

**NORTHWEST ARCTIC
SUBAREA CONTINGENCY PLAN**

**SENSITIVE AREAS
SECTION**

INTRODUCTION	D-1
PART ONE Initial Contacts	D-3
PART TWO Areas of Environmental Concern	D-7
A. Background/Criteria	D-7
B. Areas of Major Concern	D-8
C. Areas of Moderate Concern	D-9
D. Areas of Lesser Concern	D-9
PART THREE Resource Sensitivity	D-11
PART FOUR Background Information	D-27
Introduction	D-27
Land Management Maps	D-27
A. Land Management Designations	D-37
B. Habitat Types	D-39
C. Biological Resources	D-43
1. Fish and Wildlife	D-43
2. Vegetation	D-55
3. Biologically Sensitive Areas	D-57
D. Human Use Resources	D-65
1. Fish Hatcheries and Associated Ocean Net Pens	D-65
2. Aquaculture Sites	D-65
3. Cultural Resources	D-65
4. Subsistence and Personal Use Harvests	D-65
5. Commercial Fishing	D-66
6. Sport Fishing and Hunting	D-66
7. Commercial Tourism	D-66
8. Recreational Sites and Facilities	D-67
9. Marinas and Ports	D-67
10. Fish Processing	D-67
11. Logging Facilities	D-67
12. Water Intake/Use	D-68
E. Ice, Wind and Currents	D-69
PART FIVE Significant Data Gaps and Information Needs	D-79
PART SIX Key References	D-81
PART SEVEN Areas of Local Concern	D-83
ATTACHMENT ONE Seabird Colony Catalog for Norton Sound and Kotzebue Sound	

(This Page Intentionally Blank)

SENSITIVE AREAS: INTRODUCTION

This section is intended for use by the On-Scene Coordinators 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 the Northwest Arctic subarea. This information is specific to the Northwest Arctic subarea and was compiled by a multi-organization Sensitive Areas Work Group. 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 has developed a series of guidelines (see the Alaska Federal/State Contingency Plan for Response to Oil & Hazardous Substance Discharges/Releases (Unified Plan)) covering the decision processes for: application of dispersants, use of *in situ* burning, and protection of wildlife. Protection of cultural resources will be accomplished by implementation of the *Programmatic Agreement on Protection of Historic Properties during Emergency Response under the National Oil and Hazardous Substances Pollution Contingency Plan*. The National Oceanic and Atmospheric Administration Scientific Support Coordinator has developed a Shoreline Countermeasures Manual which provides helpful information on clean-up options by shoreline type. In addition, Environmental Sensitivity Index maps have been produced that illustrate selected sensitive resources and shoreline types. These guidelines and tools are not duplicated here.

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 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 the subarea 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 field work. 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.

A substantial effort to develop and refine a sensitive areas database was undertaken by Alaska Clean Seas (ACS) and was produced in their Alaskan Bering Sea Coastal Resources Manual, Norton Sound Region. The ACS material was developed with input from Federal, State, and local agencies. This information is incorporated, by reference, into this section (with the permission of ACS).

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>

The joint Federal-State Subarea Contingency Plan for this subarea is scheduled to be updated periodically. Much can be done in these updates to improve the data and its presentation, such as:

- Review and provide updated information for the Alaskan Environmental Sensitivity Index (ESI) maps.
- Enter the sensitive areas and ESI data into a commonly accessible geographic information system (GIS), standard base maps, and verify data quality.
- Complete work identified in Part Five, Significant Data Gaps and Information Needs, to adequately address sensitive areas and resources.
- Establish a continuing interagency mechanism to review, update, and maintain sensitivity information and priorities.
- Fund staff/materials to compile data and prepare materials for presentation in the Subarea Contingency Plans.
- Subdivide the area into smaller geographic areas and identify more specifically sensitive seasonal biological and other resource locations.
- Expand and further detail sensitive resources and initial response tactics for the most likely spill scenarios.

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

Doug Mutter
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
Habitat and Restoration Division
1300 College Road
Fairbanks, Alaska 99701
459-7285
FAX 456-3091
email: jack_winters@fishgame.state.ak.us

SENSITIVE AREAS: PART ONE - INITIAL CONTACTS

[see Table at end of Part One for contact information]

Agency	Resources	Primary Contact	Alternate Contact
FISH and WILDLIFE and HABITAT RESOURCES			
Alaska Department of Fish and Game	fish, shellfish, birds, terrestrial mammals, marine mammals	Jack Winters	Dick Shideler
U.S. Department of the Interior	migratory birds, sea otters, polar bears, walrus, endangered species, anadromous fish in freshwater, bald eagles, wetlands	Pamela Bergmann	Doug Mutter
U.S. Department of Commerce	sea lions, seals, whales, endangered marine species, anadromous fish in marine waters	Michael Payne	Brad Smith
U.S. Department of Agriculture	none in this subarea	none	none
Alaska Natural Heritage Program	rare and endangered plants	Julie Michaelson	Rob Lipkin
CULTURAL and ARCHAEOLOGICAL SITES			
Alaska Office of History and Archaeology	historic sites, archaeological sites, national register sites	Judy Bittner	Joan Dale
U.S. Department of the Interior	archaeological/historical sites in park and wildlife refuge system units, public lands, Native allotments/trust lands; sunken vessels	Pamela Bergmann	Doug Mutter
U.S. Department of Agriculture	none in this subarea	none	none
SHORELINE TYPES			
Scientific Support Coordinator	shoreline types, environmental sensitivity index maps	John Whitney	
LAND OWNERSHIP and CLASSIFICATIONS/DESIGNATIONS			
Alaska Department of Natural Resources	state lands, state parks and recreation areas, state forests, tidelands	Chris Milles	Sam Means
Alaska Department of Fish and Game	state game refuges, state critical habitats	Jack Winters	Dick Shideler
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	Pamela Bergmann	Doug Mutter
U.S. Department of Agriculture	none in this subarea	none	none
U.S. Department of Defense	military installations and reservations	Alaska Command	none
Local Governments: --Northwest Arctic Borough	municipal and private lands, and rights-of-way		

COMMERCIAL HARVEST			
Alaska Department of Fish and Game	fishing permits, seasons	Jack Winters	Dick Shideler
Alaska Department of Natural Resources	tideland leases, logging on private lands	Chris Milles	Sam Means
Alaska Department of Environmental Conservation	seafood processing	Manny Soares	Janice Adair
U.S. Department of Commerce	fishing permits, seasons	Michael Payne	Brad Smith
SUBSISTENCE, PERSONAL, AND SPORT USES			
Alaska Department of Fish and Game	subsistence and personal uses statewide and navigable waters, sport hunting and fishing	Jack Winters	Dick Shideler
U.S. Department of the Interior	subsistence uses on Federal lands and reserved waters; subsistence uses of: sea otters, walrus, polar bears, migratory birds	Pamela Bergmann	Doug Mutter
U.S. Department of Commerce	subsistence use of: whales, porpoises, seals, sea lions	Mike Payne	Brad Smith
RECREATION AND TOURISM USES			
Alaska Department of Natural Resources	State parks and recreation areas, anchorages, boat launches, campgrounds, State public lands	Chris Milles	Sam Means
Alaska Department of Fish and Game	sport hunting and fishing	Jack Winters	Dick Shideler
Alaska Department of Community & Economic Development	seasonal events and activities, travel, outdoor activities, local visitor bureaus, tourism industries	Alaska Division of Tourism	
U.S. Department of Agriculture	none in this subarea	none	none
U.S. Department of the Interior	recreation uses in park and wildlife refuge system units and Federal public lands	Pamela Bergmann	Doug Mutter
WATER INTAKE and USE FACILITIES			
Alaska Department of Environmental Conservation	public drinking water wells, treatment, and storage, fish processing facilities	Cindy Christian	Lee Johnson
Alaska Department of Fish and Game	hatcheries, ocean net pens and release sites, aquaculture	Jack Winters	Dick Shideler
Alaska Department of Natural Resources	tidelands leases, aquaculture sites, private logging camps and log transfer facilities	Chris Milles	Sam Means
U.S. Coast Guard	marinas and docks, mooring buoys	Marine Safety Office, Anchorage	17th District, Juneau
AREAS OF LOCAL CONCERN			
Northwest Arctic Borough	coastal program special areas, plans, policies	Charlie Gregg	
Bering Straits Coastal Resource Service Area City of Nome	coastal program special areas, plans, policies coastal program special areas, plans, policies	Chuck Degnan Randy Romenesko	

CONTACT INFORMATION:

Agency	Primary Contact		Alternate Contact	
	Name	Numbers	Name	Numbers
Alaska Department of Fish and Game	Jack Winters	work: 459-7285 fax: 456-3091 emer: 479-2320 email: jack_winters@fishgame.state.ak.us	Dick Shideler	work: 459-7283 fax: 456-3091 emer: 455-6897 email: dick_shideler@fishgame.state.ak.us
Alaska Department of Natural Resources	Chris Milles	work: 451-2711 fax: 451-2751 emer: 456-6858 email: gary_schultz@dnr.state.ak.us	Sam Means	work: 269-8548 fax: 269-8913 emer: 345-3486 email: samm@dnr.state.ak.us
Alaska Department of Environmental Conservation	Cindy Christian Manny Soares	work: 451-2138 fax: 451-2188 emer: 488-0270 email: cindy_christian@envircon.state.ak.us work: 269-7640 fax: 269-7510 emer: 333-5312 email: msoares@envircon.state.ak.us	Lee Johnson Janice Adair	work: 451-2179 fax: 451-2187 emer: 479-5017 email: Ljohnson@envircon.state.ak.us work: 269-7645 fax: 269-7651 emer: 243-2140 email: jadair@envircon.state.ak.us
Alaska Department of Community and Economic Development	Alaska Division of Tourism	work: 465-2012 fax: 465-3767 emer: email: GoNorth@dced.state.ak.us		work: fax: emer: email:
Alaska Natural Heritage Program	Julie Michaelson	work: 257-2788 fax: 257-2782 emer: 746-0959 email: anjam1@uaa.alaska.edu	Rob Lipkin	work: 257-2785 fax: 257-2782 emer: email: anrl@uaa.alaska.edu
Alaska Office of History and Archaeology	Judy Bittner	work: 269-8721 fax: 269-8908 emer: 274-7165 email: Judy_Bittner@dnr.state.ak.us	Joan Dale	work: 269-8721 fax: 269-8908 emer: email: joan_dale@dnr.state.ak.us

U.S. Department of the Interior	Pamela Bergmann	work: 271-5011 fax: 271-4102 emer: 333-0489 email: pamela_bergmann@ios.doi.gov	Doug Mutter	Work: 271-5011 fax: 271-4102 emer: 345-7726 email: douglas_mutter@ios.doi.gov
U.S. Department of Commerce	Mike Payne	work: 586-7235 fax: 586-7012 emer: 586-7639 email: Michael.Payne@noaa.gov	Brad Smith	Work: 271-5006 fax: 271-3030 emer: 248-4211 email: Brad.Smith@noaa.gov
U.S. Department of Agriculture	none in this subarea	work: fax: emer: email:	none in this subarea	Work: fax: emer: email:
U.S. Department of Defense	Alaska Command	work: 552-3944 fax: 552-4855 emer: 552-3000 email:	none	Work: fax: emer: email:
U.S. Coast Guard	Marine Safety Office, Anchorage	work: 271-6700 fax: 271-6751 emer: 271-6700 email:	17th District, Juneau	Work: 463-2025 fax: emer: email:
Scientific Support Coordinator	John Whitney	Work: 271-3593 fax: 271-3139 emer: 346-1634 email: John_Whitney_AKSSC@hazmat.noaa.gov		Work: Fax: Emer: Email:
Local Governments: --Northwest Arctic Borough, Kotzebue --Bering Straits Coastal Resource Service Area, Unalakleet --City of Nome	Charlie Gregg, Coastal Coordinator Chuck Degnan, Coastal Coordinator Randy Romenesko, Coastal Coordinator	work: 442-2500 fax: 442-2930 emer: email: victor.nwarctic@usa.net work: 624-3062 fax: 624-3811 emer: email: bscmp@nook.net work: 443-5242 fax: 443-5349 emer: pubworks@ci.nome.ak.us email:		Work: Fax: Emer: Email: Work: Fax: Emer: Email: Work: Fax: Emer: Email:

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. Data gaps in the index are discussed in Part Five, Significant Data Gaps and Information Needs.

The following criteria were developed as tools to establish levels of concern. These criteria are not listed in 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 hazardous substances, and long-term affects to habitat, species, or both
- threatened and endangered species, and/or other legal designation
- persistent concentration of oil or hazardous substances
- 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

Shoreline Geomorphology - Coastal Habitat Types:

- River deltas
- Sheltered lagoons
- Open lagoons
- Salt marshes
- Mud flats
- Barrier islands
- Spit beaches
- Protected bays

Lake and River Habitat Types:

- Connected lakes
- Freshwater springs

Upland Habitat Types:

- Riparian Willow

Ice Habitat Types:

- Leads and Polynyas
- Pack and Shore-fast Ice Edge

Threatened or Endangered Species Habitat:

- Spectacled Eider Critical Habitat

Spotted Seal Haulout Areas (> 10 seals)

Walrus Haulout Areas

Polar Bear Denning and Feeding Areas

Beluga Whale Concentration Areas

Bowhead Whale Nearshore Migration Routes

Caribou Calving and Insect Relief Areas

Large Seabird Colonies (> 100 birds)

Waterfowl and Shorebird Spring and Fall Concentration Areas

Anadromous Fish Spawning and Rearing Streams (i.e., salmon, Dolly Varden, whitefish)

Herring spawning areas

Land Management Designations:

- Federal: Wilderness
 - Wild and Scenic Rivers
 - National Natural Landmarks

- State: 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

Spotted Seal Haulout Areas (< 10 seals)
Ringed Seal Shorefast Ice Concentration Areas
Seabird Colonies (10 - 100 birds)
Waterfowl and Shorebird Nesting or Molting Concentration Areas
Anadromous Fish Streams (rearing only)
Grizzly Bear Concentration Areas (marine mammal/carcasses; salmon)
Caribou Migration Routes
Muskox Riparian Habitat
Commercial Harvest Areas
Recreational Use Areas
Land Management Designations:
 Federal: National Parks
 National Monuments
 National Wildlife Refuges
 State: State Parks
Cultural Resources/Archaeological Sites:
 National Register Eligible Sites (Other Than Village Sites)
 Sites Adjacent To Shorelines

D. AREAS OF LESSER CONCERN

Upland Habitat Types:
 Mesic/dry tussock tundra
 Alpine tundra
Bearded Seal General Distribution
Bowhead Whale General Distribution
Gray Whale Nearshore Migration and Feeding Areas
Walrus General Distribution
Polar Bear General Distribution
Seabird Colonies (< 10 birds)
Waterfowl and Shorebird General Distribution
General Freshwater Fish Habitat
Land Management Designations:
 Federal: Public Lands
 National Forests
 National Preserves
 State: General Public Lands

(This Page Intentionally Blank)

SENSITIVE AREAS: PART THREE - RESOURCE SENSITIVITY

The following sensitivity tables were developed by the Sensitive Areas Work Group, with representatives from State and Federal agencies and the private sector (not all information is complete at this time). Where references are available they are noted at the end of the tables. Periods and/or conditions when resources are of varying levels of concern (most, medium, least) with respect to oil spill impacts are noted in the following tables. Within the tables, Kotzebue Sound or Chukchi Sea refers to those areas and communities north of Little Diomedede Island and Wales. Little Diomedede Island, Wales, and all points south (excluding St. Lawrence Island) are included in the Norton Sound category.

SHORELINE GEOMORPHOLOGY

(references: 1, 25)

CATEGORY	LEAST	MEDIUM	MOST
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

THREATENED OR ENDANGERED SPECIES

(references: 1, 3, 4, 5, 9)

CATEGORY	LEAST	MEDIUM	MOST
ENDANGERED SPECIES			Whales: Bowhead, Fin, Blue, and Northern right, Humpback Pinnipeds: Steller sea lion Birds: Short-tailed albatross, Eskimo curlew
THREATENED SPECIES			Spectacled eider, Steller's eider
POTENTIAL SPECIES		Bristle-thighed curlew North American lynx	
PROTECTED SPECIES			Bald eagle, Golden eagle, All marine mammals

RINGED SEALS

(references: 3, 5, 7, 11, 14, 16)

CATEGORY	LEAST	MEDIUM	MOST
ABUNDANCE		pack ice	shorefast ice
SUSCEPTIBILITY		year-round	
HUMAN HARVEST	Jun 15 - Oct 1 (St. Lawrence Is.)	Nov 1 - Dec 10 Jul 1 - Sept 1 (Chukchi Sea) Jun 1 - Sept 1 (Norton Sound)	Oct 1 - Jun 15 (St. Lawrence Is.) Sept 1 - Nov 1 Dec 10 - June 30 (Chukchi Sea) Sept 1 - Jun 1 (Norton Sound)

Critical Life Periods

J F M A M J J A S O N D

Nearshore concentrations

in shorefast ice

=====

Pupping and Weaning

=====

Molting

=====

Present in area

=====

GRAY WHALES
(references: 7, 9, 11)

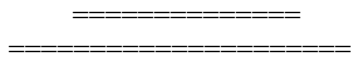
CATEGORY	LEAST	MEDIUM	MOST
ABUNDANCE	Jun 1 - Jul 31; Oct 1 - Oct 31 (Chukchi Sea) Dec 1 - Apr 30 (Bering Sea)	Aug 1 - Sept 30 (Chukchi Sea) May 1 - Nov 30 (Bering Sea)	
SUSCEPTIBILITY		When Present	
HUMAN HARVEST			Apr 15 - Nov 10 (St. Lawrence Is.)

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

Nearshore migration & feeding

Chukchi Sea

Bering Sea



WALRUS

(references: 3, 5, 7, 11, 16, 23, 28)

CATEGORY	LEAST	MEDIUM	MOST
ABUNDANCE	open water (no ice present)	Near-shore waters	Pack ice edge, leads and polynyas; haulouts
SUSCEPTIBILITY	year-round	year-round	year-round
HUMAN HARVEST	Dec - April (Chukchi Sea) November (Norton Sound) July - Oct (St. Lawrence Is.)	May, Oct - Nov (Chukchi Sea) August (Norton Sound) Nov - March (St. Lawrence Is.)	June - Sept (Chukchi Sea) May - June, Sept - Oct (Norton Sound) April - June (St. Lawrence Is.)

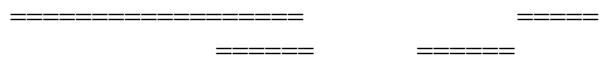
Critical Life Periods J F M A M J J A S O N D

Present on haulouts or

in nearshore waters

St. Lawrence Island

Norton Sound



LAND MANAGEMENT DESIGNATIONS

(references: 17, 18, 19, 20, 27)

CATEGORY	LEAST	MEDIUM	MOST
FEDERAL LANDS	Public Land	National Parks National Monuments Wildlife Refuges	Wild & Scenic Rivers Wilderness Areas National Natural Landmarks
STATE LANDS	Public Land ¹⁰	State Parks	Critical Habitats Refuges

¹⁰ Includes submerged lands out to 3 miles and historic bays and inlets.

CULTURAL RESOURCES/ARCHAEOLOGICAL SITES

(references:)

CATEGORY	LEAST	MEDIUM	MOST
CULTURAL AND ARCHAEOLOGICAL SITES	Cultural resources that do not meet National Register criteria	National Register eligible sites (excluding village sites) Sites adjacent to shorelines	National Historical Landmarks National Natural Landmarks Burial sites National Register eligible village sites Intertidal sites

HUMAN USE AREAS

(references: 7, 8)

CATEGORY	LEAST	MEDIUM	MOST
NON-CONSUMPTIVE USES	Chicago Creek, Sinuk River,	Lost River Area, Salmon Lake	Pilgrim Hot Springs, Serpentine Hot Springs, Golovnin Bay/Lagoon, Nome River, Sinuk River
UNIQUE FISHING SITES	Lakes and Rivers not directly connected to shoreline	Agiagpuk River, Imuruk Basin, Nuluk River, Pignuk River	St. Michael Bay, Unalakleet River Drainage, Island Point to Beeson Slough, Kwiniuk, Golovnin Bay, Stebbins Pass

SUBSISTENCE HARVEST AREAS

(references:)

Refer to Part 4: Section D.4 for a list of community contacts and reference materials that may be consulted regarding current subsistence harvest areas.

