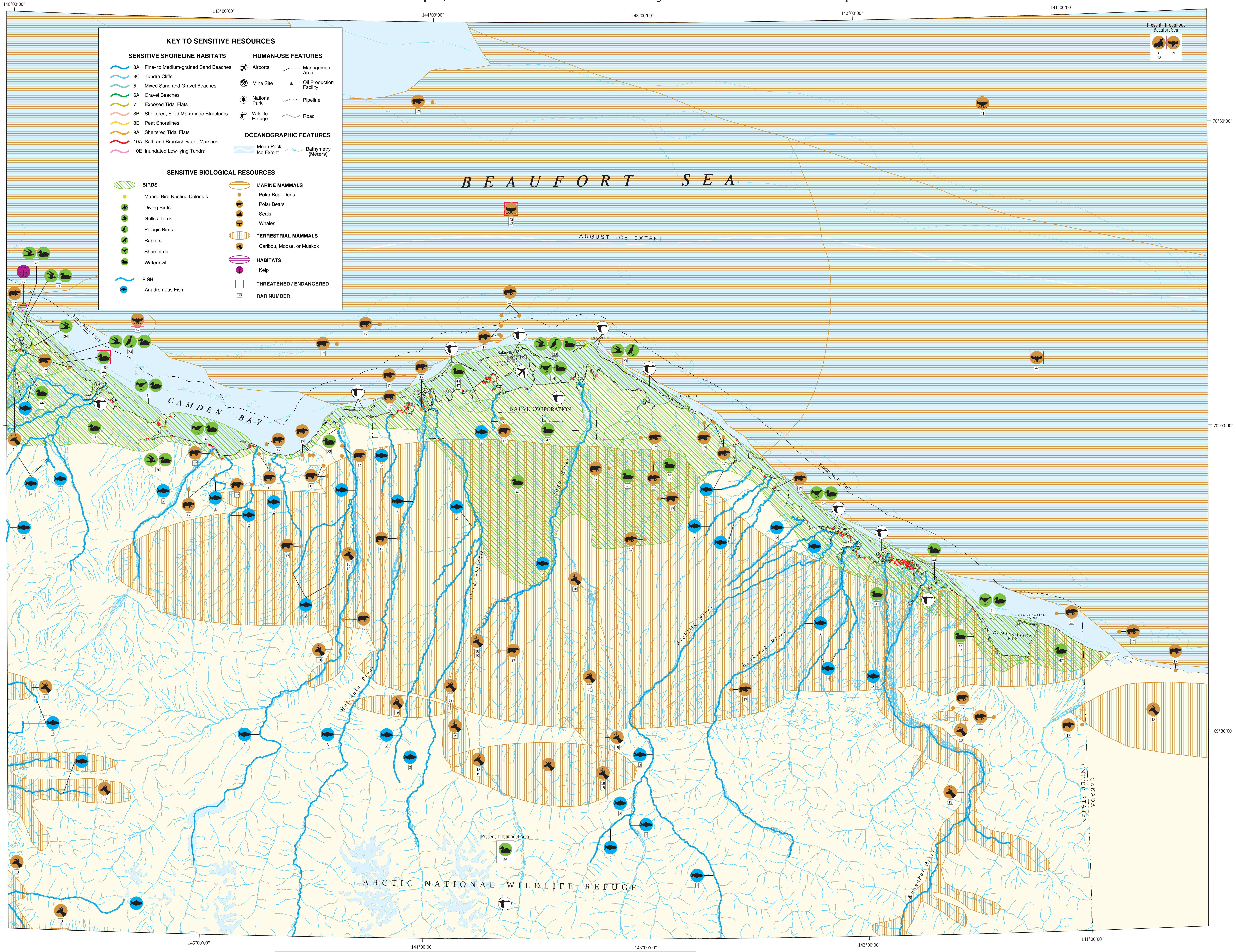
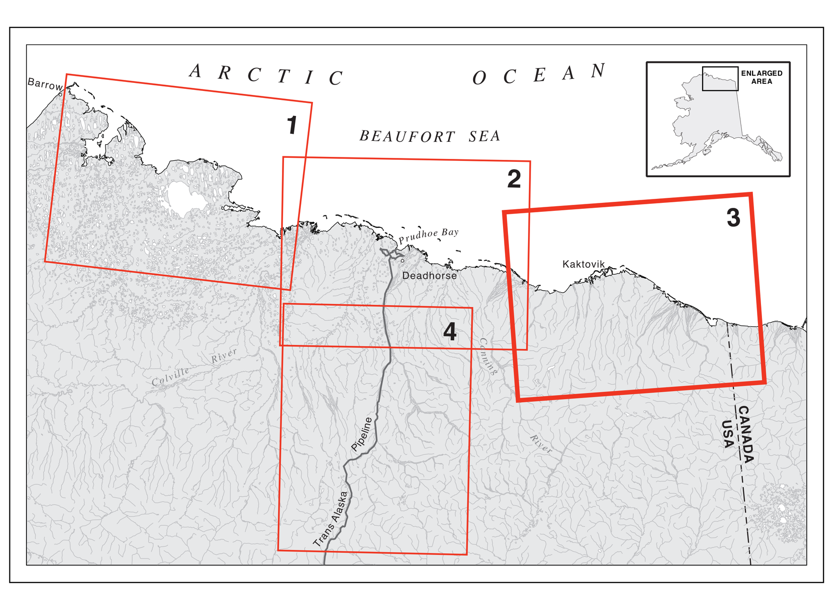
North Slope, Alaska: Environmentally Sensitive Areas Map 3





