ALASKA HABITAT MANAGEMENT GUIDE

ARCTIC REGION

MAP ATLAS

PRODUCED BY
STATE OF ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF HABITAT

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Contents

List of Plates

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Introduction

OVERVIEW OF THE ALASKA HABITAT MANAGEMENT GUIDES PROJECT

One of the responsibilities of the Alaska Department of Fish and Game (ADF&G) is to assist land managers by recommending to them the best ways and means for protecting local fish, wildlife, and habitats against adverse effects and impacts that may occur from land and water development activities. Because many proposals and plans for development and land uses require a rapid response from the department, there may not be enough time for staff to actually study the specific area in which the proposed development is to occur. However, the department still needs to accumulate and assess a wide variety of information in order to prepare meaningful recommendations for managing habitat. Therefore, the department initiated the Alaska Habitat Management Guides (AHMG) project to prepare reports of the kinds of information upon which its recommendations must be founded in order to responsibly and rapidly address land and water use proposals made by land managers. These guides include written volumes, reference maps, and color map atlases of index maps.

The guides present the best available information on selected fish and wildlife species: describing their life functions and habitat requirements; mapping and discussing their geographical distribution; mapping and discussing the human uses made of them; and estimating their value to residents of the state. The completed guides coverage encompasses the Fish and Game Resource Management Regions established by the Joint Board of Fisheries and Game (plate 1).

Essential to assessing what might happen to fish and wildlife if their habitats are altered is information about what effects or impacts are typically associated with particular kinds of developmental activities. The habitat management guides therefore also provide summaries of these known effects. This information, in conjunction with the compiled life history and distribution information, will allow concerned individuals to estimate how sensitive a given species might be to a specific proposed activity — whether or not, and to what degree, the fish and wildlife are liable to be impacted.

The guides have been designed to provide users with interrelated subject areas that can be applied to particular questions regarding habitat management. For example, information on species' seasonal and geographic habitat use can be correlated with the written and mapped information on actual distribution and abundance. The narratives and maps regarding human uses of fish and wildlife can be compared with abundance and distribution information to obtain an indication of the overall regional patterns of distribution, abundance, and human use for the species of interest. The specific information on habitat requirements also will relate directly to the information on impacts associated with land and water use.

ARCTIC REGION GUIDE

Organization and Use of the Guide

This map atlas portrays information at the 1:1,000,000 scale that has been compiled from the more detailed 1:250,000 reference maps available in Alaska Department of Fish and Game offices of the Arctic Region (plate 2). This map atlas includes information on the distribution of fish and wildlife. All maps in this volume are numbered on the left-hand corner and listed in the Contents.

The maps supplement the two written volumes (*Volume I: Life Histories and Habitat Requirements of Fish and Wildlife; Volume II: Distribution, Abundance, and Human Use of Fish and Wildlife*). The narrative volumes are closely related and interdependent. The first highlights important aspects of selected species life histories, emphasizing the interrelationships of the species with their habitats. The second volume provides the most current estimates of their distribution and relative abundance. It also delineates the regional and subregional patterns, locations, and types of human uses of fish and wildlife resources, including commercial, recreational, and subsistence uses. This portion of the guide provides an understanding of the importance of fish and wildlife to the people within and outside the Arctic Region.

Species Selection Criteria

Each species covered in the guides was selected because it met the following criteria: 1) its habitat is representative of some portion of the spectrum of the Arctic Region habitats (this criterion ensures that regional habitats are well represented); 2) it constitutes an important resource to human users in the region; 3) the species or its habitat is liable to be adversely affected by present or proposed land or water uses; and 4) adequate information on its life history, abundance, and distribution was available.

Map Production and Content

The set of maps contained in this atlas is a synthesis of current information on the distribution of selected species of fish and wildlife in the Arctic Region. The information on species distribution was collected from state and federal agency biologists most expert on each species. All data were verified by these specialists during a technical review period, which ended in December 1985. Corrections and final cartographic work continued until drafting was completed in January 1986. Lists of all mappers and reviewers are found in the Acknowledgements. Sources, including personal communications, are listed in the References. The original reference maps from which these color maps were prepared are filed in ADF&G offices of the region. Most of the reference maps are at a scale of 1:250,000. The original maps compiled by the project biologists have been archived in the Division of Habitat in Anchorage to facilitate subsequent updates of mapped information.

The maps in this atlas show the regional and subregional patterns of fish and wildlife distribution, whereas the reference maps illustrate specific distribution categories in relation to more detailed features of the landscape. The color maps provide broad overviews of distribution data and thus function as index maps that can be used in conjunction with reference maps. Although the color maps emphasize seasonal concentration areas (e.g., brown bear concentrations along fish streams) and areas utilized for specific reproductive functions (e.g., calving areas, rookeries), for many species the general distribution is also mapped. "General distribution" in this context applies to areas that provide suitable habitat for the species and are within the known range of the species. Additionally, representative of the anadromous fish species, a separate map category, "unsurveyed areas," has been added in order to denote areas that have not been surveyed to determine whether or not fish are present.

Limitations of Mapped Information

All mapped information is necessarily limited to available information. That is, **where no information appears on a map it does not automatically mean that the map category does not exist there; rather, it means that there was no available information to map**. Because of the limitations of available information and the dynamic nature of mammal, bird, and fish populations, subsequent updates of any maps will very likely change them to some degree.

To maximize the consistency of mapped source data from different specialists, a set of specific definitions was adopted prior to the actual mapping and was used by all mappers and contributors. These definitions can be found following this section. It is therefore important to note that where these maps appear to differ from other contemporary maps of the same species, it will be necessary to compare the actual definitions of categories, which will reveal the differences in what was actually mapped in each case. The potential for apparent discrepancies with other maps is particularly great where the definition requires that the category be valid for more than one year's data, which therefore may result in a more conservative mapping of an area than if only one year's data were used.

