Island, Alaska. This report was prepared under U.S. Navy Contract No. N44255-09-D-4001 for Naval Facilities Engineering Command Northwest. These services were provided by URS Group, Inc. (URS).
Organization Title: Address:	Naval Facilities Engineering Command Northwest 1101 Tautog Circle Silverdale, Washington 98315 (360) 396-0206
Prime Contractor: Address:	URS Group, Inc. 1501 4th Avenue, Suite 1400 Seattle, Washington 98101-1616 (206) 438-2700
Navy Remedial Project Manager:	Justin Peach, P.E.
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ABBREVIATIONS AND ACRONYMS

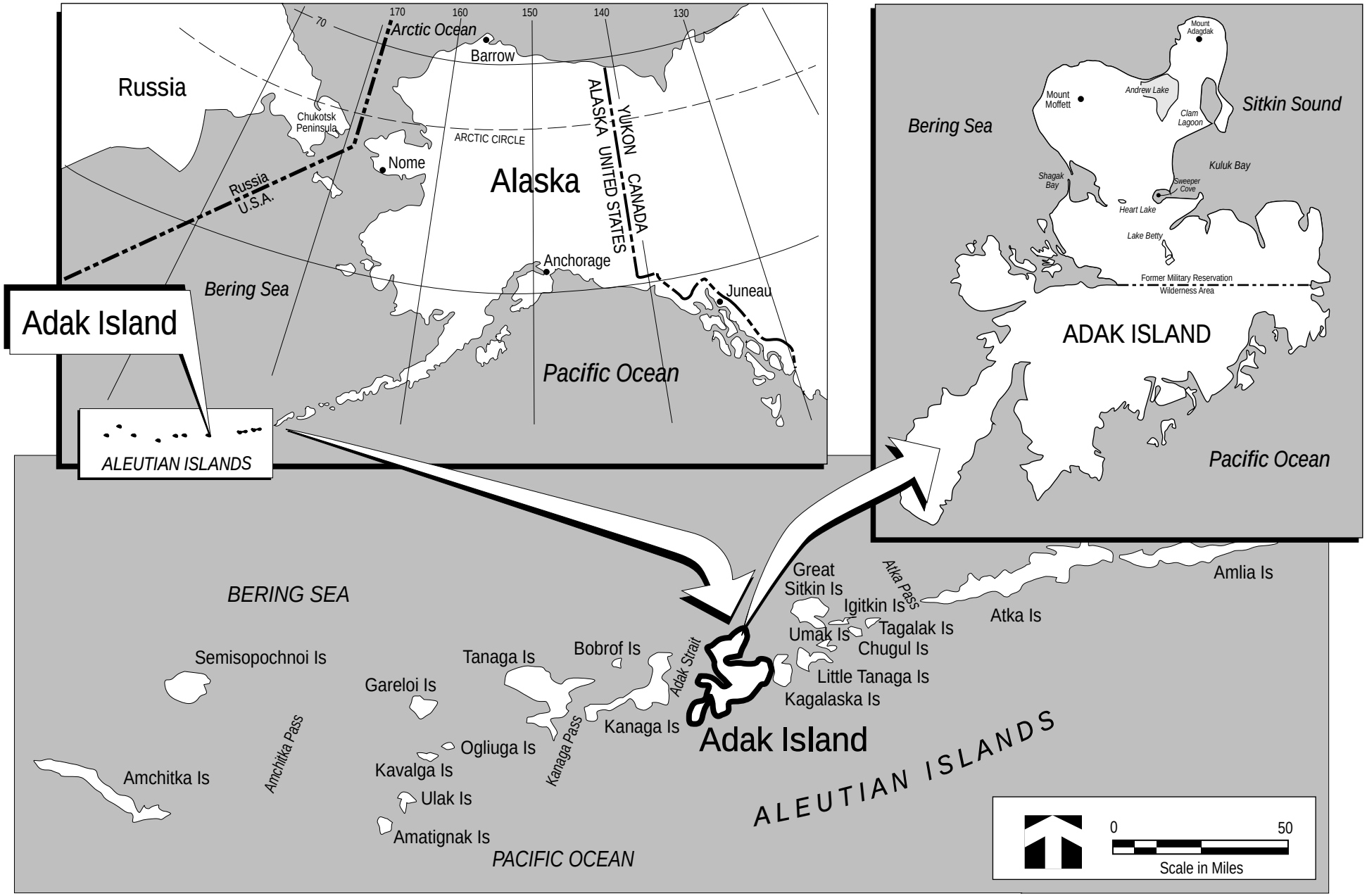
ADF&G	Alaska Department of Fish and Game
AS	Alaska Statute
BMP	best management practice
CFR	Code of Federal Regulations
EFH	essential fish habitat
°F	degree Fahrenheit
FMP	Fishery Management Plan
km	kilometer
MEC	munitions and explosives of concern
MD	munitions debris
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Navy
NOAA	National Oceanic and Atmospheric Administration
OHWM	ordinary high-water mark
OU	operable unit
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance

1.0 INTRODUCTION

The U.S. Navy (Navy) proposes to remove munitions and explosives of concern (MEC) at Operable Unit (OU) B-2 at the former Adak Naval Complex at Adak Island, Alaska (Figure 1-1). This required that Naval Facilities Engineering Command (NAVFAC) Northwest conduct an essential fish habitat (EFH) analysis for OU B-2 sites.

The Sustainable Fisheries Act of 1996 (Public Law 104-297) amended the Magnuson-Stevens Fishery Conservation and Management Act (now called the Magnuson-Stevens Act) to require federal agencies to consult with National Oceanic and Atmospheric Agency (NOAA) Fisheries on activities that may adversely affect EFH. The EFH guidelines (50 Code of Federal Regulations [CFR] 600.05-600.930) outline the process for federal agencies, NOAA Fisheries, and the Fishery Management Councils to satisfy the EFH consultation requirement under Section 305(b[2]–[4]) of the Magnuson-Stevens Act. As part of the EFH consultation process, the guidelines require federal agencies to prepare a written assessment describing the effects of actions they take on EFH (50 CFR 600.920[e][1]). This document has been prepared to satisfy that requirement.

The objective of this EFH assessment is to determine whether or not the proposed project action "may adversely affect" designated EFH for federally managed commercial fish species within the proposed action area. This report provides a description of the proposed project, a description and assessment of EFH in the project area, and an evaluation of the project impacts on these habitats. In addition, this report describes conservation and mitigation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed project.



U.S. NAVY	Figure 1-1 Adak Island Location Map	Delivery Order 0041 Adak Island, AK OU B-2 ESSENTIAL FISH HABITAT ASSESSMENT