REFERENCES FOR SENSITIVITY TABLES

1. Alaska Clean Seas. 1987. Alaskan Bering Sea Coastal Resources Manual, Norton Sound Region. ACS spill contingency planning manual. Anchorage.
2. Alaska Department of Fish and Game. 1998. An Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes. ADF&G, Div. of Habitat, Juneau.
3. Alaska Department of Fish and Game. 1986a. Distribution, Abundance, and Human Use of Fish and Wildlife. Arctic region. Volume II. Alaska Habitat Management Guide. ADF&G, Div. of Habitat, Juneau. 605 pp.
4. Alaska Department of Fish and Game. 1986b. Life Histories and Habitat Requirements of Fish and Wildlife. Arctic region. Volume I. Alaska Habitat Management Guide. ADF&G, Div. of Habitat, Juneau. 465 pp.
5. Alaska Department of Fish and Game. 1986c. Map atlas, Arctic region. Alaska Habitat Management Guide. ADF&G, Div. of Habitat, Juneau. 7 pp. + 19 plates.
6. Amstrup, S.C. and D.P. DeMaster. 1988. Polar Bear, *Ursus maritimus*. Pages 39-56 in J.W. Lentfer, ed. Selected marine mammals of Alaska: Species accounts with research and management recommendations. Marine Mammal Commission, Washington, D.C. 275 pp.
7. Bering Straits Coastal Resource Service Area Board. 1984. Volume 1 - Resource Inventory.
8. Bering Straits Coastal Resource Service Area Board. 1991. Volume 3: Coastal Management Plan for the Bering Straits Coastal Resource Service Area.
9. Davis, R.A., and D.H. Thomson. 1984. Marine Mammals. Pages 47-79 in J.C. Truett, ed. Proceedings of a synthesis meeting: the Barrow Arch environment and possible consequences of planned offshore oil development. Outer Continental Shelf Environmental Assessment Program. USDC: NOAA/USDI, MMS. Anchorage, AK. 229 p.
10. Divoky, G.J. and A.M. Springer. 1988. Pelagic and Coastal Birds. Pages 69-84 in M.J. Hameedi and A.S. Naidu, eds. The environment and resources of the southeastern Chukchi Sea: A review of scientific literature. Outer Continental Shelf Environmental Assessment Program. USDC/USDI, OCS Study, MMS 87-0113. 103 pp.
11. Frost, K.J., and L.F. Lowry. 1988. Marine Mammals. Pages 85-101 in M.J. Hameedi and A.S. Naidu, eds. The environment and resources of the southeastern Chukchi Sea: A review of scientific literature. Outer Continental Shelf Environmental Assessment Program. USDC and USDI, OCS Study, MMS 87-0113. 103 pp.
12. Hazard, K. 1988. Beluga Whale, *Delphinapterus leucas*. Pages 195-235 in J.W. Lentfer, ed. Selected marine mammals of Alaska: Species accounts with research and management recommendations. Marine Mammal Commission, Washington D.C. 275 pp.
13. Kelly, B.P. 1988. Bearded Seal, *Erignathus barbatus*. Pages 77-94 in J.W. Lentfer, ed. Selected marine mammals of Alaska: Species accounts with research and management recommendations.

- Marine Mammal Commission, Washington D.C. 275 pp.
14. Kelly, B.P. 1988. Ringed Seal, *Phoca hispida*. Pages 57-75 in J.W. Lentfer, ed. Selected marine mammals of Alaska: Species accounts with research and management recommendations. Marine Mammal Commission, Washington D.C. 275 pp.
 15. Minerals Management Service. 1996. Outer continental shelf oil and gas leasing program: 1997-2002. Draft environmental impact statement. Vol. 1. OCS EIS/EA MMS 95-0061. USDI:MMS.
 16. NANA. 1985. NANA Coastal Resource Service Area Coastal Management Plan. Volume 2, Background Report.
 17. National Park Service. 1985. Bering Land Bridge National Preserve, Alaska final general management plan, environmental assessment, land protection plan, and wilderness suitability review. USDI:NPS, Anchorage. 196 pp.
 18. National Park Service. 1985. Cape Krusenstern National Monument, Alaska final general management plan, environmental assessment, land protection plan, and wilderness suitability review. USDI:NPS, Anchorage.
 19. National Park Service. 1985. Kobuk Valley National Park, Alaska final general management plan, environmental assessment, land protection plan, wilderness suitability review, and river management plan. USDI:NPS, Anchorage AK. 227 pp.
 20. National Park Service. 1985. Noatak National Preserve, Alaska final general management plan, environmental assessment, land protection plan, and wilderness suitability review. USDI:NPS, Anchorage AK.
 21. Quakenbush, L.T. 1988. Spotted Seal, *Phoca largha*. Pages 107-124 in J.W. Lentfer, ed. Selected marine mammals of Alaska: Species accounts with research and management recommendations. Marine Mammal Commission, Washington D.C. 275 pp.
 22. Roseneau, D.G. and D.H. Herter. 1984. Marine and Coastal Birds. Pages 80-115 in J.C. Truett, ed. Proceedings of a synthesis meeting: the Barrow Arch environment and possible consequences of planned offshore oil development. Outer Continental Shelf Environmental Assessment Program. USDC:NOAA and USDI,MMS. Anchorage, AK. 229 pp.
 23. Sease, J.L. and D.G. Chapman. 1988. Pacific Walrus, *Odobenus rosmarus divergens*. Pages 17-38 in J.W. Lentfer, ed. Selected marine mammals of Alaska: Species accounts with research and management recommendations. Marine Mammal Commission, Washington D.C. 275 pp.
 24. Sowls, A.L., S.A. Hatch and C.J. Lensink. 1978. Catalog of Alaskan Seabird Colonies. FWS/OBS-78/78. Biological Services Program. USDI:USFWS.
 25. Truett, J.C. 1984. Coastal Ecosystems and Sensitivities. Pages 153-165 in J.C. Truett, ed. Proceedings of a synthesis meeting: the Barrow Arch environment and possible consequences of planned offshore oil development. Outer Continental Shelf Environmental Assessment Program. USDC: NOAA/USDI, MMS. Anchorage, AK. 229pp

26. U.S. Fish and Wildlife Service. 1993. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11 & 17.12. August 23, 1993. USDI:USFWS. Washington, D.C. 40 pp.
27. U.S. Fish and Wildlife Service. 1987. Selawik National Wildlife Refuge final comprehensive conservation plan, wilderness review, wild river plan, and environmental impact statement. USDI:USFWS. Anchorage, AK. 378 pp.
28. U.S. Fish and Wildlife Service. 1994. Conservation plan for the Pacific walrus in Alaska. Marine Mammals Management, Anchorage, AK. 87 pp. + Attachment
29. U.S. Fish and Wildlife Service. 1994. Conservation plan for the polar bear in Alaska. Marine Mammals Management, Anchorage, AK. 78 pp.
30. U.S. Fish and Wildlife Service. 1995. Habitat conservation strategy for polar bears in Alaska. Marine Mammals Management, Anchorage, AK. 232 pp.

(This Page Intentionally Blank)

SENSITIVE AREAS: PART FOUR - BACKGROUND INFORMATION

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. Several industry-generated references that have had agency input and review are incorporated by reference.

- a. See Alaska Clean Seas' Alaskan Bering Sea Coastal Resources Manual: Norton Sound (1987). This report includes narrative and maps covering the coast from the Diomed Islands and Cape Prince of Wales southward along Norton Sound to Hooper Bay in the Yukon-Kuskokwim River Delta area. It also includes St. Lawrence Island. Information covers:
 - (1) Biological resources and uses
 - (2) Cultural and historic sites
 - (3) Shoreline characteristics
 - (4) Physical environment
 - physiography
 - meteorology
 - oceanography
 - (5) Biological environment
 - ecosystems
 - environmentally unique and sensitive areas
 - birds
 - terrestrial mammals
 - marine mammals
 - threatened species
 - fishery resources
 - (6) Spill response information

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. For selected areas of high sensitivity and/or risk, sensitive areas maps are also being produced (in coordination with the National Oceanic and Atmospheric Administration's Environmental Sensitivity Index mapping schema). Contact the Scientific Support Coordinator (271-3593).

(This Page Intentionally Blank)

Insert 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/subareas.html#northwest>

Insert Insert Land Management Map 1 of 7 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/subareas.html#northwest>

Insert Insert Land Management Map 2 of 7 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/subareas.html#northwest>

Insert Insert Land Management Map 3 of 7 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/subareas.html#northwest>

Insert Insert Land Management Map 4 of 7 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/subareas.html#northwest>

Insert Insert Land Management Map 5 of 7 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/subareas.html#northwest>

Insert Insert Land Management Map 6 of 7 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/subareas.html#northwest>

Insert Insert Land Management Map 7 of 7 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/subareas.html#northwest>

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 lands are designated as State Parks or State Forests.

State owned lands occur on portions of the eastern and western Seward Peninsula and in the vicinity of Nome; in the Kobuk River drainage upstream of Ambler; and in the Kivalina and Wulik river drainages. There are no state legislatively designated areas for special uses in the Northwest Area.

3. Federal

Gates of the Arctic National Park and Preserve About 250 miles northwest of Fairbanks, the Gates of the Arctic was established in 1980 and encompasses approximately 7,952,000 acres. The area is managed to protect its wild and undeveloped character, for mountaineering and wilderness recreation, to protect habitat and wildlife, and to protect current and continued subsistence uses. Caribou, moose, Dall sheep, grizzly bear, wolves and raptors are in abundance. The Tinayguk/North Fork, John, upper Alatna, upper Kobuk, and Noatak rivers are nationally designated Wild and Scenic Rivers.

Noatak National Preserve The 6.5 million acre preserve encompasses more than 250 miles of the Noatak River, a wild and scenic river. Noatak National Preserve protects the largest undeveloped mountain-rimmed river basin in the United States. It represents a yardstick of environmental health against which future conditions can be compared. In recognition of the value of this arctic wilderness, UNESCO has designated the Noatak River Basin an International Biosphere Reserve. The river basin provides an outstanding resource for scientific research, environmental education, and subsistence and recreational opportunities.

Kobuk Valley National Park Kobuk Valley National Park, a 1.75 million acre area about 75 miles east of Kotzebue, was created to maintain the environmental integrity of the natural features of the Kobuk Valley, including the Kobuk, Salmon, and other rivers, the boreal forest, and The Great Kobuk Sand Dunes, the largest active dune field in arctic latitudes. The valley remains an important area for traditional subsistence harvest of caribou, moose, bear, fish, waterfowl, and many edible and medicinal plants. The slow-moving Kobuk River is popular for fishing, canoeing, and kayaking. Backpacking and photography are educational recreational uses.

Cape Krusenstern National Monument Cape Krusenstern National Monument is found along the

Chukchi Sea coast northwest of Kotzebue. The nearly 650,000 acre Monument is characterized by a coastal plain dotted with sizable lagoons and backed by gently rolling limestone hills. This area has been designated an Archeological District in the National Register of Historic Places, and a National Historic Landmark (which includes the Monument and extends beyond). Bluffs and a series of 114 beach ridges record the changing shorelines of the Chukchi Sea and contain a chronological record of an estimated 6,000 years of prehistoric and historic use. Portions of the monument are important use areas for subsistence activities.

Selawik National Wildlife Refuge The Selawik National Wildlife Refuge includes about 3.2 million acres east of Kotzebue Sound in northwestern Alaska. The area is managed to conserve fish and wildlife populations and habitat, and to provide for current and continued subsistence uses by local residents. The refuge includes large river deltas, alpine tundra, extensive wetland and lake complexes, meadows, mountains, glacial valleys, sand dunes, and sand, gravel, and mud beaches. The refuge is used by large numbers of anadromous and resident fish, waterfowl and other birds, terrestrial mammals, and furbearers. Seals and beluga whales occur in marine waters along the western boundary of the refuge. The upper reaches of the Selawik River are designated as "wild and scenic."

Bering Land Bridge National Preserve The Bering Land Bridge National Preserve encompasses approximately 2.8 million acres of the Seward Peninsula. The primary purpose of the preserve is to protect and preserve for research and interpretation a portion of the 1,000 mile wide land link that intermittently connected Asia and North America 14,000 to 25,000 years ago. Significant natural resources of the preserve include areas of past volcanic activity in the Arctic, dynamic coastal barrier beaches with interior lagoons, and a full representation of tundra vegetation from sea level to 3,500 feet. Some 112 migratory bird species may be seen here, along with occasional walrus, seals, and whales. Significant cultural resources include archaeological sites over 10,000 years old, former Eskimo village sites, and more recent early mining and exploration activities. Today, Eskimos from neighboring villages pursue subsistence lifestyles and manage their reindeer herds in and around the preserve.

Alaska Maritime National Wildlife Refuge Public lands on islands, barrier islands, islets, rocks, reefs, and spires in the Chukchi Sea make up the Chukchi Sea Unit of the refuge. Similar areas along the southern Seward Peninsula and in Norton Sound are included in the Bering Sea Unit of the refuge. The Alaska Maritime 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. Thousands of sea lions, seals, and walrus live in the Bering and Chukchi units of the refuge. Wildlife viewing, photography, and backpacking are primary activities.

National Wild and Scenic Rivers Congress established the National Wild and Scenic Rivers System to preserve in a free-flowing condition rivers of remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar value. All or part of 25 such rivers in Alaska are designated wild and scenic. Those located in the Northwest Arctic Subarea include: the Noatak, Kobuk, and Salmon rivers administered by the National Park Service; the Unalakleet River administered by the Bureau of Land Management; and the Selawik River administered by the United States Fish and Wildlife Service. By classifying these rivers as such, Congress mandated that these rivers will be "managed to be free of impoundments and generally inaccessible by trail, with watersheds or shorelines primitive, and waters unpolluted...representing vestiges of primitive America."

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 (reference: Environmental Sensitivity Index Guidelines (October 1997)). Updated ESI information can be found on the internet at: <http://response.restoration.noaa.gov/order/esiindex.html>

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.

3. Upland Habitats

At this time, no uplands or wetlands classifications directly related to sensitivity to oil spills have 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://www.nwi.fws.gov/reg7web.htm>

Regional Wetlands Coordinator
National Wetlands Inventory
Anchorage Alaska
786-3471

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 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.asgdc.state.ak.us/maps/cplans/subareas.html>

C. BIOLOGICAL RESOURCES

1. Fish and Wildlife

(a) Threatened and Endangered Species

Federally listed threatened and endangered species are protected under the Endangered Species Act. Spill response activities which could impact a listed species should be coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. With the exception of the Bowhead and Fin -whales, the Steller sea lion, and the Spectacled eider, the species listed below are also on the State of Alaska's endangered species list. Threatened and endangered species potentially present in the Northwest Arctic Subarea include:

Species Managed by the U.S. Fish and Wildlife Service

<u>Common Name</u>	<u>Scientific Name</u>	<u>Occurrence</u>
Spectacled eider	<i>Somateria fisheri</i>	Probable Resident
Short-tailed albatross	<i>Diomedea albatrus</i>	Probable Resident
Steller's eider	<i>Polysticta stelleri</i>	Probable Resident
Eskimo curlew	<i>Numenius borealis</i>	Possibly Extinct

Species Managed by the National Marine Fisheries Service

<u>Common Name</u>	<u>Scientific Name</u>	<u>Occurrence</u>
Bowhead whale	<i>Balaena mysticetus</i>	Seasonal Migrant
Fin whale	<i>Balaenoptera physalus</i>	Occasional Migrant
Blue whale	<i>Balaenoptera musculus</i>	Occasional Migrant
Humpback whale	<i>Megaptera novaeangliae</i>	Occasional Migrant
Northern right whale	<i>Eubalaena glacialis</i>	Occasional Migrant
Steller sea lion	<i>Eumetopias jubatus</i>	Seasonal Migrant

Critical habitat has been designated by the U.S. Fish and Wildlife Service for spectacled eiders in Norton Sound (for molting), and offshore southwest of Saint Lawrence Island (for wintering)(see following map).

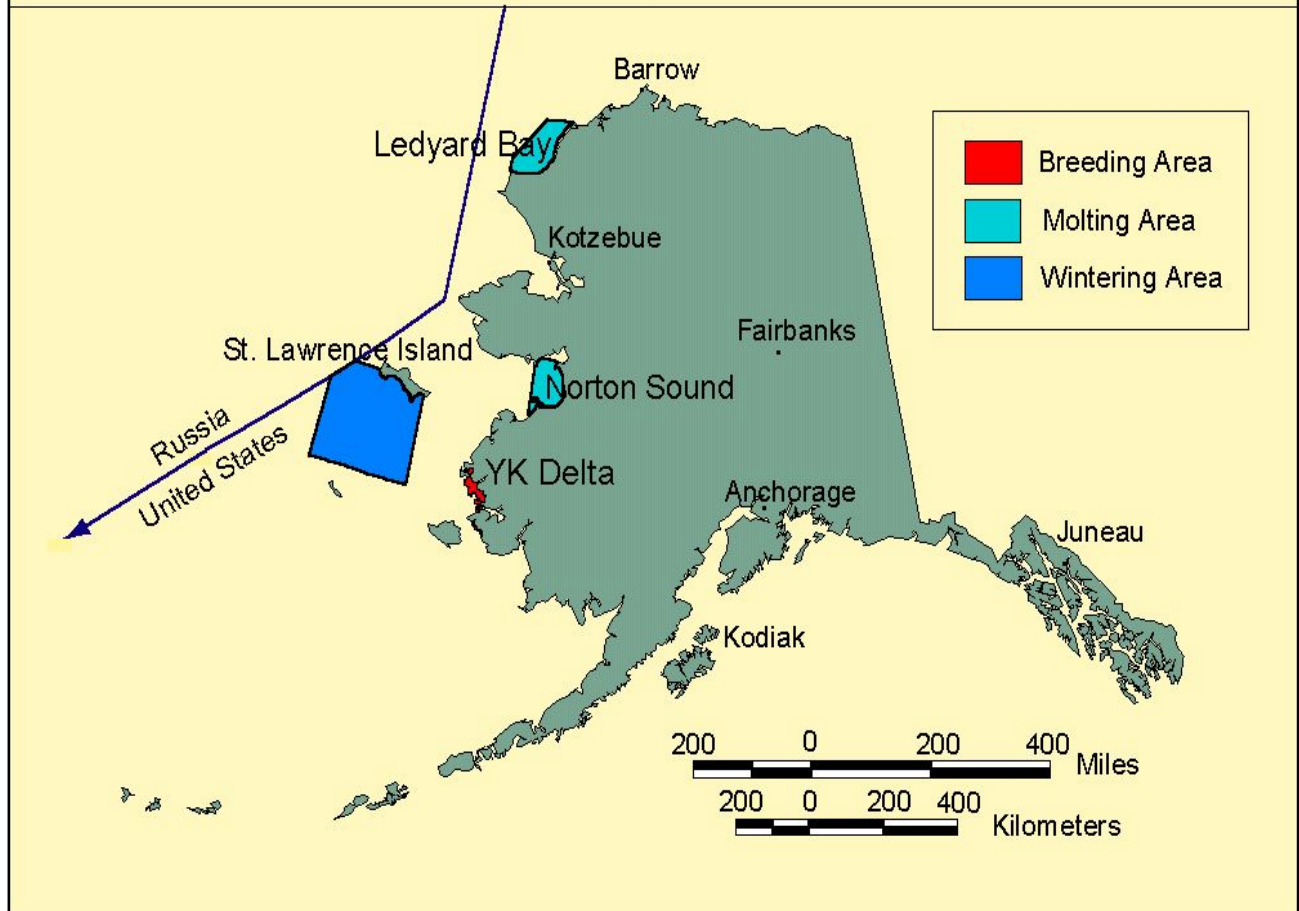
Although the U.S. Fish and Wildlife Service has determined the Arctic peregrine falcon is no longer a threatened species, monitoring of the species will continue following its 1994 delisting.

The Alaskan Bald and Golden eagles, though not on the endangered species list, are fully protected (including their nests and nest trees) under the Bald Eagle Protection Act of 1940. Spill response activities that could affect these species should be coordinated with the Fish and Wildlife Service.

While the National Marine Fisheries Service has determined the Gray whale is no longer a threatened or endangered species, monitoring of the species by the Service will continue following the 1994 delisting. All marine mammals, whether or not they are on the endangered species list, are protected by the Marine Mammal Protection Act of 1972. Any spill response activities which could affect marine mammals should be coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. For updated information try the internet at:

<http://www.r7.fws.gov/es/te.html>

Spectacled Eider Critical Habitat



(b) Fish

The Northwest Arctic subarea is drained by a number of major rivers, including the Kobuk, Selawik, Noatak, Wulik, Inmachuk, Kugruk, and Buckland rivers in Kotzebue Sound, and the Unalakleet, Ungalik, Shaktoolik, Koyuk, Fish, Solomon, Nome, Snake, Sinuk, Feather, and Kuzitrin rivers in Norton Sound. 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 three or four meters (as ice depth may approach two meters by late winter), 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 Northwest region.

Fish may use shallow lakes (< 2-3 m deep) in summer if the lakes are connected to a stream system (i.e., tapped lakes) and sufficient water exists in late summer for fish to leave the lake and move to overwintering areas. Shallow tundra beaded streams (< 2-3 m deep) freeze solid in winter and thus can be used by fish only for summer rearing. River deltas are particularly important areas for fish throughout the year. Although many rivers have not been examined for overwintering fish, those portions of rivers with depths greater than 2-3 m should be considered potential fish overwintering habitat and protected accordingly.

RESIDENT FISH

The most common resident fish found in rivers and lakes in the Northwest Arctic Subarea include arctic grayling, northern pike, burbot, and whitefishes. Whitefish species include humpback, round, and broad whitefish; and least and Bering cisco. Other species that occur in the region include lake trout, slimy sculpin, Dolly Varden, longnose sucker, Alaska blackfish, and arctic lamprey.

Arctic grayling Arctic grayling are distributed widely in most clearwater streams and some of the deeper lakes. Arctic grayling spawn in May and June over substrates ranging from silt to gravel in small streams or in lakes. Arctic grayling often feed in shallow streams throughout the summer that may freeze solid in winter. Arctic grayling winter in deep, large rivers or lakes, or in smaller streams if adequate water quality and flow exists throughout the winter.

Whitefish Broad and humpback whitefish, and least cisco are found commonly in summer in slow-moving waters of sloughs, and interconnected lakes (e.g., Selawik Flats), and the lower reaches of large rivers, and in nearshore marine waters such as Port Clarence and Golovin Bay. Round whitefish are found more commonly in streams or lakes. Bering cisco are found in Port Clarence and Grantley Harbor. These five species of whitefish spawn in late September and early October over sand and gravel bottoms of streams and lakes. These whitefish generally overwinter in deep, large rivers or lakes, although some may overwinter in estuarine areas such as Hotham Inlet and Grantley Harbor.

Northern pike Northern pike are found commonly in summer in slow-moving waters of sloughs and interconnected lakes (e.g., Selawik Flats), in larger rivers and some of the large lakes. Northern pike spawn in the spring shortly after breakup in shallow water with emergent vegetation and little current. Northern pike overwinter in deep, large rivers or lakes, or in smaller tributary streams if adequate water quality and flow exists.