The coverage of this set of maps is defined by the boundaries of the Arctic Region, and mapped information is not depicted beyond these borders. Please see the appropriate regional reference maps for information on areas outside the Arctic Region. Although it seems logical that mapped information should "edge-match," or show a consistent pattern across a regional boundary, that will not always be the case. The reason is that the distribution and harvest data can change during the time required to produce new maps of an adjacent region.

OVERVIEW OF THE ARCTIC REGION

The Arctic Region (plate 2) includes the Davidson, Philip Smith, Endicott, DeLong, Baird, and Bendeleben mountains. A few of the larger river basins in the region include the drainages of Canning, Sagavanirktok, Colville, Ikpikupk, Kuk, Utukok, Noatak, and Kobuk rivers. Marine waters associated with the region are comprised of the Norton and Kotzebue sounds and the Bering, Chukchi, and Beaufort seas.

The biophysical, biotic, and human resources of the region are briefly summarized below. Readers desiring a more detailed and extensive discussion of these characteristics of the region should consult the Alaska Regional Profiles.[1]

Biophysical Features

Portions of the Arctic Region are in the arctic, transitional, or the continental climatic zones. The weather in the region is the result of the interaction between global air movements, land topography, and major weather systems that move north-south and east-west across the Bering Sea and Arctic Ocean.

Sea ice formation in the Bering, Chukchi, and Beaufort seas begins in October, and the ice pack persists through late June, although the ice begins to melt and break up in April.

The topography of the region is primarily characterized by lowlands on the arctic coastal plain, Seward Peninsula and along the Noatak, Kobuk, and Selawik rivers, the rolling plateaus and hills of the arctic foothills and Seward Peninsula, and the more rugged Brooks Range and associated mountains. Permafrost is continuous or discontinuous throughout the region. The entire marine area of the region lies within the continental shelf.

Biota

Wet, moist, and relatively dry alpine tundra is the dominant vegetation of the Arctic Region. These highly variable tundra plant communities are comprised of herbaceous sedges, grasses, and low-growing forbs, lichens, and dwarf shrubs, with the percentage of shrubs generally increasing as the soil conditions become drier. Low and tall shrub communities comprised primarily of willow, alder, and shrub birch occur primarily along floodplains and fairly well-drained low-elevation foothill slopes. Various associations of white spruce, black spruce, paper birch, quaking aspen, and balsam poplar trees are found on well-drained soils in valley bottoms and on southerly slopes, generally below 1,000 ft.

The variety of habitats in the Arctic Region support harvestable populations of caribou, moose, brown and polar bears, Dall sheep, furbearers, ducks, geese, small game such as ptarmigan and arctic hares, Pacific walruses, and several species of seals and whales. All five species of Pacific salmon indigenous to North America, arctic grayling, arctic char/Dolly Varden, lake trout, broad whitefish, least cisco, sheefish, and many other fish species are found in the freshwater habitats. The marine environment supports populations of arctic cod, capelin, Pacific herring, saffron cod, starry flounder, king crab, and Tanner crab, as well as several other marine species.

Human Activities in the Region

Many human activities in the Arctic Region revolve around the subsistence, recreational, and commercial uses of fish and wildlife. Commercial fishing, trapping, reindeer herding, seafood processing, fur tanning and sewing, and guiding hunters and fishermen are important segments of the local economies.

Oil and gas development and production on the arctic coastal plain has provided the primary source of wage and employment and government funds over the last 12 years. The proposed development of the Red Dog zinc deposit may alter the economy of the Kotzebue Sound area in the near future. Mining for gold continues at a relatively low level compared to the mining activity around the turn of the century.

Infrastructure development is minimal by national standards, except within the developed oil fields.

[1]Arctic Environmental Information and Data Center. N.d. Alaska regional profiles: Northwest Region, Arctic Region. Prepared for the Office of the Governor and Joint Federal/State Land Use Planning Commission.

Definitions

Concentration areas — areas where the density of animals exceeds the density of the species in the surrounding area. "Concentration" is relative to the general densities within the area.
Suitable habitat — the environmental conditions that provide the species with one or more of the following: food, water, cover, or reproductive opportunities. The components of the habitat used by the species are presented in the narrative portion of this guide, *Volume I: Life Histories and Habitat Requirements of Fish and Wildlife*.

MAMMALS

BELUKHA WHALE

Known major concentration areas — estuarine and nearshore waters where large concentrations of belukha whales are known to occur during ice-free periods, primarily between 1 June and 31 July. Belukhas may utilize these areas intermittently (during a portion of a tidal cycle) or continuously (up to several days). Essential life functions, including calving, are known to occur in these waters.
Known migration patterns — known recurrent patterns of movement of belukha whales between seasonal or life function use areas. Migrational movements may occur within well-defined corridors or over a relatively broad front. The months during which the majority of the movement occurs are indicated.
Known movements associated with feeding — nearshore movements of belukha whales associated with seasonally distributed food sources.
Known summer use areas — areas where belukha whales have been observed during more than one summer, including but not limited to known life function areas.

BOWHEAD WHALE

Known feeding concentration areas — areas where concentrations of feeding bowhead whales have been observed during more than one year.
Known migration patterns — known recurrent patterns of movement of bowhead whales between seasonal or life function use areas. Migrational movements may occur within well-defined corridors or over a relatively broad front. The months during which the majority of the movements occur are indicated.