33762056_06.ai

2.0 PROJECT BACKGROUND

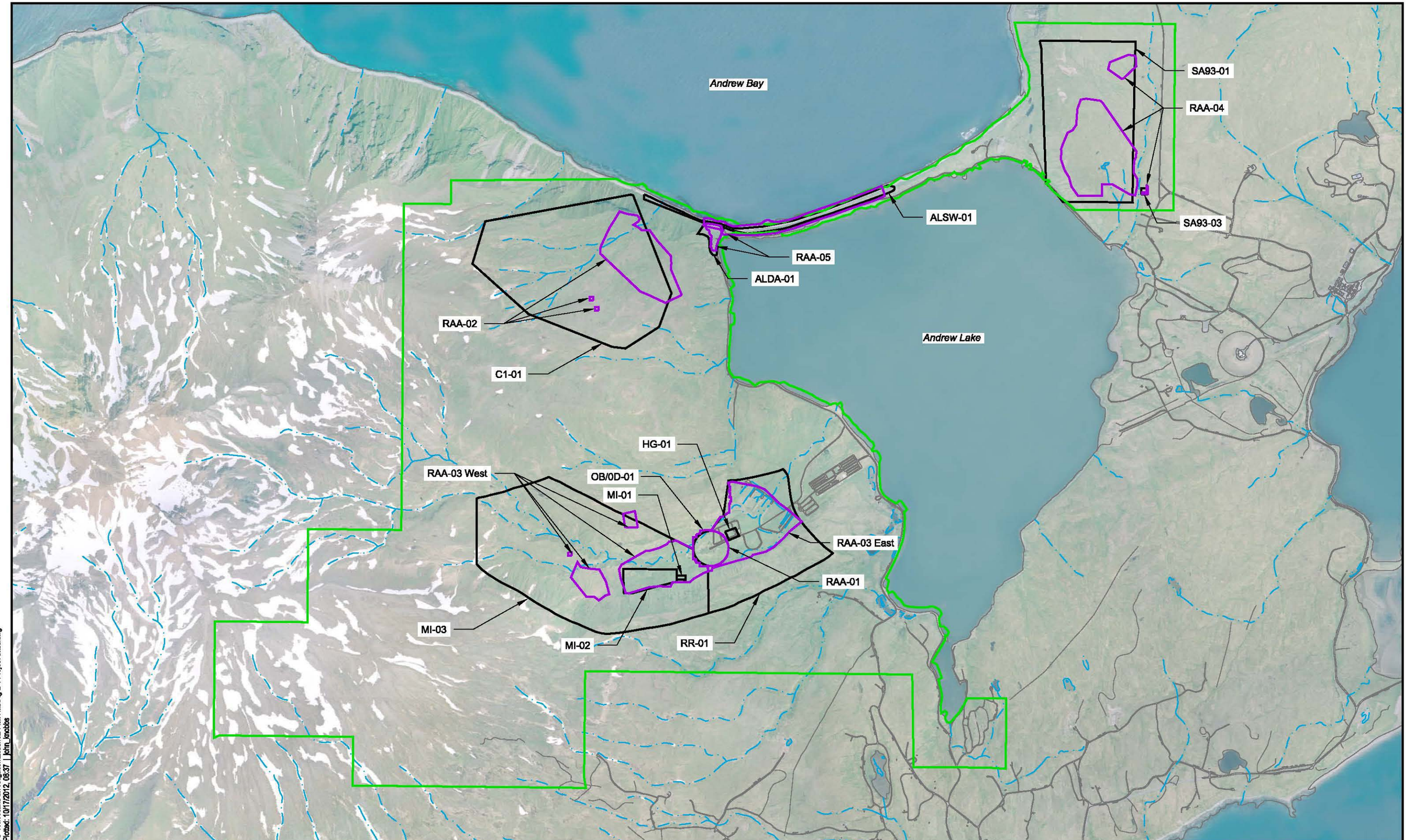
The former Adak Naval Complex is located on Adak Island, which is approximately 1,300 air miles southwest of Anchorage, Alaska, in the Aleutian chain (Figure 1-1). The Navy base occupied the northern half of the island and closed operationally on March 31, 1997. The U.S. Fish and Wildlife Service (USFWS) manages the southern portion of the island (117,265 acres), which is a designated wilderness within the Alaska Maritime National Wildlife Refuge System. The developed portion of Adak is limited to the northern portion of the island.

The Navy has undertaken a lengthy investigation and remediation process on Adak, administered under the Base Realignment and Closure Act, Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and Resource Conservation and Recovery Act of 1976. More background information and a description of the investigation and remedial actions performed to date can be found in the feasibility study report for OU B-2 sites (U.S. Navy 2012a).

The Navy proposes to remove MEC at 11 OU B-2 sites. These 11 OU B-2 sites require active remedies to address explosive hazards incompatible with the designated future land use:

- ALDA-01
- ALSW-01
- C1-01
- HG-01
- MI-01
- MI-02
- MI-03
- OB/OD-01
- RR-01
- SA93-01
- SA93-03

A description of each of the sites is provided in Table 2-1, and their locations are shown on Figure 2-1. Remedial actions at the 11 OU B-2 sites are planned for the near future, beginning in approximately 2013. The Navy intends to relinquish the parcel of land containing the OU B-2 sites to USFWS upon completion of the required remedial actions. The USFWS will manage most of the parcel of land containing the OU B-2 sites as part of the Alaska Maritime National Wildlife Refuge.



Legend:

Site Boundary

Remedial Action Area

Drainage/Stream

Parcel 4 Boundary

U.S. NAVY

Delivery Order 0041
Adak Island, AK
OU B-2 ESSENTIAL FISH
HABITAT ASSESSMENT

0 1250 2500
SCALE IN FEET

Figure 2-1
Project Sites

T:\ADAK\DI\Q\Sub-Tasks\DO 41\Wetland Investigation\Essential Fish Hab\Fig 2-1 Project Sites.dwg
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Table 2-1
OU B-2 Site Descriptions

RAA	Site Designation	Site Name	Site Description
RAA-01	OB/OD-01	Andrew Lake Open Burn/ Open Detonation Disposal Range	OB/OD-01 is a circular area with a radius of 182 meters (600 feet) that covers 18 acres. The boundary encompasses visible historical demolition craters and an ample buffer zone around the craters to account for kick-outs during disposal operations. It is bordered by RR-02 to the northwest; RR-01 to the northeast, east, and southeast; and MI-03 to the south and west. The elevation at this site ranges from about 33 to 40 meters (110 to 130 feet) asl. There is direct access to this site via the gravel range entry road, which branches from the main access road along the west side of Andrew Lake. This main road is gated (locked steel gate) near the south end of the lake to deter general access. A locked cable barrier also deters access to the range entry road. The terrain is relatively flat, but hummocky in some locations and marshy in others. There are several craters in this area resulting from previous disposal events. The site is generally covered in knee-high, grassy tundra; however, there are relatively barren areas surrounding some of the disposal craters. Moffett Creek runs from west to northeast through the northwestern portion of the site. In addition, standing water has been observed in the disposal craters. The valley floor is composed of a silty, gravelly, sandy, alluvial/colluvial, and/or outwash material overlying andesitic basalt bedrock or consolidated ash tuff. The groundwater is shallow, as evidenced by standing water in the disposal craters. Groundwater is in hydraulic communication with the creek (i.e., there is interconnection between the creek and the groundwater aquifer in this area).
RAA-02	C1-01	Combat Range #1 – Mortar Target Area	C1-01 is a target/impact area that covers 387 acres. C1-01 is located north of the former Range Complex at Andrew Lake. It is roughly oval in shape. C1-01 is situated on a sloping plateau above and west of ALDA-01 on the flanks of Mount Moffett. Elevations range from about 152 to 396 meters (500 to 1,300 feet) asl. It is bordered on all sides by C1-03. ALDA-01 and ALDA-02 are located northeast of this site, and Andrew Lake lies to the east. There is indirect access to this site via a moderate hike from the Andrew Lake range area. Access to the range area is via a locked steel gate near the south end of Andrew Lake. The terrain is moderately steep and rocky in most areas, and the site is inaccessible along the northern boundary. Vegetation consists primarily of sparse short grasses, lichens, and small alpine flowers ranging in height from 1 to 4 inches. An ephemeral drainage channel cuts across C1-01, outfalling north over a steep cliff to a rocky shelf

Table 2-1 (Continued)
OU B-2 Site Descriptions

RAA	Site Designation	Site Name	Site Description
			beside Andrew Bay. The geology of the site is characterized by shallow soils with rock outcrops. According to observations made during the preparation of the groundwater study report (U.S. Navy 1995), the occurrence of groundwater outside of the downtown area is limited by the absence of significant accumulations of permeable materials and the presence of a blanket of low-permeability tephra deposits that inhibit infiltration. As a result, most of the precipitation falling in the remote areas discharges as surface water runoff. Therefore, much of the surface of these remote areas is covered by a maze of stream channels, small impoundments, bogs, and lakes perched over the tephra layer.
RAA-03 East	HG-01	Andrew Lake Hand Grenade Range	HG-01 is a target/impact area. It is a small, square area of about 2 acres located within the former Range Complex at Andrew Lake. Remnants of a berm with incorporated throwing pits are located near the east side of the range. The pits are reinforced with heavy timbers and, at one time, offered protection from exploding grenades during training exercises. The elevation in this site is approximately 33.5 meters (110 feet) asl. This site is located wholly within RR-01. There is direct access to this site via the gravel range entry road, which branches from the main access road along the western side of Andrew Lake. This main road is gated (locked steel gate) near the south end of the lake to deter general access. A locked cable barrier also deters access to the range entry road. The terrain is relatively flat. There are steep slopes on the berm protecting the throwing pits. Vegetation consists of tall tundra grasses up to 18 inches tall interspersed with wildflowers. The valley floor is composed of a silty, gravelly, sandy, alluvial/colluvial, and/or outwash material overlying andesitic basalt bedrock or consolidated ash tuff. Groundwater is anticipated to be shallow, and there may be intermittent standing water at certain times of the year.
RAA-03 East	RR-01	Andrew Lake Range Remainder – Hand Grenade/ 40-mm Area	RR-01 is a target/impact area that covers 182 acres. It is located in the south-central portion of the Range Complex at Andrew Lake. RR-01 is bordered by RR-02 to the north; OU B-1 to the south; RR-04 to the east; and OB/OD-01, RG-01, and MI-03 to the west. HG-01 is located wholly within this site. The elevation in this site ranges from about 15 to 152 meters (50 to 500 feet) asl. There is direct access to this site via the range entry road, which branches from the main access road along the west side of Andrew Lake. This main road is gated (locked steel gate) near the south end of the lake to deter general access. A locked cable barrier also deters access to the range entry road. The terrain is generally flat in the northern portion, but can be

