BRISTOL BAY
SUBAREA CONTINGENCY PLAN

SENSITIVE AREAS
SECTION

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SENSITIVE AREAS: INTRODUCTION

This section is intended for use by the On-Scene Coordinators (OSC) during the initial phase of a spill event to assist in ascertaining the location and presence of spill-sensitive biological and cultural resources, services and users in this subarea. This information is specific to this subarea. No attempt has been made to duplicate information contained in easily accessible existing documents. This section, therefore, must be used in conjunction with the referenced materials and informational contacts identified herein. More detailed and current data should be available from on-scene resource experts when they become engaged in the response. This information is geared toward early response. If appropriate, natural resources trustees may be conducting natural resource damage assessment (NRDA) activities in conjunction with response activities. Information regarding NRDA activities should be directed to the natural resources trustees or to their appointed NRDA Liaison.

Often, the most detailed, up-to-date biological and resource use information will come from people who live and work in the impacted area. People from the local community are often knowledgeable sources for information related to fishing, hunting, non-consumptive outdoor sports, and subsistence use. They may also have a good idea of which spill response techniques (especially exclusion and diversion booming) are practicable under prevailing weather and current conditions.

The Alaska Regional Response Team (ARRT) has adopted several documents (see the *Alaska Federal/State Preparedness Plan for Response to Oil & Hazardous Substance Discharges/Releases [Unified Plan])* that address decision making to help protect sensitive areas and resources. These documents (and their location) include:

- *Oil Dispersant Guidelines for Alaska* (see *Unified Plan* Annex F, Appendix 1)
- *In Situ Burning Guidelines for Alaska* (see *Unified Plan* Annex F, Appendix 2)
- *Wildlife Protection Guidelines for Alaska* (see *Unified Plan* Annex G)
- *Alaska Implementation Guidelines for Federal OSCs for the Programmatic Agreement on Protection of Historic Properties during Emergency Response under the National Oil and Hazardous Substances Pollution Contingency Plan Protection of Historic Properties* (see *Unified Plan* Annex M)

In addition, Federal OSCs in Alaska are working in cooperation with the U.S. Department of the Interior and the National Marine Fisheries Service to ensure response activities are conducted meet Endangered Species Act requirements, in accordance with the 2001 *Inter-Agency Memorandum of Agreement Regarding Oil Spill Planning and Response Activities Under the Federal Water Pollution Control Act National Oil and Hazardous Substances Pollution Contingency Plan* (see *Unified Plan* Annex K).

In addition, Annex N of the *Unified Plan* includes *Shoreline Cleanup and Assessment Guidelines,* which provide helpful information on clean-up options by shoreline type.

Section G of the Subarea Contingency Plan contains site-specific Geographic Response Strategies (GRSs) for use by responders in protecting key sensitive areas. In addition, Environmental Sensitivity Index (ESI) maps have been produced that illustrate selected sensitive resources and shoreline types.

This section and the guidelines in the *Unified Plan* are also intended for use by facility/vessel operators in developing industry oil spill prevention and contingency plans. For an operator's facility or area of operation, industry contingency plans describe: (a) environmentally sensitive areas and areas of public concern; (b) how sensitive areas would be prioritized during a spill event; and (c) response strategies to protect sensitive areas at risk. This information within industry plans should be consistent with subarea contingency plans.

The definition of sensitive resources and their geographic locations requires use of field observations and data available from published and non-published materials or through additional fieldwork. With the limited time and funds available for subarea contingency plan development (there are ten such plans covering the state of Alaska), not all the detailed information necessary to adequately complete the Sensitive Areas Section was compiled. Identifying relative priorities among resources and resource uses takes considerable coordination and discussion among resource management agencies.

Many of the maps presented in this section are available on-line through the Internet at:

http://www.asgdc.state.ak.us/maps/cplans/subareas.html

Suggestions, comments, and more current information are requested. Please contact either:

Doug Mutter
U.S. Department of the Interior
Office of Environmental Policy
and Compliance
1689 C Street, Room 119
Anchorage, Alaska 99501
271-5011
FAX: 271-4102
email: douglas_mutter@ios.doi.gov

Jack Winters
Alaska Department of Fish and Game
Division of Habitat
1300 College Road
Fairbanks, Alaska 99701
459-7285
FAX: 459-7303
email: jack.winters@alaska.gov

SENSITIVE AREAS: PART ONE – INFORMATION SOURCES

Agency	Resources	Point of Contact
FISH AND WILDLIFE AND HABITAT RESOURCES		
Alaska Department of Fish and Game	fish, shellfish, birds, terrestrial mammals, marine mammals	Division of Habitat Fairbanks 907-459-7285
U.S. Department of the Interior	migratory birds, sea otters, polar bears, walrus, endangered species, anadromous fish in freshwater, bald eagles, wetlands	Office of Environmental Policy & Compliance Anchorage 907-271-5011
U.S. Department of Commerce, National Marine Fisheries Service	sea lions, seals, whales, endangered and threatened marine species and listed anadromous fish in marine waters	Protected Resources Division Anchorage 907-271-5006
U.S. Department of Commerce, National Marine Fisheries Service	essential fish habitat	Habitat Conservation Division Anchorage 907-271-5006
U.S. Department of Commerce, National Marine Fisheries Service	effects of oil on fisheries resources, hydrocarbon chemistry, dispersants	Alaska Fisheries Science Center Auke Bay Laboratory 907-789-6000
University of Alaska	rare and endangered plants	Alaska Natural Heritage Program Anchorage 907-257-2785
CULTURAL AND ARCHAEOLOGICAL SITES		
Alaska Department of Natural Resources	historic sites, archaeological sites, national register sites	Alaska Office of History and Archaeology Anchorage 907-269-8721
U.S. Department of the Interior	archaeological/historical sites in park and wildlife refuge system units, public lands, Native allotments/trust lands; sunken vessels	Office of Environmental Policy & Compliance Anchorage 907-271-5011

Agency	Resources	Point of Contact
SHORELINE TYPES		
U.S. Department of Commerce, National Oceanic & Atmospheric Administration	shoreline types, environmental sensitivity index maps	Scientific Support Coordinator Anchorage 907-271-3593
LAND OWNERSHIP AND CLASSIFICATIONS/DESIGNATIONS		
Alaska Department of Natural Resources	state lands, state parks and recreation areas, state forests, tidelands	Division of Mining, Land, and Water Anchorage 907-269-8565
Alaska Department of Fish and Game	state game refuges, state critical habitats	Division of Habitat Fairbanks 907-459-7285
U.S. Department of the Interior	national parks and preserves, national historic sites, national monuments, national wildlife refuges, public lands, national recreation areas, wild and scenic rivers, wilderness areas, Native trust lands	Office of Environmental Policy & Compliance, Anchorage 907-271-5011
U.S. Department of Defense	military installations and reservations	Alaska Command Anchorage 907-552-3944
Local Governments: – Bristol Bay Borough – Lake and Peninsula Borough – Bristol Bay Coastal Resource Service Area	municipal and private lands, and rights-of-way coastal program special areas, plans, policies	For the current local government contact information, go to B. Resources Section, Part One Community Profiles For the current tribal contact information, go to B. Resources Section, Part Three Information Directory, Native Organizations and Federally Recognized Tribes
COMMERCIAL HARVEST		
Alaska Department of Fish and Game	fishing permits, seasons	Commercial Fisheries Division Fairbanks 907- 459-7387
Alaska Department of Natural Resources	tideland leases	Division of Mining, Land, and Water Anchorage 907-269-8565

Agency	Resources	Point of Contact
Alaska Department of Environmental Conservation	seafood processing	Division of Environmental Health Juneau 907-269-7644
U.S. Department of Commerce National Marine Fisheries Service	fishing permits, seasons	Protected Resources Division Anchorage 907-271-5006
SUBSISTENCE, PERSONAL, AND SPORT USES		
Alaska Department of Fish and Game	subsistence and personal uses statewide and navigable waters, sport hunting and fishing	Sport Fish Division Fairbanks 907-459-7388
U.S. Department of the Interior	subsistence uses on Federal lands and reserved waters; subsistence uses of: sea otters and migratory birds	Office of Environmental Policy & Compliance, Anchorage 907-271-5011
U.S. Department of Commerce	subsistence use of: whales, porpoises, seals, sea lions	Protected Resources Division Anchorage 907-271-5006
RECREATION AND TOURISM USES		
Alaska Department of Natural Resources	State parks and recreation areas, anchorages, boat launches, campgrounds, State public lands	Division of Parks and Outdoor Recreation Fairbanks 907-451-2695
Alaska Department of Fish and Game	sport hunting and fishing	Division of Habitat Fairbanks 907-459-7285
Alaska Department of Commerce, Community & Economic Development	seasonal events and activities, travel, outdoor activities, local visitor bureaus, tourism industries	Alaska Office of Tourism Development Juneau 907-465-5478
U.S. Department of the Interior	recreation uses in park and wildlife refuge system units and Federal public lands	Office of Environmental Policy & Compliance, Anchorage 907-271-5011
WATER INTAKE AND USE FACILITIES		
Alaska Department of Environmental Conservation	public drinking water wells, treatment, and storage, fish processing facilities	Division of Water Anchorage 907-269-7601

Agency	Resources	Point of Contact
Alaska Department of Fish and Game	hatcheries, ocean net pens and release sites, aquaculture	Division of Habitat Fairbanks 907-459-7285
Alaska Department of Natural Resources	tidelands leases, aquaculture sites, private logging camps and log transfer facilities	Division of Mining, Land, and Water Juneau 907-465-3400
U.S. Coast Guard	marinas and docks, mooring buoys	Sector Anchorage Anchorage 907-271-6700

SENSITIVE AREAS: PART TWO - AREAS OF ENVIRONMENTAL CONCERN

A. BACKGROUND/CRITERIA

The following relative priority listing was developed by the Sensitive Areas Work Group, with representatives from State and Federal agencies and the private sector. The list prioritizes resources into designations of major, moderate, and lesser concern. Resources are not prioritized within each designation. These designations are for consideration in initial spill response activities; they are not applicable to extended clean-up activities. This prioritization scheme must be used in conjunction with spill-specific information (e.g., size and location of spill, type of product, trajectory) to determine the actual protection priorities for that discharge. Specific guidance to On-Scene Coordinators for protecting cultural resources is contained in Annex M of the *Unified Plan*.

The following criteria were developed as a tool to establish levels of concern. These criteria are not listed in a priority order.

CRITERIA FOR RELATIVE PRIORITY RATING

- human economic disruption -- economic/social value; human food source disruption
- mortality -- wildlife, fish, other organisms (how many potentially killed in relation to abundance)
- animal displacement and sensitivity to displacement
- aesthetic degradation
- habitat availability and rarity
- sublethal effects, including sensitivity to physical or toxic effects of oil and long-term affects to habitat, species, or both
- threatened and endangered species, and/or other legal designation
- persistent concentration of oil
- reproduction rate or recolonizing potential
- relative importance to ecosystem
- potential for physical contact with spill--pathway of oil or hazardous substances
- resource sensitivity to response measures

B. AREAS OF MAJOR CONCERN

- Threatened or Endangered Species:
  - Western Steller Sea Lion Rookeries, Haulouts and Critical habitat
  - Steller's Eider Critical Habitat
  - Sea Otter Critical Habitat
- Geomorphology - Coastal Habitat Types:
  - Marshes
  - Eelgrass Beds
  - Sheltered Tidal Flats
  - Sheltered Rocky Shores
- Geomorphology - Upland Habitat Types:
  - Streams and Lakes
  - Riparian Habitats
- Sea Otter Concentration Areas (>20)
- Harbor Seal/Spotted Seal Haulout Areas (>10)
- Walrus Haulout/Concentration Areas
- Beluga Whale Concentration Areas
- Caribou Calving and Insect Relief Areas
- Large Seabird Colonies (>5,000)
- Waterfowl and Shorebird Spring, Fall, or Winter Concentration Areas
- Eagle Nest Sites
- Anadromous Fish Streams:
  - North Side of Alaska Peninsula, >1,000,000 Sockeye Spawners
  - South Side of Alaska Peninsula, >5,000 Sockeye Spawners
  - >25,000 Pink Spawners
  - >15,000 Chum Spawners
  - >2,500 Coho Spawners
  - >500 Chinook Spawners
- Large Freshwater Fish Systems
- Herring Spawning Areas
- Land Management Designations:
  - Federal Lands:
    - Designated Wilderness Areas
    - Wild and Scenic Rivers
  - State Lands:
    - Refuges
    - Sanctuaries
    - Critical Habitat Areas
- Cultural Resources/Archaeological Sites:
  - National Historic Landmarks
  - Burial Sites
  - National Register Eligible Village Sites
  - Intertidal Sites
- Subsistence Harvest Areas
- High Commercial Use Areas
- High Recreational Use Areas

C. AREAS OF MODERATE CONCERN

Geomorphology - Coastal Habitat Types:
- Gravel Beaches
- Mixed Sand and Gravel Beaches
- Exposed Tidal Flats
- Coarse-Grained Sand Beaches

Sea Otter General Distribution (<20)
Harbor/Spotted Seal Haulout Areas (< 10)
Steller Sea Lion General Distribution
Seabird Colonies (1,000-5,000)
Waterfowl and Shorebird Nesting and/or Molting Concentration Areas
Anadromous Fish Streams:
- North Side of Alaska Peninsula, 100,000 - 1,000,000 Sockeye Spawners
- South Side of Alaska Peninsula, 500-5,000 Sockeye Spawners
- 5,000 - 25,000 Pink Spawners
- 5,000 - 15,000 Chum Spawners
- 500 - 2,500 Coho Spawners
- 100 - 500 Chinook Spawners

Moderately Sized Freshwater Fish Systems
Bear Spring Concentration Areas
Caribou Migration Routes
Commercial Harvest Areas
Recreational Use Areas
Land Management Designations:
- Federal Lands:
  - National Parks
  - National Wildlife Refuges
- State Lands: State Parks

Cultural Resources/Archaeological Sites:
- National Register Eligible Sites (Other Than Village Sites)
- Sites Adjacent To Shorelines

D. AREAS OF LESSER CONCERN

Geomorphology - Coastal Habitat Types:
- Fine-Grained Sand Beaches
- Exposed Wave-Cut Platforms
- Exposed Rocky Shores

Walrus General Distribution
Northern Fur Seal General Distribution
Seabird Colonies (<1,000)
Waterfowl and Shorebird General Distribution
Bear Fall Concentration Areas
Anadromous Fish Streams:
- North Side of Alaska Peninsula, # 100,000 Sockeye Spawners
- South Side of Alaska Peninsula, <500 Sockeye Spawners
- <5,000 Pink Spawners
- <5,000 Chum Spawners
- <500 Coho Spawners
- <100 Chinook Spawners

General Freshwater Fish Habitat
Land Management Designations:
- Federal Lands:
  - Public Lands
  - National Preserves
- State Lands:
  - General Public Lands

Cultural Resources:
- Cultural Resources that do not meet National Register Criteria

E. AREAS OF LOCAL CONCERN

The Bristol Bay Borough Coastal Management Plan identified several Special Use Areas based on unique, environmentally vulnerable, or commercially important fish and wildlife resources and habitat. Commercial fishing is a key use in many of these areas. The Lake and Peninsula Borough Coastal Management Plan and the Bristol Bay Coastal Resource Service Area both designated the Nushagak and Mulchatna Rivers Area Meriting Special Attention.

1. Area Meriting Special Attention A: Industrial Area

This is an industrial area adjacent to an important salmon migration and rearing area. Potential hazards include landslides, storm surges, erosion, and accidental petroleum spills. The area in and around the newly constructed public dock is included along with the Naknek River coastline and uplands. The area includes both private and public ownership and has mixed residential use surrounding the proposed marine industrial park. The Bristol Bay Borough owns the public dock and has planning and zoning responsibility for the area.