BROWN BEAR

General distribution — suitable habitat within the known range of brown bear, including but not limited to seasonal and life function use areas.
Known concentrations along fish streams — areas where concentrations of brown bears have been observed fishing during more than one year.
Known concentrations associated with mammalian food sources — areas where concentrations of brown bears have been observed feeding on concentrated mammalian food sources. These food sources occur consistently in geographically limited areas during spring and/or summer and include marine mammal carrion or caribou calving aggregations.
Known concentrations in berry areas — areas where concentrations of brown bears have been observed feeding on berries during years of abundant berry production.
Known spring concentration areas — areas where concentrations of brown bears have been observed during more than one spring.

CARIBOU

General distribution — suitable habitat within the known range of caribou, including but not limited to seasonal and life function use areas.
Known calving areas — one or more areas where most calving by a specific caribou herd has been observed. Small groups or individuals of the herd may calve elsewhere.
Known insect relief areas — areas where caribou have been observed to consistently seek relief from insect harassment. These areas are designated only where their availability is limited or their consistent pattern of use warrant such designation. Other areas may also be consistently used for insect relief but have not yet been identified.
Known migration patterns — known recurrent patterns of movement by a majority of a specific caribou herd. Migrational movements may occur within well defined corridors or over a relatively broad expanse between seasonal use areas.
Known winter use areas — areas where a majority of a specific caribou herd has been observed during more than one winter.

DALL SHEEP

General distribution — suitable habitat within the known range of Dall sheep, including but not limited to seasonal and life function use areas.
Known mineral licks — areas where concentrations of Dall sheep have been observed at nutritionally important mineral deposits.
Known winter use areas — areas where Dall sheep have been observed during more than one winter.

MOOSE

General distribution — suitable habitat within the known range of moose, including but not limited to seasonal and life function use areas.
Known winter concentration areas — areas where concentrations of moose have been observed during more than one winter.

PACIFIC WALRUS

Known haulout concentration areas — areas where concentrations of Pacific walruses have been observed hauled out during more than one year.
Known migration patterns — known recurrent patterns of movement of Pacific walruses between seasonal or life function use areas. Migrational movements may occur within well-defined corridors or over a relatively broad front.

POLAR BEAR

General distribution — suitable habitat within the known range of polar bear, including but not limited to seasonal and life function use areas.
Confirmed coastal denning areas — areas within which polar bear dens or denning activity have been observed in more than one winter. Dens and/or denning activity have been observed in other areas, but adequate data do not currently exist to confirm recurrent use. It was not possible to map sea ice denning areas due to variable ice conditions and lack of information.
Potential coastal denning areas — areas containing habitat exhibiting characteristics similar to confirmed coastal denning areas of polar bears. Dens or denning activity may have been observed in portions of these areas, but data indicating recurrent use are not available.

RINGED SEAL

Breeding and pupping along shore-fast ice — areas of shore-fast ice where ringed seals are known to pup and breed. Pupping and breeding also occur on stable pack ice, but the importance of this habitat is unknown at this time.
Known migration patterns — known recurrent patterns of movement of ringed seals between seasonal or life function use areas. Migrational movements may occur within well-defined corridors or over a relatively broad area.

BIRDS

DABBLING AND DIVING DUCKS

General distribution — suitable habitat within the known range of dabbling or diving ducks, including but not limited to known seasonal and life function use areas.
Known fall concentration areas — areas where concentrations of one or more species of ducks have been observed during fall migration for more than one year.
Known migration patterns — known recurrent patterns of movement of a majority of a subpopulation of ducks. Migrational movements may occur within well defined corridors or over a relatively broad expanse between seasonal use areas.
Known molting concentration areas — areas where concentrations of one or more species of molting ducks have been observed during more than one year.
Known nesting concentration areas — areas where concentrations of one or more species of nesting ducks have been observed during more than one year.
Known spring concentration areas — areas where concentrations of one or more species of ducks have been observed during spring migration for more than one year.
Known winter concentration areas — areas where concentrations of one or more species of ducks have been observed during winter for more than one year.

GEESE

General distribution — suitable habitat within the known range of geese, including but not limited to known seasonal and life function use areas.
Known fall concentration areas — areas where concentrations of one or more species of geese have been observed during fall migration for more than one year.
Known migration patterns — known recurrent patterns of movement of a majority of a subpopulation of geese. Migrational movements may occur within well defined corridors or over a relatively broad expanse between seasonal use areas.
Known molting concentration areas — areas where concentrations of one or more species of molting geese have been observed for more than one year.
Known nesting concentration areas — areas where concentrations of one or more species of nesting geese have been observed during more than one year.
Known spring concentration areas — areas where concentrations of one or more species of geese have been observed during spring migration for more than one year.

FISH

ANADROMOUS FISH

Anadromous watershed areas — drainages or migration corridors with documented presence of anadromous fish (i.e., salmon or arctic char/Dolly Varden). For other species (e.g., sheefish, whitefish, and cisco), see selected freshwater fish.
Documented presence in stream or lake — areas where the presence of anadromous fish species in a stream or lake during any time of year or life cycle has been observed.
Not present in watershed — areas that have been surveyed in which anadromous fish were documented not to be present.
Unsurveyed watershed areas — areas where documentation of the presence or absence of anadromous fish species is not available.

CAPELIN

General distribution — suitable habitat within the known range of capelin, including but not limited to seasonal and life function use areas.
Known spawning concentration areas — areas where the presence of spawning capelin has been observed.

KING CRAB

General distribution — suitable habitat within the known range of red or blue king crab, including but not limited to seasonal and life function use areas.
Known concentration areas of blue king crab — areas where concentrations of both male and female blue king crabs have been observed.
Known summer concentration areas of female red king crab — areas where concentrations of both juvenile and adult female red king crabs have been observed during summer (June through August) months.
Known winter concentration areas of female red king crab — areas where concentrations of both juvenile and adult female red king crabs have been observed during winter (November through May) months.

PACIFIC HERRING

General distribution — suitable habitat within the known range of Pacific herring, including but not limited to seasonal and life function use areas.