Table 2-1 (Continued)
OU B-2 Site Descriptions

RAA	Site Designation	Site Name	Site Description
			uneven and marshy. The steep slopes to the south make the southern third of the site largely inaccessible. The vegetation is predominantly dense, lush tundra grass in accessible lowland portions. Moffett Creek flows from west to northeast through the northern portion of this site. Lowland areas bordering this creek are often saturated with pooled water at certain times of the year. Groundwater is in hydraulic communication with the creek. The valley floor is composed of a silty, gravelly, sandy, alluvial/colluvial, and/or outwash material overlying andesitic basalt bedrock or consolidated ash tuff. The groundwater is anticipated to be shallow in lowland areas.
RAA-03 West	MI-01	Andrew Lake Mortar Impact Area – Rocket Disposal Area	MI-01 is a target/impact area that covers 0.7 acre. It is located along the southern side of the mortar impact valley in the Range Complex at Andrew Lake (west of Andrew Lake). It is bordered by MI-02 immediately to the west and is otherwise surrounded by MI-03. Elevation in the site ranges from 48 to 55 meters (160 to 180 feet) asl. There is indirect access to this site via the gravel range entry road that terminates at OB/OD-01, which branches from the main access road along the western side of Andrew Lake. This main road is gated (locked steel gate) near the south end of the lake to deter general access. A locked cable barrier also deters access to the range entry road. The terrain at the site slopes gently to the north toward the floor of the mortar impact valley. Dominant vegetation is a mixture of grasses and lowland tundra species ranging in height from 12 to 24 inches. The valley floor is composed of a silty, gravelly, sandy, alluvial/colluvial, and/or outwash material overlying andesitic basalt bedrock or consolidated ash tuff. Based on the elevation and proximity to stream channels, groundwater is anticipated to be shallow in lowland areas.
RAA-03 West	MI-02	Andrew Lake Mortar Impact Area – 40-mm Projectile Impact Area	MI-02 is a target/impact area that covers 19 acres. It is located along the southern side of the mortar impact valley in the Range Complex at Andrew Lake (west of Andrew Lake). It is bordered by MI-01 to the east and is otherwise surrounded by MI-03. The elevation at this site ranges from about 49 to 104 meters (160 to 340 feet) asl. There is indirect access to this site via a gravel range entry road that terminates at OB/OD-01, which branches from the main access road along the western side of Andrew Lake. This main road is gated (locked steel gate) near the south end of the lake to deter general access. A locked cable barrier also deters access to the range entry road. The terrain is relatively flat, rising moderately to the west toward Mount Moffett. The area is somewhat flatter in the eastern portion closer to Andrew Lake. The area is bordered on

Table 2-1 (Continued)
OU B-2 Site Descriptions

RAA	Site Designation	Site Name	Site Description
			the south by steep terrain that becomes inaccessible near the top of the ridge delineating the southern boundary of MI-02 and the Range Complex at Andrew Lake. Steep terrain also forms the northern boundary of this site to the west. Vegetation is grassy with lowland tundra species ranging in height from 12 to 24 inches. Intermittent standing water in the eastern portion of the site (i.e., lowland area) may possibly be present because of shallow groundwater. The valley floor is composed of a silty, gravelly, sandy, alluvial/colluvial, and/or outwash material overlying andesitic basalt bedrock or consolidated ash tuff. Based on the elevation and proximity to stream channels, groundwater is anticipated to be shallow in lowland areas.
RAA-03 West	MI-03	Andrew Lake Mortar Impact Area – Mortar Impact Area	MI-03 is a target/impact area that covers 425 acres. It consists of a steep valley draining west to east from the flanks of Mount Moffett toward Andrew Lake. MI-03 is bordered by OU B-1 (MM-11 and various components of MM-10) to the west, south, and north. Three OU B-2 sites border MI-03 to the east: OB/OD-01, RR-01, and RR-02. MI-01and MI-02 are located wholly within this site. The elevation in MI-03 ranges from about 40 meters (130 feet) asl at the eastern edge to about 280 meters (920 feet) asl along the western edge on the flanks of Mount Moffett. There is indirect access to this site via a gravel range entry road that terminates at OB/OD-01, which branches from the main access road along the western side of Andrew Lake. This main road is gated (locked steel gate) near the south end of the lake to deter general access. A locked cable barrier also deters access to the range entry road. The terrain ranges from relatively low and flat in the eastern portion nearest the OB/OD area to steep and inaccessible at the western end and along the southern border. There is a steep ridgeline near the northern side of the site with a relatively flat top. The top of this ridge is shared with RR-02. Vegetation is grassy in the east with lowland tundra species ranging in height from 12 to 24 inches. The vegetation transitions to upland species (mixed grasses, heaths, and mosses) of shorter stature in the west. Runoff channels or streams within the site run easterly toward Moffett Creek, which is partially located within this site. Groundwater is anticipated to be shallow in the lowland areas, which provides the potential for groundwater seeps. Small ponds or lakes are present at two locations. The valley floor is composed of a silty, gravelly, sandy, alluvial/colluvial, and/or outwash material overlying andesitic basalt bedrock or consolidated ash tuff.

Table 2-1 (Continued)
OU B-2 Site Descriptions

RAA	Site Designation	Site Name	Site Description
RAA-04	SA93-01	Source Area #93 – Multiple Ordnance Impact Area	SA93-01 is a target/impact area that covers 263 acres. It is located to the northeast of Andrew Lake. Most of the site is on a plateau some 91 to 122 meters (300 to 400 feet) above the lake, but a small strip of this site along the southwestern corner abuts the shoreline of the lake. This site is bordered by SA93-02 to the east, areas lying outside Parcel 4 to the north and south, and Andrew Lake to the southwest. It is also bordered by MAG-01 to the west, but the two areas are not physically contiguous because of a steep cliff (i.e., MAG-01 is at the base of the cliff). Elevations in the central portion of this site range from about 67 to 98 meters (220 to 320 feet) asl. Along the western edge of this site, a steep ridge rises to just over 152 meters (500 feet) and then falls very rapidly (cliff) to elevations below 100 feet asl. To the north, a steep ridge rises to over 213 meters (700 feet) on the flanks of a small mountain peak. There is indirect access to this site from the gravel road originating from the east side of Andrew Lake near the Recreation Center. The entire historical impact area in which this site resides is currently fenced (4-strand barbed wire), with posted signage to deter public access. On the west side of this site, a steep ridge forms a cliff above Andrew Lake. To the east of this ridge, the terrain falls gently toward a deep drainage ravine near the east side of this site. Vegetation is generally a mixture of grasses, sedges, mosses, and heaths ranging in height from 18 to 30 inches. A deep ravine at the eastern edge of the site carries runoff southward toward Andrew Lake. Also, there are areas of standing water or streams in the south-central portion of the site. According to observations made during the preparation of the groundwater study report (U.S. Navy 1995), the occurrence of groundwater outside of the downtown area is limited by the absence of significant accumulations of permeable materials and the presence of a blanket of low-permeability tephra deposits that inhibit infiltration. As a result, most of the precipitation falling in the remote areas discharges as surface water runoff. Therefore, much of the surface of these remote areas is covered by a maze of stream channels, small impoundments, bogs, and lakes perched over the tephra layer.
RAA-04	SA93-03	Source Area #93 – Firing Point	SA93-03 is a target/impact area that covers 0.6 acre. This small, rectangular site is located wholly within SA93-02 near the southern boundary of that site. This area was initially believed to be the principal firing point for 2.36-inch rockets found within SA93-01 (located across the ravine to the west). On the basis of items found during the 1999 site inspection, however, this site is now thought to be a rocket impact area. Nevertheless, the original name of this site has been retained to prevent confusion. The elevation of this site is

