

U.S. DEPARTMENT OF
HOMELAND SECURITY

**UNITED STATES
COAST GUARD**



ENVIRONMENTAL ASSESSMENT

U.S. COAST GUARD ARCTIC TRAINING ACTIVITIES
2015

ALASKA

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U.S. Coast Guard
District Seventeen
Juneau, Alaska

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TABLE OF CONTENTS

CHAPTER 1	PURPOSE AND NEED FOR ACTION	1-1
1.1	Project Background.....	1-1
1.2	Purpose and Need for Action.....	1-4
1.3	Coast Guard Missions.....	1-5
1.4	Coast Guard Assets.....	1-9
1.5	Public Involvement.....	1-9
CHAPTER 2	PROPOSED ACTION AND ALTERNATIVES.....	2-1
2.1	Introduction.....	2-1
2.2	Proposed Action.....	2-1
2.3	Preferred Alternative.....	2-1
2.3.1	Shore Operations.....	2-1
2.3.2	Air Operations.....	2-2
2.3.3	Sea Operations.....	2-3
2.3.4	Training Exercises.....	2-6
2.3.5	Building Partnerships: Tribal/Local Government Engagement.....	2-8
2.4	No Action Alternative.....	2-9
2.5	Best Management Practices and Conservation Measures.....	2-10
2.6	Alternatives Eliminated from Detailed Consideration.....	2-16
CHAPTER 3	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES.....	3-1
3.1	Introduction.....	3-1
3.2	Water Quality.....	3-2
3.2.1	Affected Environment.....	3-2
3.2.2	Environmental Consequences.....	3-2
3.3	Biological Resources.....	3-3
3.3.1	Affected Environment.....	3-5
3.3.2	Environmental Consequences.....	3-13
3.4	Cultural Resources.....	3-16
3.4.1	Affected Environment.....	3-16
3.4.2	Environmental Consequences.....	3-25
3.5	Socioeconomics.....	3-25
3.5.1	Affected Environment.....	3-25
3.5.2	Environmental Consequences.....	3-28
3.6	Public Health and Safety.....	3-30
3.6.1	Affected Environment.....	3-30
3.6.2	Environmental Consequences.....	3-31
CHAPTER 4	CUMULATIVE EFFECTS	4-1
4.1	Approach to Analysis.....	4-1
4.2	Projects Considered.....	4-2
4.3	Oil and Gas Exploration, Development and Production Projects.....	4-10
4.4	Other Federal Agency Activities.....	4-12

4.5	Scientific Research Projects.....	4-12
4.6	Mining.....	4-14
4.7	Transportation.....	4-15
4.8	Community Development Projects.....	4-15
4.9	Subsistence.....	4-16
4.10	Recreation and Tourism.....	4-16
4.11	Climate Change.....	4-16
4.12	Cumulative Impacts Analysis.....	4-17
CHAPTER 5	OTHER NEPA CONSIDERATIONS	5-1
5.1	Consultations and Compliance	5-1
5.2	Irreversible or Irrecoverable Commitment of Resources	5-3
5.3	Relationship Between Short-Term Uses Of The Environment And Long-Term Productivity.....	5-3
5.4	Any Probable Adverse Environmental Effects that Cannot be Avoided and are not Amenable to Mitigation.....	5-3
5.5	Possible Conflicts between the Proposed Action and the Objectives of Federal Acts, Executive Orders, Policies, and Plans	5-3
CHAPTER 6	LIST OF AGENCIES AND PERSONS CONTACTED	6-1
CHAPTER 7	LIST OF PREPARERS	7-1
CHAPTER 8	REFERENCES.....	8-1

FIGURES	Page
Figure 1-1 Action Area	1-2
Figure 1-2 Sea ice extent and Arctic activities in 1992	1-3
Figure 1-3 Sea ice extent and Arctic resources and activities in 2012.....	1-3
Figure 2-1 Fanlight antenna.....	2-1
Figure 2-2 MH-60T Helicopter participation in SAR training.....	2-2
Figure 2-3 High Endurance Cutter with helicopter flight deck	2-3
Figure 2-4 Icebreaker POLAR STAR.....	2-4
Figure 2-5 Crewmembers testing the vessel’s SORS	2-7
Figure 2-6 Spilled oil in ice recovery demonstration concept.....	2-8
Figure 3-1 Alaska habitats	3-6
Figure 3-2 Caribou herds (Source: Alaska Department of Fish and Game 2011).....	3-9
Figure 3-3 Current muskox range and reintroduction points	3-10
Figure 3-4 Moose range in Alaska.....	3-11
Figure 3-5 Dall sheep range in Alaska and western Canada	3-12
Figure 3-6 Bowhead whale	3-17
Figure 3-7 Per capita subsistence harvest in Northwest Arctic Borough and North Slope Borough.....	3-18
Figure 3-8 Bowhead whale subsistence areas	3-20
Figure 3-9 Beluga whale range	3-21
Figure 3-10 Sea lion and pups.....	3-22
Figure 3-11 Vessel activity in the Arctic	3-27

TABLES	Page
Table ES-1 Summary of Environmental Effects of the Alternatives	ix
Table 2-1 Active Acoustic Sources associated with Sea Operations and Training	2-3
Table 3-1 Sensitive Species Potentially Occurring in the Project Area	3-8
Table 3-2 Bowhead whale harvests	3-21
Table 3-3 Tribes, Tribal Entities, and Governments Contacted by the Coast Guard..	3-24
Table 4-1 Actions for Consideration Identified for the Cumulative Impacts Analysis..	4-3
Table 5-1 Laws and Executive Orders	5-1

ACRONYMS	Full Phrase or Definition
ANIMIDA	Arctic Nearshore Impact Monitoring in the Development Area
ANS	Arctic Natural Sciences
AOOS	Alaska Ocean Observing System
ARCSS	Arctic System Science
ASAMM	Aerial Surveys of Arctic Marine Mammals
AtoN	aids to navigation
BMP	best management practice
BOEM	Bureau of Ocean Energy Management
BRAC	Base Realignment and Closure
BSAI	Bering Sea and Aleutian Islands
BWASP	Bowhead Whale Aerial Survey Project
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COMIDA	Chukchi Offshore Monitoring in Drilling Area
CFR	Code of Federal Regulations
CGD17INST	Coast Guard District 17 Instruction
COMDTINST	Commandant Instruction
CSESP	Chukchi Sea Environmental Studies Program
CWA	Clean Water Act
DEW	distant early warning
DGPS	Differential Global Positioning System
FOL	Forward Operating Location
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GPS	Global Positioning System
IPCC	Intergovernmental Panel on Climate Change
kHz	kilohertz
LORAN	Long-Range Navigation
LRRS	Long Range Radar Station
MARES	Marine Arctic Ecosystem Study
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MOA	memorandum of agreement
MRO	Mass Rescue Operation
NEPA	National Environmental Policy Act
nm	nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPFMC	North Pacific Fishery Management Council

NSF	National Science Foundation
NSIDC	National Snow and Ice Data Center
OCS	Outer Continental Shelf
OPA	Oil Pollution Act
RDC	Research & Development Center
RUSALCA	Russian-American Long-term Census of the Arctic
SBI	Shelf Basin Interactions
SAR	search and rescue
SOLAS	Safety of Life at Sea
SONS	Spill of National Significance
SRRS	Short Range Radar Station
TAPS	Trans-Alaska Pipeline System
TOWEX	Towing Exercise
UAV	unmanned aerial vehicle
U.S.	United States
USC	United States Code
USGS	United States Geological Survey
UUV	unmanned underwater vehicle
USFWS	United States Fish and Wildlife Service
VGP	Vessel General Permit
VOSS	Vessel of Opportunity Skimming System

EXECUTIVE SUMMARY

Introduction

The information and analysis contained in this EA will determine whether an increased Coast Guard presence in summer of 2015 in the Bering, Chukchi, and Beaufort Seas would result in a significant impact on the environment, requiring the preparation of an environmental impact statement, or if no significant impacts would occur and a finding of no significant impact (FONSI) would be appropriate.

The United States (U.S.) Coast Guard's mission is to protect the public, the environment, and U.S. economic interests, in the nation's ports and waterways, along the coast, on international waters, or in any maritime region, as required to support national security. The Coast Guard proposes to conduct Arctic operations and training exercises in order to fulfill this mission in the Arctic in response to a substantial increase in Arctic maritime activity.

Purpose and Need for Action

The purpose of the proposed action is to provide consistent and reliable Coast Guard presence in the Arctic in summer of 2015 to fulfill the Coast Guard's Arctic Strategy, guided by direction from the President of the United States, including the National Security Strategy, National Military and Maritime Strategies, National Strategy for the Arctic Region, Arctic Region Policy NSPD-66/HSPD-25, National Strategies for Homeland Security and Maritime Domain Awareness, National Ocean Policy, and Executive Order 13580. The need for the proposed action is to meet the Coast Guard's mandated missions in the Arctic where, to date, except for U.S. Coast Guard cutter HEALY, there has not been a consistent, established Coast Guard presence. The increased levels of human activity in the Arctic will result in an increase in maritime activities.

Proposed Action and Alternatives

The proposed action is to conduct increased operations and training exercises in the Arctic in summer of 2015 to meet Coast Guard mission responsibilities due to the increase of national and international activities in the area. This would provide a shore, air, and sea Coast Guard presence to meet the seasonal surge mission requirements. These activities support the Arctic Strategy (U.S. Coast Guard 2013a) and enable the Coast Guard to fulfill its 11 mandated missions.

Preferred Alternative

The Preferred Alternative consists of five main elements: shore, air, and sea operations; training exercises, and tribal/government engagement. Specific activities related to these five elements are described below.

1. Shore Operations:

- Forward Operating Locations (FOLs) and logistics/staging locations would serve as temporary Coast Guard home bases for sea and air support during the 2015 season of Arctic activities. The locations for 2015 activities are Deadhorse and Barrow.
- The Coast Guard would conduct inspections of commercial and non-commercial vessels in major ports in Alaska to ensure compliance with law and further the missions of drug

and migrant interdiction and marine safety. The Coast Guard would discuss boating safety with subsistence and recreational boaters and gold dredge operators during Coast Guard operations including port facility inspections or in a public school classroom setting.

2. *Air Operations:*

- The Coast Guard would posture for and execute air searches to locate missing persons and vessels.
- Routine Patrols and Arctic Domain Awareness Flights serve to locate, identify, and document human contacts north of the Arctic Circle. The flights would gather and verify data on coastal erosion, ice observation, and other scientific data requests. Arctic domain awareness flights provide an opportunity for pilot and crew familiarization with the Arctic Circle and provide a safe opportunity for media coverage of events.

3. *Sea Operations:*

- Vessels would assist search and rescue activities as required. The Coast Guard would use satellite emergency position-indicating radio beacon locators, cell phones, satellite phones, distress flares, and by conducting search patterns in last known locations of missing boats. Searching vessels may employ radar and sonar technologies to aid in detection of stricken ships. Deployment of self-locating buoys can assist in determining set and drift from last known position. Vessels are required for search and rescue (SAR) as a helicopter alone cannot carry numerous additional passengers.
- Up to two icebreakers would operate to support oceanographic and meteorological research, SAR, and law enforcement missions.
- Safety zones would be enforced as needed to protect divers and prevent vessel interference during exploration activities, salvage work, enforce flight restrictions, and maintain standoff distances to any other event that presents a hazard to navigation. Flight restrictions are communicated through Notice to Airmen and Federal Aviation Administration bulletins and could be in place where high tempo Coast Guard operations are occurring.
- The Coast Guard would routinely patrol Arctic waters to detect, deter, and disrupt maritime terrorist attacks, sabotage, or subversive acts; interdict drugs; detect and investigate violations of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA); and to reduce the threat of foreign poaching of U.S. natural resources such as fish stocks or mineral deposits.

4. *Training Exercises:*

- Rescue Exercises would practice towing distressed vessels (TOWEX) or simulate evacuation of passengers from a stricken ship (Mass Rescue Operation [MRO]).
- Flight crews would log in-flight hours to meet ongoing training requirements while at their FOL. Flight Crews will be responsible for coordinating with tribal representatives to ensure proposed flight paths will not interfere with sustenance hunts or activities.
- Small boat training would include boat launching and maneuvers from cutter deployed boats. Some shore-based boats may be transported to facilities by air and then launched via vehicle on a case-by-case basis. Specific exercises include coxswain training, SAR,

and vessel boarding and inspections. Cutters can also practice launching and recovering small boats.

- Oil recovery training exercises would use simulated spill products that include buoyant, organic, and biodegradable items such as moss or fruit or fluorescein or rhodamine water-tracing dye. Use of these products provides the Coast Guard with the opportunity to study spill drift and practice skimming. Various skimming systems would be deployed.

5. Building Partnerships: Tribal/Local Government Engagement.

Formal and informal government-to-government and community engagement with tribes and local community leadership is vital to all of the Coast Guard's missions. Engagement includes:

- (1) Local government and community engagement - sustained relationships with local governments and other community leaders.
- (2) Education and training outreach- Kids Don't Float, Water Safety, Commercial Fishing Vessel Standards Outreach.
- (3) Tribal and native community engagement – sustained relationships with federally recognized tribes (tribes) and Alaska Native Organizations, and other community leaders.

No Action Alternative

Under the No Action Alternative, the Coast Guard would not be able to fulfill its mandated missions in the Arctic in summer of 2015. The Coast Guard also enforces the MMPA and ESA, and without a Coast Guard presence in the Arctic, enforcement of these laws would be significantly reduced. The No Action Alternative would simply use existing assets from their normal operating locations (i.e., Kodiak for aviation assets, Kodiak or, if deployed, the Gulf of Alaska or Bering Sea for surface assets), and therefore would not be positioned for immediate emergency response.

The No Action Alternative would not meet the Coast Guard's mandate to provide a proactive air, surface, and shore-side Coast Guard presence in the Arctic to meet statutory mission requirements. As such, it is not a viable alternative and does not meet the purpose and need, but is included here for comparison of environmental effects with the Preferred Alternative.

Summary of Potential Environmental Consequences

A summary of the environmental impacts of the alternatives is provided in Table ES-1. The proposed action includes best management practices (BMPs) developed during federal and state agency permitting and approval processes, or as standard provisions for Coast Guard work. These BMPs would be employed to avoid or minimize adverse effects on the environment.

Table ES-1 Summary of Environmental Effects of the Alternatives

Resource Area	No Action Alternative	Preferred Alternative
Water Quality	Delay in response to environmental emergencies could negatively impact water quality in the region.	No significant impacts to water quality as BMPs would be in place for Coast Guard activities and Incident Control Centers would be established to handle environmental emergencies.
Biological Resources	Coast Guard would not be present in the area to take enforcement action against poaching of U.S. fish stocks and observed violations of the ESA, MMPA, Magnuson-Stevens Act, and other applicable laws.	No significant adverse impacts to habitats, fish and essential fish habitat (EFH), marine mammals, birds, threatened or endangered species, or land mammals present in the action area are anticipated with implementation of the BMPs in Section 2.5. Positive impacts would result from Coast Guard's presence and ability to take enforcement action against poaching of U.S. fish stocks and observed violations of the ESA, MMPA, Magnuson-Stevens Act, and other applicable laws
Cultural Resources	The Coast Guard would not proceed with tribal outreach and coordination efforts. No areas containing resources utilized for subsistence would be affected.	No significant adverse impacts to subsistence resources are anticipated as Coast Guard would have ongoing communications with potentially affected communities.
Socioeconomics	Lack of Coast Guard presence could inhibit at-sea commerce and increase poaching of fishing stocks.	No significant adverse impacts to socioeconomics, with minor positive impacts from local economic stimulation at Forward Operating Location and increased sustainable fisheries through fisheries law enforcement. Coast Guard assets would also ensure the safe and efficient flow of marine traffic and commerce in the region.
Public Health and Safety	The Coast Guard would not be present to assist with navigation, commercial and non-commercial vessel safety, law enforcement, and the absence of previous outreach and educational programs.	No significant adverse impacts on public health and safety, and is likely to have positive impacts through faster response times to emergencies and continued education and outreach programs. Coast Guard assets would also ensure the safe and efficient flow of commerce in the region.



Chapter 1 Purpose and Need for Action

The Arctic region is very dynamic and strategically important to global transportation, resource management, and international cooperation. The United States Coast Guard's (Coast Guard) vision for the Arctic Region is to "ensure safe, secure, and environmentally responsible maritime activity in the Arctic" (U.S. Coast Guard 2013a). This document presents the anticipated effects from Coast Guard operations and training exercises that are proposed to occur at sea and over land in the Alaskan Arctic region in the summer of 2014. For the purposes of this Environmental Assessment (EA), the Arctic is defined as the waters of the United States (U.S.) north of latitude 62.5°N including the U.S. Exclusive Economic Zone and adjacent shoreline areas of Alaska westward to the U.S. and Russian border, northward through the Bering Sea and into the Chukchi and Beaufort Seas and eastward to the U.S. and Canadian border (Figure 1-1).

This EA has been prepared to evaluate the environmental effects of the proposed action. This EA has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] §4321 *et seq.*); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] §1500 *et seq.*); Department of Homeland Security Directive Number 023-01; and U.S. Coast Guard Commandant Instruction M16475.1D.

1.1 PROJECT BACKGROUND

There has been a progressive, yearly decline in the thickness and extent of Arctic sea ice. Figure 1-2 and Figure 1-3 compare Arctic sea ice extent, human activities, and natural resources in 1992 versus 2012. The retreat of ice has created navigation routes through the Northwest Passage and Northern Sea Route (Figure 1-3). Arctic sea ice reached a record minimum of 3.61 million square kilometers (1.39 million square miles) in September 2012 (National Snow and Ice Data Center [NSIDC] 2015).

Vessel activity in the Arctic has increased with the retreating sea ice. Expanding commercial ventures in the Arctic have increased maritime traffic in the Bering Strait. From 2008 to 2012, traffic through the Bering Strait increased by 118 percent (U.S. Coast Guard 2013a). These activities include a broad range of vessels including icebreakers, research, oil industry, ore carriers, coastal resupply, cruise ships, recreational/adventurer vessels, and commercial fishing boats. With increased traffic comes an increased potential for search and rescue, water pollution, illegal fishing, and infringement on the U.S. Exclusive Economic Zone.

The world's eight Arctic nations are Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States. These nations are developing agreements to operate effectively in the area, while pushing toward further aggressive growth of commercial shipping, exploration, and tourism. International energy companies with U.S. subsidiaries have reinvigorated their plans to conduct drilling operations in the Chukchi Sea and Beaufort Sea.

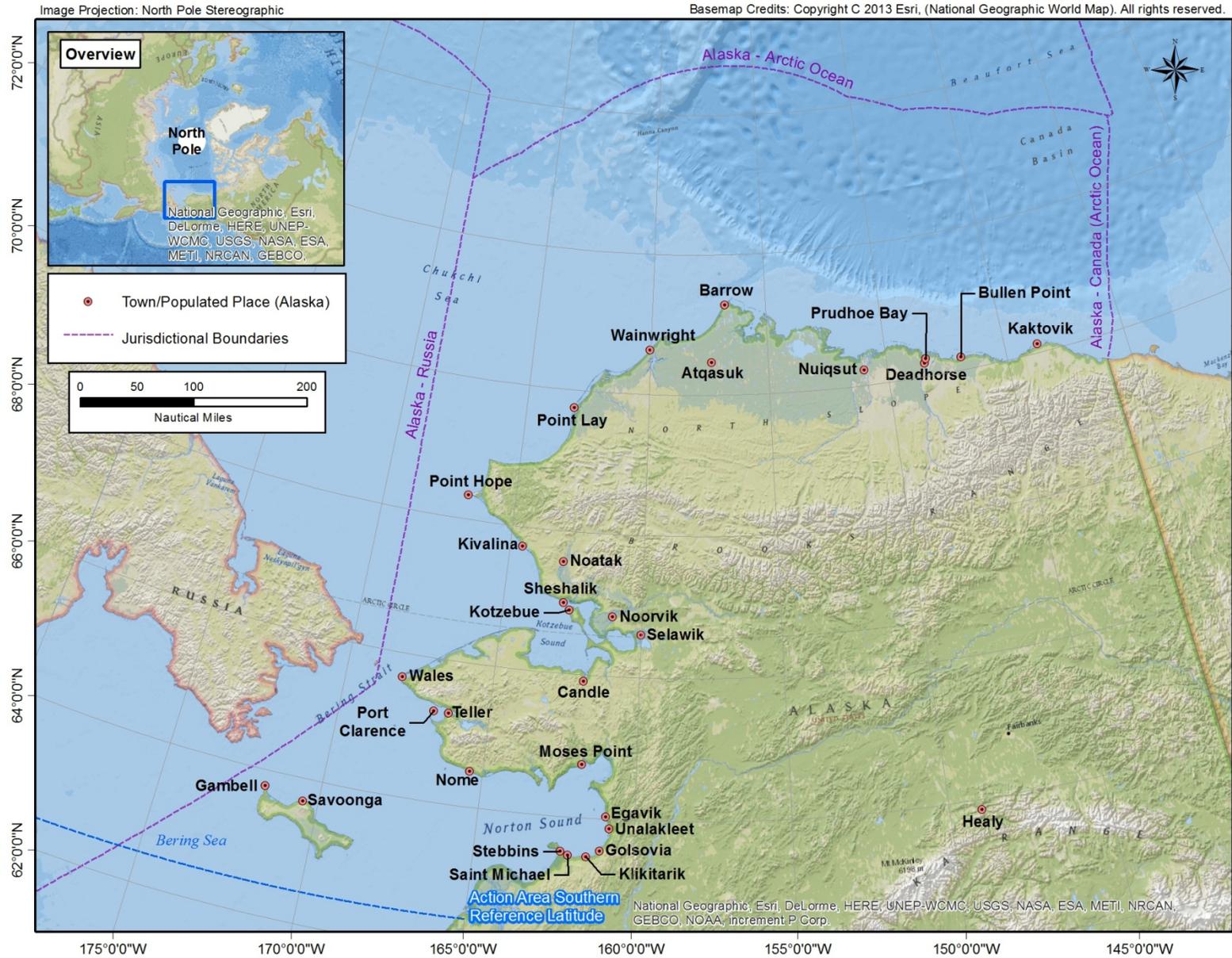


Figure 1-1 Action Area

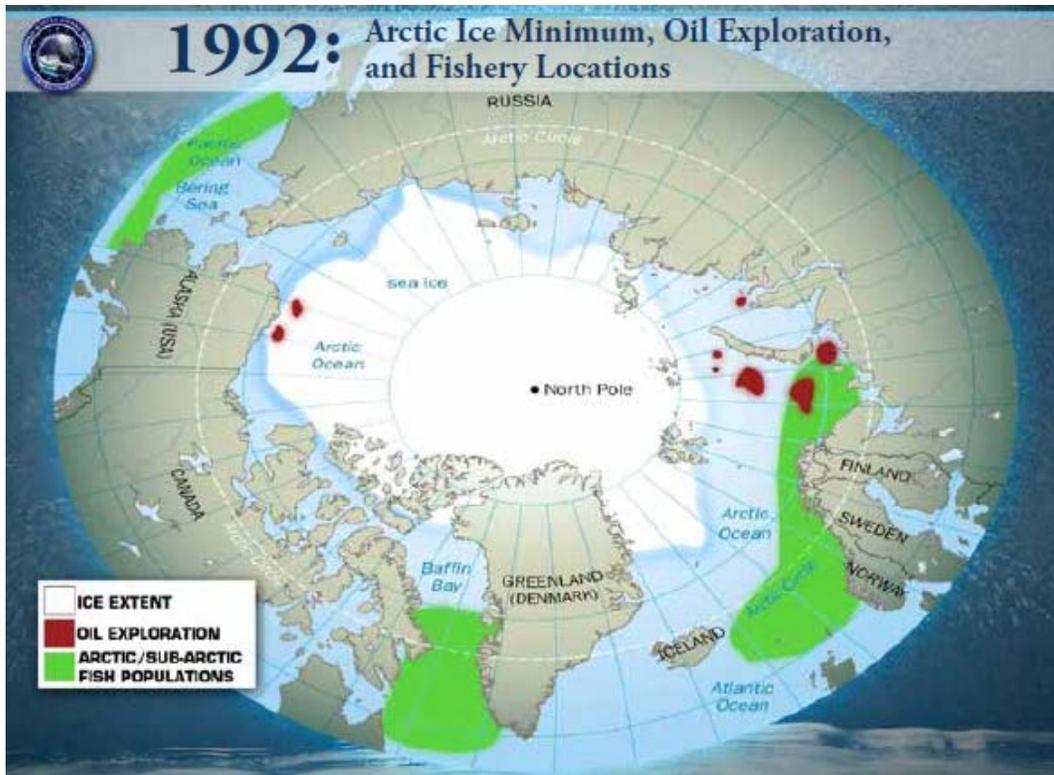


Figure 1-2 Sea ice extent and Arctic activities in 1992



Figure 1-3 Sea ice extent and Arctic resources and activities in 2012

1.2 PURPOSE AND NEED FOR ACTION

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The need for the proposed action is to meet the Coast Guard's mandated missions in the Arctic where, to date, except for U.S. Coast Guard cutter HEALY, there has not been a consistent, established Coast Guard presence. The increased levels of human activity in the Arctic will result in an increase in maritime activities.

Coast Guard District 17 encompasses the entire state of Alaska and 44,000 miles of coastline. District 17 performs its missions in Alaska with 2,500 active duty, civilian, reservists and auxiliary members. As the Nation's lead federal agency for ensuring maritime safety and security in the Arctic, District 17 began Operation Arctic Crossroads in 2008 to perform its statutory missions in the region. Arctic Shield consists of a three-pronged approach of operations, outreach and an assessment of the Coast Guard's capabilities in the Arctic.

The U.S. Coast Guard cutter HEALY has operated in the Arctic for over a decade, and Coast Guard District 17 has routinely conducted exercises, trained personnel, and tested equipment in the Arctic for only seven years. These activities have occurred to better understand and overcome obstacles to communications, logistics, and harsh weather in the Arctic. The lessons learned have informed the Coast Guard about the specific requirements needed to succeed in this environment, though rapid changes in climate, activities, and technology continue to present new challenges. In 2012 through 2014, the Coast Guard increased the tempo of training and exercises through Operation Arctic Shield.

Arctic Shield 2012 focused on operations, outreach, and an assessment of the Coast Guard's capabilities above the Arctic Circle. The forward operating location in Barrow consisted of two Kodiak-based MH-60 Jayhawk helicopters with supporting air, ground, and communications crews. The Coast Guard deployed several surface assets to the Arctic that provided a persistent operational presence and command and control capability in an area where the Coast Guard lacks the permanent infrastructure of a coastal sector. Two light-ice capable 225-foot sea-going buoy tenders, a 282-foot medium endurance cutter, and a 378-foot high endurance cutter were also deployed to the region to increase offshore operational capability, ensure the safety of mariners, patrol international borders, and provide additional search and rescue capabilities.

As part of Arctic Shield 2013, the Coast Guard opened its seasonal forward operating location in Kotzebue, Alaska in preparation for the anticipated increase of maritime activities in western Alaska and the Bering Strait. Deploying helicopters and personnel at the Alaska National Guard hangar in Kotzebue afforded the opportunity to leverage existing infrastructure and strategically positioned the Coast Guard to conduct standard operations and effectively respond to maritime emergencies in the Arctic area.

As part of Arctic Shield 2014, the Coast Guard opened its seasonal forward operating location in Barrow, Alaska to support the anticipated increase of maritime activities in western Alaska and the Bering Strait. The Coast Guard deployed helicopters and personnel from a contracted hangar which afforded the opportunity to leverage existing infrastructure and strategically positioned the Coast Guard to conduct standard operations and effectively respond to maritime emergencies in the Arctic area.

1.3 COAST GUARD MISSIONS

The legal basis for the Coast Guard is Title 14 of the United States Code (USC), which states: "The Coast Guard as established January 28, 1915, shall be a military service and a branch of the armed forces of the United States at all times."

Coast Guard District 17's overarching mission is to serve and safeguard the public, protect the environment and its resources, and defend the Nation's interest in the Alaskan maritime region. To do this, the Coast Guard has 11 statutory missions (6 USC § 468), each described in more detail below:

1. Ports, Waterways, and Coastal Security
2. Drug Interdiction
3. Aids to Navigation
4. Search and Rescue
5. Living Marine Resources Law Enforcement
6. Marine Safety
7. Defense Readiness
8. Migrant Interdiction
9. Marine Environmental Protection
10. Ice Operations
11. Other Law Enforcement

1.3.1 Ports, Waterways, and Coastal Security

The statutory mission described as ports, waterways and coastal security includes the following elements:

- Develop maritime security regimes,
- Detect, deter, and disrupt maritime terrorist attacks, sabotage, or subversive acts,
- Respond to and recover from attacks that may occur, and
- Work with port partners and review vessel and facility security plans to ensure responsible security planning in the private sector.