Dolly Varden Stream-resident Dolly Varden occur at isolated locations in small mountain streams within Kotzebue and Norton Sound drainages. Stream-resident Dolly Varden spawn in late September or October.

Burbot Burbot are found in portions of the Northwest Arctic Subarea, in both rivers and in deep lakes. They also are found in summer in interconnected lakes and sloughs in lowland areas such as the Selawik Flats. Burbot overwinter in deep, large rivers or lakes, or in smaller tributary streams if adequate water quality and flow exists.

Arctic Char Arctic char are found in deep lakes of the Brooks Range and of the Seward Peninsula. Arctic char spawn in September and October.

Lake trout Lake trout are found in the large deep lakes of the Brooks Range. Lake trout spawn in September.

ANADROMOUS FISH

Sheefish The Kobuk and Selawik rivers support populations of anadromous sheefish that spawn in the upper reaches of these rivers. These anadromous sheefish overwinter in the lower rivers, Selawik Lake, Hotham Inlet and Kotzebue Sound. Immature fish use Kotzebue Sound, Hotham Inlet, Selawik Lake and the lower rivers during summer. Fish that will spawn in the current year begin an upstream migration from estuarine areas at breakup. Sheefish enter spawning areas August and early September and spawn in late September and early October. A small population of sheefish occurs in Koyuk River and winters in Norton Bay.

Whitefishes Anadromous whitefish (broad and humpback whitefish, least and Bering cisco) migrate from overwintering areas to estuarine and nearshore brackish marine waters at breakup - mid May to early July. The whitefish remain in the nearshore marine and estuarine environment for several weeks to several months. Whitefish return to overwinter and spawn in major rivers in September and October. Some may overwinter in estuarine areas.

Dolly Varden Juvenile Dolly Varden spend up to their first five years in freshwater streams before migrating to marine summer feeding areas. Immature and mature Dolly Varden migrate from overwintering areas to marine feeding areas following breakup - mid May to early July. Fish begin returning to freshwater spawning and overwintering areas from July through October. Spawning occurs from September through December. Fry emerge from the streambed gravels between April and early June. Spawning and overwintering areas are restricted to streams with perennial springs and groundwater sources. Dolly Varden inhabit nearly all of the region's drainages, including those on St. Lawrence Island. Significant numbers of Dolly Varden are found in the Noatak, Kivalina, and Wulik river drainages.

Salmon Chinook, coho, sockeye, pink, and chum salmon occur within the Northwest Arctic Subarea. Pink and chum salmon are the most widely distributed and most abundant salmon in the region. Sockeye salmon are least abundant. Salmon are present in estuaries and bays three to four weeks before spawning (see below). Small populations of the least abundant sockeye salmon occur in the Sinuk and Pilgrim rivers on the Seward Peninsula, and in the Chukchi Sea drainages of the Noatak and Kivalina rivers.

Salmon eggs incubate in the stream gravels over the winter, fry hatch in mid or late winter, and migrate to sea following breakup in early May to late June (for chum and pink salmon fry;

chinook, sockeye, and coho fry will remain in fresh water from one to four years before migrating to sea).

Norton Sound and Port Clarence Area Salmon Run Timing

<u>Species</u>	<u>Present in Bays and Estuaries</u>	<u>Spawning</u>
Chinook	June 15 to July 15	July 10 to August 5
Pink	June 25 to July 20	July 15 to August 5
Chum	June 20 to July 25	July 10 to August 15
Sockeye	June 15 to July 25	July 15 to Sept 10
Coho	August 1 to August 20	August 20 to Sept 30

Kotzebue Sound Region Salmon Run Timing

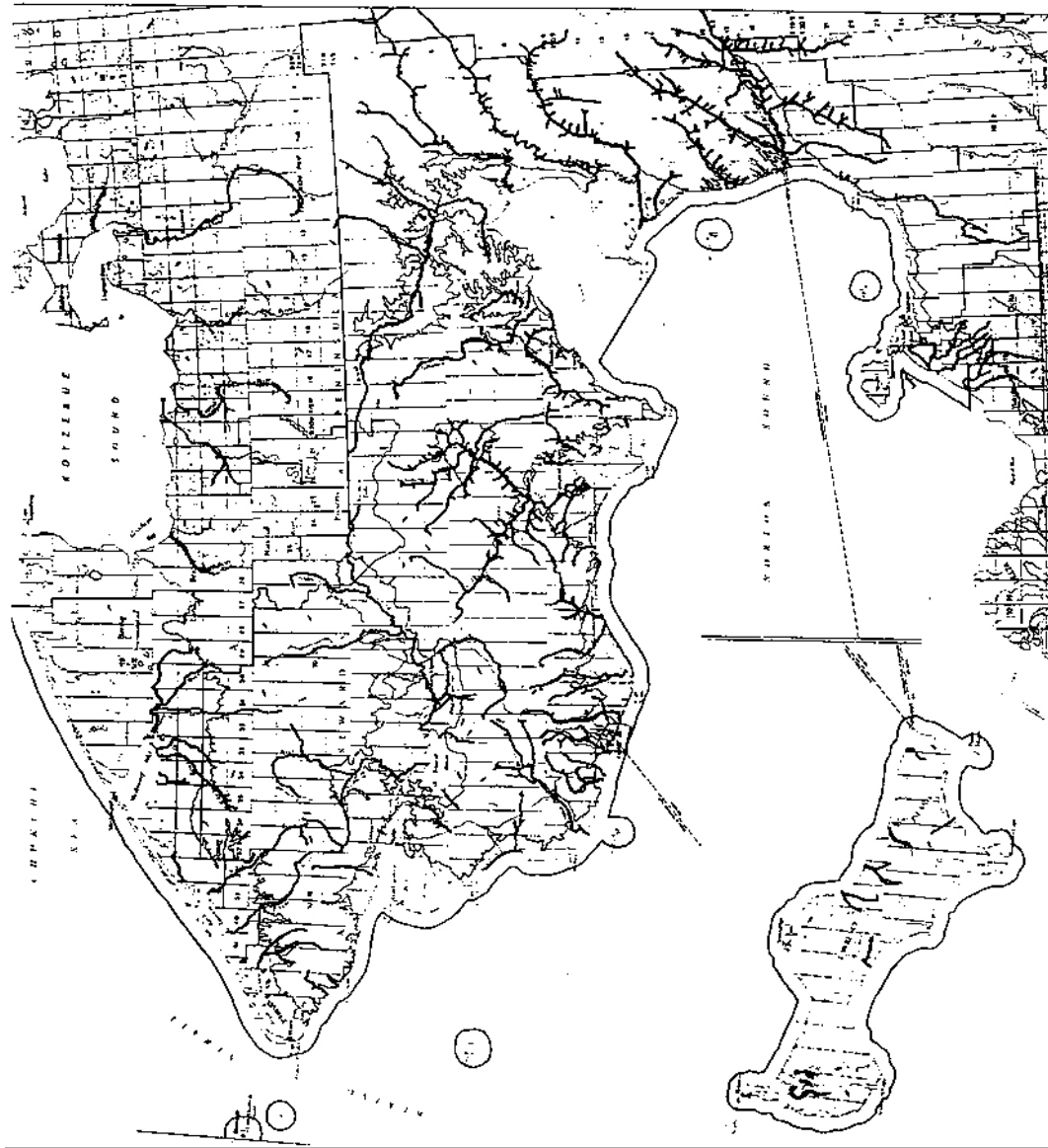
<u>Species</u>	<u>Present in Bays and Estuaries</u>	<u>Spawning</u>
Pink	July 5 to July 30	July 20 to August 15
Noatak Chum	August 1 to August 30	August 15 to Sept 15
Kobuk Chum	July 15 to August 30	August 1 to Sept 15

PEAK SALMON ESCAPEMENT IN THE BERING STRAITS, CSRA, 1983				
Stream Name	Chum	Pink	Chinook	Coho
Nome River	198	9,170	1	**
Flambeau	1,195	200	2	--
Eldorado	994	270	11	--
Bonanza	723	10,576	--	--
Solomon	310	8,180	--	--
Sinuk	2,150	1,070	47	--
Fish	20,077	300	87	--
Niukluk	8,886	50	54	--
Boston	704	--	154	--
Tubutulik	16,345	40,797	135	--
Kwiniuk (tower count)	56,907	251,965	267	--
Ungalik	8,357	23,380	21	--
Shaktoolik	12,414	18,705	1,808	--
North River	4,135	4,980	347	--
Unalakleet River System	58,540	89,324	3,025	14,656

Source: ADF&G Preliminary Norton Sound Commercial Fisheries Report, 1983

**Silver runs were not surveyed due to poor weather conditions. The Unalakleet run was counted by sonar.

Note: These counts only provide an indication of the degree of escapement because many fish are not detected. These figures do, however, provide an indication of the relative importance of some drainages to the region's salmon stocks.



— Anadromous Fish Distribution

SOURCE: ADFG's Anadromous Fish System, Cooperative
ADFG's Bering Strait Habitat Management Guide,
Bering Strait CRSA, Residents



The information on this document was developed by ADFG's Bering Strait Anadromous Fish System, Cooperative
Management Program and the Office of Ocean and Coastal Resource Management. It is intended to provide
information to the Bering Strait Community and Regional Users. It is not intended to be used for
navigation and is not a substitute for a nautical chart.

Map 3-1
ANADROMOUS FISH DISTRIBUTION

MARINE FISH

Herring Major herring spawning areas occur along the coast of St. Michael Island, along the mainland coast from St. Michael to Tolstoi Point, along much of the coastline from Unalakleet to Norton Bay, along portions of Norton Bay, along most of the coastline from Elim to Topkok Head, in Golovin Bay, in Port Clarence and the Imuruk Basin, around Shishmaref, in the Deering-Kiwalik area in Kotzebue Sound, at Elephant Point, in northern Hotham Inlet, along the Baldwin Peninsula, near Sisoalik Spit, and in Krusenstern and Kivalina lagoons. Herring spawn in shallow bays, inlets, lagoons, rocky shorelines, and on rocky headlands throughout most of Norton Sound from late May through June, in the Port Clarence area from late June through early July, and from mid to late July along the northern Seward Peninsula. Herring spawning in Kotzebue Sound may occur from late May until August, depending on ice conditions. Herring overwintering occurs in Shismaref Inlet, Imuruk Basin, Safety Sound, Golovin Bay, and some may overwinter in brackish lagoons and estuaries of the Kotzebue Sound area.

Capelin spawn along gravel beaches along the shoreline of northern Norton Sound from Rocky Point to Cape Rodney over a four-week period beginning in late May. Capelin also spawn from Cape Rodney to Port Clarence, and in Shismaref Inlet.

(c) Birds

The Northwest Arctic Subarea provides important wetland areas for nesting waterfowl (ducks, geese, and swans) and other birds, and serves as an important spring and fall staging area and migratory route for those birds headed to and returning from more northerly or westerly feeding and nesting areas. Waterfowl are concentrated on areas of open water along the major rivers in spring before wetland areas thaw. Important nesting, molting, and spring and fall staging areas include: coastal lagoons from Kivalina to Cape Krusenstern, Sisoalik Spit, Noatak River Delta, lower Noatak River valley, Kobuk River Delta, Hotham Inlet, Selawik Flats and Delta, portions of the coastlines of Eschscholtz and Spafarief Bays, the coastline from Spafarief Bay to Cape Espenberg, the barrier islands, coastal lagoons, and wetlands from Cape Espenberg to Wales, Brevig Lagoon, Port Clarence, Grantley Harbor, the Imuruk Basin, the Kuzitrin River flats, the coast from Cape Douglas to Cape Rodney, Safety Sound, Fish River Delta/upper Golovin Bay, Moses Point, Koyuk River flats/upper Norton Bay, the Shaktoolik area, wetlands southwest of Stebbins, and the southern coast of St. Lawrence Island.

Ducks Ducks begin arriving in late April and continue to arrive through the end of May, although most ducks have arrived by mid May. Nesting begins in mid May, with most eggs hatching 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 late August. Large numbers of scoters and eiders molt in lagoons and sheltered bays. Eastern Norton Sound serves as a primary molting area for female spectacled eiders nesting on the Yukon-Kuskokwim Delta. 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 mid July, although most leave the mainland areas from mid August through late September. Some ducks remain until late October before leaving at freeze-up. Large numbers of oldsquaw and eiders spend the winter in open water areas around St. Lawrence Island.

Geese Canada, emperor, and white-fronted geese and brant nest, molt and stage along lakes, coastal lagoons, wetlands, and rivers. Snow geese stage within the region during spring and fall migrations, but do not breed in the subarea. Birds arrive from early May through June, nest from late May through July, molt and rear young during July and August, and undertake fall migration

during late August through September.

Swans Tundra swans (and a few trumpeter swans) occur within the subarea. Concentration areas used by swans include the Kobuk and Selawik river deltas. Swans begin nesting around mid May, and eggs hatch from mid-to-late June. Molting occurs in July and August. Young swans are unable to fly until mid or late September. Important fall coastal staging areas include the Kobuk, Noatak, and Selawik river deltas, and the eastern side of the Baldwin Peninsula. Swans leave the Northwest region from late September to mid October.

Birds of Prey Birds of prey occurring in the subarea include golden and occasionally bald 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 owls commonly use woodlands, forests, and forested wetland areas for nesting. Prime feeding areas include wetlands containing waterfowl, seabirds, shorebirds, and other small birds. Except for snowy owls and gyrfalcons, which are year-round residents, all other birds of prey winter in areas outside the Northwest region. These birds arrive in the area in early May and depart in late August or September.

Seabirds Seabirds (murre, auklets, puffins, kittiwakes) are most abundant in the Cape Thompson area, Little Diomed Island, King Island, and St. Lawrence Island. St. Lawrence Island has 19 colonies containing 1.8 million seabirds, Little Diomed contains 1.25 million birds, the 5 Cape Thompson colonies support over 400,000 birds, and King Island supports about 246,000 seabirds. Smaller colonies occur at scattered locations along the region's coastline. These seabirds arrive in May and occupy the colonies through September. Some birds may remain in the area until the formation of sea ice forces them to more southerly areas. Gulls and terns also nest on barrier islands and spits throughout the region. (See Attachment One)

Shorebirds 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).

Upland Birds In addition, many upland species, such as ptarmigan, ravens and other nesting birds use the area.

(d) Marine Mammals

Polar Bears are associated with sea ice of the Bering, Chukchi, and Beaufort Seas. During summer, polar bears concentrate along the southern edge of pack ice, although polar bears may be found on land when pack ice edge is near shore. Polar bears commonly travel along barrier islands and mainland beaches to search for den sites and to feed on beached marine mammal carrion. In winter, polar bears are found most commonly along areas of open water, such as the pack and shorefast ice edge, flaw zone, and leads and polynyas. In late October or November, pregnant females seek out denning areas in snowdrifts on land (generally within 50 km of the coast), on shorefast ice, or drifting sea ice. Females and cubs emerge from the maternity dens in late March or early April.

Seals Three species of seal commonly occur in the nearshore waters of the Northwest Arctic subarea: ringed seal, bearded seal, and spotted seal. The ringed seal is the most common species of seal found in the Chukchi Sea and in Norton Sound. Most polar bears retreat north with the pack ice during summer months.

Ringed Seals 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. During summer, most ringed seals are found along the edge of the permanent ice pack, although a few may remain in ice-free areas. They return to nearshore areas in late fall and early winter as the shorefast ice reforms in October and November. Shorefast ice in Norton Sound, Kotzebue Sound (including Hotham Inlet), and around St. Lawrence Island is important breeding and pupping habitat.

Spotted Seals Major population segments of spotted seals migrate through outer Norton Sound from April to June and from late November to early January. During summer, spotted seals occur throughout Norton Sound, the Chukchi Sea coastline and Kotzebue Sound, and St. Lawrence Island, particularly in nearshore areas. Spotted seals haul out on sandy spits and shoals from mid July until freeze-up in late October or early November. Important haulouts are located on St. Lawrence Island, St. Michael Island, Stuart Island, Besboro Island, Cape Denbigh, Cape Darby, Safety Sound, and Port Clarence. Additional haulout and concentration areas along the Chukchi Sea coastline include Cape Espenberg, Chamisso Island, Elephant Point, Sisoalik Spit, and near the mouths of rivers and other areas with an abundance of anadromous fish, herring, smelt, capelin, or cod. Spotted seal occur in the Kotzebue area (including Hotham Inlet and occasionally Selawik Lake) from June to November. The south side of St. Lawrence Island is used heavily by spotted seal from April to December. Pupping occurs from February to May. Molting occurs from April until July.

Bearded Seals are associated primarily with the pack ice-edge, and in association with leads, flaws, and polynyas. Consequently, they are not found frequently in nearshore waters. Many bearded seals that winter in the Bering Sea migrate through the Bering Strait from late April through June and spend the summer along the ice edge in the Chukchi Sea. Bearded seal occur in Kotzebue Sound from October to July and in Norton Sound from late November to late June. From December through March, bearded seals are abundant immediately north of St. Lawrence Island. Pupping occurs from mid March to early May. Molting occurs in May and June.

Ribbon seals are generally found along the Bering Sea ice front from late March through mid July. From July through October, ribbon seals do not usually occur in nearshore waters, but frequent ice-free waters of the Bering Sea. A few ribbon seals migrate into the Chukchi Sea for the summer.

Beluga Whales Belugas bound for the Beaufort Sea migrate past St. Lawrence Island primarily in March and April, reach the Bering Strait from late March through mid May, and continue northward in leads along the northwestern Alaska coast. Belugas bound for Norton and Kotzebue Sounds begin moving to their wintering area to coastal areas from March through May. Belugas enter Norton Sound coastal waters in May and June, and remain until October or November. Belugas occupy the coast of the northern Seward Peninsula from June through October and Kotzebue Sound from mid June to August. Known summer use areas in Norton Sound include Norton Bay (May and June) and Golovin Bay (June to November). Concentration areas in Kotzebue Sound include Eschscholtz Bay and the Sisoalik Spit area. The eastern Kotzebue Sound is a high summer use area. Belugas generally return to wintering areas in the Bering Sea in

October and November. Some may winter northwest of St. Lawrence Island, a few may winter in the southeastern Chukchi Sea, and a few may winter in Norton Sound whenever prevailing winds keep polynyas and leads open.

Bowhead Whales Bowhead whales move northward past St. Lawrence Island in March and April, through the Bering Strait from late March through May, and northward along the Chukchi Sea coast as leads open in the sea ice. Bowhead whales rarely enter Norton Sound. Fall migration in the Chukchi Sea occurs offshore. Bowhead whales move south through the Bering Strait from September to December. Bowhead whales winter in the Bering Sea near the pack ice edge.

Other Whales Gray whales feed in waters near the southern capes of St. Lawrence Island, from St. Lawrence Island north to the Bering Strait, and in portions of Norton Sound from mid May through November. Gray whales enter the Chukchi Sea during the ice free season (June to October). Killer and fin whales are seen occasionally along the Alaskan Chukchi Sea coast and are frequently seen in the vicinity of St. Lawrence Island from spring through fall. Minke whales are regularly seen in the St. Lawrence Island area during the summer. Occasional use of the St. Lawrence Island area by northern right and blue whales during the open water period may occur.

Walrus Walruses, primarily females and juveniles, begin migrating north past St. Lawrence Island in March and April. Most reach the Bering Strait by late May or early June, and continue migrating northward into the Chukchi Sea. Some males remain in the Bering Sea year-round. Walruses in the Chukchi Sea begin to move south in September and early October as pack ice forms. Between October and December, large numbers occasionally haul out at St. Lawrence, Penuk, Diomedes, and King Islands, and in Norton Sound. With continuing development of ice, most walruses move to wintering areas south of St. Lawrence Island. Walruses return to the Bering Sea beginning in September and early October as pack ice reforms. Large numbers arrive between October and December at haulouts at St. Lawrence, Penuk, Diomedes, and King Islands.

Steller Sea Lion During the ice-free months, a few sea lions haul out on portions of St. Lawrence Island, the southern Penuk Islands, on Fairway Rock, and occasionally on the Diomedes Islands.

(e) Terrestrial Mammals

Caribou The Western Arctic Herd, numbering about 450,000 animals in 1993, uses a significant portion of the Northwest Arctic subarea primarily as late summer and winter range, and as a migration route to and from calving and summer range to the north of the region. During the peak insect harassment season (mid June to late August), caribou seek insect relief along gravel bars, snow and aufeis fields, glaciers, and on windy mountain slopes and ridges. Summer habitat includes primarily treeless uplands where heath tundra, alpine tundra, and sedge wetlands predominate. Winter habitat includes spruce forests and bog wetlands, ridges, and high plateaus. Wintering areas include the Selawik Lowlands, the eastern Seward Peninsula, and some of the major river valleys in the Kobuk and Noatak river drainages.

Reindeer Reindeer herding on designated grazing allotments occurs over most of the Seward Peninsula. Wild reindeer occur on St. Lawrence Island. Reindeer calving occurs in April.

Black Bear Black bears are most common in forested river floodplains and lowlands in the Kobuk, Selawik and Noatak river drainages, although black bears occasionally may occur in alpine areas. Black bears also occur along the Norton Sound coast between Shaktoolik and Klikitarik. Important summer habitats include sedge meadows, and areas of shrubs and forest containing berries. Black bears also may feed at salmon spawning areas. Black bears begin entering dens for

the winter in early October and emerge from dens in the spring from mid April through mid May.