Table 2-1 (Continued)
OU B-2 Site Descriptions

RAA	Site Designation	Site Name	Site Description
			about 29 meters (95 feet) asl, but a deep ravine abuts the site, falling to about 12 meters (40 feet) asl. There is indirect access to this site from the gravel road originating from the east side of Andrew Lake near the Recreation Center. The entire historical impact area in which this site resides is currently fenced (4-strand barbed wire), with posted signage to deter public access. The terrain is generally flat. However, a deep ravine abuts the site on the west. Vegetation consists of low-growing upland tundra species ranging in height from 6 to 12 inches. According to observations made during the preparation of the groundwater study report (U.S. Navy 1995), the occurrence of groundwater outside of the downtown area is limited by the absence of significant accumulations of permeable materials and the presence of a blanket of low-permeability tephra deposits that inhibit infiltration. As a result, most of the precipitation falling in the remote areas discharges as surface water runoff. Therefore, much of the surface of these remote areas is covered by a maze of stream channels, small impoundments, bogs, and lakes perched over the tephra layer.
RAA-05	ALDA-01	Andrew Lake Disposal Area – Landfill Area	ALDA-01 is a former garbage dump where munitions have been found, with wash-up of DMM from the offshore area of ALSW-01. ALDA-01 is located at the northwest corner of Andrew Lake and covers 6.7 acres. The site boundary is dog-legged and wider at the north end of the site near Andrew Bay. Most of this site lies at elevations ranging from about 6.1 to 12.2 meters (20 to 40 feet) asl; however, a cliff on the west side of this site rises to heights of more than 200 feet asl. There is a distinct elevation break running across the site from northwest to southeast that separates the low-lying portion of the site into higher and lower elevation areas. The elevation difference of this feature is about 8 feet. The lower elevation area is a depositional environment from Andrew Bay, with this portion of the site experiencing wash-up of DMM from offshore (see ALSW-01 description below). This site is bordered by ALDA-02 to the west, Andrew Lake to the east, ALSW-01 to the northeast, and a thin strip of ALSW-01 to the north. Parcel 4 areas outside of OU B-2 border this site to the southwest. There is direct access to this site via the main access road running along the western shore of Andrew Lake. This road is gated with a locking steel gate near the south end of the lake to deter general access. The terrain is generally flat, except for steep slopes along the western edge. A line of craters trends northwest to southeast across the site. Vegetation is predominantly grass ranging in height from 12 to 18 inches, which is sparser toward the beach area, but still thick enough to hide the underlying cobbled

Table 2-1 (Continued)
OU B-2 Site Descriptions

RAA	Site Designation	Site Name	Site Description
			surface. The geology of the site is characterized by shallow bedrock with a thin layer of soil. The soil is dominated by cobbles and boulders. There should be no groundwater because of the shallow bedrock.
RAA-05	ALSW-01	SWMU 8, Andrew Lake Seawall	ALSW-01 is a wash-up area for potential disposal at sea or along the shoreline. ALSW-01 consists of the western portion of the seawall located along the north shoreline of Andrew Lake and covers 10 acres. The seawall is narrow and elongated, similar to a dike with a narrow flat top and steep sides. The seawall separates the freshwater lake from Andrew Bay to the north, which is an embayment of the Bering Sea. A munitions dump may be located offshore of the seawall. The location and amount of munitions offshore are unknown. Elevations in the upland portion of the site range from about 3 to 9.1 meters (10 to 30 feet) asl. This site is bordered by ALDA-01 to the west, Andrew Lake to the south, the Andrew Bay beach area to the north, and non-OU B-2 areas to the east. The Navy periodically performs sweeps on the Andrew Bay beach, within the tidal zone, to remove MEC items that have washed up from offshore dump sites. The area below the mean higher high water mark on the Andrew Bay side of the seawall is owned by other agencies. There is direct access to this site via an unimproved road originating on the east side of Andrew Lake near the Recreation Center. There is a locked steel gate and rock barrier on this roadway just north of the Recreation Center to deter public access. There is also indirect access via a walk from the main access road running along the western shore of Andrew Lake. This road is gated (locked steel gate) near the south end of the lake to deter general access. The terrain transitions from generally flat atop the seawall to very steep along the sides (north and south). Vegetation consists of short, relatively sparse grass atop the wall and tussocks of taller grass along the sides where adequate soil is present. A spillway at the northwest corner of Andrew Lake allows some flow of freshwater into Andrew Bay. At times, the spillway is obstructed and discharge is limited to water flowing through the cobble substrate of the seawall to Andrew Bay. The seawall is a man-made feature composed of boulders, cobbles, gravel, large metal debris, and wood.

Notes:
asl - above sea level
DMM - discarded military munitions
MEC - munitions and explosives of concern
OU - operable unit
RAA - remedial action area

3.0 PROPOSED PROJECT

For all sites except ALSW-01, SA93-01 and SA93-03, the proposed project will include removal of detectable MEC to 2 feet below the tundra/mineral soil interface. For ALSW-01 (the seawall), annual beach sweeps for MEC are proposed. For SA93-01 and SA93-03, the Navy will remove detectable MEC to 4 feet below the top of the tundra/mineral soil interface. No underwater MEC removal will be conducted in Andrew Bay adjacent to the seawall.

The objective of the project is to provide protection to human health and the environment by reducing and/or mitigating the risk associated with MEC exposure during future use of the area for wildlife management, subsistence, and recreational activities (U.S. Navy 2012a). This objective will be achieved through implementation of one or more remedial technologies and associated process options related to MEC detection, removal, and disposal. Some combination of methods is typically utilized, and the choice of methodology varies by topography, accessibility, soil conditions, depth of MEC, number of MEC found, and cost of operations. The exact methodology cannot be determined in advance of beginning the project, because the precise location and condition of subsurface MEC cannot be predicted with absolute certainty. Brief descriptions of the methodologies that may be used as part of the project are as follows:

- Visual observation – Vegetation and other types of surface cover would be trimmed as necessary, and unexploded ordnance (UXO) technicians would slowly walk the survey area to look for and mark MEC.

- Geophysical Systems – These include geophysical tools, positioning and navigation tools, deployment platforms, and data management and interpretation techniques.

    - Analog geophysical tools are instruments that produce an audible output, a meter deflection, and/or numeric output and are used by UXO technicians while walking slowly through the survey area to identify potential MEC. These can be used with less vegetation clearing.

    - Digital Geophysical Mapping – Technicians use hand-carried, wheeled, or vehicle-towed platforms equipped with an array of passive magnetic and active electromagnetic induction sensors to identify potential MEC.

- Manual excavation – This includes removing or digging individual MEC using commonly available hand tools such as shovels, picks, or trowels. This is the "industry standard" for performing MEC removal, but may be constrained in areas with high water tables.

- Mechanical excavation – This includes removing individual MEC using commonly available excavating equipment, such as a backhoe or excavator. This is usually used to begin digging a hole near an MEC, at least 1 foot away, and manually excavating to complete the removal.

- Manual screening of excavating materials – This is used in combination with mechanical excavation. Once soil has been excavated and transported to a work area, it is placed in a thin layer. UXO technicians use analog detection equipment and hand tools to screen the soil and remove MEC.

- Blow-in-place destruction – This is used for destruction of MEC that is unsafe to move. An explosive charge is placed next to the MEC without moving it. Fragments and sound pressure waves will travel variable distances from the source, depending on the size of the MEC and explosive charge set.

- Consolidated and open detonation – This is the collection and subsequent destruction by explosive detonation of MEC items, either within the work area or at an established demolition site.

- Thermal flashing – This is used to thermally remove minor explosive residue from munitions debris (MD), such as treating small arms ammunition. A thermal flashing furnace is installed at a stationary location. MD is placed into the furnace and exposed to high temperatures (between 600 and 1,400°F). Toxic residue is produced and then disposed of in accordance with state and federal laws.

- MD inspection and final disposal – MEC removal and treatment operations leave behind residue ranging from MD to packaging materials and metal scrap from munitions and targets. Recovered MD and metallic scrap must be recycled in accordance with Department of Defense regulations. This process may involve equipment such shredders, crushers, and balers. These operations require off-site transportation and disposal.

As mentioned above, some vegetation trimming will be required in order to survey for MEC. An estimated 349 acres of vegetation cutting and surface clearing will be performed, approximately 12 acres of which will be restored via active revegetation (seeding). It is likely that vegetation will be trimmed using a combination of hand-held, gas-powered weed trimmers and truck-mounted mowers or brush choppers. Trimmed vegetation will be gathered and disposed of.

Manual excavation of MEC typically involves making a three-sided cut in the vegetation mat covering the mineral soils and pulling the resulting “flap” back. Once the MEC is removed, soil is replaced in the hole to the extent possible, and the flap is returned to its previous location. The vegetation treated in this fashion typically survives and is able to reestablish roots.

In addition to MEC detection, removal, treatment, and disposal, the project will require improvement to existing roads, construction of new temporary roads, construction of temporary creek/drainage crossings, and enhancements to drainage. The road improvements will be necessary to accommodate the vehicles required to transport personnel and equipment to and from the remedial action areas (RAAs). Approximately 2.9 miles of roads will be improved. New temporary roads will be constructed within the RAAs to minimize the amount of ground disturbance from all-terrain vehicles. Roughly 5 miles of temporary roads will be constructed. It is estimated that two new creek crossings will be constructed to facilitate the movement of personnel and equipment within the RAAs. One crossing will be installed across Moffett Creek, likely located within MI-03. The other crossing will be at the upper end of Mitchell Creek near SA93-01. Drainage enhancements over a distance of approximately 3.6 miles will occur as part of the project. Drainage enhancements will include resizing or relocating existing culverts under existing roads to reduce flooding over roads.

Disposal of project derived waste (other than scrap metal from munitions) will be at an off-island municipal landfill. Equipment mobilization to Adak will be by barge, with occasional resupply via air cargo.