1.3.2 Drug Interdiction

The statutory mission described as drug interdiction includes the following elements:

- Reduce the supply of illegal drugs entering the United States via maritime routes through interdiction of smugglers and their illicit cargos at sea, and
- Counter drug trafficking organizations through the use of counterdrug bi-lateral agreements with partner nations.

1.3.3 Aids to Navigation (AtoN)

The statutory mission described as aids to navigation (AtoN) includes the following elements:

- Provide visual and electronic navigational aids, navigation information, and vessel traffic management services for U. S. navigable waterways, and
- Ensure that bridges and causeways allow for the safe passage of waterborne commerce and other marine traffic.

1.3.4 Search and Rescue (SAR)

The statutory mission described as search and rescue (SAR) includes the following elements:

- Provide immediate response to save lives and property in peril to minimize loss of life, injury, and property damage,
- Coordinate search and rescue efforts of afloat and airborne Coast Guard assets with those of other federal, state, and local responders,
- Coordinate response efforts on waterways after accidents or disasters, exercising our Captain of the Port authorities and responsibilities, and
- Partner with the world's merchant fleet to rescue mariners in distress around the globe through the Automated Mutual-assistance Vessel Rescue system.

1.3.5 Living Marine Resources (fisheries law enforcement)

The statutory mission described as living marine resources law enforcement includes the following elements:

- Project federal law enforcement presence over the entire U.S. Exclusive Economic Zone, covering nearly 3.4 million square miles of ocean,
- Ensure compliance with fisheries and marine protected species regulations on domestic vessels,
- Prevent over-fishing, reduce mortality of protected species, and protect marine habitats by enforcing domestic fishing laws and regulations, and

- Enforce the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA).

1.3.6 Marine Safety

The statutory mission described as marine safety includes the following elements:

- Enforce safe and environmentally sound operation of U.S. flagged vessels throughout the world,
- Assert authority over foreign vessels operating in U.S. waters to enforce safe, secure, and environmentally sound operations in U.S. waters,
- Issue licenses and documents to qualified mariners, and promote competency through a combination of training courses, requisite experience, and examinations,
- Conduct inspections of U.S. and foreign vessels, marine facilities, and review plans for vessel construction, alteration, equipment, and salvage, and
- Develop and monitor vessel construction and performance.

1.3.7 Defense Readiness

The statutory mission described as defense readiness includes the following elements:

- Support U.S. Combatant Commanders including:
 - Deploying law enforcement teams aboard U.S. Navy ships to stem the flow of illegal drugs,
 - Train foreign nations in maritime law enforcement, security, and search and rescue, and
 - Conduct alert, intercept, communication, surveillance, and escort activities for National Air Defense.
- Provide capabilities and resources in support of naval warfare mission areas, and
- Function as a service under the Navy in time of war or when directed by the President.

1.3.8 Migrant Interdiction

The statutory mission described as migrant interdiction includes the following elements:

- Reinforce the Nation's border security by providing a layered defense to deter, detect, and interdict undocumented migrants attempting to enter the United States illegally, and

- Preserve safety of life at sea and respect the human rights of migrants while aboard Coast Guard assets.

1.3.9 Marine Environmental Protection

The statutory mission described as marine environmental protection includes the following elements:

- Stop unauthorized ocean dumping and regulate the discharge of oil, hazardous substances, and other shipboard wastes into U.S. and international waterways,
- Protect marine mammals,
- Regulate the introduction of invasive species into waterways,
- Respond to oil and hazardous substance accidents and reduce their impact on the marine environment, and
- Develop environmental regulations and standards for domestic vessels and marine facilities.

1.3.10 Ice Operations

The statutory mission described as ice operations includes the following elements:

- Keep critical U.S. waterways open for commercial traffic, assist vessels transiting in ice-filled waterways, free vessels stuck in ice, and break ice dams to prevent ice related flooding,
- Provide the means in ice-laden waters to allow scientific research, and
- Broadcast information on iceberg locations as mandated.

1.3.11 Other Law Enforcement

The statutory mission described as other law enforcement includes the following elements:

- Enforce foreign fishing vessel laws,
- Patrol the U.S. Exclusive Economic Zone boundary areas to reduce the threat of foreign poaching of U.S. fish stocks,
- Monitor compliance with international living marine resource regimes and international agreements, and
- Deter and enforce efforts to eliminate fishing using large drift-nets, a method of high seas fishing considered to be one of the main obstacles to sustainable world fisheries and healthy ocean ecosystems.

1.4 COAST GUARD ASSETS

Air and surface assets for Arctic operational support may come from Coast Guard District 17 covering the state of Alaska, or other Coast Guard areas of operation. These vessels may include air assets such as fixed wing aircraft and helicopters, and surface assets such as cutters, small boats, buoy tenders, and icebreakers.

Coast Guard District 17 aviation resources include both fixed-wing aircraft and helicopters. The HC-130H fixed-wing aircraft are used for long-range search, surveillance (i.e., usually law enforcement searches to locate a specific vessel or concentration of vessels), and support. MH-60 and MH-65 helicopters support short and medium range rescue, recovery, coastal surveillance, and aids to navigation.

Surface assets could include National Security Cutters, High Endurance Cutters, Medium Endurance Cutters, or sea-going buoy tenders,. Cutters also usually have a motor surf boat and/or a rigid hull inflatable boat on board. The Cutters are commissioned vessels of the Coast Guard. They are 65 feet or greater in length, have a permanently assigned crew, and have accommodations for the crew to live onboard. There are three main types of large Cutters within the Coast Guard's command. National Security Cutters are 418 feet in length, and are the largest and most technologically sophisticated cutters in the Coast Guard. Each National Security Cutter is capable of operating in the most demanding open ocean environments. The 378-foot High Endurance Cutters are equipped with a helicopter flight deck, retractable hangar, and the facilities to support helicopter deployment. The Medium Endurance Cutters vary in length from 210 to 282 feet, and have supported Coast Guard missions around the world throughout their time in service. All National Security Cutters, High Endurance Cutters, and Medium Endurance Cutters are flight deck equipped. Helicopters are assigned on flight-deck equipped cutters on a case-by-case basis, but typically all the large cutters will have a Coast Guard helicopter detachment assigned to them when working with the District 17 area. Sea-going buoy tenders are 225 feet in length and equipped with modern propulsion and ship control technology to provide the maneuverability necessary to tend buoys offshore and in restricted waters

The largest cutters operated by the Coast Guard are the icebreakers. These cutters, specifically designed for icebreaking have reinforced hulls, special icebreaking bows and strengthened machinery systems. The POLAR SEA and POLAR STAR were built in the 1970s and the newest and most technologically advanced icebreaker, the Cutter HEALY was added to the fleet in November 1999. At this time, POLAR SEA is not operational and is not expected to be so in the near future. They serve in the Arctic and Antarctic, primarily serving science and research as well as providing supplies to remote stations, but are also capable of Coast Guard missions. Polar Class icebreakers also carry an Arctic Survey Boat or Landing Craft on board, and are flight deck equipped for all standard helicopters and many military helicopters. Civilian helicopter support is likely for specific scientific missions while in the Arctic.

1.5 PUBLIC INVOLVEMENT

Council on Environmental Quality regulations implementing NEPA require federal agencies to “involve environmental agencies, applicants, and the public, to the extent practicable, in preparing [environmental] assessments” (40 CFR 1501.4[b]). The Coast Guard has coordinated with several regulatory agencies, as appropriate (see Chapter 6).

The Coast Guard conducted four public meetings on a Programmatic Environmental Assessment for Coast Guard Arctic activities in May of 2014 in Nome, Anchorage, Kotzebue, and Barrow, Alaska. Multiple meetings were also held with tribal communities and local communities to engage on their concerns with Arctic activities conducted by the Coast Guard. Outreach meetings for this 2015 Draft Environmental Assessment are planned for Nome, Kotzebue, Barrow, Nuiqsut, and Wainwright.

In addition, the Coast Guard engages with Alaska local governments and communities, including local governments, tribes, subsistence user groups, and other leaders of the communities, prior to and during Coast Guard operations. The Coast Guard works to address any concerns or questions and keep them informed of anticipated Coast Guard actions in their area.

Chapter 2 Proposed Action and Alternatives

2.1 INTRODUCTION

This chapter describes the Coast Guard's proposed action and alternatives for meeting increased mission demands in the Arctic. This chapter also includes the No Action Alternative, a discussion of the alternatives considered but eliminated from detailed consideration, and a discussion of best management practices (BMPs) included in the proposed action.

2.2 PROPOSED ACTION

The proposed action is to conduct operations and training exercises in the Arctic in summer of 2015 to meet Coast Guard mission responsibilities due to the increase of national and international activities in the area. This objective would provide a shore, air, and sea Coast Guard presence to meet the seasonal surge mission requirements. These activities support the Arctic Strategy and enable the Coast Guard to fulfill its 11 mandated missions, as described in Section 1.3, Coast Guard Missions.

2.3 PREFERRED ALTERNATIVE

The Preferred Alternative consists of five main elements: shore, air, and sea operations; training exercises, and tribal/government engagement. Specific activities related to these five elements are described below.

2.3.1 Shore Operations

2.3.1.1 Forward Operating Location and Logistics/Staging Locations

These locations serve as temporary Coast Guard homebases for sea and air support during the seasonal surge of Arctic activities in 2015.

Barrow is a forward operating location (FOL) for deployment of air assets supporting Coast Guard 2015 missions using airstrips and fueling facilities. Barrow would serve as a refueling station for Coast Guard aircraft and up to two MH-60 helicopters. Missions include support for SAR, marine resource protection, and Arctic domain awareness flights as well as support for other federal agency missions as requested.

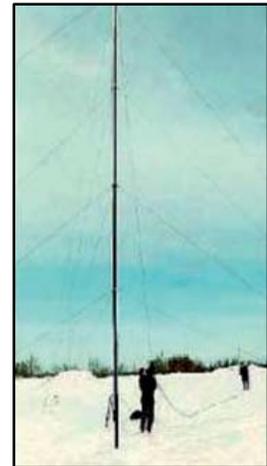


Figure 2-1 Fanlight antenna

The Coast Guard would install temporary communications facilities at the National Weather Service (NWS) facility in Barrow. These communication facilities would include: one Mobile Arctic Shield System (MASS) shelter; one 49-foot portable guyed-mast, omni-directional Fanlite antenna with fanlite antenna wires that would extend approximately 80 feet out from the mast in two triangular curtains (**Error! Reference source not found.**); and one 129-foot longwire antenna supported by three 12-foot poles with each pole set into concrete-filled tires and supported by two guy wires staked behind each pole.

The Coast Guard has consulted with the US Fish and Wildlife Service (USFWS) for a proposed multi-year land use agreement with NWS for seasonal use of this site for communications. The USFWS has determined to amend its 2008 biological opinion (BO) issued to the NWS for

development and operation of this site to include the Coast Guard MASS facilities. In accordance with the terms and conditions of the BO, the Coast Guard would do the following: install the MASS facilities as soon as snow melt allows, or around June 1, to avoid eider nesting season beginning around June 15; inspect the antennae locations for any nesting eiders prior to placement of antennae and, if necessary, adjust the antennae locations to avoid nest sites; install bird diverters on all guy and antennae wires; and ensure that NWS staff at the site monitor the Coast Guard MASS facility in conjunction with monitoring of the NWS antenna on site.

Deadhorse is a FOL for deployment of air assets supporting Coast Guard 2015 missions using leased hangar facilities. Deadhorse would serve as a refueling station for Coast Guard aircraft and hangar space for up to two Kodiak-based MH-60 helicopters, including air, ground and communications crews. Missions include support for SAR, marine resource protection, and Arctic domain awareness flights as well as support for other federal agency missions as requested.

2.3.1.2 Inspections and Safety

The Coast Guard would conduct inspections of vessels in major ports in Alaska to ensure cargos are as claimed, safety standards are intact, and construction or maintenance plans meet established standards. Inspections of both commercial and non-commercial vessels further the missions of drug and migrant interdiction and marine safety. Lasers could be used underwater for threat detection. These lasers are typically used at ranges less than 20 feet to create detailed imaging of a ship's hull. These lasers can be used to detect damage and screen for explosives. The Coast Guard would discuss boating safety with subsistence and recreational boaters and gold dredge operators during Coast Guard operations including port facility inspections or in a public school classroom setting.

2.3.2 Air Operations

2.3.2.1 Search and Rescue

Search and rescue missions are those that have the goal of preventing the loss of life and property. Because of the vast area of Coast Guard SAR responsibilities in Alaska, an aircraft often is the only viable and timely response asset. Aircraft can also be sent to find the vessel and report its location and status before a Coast Guard vessel is sent for the rescue. Air searches for persons in the water must be performed at an altitude below 500 feet to be effective. Recovering persons in the water and dropping rescue equipment must also be done while the helicopter is hovering below 500 feet. Materials that may be left behind during an SAR operation include dye packs, glow sticks, life rafts, and flares. Dye packs are diluted and non-toxic, typically fluorescein.



Figure 2-2 MH-60T Helicopter participation in SAR training

2.3.2.2 Routine Patrols and Arctic Domain Awareness Flights

These operations serve to locate, identify, and document human contacts north of the Arctic Circle. The flights would also gather and verify data on coastal erosion, ice observation, and other scientific data requests (carcass surveys, walrus haulout locations, air quality sampling, etc.). Arctic domain awareness flights provide an opportunity for pilot and crew familiarization

with the Arctic region and can be the only safe opportunity for media coverage of events. Routine patrols and Arctic domain awareness flights are typically performed above 1,000 feet altitude, weather permitting.

2.3.3 Sea Operations

For 2015, Coast Guard surface asset presence in the Arctic is anticipated to consist of two light-ice capable 225-foot sea-going buoy tenders, a 282-foot medium endurance cutter, and a 378- or 418-foot high endurance or national security cutter that would provide a persistent operational presence and command and control capability in an area where the Coast Guard lacks the permanent infrastructure of a coastal sector. These assets would also increase offshore operational capability, ensure the safety of mariners, patrol international borders, and provide additional search and rescue capabilities. All Coast Guard vessels are equipped with standard navigational technologies, including radar and navigation sonars (Table 2-1). These devices allow ships to operate safely in the complex Arctic environment, and will be used by all relevant platforms during standard operations, training, and other missions.

Table 2-1 Active Acoustic Sources associated with Sea Operations and Training

Source type	Frequency range [kHz]	Source level [dB re 1 μ Pa @ 1m]	Associated Action
Small vessel	1 – 7	175	Small boat training, routine patrols
Large vessel	0.02 – 0.30	190	All sea operations and training
Icebreaking	0.01 – 0.1	205	Icebreaking activities
Echosounder (single-beam)	3.5 -1,000	205	All sea operations and training, research and development
Echosounder (multi-beam)	180 – 500	242	Icebreaking activities, Oil Recovery Exercises, research and development
Side-scan sonar	100 – 1,600	249	Icebreaking activities, Oil Recovery Exercises, research and development

kHz: kiloHertz;

References: Richardson et al. 1995; NMFS 2012; U.S. Coast Guard 2013b; Roth et al. 2013.

2.3.3.1 Search and Rescue

When air support provides the location, Coast Guard vessels and aircraft can transit to the rescue location of a vessel or person(s) in distress. Flight deck equipped vessels provide logistical support to aircraft (Figure 2-3). Cutters can carry and deploy small boats to assist with rescues.



Figure 2-3 High Endurance Cutter with helicopter flight deck

Coast Guard vessels can locate victims without air support through satellite emergency position-indicating radio beacon locators, cell phones, satellite phones, distress flares, and by conducting search patterns in last known locations. Searching vessels may employ radar and sonar technologies to aid in detection. Deployment of self-locating buoys can assist in determining set and drift from last known position. When vessels carrying a large number of souls aboard require rescue, Coast Guard vessels must get to the site quickly, as a helicopter alone cannot carry numerous additional passengers.

2.3.3.2 Icebreaking

The Coast Guard operates two icebreakers in Arctic waters, one heavy polar icebreaker POLAR STAR (Figure 2-4) and one medium polar icebreaker HEALY. Both icebreakers are homeported in Seattle, Washington, and operate mainly in the Chukchi Sea west to the Russian border and in the Beaufort Sea east to the Canadian border. The main mission of the HEALY is oceanographic and meteorological research. More information on the HEALY and science missions can be found at www.icefloe.net. Icebreakers also participate in a few SAR and law enforcement missions each year, and are prepared to collaborate with the commercial sector in ship escort, towing, and oil-spill response activities. The HEALY has an operational profile of 60 days endurance and up to 14 months for wintering over.

Each icebreaker can land, fuel, and carry up to two MH-65C helicopters for ice reconnaissance, logistics supply, and support of specific science projects, and several boats up to a length of about 37 feet. The icebreakers have a cruising speed of 10 to 12 knots and a maximum speed of about 17 knots. During icebreaking operations, they usually travel at 3 to 8 knots, and may travel even slower when breaking heavy ice. The general method for icebreaking is simply driving the ship up on top of the ice until the weight of the ship breaks the ice. The sloped bow of the icebreaker enables it to ride up on top of the ice while the stern sinks lower in the water. The force of buoyancy acting on the submerged portion of the stern creates a lever-like action bringing the icebreaker's weight down onto the ice and breaking it. The noise is essentially the same as noise from natural icebreaking that occurs when the ice pack shifts. Another lesser-used and less preferable method of icebreaking is backing and ramming, which is repeatedly riding up on the ice in a controlled manner to break through a ridge. When backing and ramming is needed, the "best practice" of not throwing the ship into full reverse, but rather reaching that state gradually, then ramming, would be used.



Figure 2-4 Icebreaker POLAR STAR

Helicopters conduct reconnaissance flights to detect open water leads in the ice, through which the icebreaker can more easily transit. This typically occurs at 400-1,500 feet in altitude. Additionally, personnel use a combination of satellite imagery, ice reports from the National Ice

Service and Canadian Ice Service, and cameras and radar on unmanned aerial vehicles (UAVs) to identify leads and areas of reduced ice coverage or thickness.

The primary mission of the icebreakers in Arctic waters is scientific research. The POLAR STAR serves as a scientific research platform with five laboratories and accommodations for up to 20 scientists. Cranes and work areas near the stern and port side of ship give scientists the capability to do at-sea studies in the fields of geology, volcanology, oceanography, sea-ice physics, and other disciplines. The HEALY conducts a wide range of research activities, providing more than 4,200 square feet of scientific laboratory space, numerous electronic sensor systems, oceanographic winches, and accommodations for up to 50 scientists. The POLAR STAR is able to ram through ice up to 21 feet thick and steam continuously through 6 feet of ice at 3 knots and operate at -60° Fahrenheit. The HEALY can ram through ice 8 feet thick and break 4.5 feet of ice continuously at 3 knots and operate at -50° Fahrenheit.

Unless the icebreaker's mission specifically involves investigating an endangered species, the icebreaker will plan its passage through the ice to avoid any known sanctuaries or feeding grounds, to the greatest extent practicable. Trained crewmembers look specifically for marine mammals during operations. Their reports provide scientists and biologists invaluable information on endangered and threatened species and their habitats. When marine mammals are spotted, the icebreaker slows or changes course unless there is a threat to navigational safety. After consulting with local communities, the vessels avoid active subsistence whale hunting areas during spring and fall migrations of bowhead whales so as not to interfere with subsistence whale hunting.

2.3.3.3 Safety Zones

The establishment of safety zones would be conducted in accordance with the Notice of Proposed Rulemaking Process and would be published in the Federal Register with an appropriate time for public comment. These safety zones are intended to ensure the safe navigation of all vessels transiting in the area. The safety zones would establish an area that is intended to be clear of other vessels. The Coast Guard would monitor and enforce, as necessary, the established safety zones. No physical markers are used to delineate safety zones, but a Notice to Mariners is issued.

Other safety zones would be enforced as needed to provide a standoff for exploration activities, protect divers and prevent vessel interference during salvage work, enforce flight restrictions, and maintain standoff distances to any other event that presents a hazard to navigation. Flight restrictions are communicated through Federal Aviation Administration Notice to Airmen and could be in place where high tempo Coast Guard operations are occurring.

2.3.3.4 Routine Patrols

The Coast Guard would routinely patrol Arctic waters to detect, deter, and disrupt maritime terrorist attacks, sabotage, or subversive acts; detect and investigate violations of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA); provide a sovereignty presence; and to reduce the threat of foreign poaching of U.S. natural resources such as fish stocks or mineral deposits.

2.3.4 Training Exercises

The Coast Guard must continually assess the capability of personnel, assets, and resources operating in the Arctic. Training is required for ice navigation, ice rescue, oil spill response, mass rescue operations, and practicing Arctic logistics exercises for sea, land, and air. Training not only hones skills relevant to operations today, but also helps assess future capability needs for the Coast Guard. As Arctic operations expand, more joint service exercises will likely occur. Involved agencies could include the National Oceanic and Atmospheric Administration and all branches of the Department of Defense. Additionally, increasing efforts have been made in the past two years to include local governments and tribes in these exercises.

2.3.4.1 Rescue Exercises

Historically, these Coast Guard exercises have utilized primarily Coast Guard resources. Increasing effort has been made in the past two years to include local governments in these exercises. Additionally, it is becoming increasingly likely and prudent that these exercises will involve coordination with other nations such as Canada and Russia. For 2015, two “tabletop” exercises practicing both Mass Rescue Operation and Search and Rescue scenarios may be included in Kotzebue and potentially other Arctic locations. These “tabletop” exercises would consist of a scenario and actions relating to a real exercise, but is more focused on coordination and communications, and involves no actual assets or folks on the ground in an area.

2.3.4.2 Flight Training

Flight crews would be required to log in-flight hours to meet ongoing training requirements while at their FOL. As weather permits, MH-60T and MH-65D helicopters would be flown in both of the FOL areas (Barrow and Deadhorse) to meet this requirement. Flight crews would coordinate with local tribes to ensure their proposed flight paths would not interfere with subsistence harvest activities. Additionally, all cutters have a training need to conduct Deck Landing Qualifications or deck hoists, for those cutters that are not flight deck equipped. Hoist altitude depends on the height of any obstacles in the area, but is anywhere between 25 to 100 feet above the surface where the hoist is being conducted.

2.3.4.3 Small Boat Training

Small boat training would include boat launching and maneuvers, typically in the vicinity of small boat stations. The majority of small boat training will be from cutter deployed boats, as no small boat stations exist in the Arctic. Some shore-based boats may be transported to facilities by air and then launched via vehicle on a case-by-case basis. Specific exercises include coxswain training, boat beaching, SAR, and vessel boarding and inspections. These activities would also be coordinated with local communities to ensure there is no interference with subsistence harvest activities.

2.3.4.4 Oil Recovery Training Exercises

Oil or hazardous materials spill response is not a Coast Guard action that is addressed in this EA. Spill response planning in Alaska is accomplished through a series of inter-related plans. The

National Contingency Plan provides the overarching framework and sets up procedures that are designed to minimize the imminent threat to human health or the environment from an uncontrolled release of oil or other hazardous substances. The Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases EPA uses the framework and priorities set forth in the National Contingency Plan and applies them in the context of Alaska. The EPA and Coast Guard are the federal agencies responsible for the implementation of the Alaska Contingency Plan. The Alaska Contingency Plan is supplemented by 10 subarea contingency plans, which provide greater detail for local response planning in large inland and coastal areas of Alaska. The final level of response planning occurs at the local level and includes vessel- and facility-specific plans.

EPA and Coast Guard are currently in consultation with the US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, under the authority of Section 7 of the ESA, regarding the potential for actions or planning processes conducted under the authority of the Alaska Contingency Plan, that lead to decisions to initiate actions pursuant that may affect protected species and habitats.

Historically, these U.S. Coast Guard exercises have been mostly confined to U.S. resources; however, it is becoming increasingly likely and prudent that these exercises will involve coordination with local and tribal governments, as well as other nations such as Canada and Russia. The field exercises could use simulated spill products that included buoyant, organic, and biodegradable items such as moss or fruit or fluorescein or rhodamine water-tracing dye. Use of these products provides the Coast Guard with the opportunity to study spill drift and practice skimming.

Deployment of a Spilled Oil Recovery System (SORS) and Vessel of Opportunity Skimming System (VOSS). These skimming systems would be deployed over the side of vessels to practice skimming spills and debris for planning purposes and future use in response to an environmental emergency (Figure 2-5).



Figure 2-5 Crewmembers testing the vessel's SORS

Research and Development Center (RDC) Capabilities Demonstrations. Coast Guard Research and Development Center (RDC) would conduct tests of various technologies that would enhance Coast Guard mission effectiveness and/or efficiency. Technologies would include unmanned underwater vehicles (UUVs) and unmanned aerial vehicles (UAVs) to search and detect targets of interest under, in, and on ice (spilled oil in ice is an example shown in Figure 2-6). UUVs would use downward and upward directed sensors and UAVs would use radars, optics and infrared detectors to search for the targets of interest. Lasers could also be used for detection, but would operate within 20 feet of a given target. Other sensors may include 3-24 kHz bottom mapping echosounders and Acoustic Doppler Current Profilers in the 38-150 kHz range sonar systems, and fluorometers. RDC would also conduct tests of various skimming systems for recovering spilled oil in, around, and from under ice.

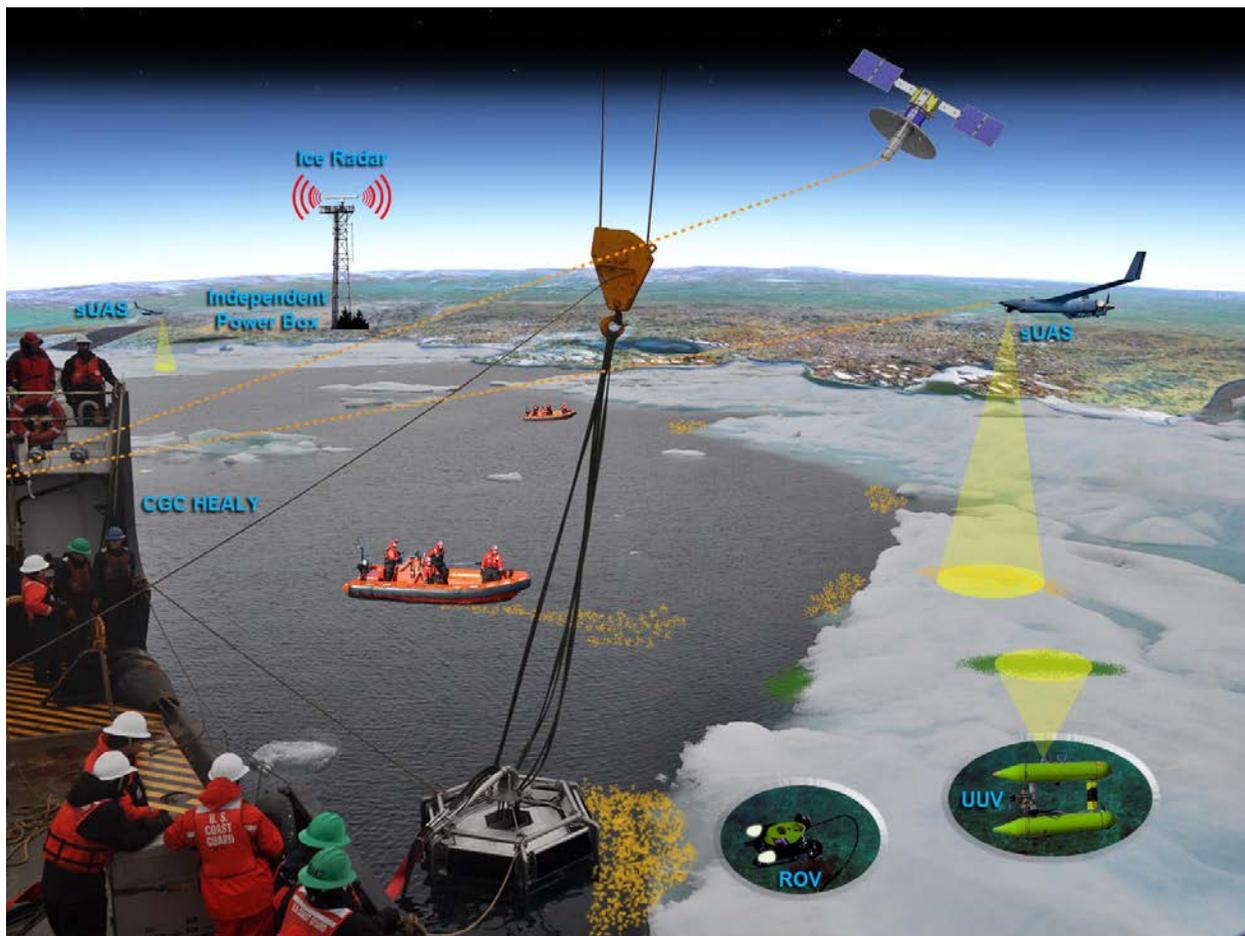


Figure 2-6 Spilled oil in ice recovery demonstration concept

2.3.5 Building Partnerships: Tribal/Local Government Engagement

Formal and informal government-to-government and community engagement with tribes and local community leadership is vital to all of the Coast Guard's missions. Engagement categories include:

- (1) Local government engagement
- (2) Educational and training outreach
- (3) Tribal and native community engagement

Local Government Engagement

Building partnerships is an important aspect of any Coast Guard activities in the Arctic region. Coast Guard District 17 personnel would share information and communicate by phone or email with local governments, elected officials, and other leaders in communities prior to and during Coast Guard activities in their local area. Year-round sustained engagement would also occur through conferences, meetings, and personal communications allowing the opportunity for community and local governments to provide input on Arctic activities. This also allows the Coast Guard to obtain key information from local stakeholders. During the summer surge of Coast Guard activities in the Arctic, this would involve regular, sometimes daily communications of Coast Guard actions and how they may interact with local governments.