Brown Bear Brown bears (grizzly bears) primarily occur in upland and mountainous areas of the Northwest region, but may occur in lowland and coastal areas. Concentrations of bears may be found along rivers when spawning salmon are present; at beached marine mammal carcasses along the Chukchi Sea coastline between Cape Seppings and Cape Thompson, in reindeer calving areas, and in caribou calving grounds and migration corridors. Brown bears enter dens from mid October through November and emerge from their dens from early April through late May. Concentrations of bears are attracted to spawning salmon on the lower Noatak, Squirrel, Salmon, Nimiuktuk, lower Kougarok, Agiapuk, lower Pilgrim, lower Sinuk, lower Cripple, lower Penny, lower Flambeau and Eldorado, lower Kwiniuk, lower Tubutulik, lower Inglutalik, lower Ungalik, lower Shaktoolik, lower Egavik, lower North, and lower Unalakleet rivers. Spring concentration areas include Cape Espenberg to Goodhope Bay coastline, Cape Rodney to Tiksook River, coastline near Bluff, and coastline from Unalakleet to St. Michael.

Moose Moose occur in habitats throughout the subarea, ranging from aquatic and riparian floodplain areas 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.

Dall Sheep are found throughout the central Brooks Range and to the Wulik Peaks area of the extreme western end of the western Brooks Range. 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.

Muskoxen Most muskoxen are on the western Seward Peninsula. About 125 muskoxen are in the Cape Thompson area along the Chukchi Sea coast south of Cape Lisburne. Some also occur in the Mulgrave Hills southeast of Kivalina. Riparian vegetation associated with river floodplains and terraces in these drainages, particularly willow thickets during summer, serves as major feeding habitat for muskoxen. Windblown ridges, bluffs, and slopes that remain partially or completely snow-free are preferred habitats in winter and during the calving period (late April to mid June).

Wolves and Foxes Wolves and foxes are found throughout the subarea. Arctic foxes occupy St. Lawrence Island and coastal areas, whereas red foxes generally occupy inland areas. Some red foxes do occur and den near the coast. 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. Arctic and red foxes have a reproductive pattern similar to that of wolves.

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

2. 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. For further information, contact the Alaska Natural Heritage Program botanist at 257-2785.

RARE PLANTS KNOWN FROM THE NORTHWEST ARCTIC SUBAREA:

Global Rank	State Rank	Scientific Name	Common name
G1	S1	<i>Douglasia beringensis</i>	
G2	S2	<i>Oxytropis kobukensis</i>	Kobuk Locoweed
G2	S2	<i>Rumex krausei</i>	
G2G3	S2S3	<i>Aster yukonensis</i>	Yukon Aster
G2G3	S2S3	<i>Douglasia alaskana</i>	Alaska Rockjasmine
G3	S2S3	<i>Artemisia senjavinensis</i>	Arctic Sage
G3	S1	<i>Claytonia arctica</i>	Arctic Springbeauty
G3	S3	<i>Oxytropis kokrinensis</i>	Kokrines Oxytrope
G3	S3	<i>Papaver walpolei</i>	Walpole Poppy
G3	S2S3	<i>Primula tschukschorum</i>	Chukch Primrose
G3?	S2S3	<i>Puccinellia wrightii</i>	Wright's Arctic Grass
G3G4	S3S4	<i>Primula anvilensis</i>	Anvil Mountain Primrose
G4	S3	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort
G4	S3	<i>Colpodium vahlianum</i>	Niokornak Arctic Grass
G4	S1	<i>Gentianopsis detonsa</i>	Sheared Gentian
G4G5	S1	<i>Pleuropogon sabinei</i>	Sabine-grass
G4T1T2Q	S1S2	<i>Artemisia globularia</i> var <i>lutea</i>	
G4T2	S2	<i>Oxytropis arctica</i> var <i>barnebyana</i>	
G4T2	S2	<i>Ranunculus glacialis</i> var 1	
G4T2T3Q	S2	<i>Phlox richardsonii</i> ssp <i>richardsonii</i>	Richardson's Phlox
G4T3T4	S2	<i>Ranunculus glacialis</i> var <i>chamissonis</i>	
G5	S1	<i>Potentilla stipularis</i>	Circumpolar Cinquefoil
G5	S3	<i>Zannichellia palustris</i>	Horned Pondweed
G5?	S1	<i>Pedicularis hirsuta</i>	Hairy Lousewort
G5T2?Q	S2?	<i>Corispermum ochotense</i> var <i>alaskanum</i>	
G5T4	S1	<i>Chenopodium glaucum</i> ssp <i>salinum</i>	
G5T5	S2S3	<i>Cypripedium parviflorum</i>	Small Yellow Lady's Slipper

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 occurrences)
 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 with 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.

Insert Known Rare Plan Locations 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.asgdc.state.ak.us/maps/cplans/subareas.html#northwest>

3. **Biologically Sensitive Areas**

The Alaska Department of Fish and Game initiated a project in 1996 to map some of the most environmentally sensitive areas (MESAs) for wildlife along Alaska's coast. This information is for contingency planning purposes and does not cover the complete coastline or sensitive areas that other organizations may identify. Maps entitled "Most Environmentally Sensitive Areas along the Coast of Alaska," were published by the Alaska Department of Fish & Game (1997), and are available in hard copy and digital format from:

Mark Fink
Alaska Department of Fish and Game
Habitat and Restoration Division
Anchorage, Alaska
267-2338

These maps are also available at the DNR *Prevention and Emergency Response Subarea Plan Maps* website located at:

<http://www.asgdc.state.ak.us/maps/cplans/subareas.html#northwest>

Each of these sensitive areas is plotted on a 1:250,000 scale U.S. Geological Survey quadrangle map. A list of the sensitive areas in the Northwest Arctic subarea and map referencing their location is provided (see the following figure and table), followed by the MESA maps.

**Oil Spill Contingency Planning
Most Environmentally Sensitive Areas
("Biological Hotspots")
along the Coast of the Northwest Arctic Subarea**

8. Noatak/Kobuk River Deltas - Kobuk and Selawik Lakes
 - anadromous fish nearshore migration and rearing
 - waterfowl spring and fall staging and molting
 - spotted seal haulouts
 - belukha whales nearshore
 - ringed seal breeding and pupping
 - bearded seals generally associated with pack ice edge

9. Little Diomed Island
 - seabird colonies (> 1.2 million birds)
 - walrus haulouts
 - polar bear dens
 - Alaska Maritime National Wildlife Refuge

10. King Island
 - seabird colonies (> 245,000 birds)
 - walrus haulouts
 - Alaska Maritime National Wildlife Refuge

11. St. Lawrence Island
 - waterfowl molting, fall staging, and winter concentrations
 - seabird colonies (> 2.3 million birds)
 - spotted seal haulouts
 - walrus haulouts
 - polar bear dens
 - Alaska Maritime National Wildlife Refuge

12. Mouth of the Yukon River ¹
 - belukha whales nearshore
 - waterfowl molting and fall staging
 - salmon concentrations
 - Yukon-Kuskokwim Delta National Wildlife Refuge

¹ Area heavily weighed by highly significant commercial and/or subsistence fisheries.

Insert MESA Index Map, Volume I (Arctic, Western, and Southwest Alaska) 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/subareas.html#northwest>

Insert MESA Map 8, (Noatak/Kobuk River Deltas-Kobuk Lake (Hotham Inlet-Selawik Lake) 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/subareas.html#northwest>

Insert MESA Map 9, (Little Diomedede Island) 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/subareas.html#northwest>

Insert MESA Map 10, (King Island) 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/subareas.html#northwest>

Insert MESA Map 11, (St Lawrence Island) 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/subareas.html#northwest>

Insert MESA Map 12, (Mouth of the Yukon River) 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/subareas.html#northwest>

D. HUMAN USE RESOURCES

1. Fish Hatcheries and Associated Ocean Net Pens

There are no fish hatcheries operating in the Northwest Arctic Subarea.

2. Aquaculture Sites

There are no aquaculture sites in the Northwest Arctic Subarea.

3. Cultural Resources

The Northwest Arctic 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 Northwest Arctic 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 and the Alaska Boards of Fisheries and Game made all decisions regarding the management of subsistence resources and harvest opportunities. In 1990, however, Federal government became responsible for managing subsistence resources on Federal public lands, and in 1999 in Federal reserved waters. The Federal Subsistence Board makes the regulations which are administered by various federal agencies on Federal public lands. State regulations continue to apply to State and private lands. As a consequence, the number of agencies involved in managing subsistence resources and 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 or the U.S. Fish and Wildlife Service Office of Subsistence Management.

Traditional subsistence harvest areas for the Bering Straits Region include the Bering Strait area, the Western Seward Peninsula, and Norton Sound Coast. The villages identified within the Bering Strait area include Diomedes, Gambell, Savoonga, and Wales; the Western Seward Peninsula area

includes Teller, Shishmaref, Brevig Mission, Mary's Igloo, and King Islanders living in Nome; and the communities associated with the Norton Sound Coast area include Solomon, Golovin, White Mountain, Council, Elim, Koyuk, Shaktoolik, Unalakleet, St. Michael, and Stebbins. The subsistence harvest areas and species associated with these areas are identified in The Bering Straits Coastal Resource Service Area Board, Volume One-Resource Inventory, Maps 2(A), 2(B), and 2(C).

Traditional subsistence harvest areas for the NANA Region include Ambler, Buckland, Deering, Kiana, Kivalina, Kobuk, Kotzebue, Noatak, Noorvik, Selawik, and Shungnak. More specific information, including technical reports and detailed maps, can be obtained from the Alaska Department of Fish and Game, The Northwest Arctic Borough, The Bering Straits Regional Corporation, and NANA Regional Corporation. Local communities can provide the most detailed and accurate information regarding current subsistence and personal use harvest. Contacts for potentially affected communities are identified in the Response Section, Part One.

5. Commercial Fishing

Commercial fishing occurs in Kotzebue Sound for salmon, and to a much lesser extent, sheefish; and in Norton Sound for salmon, herring, and crab. Commercial fishing for salmon in Kotzebue Sound generally occurs from July 10 to August 30 along the Kobuk and Noatak River deltas. Salmon fishing in Norton Sound generally occurs from June 8 to September 7, depending on the location and species harvested. A limited sheefish commercial harvest occurs in late October - early November and in March. Herring fishing in Norton Sound generally occurs from May 20 to June 10, with harvests occurring along coastline east and south of Cape Darby. The fishing season for crab runs from July 1 to September 3 in offshore waters between Sledge Island and Cape Darby, and latitudes 64° 05' N to 64° 20' N. The dates given above indicate periods when fisheries are commonly, but not always open. As fishing periods are adjusted yearly by emergency openings and closures, contact Alaska Department of Fish & Game for current fishing periods.

6. Sport Fishing and Hunting

Sport fishing and hunting occurs at a wide variety of locations in the Northwest region throughout the year. Seasons and harvest regulations vary depending on the species and the area, and may be changed from year to year. Contact Alaska Department of Fish & Game for current seasons within the area of the spill.

7. Commercial Tourism

The communities of the Northwest Arctic Subarea are just a quick flight away from Fairbanks and Anchorage, and many convenient tour packages are available. Commercial tourism in the Northwest Arctic Subarea tends to be relatively large compared to the rest of rural Alaska, receiving about 10,000 visitors annually. Nome, St. Lawrence Island (the villages of Gambell and Savoonga), and Kotzebue receive the majority of the areas tourism. Regionwide activities include: ABEC's Alaska Adventure (457-8909), Brooks Range Adventures (479-8203), and Kobuk River Jets (475-2149). Local Activities include: Gambell Village Tour (274-5400), Arctic Circle Adventures (Winter: 276-0976, Summer: 442-3509), NANA Museum of the Arctic (442-3301), Tour Arctic (442-3301), Nome Custom Adventures (443-5134), Nome Tour and Marketing (443-2323), and Visit Russia Far East From Nome (443-5464). The travel to the Northwest Arctic subarea is dictated by seasonal changes and should be noted that the majority of the tourism occurs in the summer months. For additional information contact:

Alaska Division of Tourism	465-2012
Alaska State Chamber of Commerce	586-2323
Alaska Native Tourism Council	274-5400
Alaska Wilderness Recreation & Tourism Assoc.	463-3038
Nome Convention and Visitors Bureau	562-7380

8. Recreational Sites and Facilities

Unalakleet River Lodge is located on the Unalakleet River about 10 miles upstream from the mouth. This lodge caters to an international sport fisherman clientele. The Unalakleet River has been designated as a wild and scenic river, and attracts an increasing number of visitors each year. The Niuluk River has road access from Council and is one of the most important sport fishing areas in the Seward Peninsula for grayling and Arctic char, as well as pink, chum and silver salmon. Access to Fish River from the Niuluk River also makes it an easily accessible for sport fishing. A sport lodge located on the Fish River at White Mountain caters to an international sport fishing clientele. Golovin Bay, Golovin Lagoon, and the Fish and Niukluk Rivers also provide moose hunting for Nome residents and hunters from outside the state.

9. Marinas and Ports

Cominco Alaska Inc. operates the DeLong Mountain Terminal for the Alaska Industrial Development and Export Authority along the Chukchi Sea 17 miles southeast of Kivalina for marine shipment of lead and zinc concentrate and for receiving and storing fuel. Kotzebue and Nome serve as storage and trans-shipment sites for fuel and other cargo. St. Michael also serves as a fuel storage and trans-shipment site. For more information see the Resources Section of the Subarea Contingency Plan.

10. Fish Processing

Fish processing facilities are located in Nome and Unalakleet. Contact numbers and facility names are listed below.

Nome facilities include: Nome Fish Company 443-4168, and Norton Sound Seafood Products (Anchorage number: 274-7575, Nome number: 443-2304).

The single processing facility in Unalakleet is Unalakleet Fish Plant/Norton Sound Seafood Products (Anchorage number: 274-7575, Unalakleet number: 624-3807).

11. Logging Facilities

There are no commercial logging operations in the Northwest Arctic subarea.

12. Water Intake/Use

The following information was generated by the Alaska Department of Environmental Conservation, Drinking Water/Northern Program. Included are permitted water use facilities. Additional information can be obtained from the Drinking Water/Northern Program at 451-2360.

<u>Name of Facility</u>	<u>Location</u>	<u>State ID No.</u>	<u>Source</u>
-------------------------	-----------------	---------------------	---------------

Available on request

E. ICE, WIND AND CURRENTS

The following is an overview of wind, tide, ice and current conditions from the Bering Sea to the Chukchi Sea; including the Bering Strait, Norton Sound, and Kotzebue Sound. Much of the available data is general in nature and should be supplemented by area-specific updates and any information available from local residents. Included herein are wind data, tidal ranges, data on a variety of ice conditions and maps of net surface currents. Using the current edition of the U.S. Department of Commerce National Oceanic and Atmospheric Administration tide current tables for the Pacific coast of North America, it is possible to predict the times of ebb and flood tides for points within this region.

1. Sea Ice Conditions

Bering Sea: The sea ice generally begins as fast ice formation along the shores of the Seward and Chukotsk peninsulas in October. As the season progresses and waters in the more open portions of the Bering Sea cool off, the pack ice generally begins its seasonal southward formation in November. An estimated 97% of the ice in the Bering Sea is formed within the Bering Sea; very little is transported south through the Bering Strait. During periods of increasing ice and prevailing northerly winds, the ice apparently is generated along the south-facing coasts of the Bering Sea and moves southward with the wind at as much as 1 knot before melting at its southern limit. During periods of southerly winds, ice coverage generally decreases in the Bering, causing a wide variation in ice cover from month to month and year to year.

A wind-induced polynya (a recurring area of open water in ice-covered regions) immediately south of St. Lawrence Island is a frequent but undependable feature. Northerly winds cause the polynya to form in the lee of the island as sea ice is advected to the south. The polynya can extend more than 160 km and is frequently covered with thin ice. However, the feature is temporal, and a wind shift to southerly flow can close this area rapidly. At such times, a corresponding polynya to the north of the island is sometimes observed, but it is generally much smaller and occurs less frequently.

Norton Sound: Most of the sea ice in the northern Bering Sea and Norton Sound is first year ice that forms in situ. Most of Norton Sound is covered by sea ice in November through May and into part of June. Relatively persistent, large polynyas form south of St. Lawrence Island, along the south coast of the Seward Peninsula between Cape Prince of Wales and Cape Nome, and in the northeastern part of Norton Sound.

Chukchi Sea: Sea ice within the Chukchi Sea is mostly first-year ice, with multi-year ice occurring most commonly in northward and westward areas. Ice forms between October and early December. Around mid-May the seasonal disintegration of the ice cover begins as shorefast ice and thin ice decay and loosen along the northwest coast and in the interior of Kotzebue Sound. It is not until the beginning of July that there is a significant reduction in the probability of ice cover in the southern Chukchi Sea.

Average Arctic Marine and River Breakup and Freezeup Dates

LOCATION	AVERAGE BREAKUP DATE	AVERAGE FREEZEUP DATE	AVERAGE YEARS RECORD
Kotzebue	May 31	Oct. 23	14
Nome	May 29	Nov. 12	50
Gambell, St.Lawrence Island	May 26	Nov. 21	10
Savoonga, St.Lawrence Island	May 26	Nov. 19	10
Golovin	May 23	Nov. 2	6
Kivalina	May 31	Oct. 23	14
Noorvik	May 29	Oct. 11	17
Kiana	May 18	Oct. 17	6
Deering	May 27	Oct. 16	3
Candle/Kiwalik River	May 18	Oct. 17	8
Selawik	May 28	Oct. 17	12
St. Michael	June 9	Nov. 10	53
Teller	June 7	Nov. 10	16

Source: AEIDC. 1983. AEIDC. 1975. ADF&G 1986a.

2. Current Data

Tides in the Bering Sea are considered to be the result of cooscillation with large oceans. Once inside the Bering Sea, each tidal constituent propagates as a free wave subject to Coriolis effect and bottom friction. The tide wave propagates rapidly across the deep western basin. Part of it then propagates onto the southeast Bering shelf where large amplitudes are found along the Alaska Peninsula and in Kvichak and Kuskokwim Bays. Another part propagates northeastward past St. Lawrence Island and into Norton Sound. Over most of the Eastern Bering Shelf region the tide is mainly semi-diurnal, but in Norton Sound diurnal tides predominate. Over the remainder of the Bering tides tend to be mixed. The attached table provides tide data for the Bering Strait, Norton Sound, Kotzebue Sound, and the Chukchi Sea.

Norton Sound: As indicated in the following figures, the currents in Norton Sound are dominated by regional wind and surface pressure patterns. The highest observed flow was measured at about 50 cm/s; flow decreased with increasing depth. Oceanographic data from the mouth of Norton Sound indicate a net northward water transport, with strong seasonal differences in movement rates. Currents between the mouth of the sound and St. Lawrence Island to the west are characterized by pulsive north-south flow events having speeds of 50-100 cm/s. A typical feature is westerly flow of water mass, varying in extent and intensity over time, along the northern coastline. The tidal component in the sound is on the order of 50 cm/s and reverses either diurnally or semi-diurnally. Reversals are roughly north-southeast/southwest within Norton Sound. The upper- and lower-layer circulation is decoupled in the eastern sound, but less so in the western sound, where there is a monotonic decrease in speed along with a slight rotation of flow as depth increases. In summer, easterly flow enters the sound along its southern shore, curves cyclonically to the north, and is deflected west at the north coast, roughly following the bathymetry.

Bering Strait: Near St. Lawrence Island, the Bering Sea narrows into two straits, the Shpanberg and Anadyr. North of the island the two straits merge to form the Bering Strait. Circulation here is dominated by a northward mean flow ranging from 4 to 15 cm/s, with very small tidal influences. Flow in both the Anadyr and Shpanberg is to the north, approximately parallel to the bathymetry. The flow appears to come from around both ends of St. Lawrence Island. Frequent reversals are coincidental with meteorological events. The presence of ice appears to dampen the impact of wind stress forcing. The major driving force for the northward flow through the Bering Strait is the sea surface sloping down to the north. The normal condition is, thus, one in which sea level in the southern Chukchi Sea (in summer) is about 0.5 m lower than in the northern Bering Sea. South flow events are driven by strong north winds, strong atmospheric pressure cells, and a change in sea-level slope to the south. These conditions apparently require about one day to develop. Northward transport stands in contrast to the southerly transport events. Periods of northerly flow tend to be more persistent and not so great in magnitude.

Chukchi Sea/Kotzebue Sound: As indicated in the following figures, a warm current enters the Chukchi Sea via Bering Strait. In the Chukchi, this current concentrates near the surface and overlies dense, relict bottom water trapped by the shallow depths. It has a fairly uniform velocity which averages 45 centimeter per second (cm/s) in the summer and 10 cm/s in winter. This flow has many meanders and eddies and is slowed somewhat by dominant northeasterly winds. To the east, in deeper waters, the warm water mass descends to mid-depths. Maximum temperatures are observed in 30- to 50-m depths. Water movement from the Bering Strait to Cape Lisburne takes 10-15 days in the summer. Tidal currents are rotary and very weak in the Chukchi. They vary from .3 to .9 cm/s depending on the location and tidal stage. Nearshore the tidal currents appear to be small, on the order of 1 cm/s. Kotzebue Sound currents are mostly tide- and wind-induced. Velocities through and within the sound are very slow, averaging less than 0.1 cm/s.

3. Winds

In many cases, spill trajectory is determined primarily by winds, especially when currents are weak. Throughout the Bering the wind is fairly strong year-round but blows the hardest in winter.

Prevailing summer winds blow from the south or southwest at 7 to 10 knots. Winter winds generally come from the east or northeast at 10 to 15 knots, and can persist in one direction for weeks at a time causing a wide variety of water and ice movement. Winds are usually stronger at St. Lawrence Island (averaging 15.5 knots) than along the mainland. Maximum recorded sustained wind speed at Nome is 78 knots and 92 knots at Unalakleet. Even strong winds offshore may reach speeds of 100 knots and create large waves in Norton Sound.