Known overwintering areas — areas where concentrations of Pacific herring have been observed during winter (i.e., December through March) months.
Known spawning concentration areas — areas where the presence of spawning herring or herring roe-on-substrate has been observed.

SELECTED FRESHWATER FISH[1]

Documented presence in stream or lake — areas where the presence of a species in a specific stream segment or lake has been observed.
General distribution — suitable habitat within the known range of the fish species, including but not limited to seasonal and life function use areas. Polygons include areas containing the common occurrence of these species, whether in their anadromous or freshwater form.

[1]This set of maps includes distribution information for several fish species (e.g., sheefish, whitefish, cisco, grayling, and char) that may enter estuarine or nearshore waters.

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PLATES

SIX REGIONS OF THE ALASKA HABITAT MANAGEMENT GUIDE PROJECT

1 — SOUTHEAST
2 — SOUTHCENTRAL
3 — SOUTHWEST
4 — WESTERN
5 — ARCTIC
6 — INTERIOR

ARCTIC REGIONAL BOUNDARY
1:1,000,000 LAND BASE MAPS
1:1,000,000 MARINE BASE MAPS

BEAUFORT SEA MAP
CHUKCHI SEA MAP
ARCTIC EAST MAP
ARCTIC WEST MAP
BERING SEA MAP

Chukchi Sea
Beaufort Sea
Norton Sound
Kotzebue Sound

BARROW
WAINWRIGHT
MEADE RIVER
TESHEKPUK
HARRISON BAY
BEECHEY POINT
FLAXMAN ISLAND
BARTER ISLAND
POINT LAY
UTUKOK RIVER
LOOKOUT RIDGE
IKPIKPUK RIVER
UMIAT
SAGAVANIRKTOK
MT. MICHELSON
DEMARCATION POINT
POINT HOPE
DE LONG MTS.
MISHEGUK MTN.
HOWARD PASS
KILLIK RIVER
CHANDLER LAKE
PHILIP SMITH MTN.
ARCTIC
TABLE MOUNTAIN
NOATAK
BAIRD MTN.
AMBLER RIVER
SURVEY PASS
SHISHMAREF
KOTZEBUE
SELAWIK
SHUNGNAK
HUGHES
TELLER
BENDELEBEN
CANDLE
KATEEL RIVER
NOME
SOLOMON
NORTON BAY
ST. LAWRENCE
ST. MICHAEL
UNALAKLEET
KWIGUK

U.S.S.R.
U.S.A.
CANADA

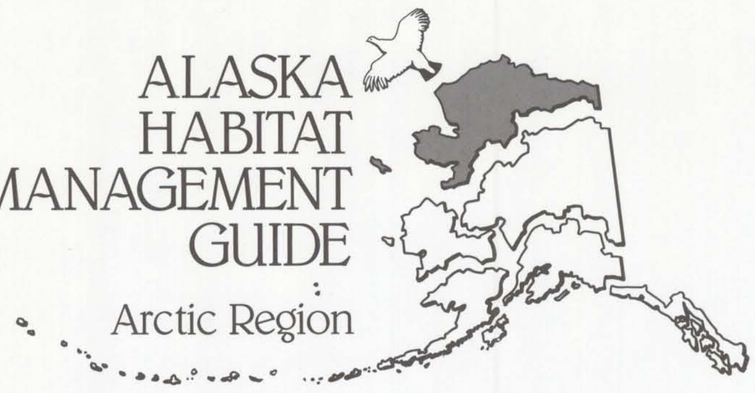
50 0 50 100 150 MILES
50 0 50 100 150 KILOMETERS

N

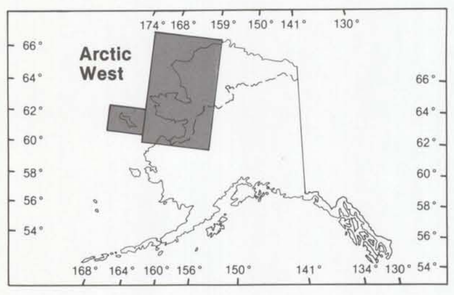
Arctic Ocean
Alaska
Bering Sea
Pacific Ocean

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



LEGEND



DISTRIBUTION OF MOOSE

MOOSE

- General Distribution
- Known Winter Concentration Areas
- Arctic Regional Boundary

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Moose—ADF&G 1973; GAAC 1984; Grauvogel, pers. comm.; James, pers. comm.; NANA Region 1984; Spindler, pers. comm.; Starr et al. 1981.

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HABITAT DIVISION
1986

Arctic Circle

BERING STRAIT

BERING SEA

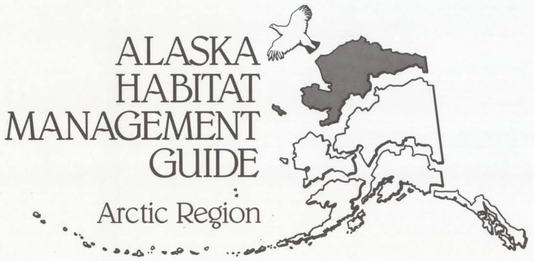
KOTZEBUE SOUND

NORTON SOUND

ST. LAWRENCE ISLAND

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region

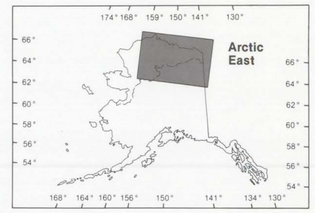


LEGEND

DISTRIBUTION OF MOOSE

MOOSE

- General Distribution
- Known Winter Concentration Areas
- Arctic Regional Boundary



Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Moose—ADF&G 1973; 1979c; GAAC 1984; Garner, pers. comm.; Hemming and Moorehouse 1976; James, pers. comm.; Lenarz et al. 1974; Mould 1977; NANA Region 1984; Roseneau and Stern 1974; Spindler, pers. comm.; Trent, pers. comm.; USFWS 1985; Whitten, pers. comm.