Educational and Training Outreach

The Coast Guard would reach out to tribes and villages and offer classes such as:

- Kids Don't Float - The Coast Guard would continue this program to maintain and supply remote communities with proper safety equipment to ensure youths can safely enjoy water and subsistence activities with their families.
- Water Safety - The Coast Guard would educate children on water safety to ensure that they understand proper water safety techniques and fewer lives are put at risk.
- Commercial Fishing Vessel Standards Outreach - The Coast Guard would provide additional outreach efforts, including dock-side exams, town hall meetings, and forums in remote communities to increase knowledge of Commercial Fishing Vessel Standards requirements, including new requirements that will go into place in the next few years.

Tribal and Native Community Engagement

Building partnerships is an important aspect of any Coast Guard activities in the Arctic region. Coast Guard District 17 personnel would share information and communicate by phone or email with Tribal leadership, mayors, and other leaders in Native communities prior to and during Coast Guard activities in their local area. Year-round sustained engagement would also occur through conferences, meetings, and personal communications allowing the opportunity for tribal governments to provide input on Arctic activities. This also allows the Coast Guard to obtain key information from tribal stakeholders. During the 2015 summer surge of Coast Guard activities in the Arctic, this would involve regular, sometimes daily communications of Coast Guard actions and how they may interact with tribal activities.

2.4 NO ACTION ALTERNATIVE

CEQ's regulations implementing NEPA require inclusion of a No Action Alternative to serve as a baseline against which the impacts of the proposed action and alternatives can be evaluated. The Coast Guard has not developed a comprehensive, long-term plan for mission execution in the Arctic. Over the past seven years, it has conducted single-year operations in the Arctic to test

equipment and train personnel to operate in the Arctic by overcoming obstacles to communications, logistics, and harsh weather.

Under the No Action Alternative, the Coast Guard would not be able to fulfill its mandated missions in the Arctic. The Coast Guard also enforces the MMPA and ESA, and without a Coast Guard presence in the Arctic, enforcement of these laws would be significantly reduced. The No Action Alternative would simply use existing assets from their normal operating locations (i.e., Kodiak for aviation assets, Kodiak or, if deployed, the Gulf of Alaska or Bering Sea for surface assets), and therefore would not be positioned for emergency response. Typical helicopter flight time from Kodiak to Barrow is over eight hours, not including refueling stops.

The No Action Alternative would not meet the Coast Guard's mandate to provide a proactive air, surface, and shore-side Coast Guard presence in the Arctic in summer of 2015 to meet statutory mission requirements. As such, it is not a viable alternative and does not meet the purpose and need, but is included here for comparison of environmental effects with the Preferred Alternative.

2.5 BEST MANAGEMENT PRACTICES AND CONSERVATION MEASURES

The Proposed Action would require all Coast Guard staff, contractors, and subcontractors to employ BMPs during Arctic activities to avoid or minimize potential impacts on the environment and cultural resources. All BMPs and conservation measures will be implemented to the fullest extent possible considering safety of personnel and equipment. However, during national security, SAR or urgent law enforcement activities, the Coast Guard will prioritize mission success over BMPs and conservation measures.

2.5.1 Coast Guard Guidance

All Coast Guard will conduct activities in accordance with the following Coast Guard guidance:

- Marine Protected Species Program for the Gulf of Alaska, Bering Sea/Aleutian Islands, and Arctic (Coast Guard District 17 Instruction [CGD17INST] 16214.2A) (U.S. Coast Guard 2011a) - CGD17INST 16214.2A outlines procedures for avoiding marine mammals and protected species; reporting whale and protected species sightings, strandings, and injuries; and enforcing the MMPA and ESA.
- Vessel Environmental Manual (COMDTINST M16455.1) – Chapter 11 of the Vessel Environmental Manual describes measures for protection of marine wildlife applicable to all waterborne Coast Guard assets. In accordance with this instruction, all Commanding Officers and Officers in Charge must plan and act to protect marine mammals during operations and planning. Whale avoidance measures are prescribed, including requiring that vessels be especially alert for activity, and proceed with caution, in areas of known whale migration routes or high animal density, and that vessels do not approach whales head on during non-emergency maneuvering. Right Whales are to be avoided by 500 yards and all other species by 100 yards, except when assisting in an animal rescue effort or enforcing the Endangered Species Act.

The Manual states ballasting and de-ballasting shall be conducted in a manner to minimize the introduction of non-native species and reduce their impact. Ballast water

taken on board from a location more than 200 nm from any shore and in water of a depth greater than 200 meters may be discharged without restriction. Ballast water taken on board within 200 nm from any shore or in water less than 200 meters deep, must be managed through step-wise protocol that ranges from ballast water exchange in waters more than 200 nm from any shore and more than 200 meters deep, to discharge at an approved receiving facility. In all cases, the minimum distance for de-ballasting shall be 12 nm from land. Any ballast water taken on board would likely be released (ballast tanks cycled) in the Bering Sea, prior to entering any port (e.g., Dutch Harbor, Nome) for refueling. Should any invasive species be in the ballast water, these species would be released in the open ocean to minimize the potential for introduction into another area. It is recognized that ship hulls can also be vectors for alien species, but at this time, only ballasting and de-ballasting is restricted.

- Coast Guard Air Operations Manual (COMDTINST M3710.1G) – The Air Operations Manual prescribes measures for protection of wildlife applicable to all Coast Guard air assets. In accordance with this instruction, Commanding officers shall implement standard operating procedures to prevent unnecessary over-flight of sensitive environmental habitat areas, to include, but not be limited to, critical habitat designated under the endangered species act, migratory bird sanctuaries, and marine mammal haul-outs and rookeries. Environmentally sensitive areas will be properly annotated on pilot’s charts as required. When it is necessary to fly over such areas, an altitude of 2,000 feet above ground level shall be maintained, except during emergency or enforcement operations. The amount of time spent at low altitudes should be limited to what is necessary to accomplish the particular emergency or reconnaissance operation.
- U.S. Coast Guard Approach, Vessel Speed and Strike Response Guidance (COMPACAREA R142308Z DEC 11) – This guidance prescribes that vessel operators shall use caution, be alert, maintain a vigilant lookout and reduce speeds, as appropriate, to avoid collisions with whales during the course of normal operations. Appropriate reduced speeds should be based on specific factors (see rule 6 [safe speed] of the international/inland navigation rules). During routine operations, when whales are sighted or known to be in the immediate vicinity, operators are required to employ all possible precautions to avoid interactions or collisions with whales, including the following:
 - Reducing speed,
 - Posting additional dedicated lookouts to assist in monitoring whales’ location,
 - Avoiding sudden changes in speed and direction, or if a swimming whale is spotted, attempting to parallel the course and speed of the moving whale so as to avoid crossing its path, and
 - Avoiding approach of sighted whales head-on, or from directly behind. Right whales shall not be approached within 500 yards. The minimum approach distance to all other whales is no closer than 100 yards. In the Bering Sea and Gulf of Alaska, a whale should be treated as a Right whale unless the whale is positively identified as another whale species.
- Maritime Law Enforcement Manual (COMDTINST 16247.1) – In accordance with this manual, during all maritime law enforcement activities the Coast Guard shall seek to

avoid collision with a whale during the course of normal operations, operators of Coast Guard vessels transiting critical habitat, migratory routes, and high-use areas use caution, remain alert, and reduce speeds, as appropriate. Additional reductions in speed are considered when a whale is sighted or known to be in the vicinity or within five nautical miles of the vessel.

- Protected Living Marine Resources Program (COMDTINST 16475.7) – This instruction outlines Coast Guard actions, during Coast Guard operations, to support the recovery of protected living marine resources through internal compliance with and enforcement of Federal, State, and international laws designed to preserve marine protected species.

In addition, included in the proposed action are a number of conservation measures developed through coordination with National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) during previous consultations and preparation of this EA. BMPs and conservation measures that are part of the proposed action are described for each resource, as applicable, below. These measures may not apply during an emergency operation involving national security, search and rescue operations, or urgent law enforcement activities. The Coast Guard also maintains an active marine mammal sighting and reporting program in cooperation with NMFS and USFWS.

2.5.2 Biological Resources

Personnel involved in the proposed action would be made aware of these operating guidelines through the Operational Order guiding Coast Guard participation in activities in the Arctic. The following measures, developed by the Coast Guard in consultation with Alaska Natives, USFWS, and NMFS, are included in the proposed action (and in addition to the guidance already outlined in Section 2.5.1) to avoid significant adverse effects on biological resources:

- An Interim Polar Bear Interaction Plan is under development in consultation with the USFWS. The purpose of the plan is to avoid changing the behavior of bears from helicopters, cutters, or small boat operations. The plan includes specific requirements for personnel training, avoidance and encounter procedures, hazing (actively deterring), waste management, monitoring requirements, etc., and will be approved by the USFWS.
- Crew members will be trained in marine mammal identification and will alert the Command of the presence of marine mammals and initiate adaptive mitigation responses including reducing vessel speed, posting additional dedicated lookouts to assist in monitoring whales' location, avoiding sudden changes in speed and direction, or if a swimming whale is spotted, attempting to parallel the course and speed of the moving whale so as to avoid crossing its path, and avoiding approach of sighted whales head-on, or from directly behind (see COMDTINST M16247.1).
- Vessels must maintain the maximum distance possible from concentrations of walrus or polar bears. No vessels will approach within a 0.5 mile (805 meters) radius of walrus or polar bears observed on land or ice, except during exigent circumstances. The Coast Guard will coordinate with the USFWS to learn of confirmed haulout locations.

- Vessel operators must take every precaution to avoid harassment of concentrations of feeding walrus when a vessel is operating near these animals, except during exigent circumstances. Vessels will reduce speed and maintain a minimum 0.5 mile (805 meters) operational exclusion zone around feeding walrus groups. Vessels will not be operated in such a way as to separate members of a group of walrus from other members of the group. When weather conditions require, such as when visibility drops, vessels will adjust speed accordingly to avoid the likelihood of injury to walrus. The Coast Guard will coordinate with the USFWS to learn of confirmed haulout locations.
- When traveling in icy waters or near barrier islands, vessel crews will not engage in activities that will attract polar bears to the vicinity of the vessel such as cooking meat on deck. Bears can smell the meat (including bacon) and can travel miles to investigate, maybe leaving a high-resource area or carcass.
- Aircraft will, at all times, conduct their activities at the maximum distance possible from concentrations of walrus or polar bears.
- Aircraft will not operate at an altitude lower than 1,500 ft (457 m) within 0.5 mi (805 m) of polar bears observed on ice or land. Helicopters may not hover or circle above such areas or within 0.5 mi of such areas. When weather conditions do not allow a 1,500 ft flying altitude, such as during severe storms or when cloud cover is low, aircraft may be operated below the 1,500 ft altitude stipulated above. However, when aircraft are operated at altitudes below 1,500 ft because of weather conditions, the operator must avoid areas of known polar bear concentrations and will take precautions to avoid flying directly over or within 0.5 mi (805 m) of these areas.
- Fixed-wing aircraft will not operate at an altitude lower than 2,000 ft (610 m) within 0.5 mi (805 m) of walrus observed on ice or land. Helicopters will not operate at an altitude lower than 3,000 ft (914 m) within one mile (1610 m) of walrus observed on ice or land, and may not hover or circle above such areas or within one mile of such areas. When weather conditions do not allow these minimum flying altitudes, such as during severe storms or when cloud cover is low, aircraft may be operated below the 2,000 ft (610 m) altitude stipulated above. However, when aircraft are operated at altitudes below 2,000 ft (610 m) because of weather conditions, the operator must avoid areas of known walrus concentrations and will take precautions to avoid flying directly over or within one mile (1610 m) of these areas.
- Avoid the following known concentration areas for Pacific walrus along the coast to the maximum extent practicable during training and routine flight activities:
 - Cape Lisburne (68° 52' 53" N, 160° 11' 39" W)
 - Corwin Bluff (68° 52' 30" N, 165° 06' 02" W)
 - Punuk Island (63° 04' 48" N, 168° 49' 05" W)
 - King Island (64° 58' 30" N, 168° 03' 35" W)
 - Diomed Islands (65° 47' N, 169° 01' W)
 - Point Lay (69° 45' 39" N, 163° 03' 20" W)

- Icy Cape (70° 19' 45" N, 161° 52' 55" W)
- Each time a walrus or polar bear is sighted; an interaction form will be filled out and submitted to the USFWS.
- Reductions in vessel speed will be considered when a whale is sighted or known to have been sighted within 5 nautical miles (nm) of intended track. Vessels will use navigationally prudent courses to avoid striking the whale and, if necessary, reduce speed to bare steerageway or come to a stop. A dedicated marine mammal lookout after the initial sighting will be recommended.
- To avoid potential impacts to seabirds from vessel lights, the Coast Guard will keep deck lights at the minimum necessary for safety.
- Vessels that encounter flocks of spectacled eiders along their path will maintain a steady speed (typically 3 to 9 knots) and divert around these flocks to avoid unnecessary disturbance.
- Helicopters will avoid approaching flocks of spectacled eiders and other birds; aircraft will maintain an altitude of at least 500 feet above sea level when flying over molting spectacled eider flocks (late July through October, in Norton Sound and the Chukchi Sea in Ledyard Bay).
- All vessels and aircraft will avoid areas of active or anticipated subsistence (whale, walrus, bird, seal, caribou, muskox, moose, sheep, and bear) hunting activities as determined through community engagement and information. Coast Guard will coordinate with tribal representatives about planned hunts.
- Coast Guard flight crews will coordinate with tribal representative to ensure proposed flight paths will not interfere with planned land mammal hunts (caribou, muskox, sheep, moose, and bear). Areas of known land mammal congregations will be avoided to the maximum extent practicable during flight operations through coordination with local and tribal governments.
- Vessels avoid active subsistence whale hunting areas during spring and fall migrations of bowhead whales so as not to interfere with subsistence whale hunting.
- Trained crewmembers are posted during operations to look specifically for marine mammals. When any marine mammal is spotted, the vessel avoids them by changing course unless there is a threat to safety. In addition, unless the vessel's mission involves specifically investigating an endangered species, the vessel will plan its passage to avoid any known sanctuaries or feeding grounds.

Mobile sonar science applications may require additional analysis beyond the scope of this EA. However, during echosounder activities (excluding use of navigational sonar), the following mitigation measures will be followed, as outlined in the Final Programmatic Environmental

Assessment for the Nationwide Use of High Frequency and Ultra High Frequency Active SONAR Technology (U.S. Coast Guard 2013b):

- Dedicated marine mammal observer would monitor the appropriately sized marine mammal mitigation zone at all times of deployment. The size of the marine mammal mitigation zone would be determined through sound propagation loss modeling based on empirical data and sonar specifications, which will result in estimates of distance from source that sound will dissipate to levels unlikely to cause harassment. All monitors would have marine mammal monitoring training per Coast Guard standard lookout training, and vessels would be equipped with whale wheels to aid in identification.
- During a short-term emergency, if a marine mammal is observed in or approaching the marine mammal mitigation zone, the operational commander would take prudent measures to avoid impacting the wildlife, such as shutting down the system, moving away from the animal, or slowing down the platform, tactical situation permitting. Prudent measures are based on the operational commander's knowledge and professional assessment of the situation with respect to safety and feasibility as to whether or not to operate the sonar in the presence of a marine mammal.
- If a threatened or endangered species of marine mammal is affected (i.e., "take" as defined by the Endangered Species Act [ESA] or Level A or B harassment, as defined by Marine Mammal Protection Act [MMPA]) during emergency operational missions, the Coast Guard would conduct emergency consultation as soon as possible with the National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFWS), as appropriate, and as provided for under 50 CFR §402.05. During emergency consultation, the NMFS or USFWS can provide recommendations on how to minimize or avoid adverse effects on listed species during the emergency response. Such recommendations are strictly advisory and are to be implemented at the discretion of the emergency response personnel. If, during an emergency situation, an unauthorized take under the MMPA should occur, Coast Guard would conduct activities that are necessary to protect human lives but consult with NMFS immediately to investigate the circumstances of the unauthorized take and jointly consider the steps that should be taken to avoid similar occurrences in the future
- For training exercises and research and development missions, if a marine mammal is detected within or approaching the marine mammal mitigation zone, sonar systems would be shut down until the marine mammal has left the area or marine mammal mitigation zone.
- Except for short-term emergency situations during which initial response time is crucial, the marine mammal mitigation zone would be visually monitored for 30 minutes prior to turning on the sonar device to ensure that marine mammals are not present.
- Ramp-up (also known as soft-start) would entail the gradual increase in intensity of a sound source. When the operational situation allows, ramp-up or soft-start procedures would be used prior to operating the sonar.

- Sonar systems would not be employed in a location that interferes with obvious marine mammal movements, or prevents entry or exit of marine mammals into and out of an area (e.g., the mouth of a bay or narrow chokepoints), where sonar could deter them from traveling through or by. The only exception to this is under rare circumstances that require deployment for emergency purposes. Coast Guard will engage in emergency consultation as appropriate, and as provided for under 50 CFR §402.05.

2.5.3 Cultural Resources

Since some subsistence hunting and fishing activities in the area of operations are unpredictable due to changing yearly conditions, the Coast Guard would coordinate with subsistence users throughout the period of operations, to try and ensure that any conflicts are avoided during planning, or any that may arise during the course of operations are addressed or avoided. Interactions with subsistence activities and marine mammal sightings are entered into operational summaries for data tracking and follow up with tribes and communities impacted by the interactions.

2.5.4 Hazardous Materials and Substances

The following BMPs and federal, state, Coast Guard, and local laws and regulations pertaining to hazards and hazardous materials and substances would be adhered to as follows:

- The Coast Guard would comply with Occupational Safety and Health Administration regulations regarding safety measures and precautions in the workplace as appropriate.
- The Coast Guard would handle all hazardous materials and substances in accordance with applicable federal regulations.
- Support for fueling aircraft and surface assets would be provided by existing facilities on shore, for example, the airport in Barrow and Deadhorse, and ports in Dutch Harbor and Nome. Any required maintenance would be performed at these existing facilities. Any solid or hazardous waste generated would be disposed of by Coast Guard facilities supporting this mission, or by existing local facilities that have these capabilities.

2.6 ALTERNATIVES ELIMINATED FROM DETAILED CONSIDERATION

During the alternative concepts identification phase, several alternatives were initially identified but then dismissed from consideration. These alternatives and the rationale for not conducting an in-depth evaluation of them are presented below.

Three additional action alternatives (alternate timeframe and location, tabletop capabilities assessments, and varying levels of both air and surface assets) have been considered and subsequently eliminated from detailed analysis because they do not meet the purpose and need for the Proposed Action.

Alternate Time Frame and Location

An alternate time frame to conduct Coast Guard Arctic activities does not exist. The mission needs for Coast Guard presence in the Arctic is based on the ice-free season of 2015, when

increased vessel traffic and other activities will be taking place in the Arctic that requires a Coast Guard presence in the area. Time-space considerations within the ice-free season of 2015 for specific activities (ie at shorter time frames) could be addressed as situations warrant. The proposed time frame of Coast Guard Arctic activities also aligns Coast Guard presence with activities related to existing leases for exploratory oil drilling in the Chukchi and Beaufort Seas.

Alternate locations would also not provide a feasible alternative for analysis. The requirement for the Coast Guard presence in the Arctic in the summer of 2015 is necessitated in the Bering, Chukchi, and the Beaufort Seas to be able to react quickly to matters requiring a Coast Guard response, including safety of life at sea, law enforcement, and potential marine collisions. Therefore, an alternative considering an alternate time frame or location would not meet the purpose and need for the proposed action.

Air Assets

Various levels of air asset support for Arctic activities in the summer of 2015 were considered as an alternative. The Coast Guard has concluded that an alternate level of air asset support for Arctic activities in summer of 2015 that meets the purpose and need does not exist. The proposed locations in Alaska are strategically located in a village with existing air and ground facilities. This advances the mission of the Coast Guard to support safety of life and search and rescue for persons within the U.S. coastal zone and the Exclusive Economic Zone.

Surface Assets

Alternative levels of surface asset support for Arctic 2015 summer activities were considered. The Coast Guard has concluded that an alternate level of surface asset support that meets the purpose and need and is feasible does not exist. The proposed locations in the Bering, Chukchi, and Beaufort Seas advance the mission of the Coast Guard to support the law enforcement and safety of life and property within the U.S. coastal zone and the Exclusive Economic Zone of the United States. The continued support of up to three Coast Guard cutter-type surface vessels throughout summer 2015 Arctic activities would adequately support Arctic needs, while balancing needs for surface asset support and operational funding throughout the Coast Guard District 17 operational area, which includes the entire state of Alaska.

Chapter 3 **Affected Environment and Environmental Consequences**

3.1 INTRODUCTION

This chapter describes the existing environmental conditions in the action area, focusing on those resources potentially affected by the proposed action. When conducted as tabletop exercises, the MRO and SONS would have no impact on resource areas, therefore those two exercises are not analyzed. Resources potentially impacted by other proposed activities include water resources, biological resources, cultural resources, socioeconomics, hazardous substances/contamination, and public health and safety. Following a discussion of the affected environment for each resource is a discussion of the environmental consequences that could result from implementing the alternatives described in Chapter 2.

Resources that would not be affected by the proposed action, and a summary of the rationale for this determination, are discussed below.

Geology and Soils. The proposed action would not result in any impacts on soils or geology. The majority of the activities in the proposed action are in-water with no dredging or impacts to bathymetry. Also, proposed land-based activities of establishing Forward Operating Locations in Barrow and Deadhorse, Alaska, would only occur on previously disturbed soils or involve no ground disturbance.

Air Quality. The proposed action would not result in any impacts to air quality. The Northern Alaska Intrastate Air Quality Control Region is in attainment for all criteria pollutants. Up to two surface assets and three helicopters at any one time would be in the Northern Alaska Interstate Air Quality Control Region. Surface assets would spend the majority of their operational time at sea outside this Region. Helicopters would operate both inside and outside the Region, but emissions are very low and flight times are limited. No new shore-based emission sources are a part of the proposed action. Therefore, the proposed action would not result in a measureable increase in air emissions in the air basin and the temporary, limited operation of Coast Guard air and surface assets would result in *de minimis* levels of emissions.

Land Use. The proposed action would be consistent with existing land uses in the action area. Implementation of the proposed action would have no impact to the excellence of nearby residential or commercial areas in local communities. All wastes would be disposed of in accordance with local, state, and federal regulations. A list of known contaminated sites is available from the Alaska Department of Environmental Conservation (Alaska Department of Environmental Conservation 2013). These sites would be avoided or land use coordinated with proper regulatory authorities. Therefore, impact on land use is not considered further in this EA.

Utilities. No disruptive alterations would be made to sewer, sanitation, electricity, or water supplies; therefore, no impacts would occur to utilities in the action areas.

Visual Resources. The proposed action would have no effect on visual resources since the at-sea activities are consistent with current vessel transits and traffic in the Arctic. Vessel mooring and other on-shore activities would occur within existing support facilities.

3.2 WATER QUALITY

3.2.1 Affected Environment

The general water quality in offshore marine waters of the Alaskan arctic is pristine, especially when compared with other areas of the world. However, detectable pollutants such as persistent organic pollutants, heavy metals, acidifying substances, and petroleum hydrocarbons are present, usually at non-threatening levels, in the Arctic marine environment (Arctic Monitoring and Assessment Programme 2002). Pollutants reach the Arctic through direct anthropogenic inputs (such as sewage discharge and drill cuttings), ocean currents (from the Pacific Ocean, through the Bering Sea, to the Chukchi and then Beaufort Seas of the Arctic Ocean), rivers, and oil seeps.

The rivers carry suspended sediments with trace metals and hydrocarbons into the ocean, but these pollutants are generally found in low levels except where industrial and municipal activities occur (Arctic Monitoring and Assessment Programme 2002; Alkire and Trefry 2006). Still, the State of Alaska has identified no Clean Water Act Section 303(d) impaired water bodies in the Arctic region (Alaska Department of Environmental Conservation 2010). River sediment load is highest during spring runoff, when rivers flow fast and high (Alkire and Trefry 2006). At sea, large oil spills are considered the largest environmental threat in the Arctic region, though naturally occurring oil seeps are also a major contributor to the low levels of petroleum hydrocarbons present in Arctic waters (Arctic Monitoring and Assessment Programme 2007).

Suspended sediment concentrations vary with wind-wave activity. High energy sea states melt the permafrost and erode the organic-rich surface layer during the ice-free season, increasing shoreline erosion and turbidity. Ice formation in the autumn locks particulates from the water column into the ice cover, resulting in lower turbidity (Mineral Management Services 2002).

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, proposed Coast Guard Arctic activities in the Chukchi, Beaufort, and Bering Seas would not take place unless an emergency requires a Coast Guard response. No activities would occur that would input unauthorized contaminants or increase sediments in the water column. No land based construction would occur that could increase runoff potential and therefore, water sediment load.

Companies sponsoring oil drilling and tankers in the Arctic are responsible for putting safety and spill avoidance measures in place. They are also the responsible party for cleanup of a resulting spill. In the event that a spill exceeds the ability of the responsible party to respond adequately, the Coast Guard and Federal assets would be involved. Without a constant Coast Guard presence in the Arctic, there could potentially be over 2,000 nm between a Coast Guard vessel in the Gulf of Alaska and an emergency in, for instance, the Beaufort Sea. If an environmental emergency occurred in the Arctic region, the Coast Guard response time could be up to one week. This

delay could negatively impact water quality and marine life in the region. The No Action Alternative doesn't meet the purpose and need, but is provided as it represents a baseline condition against which environmental consequences can be measured.

3.2.2.2 Preferred Alternative

Proposed activities of the Preferred Alternative include establishing forward operating locations in Barrow and Deadhorse, Alaska (Chapter 2, section 2.2.1). This would be the only aspect of the Preferred Alternative likely to involve installing antennae or other minor, non-ground disturbing activities that may affect water quality. The Coast Guard would utilize best management practices (such as silt fencing or re-seeding) in compliance with local and state regulations, to decrease or eliminate soil runoff potential into surface waters, should any actions be undertaken that would result in ground disturbance or otherwise result in potential soil runoff.

Support for fueling aircraft and surface assets would be provided by the Coast Guard, but in existing facilities on shore, for example, the airport in Barrow and Deadhorse, and ports in Dutch Harbor and Nome. Any required maintenance would be performed at these existing facilities. Any solid or hazardous waste generated would be disposed of by Coast Guard facilities supporting this mission, or by existing local facilities that have these capabilities and should not impact water quality.

The risk of a spill is low since all appropriate control measures would be adhered to for safe management and control of hazardous materials, and all observed spills would be cleaned up in accordance with applicable state and federal laws. There would be no intentional unauthorized discharges from Coast Guard vessels or aircraft; therefore, any effects would be due to accidental or incidental discharges. Should any spills of hazardous materials or substances occur it would be cleaned up in accordance with applicable state and federal laws (as noted in Section 2.5). Buoyant, organic, and biodegradable items used during spill skimming exercises would be retrieved as much as possible. Any remaining items would naturally degrade and should not adversely impact water quality. Prior to the use of any dyes during SAR and spill response exercises, Coast Guard would ensure compliance with all applicable state and federal regulations.

The primary responsibility for spill response lies with the responsible party; for instance, the owner of the vessel or oil rig causing a spill. In the event that a spill exceeds the ability of the responsible party to respond adequately, the Coast Guard and Federal assets would be involved. With an increased Coast Guard presence in the Arctic region, spill response would be nearly immediate and much more effective. The Coast Guard's spill cleanup capabilities make their presence in the Arctic likely to have a positive impact on marine life and long-term water quality, should a spill occur.

With BMPs in place for Coast Guard activities and Incident Control Centers established to handle environmental emergencies, the Preferred Alternative would not have significant negative impacts to water quality and in fact would limit impact in the event of a spill.

3.3 BIOLOGICAL RESOURCES

This section describes biological resources in the project area, with special attention focused on federally protected species, including marine mammals and birds. These resources are managed by USFWS and NMFS.

Applicable Laws and Regulations

National Invasive Species Act. This Act amended the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990 to mandate regulation of ballast water to prevent the introduction of invasive aquatic species.