4. Spill Trajectory Modeling

The behavior of spilled oil on water is the result of the complex interaction of the forces described above. Accordingly, trajectory modeling can be difficult. The National Oceanic and Atmospheric Administration is capable of generating computerized spill trajectory forecasts. Requests for this service should be directed to:

John Whitney
Scientific Support Coordinator
National Oceanic and Atmospheric Administration
Anchorage, Alaska
271-3593
After Hours: 346-1634
Beeper: 907-275-3134

5. Data Sources

Hood and Zimmerman (eds). Gulf of Alaska: Physical Environment and Biological Resource. (Gulf of Alaska net surface currents)

LaBelle, J.C. and J.L. Wise. 1983. Alaska Marine Ice Atlas.

Minerals Management Service. 1985. Final Environmental Impact Statement, Proposed Norton Basin Lease Sale 100. Volume 1. OCS EIS/EA MMS 85-0085. USDI:MMS. Anchorage.

National Climatic Data Center and Arctic Environmental Information and Data Center (AEIDC). 1988. Climatic Atlas, Volume II: Bering Sea. (wind roses, tidal range data and map)

National Climatic Data Center and Arctic Environmental Information and Data Center (AEIDC). 1988. Climatic Atlas, Volume III: Beaufort Sea. (wind roses, tidal range data and map)

NANA. 1985. NANA Coastal Resource Service Area Coastal Management Plan. Volume 2, Background Report.

Northern Resource Management and Yeti Map Studio. October, 1984. Bering Straits Coastal Management Program: Volume One-Resource Inventory. (wind information)

U.S. Department of Commerce National Oceanic And Atmospheric Administration. 1989. Tide Current Tables 1990: Pacific Coast of North America and Asia. (tidal current data and information)

Legend
 Bering Sea surface currents. Numbers indicate mean speed in cm/s. Arrows depict flow as follows:

- ← Prevailing current direction
- ↔ Variable current direction

Bering Sea surface currents synthesized from Arsen et al. 1967; Goodman et al. 1942; Kinder and Schumacher 1981; LaBelle 1963; Marine Advisory Program, University of Alaska; Notorov 1953; Peito 1981; Takenouti and Ohtani 1974; and U.S. Navy 1977

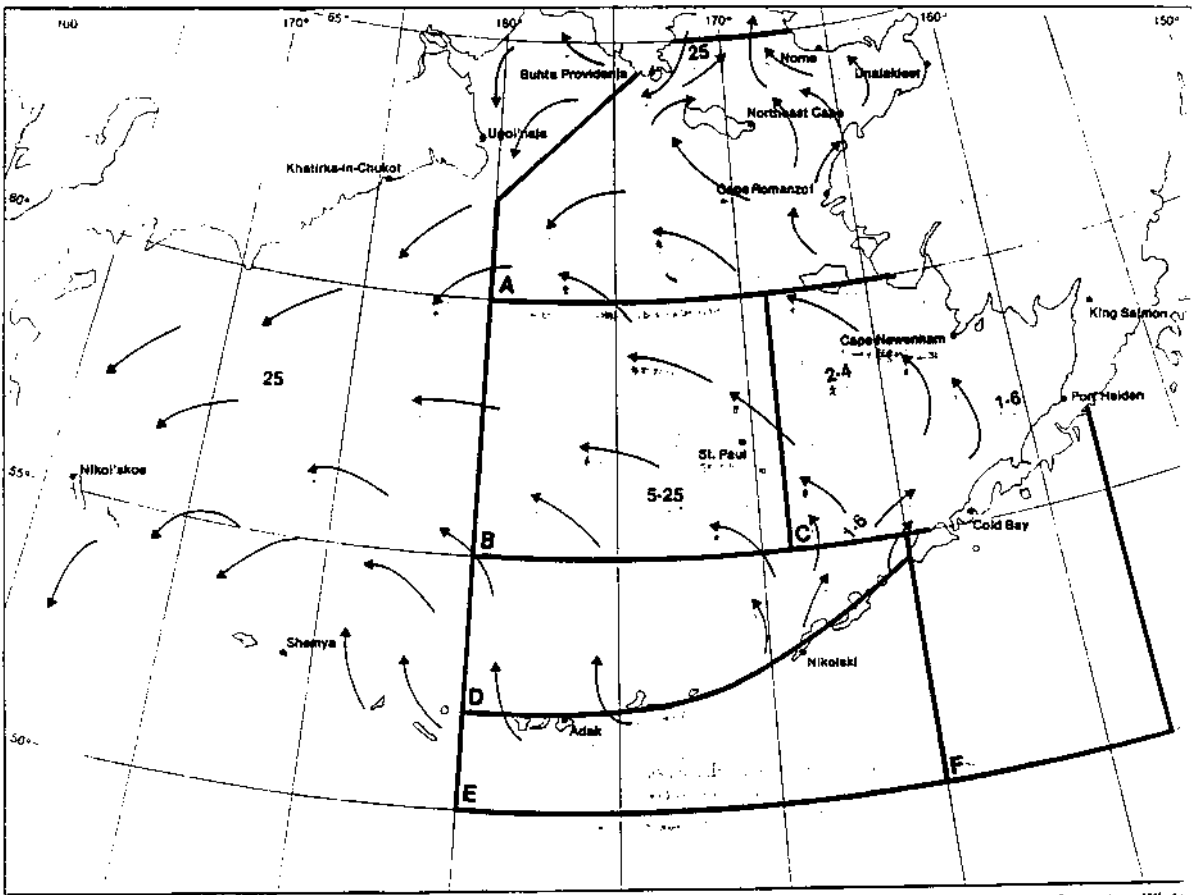


Figure 5. Bering Sea Currents—Winter

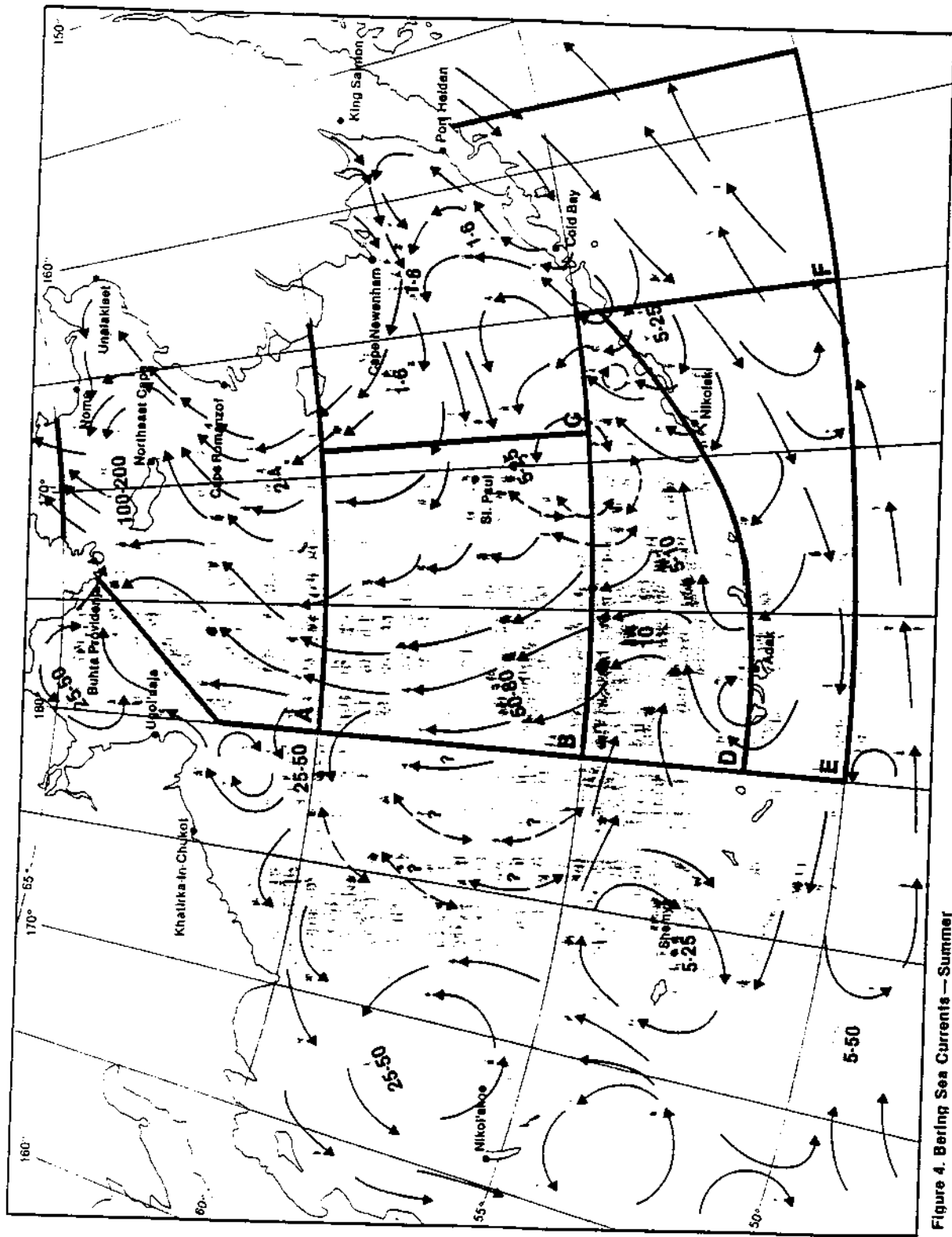
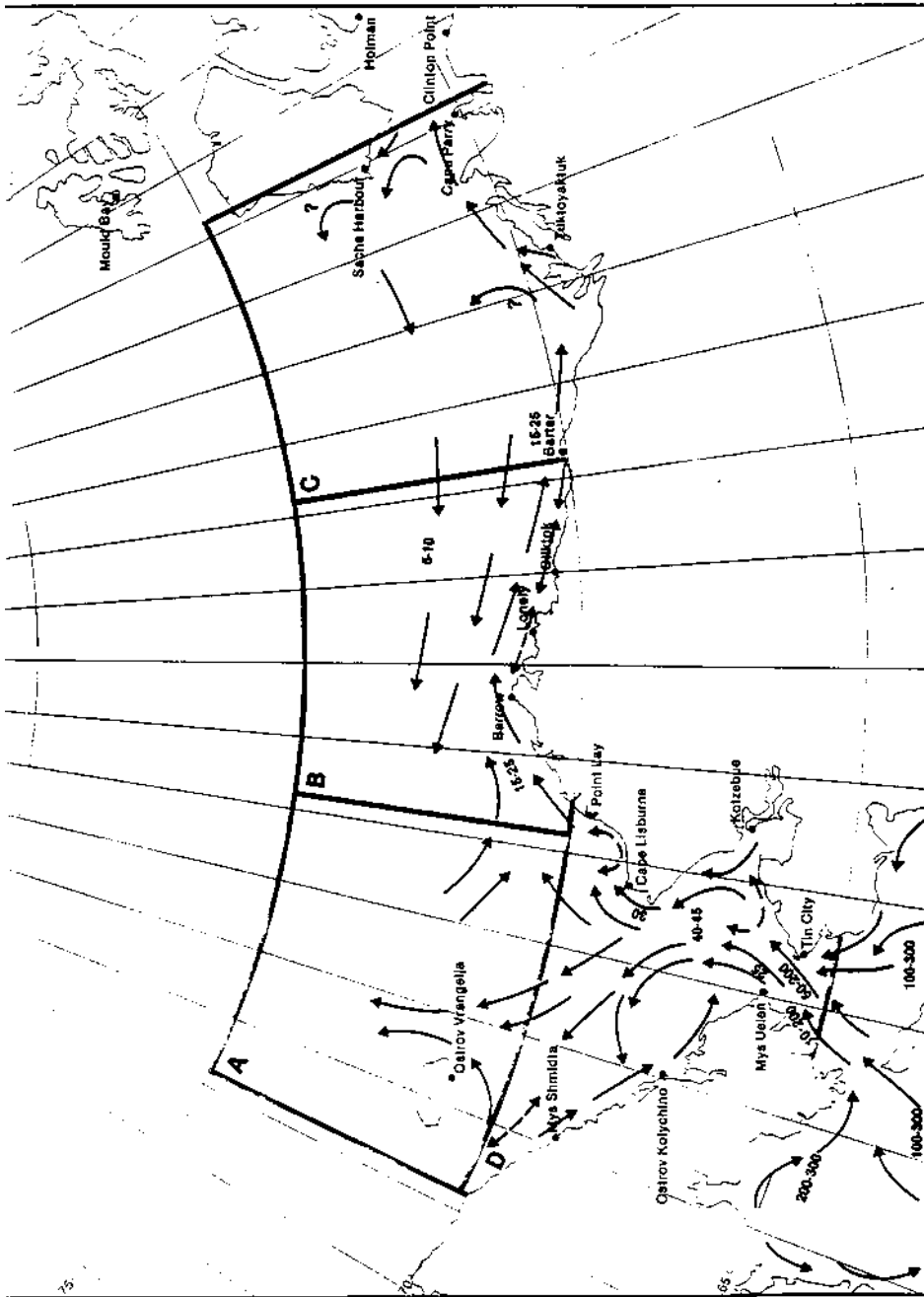


Figure 4. Bering Sea Currents — Summer



Legend
 Beaufort and Chukchi Sea surface currents. Numbers indicate mean speed in cm/s. Arrows depict flow as follows:
 — Prevailing current direction
 - - - Variable current direction
 Chukchi and Beaufort surface currents synthesized from Cochrane, Asgaard and Tripp, 1975; Drury et al. 1981; Llave et al. 1984; and O'Rourke, 1974.

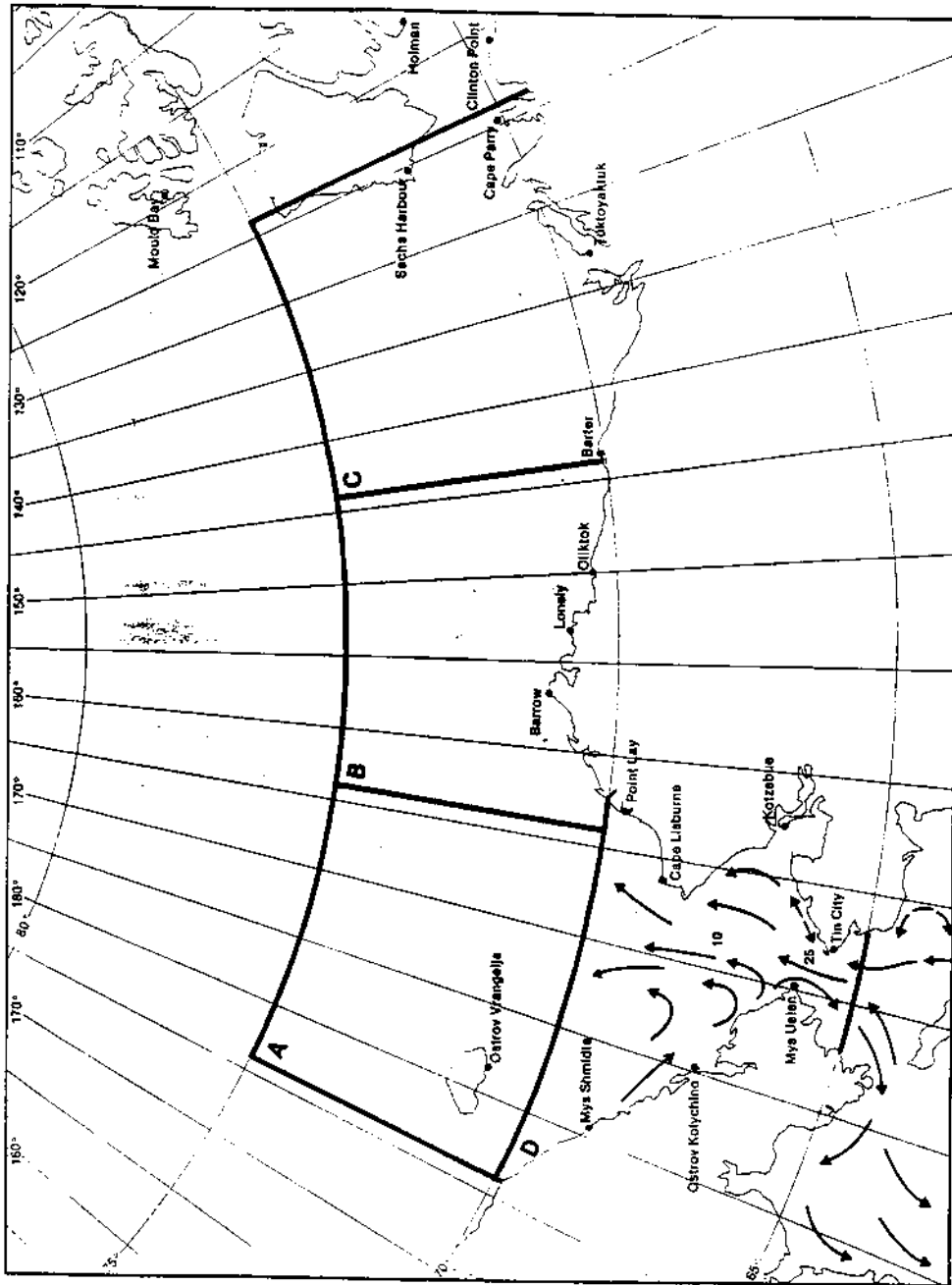


Figure 5. Sea Surface Currents — Winter

Legend

Beaufort and Chukchi Sea surface currents. Numbers indicate mean speed in cm/s. Arrows depict flow as follows:

- Prevailing current direction
- Variable current direction

Chukchi and Beaufort surface currents synthesized from Coachman, Asgaard and Tring, 1975; Drury et al., 1981; Lissauer et al., 1984; and O'Donnell, 1973.

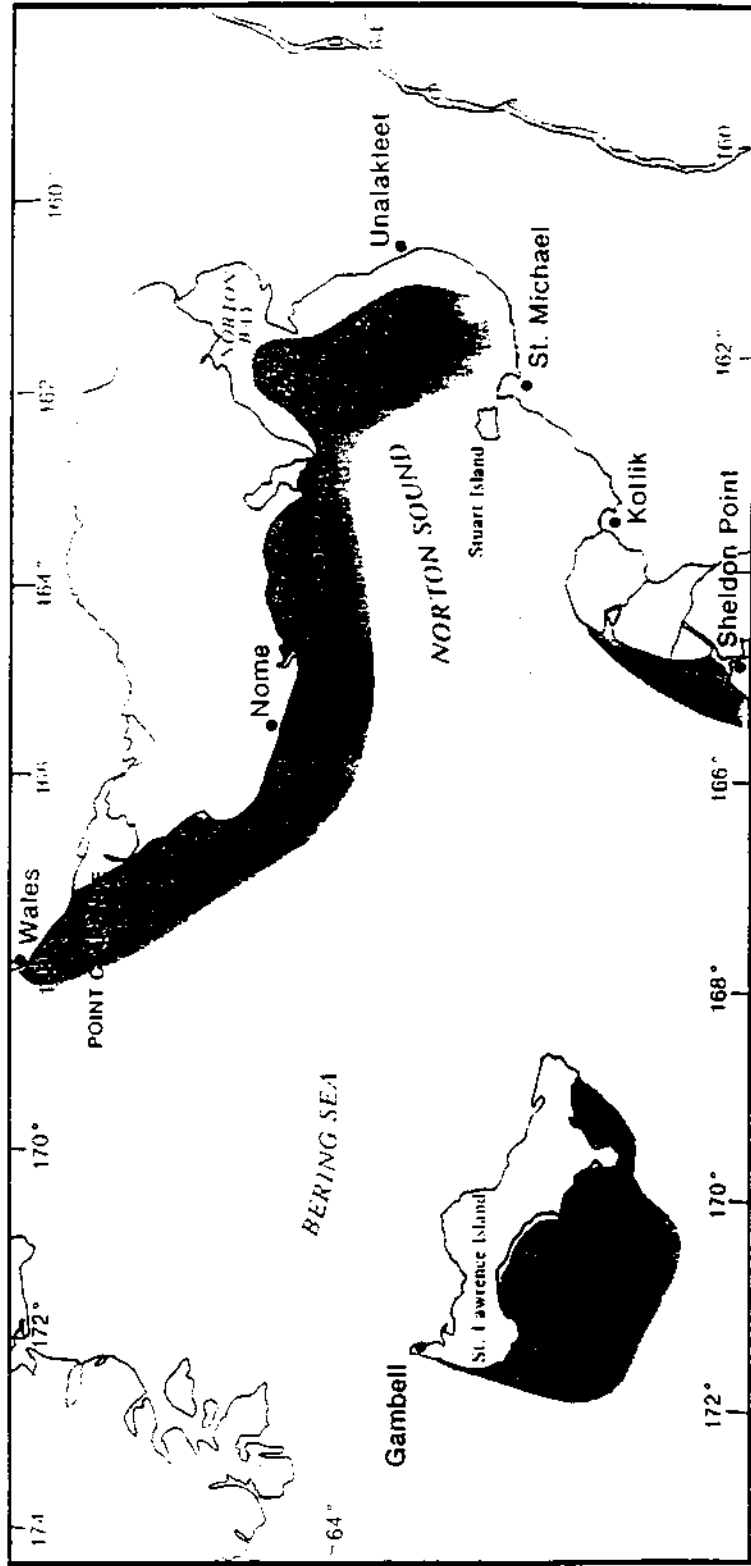


Figure 6. Recurring Polynyas
Synthesized from: McNutt 1981; Stringer, Barrett, and Schreurs 1980; Wohl 1982.

(This Page Intentionally Blank)

**SENSITIVE AREAS: PART FIVE - SIGNIFICANT DATA GAPS
AND INFORMATION NEEDS**

- (a) Detailed fish inventory and abundance information for anadromous and freshwater fish for the NANA region.
- (b) Updated information regarding the use of terrestrial haulouts by walrus in Norton Sound.
- (c) Detailed information regarding spring and fall concentration areas for waterfowl and shorebirds.
- (d) More maps and Geographic Information Systems work identifying and referencing sensitive areas.
- (e) Information regarding use of denning areas by polar bears along the Bering and Chukchi Sea coastlines.
- (f) Current and wind data for the Chukchi Sea area.