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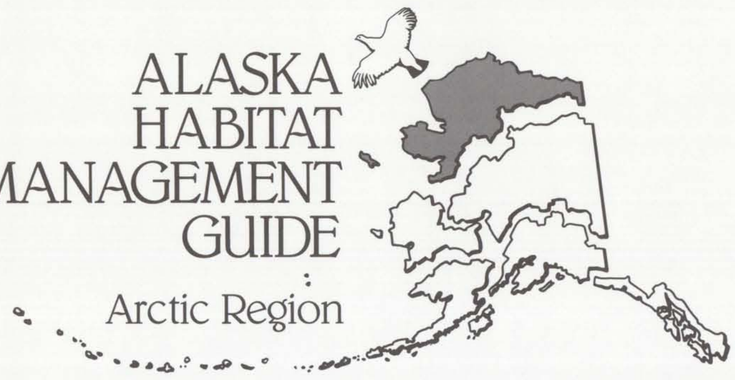
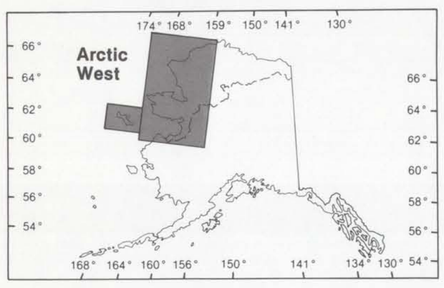
ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



NOTE: General distribution of caribou extends across the tidal flats to include Icy Cape. Small numbers of caribou have been occasionally observed on the adjacent barrier islands.

LEGEND



DISTRIBUTION OF CARIBOU

CARIBOU

- General Distribution
- Known Winter Use Areas
- Known Calving Areas
- Known Migration Patterns
- Arctic Regional Boundary

The caribou category "Known Insect Relief Areas" is not included on this map because available data do not document such areas.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Caribou—ADF&G 1973; Anderson and Smith, pers. comm.; Davis, pers. comm.; David and Valkenburg 1979; James, pers. comm.; Johnson, pers. comm.; Seaman, pers. comm.

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NOTE: There is no "Winter Use" for caribou on Selawik Lake, but small numbers of animals do cross when the lake is frozen.

Arctic Circle

BERING SEA

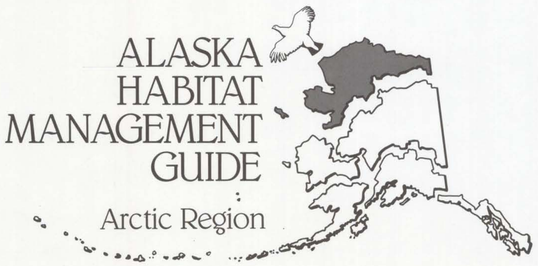
BERING STRAIT

KOTZEBUE SOUND

NORTON SOUND

NOTE: General distribution of caribou extends across the tidal flats to include Icy Cape. Small numbers of caribou have been occasionally observed on the adjacent barrier islands.

ALASKA HABITAT MANAGEMENT GUIDE
Arctic Region



LEGEND

DISTRIBUTION OF CARIBOU

CARIBOU

- General Distribution
- Known Winter Use Areas
- Known Insect Relief Areas
- Known Calving Areas
- Known Migration Patterns
- Arctic Regional Boundary

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

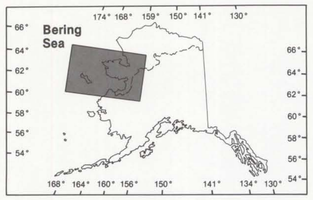
Sources: Caribou—ADF&G 1973; Anderson and Smith, pers. comm.; Cameron, pers. comm.; Davis, pers. comm.; Davis and Valkenburg 1979; James, pers. comm.; Johnson, pers. comm.; Mauer, pers. comm.; Roseneau and Stern 1974; Roseneau et al. 1974, 1975; Seaman, pers. comm.; Silva, pers. comm.; USFWS 1982, 1985; Whitten, pers. comm.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region

LEGEND



DISTRIBUTION OF POLAR BEAR, PACIFIC WALRUS, RINGED SEAL, BOWHEAD WHALE, AND BELUKHA WHALE

POLAR BEAR
- General Distribution

PACIFIC WALRUS
- Known Haulout Concentration Areas
- Known Migration Patterns

RINGED SEAL
- Breeding and Pupping Along Shore-fast Ice
- Known Migration Patterns

BOWHEAD WHALE
- Known Migration Patterns

BELUKHA WHALE
- Known Major Concentration Areas
- Known Migration Patterns
- Known Summer Use Areas
- Known Movements Associated with Feeding

- Arctic Regional Boundary

The polar bear categories "Confirmed Coastal Denning Areas" and "Potential Coastal Denning Areas" are not included on this map because available data do not document such areas.

The bowhead whale category "Known Feeding Concentration Areas" is not included on this map because available data do not document such areas.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Polar Bear—Lentfer, pers. comm. **Other Marine Mammals**—ADF&G 1981c; Fay 1982; Frost, pers. comm.; Frost et al. 1982; Iya, pers. comm.; Lowry, pers. comm.; Nelson, pers. comm.; Pungowiyi, pers. comm.; Seaman, pers. comm.; Starr et al. 1981.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

NOTE: For complete portrayal of data for this area please refer to the Chukchi Sea map in this series.

NOTE: General distribution of polar bears extends beyond the boundaries of this map and is associated with the seasonal distribution of ice.

NOTE: Distribution of polar bears in and south of Norton Sound depends on yearly extent of ice.