Threatened and Endangered Species. The Endangered Species Act (ESA) of 1973 (16 USC §§ 1531 *et seq.*), as amended, protects species that are endangered, threatened, or proposed for listing. Species with Federal status that potentially occur in the affected area of the proposed action are discussed in more detail below. The species included here are analyzed based on current data from the NMFS and USFWS showing which species are typically using waters of the Bering, Chukchi, and Beaufort Seas or coastal zones.

- North Pacific right whale
- Steller sea lion
- Bowhead whale
- Fin whale
- Humpback whale
- Pacific walrus (candidate species)
- Ringed seal
- Polar bear
- Short-tailed albatross
- Spectacled eider
- Steller's eider
- Yellow-billed loon (candidate species)

Marine Mammals. The Marine Mammal Protection Act (MMPA) of 1972, as amended in 1994 (16 USC §§ 1431 *et seq.*) governs activities with the potential to harm, disturb, or otherwise “harass” marine mammals. All marine mammals are protected under the MMPA (NOAA 2013a). The MMPA prohibits, with certain exceptions, the “take” of marine mammals in U.S. waters and by U.S. citizens on the high seas. It prohibits the importation of marine mammals and marine mammal products into the U.S. Marine mammals that may be present during the operational 2015 timeframe of the proposed action in the Chukchi and Beaufort Seas, in addition to the marine mammals in the Threatened and Endangered list above, include:

- Beluga whale
- Gray whale
- Harbor porpoise
- Killer whale
- Minke whale
- Northern fur seal
- Bearded seal
- Ribbon seal
- Spotted seal

Migratory Birds. The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC §§ 703-712) is the domestic law that affirms, or implements, the United States' commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. Each of the conventions protect selected species of birds that are common to both countries (i.e., species occur in both countries at some point during their annual life cycle). The Act protects all migratory birds and their parts (including eggs, nests, and feathers). Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, directs federal agencies to take certain actions to further implement the MBTA and to conserve migratory birds. The order prohibits the take of migratory birds or their eggs, feathers, or nests. Many waterfowl, songbirds, raptors, and other species are migratory and are protected under the MBTA. The Coast Guard has entered into a Memorandum of Understanding with the USFWS pursuant to Executive Order 13186 (66 Fed. Reg. 3,853) to strengthen migratory bird conservation through enhanced collaboration between the Coast Guard and USFWS.

Fish and Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801-1802), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established a new requirement to describe and identify Essential Fish Habitat (EFH) in each fishery management plan. Essential Fish Habitat includes those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (NMFS 2009a). The North Pacific Fishery Management Council (NPFMC) is responsible for designating EFH and Habitat Areas of Particular Concern for all federally managed species occurring in the estuarine and marine waters off the coast of Alaska. The NPFMC designated EFH for these species within the fishery management plans for each of the six primary fisheries that they manage: Bering Sea and Aleutian Islands (BSAI) groundfish fishery (NPFMC 2013), Gulf of Alaska (GOA) groundfish fishery, BSAI king and tanner crab fishery (NPFMC 2011), salmon fishery (NPFMC 2012), scallop fishery off Alaska, and the Arctic fishery (NPFMC 2009). Of these fisheries, only four (BSAI groundfish, BSAI king and tanner crabs, salmon, and Arctic) contain species for which EFH and Habitat Areas of Particular Concern have been designated within the Action Area. The following species have designated EFH within the Action Area:

- Walleye pollock
- Pacific cod
- Yellowfin sole
- Flathead sole
- Alaska Plaice
- Red king crab
- Pacific salmon (pink, chum, sockeye, chinook, coho)
- Arctic cod
- Saffron cod
- Snow crab

3.3.1 Affected Environment **Terrestrial Habitats - Barrow**

Along the coastal plains, the tundra is a treeless coastal zone is comprised primarily of wet, moist and alpine tundra, a mixture of grasses, sedges, moss, lichens, low shrubs, and other plants. Wet

and moist tundra contains standing water, at least part of the year, and caribou, muskox, bear, and birds can be found in certain areas. The drier alpine tundra occurs along slopes and at higher elevations. Taller shrub thickets occur along river courses (State of Alaska 2014). Barrow lies within the treeless region of continuous permafrost and is bounded on the west by the Chukchi Sea and on the east by the Beaufort Sea and a long chain of offshore islands, called the Plover Islands. Tundras are often found near permanent ice sheets where, during summer, the ice and snow recede to expose the ground and allow vegetation to grow.

Much of the interior south of the Brooks Range has boreal forest, comprised of spruce and hardwood trees such as birch, aspen and poplar. Interspersed in the forest are lakes, rivers, and swamps. Swampy muskegs are home to moose and insect-eating birds as well as larger predators like bears and predatory birds. In mountain regions where alpine tundra and snow-capped peaks occur, Dall sheep, caribou, bears, and other wildlife are found (State of Alaska 2014).



Figure 3-1 Alaska habitats
Source: State of Alaska 2014

Marine Habitats – Bering, Chukchi, and Beaufort Seas

The Chukchi and Beaufort Seas are the northernmost seas bordering Alaska. The Chukchi and Beaufort Seas are both part of the Arctic Ocean, but both are linked, atmospherically and oceanographically, to the Pacific Ocean. The atmospheric connection involves the Aleutian Low, which affects regional meteorological conditions. The oceanographic link is through the Bering Strait, which draws relatively warm nutrient-rich water into the Arctic Ocean from the Bering Sea (Weingartner and Danielson 2010).

The Chukchi and Beaufort Seas are covered by the arctic ice pack 7–10 months each year, but support a diverse biological ecosystem driven primarily by the seasonal presence of sea ice. The ice pack shapes the habitat for many of the biological organisms. The Arctic Ocean sea ice

conditions are influenced by weather, wind, ocean currents, and extreme daylight conditions. Ice coverage of the Bering Sea is highly variable, but can be anticipated about seven months a year from November through June. The Bering, Chukchi, and Beaufort Seas support a diverse assemblage of marine species: lower trophic organisms; anadromous and marine fishes; marine and coastal birds; and marine mammals (NMFS 2012). Lower trophic organisms like kelp, krill, and zooplankton serve as the basis of the food web in the Arctic and Pacific Oceans. They provide nutrition for birds, fish, and marine mammals throughout the ecosystems. Marine invertebrates inhabit the seafloor and water column in all the large marine ecosystems of the proposed Action Area and open ocean areas in the Arctic and Pacific Ocean. An ecosystem's balance and productivity are vulnerable to changes in abundance of lower trophic organisms.

Fish and Essential Fish Habitat

Over 400 fish species are known to inhabit Arctic seas and adjacent waters, which include marine, migratory, and freshwater fish species that enter brackish water. The Chukchi and Beaufort Seas off the coast of Alaska support at least 107 fish species, representing 25 families (Mecklenburg et al. 2002; Logerwell and Rand 2010; Love et al. 2005; Harris 1993; Johnson et al. 2010). Families include lampreys, sleeper sharks, dogfish sharks, herrings, smelts, whitefish, trout, salmon, lanternfish, cods, sticklebacks, greenlings, sculpins, poachers, lumpsuckers, snailfish, eelpouts, pricklebacks, gunnels, wolffish, sand lances, and righteye flounders.

Few species currently covered by fishery-management plans occur in these waters; however, an Arctic Fishery Management Plan was approved in August 2009 by the North Pacific Fisheries Management Council to address Arctic fisheries issues. The policy in that plan is to “prohibit commercial harvest of all fish resources of the Arctic Management Area until sufficient information is available to support the sustainable management of a commercial fishery” (NPFMC 2009). The moratorium does not manage targeted commercial fishing for Pacific salmon and Pacific halibut. At this time, no further decision has been made on commercial fisheries in the Arctic.

The Bering Sea supports over 450 species of fish and shellfish, many of which have commercial value. Commercial stocks include salmon, halibut, polluck, cod, flatfish, sablefish, Atka mackerel, herring, rockfish, sole, and crab, to name a few. Over half of the fish consumed in the U.S. comes from the Bering Sea (International Bering Sea Forum 2013).

Species with EFH in the proposed Action Area are Walleye pollock, Pacific cod, Yellowfin sole, Flathead sole, Alaska Plaice, Red king crab, Pacific salmon (pink, chum, sockeye, chinook, coho), Arctic cod, Saffron cod, and Snow crab.

Federally Listed Species

Table 3-1 summarizes the federally-listed species potentially occurring in the project area that are under the jurisdiction of NMFS and USFWS and protected by the Endangered Species Act.

Table 3-1 Sensitive Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	Critical Habitat / in Action Area	Habitat and Distribution
National Marine Fisheries Service (NMFS) Jurisdiction				
Cetaceans				
Bowhead whale	<i>Balaena mysticetus</i>	E	Not designated	Chukchi and Beaufort Seas
Fin whale	<i>Balaenoptera physalus</i>	E	Not designated	Chukchi and Bering Seas, Gulf of Alaska, and North Pacific Ocean
Humpback whale	<i>Megaptera novaeangliae</i>	E	Not designated	Bering Sea, Gulf of Alaska, and North Pacific Ocean
North Pacific right whale	<i>Eubalaena japonica</i>	E	Yes / No	Bering Sea, Gulf of Alaska, and North Pacific Ocean
Pinnipeds				
Ringed seal	<i>Phoca hispida hispida</i>	T	Not designated	Bering, Chukchi, and Beaufort Seas
Steller sea lion	<i>Eumetopias jubatus</i>	E	Yes/Yes	Bering Sea, Gulf of Alaska, and North Pacific Ocean
U.S. Fish and Wildlife Service (USFWS) Jurisdiction				
Marine Mammals				
Pacific walrus	<i>Odobenus rosmarus divergens</i>	C	Not designated	Continental shelf waters of the Bering and Chukchi Seas
Polar bear	<i>Ursus maritimus</i>	T	Not designated	On sea ice and coastline of Chukchi and Beaufort Seas
Birds				
Short-tailed albatross	<i>Phoebastria albatrus</i>	E	Not designated	U.S. Territorial waters, Gulf of Alaska, Aleutian Islands, Bering Sea Coast, Japan, Russia, high seas
Spectacled eider	<i>Somateria fischeri</i>	T	Yes / Yes	Western and northern Alaska in coastal environments
Steller's eider	<i>Polysticta stelleri</i>	T	Yes / No	Southwestern, western and northern Alaska
Yellow-billed loon	<i>Gavia adamsii</i>	C	Not designated	Arctic Coastal Plain, Seward Peninsula, St. Lawrence Island, and all coastal waters

Source: National Marine Fisheries Service, Listed Species in Alaska (NMFS 2013a); E = Endangered; T = Threatened; C = Candidate species for listing

Migratory Birds

Most marine birds that occur in the Bering, Beaufort, and Chukchi Seas are there during the open-water season. Arrival times usually coincide with the formation of leads during spring migration to coastal breeding areas. Migration times vary between species, but spring migration for most species takes place between late March and late May. Some birds that breed on the North Slope migrate to or through the project area twice each year. Some marine and coastal birds may breed outside the project area, but spend time in the Beaufort Sea after breeding or during their non-breeding seasons. Departure times from the Beaufort Sea for the fall and winter vary between species and often by sex within the same species, but most marine and coastal birds will have moved out of the Beaufort Sea by late October before the formation of sea ice.

Each winter, the world’s entire population of Spectacled eiders gathers to feed in the St. Lawrence Island Polyna. Some migratory birds also go through a process called molting, in which they replace some or all of their existing feathers with new feathers. During this period, these birds cannot fly, since their new feathers are not completely in or established.

Land Mammals

Four caribou herds are anticipated in the action area (Figure 3-2): Western Arctic, Teshekpuk, Central Arctic, and Porcupine. Caribou is an important year-round subsistence resource and herds are very sensitive to sound disturbance.

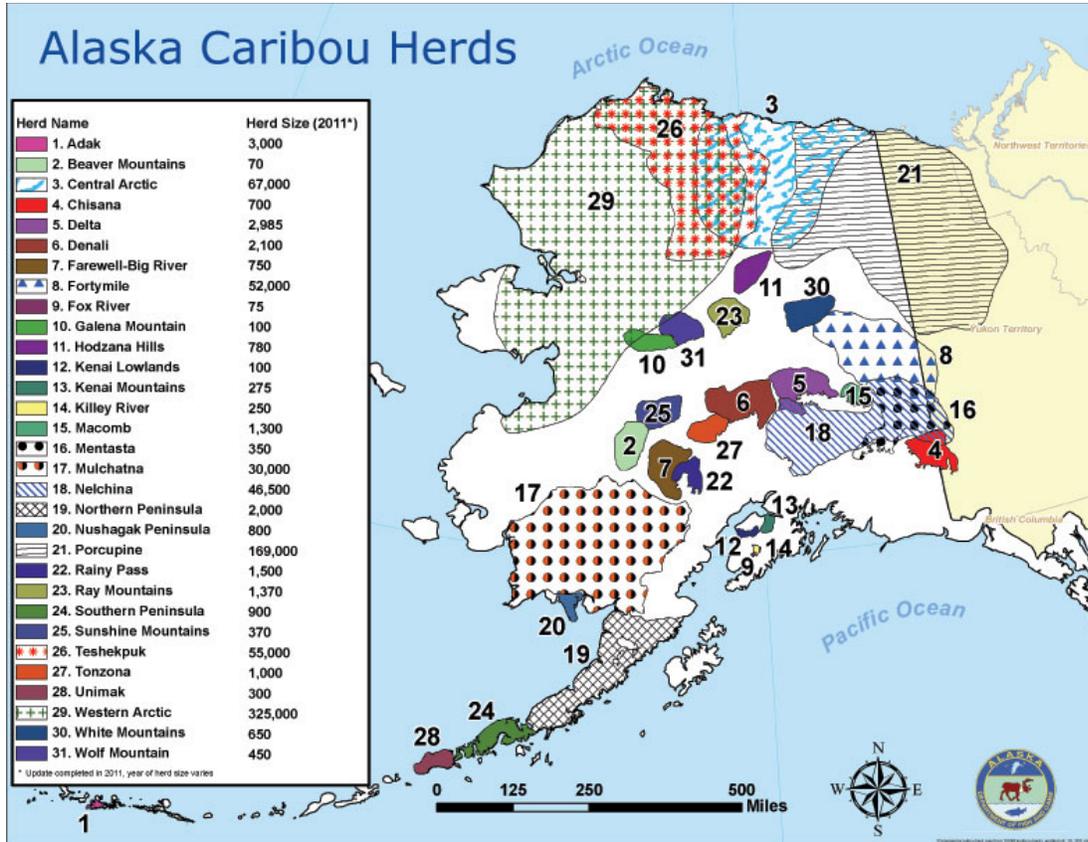


Figure 3-2 Caribou herds (Source: Alaska Department of Fish and Game 2011)

Muskoxen (*Ovibos moschatus*) are native to Alaska but were extirpated by the 1920s. In 1930, 34 muskoxen were captured in East Greenland and brought to Nunivak Island, a large island in the Bering Sea. The muskoxen thrived there and, by 1968, the herd had grown to 750 animals. Muskoxen from the Nunivak herd were later translocated throughout Alaska (Figure 3-3). There are now about 4,000 muskoxen in Alaska (Alaska Department of Fish and Game 2014b). Muskoxen are an important year-round subsistence resource and herds could be sensitive to sound disturbance.

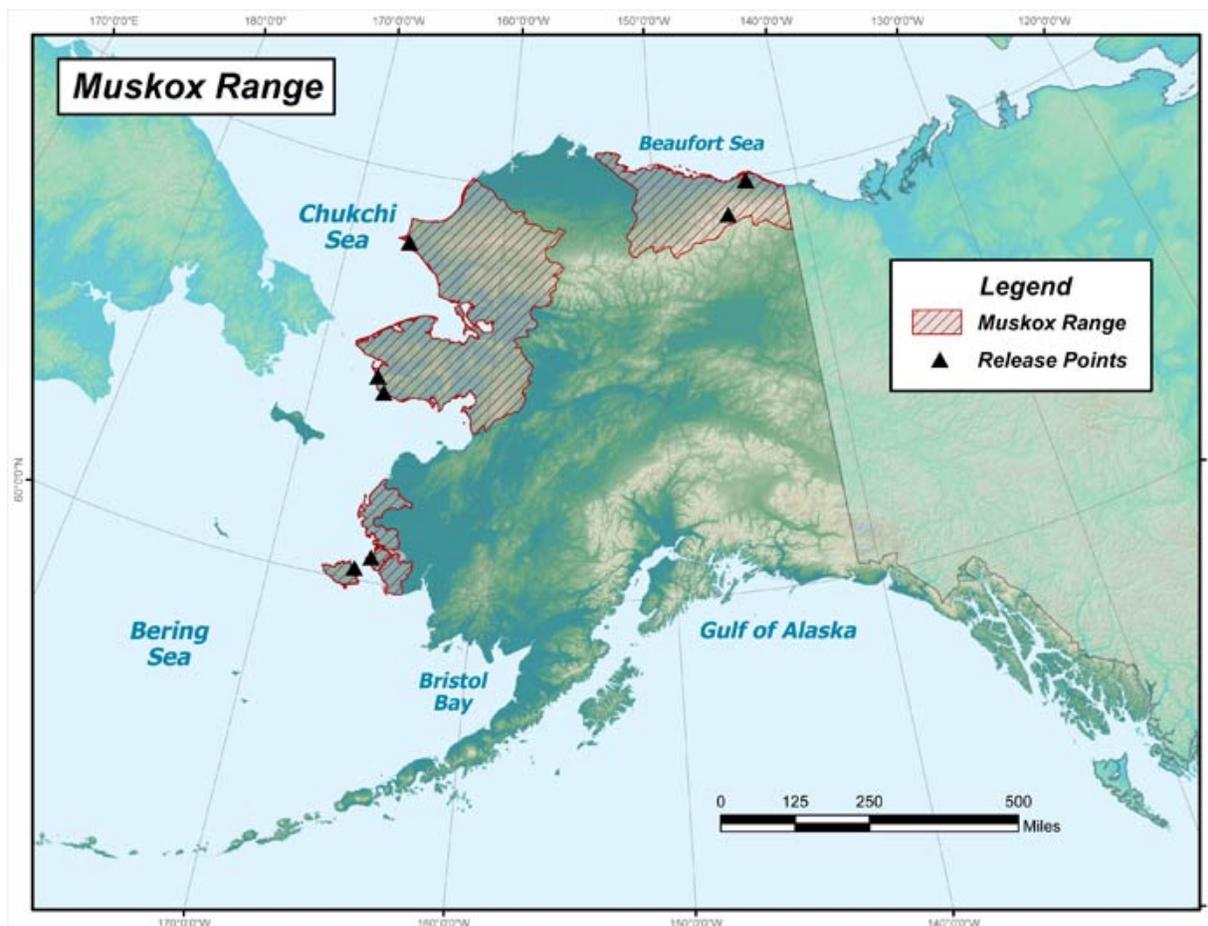


Figure 3-3 Current muskox range and reintroduction points

Moose occur in Alaska from the Stikine River of Southeast Alaska to the Colville River on the Arctic Slope (Figure 3-4). They are most abundant in recently burned areas that contain willow and birch shrubs, on timberline plateaus, and along the major rivers of Southcentral and Interior Alaska.

Alaskans and nonresidents annually harvest 6,000 to 8,000 moose, which translates into about 3.5 million pounds of usable meat (Alaska Department of Fish and Game 2014a). Only bull moose have antlers. The largest moose antlers in North America come from Alaska, the Yukon Territory, and the Northwest Territories of Canada.



Figure 3-4 Moose range in Alaska

Dall sheep inhabit the mountain ranges of Alaska (**Figure 3-5**). Dall sheep are found in relatively dry country and they frequent a special combination of open alpine ridges, meadows, and steep slopes with extremely rugged "escape terrain" in the immediate vicinity. They use the ridges, meadows, and steep slopes for feeding and resting. When danger approaches they flee to the rocks and crags to elude pursuers. They are generally high country animals but sometimes occur in rocky gorges below timberline in Alaska. They do not occur in the southeastern portion of the state (Alaska Department of Fish and Game 2014c). Sheep are harvested for subsistence use.

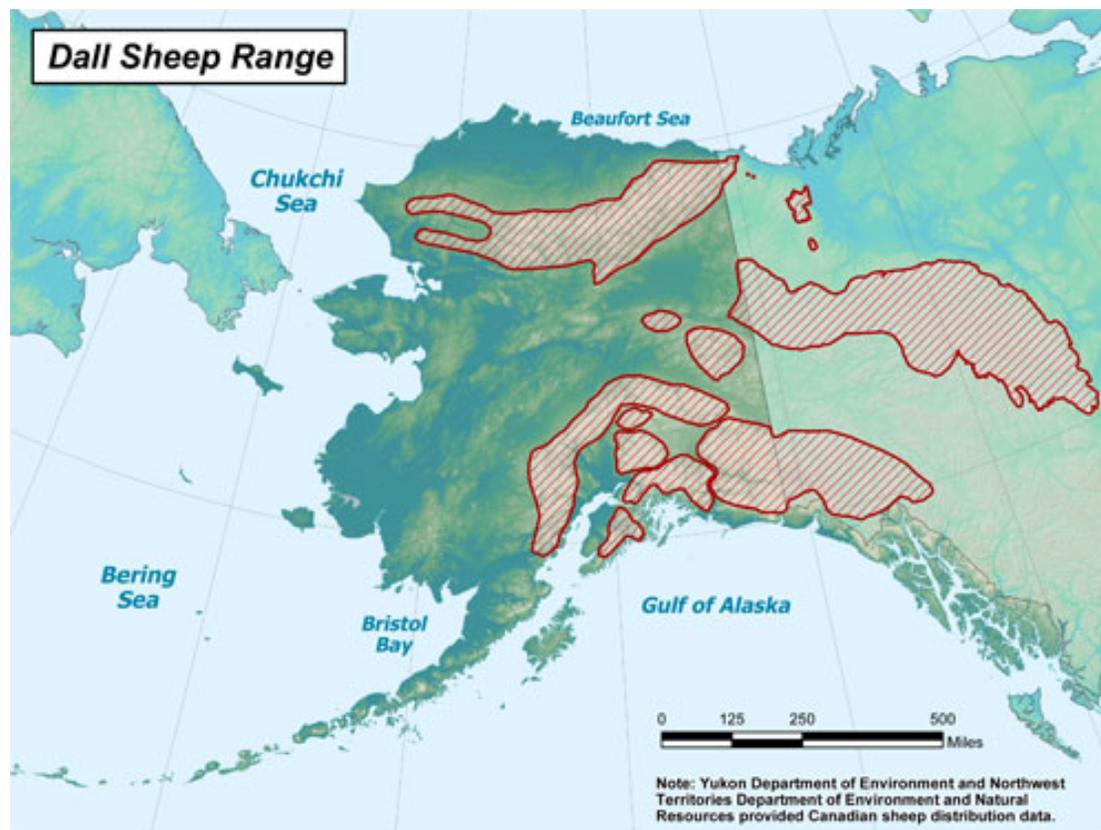


Figure 3-5 Dall sheep range in Alaska and western Canada

Polar bear (*Ursus maritimus*), black bear (*U. americanus*), and brown bear (*U. arctos*) can all be found in the action area. Polar bears occur throughout the northern polar region. In the winter, polar bears in Alaska are found as far south as St. Lawrence Island (Alaska Department of Fish and Game 2014d). Their movements are driven by regional ice dynamics and migrations can be quite extensive, following the seasonal position of the ice edge. In Alaska, black bears occur over most of the forested areas of the state, but are not found north of the Brooks mountain range (Alaska Department of Fish and Game 2014e). Both black and brown bears overwinter in dens in lieu of migration. Brown bears are found throughout Alaska, but density declines in the northern latitudes (Alaska Department of Fish and Game 2014f). Any of these bears may be harvested for subsistence use.

3.3.2 Environmental Consequences

Effects on biological resources would be considered significant if project-related actions were to result in the temporary or permanent loss of any sensitive or protected habitat or in the direct loss or damage of any sensitive resource. Effects to protected species, including critical habitat and essential fish habitat, are summarized in this section.

3.3.2.1 No Action Alternative

Under the No Action Alternative, Coast Guard Arctic activities would not occur unless an emergency requires a Coast Guard response. No Coast Guard FOLs would be established, so associated construction, training, and operations would not occur. No habitats or species would be directly impacted. In addition, the Coast Guard would not be present in the area to take enforcement action against poaching of U.S. fish stocks and observed violations of the ESA, Clean Water Act, MMPA, Magnuson-Stevens Act, and other applicable laws. The No Action Alternative doesn't meet the purpose and need, but is provided as it represents a baseline condition against which environmental consequences can be measured.

3.3.2.2 Preferred Alternative

Under the Preferred Alternative, the Coast Guard would conduct operations and training activities in the Bering, Chukchi, and Beaufort Seas. Two FOLs in Barrow and Deadhorse, Alaska and logistics/staging locations could be established to provide resupply and refueling points for Arctic-deployed Coast Guard assets. Helicopter overflights, vessel transits, and icebreaking would implement established protective measures for all non-emergency activities as described in Section 2.5 of this EA. These protective measures are designed to reduce and avoid impacts to habitats, threatened and endangered species, marine mammals, migratory birds, and land mammals and have been implemented through various Coast Guard Instructions to all personnel operating in and around the state of Alaska. These protective measures would be implemented for Coast Guard Arctic activities under the Preferred Alternative, and would be issued as a part of the Operational Order guiding these activities. Table-top exercises and Tribal/Local Government engagement would help ensure Coast Guard operational sensitivity on habitats or terrestrial, marine, or avian species, and impacts to subsistence activities.

Terrestrial Habitats – Barrow and Deadhorse

The towns of Barrow and Deadhorse are already developed, and proposed construction would involve no ground disturbance or would occur on previously disturbed soils, therefore no significant impact to terrestrial habitats would occur. Airstrips, airports, helipads, or heliports already exist at proposed logistics and staging locations, so no new construction would occur under this proposed action. Because no land uses would change, terrestrial habitats would not be significantly impacted by the Preferred Alternative.

Marine Habitats – Bering, Chukchi, and Beaufort Seas

Following the BMPs listed in Section 2.5, including the Vessel Environmental Manual (COMDTINST M16455.1) for ballasting procedures (which reduces likelihood of introducing invasive species that interrupt the ecosystem's balance), proposed Coast Guard actions would have no significant impacts on marine habitats. Dyes and flares would be used in accordance with applicable laws and regulations and are not anticipated to have a significant impact on marine habitats or lower trophic organisms within them. The Coast Guard's presence to execute

their mission to protect living marine resources also has the benefit of helping maintain the balance of the ecosystem by discouraging over fishing, illegal pollution, etc. More discussion on potential impacts, particularly to Essential Fish Habitat and critical habitat for endangered or threatened species, can be found below.

Fish and Essential Fish Habitat

Only a few of the operations and training activities proposed as part of the Proposed Action have the potential to impact EFH:

- Search and rescue missions: Considering expendable materials, the relative infrequency of annual SAR operations, the few number of self-locating buoys deployed per operation, and the amount of designated EFH available relative to the size of the impact, the **overall potential impact to designated EFH would be minimal.**
- Icebreaking: While icebreaking has the potential to expose fish occupying the water column to sound and general disturbance, potentially resulting in short-term behavioral or physiological responses, such responses would not be expected to compromise the general health or condition of individual fish. Therefore, **icebreaking operations would have no adverse effect on any designated EFH.**
- Rescue exercises: Considering potential expendable materials, **no adverse effects to designated EFH are anticipated from rescue exercises.**
- Oil recovery training exercises: Any simulated spill products missed during the exercises would remain floating at the sea surface or would become entrapped in the ice and would breakdown or degrade over time with no harm to the environment. **These exercises and tests would have no adverse effect on designated EFH.**

Implementation of the Preferred Alternative would potentially have a minor beneficial impact on fish and fish habitat in the action area due to the improved Coast Guard support to respond to any kind of environmental emergency that may potentially occur in the Arctic. In addition, Coast Guard presence in the area would benefit fish stocks because the Coast Guard would be nearby to enforce the Magnuson-Stevens Act, preventing illegal activities and overfishing.

Federally-Listed Species

Coast Guard Arctic activities by the Coast Guard could potentially result in some short-term impacts to federally listed species or candidate species under the Endangered Species Act. The protective measures detailed in Section 2.5 have been developed by the Coast Guard, in consultation with NMFS and USFWS, to prevent any disturbance to federally listed species as a result of Coast Guard activities. The Coast Guard would comply with these protective measures during Coast Guard Arctic activities with the exception of an emergency situation involving safety of life at sea or an emergent environmental emergency.

Implementation of the prescribed protective measures would reduce short-term impacts and would not cause significant adverse effects to any species or population in the action area. The Preferred Alternative may affect, but is not likely to adversely affect the federally listed species in the action area, including the bowhead whale, fin whale, humpback whale, North Pacific right whale, polar bear, ringed seal, Steller sea lion, short-tailed albatross, spectacled eider, and Steller's eider. The Preferred Alternative also would not adversely affect the candidate species

for listing, including Pacific walrus and yellow-billed loon. In addition, Coast Guard presence in the area may benefit threatened and endangered species because the Coast Guard would be nearby to take enforcement actions against observed violations of the ESA.