(This Page Intentionally Blank)

SENSITIVE AREAS: PART SIX - KEY REFERENCES

The following documents will provide information on critical fish and wildlife concentrations and human uses. The information contained in these documents is not, for the most part, duplicated in this contingency plan. Also identified are Geographic Information System (GIS) databases which may have automated resources information for the area.

Documents:

Alaska Department of Fish and Game. 1998. An Atlas to the Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes, Arctic Region.

Alaska Department of Fish and Game. 1986a. Alaska Habitat Management Guide. Distribution, Abundance, and Human Use of Fish and Wildlife. Arctic Region. Volume II. Division of Habitat, Juneau. 605 pp.

Alaska Department of Fish and Game. 1986b. Alaska Habitat Management Guide. Life Histories and Habitat Requirements of Fish and Wildlife. Arctic Region. Volume I. Division of Habitat, Juneau. 465 pp.

Alaska Department of Fish and Game. 1986c. Alaska Habitat Management Guide. Map Atlas. Arctic Region. Division of Habitat, Juneau. 7 pp. + 19 plates.

Alaska Department of Fish and Game. 1996. Division of Subsistence Community Profile Database. Microcomputer database, updated September 1996.

Alaska Department of Fish and Game. Division of Subsistence Technical Paper Series.

Bering Straits Coastal Resource Service Area Board. 1984. Volume 1 - Resource inventory.

Bering Straits Coastal Resource Service Area Board. 1991. Volume 3: Coastal management plan for the Bering Straits Coastal Resource Service Area.

City of Nome. 1983. City of Nome Coastal Management Program.

Michel, J., J. Halls, S. Zengel, J. Dahlin, and J. Petersen. 1997. Environmental Sensitivity Index Guidelines Version 2.0. National Oceanic and Atmospheric Administration Technical memorandum NOS ORCA 115.

Northwest Arctic Borough. 1997. Revised Coastal Management Plan.

Geographic Information System (GIS) Databases

Alaska Clean Seas: Jim McHale, Prudhoe Bay, 659-2405

Alaska Department of Natural Resources: Rich McMahon, Anchorage, 269-8836

Bureau of Land Management: Paula Krebs, Anchorage, 271-4540

National Oceanic and Atmospheric Administration: John Whitney, Anchorage, 271-3593

National Park Service: George Dickison, Anchorage, 257-2489

U.S. Fish and Wildlife Service: Catherine Berg, Anchorage, 786-3598

(This Page Intentionally Blank)

SENSITIVE AREAS: PART SEVEN - AREAS OF LOCAL CONCERN

Some areas within the Northwest Arctic Subarea warrant special attention due to the presence of highly productive wildlife habitat, the ability to sustain a large part of a villages' subsistence needs, the occurrence of unusual historical sites or large mineral deposits, recreation, energy development, hazardous areas, or the presence of important fisheries. These have been identified as Areas Meriting Special Attention, Important Use Areas, Special Use Areas, or Sensitive Areas through the Bering Straits Coastal Resource Service Area, Northwest Arctic Borough, and City of Nome Coastal District Management Plans. They are summarized below and outlined on the accompanying maps.

DESIGNATED AREA	REASONS FOR DESIGNATION	LAND OWNERSHIP/ VILLAGES TO CONTACT
1. St. Lawrence Island, Adjacent Islands, and Rocks	The area is habitat for 2.7 million seabirds and 100,000 walrus. Subsistence uses are: birds, bird eggs, walrus, polar bear, reindeer, Arctic fox, bowhead and other whales, seals, crab, fish, and plants. Sites identify early Siberian Yuit life.	Gambell and Savoonga
2. Little Diomede Island	Least and crested auklets are most of the 1.2 million birds here. Also habitat black-legged kittiwakes, thick-billed murres, walrus. Birds, bird eggs, native plants, walrus, seals, whales, fish, king crab are subsistence resources.	Native corp. of Little Diomede (surface), and Bering Straits Native corp. (subsurface)
3. Stebbins Wetlands	134,000 shorebirds and waterfowl on non-aquatic areas, undetermined amount in ponds. Subsistence uses are for waterfowl and eggs. Remains of five circa 1900 marine vessels are in St. Michael Channel.	Native corp. for the villages of St. Michael and Stebbins
4. Kwiniuk, Tubutulik, and Kwik River Drainages	Fish (salmon, Arctic char, whitefish, grayling), mammals (moose, bear, and beaver), and berries occur here. This is one of the important pink and silver salmon spawning rivers.	Native corp. for the village of Elim (surface and subsurface estate) and Federal
5. St. Michael Bay	The area is habitat for herring, and eelgrass beds provide food for birds, a nursery area for fish and crab, and a spawning area for herring. Subsistence uses: herring fishery, seals, salmon, and waterfowl. Commercial fishing occurs for herring and salmon. In 1833 St. Michael became the first European settlement in the region (historic cemeteries and buildings).	Native corp. for the village of St. Michael (surface), The Bering Straits Native Corp. (subsurface)
6. Unalakleet River Drainage	The area provides subsistence uses for: fish (salmon, grayling, whitefish, Arctic char, smelt, and tomcod), mammals (moose, bear, caribou, and beaver), waterfowl, berries, plants, and timber. Commercial fishing occurs for the region's largest pink salmon run, king, silver and chum salmon. Historic Sites include: house pits at Old Unalakleet Village, a prehistoric village site, and sites in the River drainage. Recreation occurs at Unalakleet River Lodge.	Native corp. for the City of Unalakleet (surface), and Bering Straits Native Corp. (subsurface)
7. Koyuk River Drainage	The Koyuk River provides habitat for one of the region's largest moose population. Caribou winter here, and one of the region's few sheefish populations are located on the lower river. Wetlands south of the river are important for shorebird nesting, and support one of the greatest densities of waterfowl. The river from Kuzitrin Lake to Norton Bay is essential for harvest of fish (salmon, whitefish, smelt, grayling, Arctic char, and tomcod), mammals (moose, caribou, bear, and beaver) and waterfowl.	Native corp. for the village of Kuyuk (surface), and Bering Straits Native Corp. (subsurface)

8. Lost River	Potential mining area for tin, tungsten, fluorite, and beryllium	Mining claims or Native corp.
9. Island Point to Beeson Slough, including Cape Denbigh	Cape Denbigh has the largest seabird colony in eastern Norton Sound (common murre, pelagic cormorants, horned puffins). Subsistence uses include: fish (salmon and herring), shellfish (crab and clam), waterfowl, eggs, and berries. Cape Denbigh is an important archaeological site, and the oldest known settlement in the region, Iyatayet is located here. Commercial fishing for herring is from May 15 to June 15, and salmon from June 8 to August 31.	Native corp. for the village of Shaktoolik (surface), and the Bering Straits Native Corp. (subsurface)
10. Golovin Bay/Lagoon and the Niukluk River Drainages	The Golovin Bay/Lagoon are important for herring, boreal and pond smelt; sandlance; humpback, broad, and round whitefish; Bering and least cisco; Arctic char; saffron cod; starry and Arctic flounder; and tubenose, Bering, and sturgeon poachers. The entire north shore of the Lagoon consists of oil-sensitive delta marsh with stands of sea grass. The Niukluk River drainages support moose, and birds. Villagers harvest fish (salmon and herring), shellfish (crab and clams), marine mammals (seals and beluga), kelp, and waterfowl. Several offshore mining permits were issued and are being examined to see if documented deposits exist. The Fish and Niukluk rivers are moderately important salmon streams for commercial fishing. The Niukluk River has road access from Council and is one of the most important sport fishing areas for grayling, Arctic char, as well as pink, chum, and silver salmon. Also important moose hunting area for hunters from outside the state.	Native corp. for the villages of Golovin, White Mountain, and Council (surface), the Bering Straits Native Corp. (subsurface), and the State
11. Rocky Point to Topkok Head	Marine waters are among the most productive in the world. The largest known concentrations of sandlance, vital for fish-eating seabirds. The area contains the largest mainland seabird colonies in the region. Peregrine falcons nest on the cliffs. Herring spawn along rocky shores, and salmon, capelin, king crab, and several species of bottom fish are located along the coast. Historic Sites include: remaining house mounds and artifacts of several villages.	Native corp. for the villages of Golovin and White Mountain (surface), Bering Straits Native Corp. (subsurface), and Federal
12. Safety Sound	The shore is composed of extensive marshes; tideflats; and seagrass beds, and supports large flocks of nesting and feeding waterfowl and shorebirds. A channel from Safety Sound to Bonanza River hosts geese, cranes, and ducks (especially in August and September). Subsistence uses are: Seals, moose, waterfowl, bird eggs, and fish. Mining occurs in the upper Eldorado River drainage and along the Salmon River drainage. There are numerous unexcavated archaeological sites in the area.	Native corp. for the village of Solomon and the City of Nome (surface), Bering Straits Native Corp. (subsurface), and the State
13. Nome River Drainage	Biologists have documented 17 species of fish in the river. The lower 30 miles of the river provide spawning for four salmon species, and the best spawning beds are located below "13 Mile Bridge". Waterfowl, moose, rabbit, ptarmigan, and three seal species (bearded, ringed, and spotted) also frequent here. From Fort Davis Bridge to the mouth of the river is important for sport fishing. Moose and bear along the river are also hunted.	Native corp. for the City of Nome (surface), Bering Straits Native Corp. (subsurface), private, and holders of mining claims
14. McCarthy's Marsh	The area is waterfowl and shorebird habitat. Subsistence uses include: waterfowl, moose, bear, and caribou.	Federal (Bureau of Land Management)
15. Cape Woolley	Waterfowl and shorebirds use Woolley Lagoon. Subsistence uses include: fishing at the mouth of the Feather River, hunting waterfowl along lagoon and in surrounding wetlands, and hunting of walrus and seals along the coast.	Native corp. for the community of King Island (surface), and Bering Straits Native Corp. (subsurface)

16. Kuzitrin River Drainage and Associated Wetlands	Wetlands in southwest corner of Bering Land Bridge National Preserve are important for waterfowl and shorebirds, and the drainage is considered one of the region's most important moose habitats.	Native corp. for the community of Mary's Igloo (surface), Bering Straits Native Corp. (subsurface), and Federal
17. Brevig Lagoon	Subsistence harvest includes waterfowl, herring, and salmon. Extensive sheltered marshes and tideflats are important molting areas for oldsquaws.	Native corp. for the village of Brevig Mission (surface), and Bering Straits Native Corp. (subsurface)
18. Agiapuk River Drainage	Moose, waterfowl, salmon, and grayling are harvested for subsistence uses..	Native corp. for the villages of Brevig Mission and Teller (surface), Bering Straits Native Corp. (subsurface), and Federal and State
19. Grantley Harbor, Imuruk Basin, and Tuksuk Channel	One of the region's most productive marine fish habitats. Imuruk Basin nests waterfowl and Grantley Harbor supports seabird colonies. Extensive seagrass lines Grantley Harbor providing feeding and rearing for fish and diving ducks. Herring, salmon, Arctic char, smelt, whitefish, tomcod, and marine mammals are harvested for subsistence use.	Native corp. for the villages of Brevig Mission, Teller, and Mary's Igloo (surface), Bering Straits Native Corp. (subsurface), Federal and State
20. Pilgrim River and Salmon Lake	The region's only known sockeye (red) salmon and the northernmost run in the state occurs here. This is an important moose hunting area due to easy access along the Kougarok-Nome road and high populations. 800 acres of land are proposed for disposal for seasonal and recreational home sites. Geothermal Development and Recreation: Pilgrim Hot Springs has geothermal and recreational development potential.	Native corp. for the village of Mary's Igloo (surface), Bering Straits Native Corp. (surface and subsurface), and State and Federal
21. Lopp Lagoon/ Cape Prince of Wales	Cape Prince of Wales coast consists of rocky, mostly barren, steep terrain. Lopp Lagoon is one of the primary waterfowl and shorebird nesting areas in the region. Wales residents harvest crab, salmon, beluga whale, bowhead whale, walrus, seal, and polar bear in offshore areas. They harvest shellfish from the beach; and salmon, waterfowl, moose, muskox, and berries in the lagoon area.	Native corp. for the village of Wales (surface), Bering Straits Native Corp. (subsurface), and State and Federal
22. Ikpek Lagoon and Nukluk, Pinguk, Kaguerak, and Kugrupaga Drainages	The drainages are important for migratory shorebird and waterfowl resting and feeding. Subsistence uses include hunting for waterfowl and moose, and fishing for salmon.	State and Federal
23. Arctic River Drainage	Important waterfowl and salmon harvest area. Wetlands in the lower part of the drainage are important waterfowl and shorebird habitat. Ten placer mining sites and one lode mine are located in the upper reaches of the watershed. Ear mountain may contain major mineral deposits.	Native corp. for the village of Shishmaref (surface), Bering Straits Native Corp. (subsurface), and State and Federal
24. Serpentine River Drainage	One of the most important moose habitats in the region. The river supports salmon, Arctic char, and grayling, and wetlands provide habitat for waterfowl and shorebirds. Serpentine Hot Springs is a traditional historic site and a contemporary spiritual site.	Native corp. for the village of Shishmaref (surface), Bering Straits Native Corp. (subsurface), and Federal

25. Moonlight Springs Watershed	Principal water supply for the city of Nome.	Sitnasuak Native Corp.
26. Sisoalik Spit	Important feeding and staging for waterfowl in spring and shorebirds in summer. The lagoon is a rearing place for sheefish. Whitefish and herring also rear near the spit. Whales and seals are found near here. The area is a fall caribou migration route. Traditional subsistence camps are here during summer.	
27. Cape Krusenstern	The area is used by waterfowl during fall migration. Seabirds nest here and shorebirds use the coastal lagoons during the summer. Whitefish and herring are found in the lagoon. Seals use the barrier island beach and whales migrate in nearshore waters. The area hosts subsistence use of seals and belukha whales.	
28. Kobuk/Selawik Lakes	Seabirds and waterfowl are found in the area. It is important fish rearing habitat for salmon, sheefish, whitefish, char and pike. Herring also spawn here. Subsistence use is year-round.	
29. Cape Espenberg and Goodhope River	Seal haulouts, fall waterfowl staging, seabird and waterfowl nesting are primary uses. Subsistence users do marine mammal and bird hunting and egg gathering, seal harvest.	
30. Kobuk River Delta	The sloughs and ponds of the Delta are important habitat for waterfowl. This is a major staging area. Sheefish, salmon and char also inhabit the Delta. Burbot and grayling are also abundant.	
31. Selawik River Delta	This is a major waterfowl use area, and is used heavily for fall migration staging. Sheefish, whitefish, char, grayling and burbot inhabit the waters of the Delta. Caribou migrate through here in the fall.	
32. Salmon River	The lower reaches of the river are used by waterfowl for nesting. Chum salmon and Arctic char spawn in the river. Caribou migrate through the area in the fall and spring. Lower reaches provide winter habitat for moose.	
33. Upper Selawik, Hunt, Redstone Rivers	Nesting waterfowl are found in the area. Arctic char and grayling are present. Chum salmon spawn in the lower Hunt and Ambler Rivers. The Hunt and Redstone River valleys are a major caribou spring and fall migration corridor. The upper Selawik is also a caribou migration area.	
34. Maniilaq River	A subsistence use area for caribou, moose, waterfowl, and furbearers. A caribou migration area and black and grizzly bear habitat.	
35. Inmachuk River	Subsistence uses include: fishing moose, and trapping. The wetlands support waterfowl. There are historic sites here. The area also has musk ox and bear. Historic sites are present.	
36. Lower Buckland River	The area supports waterfowl and seal hunting, and berry picking. Moose and waterfowl are hunted here. Salmon and other fish are in the river. Historic sites are present.	
37. North Fork Squirrel River/Omar River	Waterfowl hunting, winter trapping and fishing occur here. Caribou migrate through, moose overwinter, and salmon spawn here. Historic sites are present.	
38. North Kivalina Coast	Subsistence uses are: hunting for seals, walrus, belukha and bowhead whales; berry picking; fishing; and moose hunting. Waterfowl stage here, arctic terns nest, and fish spawn and overwinter here. Historic sites are present.	
39. Onion Portage Sensitive Use Area	An important waterfowl use and fish spawning area. Moose overwinter here. Grizzly bears and migrating caribou use the area. Because it is a focal point for migrating caribou, this is a high use subsistence area.	

40. Eschscholtz Bay Sensitive Use Area	Migrating waterfowl use the area in the spring. The Bay provides calving and feeding habitat for belukha whales. The area contains herring, cod and salmon. Seals haulout at Chamisso Island, and are common in the summer and fall.	
41. Elephant Point, Choris Peninsula Sensitive Use Area	There is an Arctic Tern colony here. Thousands of seabirds use the area for nesting. Spotted seals haul-out here. Belukha whales are subsistence hunted in the area during the spring and early summer.	
42. Kobuk River Sensitive Use Area	The river supports a large number of sheefish, who spawn between the Ambler and Selby rivers in the fall. Arctic char and whitefish also spawn in the river, as do a large number of chum salmon.	
43. Selawik River Sensitive Use Area	The 10 miles below Ingraksuksuk Creek is a major area for spawning sheefish. Whitefish also spawn here.	
44. Wulik River Sensitive Use Area	Arctic char spawn and overwinter here. Small populations of salmon are also present.	
45. Noatak River Sensitive Use Area	This river supports the NANA region's largest salmon run. Chum salmon spawn in the lower 200 miles of the river, especially concentrated between the Eli and Kelly rivers. In addition, pink salmon, Arctic char, and sheefish are present.	
46. Upper Kivalina River Sensitive Use Area	A spawning area for chum and pink salmon and Dolly Varden. Overwintering for fish. Winter habitat for moose and caribou. Subsistence uses: fish, caribou and moose.	

An August 2000 Federal/State joint survey of Native tribes in the Northwest Arctic 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, is presented below.

Native Village of Brevig Mission

Grantley Harbor	Natural resources
Imurak Basin	Natural resources
Shelman Creek	Drinking water source
Port Clarence	Salmon migration
Bering Sea	Marine mammal migration

Native Village of Diomede

The beach	Boat dock and meat storage
Tank farm	Fuel source
Village site	People live there
Surrounding waters	Where they hunt and fish

Native Village of Koyuk

Koyuk River	Fish and mammals
Norton Bay	
Homes	Where people live

Native Village of Noatak

Noatak River	Subsistence
Noatak school	Education
Noatak clinic	Health
Noatak store	Groceries
Noatak airport	Transportation

Noorvik Native Community

Elementary and High Schools and other public/residential areas where children are

Native Village of Shungnak

The river and tributaries	Drinking water source
---------------------------	-----------------------

Stebbins Community Association

Stuart Island	Traditional fishing and wildlife gathering
Romanof to Cape Stevens coast	Traditional fishing and wildlife gathering
Romanof to Cape Stevens tundra	Traditional fishing and wildlife gathering
St. Michael Island system	Traditional fishing and wildlife gathering
Village of Stebbins	Where people live

Native Village of Wales

Village Creek	Traditional water source
Bering Strait	subsistence hunting and fishing
School grounds	Students, children, employees
New clinic grounds	Health aides, patients
Village store grounds	Groceries, fuels

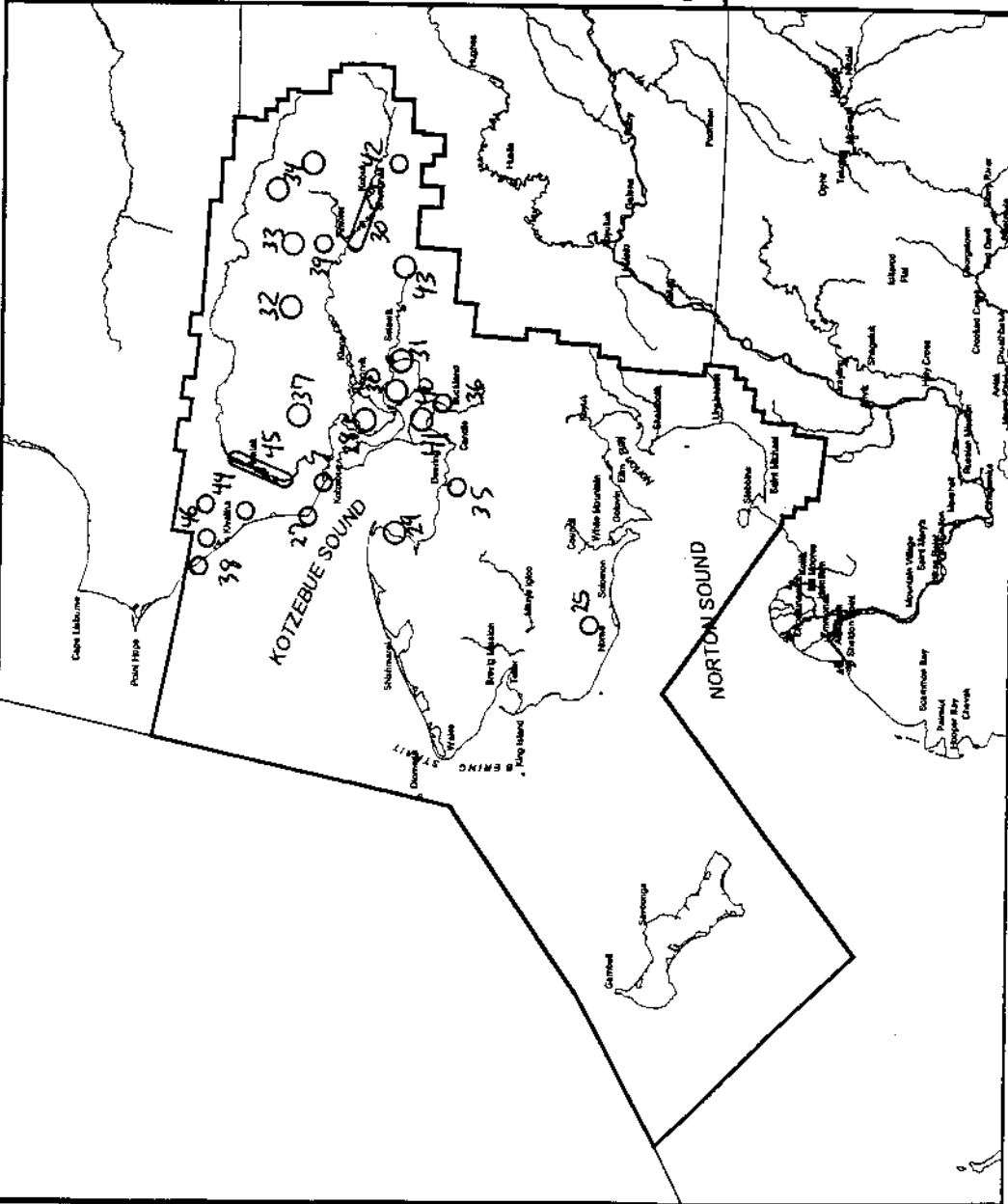
Native Village of White Mountain

White Mountain river	Subsistence food and transportation
School	Children/education
Clinic	Health
Store	Food, etc.
City office	Provides electricity and running water