PURPOSE

This series of maps provides a regional overview of the environmentally sensitive resources of the North Slope of Alaska, from Point Barrow to the Canadian border, that should receive priority protection during oil spill planning and response. The resources depicted on the map were selected on the basis of their high sensitivity and/or vulnerability to spilled oil or of their special management status. Since the North Slope is rich in natural resources, it is not possible to show all the resources that are sensitive to oil on one map set. Species with widespread ubiquitous distributions are not shown. Instead, the maps depict the distribution of sensitive resources that are most at risk from oil spills using the following criteria: (1) are highly concentrated or significant percentage of the population is present; (2) include reproductive activity or early life stages; (3) migratory or other sensitive activities; or (4) have protected species status. What is depicted on the map is not necessarily the extent of the resources, but a representation of where they are most likely to occur.

Two general types of information are present on the maps: infrastructure data and natural resources. Infrastructure includes airfields, roads, managed area boundaries, and oil facilities. The natural resources include shoreline habitats, offshore habitats, ice boundaries, and sensitive biological resources.

DEFINITION OF RESOURCES

The categories of sensitive resources depicted on the maps are defined below.

SHORELINE HABITATS

The shoreline habitats from Canning River to Saktuina Point in Harrison Bay were obtained from BP Exploration (Alaska) Inc., based on overflight mapping conducted by Owens Coastal Consulting (April, 1997). The salt marshes were identified by AeroMap US (west of Arctic NWR to Harrison Bay) and USFWS (in Arctic NWR) based on aerial photos (1:6,000, 1:7,200 and 1:60,000). The remainder of the shorelines have not been classified.

SENSITIVE BIOLOGICAL RESOURCES

Fish

Anadromous fish streams - The streams shown are those which have been classified by Alaska Department of Fish and Game as anadromous streams. The anadromous species include pink salmon, chum salmon, Arctic char (dolly varden), cisco (least and Arctic cisco, broad and humpback whitefish), and Arctic grayling. Spawning starts in August (salmon) and extends through November (Arctic char). The juveniles outmigrate back to the ocean from May through June. Juvenile fish concentrate in shallow nearshore habitats. Because of the potential for higher exposures and increased sensitivity to oil when first entering seawater, these juveniles are especially susceptible to oil impacts.

Birds

Nesting sites are of particular concern due to high concentrations of birds in adjacent waters, contamination of eggs and young by oiled adults and prey, and the potential for disturbance from response activities.

Marine bird nesting sites - Locations are shown where marine birds have been documented as nesting. The nesting colonies range in size from 2 to 518 nests and average around 60 nests. This information was derived from the USFWS database dated January 1997. The USFWS is constantly updating this database, but this region had not been updated as of June 1998.

Waterfowl nesting areas - The vast majority of the North Slope is used by nesting waterfowl. Coastal nesting areas for threatened species and species of special concern (Steller's eider, spectacled eider, king eider, yellow-billed loon, and oldsquaw) are delineated on the map. The waterfowl nesting season is from June through September. The ranges provided for the Steller's eider and spectacled eider are based on a limited number of observations. Other species of waterfowl nesting on the North Slope are northern pintail, greater white-fronted goose, Pacific loon, red-throated loon, scaup, tundra swan, scoter, and snow goose.

Waterfowl molting areas - The coastal waters behind the barrier islands and in the bays are high-concentration molting areas for oldsquaw, common eider, and phalaropes. There may be additional species present in these areas, but data from the coastwide surveys are in the preliminary compilation stages and were not available for this project. The lakes between Teshekpuk Lake and the coast are host to over 30,000 molting geese in July and August. Waterfowl are particularly vulnerable during molting.