Marine Mammals

The Preferred Alternative would not result in any significant impacts to marine mammals or habitats in the action area because the activities are minor, and mainly involve the movement of surface vessels in the Bering, Beaufort and Chukchi Seas and helicopter support out of existing facilities in Barrow and Deadhorse, Alaska. With implementation of protective and avoidance measures issued by NMFS and USFWS (see Section 2.5), Coast Guard Arctic activities would have no permanent impacts on marine mammal populations in the Bering, Chukchi or Beaufort Seas. The potential for vessel interactions with marine mammals, including collisions, would be minimized as a result of vessel avoidance measures, as described in Section 2.5. No permanent disturbance of any marine mammal habitats or populations would result from the implementation of the Preferred Alternative, as the proposed actions are minimally invasive and do not permanently alter the environment. Sonar would be utilized within the guidelines set forth in Section 2.4. Many species of marine mammals are likely to avoid icebreakers at ranges from 1 to several tens of kilometers (Richardson et al. 1995), and would not be exposed to noise at injurious levels. Any behavioral responses are likely to subside within hours of the ship's passage and ultimately not significantly affect the survival or reproduction of disturbed individuals. Implementation of the Preferred Alternative would potentially have a minor beneficial impact on marine mammals and their habitat in the action area due to the improved Coast Guard support to respond to any kind of environmental emergency that may occur in the Arctic. In addition, Coast Guard presence in the area may benefit marine mammals because the Coast Guard would be nearby to take enforcement actions against observed violations of the MMPA.

Migratory Birds

The Preferred Alternative would not result in any significant impacts to migratory birds in the action area because the activities are minor, and mainly involve the movement of surface vessels in Port Clarence, Nome, and Barrow and helicopter support out of existing facilities in Barrow and Deadhorse, Alaska. These activities would have no permanent impacts to bird populations or movements in the Bering, Chukchi, or Beaufort Seas or on shore in the Barrow area. No disturbance of migratory bird habitats or populations would result from the implementation of the Preferred Alternative, as the proposed actions are minimally invasive and do not involve any construction or permanent alteration of the environment. Flight crews would communicate with the local residents and native villages or groups daily to ensure flight paths would not interfere with planned subsistence hunts of birds, including waterfowl. BMPs specific to birds include Coast Guard diverting around at-sea flocks and maintaining slow and steady speeds. Aircraft would also maintain altitudes of at least 500 feet above sea level when flying over spectacled eiders and avoid approaching flocks of all birds. Section 2.5 of this EA details all BMPs employed to protect species. Implementation of the Preferred Alternative would potentially have a minor beneficial impact on migratory birds in the action area due to the improved Coast Guard support to respond to any kind of environmental emergency that may occur in the action area.

Land Mammals

Under the Preferred Alternative, flight crews would be required to log in-flight hours to meet ongoing training requirements. Fog and cloud cover could create a low ceiling in which pilots would be forced to maneuver their aircraft at low altitudes. This noise could spook large game, causing a change in herd direction, but would not impact a population's long-term survival. Flight operations are not expected to have a significant impact on caribou, moose, muskox, Dall sheep, bears, or other land mammals, but crews must communicate with the native villages and organizations on a daily basis to ensure flight paths would not interfere with planned subsistence hunts.

The Preferred Alternative is not anticipated to significantly impact biological resources.

3.4 CULTURAL RESOURCES

Cultural resources consist of districts, buildings, sites, structures, areas of traditional use, or objects with historical, architectural, archaeological, cultural (those important to living Native Americans, including Alaska Natives, for religious, spiritual, ancestral, or traditional reasons), or scientific importance. Maritime cultural resources can include submerged prehistoric sites, shipwrecks and associated debris, and historic materials intentionally dumped or lost.

The proposed action has no activities disturbing the sea floor. Land-based activities would not include new ground disturbance, but would include in-flight training. For purposes of this EA, analysis will focus on marine and land-based subsistence resources used by local tribes within the proposed action area.

Numerous laws and regulations mandate that possible effects on important cultural resources be considered during the planning and execution of federal undertakings. These laws define the compliance process and federal agency responsibilities. Federal mandates include Sections 106 and 110 of the National Historic Preservation Act and their implementing regulations in 36 CFR 800. As required in these regulations, the Coast Guard has complied with the requirements for using the NEPA process to achieve Section 106 compliance. Coast Guard District 17 has a designated Tribal Liaison who has ongoing communications with Alaska Native tribes, villages, and corporations in the action area about the proposed Coast Guard Arctic activities.

This section focuses on subsistence resources. We try to give an overview of subsistence resources, but realize some important species may be unintentionally omitted or not discussed in great detail. Availability of data, timeliness of publication, and sensitivity to locations of preferred hunting grounds were all factors when writing this section.

3.4.1 Affected Environment

Subsistence

Subsistence harvest plays an important role in all Native communities of the action area. There are multiple organizations that cooperatively and jointly manage subsistence resources and information. The majority of permanent residents of the Arctic and Bering Sea coasts are Alaska Natives who value many subsistence activities as group activities that further core values of

community, cooperation, and kinship. Subsistence use means the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade (36 CFR 242.4). Section 109 of the MMPA applies the same definition explicitly to the subsistence harvesting of marine mammals (NOAA 2013a).

Subsistence harvesting follows a seasonal pattern constrained by changes in season and by the migration patterns of whales, fishes, birds, and land mammals such as caribou. Muskoxen and brown and black bears don't migrate.

Birds harvested for subsistence uses include ducks, geese, seabirds, shorebirds, grebes, loons, Tundra Swan, Sandhill Crane, ptarmigan (non-migratory), and grouse (non-migratory). Species vary by location and season (Naves 2011).



Figure 3-6 Bowhead whale

Marine mammals are culturally most important even in villages where caribou, moose, sheep, bear, muskox, birds, or fish supply more meat. An overview of some land species is in Chapter 3.3, Biological Resources. A recent study of subsistence harvesting patterns in Beaufort Sea communities suggests that subsistence marine harvesting can occur anywhere along the coast, but tends to be concentrated in areas directly offshore from the villages and regularly used whaling camps. Seaward harvesting occurs within 25 miles of shore but may extend to as much as three times that distance depending on the conditions of ice and sea. Harvesters prefer locations where they do not have to fight against the currents to bring their harvest home (SRBA 2010). Whale (Figure 3-6) meat and seal oil is an important addition to meals based on the sea harvest (MMS 2008). Seal oil is a significant source of calories and used in almost all meals by the Inuit and Yup'ik households (Alaska Department of Fish and Game 1988). There is concern among Alaska Natives that increased industry and associated noise and pollution may drive away desirable species from historic hunting grounds.

Subsistence species supply more than meat. Skins and furs go into the production of clothing while bone, baleen, and ivory provide raw materials for handicrafts. Wild foods, clothing, construction, arts, crafts, furs, and other products are traditionally traded among households through extensive, non-commercial, kinship-based networks. Coastal resources such as seal oil and fish commonly are traded inland, while inland resources such as muskox and caribou are traded toward the coast (NMFS 2009b).

Overall subsistence consumption varies, and the composition of subsistence consumption varies as well, reflecting the availability of commercial sources of food and the composition of the resource base on which the community draws (Figure 3-7).

In Alaska, the U.S. government and the Alaska Eskimo Whaling Commission have jointly managed the traditional subsistence harvest of the bowhead whale under a cooperative agreement since 1981. All stocks of bowhead whales are classified as protected by the International Whaling Commission. The United States has classified bowhead whales as endangered under the Endangered Species Act and depleted under the Marine Mammal Protection Act.

Eleven Alaskan coastal villages within the action area participate in traditional subsistence hunts of bowhead whales (Table 3-2): Gambell, Savoonga, Little Diomed, and Wales (on the Bering Sea coast); Kivalina, Point Hope, Point Lay, Wainwright, and Barrow (on the coast of the Chukchi Sea); and Nuiqsut and Kaktovik (on the coast of the Beaufort Sea). The bowhead whale hunt constitutes an important subsistence activity for these communities, providing substantial quantities of food, as well as reinforcing the traditional skills and social structure of local Alaska Native culture. Such hunts have been regulated by a catch limit adopted by The International Whaling Commission regulates the catch limit, with Alaska Native subsistence hunters from northern Alaskan communities taking less than one percent of the stock of bowhead whales per year.

Contemporary hunts occur twice a year in the spring and autumn seasons based on ice and weather conditions (see Figure 3-8 for bowhead whale migration pathways). In the autumn season, aluminum skiffs or small open boats with outboard motors are used for the hunt due to the open water conditions. In the spring, traditional skin-covered *umiaks* are preferred because they are quieter and therefore more effective in the ice leads.

Traditionally, most of the whale was used for food, though other parts of the whale were used to make whaling gear, fishing equipment, traps, tools, and for many other practical day-to-day uses.

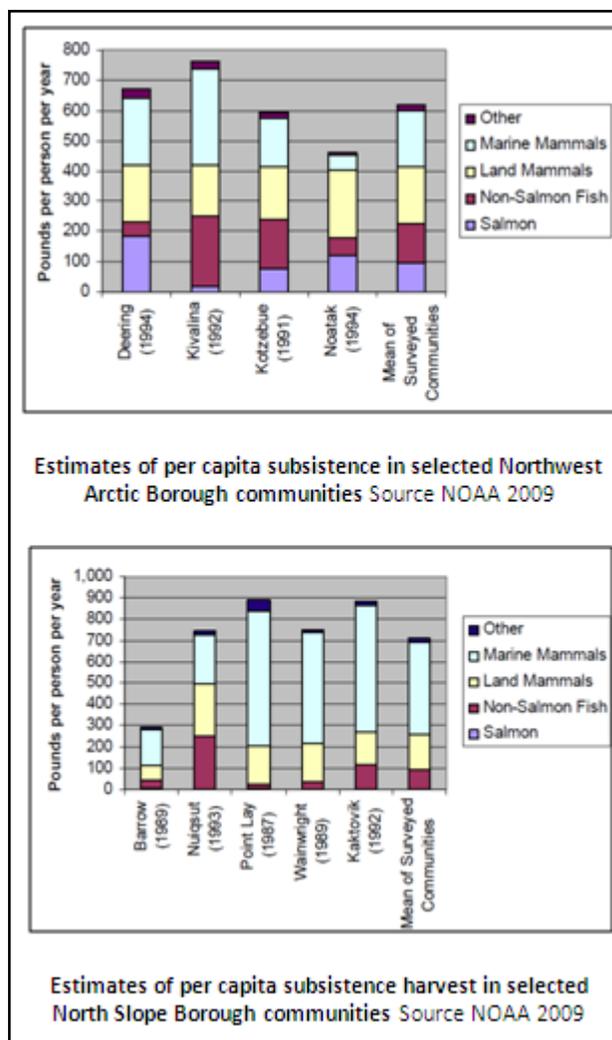


Figure 3-7 Per capita subsistence harvest in Northwest Arctic Borough and North Slope Borough

The gut was made into translucent windows, and the oil was used for heating, cooking, and lighting. The bones were used for fences, house construction, and sled runners. Baleen and bone were used in many forms of handicraft, including baleen baskets, and carvings.

Today, bowhead is still an important source of subsistence where the skin and blubber are eaten either raw or boiled in salted water. Subsistence foods also include muscle, tongue, flukes, flipper, tongue, intestines, heart and kidney, as well as stomach and liver in Point Hope. The membrane on the liver is used for drum skins (NMFS 2013b).

Bowhead subsistence whaling represents an especially important source of subsistence food among the communities in the action area. During the past 10 years (2002 – 2011), the villages have landed 388 bowhead whales, or an average of 38.8 whales per year, the largest community of Barrow takes over half of the total, with an average of 21.0 bowhead whales landed per year in the last decade. Most of the rest of the communities take one to three whales per years, while the small communities of Wales, Point Lay, and Little Diomedede have highly intermittent harvests, and Kivalina has taken no whales in this period (NMFS 2013b).

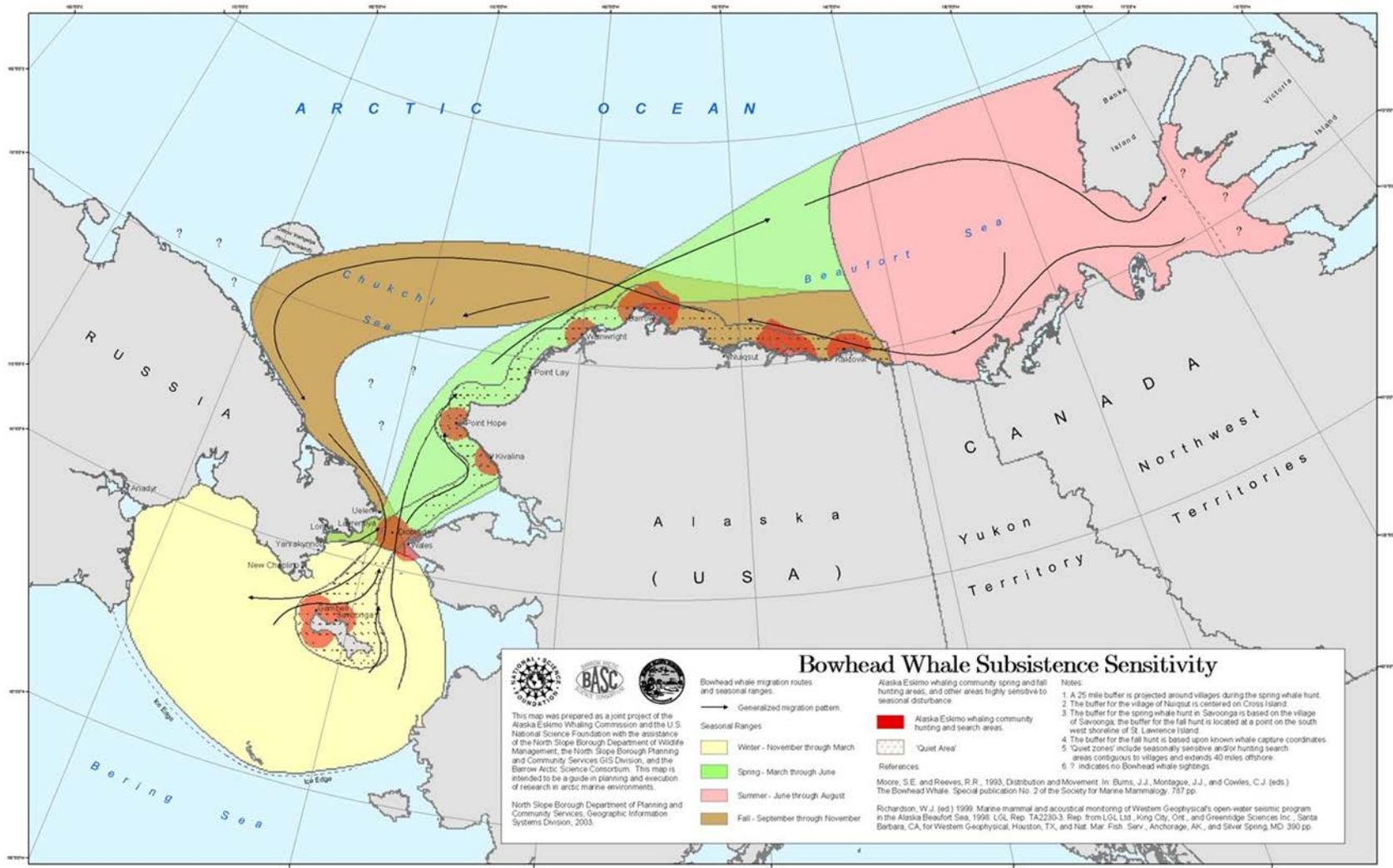


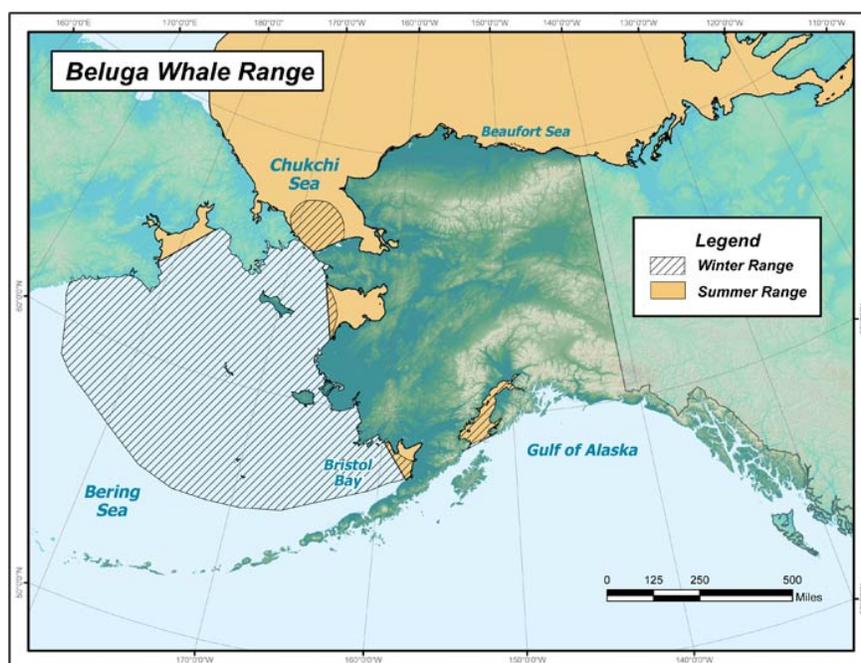
Figure 3-8 Bowhead whale subsistence areas

Table 3-2 Bowhead whale harvests

Bowhead Whales Landed 2002 - 2011												
	Gambell	Savoonga	Wales	Little Diomede	Kivalina	Point Hope	Point Lay	Wainwright	Barrow	Nuiqsut	Kaktovik	Total
Total Landed	25	32	1	1	0	25	2	30	210	32	30	388
Annual Ave.	2.5	3.2	0.1	0.1	0	2.5	0.2	3.0	21.0	3.2	3.0	38.8

Source: NMFS Bowhead Whale Final EIS January 2013

The beluga whale (*Delphinapterus leucas*--**Figure 3-9**) is another important whale species that is hunted throughout the coastal waters of the study area. Hunting is done in spring as whales travel northward through leads in the ice, as well as during the summer and autumn open-water period. Belugas are principally used for human consumption, either as meat or “maktak,” which consists of skin and the outer layer of blubber. The oil is used for cooking and for fuel. Beluga bones are sometimes used in crafts. The meat may also be used as dog food (Alaska Department of Fish and Game 2014g). Belugas are the only cetacean with skin thick enough to be used as leather when tanned. No beluga whale critical habitat has been designated in the study area and the populations of the stocks in the study area seem to be stable based on the continued availability of large, old individuals after centuries of harvesting and the apparent lack of change in the size and age structure of the catch in recent years (Harwood et al 2000).

**Figure 3-9 Beluga whale range**

Steller sea lions (Figure 3-10) inhabit haulouts and rookeries on the coast throughout the action area south of the Bering Strait. Steller sea lion females exhibit high site fidelity, generally using the same rookeries to breed and birth their pups each year. These sites are usually on remote islands where access by predators is limited. Sea lions do not migrate, but do move their “central-place haulout,” the center of their foraging activity, to track seasonal concentrations of their many types of prey (Alaska Department of Fish and Game 2014h). Historically, Steller sea lions were used as a food source, clothing, boat coverings, meat for fox farms and craftwork. Contemporary use includes food, some clothing and craftwork. Subsistence harvest has not been shown to contribute to the decline of the species.



Figure 3-10 Sea lion and pups

Increased vessel traffic in the Bering, Beaufort, and Chukchi Seas would be likely to result in greater incidents of disturbance effects on marine mammals and could result in a higher incidence of ship strikes with the potential for serious injury and mortality. However, if marine mammals are able to move away from future shipping lanes and still find suitable foraging areas, the increased risk of ship strikes and disturbance could be reduced (NMFS 2009b).

Alaska Natives have also voiced concerns over increased shipping facilitated by the opening of the Northwest Passage, since shipping noise may interfere with marine subsistence hunts. They are currently adapting to later ice formation in the fall and earlier ice retreat in the spring. The lengthening of the ice-free season allows more shipping to support the oil and gas industry, community resupply, or tourism. With increased traffic, there is a tendency to stretch the ice-free season even longer by the use of icebreakers. It follows that shipping plays a role and has an impact on the formation of sea ice (ships breaking up early ice formation and heat inputs from engines) not only on its own, but also through combining with other drivers of change (e.g., climate change) (Arctic Council 2009). Annual sea ice formation is critical for Alaska Natives as well as marine fish and mammals. Alaska Natives are very concerned by the loss of multiyear ice, which forms a sturdy platform of sufficient depth to allow for camping, butchering whales, and hunting along sea ice routes that remain passable for hunters as well as for the migratory game they pursue (Arctic Council 2009).

Many of the most important subsistence resources are in or near the sea and are thus potentially subject to the effects of increased commercial vessel traffic, oil and gas exploration, production, and any spills associated with them, and increased Coast Guard activity.

Residents of coastal communities have been remarkably consistent in their primary concerns during the more than 20 years of public hearings and meetings on State and Federal oil development on the Alaska coast (Mineral Management Service 1996). Cultural concerns mentioned include:

- The effects that oil spills are likely to have the largest and longest lasting effects on Alaska Natives, primarily in terms of subsistence activities.
- There is a general fear of cultural change, especially in terms of the loss of the subsistence lifestyle, which may lead to social disruptions or social problems in local communities (including youth becoming less interested in traditional ways). One single incident would have devastating impacts to lifestyle.
- Oil development will result in an influx of population and other influences, which will disrupt and degrade Alaska Native community life. In addition, oil development and its effects will impose additional demands on Alaska Native communities and individuals. Appearances at numerous hearings and the review of numerous documents are only the most visible of such demands.
- Whales will follow pathways created by icebreakers, which could deflect whales away from typical subsistence hunting grounds.
- The breaking of sea ice by icebreakers causes dark water to be exposed, instead of light ice. The dark water absorbs heat and causes the remaining ice to melt faster. If the ice remained intact, it is believed that the ice sheet would be more persistent.

Marine mammals are sensitive to noise. Hunters avoid making any sort of extraneous noise, and the loud and relatively constant noises associated with seismic testing, drilling, and boat and air transport will cause marine mammals to avoid areas where such noise is audible to them. The range of marine mammals' sensitivity to noise is quite large, and noise effects are a concern.

- Many Alaska Natives believe that the technology to clean up oil spills in Arctic waters, and especially in broken ice conditions, is poorly developed and has not been adequately demonstrated to be effective.
- Many residents believe that public comments at public hearings and other public forums may be noted, but they have little or no effect on project decisions or the overall direction and philosophy of the leasing program.

Executive Order 13175, *Consultation and Coordination with Tribal Governments*, issued in 2000, established collaboration with American Indian and Alaska Native tribal governments. The Coast Guard District 17 also has policies regarding Government-to-Government Consultation in the United States that are outlined in CGD17INST 5726.1B, *Tribal Consultation and*

Engagement Guidance (U.S. Coast Guard 2011b). The instruction includes several BMPs for Coast Guard units within District 17 to coordinate and ensure no conflicts exist between their actions and any identified tribal activities, such as subsistence harvest of fish, marine mammals, and land mammals as a result of Coast Guard activities. Table 3-3 outlines the tribes, tribal entities, and governments that Coast Guard has engaged to discuss Coast Guard Arctic activities.

Table 3-3 Tribes, Tribal Entities, and Governments Contacted by the Coast Guard

Name of Tribe or Tribal Entity	Location
North Slope Borough Mayor's Office	Barrow, Alaska
North Slope Assembly	Barrow, Alaska
Inuit Circumpolar Conference	Anchorage, Alaska
Native Village of Barrow	Barrow, Alaska
Inupiat Community of the Arctic Slope	Barrow, Alaska
Maniilaq	Kotzebue, Alaska
Arctic Slope Regional Corporation	Barrow, Alaska
Northwest Arctic Leadership Team	Kotzebue, Alaska
Northwest Arctic Borough	Kotzebue, Alaska
Bering Straits Native Association	Nome, Alaska
Kawerak, Norton Sound Health Consortium	Nome, Alaska
Northern Waters Task Force (formed by Alaska State Legislature)	Nome, Kotzebue, and Barrow, Alaska
Native Village of Kotzebue	Kotzebue, Alaska
Kiana Traditional Council	Kiana, Alaska
Native Village of Kivalina	Kivalina, Alaska
Kotzebue IRA Council	Kotzebue, Alaska
Native Village of Noatak	Noatak, Alaska
Noorvik Native Community	Noorvik, Alaska
Selawik Village Council	Selawik, Alaska
Native Village of Shungnak	Shungnak, Alaska
Village of Anaktuvuk Pass	Anaktuvuk, Alaska
NANA Regional Corporation, Inc	Kotzebue, Alaska
Atqasuk Village	Atqasuk, Alaska
Kaktovik Village	Kaktovik, Alaska
Native Village of Nuiqsut	Nuiqsut, Alaska
Native Village of Point Hope	Point Hope, Alaska
Native Village of Point Lay	Point Lay, Alaska
Native Village of Wainwright	Wainwright, Alaska
Arctic Slope Native Corporation	Barrow, Alaska
Alaska Eskimo Whaling Commission	Barrow, Alaska
Eskimo Walrus Commission	Nome, Alaska
Alaska Nanuq Commission	Nome, Alaska
Alaska Beluga Whale Committee	Kotzebue, Alaska
Ice Seal Committee	Nome, Alaska
North Slope Borough Department of Wildlife Management	Barrow, Alaska

Subsistence hunting is very important in these communities and occurs during various timeframes and in various locations throughout the year. Important subsistence species include fish, bowhead whale, beluga whale, various other whales, various seals, walrus, sea lion, caribou, moose, sheep, bear, birds, and muskox.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, Coast Guard Arctic activities would not occur unless an emergency requires a Coast Guard response. The Coast Guard would not proceed with tribal outreach and coordination efforts. The No Action Alternative does not meet the purpose and need, but is provided as it represents a baseline condition against which environmental consequences can be measured.

3.4.2.2 Preferred Alternative

Potential impacts to subsistence activities within the action area could occur based on subsistence harvest activities. Noise from ships, helicopters, and planes could result in these species avoiding the area. Flight crews would coordinate with local tribes to ensure their proposed flight paths would not interfere with subsistence harvest activities. Flight plans would be altered to accommodate any planned hunts. This coordination would ensure that no significant impact occurs to subsistence activities. Ship crews would also coordinate with local tribes in the same manner, including communicating established safety zones.

The Coast Guard strives to communicate on a regular basis with affected tribes and communities regarding Coast Guard activities and presence. For the Coast Guard Arctic activities, the Coast Guard has been proactively engaging with many communities, tribes, and corporations of the North Slope area and affected communities, as listed in Table 3-4. With the BMPs defined in the Coast Guard District 17 Instruction 5726.1B, such as de-conflicting Coast Guard activities and promoting continued communication with the appropriate tribal governments and communities, impacts to subsistence use of the land and Bering, Chukchi, and Beaufort Seas from Coast Guard activities would be minimized. Therefore, it is anticipated that the Preferred Alternative would have no significant impacts to tribal rights and resources, including subsistence activities.

3.5 SOCIOECONOMICS

3.5.1 Affected Environment

Population and Employment

Among the Nome Census area, the North Slope Borough, and the Northwest Arctic Borough, there are approximately 27,000 people in the action area (U.S. Census Bureau 2012). The Arctic region is projected to experience average annual increases in population of 1.08% between 2010 and 2020, with a slightly lower average annual rate of 0.95% over the period 2020 to 2030. Projections of demographic and economic data assume the continuation of existing social, economic, and technological trends at the time of the forecast, including employment associated with the continuation of current oil and gas leasing activity, as well as the continuation of trends in other industries important to the region (Alaska Department of Labor and Workforce Development 2007).

The largest employing sectors by place of work in the Arctic region in 2008 were mining and oil and gas development, with 8,477 people employed representing 49% of total employment, service industries with 6,025 employees at 35% of total employment, and State and local government with 2,859 employees at 17% of total employment. Between 2001 and 2006, approximately 70% of North Slope workers in the oil and gas industry commuted to and from permanent residences elsewhere in Alaska (Mineral Management Services 2008).

The NANA Regional Corporation owns the Red Dog Mine, which is located in the DeLong Mountains about 90 miles north of Kotzebue, Alaska, and is one of the world's largest zinc mines. It contributes nearly one billion dollars in State and regional taxes and revenues, as well as serving as a significant source of employment in the surrounding area. Estimates credit Red Dog Mine with creating roughly 2,800 jobs statewide and paying more than \$166 million in total compensation. In 2009, Red Dog Mine purchased approximately \$173 million in goods and services, including work with 10 Alaska mining support companies. Alaska Native peoples throughout the state also benefit from the mine through the Alaska Native Claims Settlement Act's 7(i) sharing provision. In 2011, NANA distributed \$82 million dollars through this agreement to all Alaska Natives (NANA 2013).