Northwest Arctic, Alaska Contingency Subarea

LEGEND

Local Areas
of Concern
(generalized)



(This Page Intentionally Blank)

SENSITIVE AREAS: ATTACHMENT ONE

U.S. FISH AND WILDLIFE SERVICE

Seabird Colonies

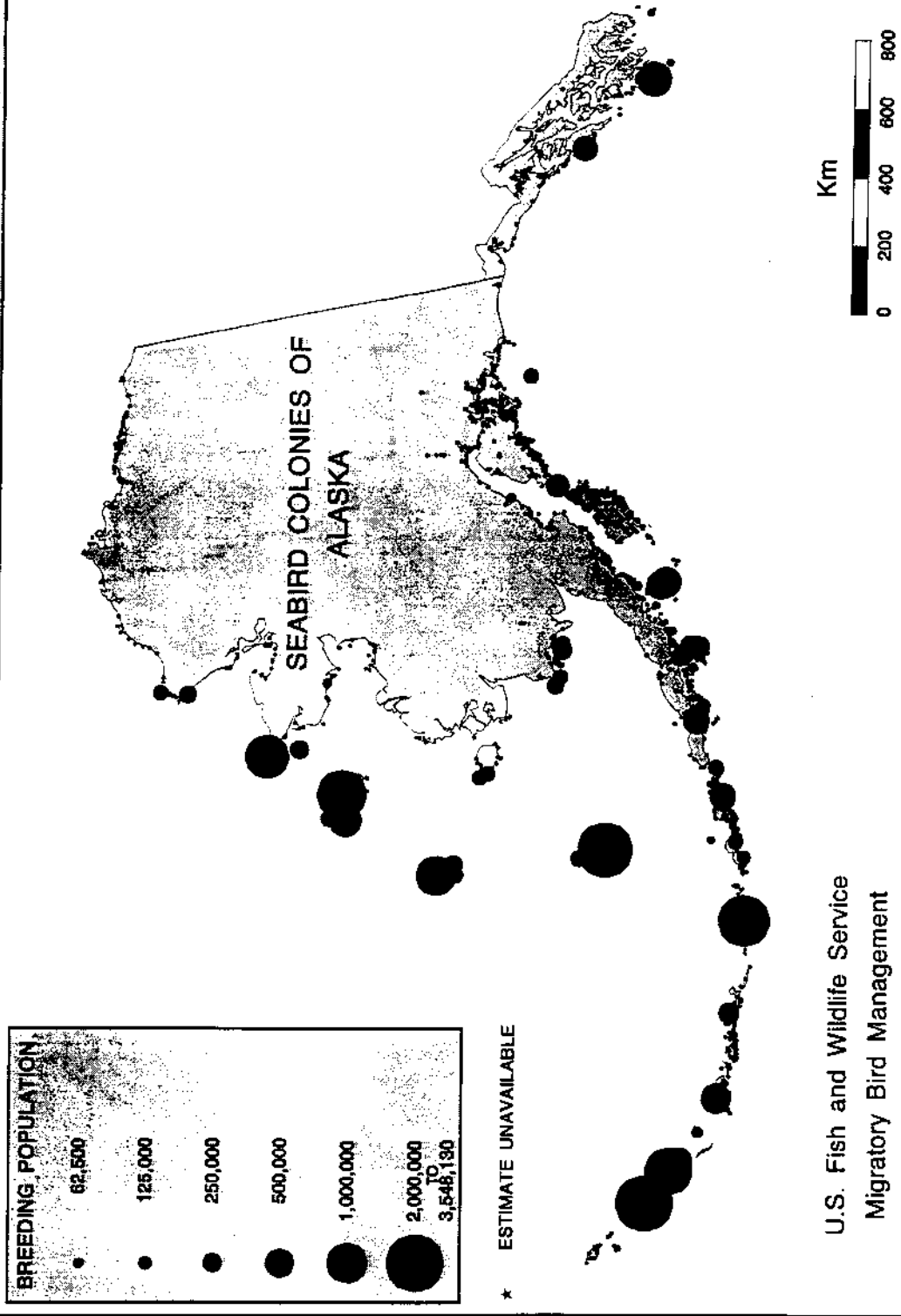
The Alaskan Seabird Colony Catalog is an automated database that contains the distributions of breeding seabirds and the relative size of all the colonies in Alaska. The data reports indicating estimated species composition and numbers for seabird colonies of Norton and Kotzebue Sound are summarized from the catalog. The maps display colony locations. The Alaska Seabird Colony Catalog is maintained by the U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Marine and Coastal Bird Project, in Anchorage. Questions or comments regarding the information contained in the Alaska Seabird Colony Catalog should be directed to the U.S. Fish and Wildlife Service at 786-3691. For updated information try the internet at: http://164.159.151.5/seabird/main_seabird.html

Seabirds Identified at colonies in the Subarea:

<u>Species Present</u>	<u>Estimated Population</u>
Glaucous-winged gull	3,982
Herring gull	117
Mew gull	20
Common murre	216,915
Thick-billed murre	143,604
Unidentified murre	228,480
Tufted puffin	5,421
Horned puffin	48,310
Pelagic cormorant	3,122
Black-legged kittiwake	86,390
Parakeet auklet	67,867
Least auklet	2,560,158
Crested auklet	874,666
Aleutian tern	943
Arctic tern	281
Common eider	218
Pigeon guillemot	3,521
Black guillemot	0
Dovekie	52

(This Page Intentionally Blank)

Alaska Seabird Colony Catalog



Insert Map, Northwest Arctic, Alaska Contingency Plan Subarea with 2000 Seabird Population, 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/subareas.html#northwest>

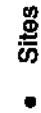
Alaska Seabird Colony Catalog
US Fish & Wildlife Service

Layer Legend

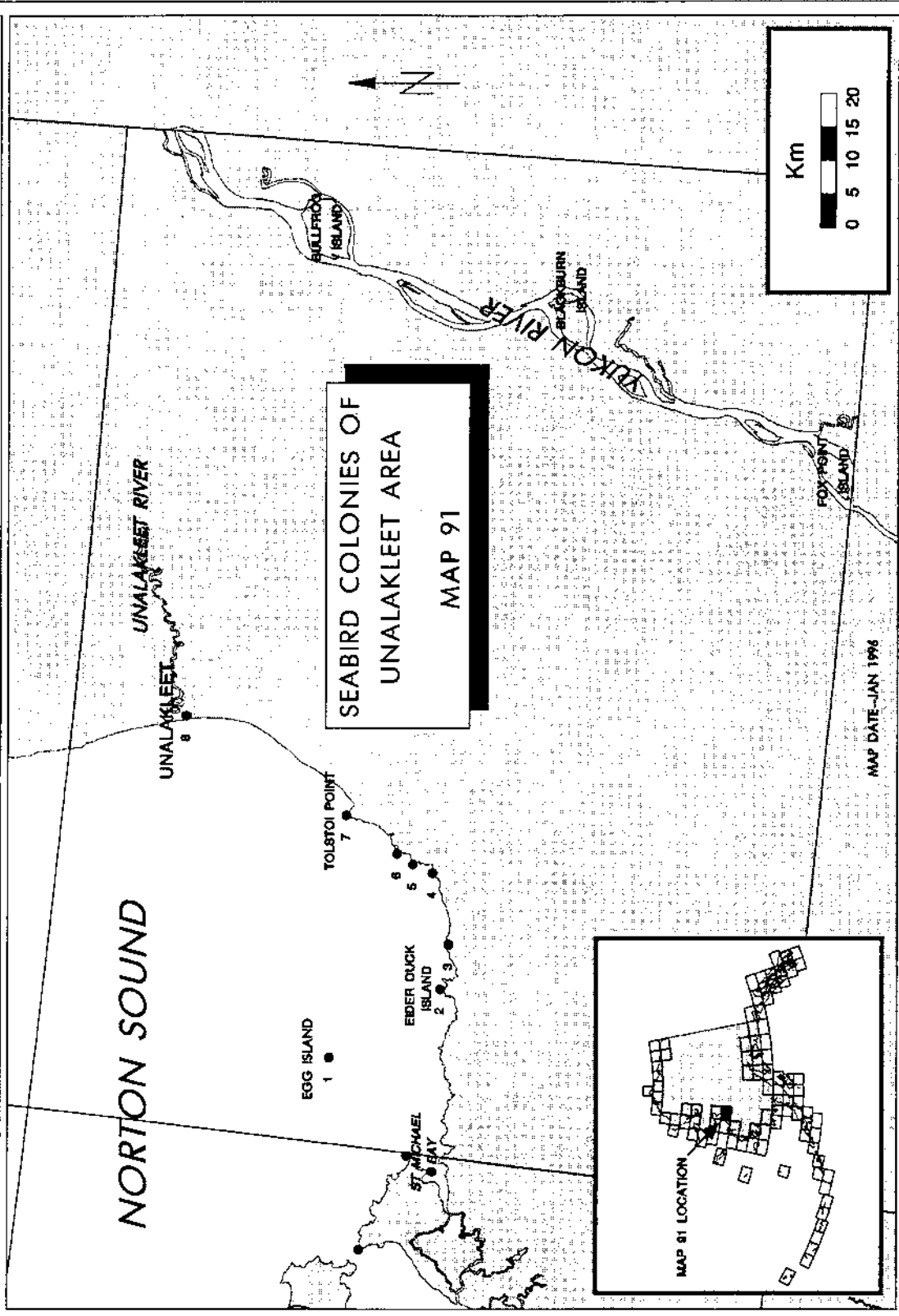
Land

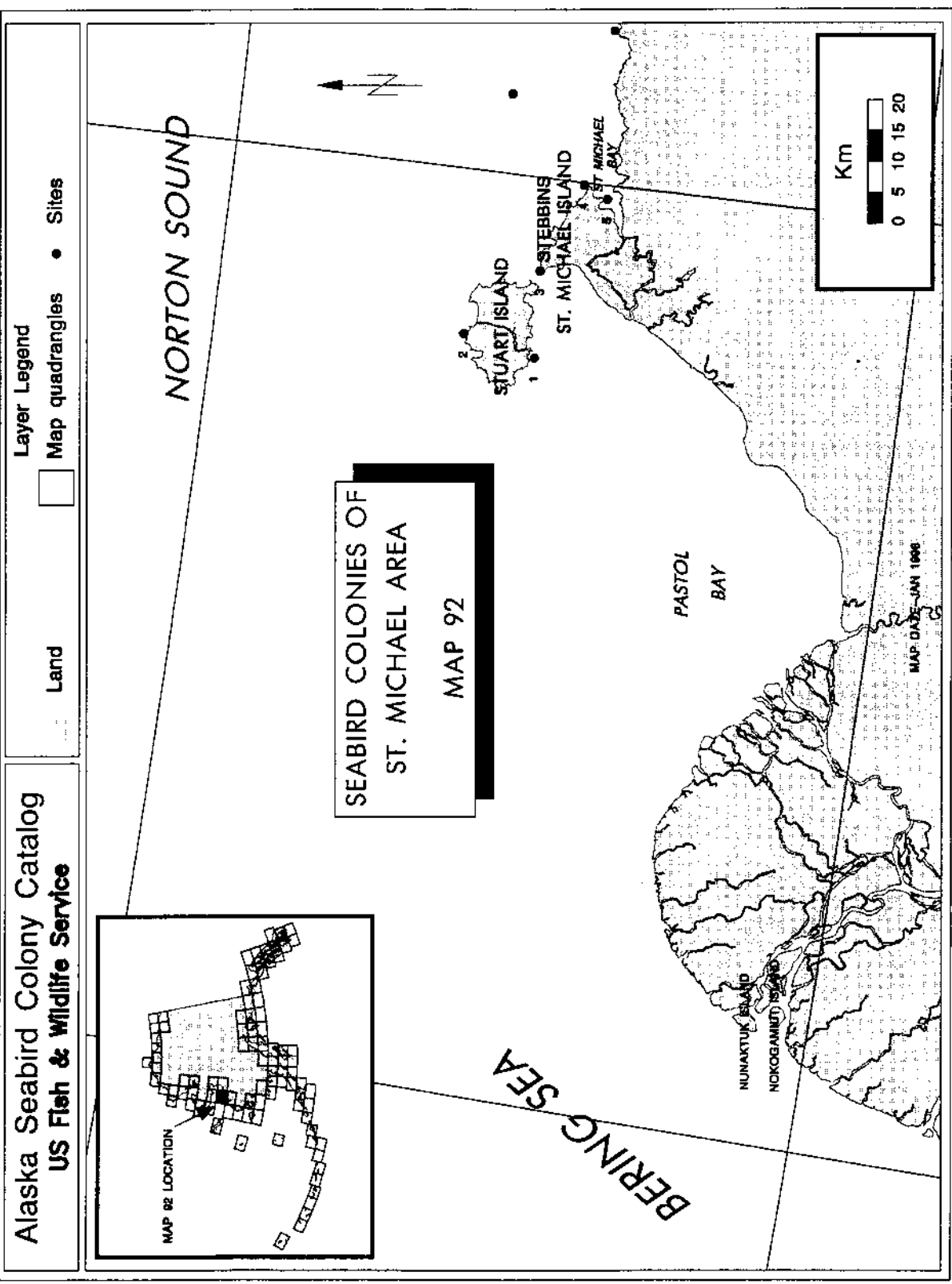


Map quadrangles






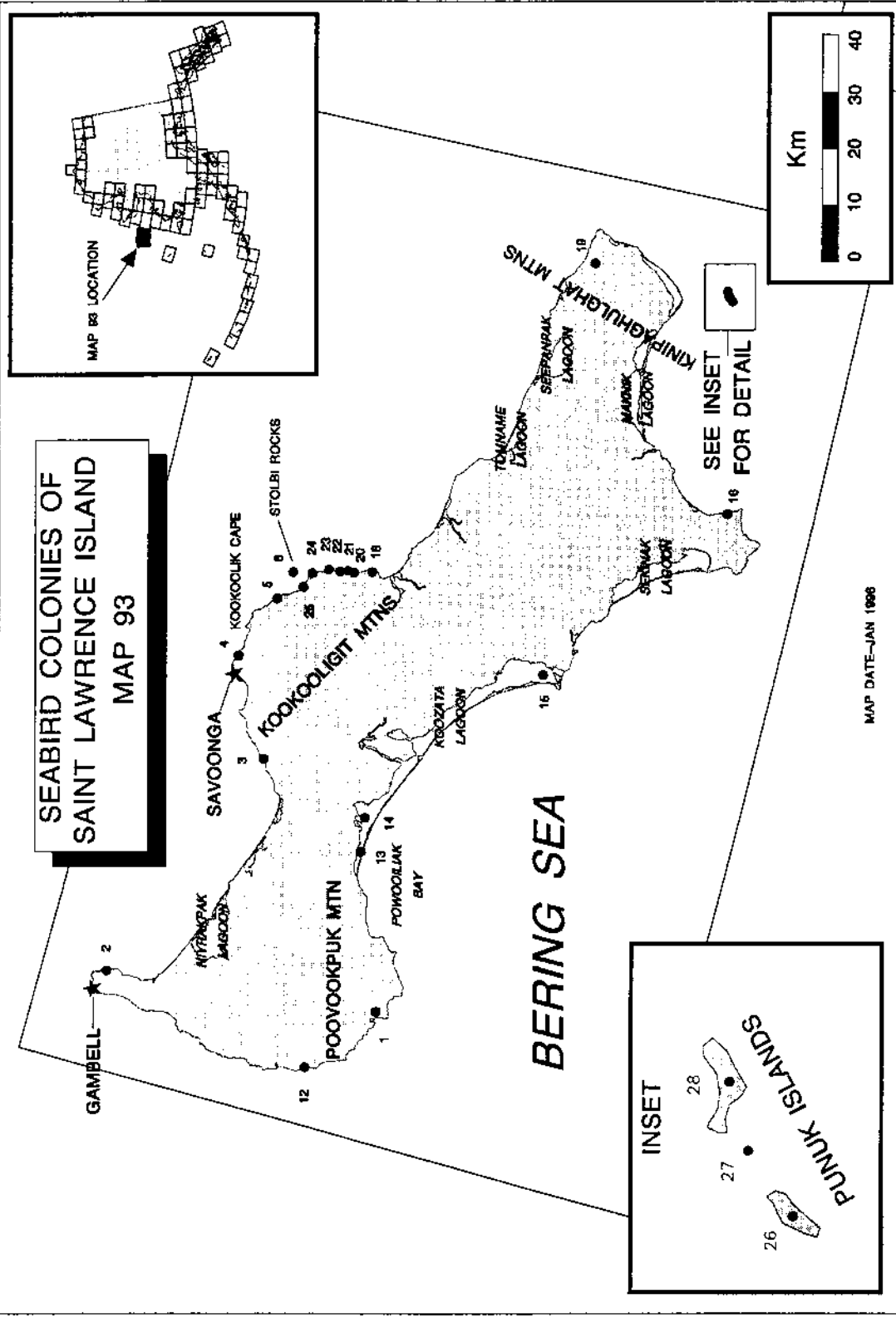
Sites








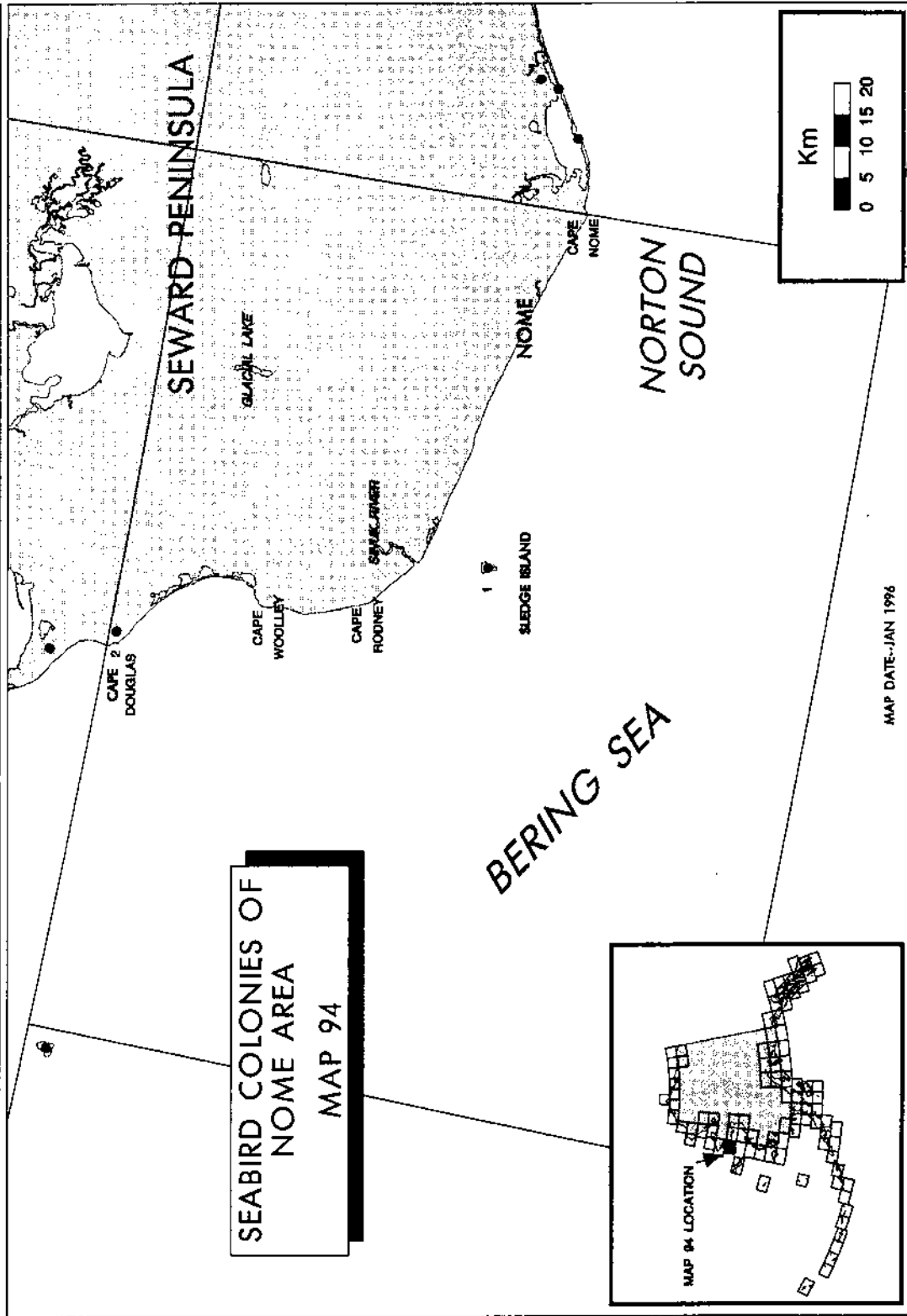
**Alaska Seabird Colony Catalog
US Fish & Wildlife Service**