2. Area Meriting Special Attention B: Paul's Creek/King Salmon Creek Area

This area is of high natural productivity and of essential habitat for wildlife, especially salmon, trout, bear, and moose. The area includes the upland and floodplain around Paul's Creek and King Salmon Creek. It extends from approximately 1 mile west of Paul's Creek and 1 mile east of King Salmon Creek, and from the Naknek River, 4 miles north to the rolling uplands. The area includes the intersection of the Naknek-King Salmon Highway and two of the Borough's most important salmon spawning creeks.

3. Area Meriting Special Attention C: Big Creek and rapids section of the Naknek River

This area includes the Big Creek and rapids section of the Naknek River. The reason for the designation is the high spawning concentration of king, coho, pink, and chum salmon and rainbow trout in an area that is privately owned and being leased for residential development. The area is an area of high natural productivity and of essential habitat for wildlife. In addition to containing prime salmon spawning reaches, the lower reaches of Big Creek serve as a staging area for a large population of swans. It extends from King Salmon along the Naknek River to the federally owned land of Katmai National Park. It includes the upland on both sides of the river as well as the first three miles of Big Creek.

4. Nushagak and Mulchatna Rivers Area Meriting Special Attention

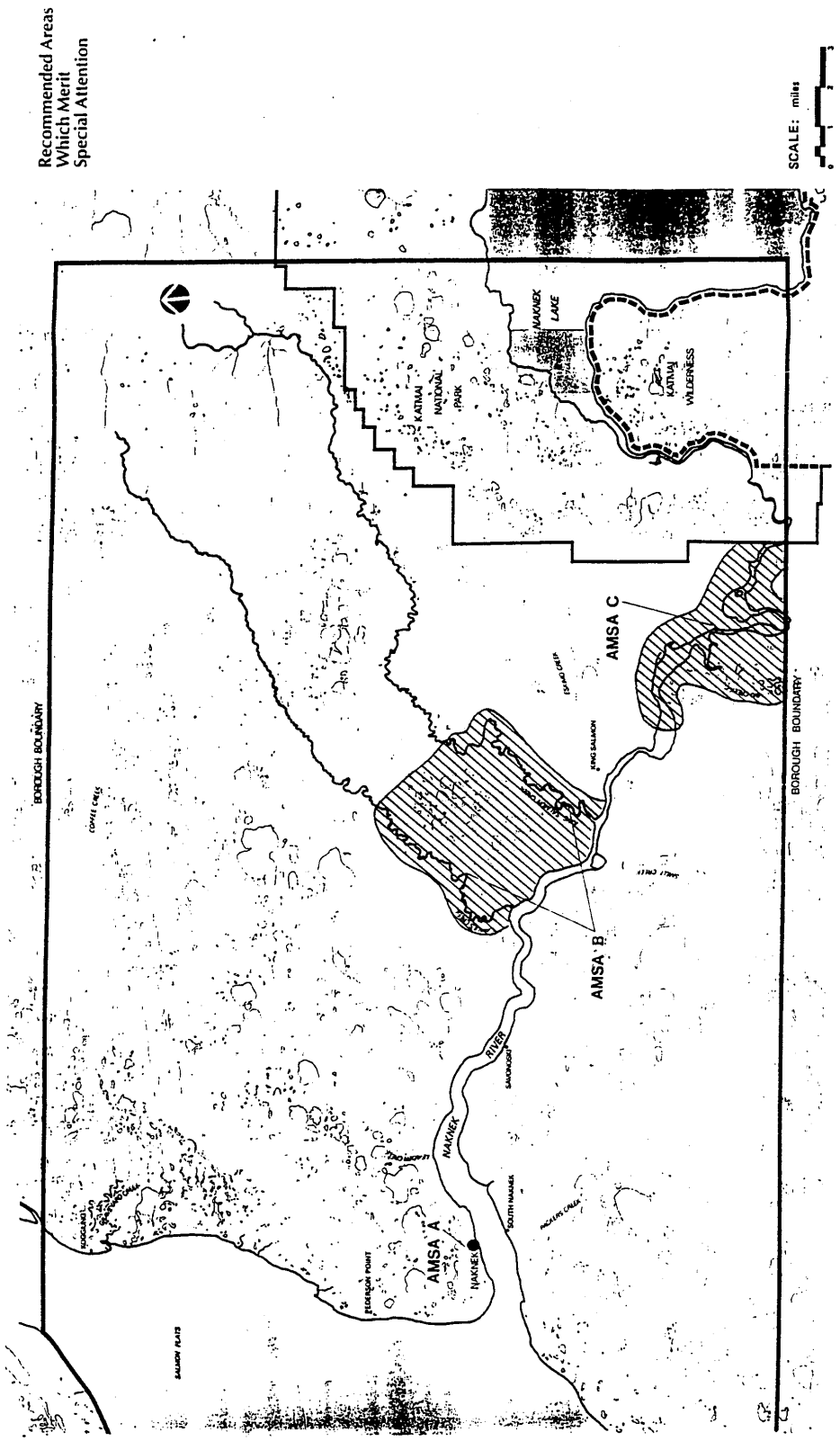
In 1990, a cooperative recreation management plan was developed with the Alaska Departments

of Fish and Game and Natural Resources. Public use areas (25) and guidelines for primitive, semi-primitive, and semi-developed uses were developed for the 200-mile corridor, which stretches from the headwaters of the Mulchatna River to Dillingham.

An August 2000 Federal/State joint survey of Native tribes in the subarea yielded additional information about sensitive areas near villages, as viewed from the local perspective. The tribes responding to the survey, their top five sites of concern, and the reason for their importance, are:

Clarks Point Village Council	
City well	Main water source
Hurleys well	Water for homes without running water
City tank farms	Drainage to wetlands
Trident tank farms	Drainage to wetlands and waterfront beach
Nushagak River	Subsistence and commercial fisheries
Egegik Village Tribal Council	
City dock	Oil transfer point
Oil tank farm	Heating oil storage
Egegik Light & Power Co.	Power provider
Alaska General Seafoods	Seafood company support plant
Woodbine Alaska Fish Co.	Seafood processing & support camp
Naknek Native Village Council	
Naknek River	Subsistence fishing
Naknek Lake	Subsistence fishing
Kvichak River	Subsistence fishing
New Koliganek Village Council	
Wells at both ends of Village	Water source
Homes where people live	Homes
River	Water & wildlife source
Land surrounding Village	Subsistence uses
Newhalen	
Newhalen River	Sockeye Spawning area/traffic
Lake Iliamna	Largest lake in area and every tributary
City water well	Drinking water source
Newhalen school	School ground
Nondalton	
Sixmile Lake	Important spawning area for salmon-commercial/subsistence
Native Council of Port Heiden	
Port Heiden Bay	Access to all rivers
Stroggunoff Point	Access to mudflats
Meshik river	King and silver salmon
North River	Silver and pink salmon
Chumonbuk River	Food resource for Village
Traditional Council of Togiak	
Togiak school	Largest building for children
AVEC plant	Provides electricity
W&S pump house	Provides water
Clinic	Health facility

Church	Place for church gatherings


Recommended Areas
Which Merit
Special Attention
SCALE: miles
BOROUGH BOUNDARY
BOROUGH BOUNDARY
KATMAI NATIONAL PARK
KATMAI WILDERNESS
NAKNEK LAKE
AMSA C
AMSA B
AMSA A
NAKNEK
NAKNEK RIVER
SOUTH NAKNEK
KING SALMON
KING SALMON
KOGGIUNG
EGEGIK POINT
SALMON FLATS

SENSITIVE AREAS: PART THREE - RESOURCE SENSITIVITY

The following sensitivity tables were developed by the State and Federal Natural Resources Trustees with legislative responsibility for management and protection of these resources. This includes the following agencies: National Marine Fisheries Service, U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Alaska Department of Fish and Game, and Alaska Department of Natural Resources. This information is a summary derived from recent field studies, research reports, long-term monitoring, stakeholder input, and local knowledge. Periods and/or conditions when resources are of varying levels of concern (low, medium, high) with respect to affects from an oil spill are noted in the following tables.

GEOMORPHOLOGY

CATEGORY	LOW	MEDIUM	HIGH
COASTAL HABITAT TYPES	Fine-grained sand Beaches Exposed wave-cut Platforms Exposed rocky shores	Gravel beaches Mixed sand & gravel beaches Exposed tidal flats Coarse grained sand beaches Riprap structures	Marshes Eelgrass beds Sheltered tidal flats Sheltered rocky flats
LAKE AND RIVER HABITAT TYPES	Exposed rocky cliffs & Banks Bedrock shores & Ledges, rocky shoals Eroding scarps/bank in unconsolidated sediment Exposed man-made Structures	Sand beaches & bars Mixed sand & gravel beaches/bars Gravel beaches/bars Gently sloping banks Exposed flats Riprap	Sheltered scarps in bedrock Vegetated steep sloping bluffs Sheltered man-made structures Vegetated low banks Sheltered sand & mud & muddy substrates Marshes
UPLAND HABITAT TYPES	Alpine tundra Mesic/dry tussock Tundra	Low shrub vegetation Dwarf shrub mat and cushion tundra	Riparian willow

WHALES AND PORPOISES

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	<10	10 - 50	>50
SUSCEPTIBILITY	Oct 1 - Apr 30	Aug 1 - Sept 30	March 1 - July 31
HUMAN HARVEST	July 1 - May 1	May 1 - June 30 (beluga)	

Critical Life Periods **J F M A M J J A S O N D**

Present nearshore:

Gray Whale ==========

Killer Whale ==========

Beluga Whale ==========

Harbor Porpoise ==========

Calving

Killer Whale ==========

Beluga Whale =========

Harbor Porpoise ======

HARBOR SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (ON HAULOUTS)	<5	5 - 10	>10
SUSCEPTIBILITY		Year-round	
HUMAN HARVEST	June 1 - May 1		May 1 - May 31

Critical Life Periods **J F M A M J J A S O N D**

Pupping ======

Molting ==========

On haulouts (prime period) ==========

RINGED SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (ON HAULOUTS)		In pack ice	In shorefast ice
SUSCEPTIBILITY		Year-round	
HUMAN HARVEST	Nov 1-Jan 15		Jan 15-Oct 30

Critical Life Periods J F M A M J J A S O N D

Pupping ======
Molting =========
Present in Bering Sea ==========
Nearshore concentrations
in shorefast ice ========== =====

BEARDED SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (ON HAULOUTS)		In pack ice	In ice edge
SUSCEPTIBILITY		Year-round	
HUMAN HARVEST	Nov 1-Jan 15		Jan 15-Oct 30

Critical Life Periods J F M A M J J A S O N D

Pupping and weaning ==========
Molting ========
Present in Bering Sea ==========

SPOTTED SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (ON HAULOUTS)	<10	10 - 100	>100
SUSCEPTIBILITY		Year-round	
HUMAN HARVEST	Nov 1-Jan 15		Jan15-Oct 30

Critical Life Periods J F M A M J J A S O N D

Pupping and weaning =======
Molting ========
In nearshore waters ==========

NORTHERN FUR SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (ON HAULOUTS)	June - October		
SUSCEPTIBILITY	May - October		
HUMAN HARVEST	August - October		

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Pupping						========						
Molting					========							
Present								==========				

WESTERN STELLER SEA LIONS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (ON HAULOUTS)	<15	15 - 30	>30
SUSCEPTIBILITY		year - round	
HUMAN HARVEST			

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Pupping						=======						
Molting							==========					
On rookeries					==========							
On haulouts (prime period)							==========					
In area waters	==========											

SEA OTTERS[1]

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE		<20	>20
SUSCEPTIBILITY			year-round
HUMAN HARVEST	year-round		

[1]South side of the Alaska Peninsula.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Present nearshore	==========											
Pupping	==========											

WALRUS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE		Oct 1 - Mar 31	Apr 1 - Sept 30
SUSCEPTIBILITY		year-round	
HUMAN HARVEST	Oct 15 - Mar 15 May 31 - Aug 15		Mar 15 - May 31 Aug 15 -Oct 15

Critical Life Periods **J F M A M J J A S O N D**

Present in nearshore waters or on haulouts ==========

Edge of pack ice ========= ===

BROWN BEAR

CATEGORY	LOW	MEDIUM	HIGH
SUSCEPTIBILITY[2,3]	Nov 1 - Apr 30	May 1 - June 30 Sept 1 - Oct 31	July 1 - Aug 31
HUMAN HARVEST[4]	Nov 1 - Apr 15		Apr 15 - May 31 Sept 1 - Oct 31

[2]Bear densities and susceptibility to oil impacts increases through spring as more individuals emerge from dens and move to coastal areas.

[3]Bear densities and susceptibility to oil impacts decreases through the summer depending upon the availability of fish in lower reaches of streams.

[4]Most bear hunting opportunities are closed during the summer; however, bear viewing opportunities in some areas peak during the summer period.

Critical Life Periods **J F M A M J J A S O N D**

Denning ========== ========

Feeding in coastal areas (primary period) ======

Feeding along salmon streams (primary period) ======

CARIBOU/REINDEER

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	Oct 1 - May 15		May 15 - Sept 30
HUMAN HARVEST	May 1 - July 31	Apr 1 - Apr 30	Aug 1 - Mar 31

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Calving					===							
Insect relief habitat						==========						
Wintering area	==========										=======	

MOOSE

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	June 15 - May 15	May 15 - June 15	
HUMAN HARVEST	Oct 1 - Nov 31 Jan 1 - Aug 15		Aug 15 - Sept 30 Dec 1 - Dec 31

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Calving					====							
Wintering area	==========										======	

BALD EAGLES

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	<1 nest / 3 coastal miles	1 nest / 3 coastal miles	>1 nest / 3 coastal miles
SUSCEPTIBILITY			year-round

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Present in area	==========											
Nesting and brood rearing					==========							

DUCKS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	<100	100 - 1,000	>1,000
SUSCEPTIBILITY	Nov 16 - Feb 28	June 1 - Aug 31	Mar 1 - May 31 Sept 1 - Nov 15
HUMAN HARVEST[5]	June 1 - Aug 15 Dec 1 - Mar 31		Apr 1 - May 31 Aug 15 - Nov 30

[5]Waterfowl eggs are collected by some communities from early April through May.

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Present in area	==========											
Spring migration			========									
Nesting, brood rearing, and molting					==========							
Fall staging/migration								========				

GEESE

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	<100	100 - 1,000	>1,000
SUSCEPTIBILITY	Nov 1 – Mar 31	June 1 - Aug 31	Apr 1 - May 31 Sept 1 - Oct 31
HUMAN HARVEST[6]	June 15 – Aug 15 Dec 1 – Mar 31		Apr 1 - June 15 Aug 15 - Nov 30

[6]Waterfowl eggs are collected by some communities from early April through May.