BERING SEA

NORTON SOUND

KOTZEBUE SOUND

ST. LAWRENCE ISLAND

Ringed Seal March-April

Belukha Mid June-Mid July

Belukha June-July

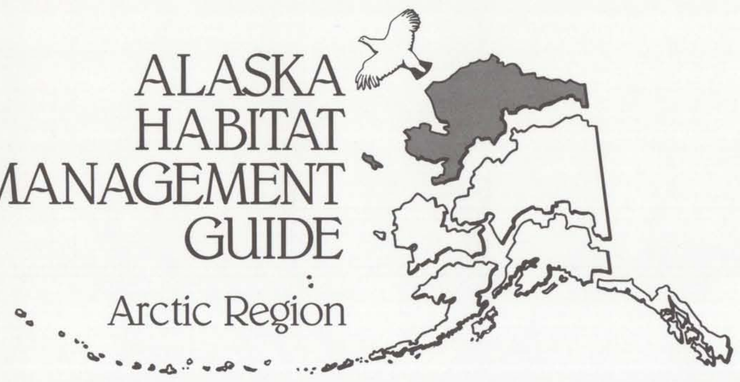
Belukha June-Nov.

Belukha July-Sept.

Arctic Circle

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



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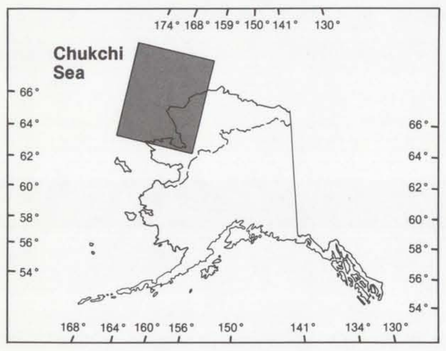


DISTRIBUTION OF POLAR BEAR, PACIFIC WALRUS, RINGED SEAL, BOWHEAD WHALE, AND BELUKHA WHALE

POLAR BEAR
- General Distribution
- Confirmed Coastal Denning Areas
- Potential Coastal Denning Areas

PACIFIC WALRUS
- Known Haulout Concentration Areas
- Known Migration Patterns

RINGED SEAL
- Breeding and Pupping Along Shore-fast Ice
- Known Migration Patterns

BOWHEAD WHALE
- Known Migration Patterns

BELUKHA WHALE
- Known Major Concentration Areas
- Known Migration Patterns
- Known Summer Use Areas
- Known Movements Associated with Feeding

- Arctic Regional Boundary

The bowhead whale category "Known Feeding Concentration Areas" is not included on this map because available data do not document such areas.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Polar Bear—Lentfer, pers. comm.; Lentfer and Hensel 1980; Nelson, pers. comm. **Other Marine Mammals**—ADF&G 1981c; Fay 1982; Frost, pers. comm.; Frost et al. 1982; Iya, pers. comm.; Lentfer 1984; Lowry, pers. comm.; Nelson, pers. comm.; Pungowiyi, pers. comm.; Seaman, pers. comm.; Seaman and Burns 1981; Starr et al. 1981.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

NOTE: General distribution of polar bears extends beyond the boundaries of this map and is associated with the seasonal distribution of ice.

NOTE: General distribution of polar bears extends beyond the boundaries of this map and is associated with the seasonal distribution of ice.

C H U K C H I

S E A

K O T Z E B U E

S O U N D

Sept.-Nov.
June-Aug.
Late Sept.-Oct.
Apr.-May
July-Aug.
Ringed Seal March-May
June-July
Apr.-early May
June
Late Sept.-Oct.
Apr.-early May
Apr.-July
June
March-May
March-July
Oct.-Nov.
Sept.-Nov.
May-June
Ringed Seal March-April
Late March-May
June-early July
Mid March-June
March
May
Sept.-Dec.
Oct.-Nov.
Late June
Late June-Oct.
Late June-Aug.
Mid March-July
May-June
Belukha Mid June-Mid July
Belukha June-July

Pt Belcher
Wainwright
Solivik Island
Point Lay
Cape Beaufort
Cape Sabine
Cape Lisburne
Cape Dyer
Kilikralik Pt
Point Hope
Cape Thompson
Cape Seppings
Kivalina
Noatak
Cape Krusenstern
Sheshalik Spit
Kotzebue
Cape Blossom
Cape Espenberg
Shishmaref
Cape Deceit
Deering
Chamisso
Candle
Buckland
Kiana
Noorvik
Selawik Lake
Arctic Circle
Big Diomede Island
Little Diomede I
Wales
Lopp Lagoon
Krusenstern Lagoon
Goodhope Bay
Devil Mtn Lakes
Killeak Lakes
Ekichuk Lake
Shishmaref Inlet
Hotham Inlet
Eschscholtz Bay
Utukok River
Ipisaruk River
Kaolak River
Colville River
Kukpowruk River
Katpuk River
Kivalina River
Kelly River
Kugururok River
Noatak River
Agashashok River
Squirrel River
North Fork Omar River
Buckland River
Kugruk River
Nimiuktuk River
Kauk Rd
Mungoak River
West Fork River
Arctic Lake
Walik River
Aniuk River
Kuchuk Creek
Putneegen River
Kukpowruk River
Katpuk River
Kivalina River
Kelly River
Kugururok River
Noatak River
Agashashok River
Squirrel River
North Fork Omar River
Buckland River
Kugruk River
Nimiuktuk River
Kauk Rd
Mungoak River
West Fork River
Arctic Lake
Walik River
Aniuk River
Kuchuk Creek

LEGEND

DISTRIBUTION OF POLAR BEAR, PACIFIC WALRUS, RINGED SEAL, BOWHEAD WHALE, AND BELUKHA WHALE

POLAR BEAR
- General Distribution
- Confirmed Coastal Denning Areas
- Potential Coastal Denning Areas