Layer Legend
 Land  Map quadrangles  Sites 






Alaska Seabird Colony Catalog
US Fish & Wildlife Service

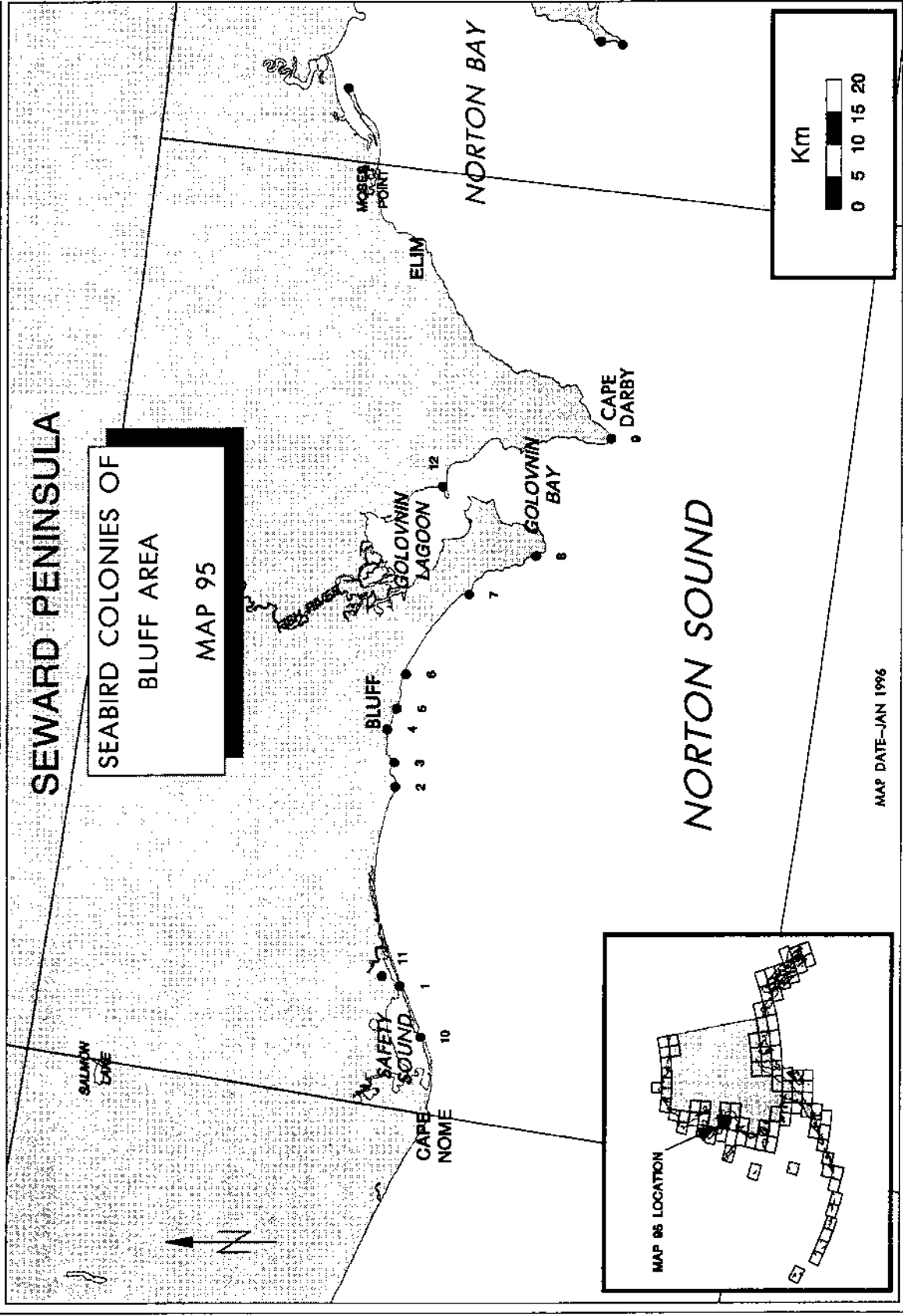
Land  Layer Legend
Map quadrangles  Sites 






Alaska Seabird Colony Catalog
US Fish & Wildlife Service

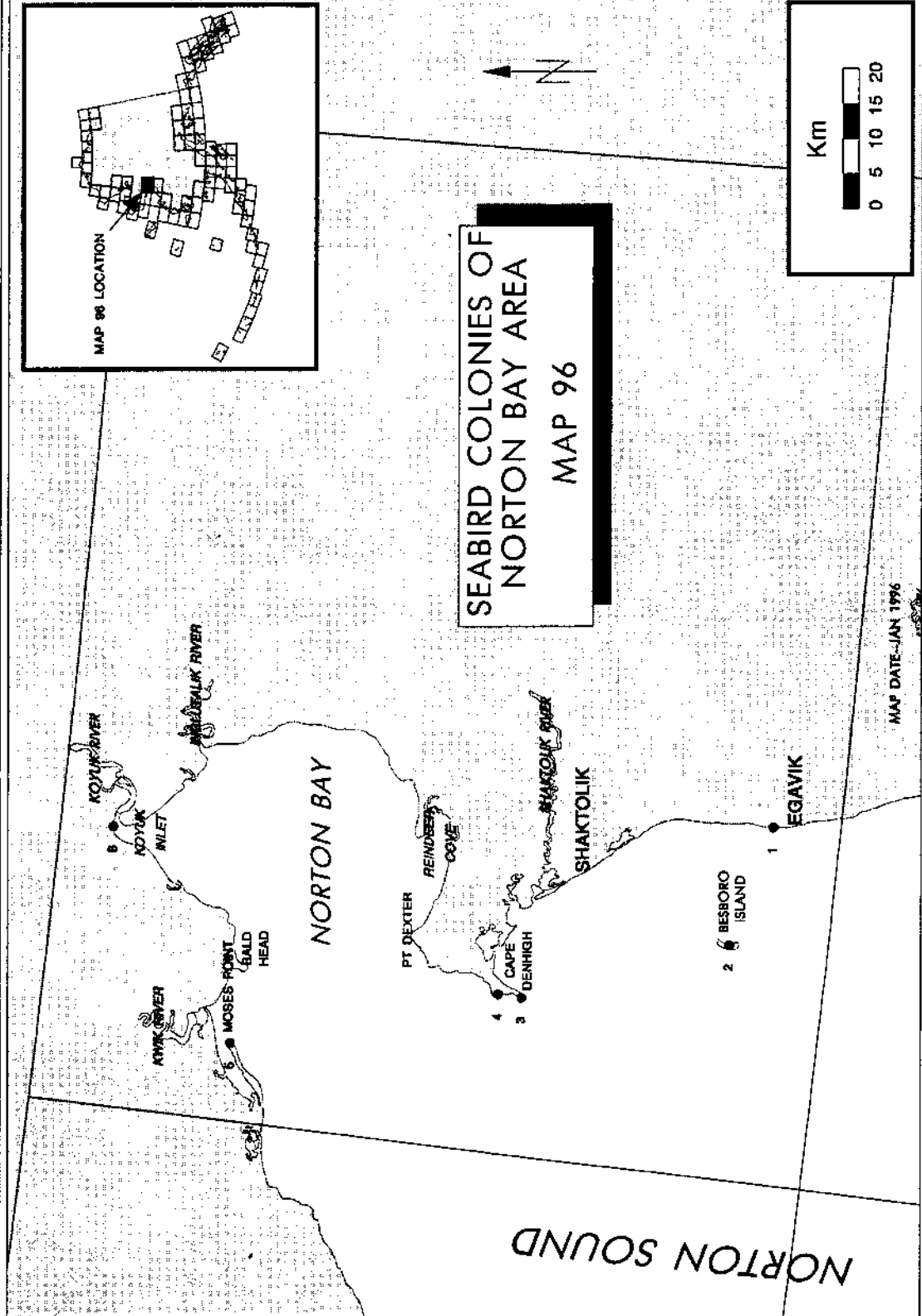
Layer Legend

Land  Map quadrangles  Sites 



Alaska Seabird Colony Catalog
US Fish & Wildlife Service

Layer Legend
 Land  Map quadrangles  Sites 

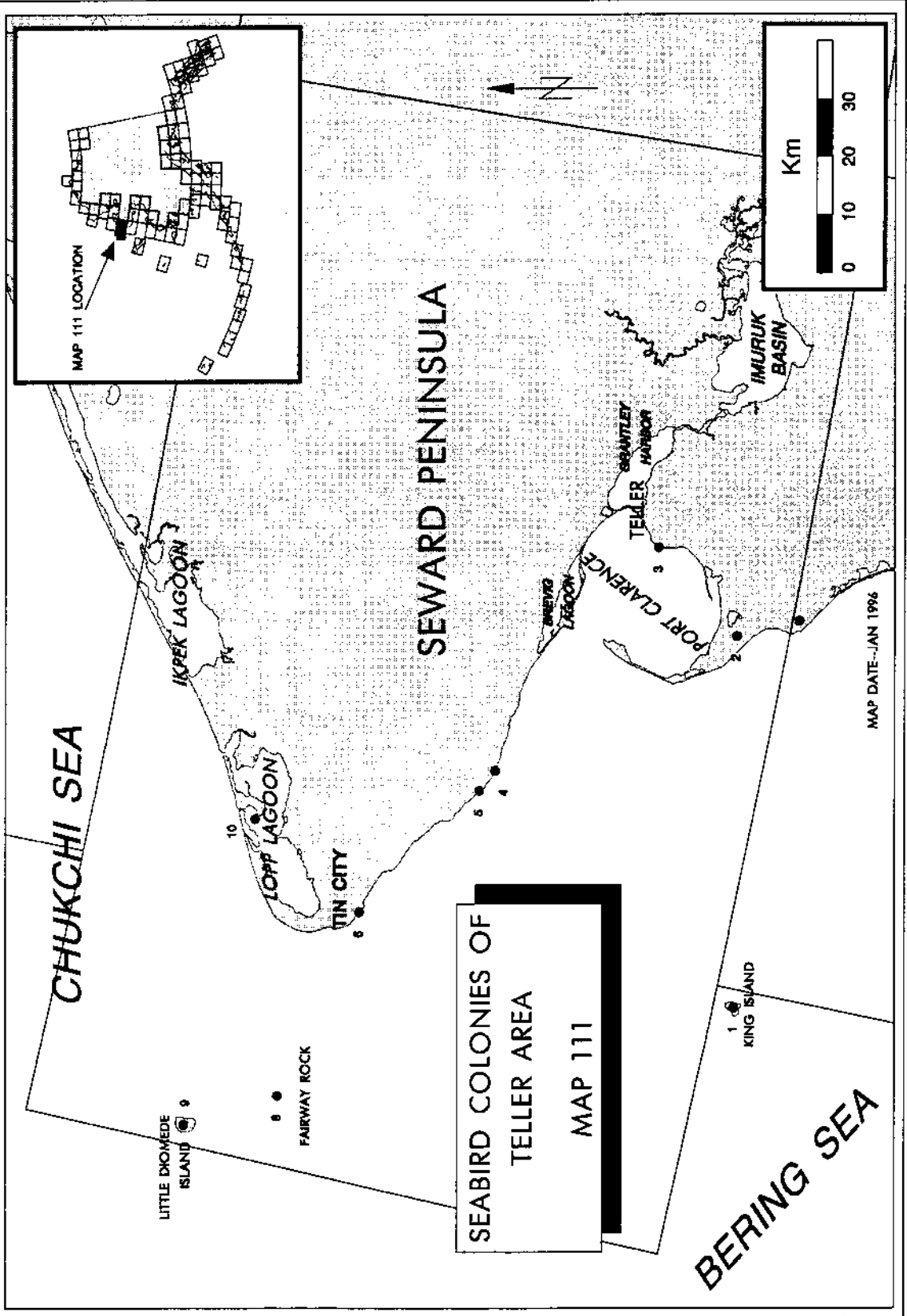


Alaska Seabird Colony Catalog
US Fish & Wildlife Service

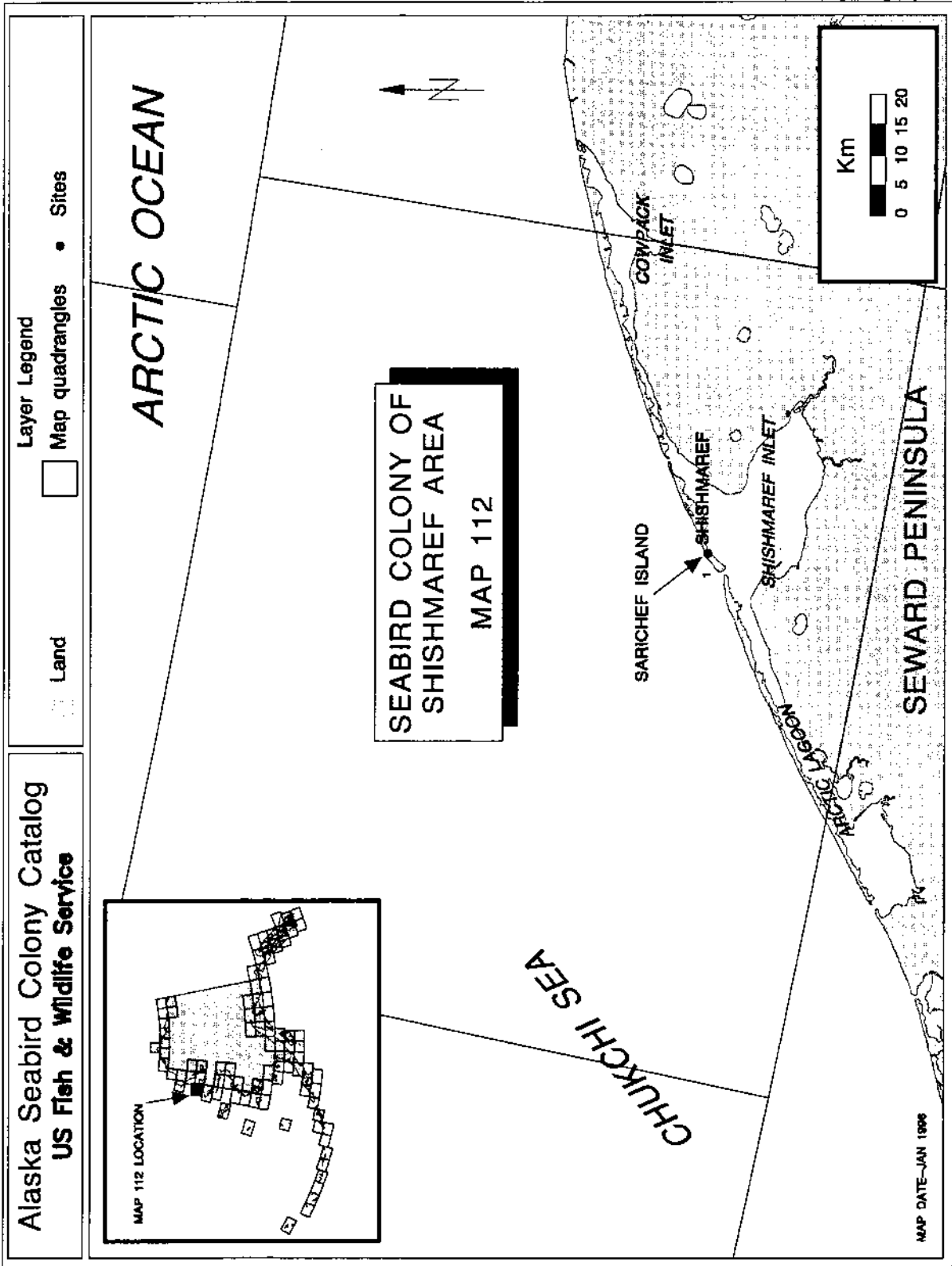
Layer Legend

Land

Map quadrangles • Sites






SEABIRD COLONIES OF
TELLER AREA
MAP 111

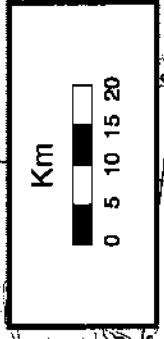


Alaska Seabird Colony Catalog
 US Fish & Wildlife Service

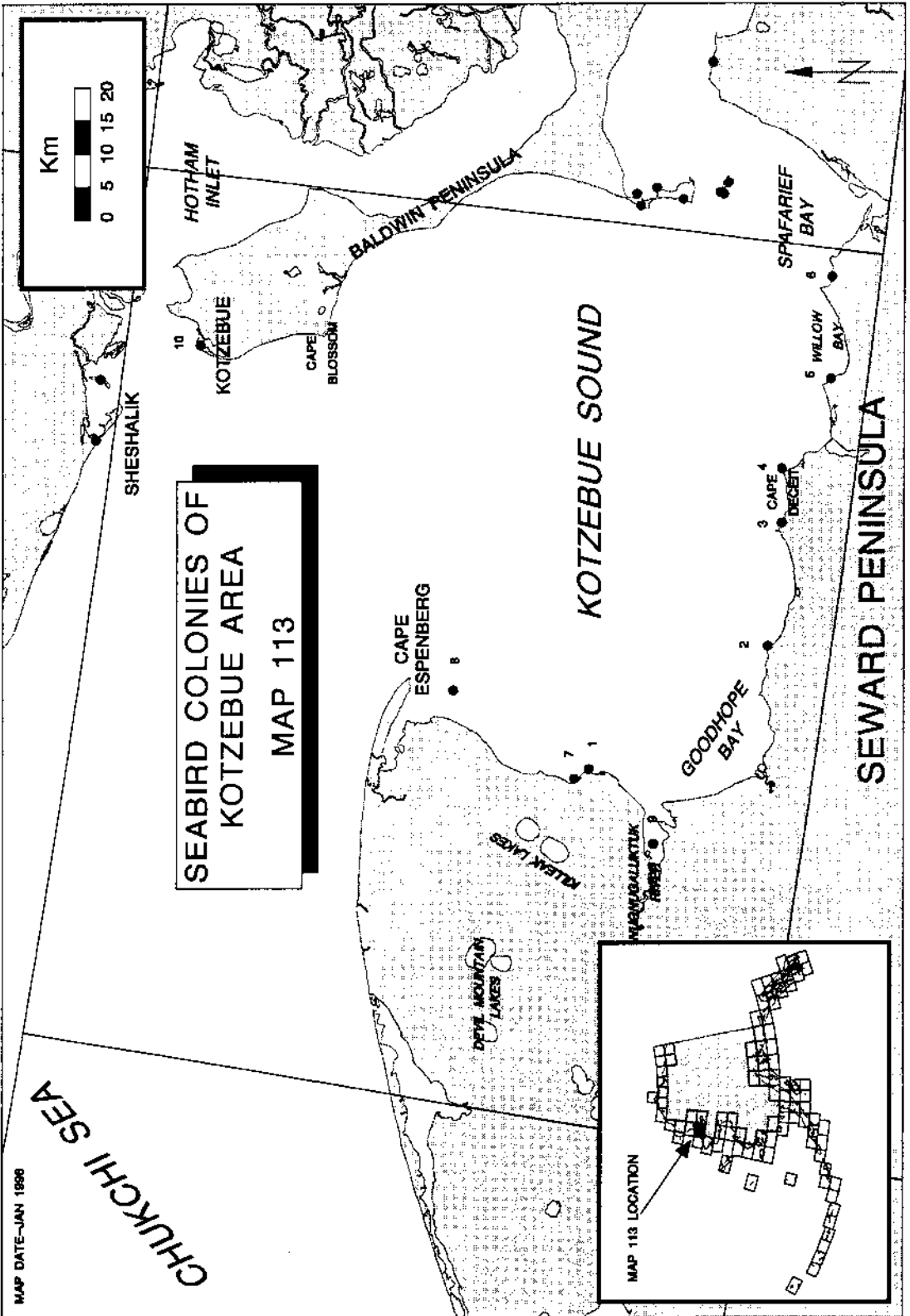
MAP DATE—JAN 1988

Layer Legend

Land  Map quadrangles  Sites 



SEABIRD COLONIES OF
 KOTZEBUE AREA
 MAP 113



Alaska Seabird Colony Catalog
US Fish & Wildlife Service

Land Layer Legend
Map quadrangles • Sites

MAP DATE—JAN 1998

NOATAK RIVER

BAIRD MOUNTAINS

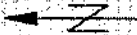
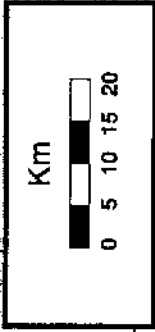
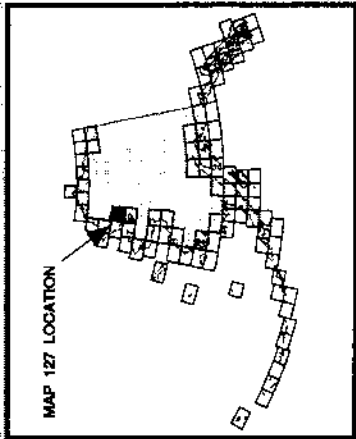
NO SEABIRD COLONIES DOCUMENTED
IN THE BAIRD MOUNTAIN AREA

MAP 127

KOBUK RIVER

SQUIBBEL RIVER

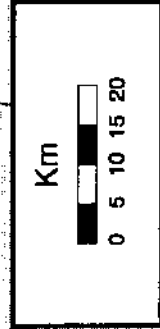
HOTHAM INLET



Alaska Seabird Colony Catalog
US Fish & Wildlife Service

Land Layer Legend
Map quadrangles • Sites

MAP DATE—JAN 1996



SEABIRD COLONIES OF
NOATAK AREA
MAP 128