Because of the extreme winter conditions, remedial activities are expected to occur only between the months of May and September each year (depending on the weather). The project will begin in 2013 and is estimated to extend through 2014. The work is expected to occur seven days per week for up to 12 hours per day.

4.0 SITE DESCRIPTION

Adak Island experiences a polar maritime climate characterized by persistently overcast skies, high winds, frequent and often violent storms, and a narrow range of temperature fluctuation throughout the year. Monthly temperatures range from a low of 32.9°F in February to a high of 51.3°F in August. Average monthly precipitation varies from a low of about 3 inches during June and July to a high of 7 to 8 inches during November and December. Snowfall averages over 100 inches a year at sea level (U.S. Navy, USEPA, and ADEC 2000).

Adak Island was formed by geologic events that included volcanic eruption and tectonic subduction (movement of the oceanic crust toward and beneath the continental crust). Advancing and receding glaciers, frequent rainfall, and high winds have shaped Adak Island into dramatic hills, valleys, cliffs, and floodplains. The northern region of Adak is dominated by the remnants of three volcanoes. The highest of which is Mount Moffett (elevation approximately 1,181 meters [3,875 feet]). In addition, some cliffs on the island rise 762 meters (2,500 feet) above sea level. The majority of the island is underlain by a thick (estimated at 2,438 meters [8,000 feet]) sequence of rock, designated the Finger Bay volcanics (Coats 1956).

Vegetation on Adak Island is classified as maritime tundra. It is typified by low-growing grasses, forbs, and shrubs. Trees and tall shrubs are absent due to strong winds. Ferns are conspicuous, and mosses and lichens are common on the ground surface. The terrestrial vegetation is composed primarily of perennial species that grow close to the ground and form rather continuous monotonous stands. Most species die back to ground level following the brief growing season (early May through mid-October) and overwinter as bulbs, corms, tubers, and rhizomes. However, a few plants, such as crowberry (*Empetrum nigrum)* and alpine azalea (*Loiseleuria procumbens*), are evergreen and provide food for animals throughout the year.

Two perennial streams and one ephemeral stream occur within the project sites. The largest stream is Moffett Creek, located within the Moffett Valley, which flows through portions of MI-03, OB/OD-01, and RR-01 (in order from upstream to downstream). The second stream, called Mitchell Creek (also known as Park Creek) flows through SA93-03. Moffett Creek and Mitchell Creek drain to Andrew Lake, which is connected to the ocean by a narrow channel or spillway. The third ephemeral stream is associated with C1-01 but is unnamed and drains directly to Andrew Bay.

The Andrew Lake spillway was originally constructed in the late 1940s. Under natural conditions, Andrew Lake is not connected to Andrew Bay. During the 1980s and 1990s, the Navy did not consistently clear the spillway on an annual basis. Since 2006 or 2007, the Navy has cleared the spillway annually, around late August or early September. The Navy intends to clear the spillway annually for the foreseeable future in order to maintain access to ALDA-01 and prevent erosion of a landfill located on the southeast side of Andrew Lake. The spillway obstruction is typically caused by winter storms that deposit gravel and rock.

Photo: Andrew Lake spillway, September 2011.

Photo: Andrew Lake spillway blockage in May 2009.

A stream assessment was conducted between September 18 and October 6, 2011. Pedestrian surveys were performed immediately adjacent to Moffett Creek and Mitchell Creek, with the goal of determining the presence or absence of spawning salmonids. Stream surveys included visual observations to locate and map spawning adult salmon. Visual evidence that would corroborate salmonid spawning included presence of redds (fish nests), salmon carcasses (in the stream or on shore), and observation of live fish. These stream surveys were conducted during low-flow conditions in what would be considered a dry time of year for Adak (late summer to early fall). Very little precipitation was recorded during the 18-day survey period.

Visual inspections were conducted June 11 through 17, 2012, at the Moffett Creek culverts and at various locations along Moffett Creek throughout MI-03, OB/OD-01, and RR-01. Visual inspections were also made in the portion of Mitchell Creek below the fish passage barrier (Figure 4-1). Each of the three creeks is discussed further below.

4.1 MOFFETT CREEK

Moffett Creek drains the eastern slopes of Mount Moffett with numerous small tributaries that eventually consolidate into one main channel in the valley within MI-03. Moffett Creek drains into Andrew Lake, which is connected to Andrew Bay through a channel cut into the seawall. Moffett Creek contains an apparent fish passage barrier where it flows through five culverts under the main road, just before it drains into Andrew Lake (Figure 4-1).

Photo: Upper reach of Moffett Creek main stem.

The length of Moffett Valley was traversed on foot. At the west end of MI-03 are three branches to Moffett Creek. Located at the bottom of steeply sloped ravines (approximately 50 feet in height), these tributaries were mostly viewed from above because of the lack of safe access points. At the west end, the creek bed was typically 5 to 8 feet wide with 1 foot or less depth of flowing water. Large boulders approximately 2 to 3 feet in diameter occupied the creek bed, and steep drops of 1 to 2 feet in elevation were common along these upper reaches. Because of the steep gradient and lack of suitable spawning substrate, it is unlikely that spawning salmonids utilize this step-pool section of upper Moffett Creek. However, this habitat is suitable for Dolly Varden (*Salvelinus malma*). The two northern forks of the creek converge into one channel, which converges with the third fork at approximately the middle of MI-03. There are two small check dams located in the creek within MI-03. One check dam is located on the main stem of Moffett Creek, and a second is approximately 75 yards downstream at the mouth of a side channel. These dams are considered historic structures and are identified in the cultural resources survey report for Adak (U.S. Navy 2012b).

The floodplain widens downstream of the confluence of the stream forks, and the topography becomes flatter. In the eastern half of MI-03, Moffett Creek is typically 6 to 8 feet wide, but reaches 15 feet in some places. Boulders up to 6 feet in diameter occur in places. There is some gravel in the streambed, but few erosional features appear evident that could be feeder sources of gravel for the stream. Within OB/OD-01, Moffett Creek widens to an average of 12 feet, and the water remains approximately 1 foot deep. Downstream from this location, the entire creek edge was walked as part of the stream assessment. There were abundant cobbles up to 12 inches in diameter and some sand in the streambed. Moffett Creek continues to meander through RR-01, where the drainage has been modified by previous construction of roads and berms associated with the rifle range. Moffett Creek flows through two culverts as it passes under a road leading to the rifle range target area. These culverts appear to be fish passable.

Photo: Moffett Creek in OB/OD-01

Downstream of RR-01, the Moffett Creek floodplain widens and the stream sinuosity increases. This section contains suitable spawning and rearing habitat. There are several meanders in the stream where small side pockets of still water exist. The stream widens to 15 to 18 feet and depth decreases to 4 to 6 inches. In this portion of the stream, the substrate consists of cobbles approximately 8 to 12 inches in diameter, gravel, and some sand. A resident of Adak reported that in the spring when snow melt from Mount Moffett is high, Moffett Creek will frequently overtop the streambank in this lower floodplain (Spitler 2011). Several small fish (2 to 3 inches) were observed in Moffett Creek between OB/OD-01 and Andrew Lake. No adult salmon spawner, redd, or other evidence of salmon were observed during this stream survey.

4.2 MITCHELL CREEK

Mitchell Creek (previously called Park Creek in USFWS 1995) flows through a small portion of SA93-03 and drains most of the surrounding landscape. Mitchell Creek was surveyed on foot from Andrew Lake upstream to the small dam historically used as a power generating facility for the Adak Recreation Building. This dam and a small waterfall directly downstream are considered fish passage barriers (Figure 4-1). The short length of Mitchell Creek downstream of the barrier that is accessible to fish from Andrew Lake is approximately 4 feet wide and 12 inches deep, with cobbles up to 2 feet in diameter in places. Grasses and herbaceous vegetation are abundant and grow directly to the edge of the creek. No fish were observed during this survey.