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Present in area	==========											
Spring migration				====								
Nesting, brood rearing, molting					==========							
Fall staging/migration								======				

TUNDRA SWANS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	Nov 1 - Mar 31	June 1 - Aug 31	Apr 1 - May 31 Sept 1- Oct 31
HUMAN HARVEST			

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Present in area	==========											
Spring migration			======									
Nesting, brood rearing, molting					==========							
Fall staging/migration										======		

SEABIRDS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	<1,000	1,000 - 5,000	>5,000
SUSCEPTIBILITY	Nov 1 - Jan 31	Feb 1 - Mar 31	Apr 1 - Oct 31
SPECIES DIVERSITY	1 – 3	4 - 6	>6
HUMAN HARVEST[7]	June 1 - Apr 30		May 1 - May 31

[7]Seabird eggs are harvested by some native communities.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Present in area	==========											
At brooding colonies			==========									
Nesting				==========								

GROUNDFISH[10]

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	May 1 – Mar 1		Mar 1 -Apr 30
HUMAN HARVEST			

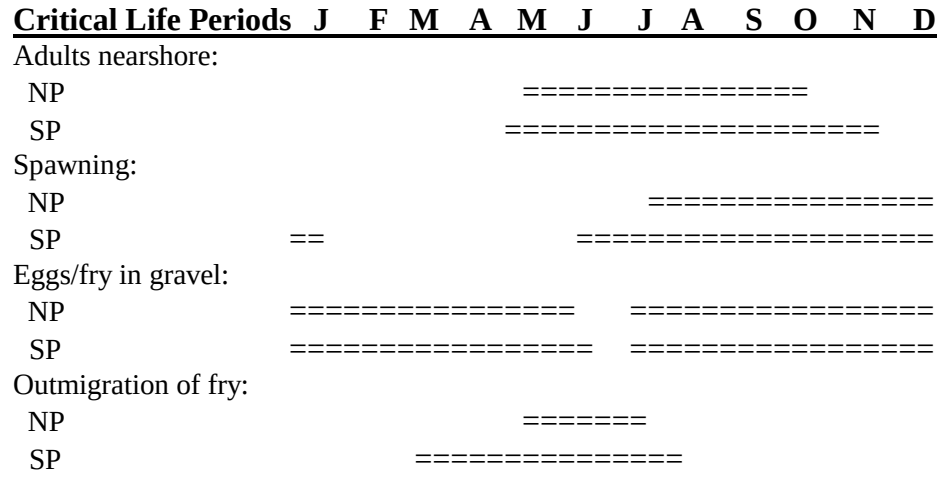
[10]South side of AK Peninsula only; information not available for North side of AK Peninsula and Bristol Bay.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Spawning (gadids)			=====									

SALMON (pink, chum, coho, sockeye, and chinook)[8]

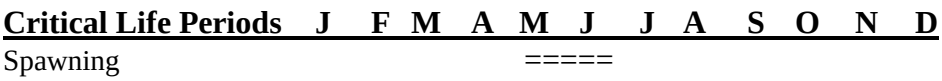
CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (spawners)	NP: # 100,000 sockeye SP: <500 sockeye <5,000 pink <5,000 chum <500 coho <100 chinook	NP: >100,000-1,000,000 sockeye SP: 500 - 5,000 sockeye 5,000 - 25,000 pink 5,000 - 15,000 chum 500 - 2,500 coho 100 - 500 chinook	NP: >1,000,000 sockeye SP: >5,000 sockeye >25,000 pink >15,000 chum >2,500 coho >500 chinook
SUSCEPTIBILITY	Jan 1 - Jan 31	NP: Nov 1 - Dec 31 Feb 1 - Apr 30 SP: Dec 1 - Dec 31 Feb 1 - Apr 30	NP: May 1 - Oct 31 SP: May – Nov 30
SPECIES DIVERSITY	1	2 – 4	5
HUMAN HARVEST	NP: Oct 1 - May 31 SP: Oct 15 - May 31	NP: Aug 15 - Sept 30 SP: Sept 15 - Oct 15	NP: June 1 - Aug 15 SP: June 1 - Sept 15

[8]NP: North side of Alaska Peninsula; SP: South side of Alaska Peninsula



CAPELIN

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	July 1 – May 15		May 15 - June 30



PACIFIC HERRING[9]

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (Biomass in Tons)	NP: <500	NP: 500 - 5,000	NP: >5,000
SUSCEPTIBILITY	Oct 1 – Feb 28	Mar 1 - Mar 31	Apr 1 - Sept 30
HUMAN HARVEST	June 1 – Apr 15		NP: Apr 15 - May 31

[8]NP: North side of Alaska Peninsula; SP: South side of Alaska Peninsula

Critical Life Periods J F M A M J J A S O N D

Congregate to spawn
NP ========
SP ====
Spawning
NP ========
SP ====
Migration (post-spawning)
NP ============
Larvae/juveniles near shore
NP ============
SP =========

HALIBUT

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	Sept 1 – May 31		June 1 - Aug 31
HUMAN HARVEST	Oct 1 - Apr 30		May 1 - Sept 30

Critical Life Periods J F M A M J J A S O N D

Adults move inshore ============
Adults move offshore =========
Planktonic larvae/eggs ================== ===

RED KING CRABS[11]

CATEGORY	LOW		MEDIUM	HIGH
SUSCEPTIBILITY	Larvae	July 1 – Jan 31	Feb 1 - Mar 1	Mar 1 - May 31
	Adult		June 1 - Feb 15	Feb 15 - May 31
HUMAN HARVEST		Feb 1 – June 1		June 1 - Jan 31[12]

[11]South side of AK Peninsula only; information not available for North side of AK Peninsula and Bristol Bay.
[12]Currently subsistence harvest only.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Larvae			=========									
Adults in nearshore			==========									

DUNGENESS CRABS[13]

CATEGORY		LOW	MEDIUM	HIGH
SUSCEPTIBILITY	Larvae	Aug 1 - Apr 1	Apr 1 - Apr 30	May 1 - July 31
	Adult		Oct 1 - Apr 30	May 1 - Sept 30
HUMAN HARVEST				May 1-Jan 1

[13]South side of AK Peninsula only; Dungeness do not occur in Bristol Bay.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Larvae					=========							
Adults in nearshore					==========							

TANNER CRABS[14]

CATEGORY		LOW	MEDIUM	HIGH
SUSCEPTIBILITY	Larvae	July 1 - Jan 31	Jan 1 - Jan 31 June 1 - July 1	Feb 1 - May 31
	Adult		Jan 1 - Jan 31	Feb 1 - May 31
HUMAN HARVEST				Jan 1 - Dec 31[15]

[14]South side of AK Peninsula only; few tanner crabs in shallow waters of north side of AK Peninsula and Bristol Bay.
[15]Subsistence only.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Larvae			==========									
Adults in nearshore				==========								

FRESHWATER FISH SPECIES

Dolly Varden/Char

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	Nov 1 - Mar 31	June 1 - Oct 31	Apr 1 - May 31
HUMAN HARVEST	Nov 1 - Mar 31	Oct 1 - Oct 31	Apr 1 - Sept 30

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Present nearshore				==========								
Spawning									==========			
Eggs/fry in gravel	==========								==========			

Rainbow Trout

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	Nov 1 - Mar 31	June 1 - Oct 31	Apr 1 - May 31
HUMAN HARVEST	Nov 1 - Mar 31	Oct 1 - Oct 31	Apr 1 - Sept 30

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Spawning				========								
Eggs/fry in gravel				=========								

Grayling

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			
SUSCEPTIBILITY	Nov 1 - Mar 31	June 1 - Oct 31	Apr 1 - May 31
HUMAN HARVEST	Nov 1 - Mar 31	Oct 1 - Oct 31	Apr 1 - Sept 30

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Spawning				========								

LAND MANAGEMENT DESIGNATIONS

CATEGORY	LOW	MEDIUM	HIGH
FEDERAL LANDS	Public Land	National Parks Wildlife Refuges	Wild & Scenic Rivers Wilderness Areas National Natural Landmarks
STATE LANDS	Public Land[16]	State Parks	Critical Habitats Refuges

[16]Includes submerged lands out to 3 miles and historic bays and inlets.

CULTURAL RESOURCES/ARCHAEOLOGICAL SITES

CATEGORY	LOW	MEDIUM	HIGH
CULTURAL AND ARCHAEOLOGICAL SITES	Cultural Resources that do not meet National Register criteria	National Register eligible sites (excluding villages sites) Sites adjacent to shorelines	National Historical Landmarks; National Natural Landmarks; Burial sites; National Register eligible village sites; Intertidal sites

SENSITIVE AREAS: PART FOUR – BIOLOGICAL AND HUMAN USE RESOURCES

A. INTRODUCTION

The background information contained in this section is a mixture of references to readily available documents, knowledgeable contacts, and data not readily available elsewhere.

B. HABITAT TYPES

Shoreline habitats have been defined and ranked according to Environmental Sensitivity Index (ESI) standards produced by the National Oceanic and Atmospheric Administration (NOAA) in *Environmental Sensitivity Index Guidelines* (October 1997). Seasonal ESI maps in poster and atlas formats have been produced for the subarea, as shown on the following index map. These maps are available on the internet at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/PDFS/ESI_DATA/INDEX.PDF

Updated ESI information can also be found on the internet at:

http://response.restoration.noaa.gov/type_subtopic_entry.php?RECORD_KEY%28entry_subtopic_type%29=entry_id,subtopic_id,type_id&entry_id(entry_subtopic_type)=74&subtopic_id(entry_subtopic_type)=8&type_id(entry_subtopic_type)=3

1. Benthic Habitats

Oil vulnerability is lower in benthic areas than in the intertidal zone since contamination by floating slicks is unlikely. Sensitivity is derived from the species which use the habitat. Benthic habitats have not been traditionally classed by ESI rankings, but are treated more like living resources which vary with season and location. Benthic habitats include: submerged aquatic vegetation beds, large beds of kelp, worm reefs, coral reefs.

2. Shoreline Habitats

Habitats (estuarine, large lacustrine and riverine) ranked from least to most sensitive (see the following table) are described below:

ESI #1--Exposed impermeable vertical substrates: exposure to high wave energy or tidal currents on a regular basis, strong wave-reflection patterns common, substrate is impermeable with no potential for subsurface penetration, slope of intertidal zone is 30 degrees or greater, attached organisms are hardy and accustomed to high hydraulic impacts.

ESI #2--Exposed impermeable substrates, non-vertical: exposure to high wave energy or tidal currents on a regular basis, strong wave-reflection patterns regular, substrate is impermeable with no potential for subsurface penetration over most of intertidal zone, slope of intertidal zone is less than 30 degrees, there can be accumulated but mobile sediments at the base of cliff, attached organisms are hardy and accustomed to high hydraulic impacts.

ESI #3--Semi-permeable substrate: substrate is semi-permeable with oil penetration less than 10 cm, sediments are sorted and compacted, slope is less than 5 degrees, sediment and potential for rapid burial mobility is low, surface sediments are subject to regular reworking by waves, there are

relatively low densities of infauna.

ESI #4--Medium permeability substrate: substrate is permeable with oil penetration up to 25 cm, slope is 5 - 15 degrees, rate of sediment mobility is high with accumulation of up to 20 cm of sediments in a single tidal cycle, sediments are soft with low trafficability, low densities of infauna.

ESI #5--Medium to high permeability substrate: substrate of medium to high permeability which allows oil penetration up to 50 cm, spatial variations in distribution of grain sizes with finer ones at high tide line and coarser ones in the storm berm and at toe of beach, 20 percent is gravel, slope between 8 and 15 degrees, sediment mobility is high during storms, sediments are soft with low trafficability, low populations infauna and epifauna except at lowest intertidal levels.

ESI #6--High permeability substrates: substrate is highly permeable with oil penetration up to 100 cm, slope is 10 to 20 degrees, rapid burial and erosion of shallow oil can occur during storms, high annual variability in degree of exposure and frequency of wave mobilization, sediments have lowest trafficability of all beaches, natural replenishment rate is the lowest of all beaches, low populations of infauna and epifauna except at lowest intertidal levels.

ESI #7--Exposed flat permeable substrate: flat (less than 3 degrees) accumulations of sediment, highly permeable substrate dominated by sand, sediments are well saturated so oil penetration is limited, exposure to wave or tidal-current energy is evidenced in ripples or scour marks or sand ridges, width can vary from a few meters to one kilometer, sediments are soft with low trafficability, high infaunal densities.

ESI #8--Sheltered impermeable substrate: sheltered from wave energy and strong tidal currents, substrate of bedrock or rocky rubble, variable in oil permeability, slope greater than 15 degrees with a narrow intertidal zone, high coverage of attached algae and organisms.

ESI #9--Sheltered flat semi-permeable substrate: sheltered from wave energy and strong tidal currents, substrate is flat (less than 3 degrees) and dominated by mud, sediments are water-saturated so permeability is low, width varies from a few meters to one kilometer, sediments are soft with low trafficability, infaunal densities are high.

ESI #10--Vegetated wetlands: marshes and swamps with various types of emergent herbaceous grasses and woody vegetation over the substrate.

Alaska ShoreZone Coastal Habitat Mapping. An on-going coastal habitat mapping effort is producing an on-line database, digital maps, and color aerial imagery and videos of the coastline in the subarea. This geo-referenced data set collected at low tide includes coastal geomorphology and biological habitat for some intertidal and shallow subtidal areas.

Responders have access to several useful tools through the ShoreZone web portal. Low altitude video and high resolution still photos are available with longitude and latitude and presented spatially on base maps (basic maps, topos, and satellite images). Also, habitat maps can be generated online for attributes such as Oil Residency Index, ESI, and sensitive biota (e.g. eelgrass).

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Regional Office hosts the Alaska ShoreZone web portal at:

http://alaskafisheries.noaa.gov/shorezone/

3. Upland Habitats

At this time, no uplands or wetlands classifications directly related to sensitivity to oil spills has been identified. A general wetlands classification has been developed by the U.S. Fish and Wildlife Service, National Wetlands Inventory, in Anchorage. Considerable mapping of wetlands has been completed, some of which are available in a Geographic Information System database (see the following figure). Updated map data is being placed on the National Wetlands Inventory Internet web site at: http://wetlands.fws.gov/

ESI HABITAT RANKING

ESI NO.	ESTUARINE	LACUSTRINE	RIVERINE (large rivers)
1 A	Exposed rocky cliffs	Exposed rocky cliffs	Exposed rocky banks
1 B	Exposed sea walls	Exposed sea walls	Exposed sea walls
2	Exposed wave-cut platforms	Shelving bedrock shores	Rocky shoals; bedrock ledges
3	Fine- to medium-grained sand beaches	Eroding scarps in unconsolidated sediments	Exposed, eroding banks in unconsolidated sediments
4	Coarse-grained sand beaches	Sand beaches	Sandy bars and gently sloping banks
5	Mixed sand and gravel beaches	Mixed sand and gravel beaches	Mixed sand and gravel bars and gently sloping banks
6 A	Gravel beaches	Gravel beaches	Gravel bars and gently sloping banks
6 B	Riprap	Riprap	Riprap
7	Exposed tidal flats	Exposed flats	Not present
8 A	Sheltered rocky shores	Sheltered scarps in bedrock	Vegetated, steeply sloping bluffs
8 B	Sheltered sea walls	Sheltered sea walls	Sheltered sea walls
9	Sheltered tidal flats	Sheltered vegetated low banks	Vegetated low banks
10 A	Saltwater marshes		
10 B	Freshwater marshes	Freshwater marshes	Freshwater marshes
10 C	Freshwater swamps	Freshwater swamps	Freshwater swamps
10 D	Mangroves		

'' Environmental Sensitivity Index Guidelines" (October 1995) NOAA Technical Memorandum NOS ORCA 92

Insert Environmental Sensitivity Index Map Atlas Index here - to view the map from the ARRT website, please go to the DNR Prevention and Emergency Response Subarea Plan Maps website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/PDFS/ESI_DATA/INDEX.PDF

Insert Wetlands Status map here - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.fws.gov/wetlands/Data/mapper.html

C. BIOLOGICAL RESOURCES

1. Threatened and Endangered Species

Federally listed threatened and endangered species are protected under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.). If response strategies are proposed in locations where migratory birds and/or marine mammals listed as threatened and/or endangered are (or may be) present, the Federal On-Scene Coordinator will need to immediately consult with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service (as appropriate) regarding the proposed strategies, in accordance with the Endangered Species Act Memorandum of Understanding (see the *Unified Plan*, Annex K). The following species[1] and critical habitat occur in this subarea:

Table 1: Endangered Species Act of 1973 Protected species and critical habitat			
Listed species	**Stock**	**Latin Name**	**Status**
Fin whale*		*Balaenoptera physalus*	Endangered
Humpback whale*		*Megaptera novaeangliae*	Endangered
North Pacific right whale*		*Eubalaena japonica*	Endangered
Steller sea lion*	Western	*Eumetopias jubatus*	Endangered
Spectacled eider**		*Somateria fischeri*	Threatened
Steller's eider**	Alaska breeding	*Polysticta stelleri*	Threatened
Short-tailed albatross**		*Diomedea albatrus*	Endangered
Northern sea otter**	Southwestern	*Enhydra lutris kenyoni*	Threatened
Yellow-billed loon**		*Gavia adamsii*	Candidate
Pacific walrus**		*Odobenus rosmarus divergens*	Candidate

Designated Critical Habitat	
Species Group	**General Reference Area**
Steller's eider	See designation maps below (50 CFR Part 17)
Northern sea otter	See designation maps below (50 CFR Part 17)
Steller sea lion	See map below for haulouts and rookeries (50 CFR 226.202)
North Pacific right whale	See designation map below (50 CFR Part 226)

*Managed by the National Marine Fisheries Service
**Managed by the U.S. Fish and Wildlife Service

Candidates are species for which there is enough information on their biological status and threats to propose them as endangered or threatened, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

[1] In its definition of species, the Endangered Species Act of 1973, as amended, includes the traditional biological species concept of the biological sciences and "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature" (16 U.S.C. 1532). The National Marine Fisheries Service uses the term *evolutionarily significant unit* as synonymous with *distinct population segment* and lists Pacific salmon accordingly. For the purposes of section 7 consultations, these are all "species."