PACIFIC WALRUS
- Known Migration Patterns

RINGED SEAL
- Breeding and Pupping Along Shore-fast Ice

BOWHEAD WHALE
- Known Feeding Concentration Areas
- Known Migration Patterns

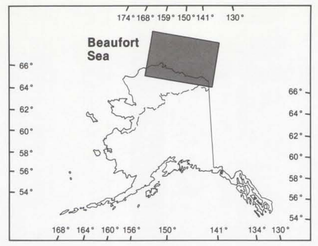
BELUKHA WHALE
- Known Major Concentration Areas
- Known Migration Patterns
- Known Summer Use Areas
- Known Movements Associated with Feeding

Arctic Regional Boundary

The Pacific walrus category "Known Haulout Concentration Areas" is not included on this map because available data do not document such areas.

The ringed seal category "Known Migration Patterns" is not included on this map because available data do not document such areas.

Sources: Polar Bear—Amstrup, pers. comm.; Lentfer, pers. comm.; Lentfer and Hensel 1980; Lowry, pers. comm.; USFWS 1982. **Other Marine Mammals**—ADF&G 1979, 1981a, 1981b, 1981d; Fay 1982; Frost, pers. comm.; Lentfer 1984; Lowry, pers. comm.; Nelson, pers. comm.; North Slope Borough 1984; Seaman and Burns 1981.



Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

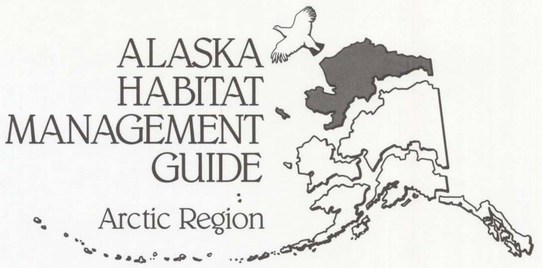
10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



NOTE: General distribution of polar bears extends beyond the boundaries of this map and is associated with the seasonal distribution of ice.

NOTE: General distribution of polar bears extends beyond the boundaries of this map and is associated with the seasonal distribution of ice.

NOTE: General distribution of polar bears extends beyond the boundaries of this map and is associated with the seasonal distribution of ice.

Aug.-Oct.
Aug.-Oct.
April-May
April-May
May-June
May-June
Aug.-Oct.
Aug.-Oct.
May-June
May-June
Aug.-Oct.
Aug.-Oct.
Aug.-Oct.
Aug.-Oct.
Aug.-Oct.
Aug.-Oct.
June-Aug.
Late Sept.-Oct.
July-Aug.
July-Aug.
Aug.-Sept.
Bowhead Aug.-Oct.
Aug.-Oct.
Bowhead Aug.-Sept.
Ringed Seal March-May
Ringed Seal March-May
Ringed Seal March-May
Bowhead Aug.-Oct.

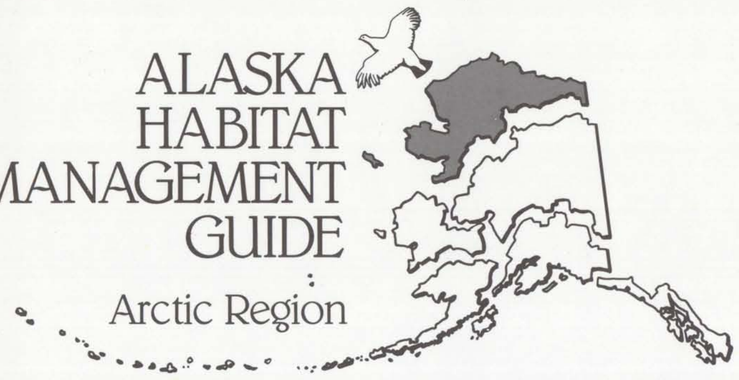
Pt Barrow
Barrow
Pt Franklin
Pt Belcher
Skull Cliff
Wainwright
Kuk-Kruk Island
Cape Simpson
Pitt Point
Cape Halkett
Eskimo Is
Atigaru Pt
Jones Is
Midway Is
Cross I
McClure Is
Stockton Is
Maguire Is
Flaxman Is
Brownlow Pt
Camden Bay
Konganevik Pt
Barter Island
Arey Island
Demarcation Pt
Meade River
Peard Bay
Smith Bay
Tesekpuk Lake
Colville River
Kuparuk River
Sagavanirktok River
Shaviovik River
Staines River
Aichilik River
Canning River
Hulahula River
Okpilak River
Jago River
Katakturuk River
Kongakut River
Hula Hula River
Juniper Creek
Lake Schrader
Lake Peters
Sadlerochit
Malcolm
Titaluk
Meade
Shaningarok Creek
Kaolak
Kuk River
Avalik River
Ikpikpuk River
Kogosukruk River
Kikiakrorak River
Kuparuk River
Toolik
Itkillik
Anaktuvuk River
Chandler River
Killik River
Colville River
Ivishak River
Sagavanirktok River
Shaviovik River
Aichilik River
Canning River
Hulahula River
Okpilak River
Jago River
Katakturuk River
Kongakut River
Juniper Creek
Lake Schrader
Lake Peters
Sadlerochit
Malcolm
Titaluk
Meade
Shaningarok Creek
Kaolak
Kuk River
Avalik River
Ikpikpuk River
Kogosukruk River
Kikiakrorak River
Kuparuk River
Toolik
Itkillik
Anaktuvuk River
Chandler River
Killik River
Colville River
Ivishak River