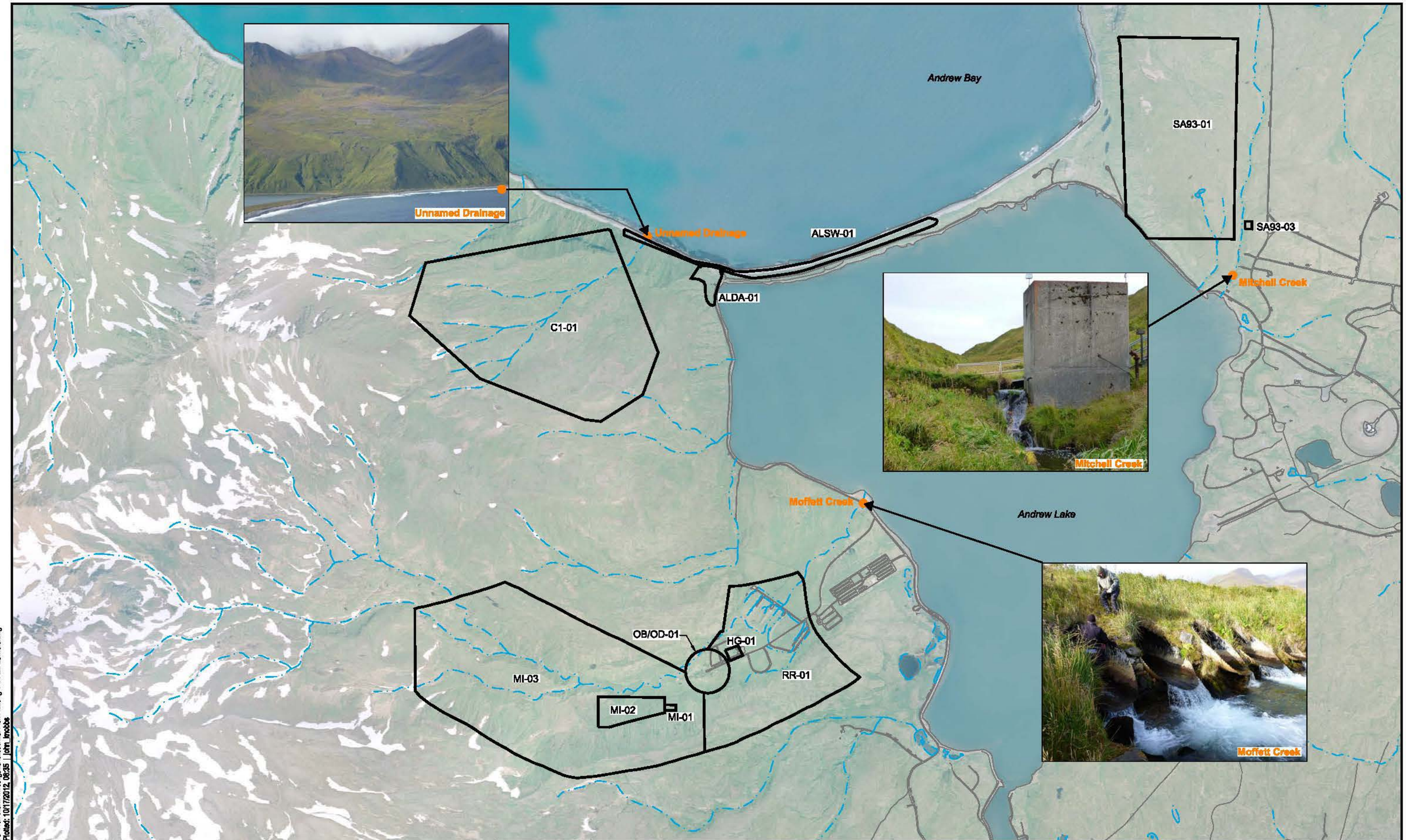
Photo: Mitchell Creek where it drains to Andrew Lake.

Photo: Mitchell Creek at the north end of SA-93-01.

4.3 C1-01 (UNNAMED DRAINAGE)

There is one mapped (ephemeral stream) drainage feature in C1-01 that connects to Andrew Bay northeast of the site. This unnamed feature is entirely blocked to fish because of the steepness of the terrain between Andrew Bay and C1-01 (Figure 4-1).

Photo: C1-01 unnamed drainage where it connects to Andrew Bay.



Legend:

- Site Boundary
- Drainage/Stream
- Fish Passage Barrier

U.S. NAVY

Delivery Order 0041
Adak Island, AK
OU B-2 ESSENTIAL FISH
HABITAT ASSESSMENT

0 1000 2000
SCALE IN FEET

Figure 4-1
Fish Passage Barriers

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Mod: 09/26/2012, 15:54 | Plotted: 10/17/2012, 08:35 | john_knobbs

5.0 ESSENTIAL FISH HABITAT ASSESSMENT

This EFH assessment includes the regulatory definition of EFH, specific considerations for Pacific salmon EFH, identification of EFH in the project area, EFH determination, and potential adverse effects of the project on EFH.

5.1 EFH REGULATORY DEFINITION

Many fish species exist in Alaskan waters. However, EFH is identified for only those species managed under a federal Fishery Management Plan (FMP). FMPs describe and identify specific habitats determined to be EFH for each life stage of the managed species.

EFH and life stages are defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 United States Code 1802[10]). For the purpose of interpreting this definition of EFH, the following additional definitions are provided:

- **Waters** include aquatic areas (marine waters, intertidal habitats, and freshwater streams) 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.
- **Necessary** means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem.
- **Spawning, breeding, feeding, or growth to maturity** covers a species full life cycle (50 CFR 600.10).

FMPs also identify the specific geographic location or extent of habitats described as EFH. For Adak Island, Alaska, the only EFH is for Alaska stocks of Pacific salmon (NOAA 2012). An FMP exists for Bering Sea and Aleutian Island groundfish and king and Tanner crab. However, the EFH for these species is confined to pelagic (marine) waters. The proposed OU B-2 project is confined entirely to the freshwater (terrestrial) environment, as discussed in Section 3. Therefore, the only EFH considered here is for Pacific salmon, which are anadromous (migrate from salt water to freshwater to breed).

5.2 PACIFIC SALMON EFH

Freshwater EFH for salmon fisheries in Alaska include all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in the state. This represents a vast array of diverse aquatic habitats over an extremely large geographic area. Alaska contains over 3,000 rivers and has over 3 million lakes greater than 8 hectares. Over 14,000 water bodies containing anadromous salmonids identified in the state represent only part of the salmon EFH in Alaska, because many likely habitats have not been surveyed. A significant body of information exists on the life histories and general distribution of salmon in Alaska. The locations of many freshwater bodies used by salmon are contained in documents organized and maintained by the Alaska Department of Fish and Game (ADF&G). Alaska Statute (AS) 16.05.870 requires ADF&G to specify the various streams that are important for spawning, rearing, or migration of anadromous fishes.

Upstream and downstream criteria have to be considered when identifying Pacific salmon EFH in the field. On the downstream end, the fish need access to salt water. The upstream limits are determined by the presence of natural migration blockages. Natural migration blockages include features such as waterfalls and stream segments with too steep of a gradient. Steep gradients cause a water velocity barrier or water too shallow for swimming. Manmade barriers to fish passage, such as culverts, are not considered as the upstream limit for EFH in an otherwise suitable habitat. Therefore, a particular stream reach need not be presently occupied by salmon to be considered EFH.

Pacific salmon EFH is further defined in Alaska by the Alaska Forest Resources and Practices Act (AS 41.17). The Act states that an "anadromous water body" is the portion of a freshwater body or estuarine area cataloged under AS 16.05.870 as important for anadromous fish, or has been determined by ADF&G to contain or exhibit evidence of anadromous fish. The anadromous portion of the stream or waterway extends up to the first point of natural physical blockage. Therefore, if salmon occur in a stream's estuary, the area of stream up to the first point of natural physical blockage is presumed to be salmon habitat.

Based on the available life history information, freshwater EFH for Pacific salmon consists of four major components: (1) spawning and incubation, (2) juvenile rearing, (3) juvenile migration corridors, and (4) adult migration corridors and adult holding habitat (prespawning freshwater pools).

Important features of essential habitat for spawning, rearing, and migration include the following:

- Substrate composition

- Water quality (dissolved oxygen, nutrients, and temperature)
- Water quantity, depth, and velocity
- Channel gradient and stability
- Food availability
- Cover and habitat complexity (large woody debris, pools, channel complexity, and aquatic vegetation)
- Space (habitat area)
- Access and passage
- Floodplain and habitat complexity

All of these features and life history stages were evaluated as part of this EFH assessment.

5.3 EFH IN THE PROJECT AREA

This project is located in the Andrew Lake watershed on Adak Island. A review of background documents and a field investigation were conducted to aid in identifying EFH in the project area. The background documents and Web resources include the Anadromous Fish Stream Interactive Maps (ADF&G 2011) and *Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes* (ADF&G 1977), *Essential Fish Habitat Assessment Report for the Salmon Fisheries in the EEZ off the Coast of Alaska* (NOAA Fisheries 2005), and *Survey of the Fishery Resources on Adak Island, Alaska Maritime National Wildlife Refuge, 1993 and 1994* (USFWS 1995). The lead author (Douglas Palmer) and lead field technician (Brad Benter) for the USFWS (1995) study were also contacted by telephone to clarify some details of the study. No fish surveys were conducted on Adak between 1994 and 2011 (Spitler 2012 and Williams 2012).