For updated information on the internet:

U.S. Fish and Wildlife Service Regional Threatened and Endangered Species web site:
http://alaska.fws.gov/fisheries/endangered/index.htm

The National Marine Fisheries Service Regional Threatened and Endangered Species web site:
http://www.fakr.noaa.gov/protectedresources/esa/ak_specieslst.pdf

Alaska Department of Fish and Game Threatened and Endangered Species web site:
http://www.wildlife.alaska.gov/index.cfm?adfg=endangered.main

Critical habitat maps for sea otters:
http://alaska.fws.gov/fisheries/mmm/seaotters/pdf/SeaOtterCriticalHabitatMaps.pdf

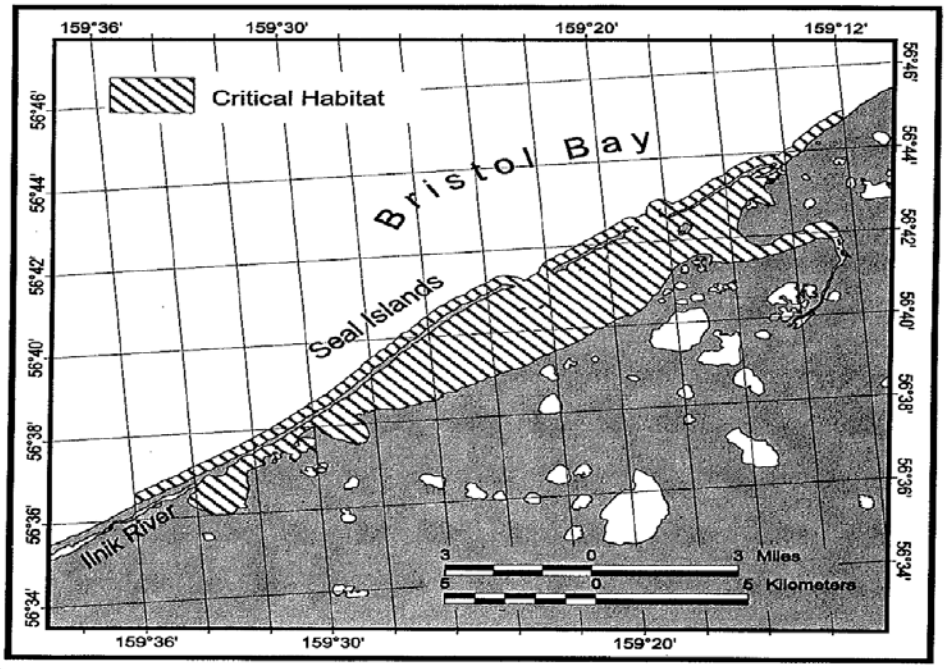
Steller's eider range map:
http://alaska.fws.gov/fisheries/endangered/StellEider_RangeMap.htm

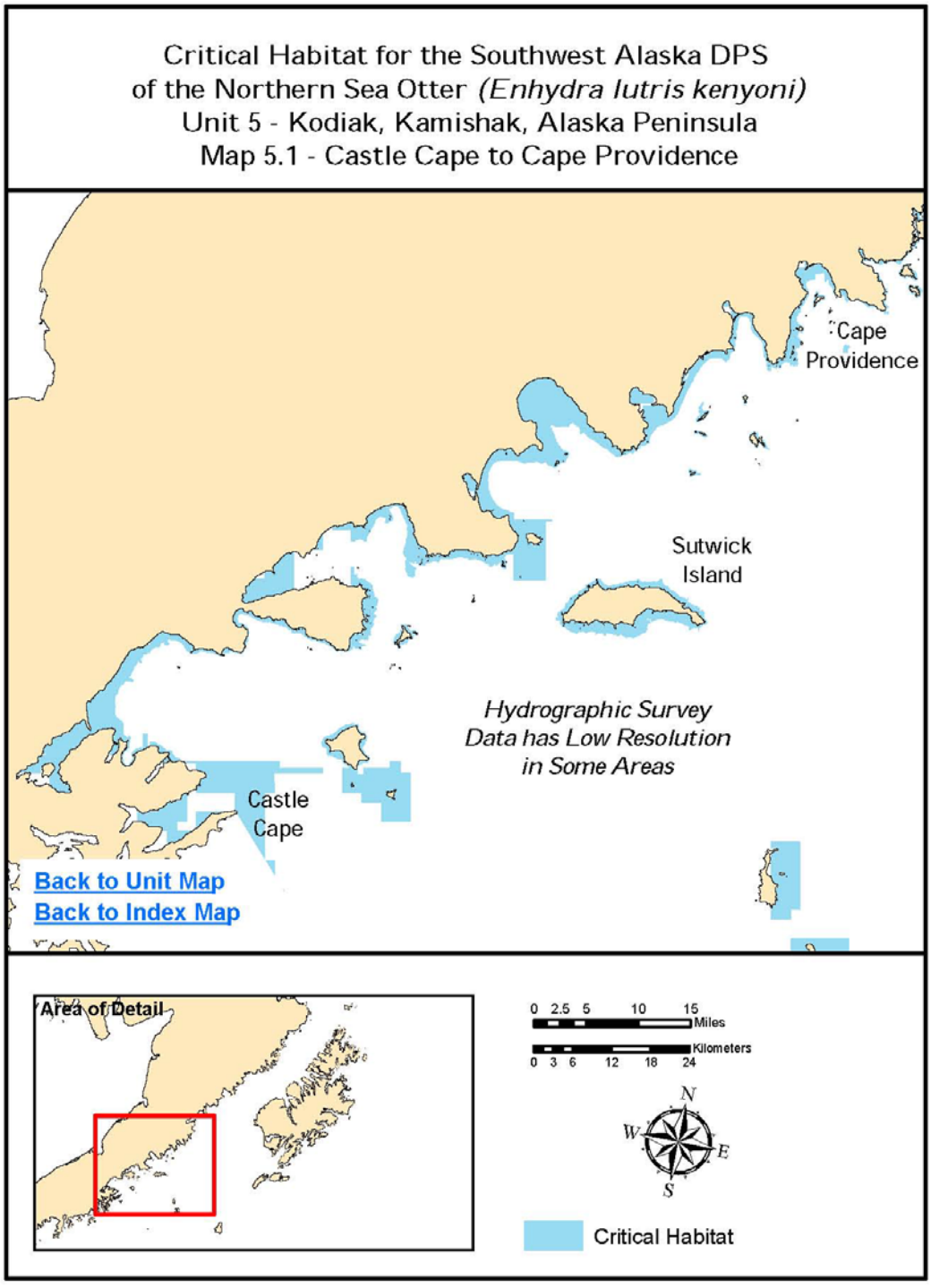
Steller's eider critical habitat map:
http://alaska.fws.gov/fisheries/endangered/StellEider_CHMap.htm

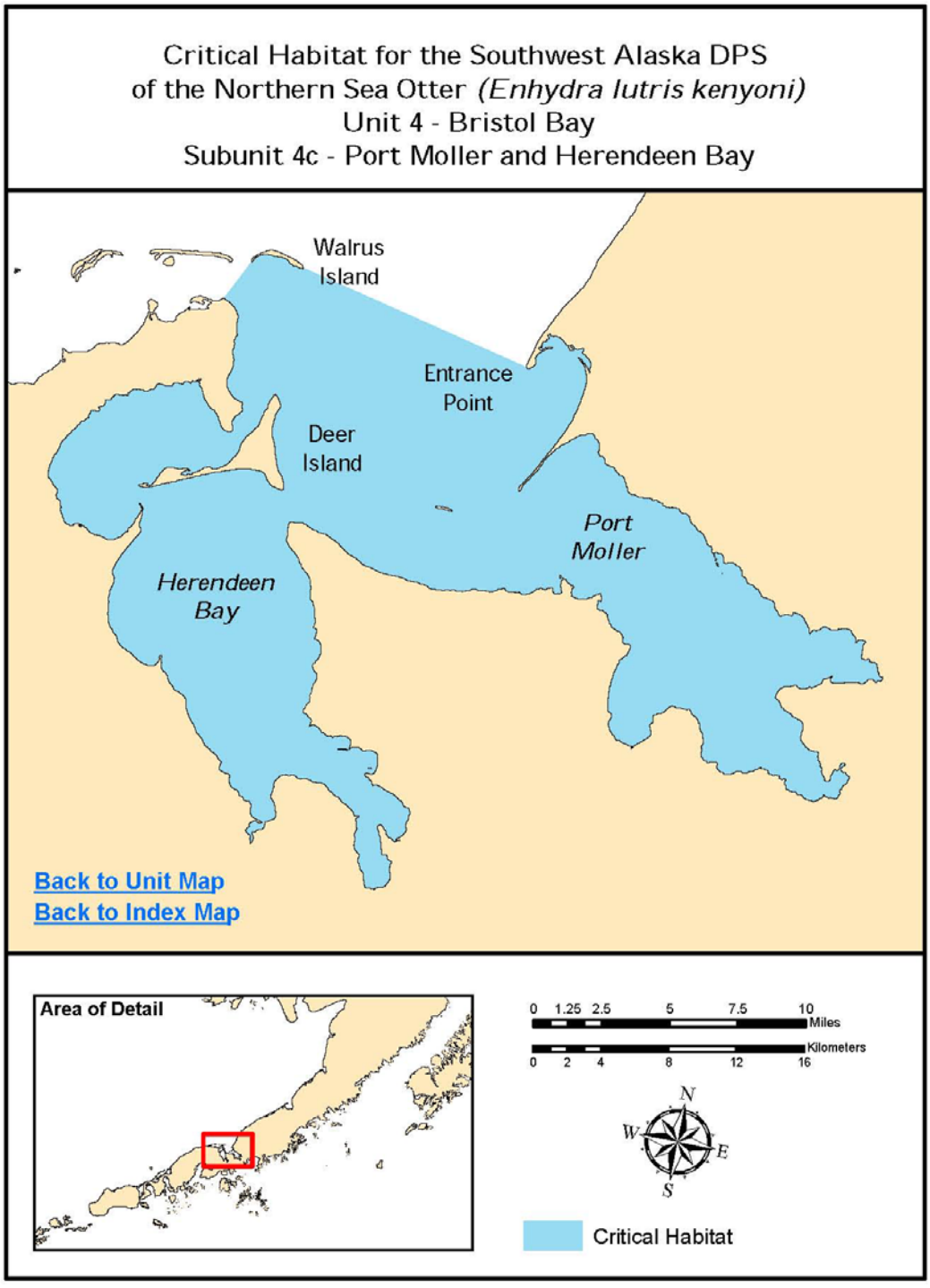
Steller sea lion critical habitat map:
http://alaskafisheries.noaa.gov/protectedresources/stellers/maps/criticalhabitat_map.pdf

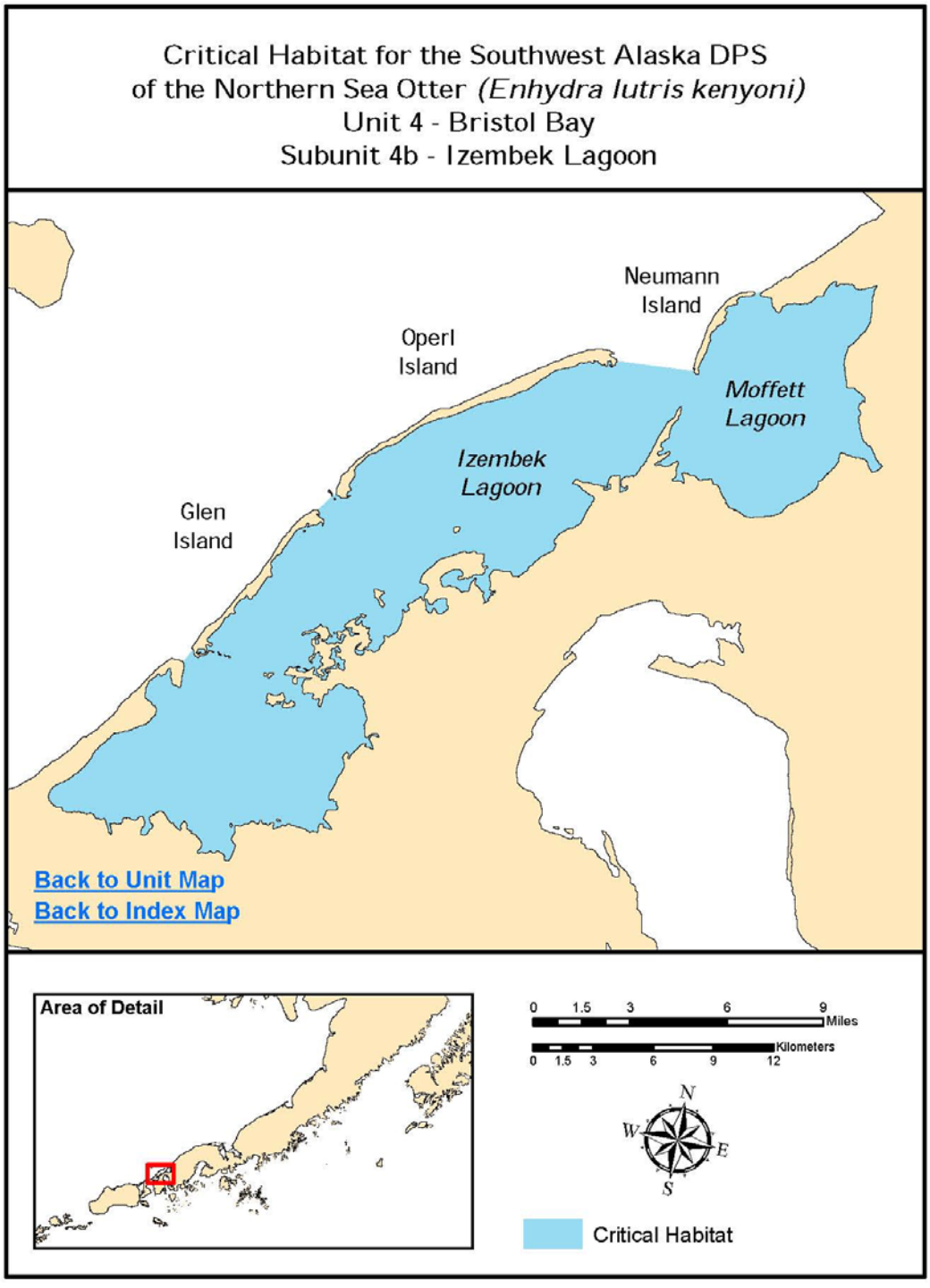
North Pacific right whale critical habitat designation:
http://www.fakr.noaa.gov/frules/73fr19000.pdf