Marine Mammals

Ringed seal - Ringed seals are associated with the floating shorefast-ice zone. They use this zone for pupping and breeding, with the pups being born in late March and April. The pups are extremely sensitive to oil contamination for the first 6 to 8 weeks, since their primary insulation is from fur and not from a thick layer of blubber.

Spotted seal - This species is a summer resident of the area. They arrive in the summer and haulout on sandy beaches and spits, and leave before freeze-up in October. There are no pupping activities in the study area.

Bearded seal - This species can generally be found in the deeper waters and is associated with the pack ice. There is very little information on pupping in the study area, though it may occur.

Beluga whale - This whale is found normally in the deeper waters off the continental shelf. In June and July they migrate along the ice leads from the Bering Sea to Canada. The summer concentration areas are east of the study area near the mouth of the Mackenzie River. The fall migration route of the whales follows the continental shelf, even though some whales may be seen closer to shore.

Bowhead whales - These whales are a federally endangered species, and their primary fall migration corridor is in the relatively shallow (20-50 m) waters near the shoreline. Bowhead whales are even sited in many of the bays along the shoreline during the fall migration. They follow the ice leads during both spring and fall migrations.

Polar bears - Polar bears are faithful to a den habitat type but not to a specific location. The point data on the map indicate historic locations of polar bear dens. The exact location of the dens cannot be predicted, since the dens are built into snowdrifts along bluffs or pressure ridges. On the ice, the den locations move from east to west with the floating ice. Only pregnant females den, starting in November and emerge in March or April. During the fall (October to November), polar bear feeding areas are concentrated on the shoreline, on barrier islands, and along the leads in the ice. Once the ocean is frozen over, the bears disperse onto the ice. Cross Island, Oliktok Point, Narwhal Island, Tigvariak Island, and Barter Island are areas where polar bears historically congregate to feed on carcasses.

Terrestrial Mammals

Caribou - Polygons on the map depict the caribou calving areas for three of the four major caribou herds on the North Slope. The caribou usually concentrate within these areas during calving (late May to June) but also may be found in other areas. The entire coastline is an insect-relief zone for the caribou. From mid-June through mid-August, when temperatures warm up and the wind dies down, insects force the caribou to seek refuge in and near the water.

Moose - The Colville River is a winter concentration area for moose. As many as half of the moose present on the western North Slope overwinter along the Colville River.

Habitats

Boulder fields/kelp beds - These areas are of special concern in the Beaufort Sea, since they are the only known areas with a hard substrate. The hard substrate allows the growth of kelp, soft corals, and anemones. As a result, numerous fish and invertebrates are associated with this habitat, prompting the state to classify the boulder fields as a Most Environmentally Sensitive Area.

HUMAN-USE RESOURCES

The maps include other human-use resources and oceanographic features related to oil spill planning and response.

Airports - The airports depicted are all capable of handling small, twin-engine airplanes. Private, as well as public, airports have been included.

Bathymetric contours - Contours for 10, 20, 60, and 200 m are shown. In addition to providing information for dispersant use, the contours correspond to marine mammal distributions and the extent of shorefast ice.

Ice - The ice lines show the average extent of the 50 percent coverage of pack ice by month.

Management areas/parks - The boundaries of national parks, national wildlife refuges, and special management areas such as National Petroleum Reserve - Alaska (NPR-A) are shown.

Native lands - The boundaries of the native corporation lands are shown.

Oil production facilities - Facilities related to oil production, as of November 1998, are depicted, including production wells, transfer facilities, and pumping stations.

Pipelines - The major production pipelines, including the Trans-Alaska Pipeline, are shown.

Roads - All primary and secondary roads are shown.

RESOURCES NOT SHOWN

Archaeological and Historic Sites - Users of these maps should be aware that the maps include the best available, but still incomplete depiction of the highly sensitive resources of the North Slope. Cultural resources are widespread on the North Slope and are not included on these maps. In the case of oil spills, for information on their location and recommended protection strategies, contact the Federal On-Scene Coordinator's Historic Properties Specialist. In other cases, for information on cultural resources contact: State Archaeologist at Alaska Office of History and Archaeology in Anchorage ((907) 269-8721) and/or the Inupiat History, Language and Cultural Commission in Barrow.

Raptor nesting areas - The bluffs along the Colville River are an important nesting habitat for several species of raptors. Golden eagle nests are found in the foothills and mountains of the Brooks Range.

Caribou - General caribou distribution, migration routes, and wintering areas are not shown on the maps. These areas are distributed throughout the North Slope.