In Alaska, Pacific salmon EFH has been designated for the following species: pink salmon (*Oncorhynchus gorbuscha*), chum salmon (*Oncorhynchus* keta), sockeye salmon (*Oncorhynchus nerka*), Chinook salmon (Oncorhynchus tshawytscha), and coho salmon (*Oncorhynchus kisutch*) (NOAA Fisheries 2005). On Adak, all but Chinook salmon have been recorded (USFWS 1995). Chum salmon do not occur in Andrew Lake or any of its tributaries. Small numbers of adult chum have been observed in 11 other streams on Adak and were present during mid-August to

late September of 1993 and 1994 (USFWS 1995). The timing of salmon runs on Adak is shown on Figure 5-1, and salmon distribution information for Adak is provided in Table 5-1.

In Andrew Lake, known species include pink salmon, sockeye (kokanee) salmon, and coho salmon (USFWS 1995). However, during site visits in 2011 and 2012, no salmon were observed in either Moffett Creek or Mitchell Creek. Each of those three species, including their distribution and abundance on Adak, is discussed in further detail below.

Pink Salmon

Pink salmon are the most abundant and widely distributed salmon species on Adak and have been found in 50 streams (USFWS 1995). They were recorded in both Moffett and Mitchell Creeks. Adult pink salmon began entering Adak streams in early August and were present until mid-October of 1993 and 1994. Peak numbers of spawners were present during late August and early September. Pink salmon escapements (numbers arriving to spawn) observed during 1994 were much higher than those observed in 1993. There were no counts in Moffett or Mitchell Creeks during 1993. In 1994, 628 pink salmon were counted in Moffett Creek and 3 in Mitchell Creek. The estimated escapement from Moffett Creek was 1,080 individuals and 4 from Mitchell Creek. This even-year abundance of pink salmon is characteristic of many Alaska regions, including most streams on Kodiak, Cook Inlet, Bristol Bay, and other Aleutian Islands (Palmer 2012, McLean et al. 1977, and Holmes 1982).

No pink salmon were observed in either Moffett or Mitchell Creeks during September and October 2011 or June 2012. Field work was timed with existing pink salmon runs in 2011, and they were observed in other streams on Adak during this time. 2011 is an odd-year, which may have resulted in decreased pink salmon numbers (Palmer 2012). Pink salmon are also somewhat opportunistic in their choice of spawning location; if one creek is blocked, they may choose another nearby (Benter 2012).

Adult pink salmon likely have the strength to jump into the Moffett Creek culverts discussed in Section 4.1, which is a vertical distance of approximately 2 feet. Juvenile pink salmon would be unlikely to clear that distance (Palmer 2012 and Benter 2012).

Sockeye Salmon

Anadromous sockeye were recorded in Andrew Lake and certain tributaries. Lacustrine forms of sockeye salmon (“landlocked” salmon or those occurring only in freshwater), also called kokanee, have been observed in Moffett Creek, but not Mitchell Creek. Kokanee are well established in the watershed as evidenced by high catch rates with experimental gill nets in Andrew Lake and observations of spawners in five tributary streams. Conversely, anadromous sockeye are poorly established in the watershed, with only five anadromous spawners observed

in Nurse Creek (a tributary to Andrew Lake, not part of the OU B-2 sites). The Andrew Lake watershed is capable of supporting a larger run of sockeye salmon, but is probably limited because of accessibility. Historically, access to this watershed has been blocked during some years by debris that accumulates in the spillway connecting the lake to the ocean. Field surveys in September and October 2011 were conducted past the "peak" timing for sockeye salmon. No sockeye, or any indicators of salmon spawning were observed in either Moffett or Mitchell Creeks during this time.

Coho Salmon

Coho salmon were widely distributed on Adak Island, with adults or juveniles observed in 38 different streams in 1993 and 1994 (USFWS 1995). Coho were also recorded in Andrew Lake. However, coho salmon were not recorded in either Moffett Creek or Mitchell Creek. Juvenile coho salmon were captured in 34 streams and adults were observed in only 16 streams. Adult coho salmon probably returned to most of the streams that supported juveniles, but were not observed because of the late run timing of this species (Figure 5-1). Escapements of coho salmon observed during 1994 were generally higher than those observed in 1993. The only stream where juvenile coho were captured by USFWS in 1994 was Nurse Creek. Although no anadromous coho salmon were observed in tributaries to Andrew Lake, the occurrence of residuals (resident, nonmigratory progeny of anadromous parents) in the lake and juveniles in Nurse Creek suggests that anadromous fish occasionally spawn in this watershed. Morrow (1980) reported that residual coho become sexually mature but never spawn. Hence, all residuals in Andrew Lake and juveniles in Nurse Creek are the offspring of anadromous parents. Like sockeye salmon, the coho salmon population in this watershed is probably limited because of historical inaccessibility. Poor or no recruitment to the population has occurred during years when the outlet stream was blocked with debris. Debris accumulation in the spillway may have also interfered with the smolt out-migration during some years, resulting in a higher level of residualism (new residuals).

5.4 EFH DETERMINATION

As mentioned in Section 4, field surveys during September and October 2011 and June 2012 confirmed the presence and location of a natural fish passage barrier (a waterfall with a manmade dam just upstream) on Mitchell Creek approximately 0.1 km from the mouth. Based on surveys conducted in 1993 and 1994 on Adak, pink salmon are known to occur in the portion of Mitchell Creek below the barrier. Therefore, the lower 0.1-km segment of Mitchell Creek has designated EFH for adult, spawning, and juvenile pink salmon.

For Moffett Creek, the background studies conducted in 1993 and 1994 and the 2011 and 2012 field observations seem to yield differing conclusions. However, for the purposes of this assessment, Moffett Creek is considered EFH for adult, spawning, and juvenile pink salmon because the potential fish passage barrier is manmade (culverts). Although kokanee were recorded in Moffett Creek, anadromous sockeye were not (USFWS 1995). By definition kokanee are a landlocked strain of sockeye salmon, and therefore cannot have designated EFH.

In 2011 and 2012, it appeared that Moffett Creek has a fish passage barrier near its mouth where it joins Andrew Lake. The series of five culverts at the mouth of Moffett Creek appears to be at least partially acting as a fish passage barrier to migrating salmonids during low-flow conditions (Figure 4-1). In some years, when debris blocked the Andrew Lake spillway, lake levels may have risen and therefore created a shorter distance between the bottom of the culverts and the lake elevation. However, the same spillway debris obstruction may prevent salmon from entering Andrew Lake from the ocean.

Conditions of the Moffett Creek culverts and surrounding outfall may have changed since the 1993 and 1994 fish surveys were conducted. At that time, surveys were limited by restricted entry because of MEC, so it is not clear how much of the stream was surveyed. However, pink and kokanee salmon were recorded in that study.

To further evaluate whether or not salmon could migrate through the Moffett Creek culverts, ADF&G criteria for adult fish passage barriers were consulted. Table 5-2 outlines ADF&G criteria for different salmonid species. This table was developed by the ADF&G and Department of Natural Resources as a revision to the Alaska Forest Resources and Practices Act (AS 41.17.950) (ADF&G 1997).

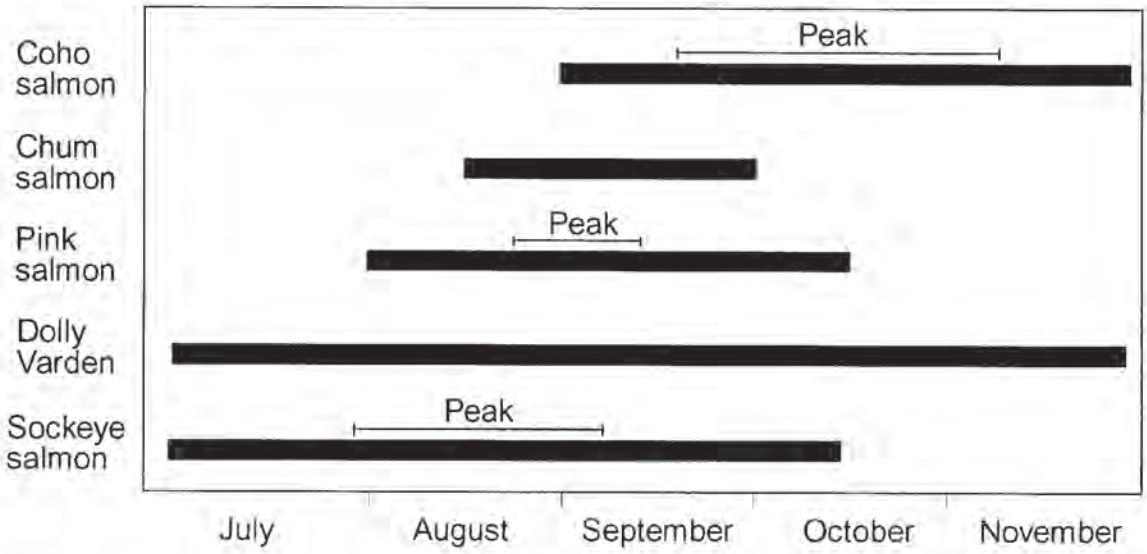
The maximum fall height for pink salmon is considered 0.9 to 1.2 meters (approximately 3 to 4 feet). Figure 4-1 shows the location of fish passage barriers. The perched height of each culvert in Figure 4-1 is approximately 2 feet. The five culverts do not constitute a passage barrier to pink salmon, according to the criteria in Table 5-2. However, other factors likely influence passability. The length of each culvert is at least 10 feet, which presents an additional challenge to migrating salmon. The depth of water in each culvert was low (2 to 3 inches) in early October 2011, which is traditionally a relatively dry time of year. Blockages of the spillway have also historically provided a potential barrier to salmon entering Andrew Lake.