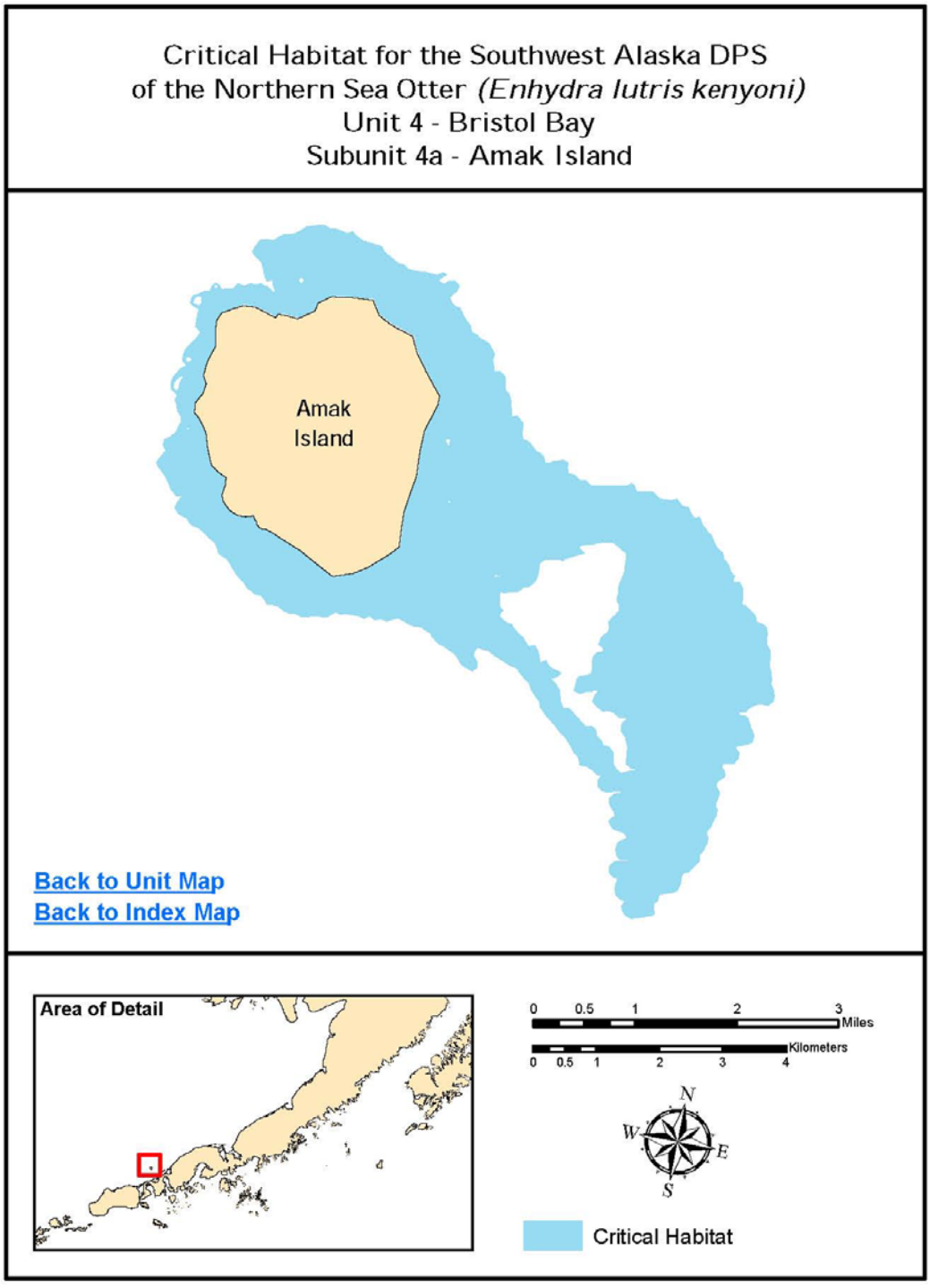
Steller's eiders critical habitat

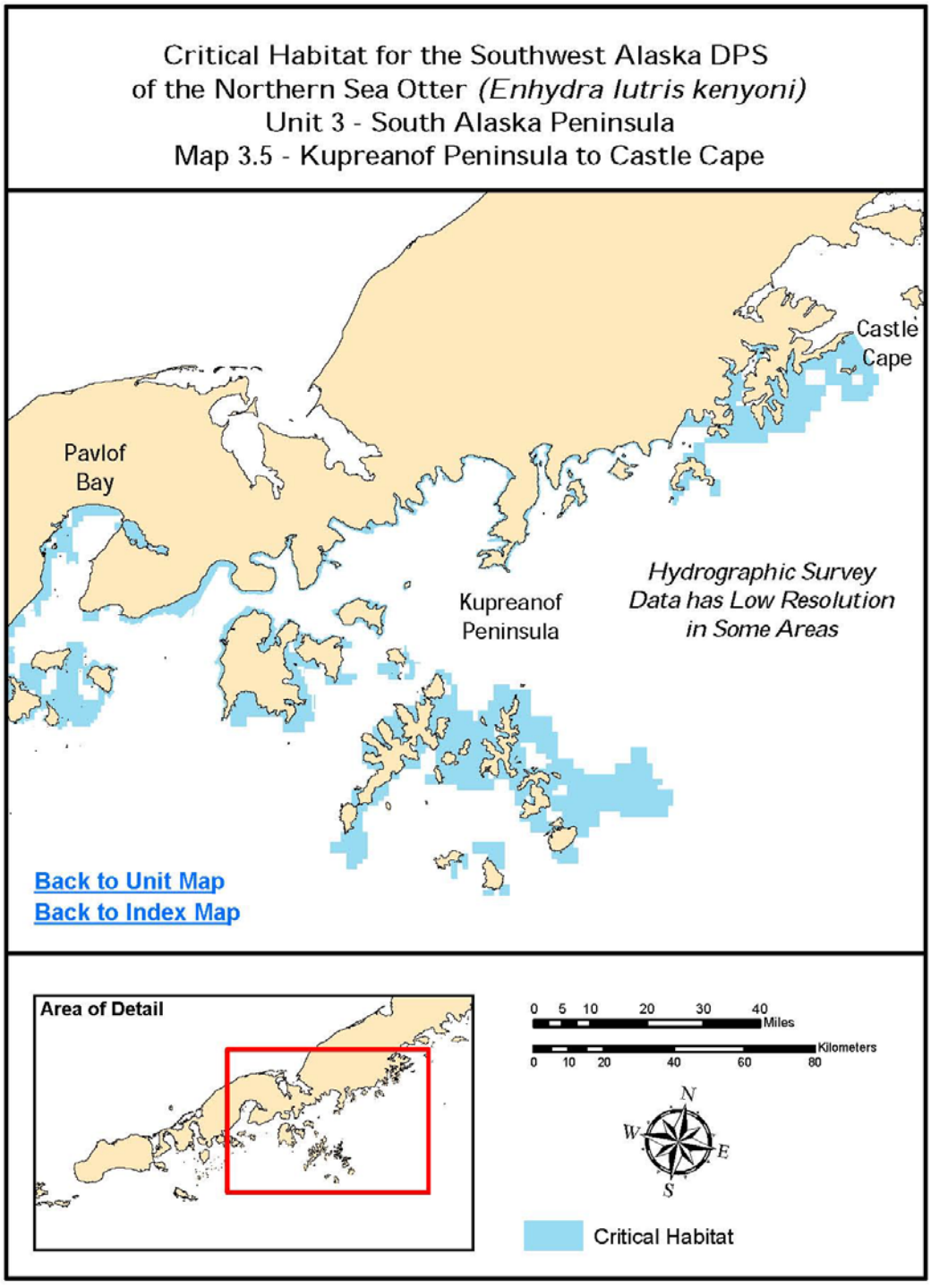



Critical Habitat for the Southwest Alaska DPS
of the Northern Sea Otter (Enhydra lutris kenyoni)
Unit 5 - Kodiak, Kamishak, Alaska Peninsula
Map 5.1 - Castle Cape to Cape Providence
Cape
Providence
Sutwick
Island
Hydrographic Survey
Data has Low Resolution
in Some Areas
Castle
Cape
Back to Unit Map
Back to Index Map
Area of Detail
0 2.5 5 10 15
Miles
0 3 6 12 18 24
Kilometers
N
W
E
S
Critical Habitat


Critical Habitat for the Southwest Alaska DPS
of the Northern Sea Otter (Enhydra lutris kenyoni)
Unit 4 - Bristol Bay
Subunit 4c - Port Moller and Herendeen Bay
Walrus Island
Entrance Point
Deer Island
Port Moller
Herendeen Bay
Back to Unit Map
Back to Index Map
Area of Detail
0 1.25 2.5 5 7.5 10
Miles
0 2 4 8 12 16
Kilometers
N
W
E
S
Critical Habitat


Critical Habitat for the Southwest Alaska DPS
of the Northern Sea Otter (Enhydra lutris kenyoni)
Unit 4 - Bristol Bay
Subunit 4b - Izembek Lagoon
Neumann Island
Operl Island
Moffett Lagoon
Izembek Lagoon
Glen Island
Back to Unit Map
Back to Index Map
Area of Detail
0 1.5 3 6 9 Miles
0 1.5 3 6 9 12 Kilometers
N
W
E
S
Critical Habitat

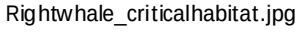

Critical Habitat for the Southwest Alaska DPS
of the Northern Sea Otter (Enhydra lutris kenyoni)
Unit 4 - Bristol Bay
Subunit 4a - Amak Island
Amak
Island
Back to Unit Map
Back to Index Map
Area of Detail
0 0.5 1 2 3 Miles
0 0.5 1 2 3 4 Kilometers
N
W
E
S
Critical Habitat


Critical Habitat for the Southwest Alaska DPS
of the Northern Sea Otter (Enhydra lutris kenyoni)
Unit 3 - South Alaska Peninsula
Map 3.5 - Kupreanof Peninsula to Castle Cape
Castle Cape
Pavlof Bay
Kupreanof Peninsula
Hydrographic Survey Data has Low Resolution in Some Areas
Back to Unit Map
Back to Index Map
Area of Detail
0 5 10 20 30 40 Miles
0 10 20 40 60 80 Kilometers
N
W
E
S
Critical Habitat

Insert Steller sea lion critical habitat map for Western and Southcentral Alaska

http://alaskafisheries.noaa.gov/protectedresources/stellers/maps/criticalhabitat_map.pdf

Northern Pacific right whale critical habitat map



2. Fish and Wildlife

(a) Fish

ESSENTIAL FISH HABITAT (EFH)

In 1996 Congress added new habitat provisions to the Magnuson-Stevens Fishery Conservation and Management Act, the federal law that governs U.S. marine fisheries management. Under the Magnuson-Stevens Act, each fishery management plan must describe and identify EFH for the fishery, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. Federal agencies must consult with the National Marine Fisheries Service on any action they authorize, fund, or undertake that may adversely affect EFH, and the National Marine Fisheries Service must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH. Reference information for EFH in the subarea as identified by the National Marine Fisheries Service, can be found on their internet site at:

http://alaskafisheries.noaa.gov/habitat/efh.htm .

An additional EFH resource is their interactive mapping internet site:

http://mapping.fakr.noaa.gov/Website/EFH/viewer.htm?simple

FINFISH

The Alaska Department of Fish and Game Anadromous Waters Catalog Maps may be found at the following web site:

http://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=maps.selectMap&Region=ARC

Additional information on anadromous fish may be found at:

http://gis.sf.adfg.state.ak.us/FlexMaps/FishResourceMonitor.html

The waters of this subarea are among the most productive in the world. Major freshwater systems of the region include the Nushagak/Mulchatna, Kvichak, Togiak, Naknek, Egegik, Ugashik, Cinder, Meshik, and Chignik river systems. Most of the flowing waters and many of the lakes support populations of anadromous or resident species of fish. Lagoons and estuarine areas are important rearing and overwintering areas for anadromous fish. River deltas are particularly important areas for fish throughout the year. Shallow lakes, oxbows, and seasonally-flooded wetlands connected to streams or rivers may support fish during the summer but may freeze to the bottom in winter. If the depth of the water exceeds that of the seasonal ice thickness, fish may be found in a particular waterbody year-round. Deep lakes and rivers, and spring-fed stream systems serve as overwintering areas for fish in the Bristol Bay subarea.

Arctic Grayling are found in most clear-water streams of drainages of Bristol Bay south to the Mother Goose Lake-King Salmon River drainage; grayling do not occur on the south side of the peninsula. Large grayling are found in the Ugashik, Becharof, Nuyakuk and Togiak river drainages. Arctic grayling spawn in May and June, typically in unsilted rapid-runoff streams and lake inlets and outlets; fry emerge by early June. Grayling commonly overwinter in deep, large rivers or lakes, or in smaller streams if adequate water

quality and flow exists throughout the winter.

Arctic Char/Dolly Varden are widely distributed throughout the Bristol Bay subarea; important drainages include the Togiak River and Wood River Lakes, the Naknek River and lake, and the Becharof and Ugashik rivers. Migration of anadromous char from overwintering areas to marine feeding areas occurs from April to June. Fish return to freshwater spawning and overwintering areas from July through December. Char spawn from August through December; fry emerge in April and May. Char typically overwinter in lakes.

Rainbow Trout and Steelhead inhabit all major Bristol Bay drainages north of Becharof Lake-Egegik River. Rainbow trout are primarily found in the Kvichak watershed below Six-Mile lake and in the Naknek watershed; they also occur in the Wood and Nushagak river systems, but they are not found in the Egegik or Ugashik Rivers. Steelhead (anadromous) are found in a few streams in the Bristol Bay Region, including the King Salmon River on the north side of the Alaska Peninsula, and the Chignik River and stream that drains into Ivanof Bay on the south side of the peninsula. Rainbow trout generally spawn during May and June, and fry emerge by July. Steelhead generally spawn between March and May, and fry emerge during July.

Salmon. Chinook, coho, sockeye, pink, and chum salmon occur within the subarea. The most significant drainages for salmon in the region include the Nushagak, Kvichak, Naknek, Egegik, Ugashik, Meshik, and Chignik. The six major river systems of Bristol Bay are home to the largest commercial sockeye salmon fishery in the world. Adult salmon are present in freshwater from mid March through early October, depending on the species of salmon and the stream system. Salmon eggs incubate in the stream gravels over the winter; fry emerge from stream gravels from mid March through early June. Chinook, sockeye, and coho fry remain in fresh water from one to four years before migrating to sea.

Pacific Herring spawning concentration areas occur along the south side of the Alaska Peninsula in a number of small bays; the largest concentrations are found in Amber and Aniakchak Bays. On the south side of the Alaska Peninsula, spawning occurs from late April to mid June. In Bristol Bay, herring spawn in numerous rocky bays from Nushagak Bay to Cape Newenham, as well as along Hagemeister, Summit, High and Crooked Islands and Asigyukpak Spit, from late April through July. The major herring concentration that occurs in the Togiak area each spring is the focus of two commercial fisheries (sac roe and spawn on kelp harvests). Spawning occurs in intertidal and subtidal areas; kelp or eelgrass are typically the preferred spawning substrates. Herring south of the Alaska Peninsula characteristically move offshore to feed after spawning. In Bristol Bay, they migrate south along the north shore of the Alaska Peninsula through at least mid-summer and possibly later. Herring in both areas usually migrate to deeper waters during winter.

Capelin. Infrequently harvested, capelin are nevertheless important forage fish for higher trophic predators such as seabirds and marine mammals because of their high oil content. Capelin spawn on sandy to small gravel beaches on both sides of the Alaska Peninsula and Bristol Bay, typically from May through July, but inconsistently in timing, location, and numbers from year to year. Capelin are infrequently repeat spawners. Much of their life history in this area is unknown.

Other Forage Fish. Numerous species of fish inhabit the nearshore area and these populations are often dominated by sand lance and rainbow smelt which may comprise 40% of the nearshore fish by number. Sand lance is one of the most important forge fish in the subarea. Rainbow smelt, well as being forage fish, is an important subsistence food (to several thousand pounds per community). These anadromous fish are often seen in the vicinity of spawning herring in the spring in northern Bristol Bay with some estimates at over 1,000 tons of fish. Particularly good runs have been reported from Togiak and Nushagak Rivers after ice-out.