Muskoxen - Muskoxen are gradually expanding their range westward on the North Slope. The greater populations are on the eastern edge and in Canada. These animals are present year-round, and do not appear to migrate seasonally.

Coastal Fish - The coastal waters are important habitat and migration routes for Arctic and Bering Cisco, Arctic Cod, and other species of fish.

DATA SOURCES

Nearly all of the information shown on the maps was provided in digital format by Minerals Management Service, Bureau of Land Management, U.S. Fish and Wildlife Service, USGS Biological Resources Division, Alaska Department of Fish and Game, Alaska Department of Natural Resources, and BP Exploration (Alaska) Inc. The data were reviewed and edited in April 1999 by resource managers from these agencies.

ACKNOWLEDGMENTS

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BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S/F	T/E	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Laying	Hatching	Fledging
14	Common eider									X	X	X				-	-	-	-
	Oldsquaw									X	X	X				-	-	-	-
	Phalaropes									X	X	X				-	-	-	-
16	Spectacled eider	F	T						X	X	X	X				JUN-SEP	-	-	-
23	Arctic tern						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Black guillemot						X	X	X	X	X	X	X			APR-OCT	-	-	-
24	Arctic tern						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Sabine's gull						X	X	X	X	X	X	X			APR-OCT	-	-	-
30	Common eider						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Glaucous gull						X	X	X	X	X	X	X			APR-OCT	-	-	-
31	Arctic tern						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Common eider						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Glaucous gull						X	X	X	X	X	X	X			APR-OCT	-	-	-
32	Common eider						X	X	X	X	X	X	X			APR-OCT	-	-	-
33	Arctic tern						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Black guillemot						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Common eider						X	X	X	X	X	X	X			APR-OCT	-	-	-
34	Arctic tern						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Black guillemot						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Common eider						X	X	X	X	X	X	X			APR-OCT	-	-	-
	Glaucous gull						X	X	X	X	X	X	X			APR-OCT	-	-	-
36	Waterfowl							X	X	X	X	X				JUN-JUL	-	-	JUL-SEP
44	Oldsquaw							X	X	X	X	X				JUN-JUL	-	-	JUL-SEP
47	Tundra (whistling) swan							X	X	X	X					MAY-AUG	-	-	-

FISH:

RAR#	Species	S/F	T/E	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
2	Arctic char			X	X	X	X	X	X			X	X	X	X	SEP-NOV	SEP-JUN	SEP-JUN	-	-
3	Arctic char			X	X	X	X	X	X			X	X	X	X	SEP-NOV	SEP-JUN	SEP-JUN	-	-
	Arctic grayling							X	X	X	X	X				MAY-JUN	-	-	-	-
4	Arctic char			X	X	X	X	X	X			X	X	X	X	SEP-NOV	SEP-JUN	SEP-JUN	-	-
	Arctic grayling							X	X	X	X	X				MAY-JUN	-	-	-	-
	Chum salmon (dog)			X	X	X	X	X	X		X	X	X	X	X	AUG-SEP	AUG-JUN	AUG-JUN	-	-
	Cisco			X	X	X	X	X	X			X	X	X	X	SEP-NOV	-	-	-	-
	Pink salmon (humpy)			X	X	X	X	X	X		X	X	X	X	X	AUG-SEP	AUG-JUN	AUG-JUN	-	-

HABITAT:

RAR#	Species	S/F	T/E	J	F	M	A	M	J	J	A	S	O	N	D
12	Kelp			X	X	X	X	X	X	X	X	X	X	X	X

MARINE MAMMAL:

RAR#	Species	S/F	T/E	J	F	M	A	M	J	J	A	S	O	N	D	Mating	Calving	Den/Pupping	Molting
17	Polar bear			X	X	X	X					X	X	X	X	-	-	NOV-APR	-
37	Ringed seal			X	X	X	X	X	X				X	X	X	-	-	MAR-MAY	-
39	Bowhead whale	F	E								X					-	-	-	-
40	Bearded seal									X	X	X	X			-	-	-	-
41	Beluga whale										X	X				-	-	-	-
42	Bowhead whale	F	E									X				-	-	-	-
43	Bowhead whale	F	E										X			-	-	-	-

TERRESTRIAL MAMMAL:

RAR#	Species	S/F	T/E	J	F	M	A	M	J	J	A	S	O	N	D
18	Caribou							X	X						
19	Moose			X	X	X	X	X					X	X	X

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SCALE 1:250000
Albers Equal Area Projection

5 0 5 10 15
NAUTICAL MILES

5 0 5 10 15
MILES

5 0 5 10 15
KILOMETERS