About 9,600 people (U.S. Census Bureau 2012) live in the North Slope borough, most of them in Barrow, but the greatest impact the oil and gas industry has on them is through oil-related property tax revenues. The North Slope oil industry infrastructure and work sites are self-contained and hundreds of miles away from most of the borough's resident population. Prudhoe Bay, the largest oilfield in North America, is the hub for most oil and gas related activity in the borough. Oil producers provide about 20 percent of the jobs in Prudhoe Bay and oil support services companies provide another 65 percent. The remaining jobs are other industries, such as construction, transportation, or professional services but directly tied to Prudhoe Bay or other area oil operations (Alaska Oil and Gas Association 2011).

Commercial Shipping and International Routes

Currently, commercial traffic within the action area supports oil and gas industries and the Red Dog mine, as well as barges or cargo vessels used to supply coastal villages and international shipping. Shipping traffic is rapidly increasing in the study area. The Bering Strait is the entry and exit point to the western Arctic. As reported by Coast Guard District 17 for 2008 to 2012, annual vessel traffic transiting the Bering Strait increased from 220 vessels a year to 480 vessels a year (see Figure 3-11), a more than 100 percent increase. Total vessel traffic in the Arctic has more than doubled as well. The growth rate was particularly high for tank vessels; tugs and other cargo vessels, which were the second and third largest categories of movements.

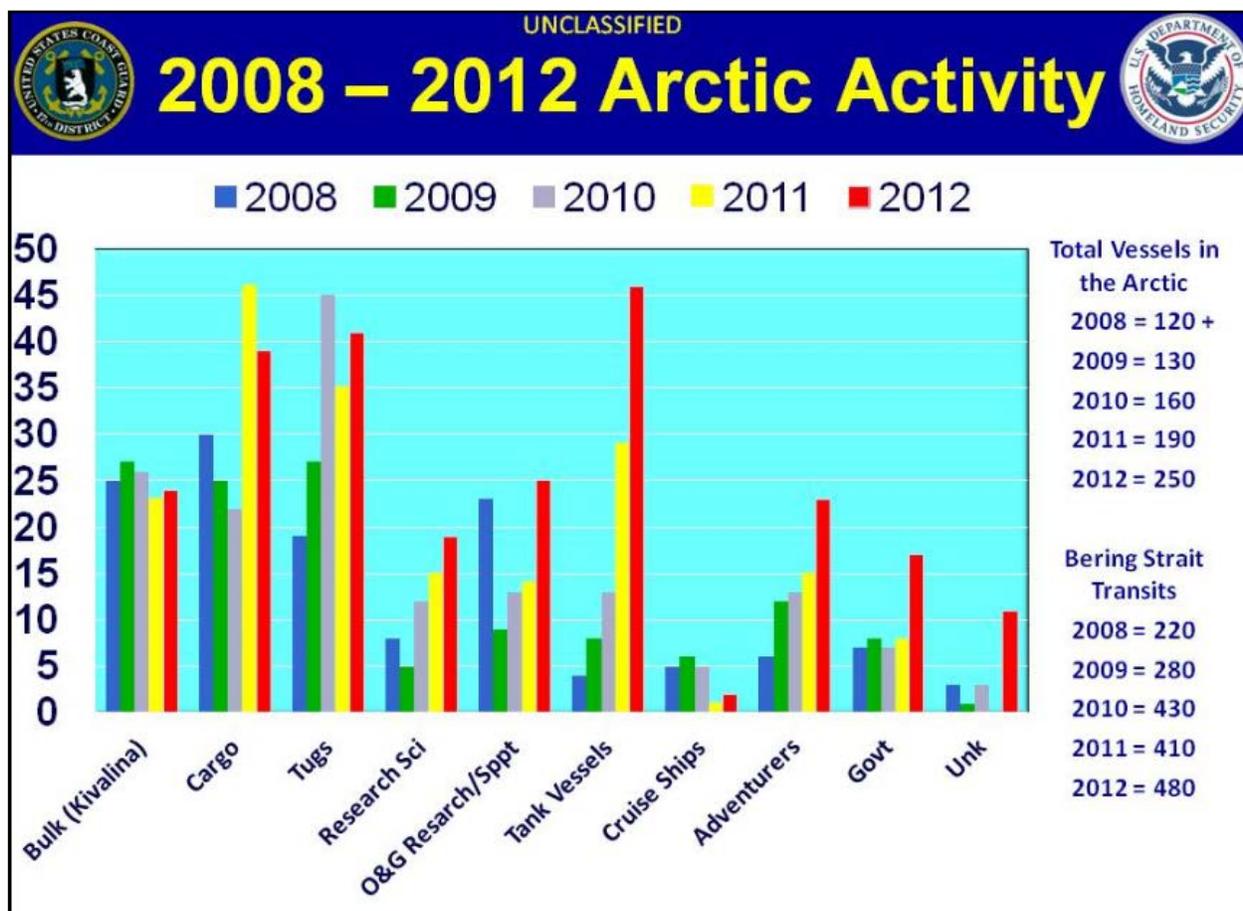


Figure 3-11 Vessel activity in the Arctic

Another near-term example of an increase in U.S. Arctic marine traffic has been the 2012 exploratory oil drilling in the Beaufort and Chukchi Seas. A July 2012 *Bloomberg* government article reports that Royal Dutch Shell PLC has spent \$4.5 billion on Arctic drilling preparations since 2005 (U.S. Committee on the Marine Transportation System 2013). This and other indicators of private sector intent to expand exploration in the region, both within and beyond U.S. waters, highlight the potential for economic development in the Arctic.

Commercial shipping activity in the U.S. Arctic is primarily regional, centered on the transport of natural resources from the Arctic and the delivery of general cargo and supplies to communities and natural resource extraction facilities. Diminished Arctic ice is now creating growth potential for commercial shipping on trans-Arctic routes. This could reduce existing transit distance between Europe and Asia by roughly 4,500 nautical miles. For commercial interests, saving a week's time and 40 percent in freight shipping costs presents a compelling case to consider routing vessels through the Arctic. Regardless of purpose, commercial vessel traffic into and through the Arctic is increasing and will continue to increase underscoring the need for emergency preparedness.

Commercial and Recreational Fishing

The Arctic Management Area, consisting of the U.S. Exclusive Economic Zone of the Chukchi and Beaufort Seas from 3 nm offshore the coast of Alaska is currently closed to commercial fishing. In the State waters of the Beaufort Sea, there is a single commercial fishery targeting cisco and whitefish in the Colville River Delta that operates in the summer months. Markets for these fish are primarily regional, although some fish are sent to Anchorage and to markets that are more distant. In the Chukchi Sea, there is a relatively small summer salmon fishery (NPFMC 2009).

The number of commercial fishing vessels is expected to stay relatively consistent due to a moratorium on commercial fishing in U.S. Arctic waters instituted in 2009. The moratorium is in effect until appropriate scientific information is available to manage the resources in this region. The moratorium does not manage targeted commercial fishing for Pacific salmon and Pacific halibut, so commercial vessels fishing for those species are present in the area. Extensive commercial fishing can be expected in the Bering Sea.

There is little data on recreational (non-commercial) fishing in the Beaufort and Chukchi Seas. The North Pacific Fishery Management Council concluded that there are few fisheries in the Beaufort and Chukchi Sea Planning Areas. Sport fishing likely occurs at the larger population centers such as Barrow. Alaska State law would regulate any recreational fisheries that do occur in State waters. The available data is not adequate to determine the population trends in recreational and subsistence harvests in the Arctic Management Area.

Economy and Tourism

There is lodging available in Deadhorse during the months that the proposed action would occur. Available accommodations include 6 hotels in Deadhorse. The Coast Guard has a hangar in Deadhorse under lease for the duration of the proposed action. This hangar has basic infrastructure for aircraft support.

Eco-tourism and recreational vessel activity in the Arctic have increased due to consistent opening of the Northwest Passage from sea ice retreat during the summer months. Numerous sailing and yachting publications have shared Arctic routes, recommendations, and experiences. Cruise ships are increasingly present in the Arctic during the summer months. Adventurers also attempt to cross the Bering Strait using various modes of transportation, but many adventurers are not successful and abandon their attempt or require rescue.

Subsistence

Alaska Native tribes utilize caribou and marine fish and mammals for subsistence. The adaptations of native Alaskans to the harsh Arctic environment have enabled their people and culture to survive and thrive for thousands of years. Subsistence requires cooperation on both the family and community level. More information on subsistence can be found in Cultural Resources, Section 3.4. Each hunting excursion costs time, money, and resources for those involved, so it is important that Coast Guard actions not interfere with subsistence hunts.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, Coast Guard Arctic activities would not increase operations and training within the action area. Income to communities for lodging, food, and sundry purchases made by Coast Guard personnel stationed at seasonal forward operating locations would not increase. Coast Guard assets in the Arctic would not increase to assist with enforcement of fish and game laws, subsistence hunting rights, and outreach programs. The Coast Guard would not increase its presence to ensure the safe and efficient flow of commerce as activities increase in the Arctic. The No Action Alternative does not meet the purpose and need, but is provided as it represents a baseline condition against which environmental consequences can be measured.

3.5.2.2 Preferred Alternative

The proposed action is to conduct increased operations and training exercises in the Arctic in summer of 2015 to meet Coast Guard mission responsibilities due to the increase of national and international activities in the area.

Relative to the preceding discussion regarding noises, the NMFS summary in the Final Environmental Impact Statement for Issuing Annual Quotas to the Alaska Eskimo Whaling Commission for a Subsistence Hunt on Bowhead Whales for the years 2013 through 2018 states that “the effects of vessel and aircraft noise on bowhead whales are primarily related to temporary disturbances in limited geographic areas and are expected to make only minor contributions to cumulative impacts on bowhead whales” (NMFS 2013b). In the Biological Evaluation in Support of the Beaufort Sea Oil and Gas Exploration, the U.S. Environmental Protection Agency (EPA) stated, “The overall impacts to whales and pinnipeds from noise and vessel disturbances are expected to be temporary, resulting in a short-term alteration of behavior.” Effects determinations for all ESA listed and proposed species potentially present within the Action Area were “may affect, not likely to adversely affect” (U.S. EPA 2012).

Considering the available vessels and aircraft assets in District 17 and coverage for all of Alaska; it is likely that the Coast Guard would have only an estimated two to four vessels and two to four aircraft and helicopters in operation in throughout the action area at any one time during the summer of 2015. By comparing the context and intensity of input from other sources, and given the limited number of exposures and short length of time of exposure by Coast Guard vessels and aircraft, there are not likely to be significant impacts to marine mammals or endangered species within the action area. Other aspects of socioeconomic effects, such as income to localities from seasonal forward operating locations and law enforcement reducing poaching, would be beneficial because of the preferred alternative.

Community and Economy

Lodging for minimal 2015 Coast Guard personnel in Deadhorse would be in existing hotels. Deadhorse hotels would still have lodging available for summer tourists. The approximately 20 Coast Guard personnel living temporarily in Deadhorse would increase local restaurant and grocery store revenues.

The proposed action would not affect the ecotourism and recreational vessel activities, as the Coast Guard would transit in established shipping lanes, which would not interfere with

commercial or private vessel transits. The proposed action increases Coast Guard presence to respond to emergencies encountered by tourists.

Subsistence

The proposed action involves areas that are used for subsistence hunting and fishing by Alaska Natives. Since some subsistence hunting and fishing activities are somewhat predictable, but variable due to yearly conditions, Coast Guard personnel would closely coordinate with subsistence users at the time planning details develop to avoid conflicts during operations. With ongoing coordination with Alaska Natives, no significant impacts to subsistence resources would occur.

Commercial Activities

The proposed action would increase Coast Guard presence in the Arctic. The Coast Guard would be present in the Bering, Chukchi, and Beaufort Seas to respond to potential issues and to ensure a safe and efficient flow of commerce; therefore, a positive impact on commercial activities would occur. Exercises occurring in the Bering Sea would coincide with commercial fishing harvest, but through coordination and Notice to Mariners, no significant impacts to commercial fisheries is anticipated.

It is likely that the Coast Guard's increased presence in the Arctic would have a minor positive impact on socioeconomics due to improved safety and efficiency of commerce, but no significant impacts would occur as a result of the Preferred Alternative.

3.6 PUBLIC HEALTH AND SAFETY

The evaluation of impacts to public health and safety considers whether the proposed action compromises public health and safety directly or indirectly.

3.6.1 Affected Environment

The U.S. Coast Guard Navigation Center is the official government source of information for civil users of the Global Positioning System (GPS). The Navigation Information Service is available 24 hours a day, seven days a week. The Coast Guard Navigation Center also disseminates GPS and differential GPS (DGPS) safety advisory broadcast messages. The broadcasts provide the GPS and DGPS user in the marine environment with the status of the navigation systems, as well as any planned/unplanned system outages that could affect GPS and DGPS navigational accuracy. These navigational systems are very important to public and commercial safety in the Arctic where traditional aids to navigation are lacking, the coastline and ice are virtually featureless for miles, and celestial navigation is inhibited due to fog or overcast weather conditions.

The increase in human activity in the Arctic, including Arctic marine shipping and the continued overflights of the Arctic region by commercial aircraft, will place increasing demands for public health and safety infrastructure in the study area. As more ships and planes venture into the Arctic, the demand for aids to navigation, vessel escorts, law enforcement, and SAR in the Arctic, will continue to increase.

As large passenger vessels continue to operate more frequently and farther north in the Arctic, the prospect of having to conduct mass rescue operations with limited SAR resources increases.

The potential number of people on cruise ships that would need rescue exceeds the capacity of most SAR response vessels and aircraft available in the Arctic. While the North Slope Borough does have search and rescue capabilities, their capacity could become limited as Arctic activities increase. The nearest permanent Coast Guard aviation asset capable of responding to a search and rescue situation is located over 820 nm away in Kodiak; which takes over four hours flight time.

Currently, vast areas of the Arctic have insufficient infrastructure to support safe marine shipping and respond to marine incidents in the Arctic. Large areas of white space on U.S. Arctic nautical charts highlight a fact: less than 1 percent of Arctic waters have been surveyed with modern technology to determine depths and depict hazards to navigation (Committee on Marine Transportation System 2013).

Planned activities by the oil industry and increased vessel traffic in the Chukchi and Beaufort Seas heightens the threat of an oil spill in the area. The primary responsibility for spill response lies with the responsible party, the owner of the vessel or oil platform causing the spill. In the event that a spill exceeds the ability of the responsible party to respond adequately, the Coast Guard and Federal assets would be involved. The Coast Guard's capability to assist in the clean-up of oil in the event of an offshore or nearshore oil release is limited due to the lack of adequate land-based infrastructure in the Arctic. Dedicated support vessels, such as tugs and barges that would allow the safe deployment of the oil recovery system without use of a pier and maximize the amount of oil cleanup, are not readily available in the Arctic.

During the Arctic Shield 2015 activities, the Coast Guard would conduct other efforts relative to public health and safety as available. Coast Guard personnel conduct the "Kids Don't Float" and water safety programs to provide personal flotation devices and educate children on water safety. Further public safety improvements include the Commercial Fishing Vessel Standards Outreach to increase knowledge of current and upcoming standards of safety requirements.

These outreach efforts will continue and additional public safety benefits will become evident with increased Coast Guard presence to establish safety zones, inspect commercial shipping and future ports, and conduct drug interdiction and security missions. Training for mass rescue operations and spills of national significance may prove to be additional future public health and safety benefits if those emergencies arise.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, Coast Guard Arctic activities would not occur unless an emergency requires a Coast Guard response. The Coast Guard would not be present in the Arctic and therefore, could not quickly respond to law enforcement or search and rescue emergencies, which would negatively affect human health and safety in the region. The Coast Guard would not be present to assist with navigation, commercial and non-commercial vessel safety, law enforcement, and provide outreach and educational programs. The No Action Alternative does not meet the purpose and need, but is provided as it represents a baseline condition against which environmental consequences can be measured.

3.6.2.2 Preferred Alternative

The proposed action would establish FOLs in Barrow and Deadhorse in summer of 2015 to create two central locations along the North Slope from which Coast Guard helicopter search and rescue teams could deploy. The establishment of FOLs in Barrow and Deadhorse increases the ability of the Coast Guard to respond to incidents in a timely manner, therefore increasing the chance of a successful effort.

As part of the Coast Guard's proposed action, flight deck-equipped cutters and oil skimmers would be present in the Chukchi and Beaufort Sea from July to October to respond to SAR and environmental incidents. Being close to where emergencies may occur shortens response time. Quick response times by the Coast Guard would decrease the risk of loss of life at sea and reduce the negative impacts of an emergency on marine life and humans. The primary responsibility for spill response lies with the responsible party, the owner of the vessel or oil rig causing the spill. In the event that a spill exceeds the ability of the responsible party to respond adequately, the Coast Guard and Federal assets would be involved. The flight deck-equipped cutters also accommodate MH-65D helicopters for search and rescue operations. As part of the Preferred Alternative, an Incident Control Center would manage logistics. With an increased presence at sea, the Coast Guard has a positive impact on human health and safety by providing faster search and rescue services and law enforcement. Coast Guard assets would also ensure the safe and efficient flow of commerce in the region. Outreach and educational efforts including the Kids Don't Float and water safety programs would continue having a positive impact on public health and safety.

The Preferred Alternative would not have a significant adverse effect on public health and safety, and is more likely to have positive effects on public health and safety.

Chapter 4 Cumulative Effects

The analysis of cumulative impacts presented in this section follows the requirements of the National Environmental Policy Act (NEPA) and Council on Environmental Quality guidance (Council on Environmental Quality 1997). The Council on Environmental Quality regulations (40 Code of Federal Regulations [C.F.R.] §§ 1500-1508) provide the implementing regulations for NEPA. The regulations define cumulative impacts as:

“...the impact on the environment which results from the incremental impact of the action when added to the other 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 individually minor but collectively significant actions taking place over a period of time (40 C.F.R. §1508.7).”

While a single project may have minor impacts, overall impacts may be collectively significant when the project is considered together with other projects on a regional scale. A cumulative impact is the additive effect of all actions in the geographic area. As directed by CEQ’s NEPA regulations (40 CFR 1502.16), direct and indirect impacts on specific physical, biological, and social resources are discussed in combination with varying levels of effects, ranging from negligible to major. The cumulative effects analysis focuses on impacts to long-term productivity and sustainability of valued ecosystem components.

4.1 APPROACH TO ANALYSIS

Cumulative impacts were analyzed for each resource addressed in Chapter 3 (Affected Environment and Environmental Consequences) for the Proposed Action in combination with past, present, and reasonably foreseeable future actions. The cumulative impacts analysis included the following steps:

1. Identify appropriate level of analysis for each resource.
2. Define the geographic boundaries and timeframe for the cumulative impacts analysis.
3. Describe current resource conditions and trends.
4. Identify potential impacts of the Proposed Action that might contribute to cumulative impacts.
5. Identify past, present, and other reasonably foreseeable future actions that affect each resource.
6. Analyze potential cumulative impacts.

The geographic boundaries for the cumulative impacts analysis include the Arctic Ocean north of the coastline of the state of Alaska study area (Figure 1-1). Determining the timeframe for the cumulative impacts analysis requires estimating the length of time the impacts of the Proposed Action would last and considering the specific resource in terms of its history of degradation (Council on Environmental Quality 1997). The Proposed Action includes 2015 Coast Guard Arctic response, training and testing activities. Some reasonably foreseeable future actions and other environmental considerations addressed in the cumulative impacts analysis are expected to

continue indefinitely (e.g., aviation traffic, maritime traffic, subsistence harvest). Therefore, the cumulative impacts analysis is not bounded by a specific future timeframe. For past actions, the cumulative impacts analysis only considers those actions or activities that have ongoing impacts.

In Chapter 3 (Affected Environment and Environmental Consequences), the Coast Guard describes current resource conditions and trends, and discusses how past and present human activities influence each resource. The current aggregate impacts of past and present actions are reflected in the baseline information presented in Chapter 3 (Affected Environment and Environmental Consequences). This information is used in the cumulative impacts analysis to understand how past and present actions are currently impacting each resource and to provide the context for the cumulative impacts analysis.

4.2 PROJECTS CONSIDERED

Table 4-1 lists the past, present and future actions for consideration in the cumulative impacts analysis. For the purposes of this EA, present actions are those that are ongoing and have activities that contribute to potential cumulative effects. Future actions are those that are reasonably foreseeable within the next five to ten years. Table 4-1 separates specific actions by category to place similar actions together.

Table 4-1 Actions for Consideration Identified for the Cumulative Impacts Analysis

Project Location	Project Name	Project Description	Timeframe of Project
Oil and Gas Exploration, Development and Production Projects			
Beaufort Sea - Offshore	Shell Beaufort Sea Camden Bay Planning Area Exploration Plan	Exploratory drilling to evaluate the oil and gas resource potential of three of the company's Outer Continental Shelf leases. Shell proposes to drill four exploration wells, two on the Sivulliq oil and gas prospect and two on the Torpedo oil and gas prospect, near Camden Bay in the Beaufort Sea.	July 2015 – multiple years Present, Future
Chukchi Sea - Offshore	Shell Chukchi Sea Proposed Exploration Plan	Multiple-well exploration drilling on leases in the Chukchi Sea during the summer of 2015 and beyond. The proposed Chukchi Sea exploration plan envisions drilling up to six exploration wells in one prospect located 64 miles offshore and 410 miles west of the Beaufort Sea drilling locations.	July 2015 – multiple years Present, Future
Beaufort Sea – Coastal	Beaufort Sea Coastal – Badami Unit	Production currently 1,500 barrels of oil per day, pipeline to Endicott, additional exploration ongoing, winter sea ice road access.	Past, Present, Future
Beaufort Sea – Nearshore	Beaufort Sea Nearshore - Duck Island Unit	Endicott, Eider, Sag Delta and Ivishak – currently producing offshore facility, pipeline and vehicle access to Prudhoe Bay. Liberty – past exploration, future development and construction, onshore drilling of offshore field.	Past, Present, Future
Beaufort Sea – Coastal	Milne Point Unit (Milne Point, Kparuk, Sag River, Schrader Bluff, Ugnu)	Currently producing oil, access by road system from Prudhoe Bay.	Past, Present, Future
Beaufort Sea – Offshore	Northstar Unit Offshore – Northstar, Kuparuk	Currently producing offshore production facility, buried pipeline to onshore.	Past, Present, Future
Beaufort Sea – Coastal and Inland	Prudhoe Bay – multiple areas	Currently producing, pipeline and road access, central North Slope processing facilities, start of Trans-Alaska Pipeline.	Past, Present, Future

Project Location	Project Name	Project Description	Timeframe of Project
Beaufort Sea – Nearshore	Oooguruk Unit – Ooogurukm Kuparuk, Nuiqsut	Currently producing offshore production facility, buried pipeline to shore.	Past, Present, Future
Beaufort Sea – Nearshore and Coastal	Nikaitchuq Unit – Nikaitchuq, Ivisak, Scharder Bluff	Currently producing from onshore production facility at Oliktok Point, pipeline to Kuparuk, proposed drilling from constructed offshore artificial island at Spy Island, pipeline to shore.	Past, Present, Future
Beaufort Sea – Coastal	Point Thomson Unit	Exploratory drilling completed, future potential expanded gas cycling, onshore pipeline to Badami, barge, air, and ice road access.	Past, Present, and Future
Beaufort Sea Nearshore, Coastal, Inland	Prudhoe Bay – Alaska Producers Pipeline Project	Dredging and improvements to West Dock for pipeline and processing module delivery, large multi-year sealifts delivering processing modules and pipeline to West Dock, construction of large gas processing plant, construction of large diameter gas pipeline.	Future
Oil/Gas Exploration Canadian Beaufort Sea	Multiple Beaufort Sea projects in Canadian Beaufort Sea	Multiple seismic surveys and exploration work related to oil and gas development in the Canadian Beaufort Sea.	Past, Present and Future
Oil/Gas Exploration Arctic Islands (Canadian)	Canadian Polar Margin Seismic Reflection Survey	Natural Resources Canada and Fisheries Ocean Canada, acting on behalf of the Government of Canada, is operating a project in the western Arctic Ocean (Canada Basin) to acquire necessary marine geophysical and geological data.	Past, Present
Oil/Gas Exploration (Canadian)	Arctic Islands and Mackenzie Delta offshore	Ongoing exploration activities within existing oil and gas lease areas for future efforts.	Past, Present
Russian Chukchi Sea – offshore	Oil/gas exploration (seismic surveys, exploratory drilling, shallow hazards)	Multiple projects to explore for oil and gas development in the Russian Chukchi Sea. These include exploring subsoil use and seismic data gathering.	Past, Present and Future

Proponent	Project Name	Project Description	Timeframe of Project
Federal Agency Activities			
U.S. Coast Guard	Port Access Route Study at Bering Strait	A study being done by the U.S. Coast Guard District 17 to evaluate proposed traffic separation schemes in the Bering Strait to accommodate increased maritime traffic in the region.	Present and Future
U.S. Coast Guard	Aids to Navigation Maintenance (AtoN)	U.S. Coast Guard activities to service and repair floating and land-based AtoN to maintain safe navigation signals within the action area.	Year-round, ongoing and future
U.S. Military	Distant Early Warning (DEW) Line Sites	The Distant Early Warning Line was a system of 63 radar stations located across the northern edge of the North American Continent. These were constructed between 1954 and 1957, and decommissioned in the 1990s. Multiple sites within the EA action area still exist, including Barter Island, Bullen Point, Point Barrow, Wainwright, Cape Lisburne, and Kotzebue.	Past and present
U.S. Navy	Ice Exercises	U.S. Navy submarine transits through the Bering Strait and the Arctic conducting under-ice operations. These have been conducted for more than 50 years in support of transit, training, engagements with allies and military operations.	Past, present, and future
State of Alaska and Army Corps of Engineers	Arctic Deep Draft Port Study	Deep draft port facilities to accommodate the increasing human presence in the Arctic. Several port configurations are being explored, but will likely include 2 or 3 locations. It is currently believed that Nome and Point Spencer will likely be included.	Present and future. Actual port completion target of 2020.
U.S. Coast Guard and EPA	Unified Plan	A preparedness plan for responding to oil and hazardous substances discharges or releases	Present and future
U.S. Coast Guard	Portable Communications Platform	Temporary, unmanned Mobile Arctic Shield System portable comms (MASS) trailer at the National Weather Service facility in Barrow, Alaska, including 1/2 antennae.	Present: June-October 2015-2020

Proponent	Project Name	Project Description	Timeframe of Project
NOAA	Arctic Action Plan	Outlines efforts to improve forecasts for sea ice, weather, and water; detect Arctic climate and ecosystem changes; advance resilient and healthy Arctic communities and economies; strengthen international cooperation and partnerships.	Present and future (2014 and 2015)
NOAA	Seafloor Reconnaissance in potential Arctic shipping routes	The NOAA Office of Coast Survey will be sending multiple vessels into the Arctic to survey in detail potential Arctic shipping routes to ensure the latest technology is applied to these areas to ensure vessel safety.	Present and future
Scientific Research Projects			
Various stakeholders	Chukchi Sea Environmental Studies Program	The Chukchi Sea Environmental Studies Program (CSESP) is a multi-year, multi-disciplinary marine science research program in the northeastern Chukchi Sea, funded by various stakeholders in oil and gas leases in the area.	Started in 2008, ongoing
University of Alaska Fairbanks	Arctic Ecosystem Integrated Survey (2014)	Multiple studies designed to provide enhanced baseline information on the species composition, abundance, distribution, and ecology of the pelagic and demersal communities of the Northern Bering and Chukchi Seas.	Ongoing and future
Bureau of Ocean Energy Management (BOEM)	Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA III)	ANIMIDA III is a two-pronged monitoring project to continue environmental monitoring research in the Beaufort Sea, including comprehensive scientific studies to characterize the oil and gas lease areas of the Beaufort Sea that expand beyond past sampling efforts conducted during prior ANIMIDA and cANIMIDA work..	Future (2014-2017)

Proponent	Project Name	Project Description	Timeframe of Project
BOEM and various other partners	Marine Arctic Ecosystem Study (MARES)	Integrated ecosystem dynamics & monitoring (physics, chemistry, biology, social) through coordinated observational & modeling efforts in Beaufort Sea	Present and future (2015-2016)
NMFS National Marine Mammal Lab	Aerial Surveys of Arctic Marine Mammals (ASAMM)	The Aerial Surveys of Arctic Marine Mammals project is a continuation of the Bowhead Whale Aerial Survey Project (BWASP) and Chukchi Offshore Monitoring in Drilling Area (COMIDA) marine mammal aerial survey project. The goal of these studies is to document the distribution and relative abundance of bowhead, gray, right, and fin whales, belugas, and other marine mammals in areas of potential oil and natural gas exploration and development activities in the Alaskan Beaufort and northeastern Chukchi Seas.	Present and future
BOEM and various universities	Chukchi Sea Offshore Monitoring in Drilling Area-Hanna Shoal Ecosystem Study	This project is a multi-disciplinary investigation to examine the biological, chemical and physical properties that define the ecosystem in the northern Chukchi Sea where shallow depths (40-55 meters) and high bottom flow facilitate high standing stocks of biota.	Present and future
National Science Foundation	Western Arctic Shelf-Basin Interactions, Arctic Natural Sciences Program, Alaska Ocean Observing System (AOOS), Arctic Observing Network Program	A range of science including Arctic System Science (ARCSS) global change program project to learn physical and biogeochemical connections between the Arctic shelves, slopes, and deep basins that could be influenced by global change; Arctic Natural Sciences (ANS) Program supporting disciplinary and interdisciplinary research on arctic processes and phenomena; and development of integrated ocean observing system.	Present and future