Halibut. Little information is available for nearshore areas of Bristol Bay or the north shore of the Alaska Peninsula. Halibut follow salmon into the shallow waters of the mouths of the salmon's natal streams along the south shore of the Alaska Peninsula from June through August.

Groundfish. Some Pacific cod and pollock spawn near the south shore of the Alaska Peninsula in April and May and their larvae may be susceptible to oil contamination at that time. Yellow fin sole, after pollock, are the most abundant fish in the Bering Sea with a biomass of several million metric tons. They migrate to the nearshore areas in April and May to spawn. Juveniles stay in the nearshore area for 3 to 5 years.

SHELLFISH

Dungeness Crabs are found from the intertidal region to a depth of 230 m. Dungeness crabs are most common on sand or muddy-sand bottoms in the subtidal region, and are often found in or near eelgrass beds. However, they can also be found on a number of other substrata including various mixtures of silt, sand, pebble, cobble, and shell. Juvenile Dungeness crabs are found in similar habitats to adults, but they generally occupy shallower depths than adults. Juvenile crabs can be very abundant in the intertidal zone, but also occur in shallow subtidal areas. Survival of young crabs is greatest in habitats such as intertidal shell and eelgrass beds, where they can gain refuge from predators. In the Bristol Bay subarea, Dungeness crabs are found on the south side of the Alaska Peninsula only, and are generally distributed with a notable concentration in Castle Bay.

Red King Crab larvae generally exhibit a diel movement being most abundant in the upper water column during the day and deeper at night. Young of the year crab occur at depth of 50 m or less. They are solitary and need high relief habitat or coarse substrate such as boulders, cobble, shell hash, and living substrates such as bryozoans and stalked ascidians. Between the ages of two and four years, there is a decreasing reliance on habitat and a tendency for the crab to form pods consisting of thousands of crabs. Podding generally continues until four years of age (about 6.5 cm), when the crab move to deeper water and join adults in the spring migration to shallow water for spawning. Adult red king crab occur to a depth of 365 m; preferred habitat for reproduction is water less than 90 m. Red king crab are widely distributed south of the Alaska Peninsula. They move into waters of less than 10 fathoms from about mid-February to June 1 to mate and molt with concentrations in Castle, Chignik, Hook and Mitrofania Bays. Red king crab also occur north of the peninsula; however, no notable concentrations have been reported.

Tanner Crab larvae are strong swimmers and perform diel vertical migrations in the water column (down at night). They usually stay near the depth of the chlorophyll maximum during the day. The length of time larvae take to develop is unknown, although it has been estimated at only 12 to 14 days. After settling to the bottom, Tanner crabs are widely distributed at depths up to 473 m. South of the Alaska Peninsula, areas with concentrations of tanner crabs include Ivanof Bay, Mitrofania Island, Kuiukta Bay and Chignik Bay. Greatest numbers are found in depths of 100-200 m. North of the peninsula, tanner crabs are distributed along the continental shelf edge. Females are known to form high density mating aggregations consisting of hundreds of crabs per mound. The mounds likely form in the same general location each year, but the location of the mounds is largely undocumented.

Shrimp. Along the south side of the Alaska Peninsula, Pandalid shrimp (northern pink shrimp, humpy/flexed shrimp, spot shrimp/prawn, coonstripe shrimp, and sidestripe/giant red shrimp) are distributed throughout most major bays and certain nearshore and offshore areas; areas with shrimp concentrations include Chignik Bay, Kujulik Bay, Mitrofania Island, Ivanof Bay, and Nakalilok Bay. Following a regime shift in the late 1970□s most of these populations were reduced to relict status. Pandalid shrimp also occur in Bristol Bay; no specific concentration areas have been noted.

Razor Clams. On the south side of the Alaska Peninsula, razor clams are found intertidally to a depth of several meters on exposed beaches consisting of fine or coarse sand with some glacial silt or gravel. Yantarni Bay is among the locations with productive clam beaches. On the north side of the Alaska Peninsula, an extensive clam bed of mixed species extends from Port Moller to Ugashik Bay. Kulukak Bay is a good source for cockle clams.

(b) Birds

Ducks begin arriving in the Bristol Bay subarea in early April and continue to arrive through the end of May, although most ducks have arrived by mid May. Nesting begins in mid May; most eggs hatch from mid June through mid July. Broods are reared on lakes, ponds, flooded wetlands, coastal lagoons, and rivers. Some ducks begin molting in mid June, most during July, and a few are still in molt condition in early September. Large numbers of scoter and oldsquaw leave the tundra in mid July to molt at sea, often near estuaries. Scaup, goldeneye, and other divers molt largely on inland lakes. Important feeding and fall staging areas for ducks include river deltas, lagoons, salt marshes, mudflats, and coastal tundra areas. Some ducks begin their fall migration in August, although most leave the mainland areas by late September or early October. Diving ducks, particularly oldsquaw and scoter, winter along the Bristol Bay coast. Steller's and king eiders winter in the region; Steller's eiders also congregate on the north side of the peninsula during spring before migrating north to nesting grounds. In addition, a resident population of common eiders is found in the region. Dabbling ducks found in the Bristol Bay subarea include northern pintails, mallards, American wigeons, green-winged teal, and northern shovelers.

Geese. Canada and white-fronted geese and brant nest, molt and stage along lakes, coastal lagoons, wetlands, and rivers within the subarea. Snow and emperor geese stage within the region during spring and fall migrations, but do not breed there. Birds arrive from early April through mid May; nest, molt, and rear young from mid May through the end of August; and undertake fall staging and migration during September through October. Staging areas are usually associated with productive estuaries, river deltas, lagoons, marshes, and tidelands. Particularly important staging areas include the Naknek River Delta, Ugashik Bay, the Cinder River lagoon, Egegik Bay, the Seal Islands, and Pilot Point.

Swans. The Bristol Bay subarea supports the second largest tundra swan breeding population in Alaska. Swans arrive in the region from April to May. Swans begin nesting around mid May, and eggs hatch from mid-to-late June. Important swan nesting habitat includes the Pilot Point and Ugashik areas. Molting occurs from mid July through late August. Young swans are unable to fly until September. Fall staging and migration occurs in September and October. The Naknek River supports a particularly high density of swans, particularly during spring.

For more information on waterfowl in Alaska, see the U.S. Fish and Wildlife Service web site at: http://alaska.fws.gov/mbsp/mbm/waterfowl/waterfowl.htm

Bald Eagles are distributed throughout the Bristol Bay subarea. Bald eagles nest along rivers, lakes, and the coastline. Nesting is concentrated along the south side of the Alaska Peninsula and begins in late March and runs through May. Young eagles fledge from early July through late August. Feeding areas include sea beaches and rock coastlines, freshwater anadromous fish streams and lakes, and terrestrial habitats. Bald eagles are opportunistic feeders, scavenging various forms of carrion and/or preying upon fish, small mammals or birds.

Other Raptors occurring in the subarea include golden eagles; osprey; gyrfalcon; peregrine and other falcons; goshawks and other hawks; and owls. Golden eagles, peregrine falcons, gyrfalcons, and rough-legged hawks nest on coastal or inland cliffs, bluffs, or other steep terrain. Snowy and short-eared owls

nest on the tundra. Hawks and other owls commonly use woodlands, forests, and forested wetland areas for nesting. Prime feeding areas for many raptors include wetlands containing waterfowl, seabirds, shorebirds, and other small birds. For more information on landbirds and raptors, see the U.S. Fish and Wildlife Service web site at: http://alaska.fws.gov/mbsp/mbm/landbirds/landbirds.htm

Seabird nesting colonies are found throughout the subarea. Common breeders include cormorants, murres, auklets, puffins, and kittiwakes; the majority of nesting seabirds are murres. Large nesting colonies occur in the Walrus Islands; smaller colonies occur at scattered locations along the region's rocky coastline. Seabirds arrive at breeding colonies in April, nest and rear chicks from May through mid August, and continue to occupy the colonies through September. Some birds remain in the area until the formation of sea ice forces them to more southerly areas. A large scattered population of gulls and terns also nest in widely-scattered locations along lowland coastal habitat throughout the coastal portion of the subarea.

The Alaskan Seabird Colony Catalog is an automated database that contains the distributions of breeding seabirds and the relative size of all the colonies in Alaska. The data reports indicating estimated species composition and numbers for seabird colonies of the subarea are summarized from the catalog. The maps display colony locations. The Catalog is maintained by the U.S. Fish and Wildlife Service. Access the web site at: http://alaska.fws.gov/mbsp/mbm/northpacificseabirds/colonies/default.htm

Shorebirds (sandpipers, plovers, phalaropes) arrive in the region beginning in mid May, using most of areas identified as concentration areas for waterfowl. They begin nesting on tundra wetland habitat by mid June. Most eggs hatch from late June to mid July. Shorebirds congregate along the barrier islands, coastal lagoons, bays, salt marshes, river deltas, and mudflats from mid July through September to feed before beginning their fall migration in August or September (some may begin their fall migration in July).

(c) Marine Mammals

For more information on seals, see the National Marine Fisheries Service web site at: http://www.fakr.noaa.gov/protectedresources/seals/default.htm

Ringed Seals are associated with ice most of the year returning to nearshore areas in late fall and early winter as the shorefast ice reforms. Most ringed seal pups are born in March or April in birthing lairs constructed on shorefast ice with adequate snow cover. The seal pups remain in the lairs for four to six weeks until they are weaned. Ringed seals molt on shorefast ice and on large flat ice flows in the pack from late March until July, with peak molting occurring in June.

Bearded Seals are associated primarily with the pack ice, and in association with leads, flaws, and polynyas. Consequently, their movements are directly related to the advance and retreat of sea ice and so are not found as frequently in nearshore waters as are spotted or harbor seals. Pupping occurs from mid-March to early May. Molting occurs in May and June.

Spotted Seals are found in Bristol Bay waters year-round. They are associated with the sea ice-front in winter and have pups, breed, and molt there. Pupping occurs in April and May. Molting occurs from May until mid-July. Spotted seals move toward the coast as the sea ice melts, and feed in nearshore during the ice-free months. Spotted seals are known to occasionally haul out, inter-mixed with harbor seals, in northern Bristol Bay at sites such as Nanvak Bay and as far south as the mouth of the Kvichak River. Nanvak Bay is, generally, considered the southern extent of spotted seal land use. They move out of the coastal zone when the shorefast ice begins to form in late fall.

Harbor Seals are found in nearshore waters throughout the subarea. Harbor seals tend to concentrate in estuaries and protected waters. Habitats used for haulouts include cobble and sand beaches, tidal mud

flats, offshore rocks and reefs, and ice (frozen heads of bays, in fjords, etc.) when available; on the northern coast of the Alaska Peninsula, seals concentrate on shoals and sandbars exposed during low tides primarily in estuaries. Harbor seals enter lakes and rivers on a seasonal basis. Iliamna Lake appears to support one of the few freshwater populations of harbor seals in the world. Known seal haulouts occur throughout the Bristol Bay subarea. Major haulout locations include the Seal Islands, Port Heiden, Port Moller, Cinder River, Egegik and Ugashik bays, off-shore sandbars near the mouth of the Kvichak River, Izembek Lagoon and nearby off-shore sandbars. Walrus, Round and Haggemeister islands represent the northern extent of harbor seals within the sub area. Haulouts are used for pupping, molting, and resting, and may be used year-round; peak haulout use occurs during June through early October. Pupping occurs between late May and early July; most pups are born during the first three weeks of June.

Northern Fur Seals are primarily pelagic, coming ashore only to breed and pup. The fur seal pelagic distribution in the subarea includes waters on the south side of the Alaska Peninsula; no known rookeries are found in this region.

Walrus. In winter walruses are associated with active ice. During years with extensive ice, walruses may be widely distributed and numerous in Bristol Bay; when ice cover is light, relatively few walruses may be found in the area. Walruses, primarily females and juveniles, follow the receding ice edge north begin migrating north beginning in late March or April. Virtually all walruses that remain in Bristol Bay during the summer are males. Bristol Bay Region terrestrial haulouts used by males during summer include Cape Seniavin, Port Moller, and Walrus Islands. Round Island, a part of the Walrus Islands State Game Sanctuary, is the center of abundance for walruses summering in Bristol Bay, and it is used throughout the summer by 8,000 to 12,000 bulls. Cape Pierce and Cape Newenham (Togiak National Wildlife Refuge) are also significant terrestrial haulouts--during May-October, up to 7,000 animals may be there.

The Steller Sea Lion population that occurs within the Bristol Bay subarea is part of the population segment (classified in 1997 as endangered under the Endangered Species Act. Sea lions are found along the south side of the Alaska Peninsula and along the north side of the peninsula as far northeast as Cape Seniavin. There are no reported haulouts in southern and eastern Bristol Bay, but sea lions are common throughout northwestern Bristol Bay. There are two major Steller sea lion haulouts in northern Bristol Bay area that are designated as critical habitat under the ESA: Round Island, part of the Walrus Islands at 58°36'N, 159°58'W, and Cape Newenham at 58°39'N, 162°10.5'W. Critical habitat includes a terrestrial zone that extends 3000 feet (0.9 km) landward and an aquatic zone that extends 20 nm (37 km) seaward from the base point surrounding the terrestrial site. Pupping occurs from late May to early July, with most pups being born during June. During May through August, territorial breeding behavior occurs on the rookeries, but there are no rookeries on the north side of the Alaska Peninsula.

Northern fur seals inhabit the eastern Bering Sea during their breeding season in summer and early fall (May-October). They breed on the Pribilof Islands and on Bogoslof Island in Alaska do not generally haul-out on land in the Bristol Bay subarea. However, some foraging trips of Pribilof fur seals could extend into the Bristol Bay subarea.

Beluga Whales are present along north side of the Alaska Peninsula from late March to freeze-up. During late March through May, belugas concentrate in the mouth of the Naknek River, feeding on smelt, and moving upriver with spring breakup. Several weeks later, they move to the mouth of the Kvichak River to feed on outmigrating sockeye salmon smolt; other rivers where concentrations of belugas have been observed include the Snake River, Igushik River, Wood River, and Nushagak River. Calving occurs between June and August; belugas are distributed throughout the Kvichak and Nushagak Bays during this period. Belugas remain in inner Bristol Bay through the summer; and may ascend rivers as far as King Salmon on the Naknek River, Portage Creek on the Nushagak River, and Levelock on the Kvichak River. They to move offshore in October.

Insert seabird summary map here (page 1 of 1)

http://www.asgdc.state.ak.us/maps/cplans/bristol/bb3seabird.pdf

Other Whales. From Unimak Pass, migrating gray whales follow the northern Alaska Peninsula coast up to Egegik Bay, then head towards Nunivak and St. Lawrence Islands during spring. Gray whales have been observed feeding near the Walrus Islands. Harbor and Dall's porpoises and killer whales are found year-round on the south side of the Alaska Peninsula, and during the summer on the north side of the peninsula. Minke whales may be found throughout the Bristol Bay Region during summer. Humpback whales are present in the marine waters north and south of the Alaska Peninsula, while fin whales occur in the waters south of the Alaska Peninsula and north of the Bristol Bay area. For more information on whales, see the National Marine Fisheries Service web site at: http://www.fakr.noaa.gov/protectedresources/whales/default.htm

Sea Otters are generally found in shallow (<40 m) nearshore waters of the open coast. Along the north side of Alaska Peninsula, sea otter concentrations are greater in areas westward of the subarea, such as Port Moller, Amak Island, Izembek Lagoon and Bechevin Bay. The eastern limit of the sea otter range fluctuates depending on the severity of winter sea ice conditions. Port Heiden has the furthest eastward concentration of sea otters, however low densities may be observed as far east as Egegik Bay. Two consecutive winters of heavy ice conditions resulted in sea otters concentrating in the Port Heiden area, with many hauled out on land. Local residents reported 200-300 sea otters in the vicinity of Port Heiden during the Fall of 1999, and approximately 70 sea otters were observed in Port Heiden Bay during March 1999 by a U.S. Geological Survey biologist (USFWS, USGS unpublished information). Sea otters are also found along the south side of the Alaska Peninsula, with highest concentrations of otters occurring at Kujulik and Hallo Bays. Scattered individuals may also be found at other locations along the Peninsula in other parts of the subarea. Breeding can occur year round.