5.5 POTENTIAL ADVERSE EFFECTS OF THE PROPOSED PROJECT

The definition of adverse effect is “any impact that reduces quality and/or quantity of EFH, including direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or

reduction in species fecundity), and site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810).

The proposed project would result in long-term effects from physical disruptions of the stream channels in Moffett and Mitchell Creeks. Each of these creeks would each require at least one temporary crossing structure. The crossing structures would be composed of one or more culverts and gravel fill placed below the ordinary high-water mark (OHWM). The proposed project also has the potential to result in the release of sediment from the terrestrial environment due to ground disturbing activities. These activities will include excavation for the identification and removal of MEC, improvements to existing roads, construction of new temporary roads, construction of temporary creek/drainage crossings, and enhancements to drainage.



Note: Actual run times may vary from year to year.

Source: U.S. Fish & Wildlife Service (1995)

U.S. NAVY	**Figure 5-1** **Approximate Run Timing of Anadromous Fish on Adak Island**	Delivery Order 0041 Adak Island, AK OU B-2 ESSENTIAL FISH HABITAT ASSESSMENT

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Table 5-1
Salmon Distribution on Adak Island

Species	Essential Fish Habitat in Alaska	Occurs on Adak[a]	Moffett Creek[a]	Mitchell Creek[a]
Pink salmon	X	X	X	X
Chum salmon	X	X		
Sockeye salmon	X	X	X	
Chinook salmon	X			
Coho salmon	X	X		

[a]From USFWS 1995

Table 5-2
Criteria for Determining the Upstream Limit of Salmon in a Stream System

Criterion	Species				
	Chinook	Coho	Sockeye	Chum	Pink
Maximum fall height: A blockage may be presumed if fall height exceeds this distance.	3.3 m	3.3 m	3.0 m	1.2 m with deep jump pool; 0.9 m without pool	
Pool depth: A blockage may be presumed if the unobstructed water column depth within the pool is less than this distance.	1.25 times fall height, except that there is no minimum pool depth for falls less than 1.2 m for coho and less than 0.6 m for other species				
Steep channel: A blockage may be presumed at the upper end of the reach if channel steepness exceeds the following without resting places for fish.	Greater than 70 m at 12% gradient Greater than 30 m at 16% gradient Greater than 15 m at 20% gradient Greater than 8 m at 24% gradient			Greater than 30 m at 9% gradient	

Note: m - meter

6.0 DETERMINATION OF EFFECT

All project activities, including the placement of culverts and rock material below the OHWM, were assessed for impacts to EFH. The project will result in effects from surface erosion and the creation of a physical barrier to fish passage (culvert). This would result in a "may adversely affect" determination for pink salmon EFH and a "no adverse effect" determination for coho and sockeye salmon (Table 6-1).

Table 6-1
Essential Fish Habitat Effects Determination

Pacific Salmon Species	Occurrence	Determination
Sockeye salmon	No, not documented	No adverse effect
Coho salmon	No, not documented	No adverse effect
Pink salmon	Yes, documented	May adversely affect

7.0 ESSENTIAL FISH HABITAT CONSERVATION MEASURES

The following draft conservation measures and best management practices (BMPs) were developed to protect and minimize the impact to aquatic species and their habitat that the proposed action may cause. BMPs will be finalized by the construction contractors when they are selected.

- Erosion and sediment control BMPs will be used to select, implement, maintain, and remove appropriate temporary erosion and sediment controls.

- An approved construction management plan, which includes soil erosion and sedimentation control, will be implemented to prevent accelerated erosion and off-site migration of soil from occurring during MEC removal. The BMPs include but are not limited to temporary erosion control practices such as the following:

  - Straw wattles or bales
  - Mulching of exposed ground
  - Stabilized construction entrances
  - Spill prevention

- Disturbance of existing vegetation in ditches and at stream crossings will be minimized to the greatest extent possible.

- After project completion, temporary stream crossings will be abandoned and the stream channel restored where necessary.

- Any native vegetation displaced by construction will be stockpiled for use during site restoration.

- When construction is finished, the construction area will be cleaned up and rehabilitated (replanted and reseeded) as necessary to renew ecosystem processes that form and maintain productive fish habitats.

- All waste material, such as construction debris, excess dirt, or overburden resulting from this project will generally be deposited above the limits of flood water in an off-site disposal site.

- Construction-related debris will not be dumped or allowed to enter the stream channel or tributary.
- The number of temporary access roads will be minimized, and roads will be designed to avoid adverse effects such as creating excessive erosion.
- All temporary accessways will be removed (including gravel surfaces) and planted after project completion.
- A supply of emergency erosion control materials will be on hand, and temporary erosion controls will be installed and maintained in place until site restoration is complete.
- Heavy equipment will be limited to that with the least adverse effects on the environment (e.g., minimally sized, low ground pressure equipment).
- The approved construction management plan, which includes spill containment procedures, will be finalized before operations begin. The plan will identify containment locations.
- A spill containment kit will be located where equipment is stored and used.
- Heavy equipment that is staged on site will be inspected to ensure that it is free of external petroleum-based products.
- Heavy equipment that is staged on site will be checked daily for leaks, and any necessary repairs will be completed prior to commencing work activities around the water.
- When not in use, vehicles and equipment that contain oil, fuel, and/or chemicals will be stored in a staging area located at least 150 feet from wetlands and water bodies, where feasible.
- Refueling of power equipment will be at a location remote from water bodies (at least 100 feet distant) to prevent direct delivery of contaminants into a water body (or absorbent pads will be used for immobile equipment).

8.0 QUALIFICATIONS OF THE FIELD TEAM AND AUTHORS

The qualifications of the field team, report author, and senior technical reviewer are provided below.

Jennifer Pretare, Ph.D.

Dr. Jennifer Pretare was the field team leader for both deployments to Adak Island discussed in this report and the report author. She is a senior biologist at URS in Seattle, Washington, with over 16 years of experience as a professional biologist. She received her Ph.D. in 2000 from the University of California, Berkeley in Environmental Science, Policy, and Management. She received her B.S. from the Evergreen State College in Olympia, Washington in 1993.
Dr. Pretare has specialized training in preparation of biological assessments and EFH assessments under the Endangered Species Act (training by Washington Department of Transportation in 2011), monitoring of marbled murrelets for pile-driving activities (training by USFWS in 2011), and wetland delineation (training by Wetland Training Institute in 2001).
Dr. Pretare has coordinated and completed numerous large field deployments throughout her career at URS. She is a senior technical specialist on issues related to wildlife, especially birds.

Eric Lillywhite

Eric Lillywhite was part of the stream survey data collection team. He is a senior environmental scientist with URS in Seattle, Washington. Eric has a B.A. degree from the Evergreen State College in Olympia, Washington. He has 20 years of experience in a wide range of environmental studies. Eric has been to Adak over 30 times since 1996, where he has worked on a variety of projects, including studies on rock sole and blue mussels.

Bill Mavros

Bill Mavros was the senior technical reviewer for this EFH assessment. Mr. Mavros is a senior fisheries biologist with URS in Seattle, Washington. He has a master's degree in zoology from the University of Manitoba and 20 years of experience as a fisheries biologist. He has specialized training in preparation of biological assessments and EFH assessments under the Endangered Species Act (training by Washington Department of Transportation in 2006). His project experience includes fisheries habitat restoration and mitigation (marine and freshwater), hydropower, habitat conservation plans, Endangered Species Act issues, population genetics, habitat modeling, conservation hatcheries, environmental permitting, watershed planning, water quality, environmental education, and public outreach. He also has considerable field experience with benthos sampling, fish passage, eelgrass surveys, beach seining, marine and freshwater habitat analysis and restoration, redd surveys, in-stream habitat surveys, electro-fishing, fish

tagging, fish trapping, telemetry, fish screen evaluations, snorkel surveys, underwater imaging, water quality monitoring, and research scuba diving.

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