Proponent	Project Name	Project Description	Timeframe of Project
NOAA/Russian Academy of Sciences	Russian-American Long-term Census of the Arctic (RUSALCA)	This project fosters the joint pursuit of world oceans and polar regions science and technology activities between the U.S. and Russia, taking into account the mutual interests and experience of both countries.	Past, present and future
Mining			
Red Dog Port	Southwest Chukchi Sea Coastal area mining and minerals export	Large inland zinc mine, vessel traffic bringing in supplies, transshipping processed mineral product, and aircraft traffic related to mining activities.	Past, present and future
Western Arctic Coal Project	Western Chukchi Sea Coastal Coal exploration and development	Vessel traffic related to exploration and development bringing in supplies and equipment.	Future
Transportation			
Various	Beaufort and Chukchi Seas – Coastal areas	There are various modes of transportation in these coastal areas, including community roads and vehicular traffic, air transportation and aircraft traffic, marine vessel movements, and pipeline transport of petroleum products.	Past, present and future
Various	Beaufort and Chukchi Seas – Offshore	There are various modes of transportation in the offshore areas of the Beaufort and Chukchi Seas, including marine vessel traffic and aircraft traffic.	Past, present and future
Community Development Projects			
Various	U.S. Community Development/Capital Projects	Various community development projects in coastal North Slope villages, including Kaktovik, Nuiqsut, Barrow, Wainwright, Point Lay, Point Hope, Kivalina, and Kotzebue.	Past, present and future
Various	Submarine fiber optic cabling	Multiple communications companies in Canada, the U.S. and Russia are considering submarine fiber optic cable projects in the Arctic.	Future

Proponent	Project Name	Project Description	Timeframe of Project
Subsistence Activities			
Various Tribes	Bowhead Whale Harvest	Activities by various Alaska Native tribes in the North Slope communities to harvest bowhead whales, including marine vessel traffic and transportation.	Past, present and future
Various Tribes	Harvest of beluga, walrus, and seals	Activities by various Alaska Native tribes in the North Slope communities to harvest beluga whales, walrus and seals, including marine vessel traffic and land-based transportation.	Past, present and future
Various Tribes	Hunting, gathering, fishing, trapping and associated activities	Activities by various Alaska Native tribes in the North Slope communities to conduct hunting, gathering, trapping and fishing activities, including marine vessel traffic and land-based transportation.	Past, present and future
Recreation and Tourism			
Various	Recreation/Tourism (wildlife watching, cruise ships)	Multiple locations within the EA action area, including the Arctic National Wildlife Refuge in the eastern Beaufort Sea, the Kaktovik area in the eastern Beaufort Sea, and offshore and nearshore areas of the Beaufort Sea.	Past, present and future
Various	Recreational/Sport Hunting/Fishing	Various locations within the EA action area, including the Arctic Wildlife Refuge in the eastern Beaufort Sea and offshore areas of the Chukchi Sea.	Past, present and future

4.3 OIL AND GAS EXPLORATION, DEVELOPMENT AND PRODUCTION PROJECTS

Oil and gas development is the main agent of industrial-related change within the action area. There are a number of past, present, and ongoing oil and gas projects that contributed to past and present cumulative effects (Table 4-1). Among the cumulative effects issues associated with these activities are effects on marine mammals, subsistence, and air and water quality. The majority of exploration activities and all of the production and transportation systems have occurred in the central Beaufort Sea, mainly the eastern portion of the EA action area. Although oil from seepages was used as fuel by Iñupiat people prior to western contact, the first modern program of oil and gas exploration on the North Slope was conducted by the U.S. Navy and the United States Geological Survey (USGS) during the 1940s and 1950s. Federal leasing on the North Slope began in 1958 and led to several industry-sponsored exploration programs. The discovery of oil at Prudhoe Bay in 1968, followed by discoveries at Kuparuk, West Sak, and Milne Point in 1969, marked the beginning of commercial oil development in the region (National Research Council 2003). Completion of the Trans-Alaska Pipeline System (TAPS) in 1977 allowed year-round transport of North Slope oil to the marine terminal in Valdez and efficient export to market. Leasing of state and federal outer continental shelf (OCS) areas began in 1979, and offshore discoveries were made at Endicott, Sag Delta, Point McIntyre, Niakuk, and Northstar (National Research Council 2003). The Point McIntyre and Niakuk pools, as well as the more recently discovered Liberty field, are located mostly in the offshore area; the Point McIntyre and Niakuk production facilities are located either onshore or on existing nearshore production facilities (Mineral Management Service 2008). Several additional developments including Nikaitchuq, Northstar, and Ooguruk operate in nearshore areas of the Beaufort Sea. Currently there are 35 fields and satellites producing oil on the North Slope and in nearshore areas of the Beaufort Sea, and additional discoveries are under development.

Oil and gas exploration activities have also occurred over the last 60 years throughout the action area, but unless they lead to development of a project, are generally limited in time to a specific seasonal period over the course of one or two years, and are individually limited in geographic extent. As a result, the impacts from exploration activities tend to be limited in duration and occur in the immediate vicinity of exploration activities and transportation support routes. Exploration activities include seismic exploration (on land, over ice, open water) and exploratory drilling (onshore gravel pads and ice pads, offshore drillships and artificial islands). By far, the majority of onshore and offshore exploration activities have taken place in the Beaufort Sea and have occurred on a regular basis since the late 1960s, although some military programs date back to the 1940s. More limited and intermittent exploration activities have taken place in offshore areas of the Chukchi Sea since the 1980s. However, it should be noted that barge traffic to and from the Prudhoe Bay area passes through the Chukchi Sea in early summer, returning in late fall.

There are currently no State of Alaska leases in the Chukchi Sea, and no onshore oil and gas production along the Chukchi Sea coast. The State of Alaska has scheduled lease sales that would offer exploratory rights in certain regions, including the Beaufort Sea nearshore areas. Activities in these areas are considered reasonably foreseeable; however, the exact locations and amount of acreage available for leasing are yet to be determined. In its most recent five-year plan, the State of Alaska does not intend to hold lease sales in the nearshore waters of the Chukchi Sea (Alaska Department of Natural Resources 2014). There are a number of onshore and nearshore exploration wells being proposed on state oil and gas leases in the Beaufort Sea

region. State lease sales in this region, as well as Bureau of Land Management lease sales for the National Petroleum Reserve-A, are proposed. However, these prospects are primarily onshore or inshore with little potential for affecting the action area.

Internationally, but within the geographic scope of the proposed area, there are a number of past, present, and reasonably foreseeable future activities related to oil and gas exploration, development, and production located in Canadian and Russian waters. Oil and gas exploration has occurred in the Canadian Arctic, specifically in the eastern Beaufort Sea, off the Mackenzie River Delta and in the Arctic Islands. Characteristics are similar to exploration activities in Alaska (shallow hazards, site clearance, two-dimensional and three-dimensional seismic surveys, exploratory drilling), except that the majority of support is provided by road access and coastal barges. Oil and gas exploration has also occurred in offshore areas the Russian Arctic and in areas around Sakhalin Island to the south of the Bering Strait. Sakhalin Island is located approximately 2,000 mi (3,220 km) from Kotzebue at a latitude approximately the same as British Columbia. There is little information on specific plans, but the effects of Canadian and Russian activities are expected to be similar to those resulting from activities occurring in the Alaskan Arctic OCS.

It is anticipated that industry will develop considerable amounts of undiscovered fossil fuels and natural resources in the action area in the near future. Recent estimates of the total mean volume of undiscovered, technically recoverable resources in the action area by the U.S. Geological Survey are nearly 30 billion barrels of oil and 181 trillion cubic feet of non-associated gas in the Arctic Alaska petroleum province, which includes lands north of the Brooks mountain range and the adjacent continental shelf areas (USGS 2012). Since 2005, commercial investments in offshore leases in the Chukchi and Beaufort Seas exceeded \$3.7 billion (U.S. Coast Guard 2013). In the near-term, mineral resources, particularly rare earth and strategic minerals, including iron ore, zinc, nickel, coal, graphite, palladium, and many others will also be important drivers for economic growth in the Alaskan Arctic Region.

From the perspective of cumulative effects, multiple exploration activities that may occur over a large geographic area, with some level of activity going on from year to year, raise concerns about disturbance to fish and wildlife and response in behavior and distribution. The potential geographic extent of exploration activities, along with air and marine support, implies that sound producing activities are occurring across much of the range of many marine mammal species. In addition, the availability of fish and wildlife for subsistence harvest based on response to exploration activities and interference with subsistence hunting is also of concern to North Slope Native Alaskans.

Activities related to natural gas development in the EA project area are reasonably foreseeable, assuming a market is found for the gas, and a gas pipeline is constructed to transport the gas. Such activities may include the construction and installation of a gas pipeline to shore from existing offshore production facilities in the Beaufort Sea, and expansion of existing offshore and shore-based facilities to accommodate natural gas production. There is interest in the development of pipelines to carry natural gas from the North Slope across Alaska and the Yukon to connect with the continental pipeline system in northern Alberta. Two competing proposals are under development. One, proposed by the TransCanada pipeline company, has received a license from the state of Alaska. Another sponsored by British Petroleum and ConocoPhillips is

proceeding independently of the state. While it is not clear which, or if any, line will be built, the state of Alaska and several companies have taken significant steps towards pipeline development. At this time, the North Slope does not produce natural gas because of the lack of transportation infrastructure. Construction of a natural gas pipeline would be likely to lead to additional, gas-related development activity in Northern Alaska, in the Beaufort Sea, and possibly in the Chukchi Sea (NMFS 2009c).

4.4 OTHER FEDERAL AGENCY ACTIVITIES

Other federal agency (including military) activities are also ongoing in the EA action area that could contribute to cumulative impacts. This category includes two ongoing U.S. Coast Guard activities, the Bering Strait Port Access Route Study and ongoing and continuing Aids to Navigation maintenance. The Bering Strait Port Access Route Study is being prepared to study vessel movements in the restricted areas of the Bering Strait to accommodate future vessel traffic and increase in vessel movements through the area. Ongoing Aids to Navigation maintenance is conducted by the U.S. Coast Guard, District 17 as necessary for established Aids to Navigation in the EA action area, including the Chukchi and Beaufort Seas. Maintenance would involve vessel transits and activities at existing buoy locations.

Other military activities in the EA action area include U.S. Navy submarine transits and activities in support of Ice Exercises. These are seasonal activities, typically in the spring time, are planned and coordinated by the U.S. Navy's Arctic Submarine Laboratory. Submarines have conducted under-ice operations in the Arctic region for more than 50 years to support of inter-fleet transit, training, engagements with allies and military operations.

The Coast Guard is working with EPA on the proposed implementation of the Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases (a.k.a. the Unified Plan). In consideration of the increased activity in the Arctic region, this project is an integral part of protecting the resources, ecosystem, and subsistence lifestyle. The Coast Guard also will install a temporary communications platform in Barrow to support critical missions in the Arctic Region.

NOAA recently released its Arctic Action Plan. The Plan outlines numerous projects to advance U.S. security interests with improved weather and sea ice forecasts; pursue Arctic region stewardship through ecosystem studies and management and advance native communities and economies; and strengthen international partnerships. NOAA is also beginning a multi-year effort to complete comprehensive mapping of the seafloor in potential Arctic shipping route areas to ensure accurate mapping of these areas for future efforts.

4.5 SCIENTIFIC RESEARCH PROJECTS

Scientific research in the Arctic region has been increasing as the interest and awareness of climate change and Arctic activities have heightened. There are a number of scientific research programs that take place in offshore areas of the Beaufort and Chukchi seas. This section cannot be exhaustive in the listing of all studies funded by federal and industry partners in these waters. The following is a representative sample of the number and types of studies that have been and continue to be pursued in Alaskan Arctic waters. These activities involve vessel, air, and over-ice support which may contribute to cumulative effects through disturbance of marine mammals and impacts to subsistence harvest through marine vessel and aircraft traffic, and disturbance of

bottom sediment through sampling. Bureau of Ocean and Energy Management (BOEM) supports a variety of research programs aimed at understanding the Arctic OCS environment and associated ecosystems. BOEM Alaska OCS regional research in 2013 included physical oceanography studies, habitat and ecology studies including mapping the distribution of marine mammals, shorebirds, fish, benthic, and epifaunal communities in the northern Chukchi Sea and central and eastern Beaufort Sea, studies designed to understand the rate and effects of climate change, modeling of weather and changing patterns of ice formation and loss, atmospheric effects from increased economic development, and effects of development and climate change on native subsistence and cultures. These studies included the Hanna Shoal Ecosystem Study and the Synthesis of Arctic Research study, both designed to attempt synthesizing past and future information being collected in the Alaskan Arctic. Marine mammal research studies were also included, such as the Bowhead Feeding Variability in the Western Alaska Beaufort Sea, as well as the Chukchi Offshore Monitoring in Drilling Area (COMIDA) program to establish an integrated knowledge of the Chukchi Sea ecosystem (National Marine Mammal Laboratory 2014). These programs conduct studies to understand bowhead whale population and migration structures and include a range of biological, chemical, and physical processes. These include collections to establish baseline data sets for benthic infauna and epifauna, organic carbon and sediment grain size, radioisotopes for down core dating, trace metals in sediments, biota and suspended particles, as well as associated parameters. The program operates annually in the Chukchi Sea.

In the past, the Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA) and the continuation (c)ANIMIDA Projects operated during the summers of 2004, 2005, 2006, and 2007. An explicit goal of the (c)ANIMIDA Project is to examine temporal and spatial changes in chemical and biological characteristics of the oil and gas exploration and development area of the Alaskan Beaufort Sea and to determine if any observed changes are related to the Northstar development and production operations. From 1997 through 2008, BOEM developed and conducted 31 projects directly related to improving equipment and processes for the prompt identification and removal of oil from harsh Arctic environments. The ANIMIDA III project was awarded in January 2014 to continue this research in the Beaufort Sea during the timeframe of 2014 – 2017.

The Russian-American Long-term Census of the Arctic (RUSALCA) is funded by NOAA and the National Science Foundation (NSF) Arctic Observing Network Program to understand and ultimately predict the effects of climate change in the northern Bering and Chukchi seas. To this end, the RUSALCA program collects information related to changes in physical and biogeochemical processes, and alteration of biomass and productivity of organisms and their associated marine food webs. The census involves a series of biophysical moorings in the western Bering Strait; Conductivity, Temperature, Depth transects conducted across the Herald Shelf Valley; and a series of shipboard projects aimed at understanding biogeochemical processes that influence climate and ecosystem dynamics in the study area. RUSALCA operates annually during the open water season and overlaps with the EA project, in particular, in the Chukchi Sea near Cape Lisburne and Point Hope, and in the northern Beaufort Sea.

The Alaskan Ocean Observing system (AOOS) has various sensors and monitors deployed throughout the EA action area to measure and record meteorological conditions and other

environmental variables. AOOS also coordinates a seabird monitoring network in the proposed action area.

The Western Arctic Shelf Basin Interactions (SBI) project, sponsored by the NSF and the Office of Naval Research, was a multi-year, interdisciplinary program aimed at investigating the impact of global change on physical, biological and geochemical processes over the Chukchi and Beaufort Sea shelf basin region in the Western Arctic Ocean. The goal was to improve understanding of shelf-basin exchange, and to improve predictions of global change impacts in the Arctic. The SBI program includes both field and modeling studies. The project collected data during the 2002 to 2004 field seasons.

The Marine Arctic Ecosystem Study (MARES) is planned for 2015-2016 and will study integrated ecosystem dynamics and monitoring (physics, chemistry, biology, social) through coordinated observational and modeling efforts in Beaufort Sea. MARES is directed at the development and use of unmanned systems in the Arctic. The results of this study are of particular importance to the Coast Guard as they involve the development and use of autonomous underwater vehicles that can map oil under ice.

There are also various research projects for activities within the Chukchi Sea. Chukchi Sea baseline studies, titled the Chukchi Sea Environmental Sciences Program, and funded by ConocoPhillips Alaska, Inc., Statoil, and Shell, include physical oceanography, benthic, zooplankton, fish, acoustics, and ice studies in the Chukchi Sea.

4.6 MINING

Mineral resources in the Arctic region are substantial, estimated at some one trillion dollars' worth of minerals including gold, zinc, palladium, nickel, platinum, lead, rare-earth minerals, and gem-quality diamonds (U.S. Coast Guard 2013a). Mining takes place in onshore areas of the Chukchi Sea portion of the EA action area. While the majority of mining activities take place onshore, marine and air transportation could contribute to potential cumulative effects through the disturbance of marine mammals and impacts to the subsistence harvest. The Red Dog deposit, located in the western Brooks Range, is one of the largest zinc deposits in the world. Mining of this deposit at the Red Dog Mine of lead and zinc began in 1989 and continues today (USGS 2013). Though recession of sea ice could potentially lengthen shipping season, the number of shipments of ore concentrate from the Red Dog Mine is only dependent on total production. Production is anticipated to remain constant for the foreseeable future and therefore there should not be an increase in total marine transits that would increase the chance of accident rates.

There are also untapped coal deposits along the Chukchi Sea, and massive sulfide deposits with high grades of graphite, copper, silver, and gold in the western Arctic. In addition to known mineral deposits, increased exploration efforts may lead to discovery of more resources. This in turn would lead to a greater dependence on marine transport of equipment, supplies, personnel, and mineral ores. This includes potential seabed resources located on the extended continental shelf of the United States. Past, present and reasonably foreseeable future activities related to mining activities within the EA action area are summarized in Table 4-1.

4.7 TRANSPORTATION

In addition to marine and air transportation associated with the previously mentioned activities, there is frequent marine and air traffic associated with coastal communities on the North Slope and in Northwest Alaska. Marine and air transportation could contribute to potential cumulative effects through the disturbance of marine mammals and impacts to the subsistence harvest. It is reasonable to assume that trends associated with transportation to facilitate the maintenance and development of coastal communities will continue. In some specific cases, described below, transportation and associated infrastructure in the proposed action area may increase as a result of increased commercial activity in the area.

Vessel traffic through the Bering Strait has risen steadily over recent years, according to Coast Guard estimates, and Russian efforts to promote a Northern Sea Route for shipping may lead to continued increases in vessel traffic adjacent to the western portion of the EA action area. An analysis done by Shell Oil as part of a Revised Outer Continental Shelf Lease Exploration Plan for the Chukchi Sea (Shell 2013) indicated that barge traffic passing through the Chukchi Sea during the month of July through October has increased from roughly 2000 miles of vessel traffic in 2006 to roughly 11,500 miles of vessel traffic in 2010. Miles of vessel traffic is defined as miles travelled by vessels in a specific geographic area. In 2012, over one million tons of cargo transited an Arctic route that reduces thousands of miles off of traditional voyages between the Atlantic and Pacific Oceans (U.S. Coast Guard 2013a). Vessel traffic within the EA action area can currently be characterized as traffic to support oil and gas industries, barges or cargo vessels used to supply coastal villages, smaller vessels used for hunting and local transportation during the open water period, military vessel traffic, and recreational vessels such as cruise ships and a limited number of ocean-going sailboats. Barges and small cargo vessels are used to transport machinery, fuel, building materials and other commodities to coastal villages and industrial sites during the open water period. The Coast Guard anticipates a continued increase in vessel traffic in the Arctic. Changes in the distribution of sea ice, longer open-water periods, and increasing interest in studying and viewing Arctic wildlife and habitats may support an increase in research and recreational vessel traffic in the proposed action area regardless of oil and gas activity.

Aircraft traffic in the EA action area includes helicopters and fixed wing aircraft to support routine activities. In addition, at least four companies operate passenger and air cargo services between North Slope communities and population centers, flying inland and along the coast. These may involve several scheduled flights daily using small propeller-driven aircraft. The majority of air travel and freight hauling between Arctic coastal communities involves small commuter-type aircraft, and government agencies and researchers often charter aircraft for travel and research purposes. These activities are expected to continue, and the level of aircraft traffic within the EA action area may increase as a result of climate change and/or increased industrial activity and community development.

4.8 COMMUNITY DEVELOPMENT PROJECTS

Community development projects in Arctic communities involve both major infrastructure projects, such as construction of airports and response centers, as well as smaller projects. These projects could result in construction noise in coastal areas, and could generate additional amounts of marine and aircraft traffic to support construction activities. Marine and air transportation could contribute to potential cumulative effects through the disturbance of marine mammals and

impacts to the subsistence harvest. Major community development projects that are foreseeable at the present time include the construction of a new airport at the village of Kaktovik and potentially a new emergency response facility at Wainwright on the North Slope.

Communications companies are also considering the Arctic as a new home for submarine fiber optic cables. Shorter distances, decreased latency, and reduced likelihood of damage from anchors are compelling reasons for laying cable through the region, despite the harsh conditions. Two cables are planned through the Northwest Passage above North America, while a third is planned along the Russian coast. The longest of these links will become the world's longest single stretch of optical fiber (Hecht 2012). Canadian, Russian, and an Alaska Corporation have applied for permits to begin in 2014 and be operational by 2016 (CBC News 2013).

4.9 SUBSISTENCE

Subsistence activities occur in coastal and offshore portions of the EA action area. Subsistence hunting of cetacean species is regulated by the International Whaling Commission, which in 2012 renewed catch limits for bowhead whales for Russian Natives and Alaska Natives through 2018. The maximum annual strike quota is 82 strikes per year for both groups combined; per international agreement, no more than 306 whales will be landed by Alaska Natives between 2012 and 2018 (78 FR 4143). This amounts to less than one percent of the Bering-Chukchi-Beaufort stock of bowhead whales each year. Only a single humpback whale has been reported as a subsistence take since 2006. Subsistence harvest data on NMFS' jurisdictional species is no longer being collected (Allen and Angliss 2013), but harvest of bowhead whales, bearded seals, ringed seals, and Steller sea lions is important to the communities of northern Alaska. Of U.S. Fish and Wildlife Service species, polar bears, Pacific walrus, spectacled eider, Stellar's eider, and yellow-billed loons are harvested during subsistence hunts. Harvested animals are used for food, traditional ceremonies, and handicrafts. Hunting is regulated, monitored and managed by State and Federal agencies. Subsistence hunters primarily use boats and snow machines for access. In addition to the harvest of marine mammals, boat and snow machine traffic could lead to the disturbance of marine mammals as well. Current and past hunting, gathering, fishing, and trapping subsistence activities would be similar in the types of activities and areas utilized for the communities associated with the EA action area in the future. A pending revision to the Magnuson-Stevens Act could require subsistence fish harvests be documented.

4.10 RECREATION AND TOURISM

Recreation and tourism activities are generally pursued by non-residents of the EA action area. Marine and coastal vessel and air traffic could contribute to potential cumulative effects through the disturbance of marine mammals or impacts to the subsistence harvest. With the exception of adventure cruise ships that transit the Beaufort and Chukchi Sea coasts in small numbers, much of the air sightseeing traffic is concentrated in Arctic National Wildlife Refuge. The types of recreation and tourism activities that were described in Chapter 3 are expected to continue into the future. Current and past sport hunting and fishing, or other recreation or tourism-related activities would be similar in the types of activities and areas utilized for the communities associated with the EA action area in the future.

4.11 CLIMATE CHANGE

Climate change is an ongoing factor in the consideration of cumulative environmental effects on the Arctic region. It has been implicated in changing weather patterns, changes in the

classification and seasonality of ice cover, and the timing and duration of phytoplankton blooms in the Beaufort Sea. Climate conditions in the EA action area have been undergoing remarkable changes, particularly over the past 20 years. Alaska has warmed more than twice as rapidly as the rest of the United States over the past 60 years, with state-wide average annual air temperature increasing by three degrees Fahrenheit and winter temperature by six degrees Fahrenheit. This warming involves more extreme hot days and fewer extreme cold days.¹⁸ Climate-change impacts in Alaska are already apparent, including earlier spring snowmelt, reduced sea ice, widespread glacier retreat, warmer permafrost, drier landscapes, and more extensive insect outbreaks and wildfires (U.S. Coast Guard 2013a). In addition, due to the changing extent and thickness of sea ice, resulting from changes in the temperature regime, there is more open water during the summer season. The lack of sea ice also leads to the creation of wind driven waves, which in turn contribute to coastal erosion. These changes have been attributed to rising carbon dioxide (CO₂) levels in the atmosphere and corresponding increases in CO₂ levels in the waters of the world's oceans. These changes have also led to the phenomenon of ocean acidification (IPCC 2007). This phenomenon is often called a sister problem to climate change, because they are both attributed to human activities that have resulted in increased CO₂ levels in the atmosphere. Ocean acidification in high latitude seas is happening at a more advanced rate compared to other areas of the ocean. The capacity of the Arctic Ocean to uptake CO₂ is expected to increase in response to increased levels as a result of climate change (Bates and Mathis 2009). This is due to the loss of sea ice that increases the open water surface area of the Arctic seas. Exposure of cooler surface water lowers the solubility (or saturation) of calcium carbonate within the water, which in turn leads to lower available levels of the minerals needed by shell-producing organisms (Fabry et al. 2009). Other factors such as seawater temperature, the presence or absence of ice, the degree of freshwater input, the degree of mixing and increases in phytoplankton also affect the amount of CO₂ taken up by the sea. Therefore, other aspects of climate change, such as melting ice, increased riverine discharge, storm frequency and intensity, and changes in precipitation type, volume and timing also play into acidification of the ocean (IPCC, 2007; Mathis 2011). Climate change could affect the habitat, behavior, distribution, and populations of marine mammals, fish, and other wildlife within the EA action area. Climate change could also affect the availability of, or access to, subsistence resources, particularly spring hunts for bowhead whales and other marine mammals. Climate change also affects the length of seasons that ice roads are operable, potentially leading to more reliance on marine access.

4.12 CUMULATIVE IMPACTS ANALYSIS

In accordance with Council on Environmental Quality guidance, the cumulative impacts analysis focused on impacts that are “truly meaningful.” The level of analysis for each resource was commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences). Detailed analysis of cumulative impacts on the following resources was not necessary as the incremental contribution of the Proposed Action to cumulative impacts would be low. Further analysis of cumulative impacts is not warranted on the following resources:

- Geology and Soils
- Air quality
- Land Use
- Utilities
- Visual Resources

Water Quality

The principal regulatory method for controlling pollutant discharges into waters of the U.S. is the Clean Water Act (CWA) of 1972, as amended. Section 402 establishes the National Pollution Discharge Elimination System (NPDES). The General NPDES Permit issued by EPA for offshore oil and gas exploration facilities in Alaska (AKG280000) permits authorized discharges, with restrictions, into the Beaufort Sea. EPA regulations (40 CFR 125.122) require a determination that the permitted discharge will not cause unreasonable degradation of the marine environment. EPA issued an NPDES Vessel General Permit (VGP) for “Discharges Incidental to the Normal Operation of a Vessel;” the EPA VGP for Alaska took effect December 19, 2013 (U.S. EPA 2013). The final VGP applies to owners and operators of non-recreational vessels that are 79 feet (24.08 meters) and greater in length, as well as to owners and operators of commercial vessels of less than 79 feet which discharge ballast water.

The proposed action and the cumulative actions listed in Table 4-1 would have no significant incremental adverse impacts on water resources or the coastal zone in the EA action area. Because of the existing increase and anticipated future increase in commercial activity in the Arctic, the proposed action will help safeguard against oil spill threats, through enforcement of safety zones.

Biological Resources

The proposed action and cumulative actions would have no significant cumulative impacts on federally listed or protected species. Each project listed in Table 4-1 that could potentially affect biological resources has individually complied with the Endangered Species Act and the Marine Mammal Protection Act as appropriate. Human activities in the Arctic are still at a low tempo compared to many other commercially developed parts of the world. Established protective measures and monitoring from the proposed action and each of the cumulative projects will increase knowledge of the Arctic and its unique characteristics and life cycles. Each of these individual projects will incorporate similar protective measures to protect these sensitive species during a time of unprecedented change in the Arctic. For these reasons, cumulative impacts to biological resources are not anticipated to be significant from the implementation of the proposed action and other cumulative projects in the Arctic region.