(d) Terrestrial Mammals

Caribou. Two distinct caribou herds use habitat within the Bristol Bay subarea, the Mulchatna and the Northern Alaska Peninsula herds. The Mulchatna herd ranges east of the Nushagak River and north of Lake Iliamna. The Northern Peninsula herd ranges between the Naknek River and Port Moller. Calving occurs from mid May to early June. On the Alaska Peninsula, calving occurs on the coastal plain between Port Moller and Cinder River, frequently associated with areas of extensive wet sedge marshes. The Mulchatna herd generally calves in the upper Mulchatna and Chilikadrotna drainages, north of Lake Clark, and the upper Nushagak drainage. Summer habitat is primarily treeless uplands where heath tundra, alpine tundra, and sedge wetlands predominate. Winter habitat includes spruce forests and poorly drained coastal plains where sedges are abundant. Lowlands between Becharof Lake and the Naknek River are important wintering grounds for the Northern Peninsula herd; lowlands north of the Kvichak River and west and north of Iliamna Lake are used by the Mulchatna herd during winter.

Moose occur in habitats throughout much of the Bristol Bay subarea, ranging from aquatic and riparian floodplains to sub-alpine willow-dominated areas. Sedge meadows, ponds and lakes with extensive aquatic vegetation, riparian and subalpine willow stands, and forested areas provide important summer habitat for moose. Important winter habitat includes shrub-dominated alpine and riparian areas, and forested areas. Riparian areas along the major rivers and tributary streams are particularly important during winter. Calving occurs in late May and early June, frequently in isolated marshy lowlands.

Brown Bears are distributed throughout the Bristol Bay subarea. During spring, concentrations of bears may be found along the beaches, grass flats, sedge meadows, and saltwater wetlands of the Alaska Peninsula coastal plain. Bear concentrations may also be found along rivers when spawning salmon are present. Brown bears enter dens beginning in late October, with most bears denned by mid December. Bears emerge from their dens as early as mid March, depending on weather conditions.

Wolves and Foxes are found throughout the subarea. Wolves and foxes select den sites where unfrozen,

well-drained soils occur (e.g., dunes, river banks, moraines, pingos). Wolves may initiate den construction in mid-April. Pups are born from mid May through early June, and generally leave the den by mid July, although dens may be occupied until August. Red foxes have a reproductive pattern similar to that of wolves.

Dall Sheep are found in Lake Clark National Park and Preserve. Sheep often are concentrated during winter on windblown slopes and ridges along major river valleys. During summer, sheep disperse to smaller valleys, mountain peaks, and other areas. Mineral licks are important habitat that sheep use primarily from late May through mid July, although sheep may be seen at these sites from April through October. Lambing occurs from mid May through mid June.

Aquatic Furbearers such as beaver, mink, and river otter are common inhabitants of aquatic and riparian floodplain and wetland areas, including marshes, ponds, lakes, streams, and rivers.

For more information on terrestrial mammals, see the Alaska Department of Fish and Game web site at: http://www.adfg.alaska.gov/index.cfm?adfg=animals.listmammals

3. Vegetation

Rare plant species are identified below, as documented by the Alaska Natural Heritage Program. The map on the following page identifies the general locations of these rare plants.

RARE PLANTS KNOWN FROM THE BRISTOL BAY SUBAREA

Global Rank	State Rank	Scientific Name	Common Name	Federal Status
G5	S1	*Catabrosa Aquatica*	Brook Grass	
G2G3	S2S3	*Douglasia Alaskana*	Alaska Rock Jasmine	
G3G4	S3	*Papaver Alboroseum*	Pale Poppy	
G3	S2S3	*Primula Tschuktschorum*	Chukchi Primrose	
G3	S3	*Rumex Beringensis*		
G2	S2	*Smelowskia Pyriformis*		
G3Q	S3	*Taraxacum Carneocoloratum*	Pink-Flower Dandelion	
G3	S3	*Thlaspi Arcticum*	Arctic Pennycress	

Species Ranks used by The Alaska Natural Heritage Program:

Species Global Rankings

G1: Critically imperiled globally. (typically 5 or fewer occurrences)
G2: Imperiled globally. (6-20 occurrences)
G3: Rare or uncommon globally. (21-100 occurrence
G4: Apparently secure globally, but cause for long-term concern (usually more than 100 occurrences)
G5: Demonstrably secure globally.
G#G#: Rank of species uncertain, best described as a range between the two ranks.
G#Q: Taxonomically questionable.
G#T#: Global rank of species and global rank of the described variety or subspecies of the species.

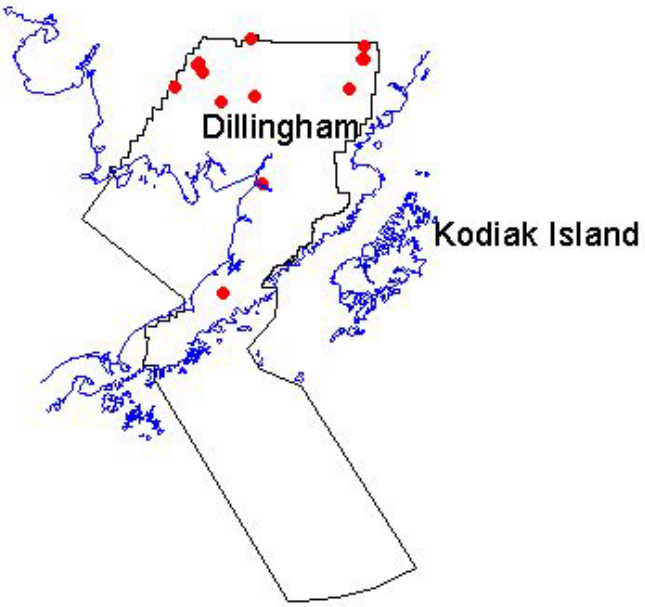
Species State Rankings

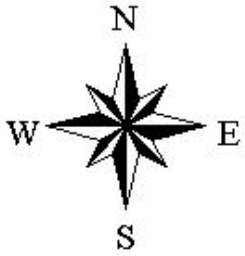
S1: Critically imperiled in state. (usually 5 or fewer occurrences)
S2: Imperiled in state. (6-20 occurrences)
S3: Rare or uncommon in state. (21-100 occurrences)
S4: Apparently secure in state, but cause for long-term concern (usually more than 100 occurrences)
S5: Demonstrably secure in state.
S#S#: State rank of species uncertain, best described as a range between the two ranks.

To view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/rareplants.jpg

Known Rare Plant Locations for the Bristol Bay Subarea Contingency Plan





Source Data : University of Alaska
Alaska Natural Heritage Program
Biological Conservation Database

D. HUMAN USE RESOURCES

1. *Fish Hatcheries and Associated Ocean Net Pens*

There are no fish hatcheries operating in the subarea.

2. Aquaculture Sites

There are no aquaculture sites in the subarea.

3. Historic Properties

The subarea contains a multitude of known and unidentified archaeological and historic sites. Oil spills and hazardous substance releases may result in direct and/or indirect impacts to those cultural resources. Federal On-Scene Coordinators are responsible for ensuring that response actions take the protection of cultural resources into account and that the statutory requirements for protecting cultural resources are met. Annex M of the *Unified Plan* outlines Federal On-Scene Coordinator responsibilities for protecting cultural resources and provides an expedited process for compliance with Section 106 of the National Historic Preservation Act during the emergency phase of a response.

4. Subsistence and Personal Use Harvest

Subsistence-related uses of natural resources play an important role in the economy and culture of many communities in the subarea. A subsistence economy may be defined as follows:

> ...an economy in which the customary and traditional uses of fish, wildlife, and plant resources contribute substantially to the social, cultural, and economic welfare of families in the form of food, clothing, transportation, and handicrafts. Sharing of resources, kinship-based production, small scale technology, and the dissemination of information about subsistence across generational lines are additional characteristics.

Before 1990, the State of Alaska made all decisions regarding the management of subsistence resources and harvest allocation. In 1990, however, the Federal government became responsible for assuring a Federal subsistence priority on Federal public lands, and in 1999 on Federal reserved waters. The Federal Subsistence Board adopts regulations which are administered by the various Federal agencies on Federal public lands. State regulations still apply on all lands, and the State is still the manager of fish and wildlife on all lands and waters in Alaska. As a consequence, the number of agencies involved in managing subsistence uses has increased. Therefore, in the event of a spill, extensive coordination will be required in order to address subsistence resources. Regulations regarding subsistence harvest can also be expected to undergo further regular modification. Current information on harvest regulations can be obtained from the Alaska Department of Fish and Game, Subsistence Division at Anchorage or Dillingham; and the U.S. Fish and Wildlife Service, Office of Subsistence Management at Anchorage at: http://alaska.fws.gov/asm/index.cfml.

5. Commercial Fishing

The five species of salmon found in the Bristol Bay subarea are the focus of major commercial harvests. Bristol Bay is world renowned for sockeye salmon production. In addition, the Togiak herring fishery is the largest in Alaska.

The following figures provide seasonal information on the major commercial fisheries. It must be remembered, however, that all fishing seasons are subject to emergency openings and closures and that most seasons are only open for a portion of the time specified in the regulations. Also, fishing regulations and seasons can change from year to year. Specific information on which species are being harvested may be obtained from the Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development at either Anchorage or Kodiak.

Maps of key commercial fishing areas are available in the previously referenced Alaska Department of Fish and Game publications, the Alaska Habitat Management Guide Reference Maps, Southwest Region, Vol. III and the Alaska Habitat Management Guide, Southwest Region Map Atlas. As fishing periods are adjusted yearly by emergency openings and closures, contact Alaska Department of Fish and Game for current fishing periods. Updated information may be found at their Commercial Fisheries web site: http://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercial.main

The following groups can be contacted with requests for specific information on the location and timing of fish runs as well as local current conditions. Although the primary function of these organizations is not to provide such information, the individual members will be quite knowledgeable about environmental conditions and will often be willing to share information.

Organization	Phone
Alaska Indep. Fishermen's Marketing Association	206-542-3930
Bering Sea Fisherman's Association	279-6519
Bristol Bay Driftnetters Association	463-4970
Bristol Bay Herring Marketing Cooperative	842-2386
Bristol Bay Native Association	842-5257
Bristol Bay Native Corporation	278-3602
Kvichak Setnetters Association	277-0187
Setnetters Association of Bristol Bay	272-4114

6. Sport Fishing and Hunting

Sport fishing and hunting occurs at a wide variety of locations in the subarea throughout the year. Seasons and harvest regulations vary depending on the species and the area, and may be changed from year to year. Contact the Alaska Department of Fish and Game for current seasons within the subarea. There are many commercial and private fishing and hunting lodges in the subarea. Updated information may be found at their Sport Fish web site: http://www.adfg.alaska.gov/index.cfm?adfg=fishingSport.main

7. Recreational Sites and Facilities

Wood-Tikchik State Park, Dillingham
: Primitive back country recreation and boating, 5 commercial lodges are in the park

Katmai National Park and Preserve, King Salmon
: Brooks Camp on Naknek Lake (bear viewing), several commercial lodges in King salmon

Lake Clark National Park and Preserve, Port Alsworth
: Primitive back country recreation, several commercial lodges at Port Alsworth

Nushagak and Mulchatna Rivers
: River rafting, camping, sport fishing

Alaganak Wild River
: Sport fishing and recreation

8. Commercial Tourism

The travel to the subarea is dictated by seasonal changes--the majority of the tourism occurs in the summer months. For additional information contact:

Alaska Office of Tourism Development	465-2012
Alaska State Chamber of Commerce	586-2323
Alaska Native Tourism Council	274-5400
Alaska Wilderness Recreation & Tourism Assoc.	463-3038

9. Marinas and Ports

(See the Resources Section)

10. Fish Processing

The seafood processing companies with permits from the Alaska Department of Environmental Conservation are listed on the web pages below. See also: http://alaska.state.gegov.com/alaska/seafood_listing.cfm

Retort Processors (Cannery): Processors approved to produce shelf-stable, non-refrigerated seafood product in cans, jars, or retort plastic pouches.

Land-based Processors: Processors approved to produce fresh, frozen, salted, or formulated seafood products at a land based facility.

Vessel Processors: Processors approved to produce fresh, frozen, salted, or formulated seafood products onboard a large floating vessel facility.

Direct Market Fishing Vessels: Processors approved to produce fresh and frozen seafood products of their own catch onboard a small floating boat facility.

Shellfish Dealers: Processors approved to grow, harvest, or buy shellstock (oysters, clams, or mussels) and can pack the shellstock or shuck and pack the shellfish (without shell) for sale.

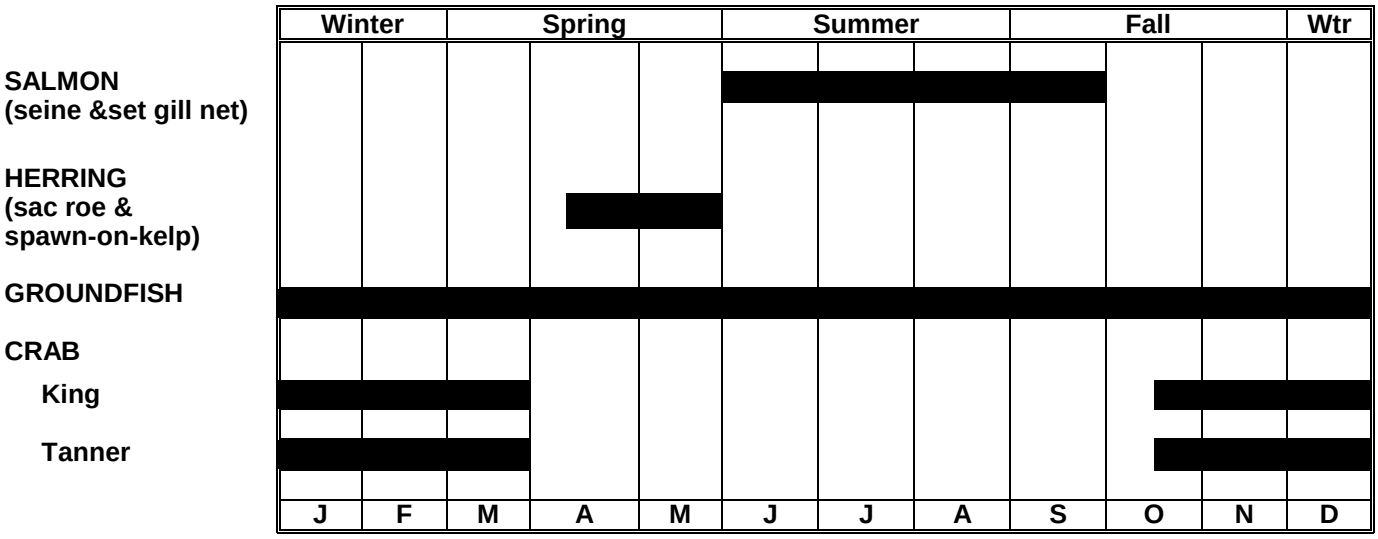
Shellfish Harvesters: Harvests shellstock and delivers to processor or shipper.

Geoduck Dive Vessel: A vessel approved by the Department for the harvest of geoducks.

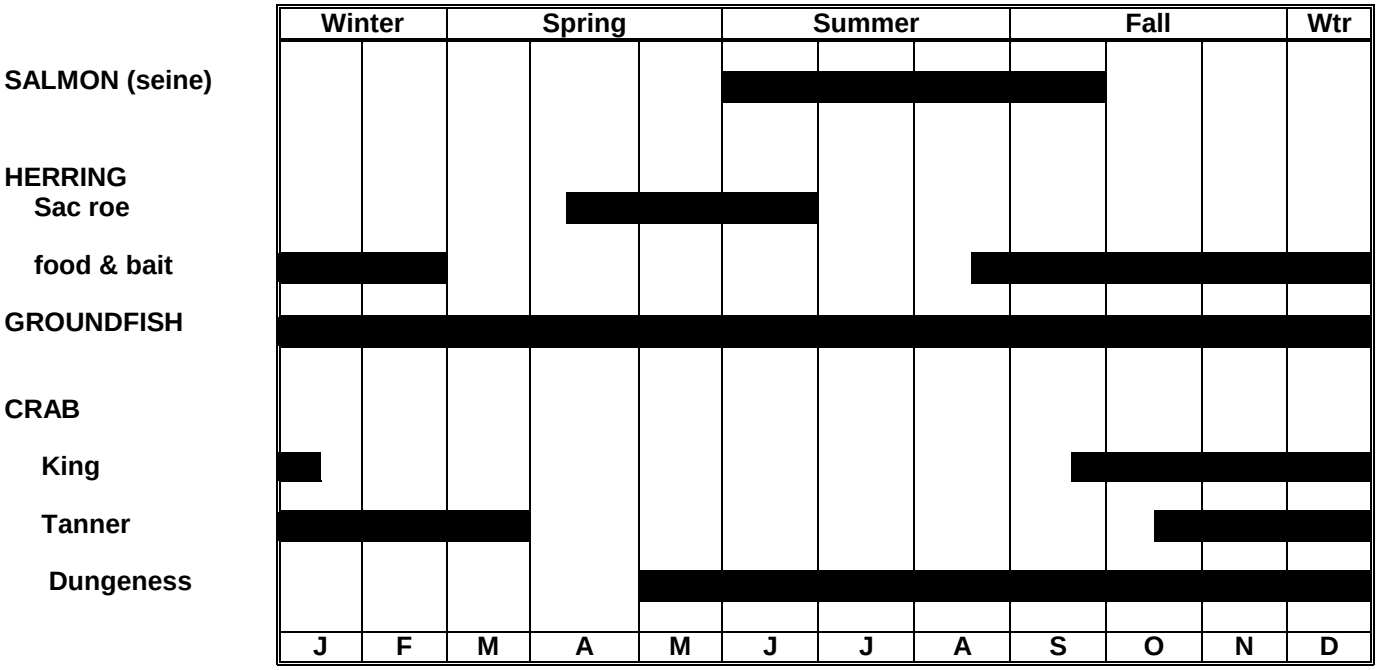
11. Logging Facilities

There are no commercial logging operations in the subarea.

COMMERCIAL FISHING SEASONS: BRISTOL BAY*



COMMERCIAL FISHING SEASONS: CHIGNIK*



*Times are approximate

12. Water Intake/Use

The following information was generated by the Alaska Department of Environmental Conservation. Included are permitted water use facilities by index number, facility name, and facility location. The Alaska Division of Water's web site is: http://dec.alaska.gov/water/index.htm

Name of System	Location	State ID No.	Source
Aleknagik Mission Lodge	Aleknagik	262536	Well
SWSD Aleknagik School	Aleknagik	261185	Well
Chignik Bay #2	Chignik	262296	Well
Chignik Bay WS #1	Chignik Bay	260228	Well
Chignik Lagoon Water System	Chignik Lagoon	261444	Well
Chignik Lake Water System	Chignik Lake	261096	Well
L&PSD Chignik Lake School	Chignik Lake	262555	Well
Clarks Point			
BBAHC Kanakanak Hospital	Dillingham	261282	Well
Bernie S/D Lots	Dillingham	261389	Well
Bingman Apts	Dillingham	261460	Well
Crystal Creek Lodge	Dillingham	262400	Well
Dillingham Water System	Dillingham	260197	Well
Golden Horn Lodge	Dillingham	261931	Well
Ricardos of Dilligham	Dillingham	262571	Well
Tikchik Narrow Lodge	Dillingham	261648	Well
Clark's Fish Co.	Egegik	262023	Well
Egegik	Egegik	262238	Well
Ekuk			
SWSD Ekwok School	Ekwok	260171	Well
Igiugig Water System	Igiugig	260812	Well
Iliamna Lake Resort &condos	Iliamna	261410	Well
Rainbow King Lodge	Iliamna	261606	Well
Ivanof Bay	Ivanof Bay	261502	Well
L&PSD Kakhonak School	Kakhonak	260406	Well
Bristol Bay Contractors Well	King Salmon	262636	Well
Eddies Fireplace Inn	King Salmon	261486	Well
FAA King Salmon East Housing	King Salmon	261305	Well
International Seafoods	King Salmon	262678	Well
Katmai Fishing Lodge	King Salmon	262107	Well
USFWS AK Pen Becharof NWR	King Salmon	261517	Well
USNPS Brooks Camp	King Salmon	260553	Well
Koliganek Water System	Koliganek	260040	Well
L&PSD Levelock School	Levelock	260082	Well
Manokotak Heights	Manokotak	262246	Well
Manokitak Water System	Manokotak	260090	Well
Alaska Commercial	Naknek	262686	Well
BBBSD Naknek	Naknek	260464	Well
Bristol Bay Boro. Bldg.	Naknek	261583	Well
Bristol Bay Boro. Dock	Naknek	261591	Well
Camai Health Clinic	Naknek	261981	Well
D&D Restaurant	Naknek	262660	Well
Fisherman's Bar	Naknek	262068	Well

Naknek Village Council HUD	Naknek	261004	Well
Paug Vik Inc. Inlet Salmon	Naknek	262705	Well
Paug Vik King Salmon West	Naknek	260422	Well
Red Dog Inn	Naknek	260749	Well
L&PSD School Newhalen	Newhalen	260634	Well
Newhalen	Newhalen	260066	Well
Nondalton	Nondalton	260260	Ground
L&PSD School Pedro Bay	Pedro Bay	260642	Well
Perryville Water System	Perryville	260359	Surface
Pilot Point			
Portage Creek			
Port Alsworth			
L&PSD School Port Heiden	Port Heiden	260676	Well
BBBSD South Naknek	South Naknek	260472	Well
South Naknek Water System	South Naknek	260333	Well
Togiak	Togiak	260325	Well
Twin Hills Water System	Twin Hills	260032	Well
Ugashik			

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SENSITIVE AREAS: PART FIVE – LAND MANAGEMENT

A. LAND MANAGEMENT DESIGNATIONS

1. Access to Lands

Land ownership must be determined and landowners contacted to evaluate incident-specific protection priorities, obtain land-use permitting requirements, and obtain permission to access lands. Native corporation lands, as well as local, State, and Federal government lands often require special use permits. If an incident affects private lands or Native Allotments, permission to enter lands should be sought from the landowner. The local Borough government is often the best source of private land ownership records.

2. State

The State of Alaska owns the majority of tide and submerged lands within the state. Tide and submerged lands and those areas located between the mean high tide line and three miles distance offshore. Submerged lands are those located beneath the line of ordinary high water along navigable water bodies. The Alaska State Legislature has classified certain areas as being essential to wildlife and fisheries resources. These areas are designated as a Game Refuge, Critical Habitat Area, or Game Sanctuary. Other designated lands are State Parks or Forests.

The following four State critical habitat areas may be located at the web page:
http://www.adfg.alaska.gov/index.cfm?adfg=bristolbay.main

Port Heiden State Critical Habitat Area was established in 1972 to protect fish and wildlife habitat, particularly that of waterfowl. Spring, fall, and molting concentrations of waterfowl occur in this area and brown bear concentrations occur during both spring and summer (along spawning streams). A harbor seal haulout area is also found in Port Heiden. The area is managed by the Alaska Department of Fish and Game.

Cinder River State Critical Habitat Area was established in 1972 to protect fish and wildlife habitat, particularly that of waterfowl. Spring, fall, and molting concentrations of waterfowl occur in this area, as do brown bear spring concentrations. Harbor seals haul out at the mouth of the Cinder River. The area is managed by the Alaska Department of Fish and Game.

Egegik State Critical Habitat Area was established in 1972 to protect fish and wildlife habitat, particularly that of waterfowl. Spring, fall, and molting concentrations of waterfowl occur in this area, as do brown bear spring concentrations. A harbor seal haulout area is located at the in Egegik Bay. The area is managed by the Alaska Department of Fish and Game.

Pilot Point State Critical Habitat Area was established in 1972 to protect fish and wildlife habitat, particularly that of waterfowl. Spring, fall, and molting concentrations of waterfowl occur in this area, as do brown bear spring concentrations. A harbor seal haulout area is located in Ugashik Bay. The area is managed by the Alaska Department of Fish and Game.

Walrus Islands State Game Sanctuary, a group of seven small islands in Bristol Bay, was established in 1960 to protect walruses and other game. Best known among the Walrus Islands is Round Island, where each summer 8,000 to 12,000 male walruses haul out on exposed rocky beaches; in addition, the island hosts the Sanctuary's largest haulout concentration of Steller sea lions (600-700 animals). Also, hundreds of thousands of seabirds nest on the islands each summer. The area is managed by the Alaska Department

of Fish and Game. Web page: http://www.adfg.alaska.gov/index.cfm?adfg=walrusislands.main

Wood -Tikchik State Park, the largest state park in the nation, at 1.6 million acres, was created in 1978 for the purpose of protecting the area's fish and wildlife breeding and support systems and preserving continued subsistence and recreational activities. The management philosophy is one of non-development and maintenance of the area's wilderness character. Park facilities are rustic and few, with great emphasis placed upon low impact camping and "pack it in, pack it out" practices. Access is by air from Dillingham. All 5 species of pacific salmon spawn here. Moose, caribou, brown bear and small game/furbearers are present. Many birds nest and/or migrate through the area. The Park is managed by the Alaska Department of Natural Resources. Web page: http://dnr.alaska.gov/parks/units/woodtik.htm

3. Federal

Togiak National Wildlife Refuge Managed by the U.S. Fish and Wildlife Service, the Refuge encompasses about 4.3 million acres of land between Kuskokwim Bay and Bristol Bay in southwestern Alaska. The refuge is bordered on the north by the Yukon Delta National Wildlife Refuge. Five species of salmon and several species of resident fish occur in the streams and lakes of the refuge. Over 30 species of mammals are present, including brown and black bear, moose, caribou, wolves, and wolverine. Sea lions, walrus, and harbor seal inhabit coastal areas. The refuge's coastal lakes, bays, and wetlands also are heavily used by migrating waterfowl in spring and fall. Seabirds occupy rugged coastal cliffs along the refuge's coastline. Web page: http://alaska.fws.gov/nwr/togiak/index.htm

Alaska Maritime National Wildlife Refuge Managed by the U.S. Fish and Wildlife Service, the Refuge consists of over 2,400 islands, headlands, rocks, islets, spires, and reefs along the Alaskan coast, stretching from Southeast Alaska to Cape Lisburne on the Chukchi Sea. The Refuge is synonymous with seabirds. About 75 percent of Alaska's marine birds (15 to 30 million of 55 species) use the Refuge. The Refuge also is home to thousands of sea lions, seals, walrus, and sea otters. Wildlife viewing, photography and backpacking are primary uses. Web page: http://alaska.fws.gov/nwr/akmar/index.htm

Alaska Peninsula National Wildlife Refuge The Refuge lies on the Pacific side of the Alaska Peninsula and covers about 3.5 million acres. The landscape includes active volcanoes along the Aleutian Range, lakes, rivers, tundra, and rugged coastline. Moose, caribou, wolves, brown bears, and wolverines reside on the refuge. Sea lions, seals, sea otters (about 30,000), and whales live in the marine environment. Ducks, geese, and shorebirds also thrive in the area, as do several species of fish. Big game hunting and sport fishing are popular uses of the Refuge. The Refuge was established in 1980 and is managed by the U.S. Fish and Wildlife Service. Web page: http://alaska.fws.gov/nwr/akpen/index.htm

Becharof National Wildlife Refuge Managed by the U.S. Fish and Wildlife Service, the Refuge was established in 1980. The Refuge covers 1.2 million acres, and is dominated by Becharof Lake, the second largest lake in Alaska. The lake is surrounded by low rolling hills, tundra, wetlands, and volcanic peaks. Salmon spawning streams attract one of the largest brown bear populations in the state. Moose, caribou, wolves, wolverines, fox, and beaver are abundant. Sea otters, sea lions, harbor seals, and whales, inhabit the marine environment. The Refuge is a major source of salmon, grayling, and arctic char. Waterfowl are common, as are eagles, peregrine falcons, and thousands of seabirds. Big game hunting and sport fishing are primary visitor uses. Web page: http://alaska.fws.gov/nwr/becharof/index.htm

Aniakchak National Monument and Preserve The Monument and Preserve was initially created as a unit of the National Park System in 1978; it was subsequently designated as a Monument and Preserve in 1980. The Monument includes Aniakchak caldera, one of the largest calderas on the Alaska Peninsula. Terrestrial mammals that inhabit the Monument and Preserve include moose, caribou, brown bears, wolves, beaver, and fox. Marine mammals which may be found along the coast include sea otters, harbor

seals, and sea lions. Bald eagles nest and feed in the Monument and Preserve, and large numbers of waterfowl and shorebirds migrate through or nest in the area. Salmon and arctic char are among the fish species supported by the fresh and salt waters of the area. Aniakchak is managed by the National Park Service. Web page: http://www.nps.gov/ania/index.htm

Katmai National Park and Preserve Managed by the National Park Service, the Park and Preserve cover approximately 4 million acres on the Alaska Peninsula. Katmai was established in 1918 as a National Monument, and was expanded and re-designated in 1980. In 1912 Mount Katmai exploded, creating the Valley of Ten Thousand Smokes. The area supports significant populations of salmon as well as providing for trophy sport fishing (e.g. rainbow trout). The park supports the largest protected population of brown bears in North America; other terrestrial mammals include moose, caribou, wolves, lynx, wolverines, fox, and beaver. Waterfowl, shorebirds, and bald eagles are relatively common. In addition, the Park's coastal environment supports seabird colonies, and marine mammals such as sea otters, harbor seals, and sea lions. The Alagnak Wild River heads in Kukaklek and Nonvianuk lakes in Katmai National Park and Preserve. Web page: http://www.nps.gov/katm/index.htm

Lake Clark National Park and Preserve Managed by the National Park Service, this 4 million acre Park and Preserve was designated in 1980. Terrestrial mammals found within the area include moose, Dall sheep, caribou, black bears, brown bears, wolves, wolverine, fox, beaver, and lynx. Waterfowl, shorebirds, and bald eagles are also supported by the Park and Preserve. Marine mammals found along the coast include harbor seals, sea lions, and beluga whales. Salmon, grayling, rainbow trout, and arctic char are among the fish species supported by the salt and fresh waters of the area. Web page: http://www.nps.gov/lacl/index.htm

B. LAND MANAGEMENT MAPS

The Alaska Department of Natural Resources, under agreement with the Alaska Department of Environmental Conservation, produced digital base and land management maps for each of the subareas using their ARC-INFO based Geographic Information System. The following land management maps provide an index to the Public Land Record and should not be viewed as legal documents. These maps are available on the internet at: http://www.asgdc.state.ak.us/maps/cplans/subareas.html

For more current detailed information on land status, go to the Bureau of Land Management's Spatial Data Management System web site at: http://sdms.ak.blm.gov/isdms/imf.jsp?site=sdms and click on the Generalized Land Status layer.

Insert land management map legend page here - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/base/cover1n3.pdf

Insert land management designation map: Map 1 of 6 - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/BristolMap1of6.pdf

Insert land management designations map: Map 2 of 6 - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/BristolMap2of6.pdf

Insert land management designations map: Map 3 of 6 - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/BristolMap3of6.pdf

Insert land management designations map: Map 4 of 6 - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/BristolMap4of6.pdf

Insert land management designations map: Map 5 of 6 - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/BristolMap5of6.pdf

Insert land management designations map: Map 6 of 6 - to view the map from the ARRT website, please go to the DNR ***Prevention and Emergency Response Subarea Plan Maps*** website located at:

http://www.asgdc.state.ak.us/maps/cplans/bristol/BristolMap6of6.pdf