Cultural/Subsistence Resources

The proposed action and cumulative actions would have no significant cumulative impacts on underwater cultural resources or subsistence resources. Because the Preferred Alternative has no effect on the sea floor (and therefore, underwater cultural resources), no combined effect is possible. All Coast Guard Arctic Domain Awareness flights and Arctic helicopter flights would be coordinated with North Slope Borough, local governments, tribes, etc. to ensure that flight paths do not disrupt planned subsistence hunts. Coordination would occur between the Coast Guard and Alaska Native subsistence hunting groups during vessel movements once subsistence whaling and fishing seasons begin. The Preferred Alternative is not likely to affect subsistence resources.

Socioeconomics

A Notice to Mariners would inform boaters of any safety zones enforced around Shell drilling platforms. Coast Guard will coordinate flight paths from the proposed action and Arctic Domain

Awareness flights with tribal representatives. Coordination would also be between Coast Guard and tribes during vessel movements once subsistence whaling and fishing season begins. With coordination and enough notice, no incremental impacts to ecotourism or commercial or subsistence fishing and hunting are anticipated. The proposed action and cumulative actions would have no significant cumulative impacts on socioeconomics.

Public Health and Safety

The Coast Guard will initiate and /or provide support for several of the evaluated actions in Table 4-1. The proposed action together with cumulative projects is likely to have minor, positive impacts, but no significant cumulative impacts on public health and safety.

Greenhouse Gases and Climate Change

Climate change is having an effect on the Arctic environment now and is anticipated to have major effects in the future including warming sea surface, reduction in sea ice, and increased ocean water acidity (U.S. Navy 2011). The number of cargo, tourism, and research vessels in the region is increasing as the ice cover is reduced. This increases the risk of vessel accidents, groundings, potential oil and cargo spills, and introduction of marine invasive species. These ongoing effects would be the background on which Coast Guard Arctic activities would occur.

Coast Guard assets that would be used during Arctic activities are existing assets that, if not operating as part of Arctic Coast Guard support, would otherwise be operationally engaged elsewhere. Consequently, to the extent that emissions may be a factor in climate change, these assets would not result in any new anthropogenic sources and a further contribution to climate change. Coast Guard vessels and air support are not significant contributors to greenhouse gas emissions. Greenhouse gases include: carbon dioxide (CO₂), methane (CH₄), nitrous oxides (N₂O), and fluorinated gases such as chlorofluorocarbons (compounds consisting of chlorine, fluorine, and carbon) and hydrochlorofluorocarbons (compounds consisting of hydrogen and sulfur hexafluoride—SF₆).

Actions in Table 4-1 would be associated with temporary increases in air emissions; however these increases would be minor and temporary. Coast Guard Arctic activities will employ currently active Coast Guard assets. When evaluated against greenhouse gas emissions for the entire Coast Guard's operations, greenhouse gas emissions for these operations are expected to be neither appreciable nor significantly additional; as a result, the proposed action and cumulative actions would have no significant impact on global climate change is expected. While Coast Guard Arctic operations would not represent an increase in emissions that may contribute to climate change, Coast Guard presence in the Arctic would help to protect this vulnerable ecosystem from other potential threats and therefore have a positive impact on cumulative resources.

Chapter 5 Other NEPA Considerations

5.1 CONSULTATIONS AND COMPLIANCE

The Coast Guard has initiated consultation or coordinated with a number of regulatory agencies with jurisdiction over the proposed action. As described previously, a number of conservation measures or conditions have been identified through this process and included in the proposed action to ensure that the action alternatives avoid or reduce impacts on sensitive resources to less than significant levels. Regulatory compliance that would be required for the proposed action is described below.

Table 5-1 Laws and Executive Orders

Law or Executive Order	Responsible Agency	Determination
National Environmental Policy Act (NEPA) of 1969 (42 USC §§ 4321 et seq.) CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR §§ 1500-1508)	Coast Guard	Public review and outreach regarding this EA is being conducted in compliance with NEPA, and this Draft EA was released for a public comment period to support the requirements of NEPA.
Clean Water Act (33 USC §§ 1344 et seq.)	U.S. Environmental Protection Agency	The Coast Guard would follow all applicable regulations to maintain compliance with the Clean Water Act. No intentional releases to Arctic waters are proposed as a part of the Preferred Alternative.
National Invasive Species Act	Coast Guard	The Coast Guard would follow all applicable regulations, particularly pertaining to ballast water management, to maintain compliance with the National Invasive Species Act.
Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801-1802)	NMFS	The Coast Guard determined that SAR would have a minimal overall potential impact to designated Essential Fish Habitat. Other activities of the proposed action would have no adverse effect on designated EFH.
Endangered Species Act (ESA) (16 USC §§ 1531 et seq.)	NMFS and USFWS	The Coast Guard has determined that the Preferred Alternative may affect, but is not likely to adversely affect, threatened and endangered species protected by the ESA. Communication with USFWS and NMFS is ongoing.

Law or Executive Order	Responsible Agency	Determination
Marine Mammal Protection Act (MMPA) (16 USC §§ 1361 et seq.)	NMFS	Coast Guard adheres to practices outlined in their Marine Protected Species Program for the Gulf of Alaska, Bering Sea/Aleutian Islands, and Arctic (U.S. Coast Guard 2011a). The Coast Guard will continue consulting with USFWS and NMFS to address potential impacts to marine mammals.
Migratory Bird Treaty Act	USFWS	Vessels and aircraft are a bird strike hazard. A bird handling and reporting protocol for strike incidents on routine sea patrols has been prepared in cooperation with the USFWS.
Coastal Zone Management Act	Alaska Department of Natural Resources	The Alaska Coastal Management Program expired on July 1, 2011 (Alaska Department of Natural Resources 2011), resulting in a withdrawal from participation in Coastal Zone Management Act's National Coastal Management Program. The Federal Coastal Zone Management Activity consistency provision no longer applies in Alaska.
National Historic Preservation Act (16 USC §§ 470 et seq.)	Alaska State Historic Preservation Office	The Coast Guard has determined that the proposed action would have no effects on cultural and historic resources. The Coast Guard would work closely with tribal governments throughout the summer to ensure subsistence hunting and fishing are not impacted.
Executive Order 13175, <i>Consultation and Coordination with Tribal Governments</i>	Coast Guard	The Coast Guard has informed tribal governments of the proposed action and will continue to coordinate all actions, comments and questions.
Executive Order 13045, <i>Protection of Children from Environmental Health Risks and Safety Risks</i>	Coast Guard	The proposed action would not result in environmental health and safety risks to children.
Executive Order 12898, <i>Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations</i>	Coast Guard	The Proposed Action would not result in any disproportionately high adverse human health or environmental effects on minority or low-income populations.

5.2 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA regulations (40 CFR 1502.16) require an analysis of significant irreversible or irretrievable effects resulting from implementation of proposed actions. Resources that are irreversibly or irretrievably committed to a project are those that are typically used on a long-term or permanent basis. However, those resources used on a short-term basis that cannot be recovered (such as metal, wood, fuel, paper, and other natural resources) are also irretrievable. Human labor is also considered an irretrievable resource. These resources are irretrievable in that they would be used for one project when they could have been used for other purposes. Another impact that falls under the category of irretrievable commitment of resources is the destruction of natural resources that could limit the range of potential uses of that particular environment. Implementation of the proposed action would not limit the range of potential future uses of the action area, nor is it anticipated to destroy natural resources. Human labor, fuel, construction supplies to build FOL facilities, and unrecoverable search and rescue equipment are irretrievable resources required to fulfill the Coast Guard's mission.

5.3 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

NEPA requires consideration of the relationship between short-term use of the environment and the impacts that such use could have to long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. Such impacts include the possibility that choosing one alternative could reduce future flexibility to pursue other alternatives.

Implementation of the preferred alternative would not result in any such environmental impacts because it would not pose long-term risks to health, safety, or the general welfare of the communities surrounding the action area that would significantly narrow the range of future beneficial uses. In addition, biological productivity would not be affected, as implementation of the preferred alternative would not result in significant direct, indirect, or cumulative impacts to any biological resources.

5.4 ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED AND ARE NOT AMENABLE TO MITIGATION

This EA has determined that the Preferred Alternative would not result in any significant impacts; therefore, there are no probable adverse environmental effects that cannot be avoided or are not amenable to mitigation.

5.5 POSSIBLE CONFLICTS BETWEEN THE PROPOSED ACTION AND THE OBJECTIVES OF FEDERAL ACTS, EXECUTIVE ORDERS, POLICIES, AND PLANS

Implementation of the Proposed Action would comply with existing federal regulations. The federal codes, acts, Presidential Directives, and Interagency Agreements that apply include the following:

U.S. Code

- Title 6 – Domestic Security
- Title 14 – Coast Guard
- Title 15 – Commerce and Trade

- Title 16 – Conservation
- Title 18 – Crimes and Criminal Procedure
- Title 33 – Navigation and Navigable Waterways
- Title 46 – Shipping

Statutes

- Homeland Security Act of 2002
- Arctic Research and Policy Act of 1984
- Ports and Waterways Safety Act of 1972
- Federal Water Pollution Control Act of 1972 (as amended)
- Port and Tanker Safety Act of 1978
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980
- Act to Prevent Pollution from Ships of 1980
- Oil Pollution Act (OPA) of 1990
- Maritime Transportation Security Act of 2002
- Maritime Pollution Prevention Act of 2008 Treaties and Conventions
- Convention on International Civil Aviation, 1947
- Convention of the High Seas, 1958
- International Convention on the Prevention of Pollution from Ships, 1973 (modified in 1978)
- Convention on the Safety of Life at Sea (SOLAS), 1974
- International Convention on Maritime Search and Rescue, 1979

Presidential Directives

- PDD 36 – U.S. Policy on Protecting the Ocean Environment
- NSPD 41/HSPD 13 – Maritime Security Policy
- NSPD 66/HSPD 25 – Arctic Region Policy

Interagency Agreements

- Memorandum of Agreement (MOA) between the Department of the Navy and the Department of the Treasury on the Operation of Icebreakers, 1965
- MOA between the Department of Defense and the Department of Homeland Security on the Use of U.S. Coast Guard Capabilities and Resources in Support of the U.S. Military Strategy, 2008, with a 2010 update to Annex E of the 2008 MOA

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Chapter 8 **References**

36 CFR 242.1 et seq. Subsistence Management Regulations for Public Lands in Alaska--2013-14 and 2014-15 Subsistence Taking of Fish Regulations.

Alaska Department of Environmental Conservation. 2010. Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report, July 15.

Alaska Department of Environmental Conservation. 2013. Contaminated Sites Program. Internet website: <http://dec.alaska.gov/applications/spar/CSPSearch/>. Accessed on 20 Dec 2013.

Alaska Department of Fish and Game, Division of Subsistence. 1988. The Production and Exchange of Seal Oil in Alaska. (Special Publication No. SP1988-01). Juneau AK: Alaska Department of Fish and Game, Division of Subsistence.

Alaska Department of Fish and Game. 2011. Caribou species profile. Internet website: <http://www.adfg.alaska.gov/index.cfm?adfg=caribou.main>. Accessed on 17 Mar 2014.

Alaska Department of Fish and Game [Internet]. 2014a. Moose species profile. Accessed 2 July 2014. Retrieved from: <http://www.adfg.alaska.gov/index.cfm?adfg=moosehunting.main>

Alaska Department of Fish and Game. [Internet]. 2014b. Muskox species profile. Accessed 16 April 2014. Available from: <http://www.adfg.alaska.gov/index.cfm?adfg=muskox.main>

Alaska Department of Fish and Game [Internet]. 2014c. Dall sheep species profile. Accessed 2 July 2014. Retrieved from: <http://www.adfg.alaska.gov/index.cfm?adfg=sheephunting.main>

Alaska Department of Fish and Game [Internet]. 2014d. Polar bear species profile. Accessed 10 July 2014. Retrieved from: <http://www.adfg.alaska.gov/index.cfm?adfg=polarbear.main>

Alaska Department of Fish and Game [Internet]. 2014e. Black bear species profile. Accessed 10 July 2014. Retrieved from: <http://www.adfg.alaska.gov/index.cfm?adfg=blackbear.main>

Alaska Department of Fish and Game [Internet]. 2014f. Brown bear species profile. Accessed 10 July 2014. Retrieved from: <http://www.adfg.alaska.gov/index.cfm?adfg=brownbear.main>

Alaska Department of Fish and Game [Internet]. 2014g. Beluga whale species profile. Accessed 15 July 2014. Retrieved from: <http://www.adfg.alaska.gov/index.cfm?adfg=beluga.us>

Alaska Department of Fish and Game [Internet]. 2014h. Steller sea lion species profile. Accessed 15 July 2014. Retrieved from: <http://www.adfg.alaska.gov/index.cfm?adfg=stellersealion.main>

Alaska Department of Labor and Workforce Development. 2007. Alaska Population Projections, 2007-2030. Retrieved from <http://laborstats.alaska.gov/pop/projected/pub/popproj0730.pdf>. Accessed 18 Oct 2013.

Alaska Department of Natural Resources. 2011. *Alaska Coastal Management Program*. Internet website: <http://www.alaskacoast.state.ak.us/>. Accessed on 12 Apr 2012.

Alaska Department of Natural Resources. [Internet]. 2014. State of Alaska Five-Year Program of Proposed Oil & Gas Lease Sales. Division of Oil and Gas. January 2014. 53 pp. [accessed on 17 March 2014]. Available from:
<http://dog.dnr.alaska.gov/Leasing/Documents/5YearReports/2014/2014-Five-Year-Program.pdf>

Alaska Oil and Gas Association. 2011. *The Role of the Oil and Gas Industry in Alaska's Economy*. McDowell Group, Inc. Juneau, Alaska.

Alkire, M.B. and J.H. Trefry. 2006. Transport of Spring Floodwater from Rivers under Ice to 20 the Alaskan Beaufort Sea. *Journal of Geophysical Research* 111:C12008.

Allen, B. M., and R. P. Angliss. 2013. Alaska marine mammal stock assessments, 2012. U.S. 19 Dep. Commerce, NOAA Tech. Memo. NMFSAFSC-245, 282 p. Seattle, WA: U.S. 20 Department of Commerce, National Oceanic and Atmospheric Administration, National 21 Marine Fisheries Service, Alaska Fisheries Science Center.

Arctic Council. 2009. Arctic Marine Shipping Assessment 2009 Report. Internet website: http://www.arctic.noaa.gov/detect/documents/AMSA_2009_Report_2nd_print.pdf

Arctic Ecosystem Integrated Survey, https://web.sfos.uaf.edu/wordpress/arcticeis/?page_id=59, accessed 12 Mar 2014.

Arctic Monitoring and Assessment Programme. 2002. Fact Sheet: Persistent Organic Pollutants – Old and New. October 2002.

Arctic Monitoring and Assessment Programme. 2007. Arctic Oil and Gas. Oslo, Norway.

Bates N.R., Mathis J.T. 2009. Arctic ocean marine carbon cycle; evaluation of air-sea CO₂ exchanges, ocean acidification impacts and potential feedbacks. *Biogeosciences Discussions*. 6: 6695-6747.

Bureau of Ocean and Energy Management. 2011c. 2012-2017 OCS Oil and Gas Leasing Program Draft Programmatic EIS. Retrieved from:
http://ocs5yeareis.anl.gov/documents/dpeis/BOEM_Chapter_3.pdf. Accessed on 20 Dec 2013.

Harwood, L.A., P. Norton, B. Day, and P. Hall. 2000. The harvest of beluga whales in Canada's Western Arctic: hunter-based monitoring of the size and composition of the catch. Accessed on 15 Jul 2014 from:
[http://fishfp.sasktelwebhosting.com/publications/Harvest%20of%20Beluga%20in%20Western%20Arctic%20\(Harwood%202000\).pdf](http://fishfp.sasktelwebhosting.com/publications/Harvest%20of%20Beluga%20in%20Western%20Arctic%20(Harwood%202000).pdf)

- CBC News. [Internet]. 2013. Canadian Broadcasting Corporation News Radio-Canada. Company surveys Arctic fiber optic cable route. [accessed on 11 Nov 2013]. Available from: <http://www.cbc.ca/news/canada/north/company-surveys-arctic-fibre-optic-cable-route-1.1389176>.
- Chukchi Sea Environmental Studies Program, <http://www.chukchiscience.com/>, accessed 12 Mar 2014.
- Council on Environmental Quality (CEQ). 1997. Environmental Justice: Guidance on the National Environmental Policy Act. December 10.
- Fabry V.O.J., J.B. McClintock, J.T. Mathis, J.M. Grebmeier. 2009. Ocean acidification at high latitudes: The bellwether. *Oceanography*. 22(4): 160-171.
- Harris, R.K. 1993. Beaufort Sea Coast Fish Studies Overview and Bibliography. U.S. Army Corps of Engineers Cold Regions Research & Engineering Laboratory. Special Report 93-16.
- Hecht, J. [Internet]. 2012. Fiber optics to connect Japan to the UK – via the Arctic. [accessed on 7 Nov 2013]. Available from: <http://www.newscientist.com/article/mg21328566.000-fibre-optics-to-connect-japan-to-the-uk--via-the-arctic.html>.
- IPCC. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel of Climate Change. S. Solomon, D Q in M. Manning Z. Chen M. Marquis K. B. Avery M. Tignor and H. L. Miller, eds. New York.
- International Bering Sea Forum. 2013. Issues. Internet website: <http://www.beringseaforum.org/issues.html> Accessed on February 26, 2013.
- Johnson, S.W., J.F. Thedinga, A.D. Neff, C.A. Hoffman. 2010. Fish Fauna in Nearshore Waters of a Barrier Island in the Western Beaufort Sea, Alaska. NOAA Technical Memorandum NMFS-AFSC-210.
- Logerwell, E. and K. Rand. 2010. Beaufort Sea Marine Fish Monitoring 2008: Pilot Survey and Test of Hypotheses, Final Report. Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA. Seattle, WA.
- Love. M.S., C.W. Mecklenburg, T.A. Mecklenburg, and L.K. Thorsteinson. 2005. Resource Inventory of Marine and Estuarine Fishes of the West Coast and Alaska: A Checklist of North Pacific and Arctic Ocean Species from Baja California to the Alaska–Yukon Border. U.S.
- Mathis, J. 2011. Biogeochemical Assessment of the OCS Arctic Waters: Current Status and Vulnerability to Climate Change. Ongoing study, focus shifted from North Aleutian Basin to Chukchi Sea, latest report in: Coastal Marine Institute, UAF, Annual Report No. 17. Submitted

to USDOJ, Bureau of Ocean Energy Management, Regulation, and Enforcement. BOEMRE 2011-029, pg 17. Available from:

<http://www.boem.gov/BOEM-Newsroom/Library/Publications/2011/2011-029.aspx>.

Mecklenburg, C.W., T.A. Mecklenburg, and L.K. Thorsteinson. 2002. Fishes of Alaska. Bethesda, MD: American Fisheries Society.

Minerals Management Service. 1996. Outer continental shelf oil & gas leasing program 1997-2002, Final Environmental Impact statement. Washington, D.C.

Mineral Management Service. 2002. EIS: Outer Continental Shelf Oil & Gas Leasing Program: 2002-2007, volume 1.

Mineral Management Service. 2008. Beaufort Sea and Chukchi Sea Planning Areas, Oil and Gas Lease Sales 209, 212, 217, and 221, Draft Environmental Impact Statement: U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region, MMS 2008-055, November.

NANA Regional Corporation. 2013. Red Dog Mine. Retrieved from <http://nana.com/regional/resources/red-dog-mine/>. Accessed on 17 Oct 2013.

National Marine Mammal Laboratory, [Internet] .2014.
<http://www.afsc.noaa.gov/NMML/cetacean/bwasp/> Accessed 17 Mar 2014

NMFS. [Internet]. 2007. National Marine Fisheries Service. 2007. Supplemental Environmental Assessment of the 2007 Open Water Seismic Survey Season in the Chukchi and Beaufort Seas. National Oceanic and Atmospheric Administration, National Marine Fisheries Service. Silver Spring, Maryland. 39 p. Available from:
http://www.nmfs.noaa.gov/pr/pdfs/permits/shell_arctic_seismic_ea.pdf

NMFS. 2009a. EFH Text Description (Appendix A). Arctic Fishery Management Plan. August 2009.

NMFS. 2009b. Final EA/RIR/FRFA for the Arctic FMP and Amendment 29 to the FMP for BSAI King and Tanner Crabs. National Oceanic and Atmospheric Administration, Alaska Regional Office. Available at: <http://www.fakr.noaa.gov/sustainablefisheries/arctic> Accessed 13 Apr 2012.

NMFS. 2009c. Environmental Assessment on the Issuance of an Incidental Harassment Authorization to Shell to Take Marine Mammals by Harassment Incidental to Conducting an Open-water Marine Survey Program in the Chukchi Sea, Alaska, during 2009-2010. 52p.

NMFS. 2012. Environmental Assessment for issuance of IHAs for Shell Beaufort and Chukchi Sea Oil Exploration Plans, May 2012.

- NMFS. 2013a. Endangered, Threatened, Proposed, Candidate and Delisted Species in Alaska. Updated February May 24, 2013. Accessed 13 Jul 2013. Available at: http://alaskafisheries.noaa.gov/protectedresources/esa/ak_specieslst.pdf
- NMFS. 2013b. Final Environmental Impact Statement for Issuing Annual Quotas to the Alaska Eskimo Whaling Commission for a Subsistence Hunt on Bowhead Whales for the Years 2013 through 2018.
- NOAA. 2013a. Text of the Marine Mammal Protection Act (MMPA) <http://www.nmfs.noaa.gov/pr/pdfs/laws/mmpa.pdf>. Accessed on 16 Apr 2014.
- NOAA. 2013b. Arctic Nautical Charting Plan – A Plan to support sustainable marine transportation in Alaska and in the Arctic. NOAA Office of Coast Survey Marine Chart Division. Available from: http://www.nauticalcharts.noaa.gov/mcd/docs/Arctic_Nautical_Charting_Plan.pdf
- NOAA. 2014. Arctic Action Plan. Available at: <http://www.arctic.noaa.gov/NOAAarcticactionplan2014.pdf> Accessed 2 May 2014.
- NOAA and BOEM. [Internet]. 2013. Effects of Oil and Gas Activities in the Arctic Ocean Supplemental Draft Environmental Impact Statement. NOAA Fisheries. March 2013. 1,492 pp. [Accessed on 25 Mar 2014]. Available from: <http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>
- National Research Council. [Internet]. 2003. Cumulative Environmental Effects of Oil and Gas Activities on Alaska’s North Slope Committee on Cumulative Environmental Effects of Oil and Gas Activities on Alaska’s North Slope, Board of Environmental Studies and Toxicology, Polar Research Board, Division of Earth and Life Studies. The National Academies Press, Washington, D.C [Accessed 17 Mar 2014]. Available from: <http://www.nap.edu>
- National Science Foundation, Arctic Natural Sciences Program Active Awards, https://www.nsf.gov/awards/award_visualization.jsp?org=NSF&pims_id=13424&ProgEleCode=5280&RestrictActive=on&BooleanElement=true&BooleanRef=true&from=fund#region=US-AK, accessed 12 Mar 2014
- National Science Foundation Arctic Natural Sciences Program, https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13424, accessed 14 Mar 2014
- NPFMC. 2009. Fishery Management Plan for Fish Resources of the Arctic Management Area. August 2009.
- NPFMC. 2011. Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs. Anchorage, Alaska: North Pacific Fishery Management Council. 222 p.

- NPFMC. 2012. Fishery Management Plan for the Salmon Fisheries in the EEZ Off Alaska. Anchorage, Alaska: North Pacific Fishery Management Council. 59 p.
- NPFMC. 2013. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. Anchorage, Alaska: North Pacific Fishery Management Council. 142 p.
- Naves, L. C. 2011. Alaska subsistence harvest of birds and eggs, 2011, Alaska Migratory Bird Co-Management Council. Technical Paper No. 395.
<http://www.fws.gov/alaska/ambcc/ambcc/Harvest/AMBCC%202011%20Report.pdf>
- NSIDC. 2012. Arctic sea ice reaches lowest extent for the year and the satellite record. The National Snow and Ice Data Center. Internet website:
<http://nsidc.org/arcticseaicenews/2012/10/poles-apart-a-record-breaking-summer-and-winter/>.
Accessed on February 6, 2013.
- Richardson, W. J., C. R. J. Green, C. I. Malme and D. H. Thomson, 1995. *Marine Mammals and Noise*. San Diego, CA, Academic Press.
- Roth, E. H., Schmidt, V., Hildebrand, J. A., & Wiggins, S. M. (2013). Underwater radiated noise levels of a research icebreaker in the central Arctic Ocean. *The Journal of the Acoustical Society of America*, 133(4), 1971-1980.
- Shelf Basin Interactions data archive, accessed 17 Mar 2014.
<http://www.eol.ucar.edu/projects/sbi/>
- Shell Offshore, Inc. 2011. Environmental Impact Analysis Revised Outer Continental Shelf Lease Exploration Plan Camden Bay, Beaufort Sea, Alaska. Shell Offshore Inc., Anchorage, AK. 482 p. and Appendices. Available from: <http://www.boem.gov/About-BOEM/BOEM-Regions/Alaska-Region/Leasing-and-Plans/Plans/Shell---Beaufort-Sea-Exploration-Plan-and-Supporting-Documents.aspx>
- Shell Offshore, Inc. 2013. Revised Outer Continental Shelf Lease Exploration Plan, Chukchi Sea, Alaska. Burger Prospect: Posey Area Block 6714, 6762, 6764,6812,6912,6915. Revision 2, November 2013. 423 p. Available from:
http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Leasing_and_Plans/Plans/2013-11-06%20Shell%20Chukchi%20Sea%20EP%20Revision%202.pdf
- SRBA (Stephen R. Braund & Associates). 2010. Subsistence mapping of Nuiqsut, Kaktovik, and Barrow. Anchorage, Alaska: Stephen R. Braund & Associates.
- State of Alaska. 2014. [Internet] Wildlife habitats.
<http://www.travelalaska.com/Things%20To%20Do/Wildlife%20Viewing/Wildlife%20Habitats.aspx>. Accessed 10 Jul 2014.

-
- University of Alaska [Internet]. 2014. Accessed 12 Mar 2014. Arctic Ecosystem Integrated Survey. https://web.sfos.uaf.edu/wordpress/arcticeis/?page_id=59
- U.S. Army Corps of Engineers. 2013. Alaska Deep-Draft Arctic Port System Study. March 2013. Available at: <http://www.poa.usace.army.mil/Portals/34/docs/AKports/1ADDAPSReportweb.pdf> Accessed 2 May 2014.
- U.S. Census Bureau. 2012. Internet website: <http://quickfacts.census.gov/qfd/states/02/02188.html>. Accessed 11 Mar 2014.
- U.S. Committee on the Marine Transportation System. 2013. U.S. Arctic Marine Transportation System: Overview and Priorities for Action 2013. Committee on the Marine Transportation System. Washington D.C.
- U.S. Coast Guard. 2011a. CGD17INST 16214.2A: Marine Protected Species Program for the Gulf of Alaska, Bering Sea/Aleutian Islands, and Arctic. 13 Jul 2011
- U.S. Coast Guard. 2011b. CGD17INST 5726.1B: Tribal Consultation and Engagement Guidance. 14 Jul 2011.
- U.S. Coast Guard. [Internet]. 2013a. United States Coast Guard Arctic Strategy. U.S. Coast Guard, Washington D.C. [accessed 26 March 2014]. Available from: http://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf
- U.S. Coast Guard. 2013b. Final Programmatic Environmental Assessment for the Nationwide Use of High Frequency (HF) and Ultra High Frequency (UHF) Active SONAR Technology. United States Coast Guard Headquarters, Washington, D.C. November 2013.
- U.S. EPA. 2012. United States Environmental Protection Agency. Biological Evaluation In Support of the Beaufort Sea Oil and Gas Exploration NPDES General Permit (NPDES Permit No.: AKG-28-2100). Prepared by Tetra Tech. Bothel WA.
- U.S. EPA. 2013. Vessel General Permit for Discharges Incidental to Normal Operation of Vessels.
- USGS. Houseknecht, D., Bird, K., Garrity, C. 2012. Assessment of Undiscovered Petroleum Resources of the Arctic Alaska Petroleum Province, Circum-Arctic Resource Appraisal Project, Scientific Investigations Report 2012-5147.
- USGS. [Internet]. Page Updated 9 Jan 2013. Natural Environmental Effects of Silver-Lead-Zinc Deposits in the Brooks Range, Alaska, Fact Sheet 092-95. [Accessed 27 Mar 2014]. Available from: <http://pubs.usgs.gov/fs/fs-0092-95/>.

U.S. Navy. 2011. Arctic Environmental Assessment and Outlook Report. August 2011.

Weingartner, T. and S. Danielson. 2010. Physical Oceanographic Measurements in the Klondike and Burger Survey Areas of the Chukchi Sea: 2008 and 2009. Prepared for ConocoPhillips Inc. and Shell Exploration and Production Company by Weingartner T, and Danielson S; Institute of Marine Science University of Alaska, Fairbanks. 50 p.