HARRISON BAY
B E A U F O R T S E A

74°
73°
72°
71°
70°
69°
163° 162° 161° 160° 159° 158° 157° 156° 155° 154° 153° 152° 151° 150° 149° 148° 147° 146° 145° 144° 143° 142° 141° 140° 139° 138°
161° 160° 159° 158° 157° 156° 155° 154° 153° 152° 151° 150° 149° 148° 147° 146° 145° 144° 143° 142° 141° 140°

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



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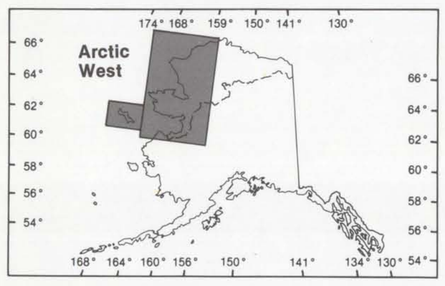


DISTRIBUTION OF ANADROMOUS FISH SPECIES

- Documented Presence in Stream or Lake
- Anadromous Watershed Areas
- Unsurveyed Watershed Areas
- Not Present in Watershed Areas
- Arctic Regional Boundary

For details of known spawning or rearing areas, see An Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes.

Anadromous fish distribution is represented on this map by the following species: chinook, coho, chum, sockeye, and pink salmon; and Dolly Varden/arctic char.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

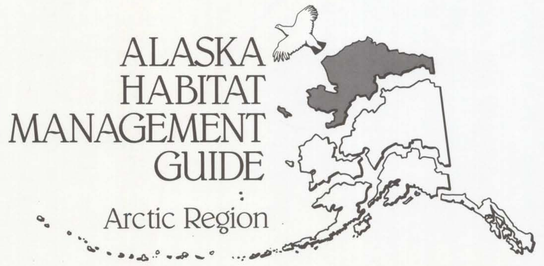
ALBERS EQUAL AREA PROJECTION

Sources: ADF&G 1984a; Bigler, pers. comm.; Lean, pers. comm.; Schwarz, pers. comm.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



LEGEND

DISTRIBUTION OF ANADROMOUS FISH SPECIES

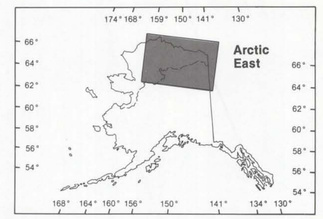
- Documented Presence in Stream or Lake
- Anadromous Watershed Areas
- Unsurveyed Watershed Areas
- Arctic Regional Boundary

For details of known spawning or rearing areas, see An Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes.

Anadromous fish distribution is represented on this map by the following species: chinook, coho, chum, sockeye, and pink salmon; and Dolly Varden/arctic char.

The category "Not Present in Watershed Areas" is not included on this map because available data do not document such areas.

Sources: ADF&G 1984a; Bigler, pers. comm.



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SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

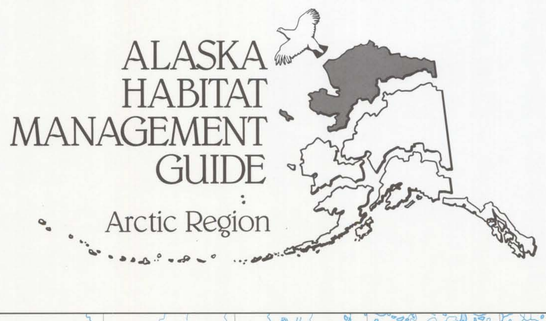
10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



LEGEND

DISTRIBUTION OF GEESE AND DALL SHEEP

GEESE

- General Distribution
- Known Spring Concentration Areas
- Known Fall Concentration Areas
- Known Spring and Fall Concentration Areas
- Known Nesting Concentration Areas
- Known Molting Concentration Areas
- Known Migration Patterns

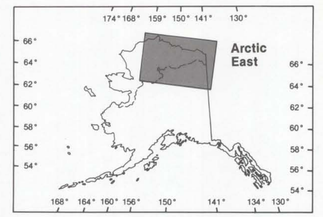
DALL SHEEP

- General Distribution
- Known Winter Use Areas
- Known Mineral Licks
- Arctic Regional Boundary

The geese category "Known Winter Concentration Areas" is not included in the Arctic Region because available data do not document such areas.

The geese population consists primarily of Pacific black brant; lesser and Taverner's Canada; snow; and white-fronted geese. Emperor geese also occur in limited areas.

Sources: Dall Sheep—ADF&G 1973, 1979c; Hemming and Morehouse 1976; Jakimchuk et al. 1984; James, pers. comm.; NANA Region 1984; Spindler 1983; USDI 1975; Winters, pers. comm. **Geese**—Brackney, pers. comm.; Dirksen et al. 1979; Johnson et al. 1975; King, pers. comm.; King and Lensink 1971; Lehnhausen and Quinlan 1981; Haddock and Evans 1975; Rothe, pers. comm.; Seaman et al. 1981; Spindler 1984.



Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

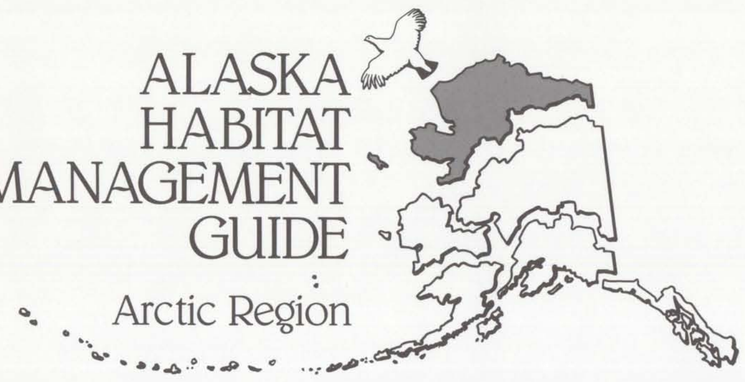
10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



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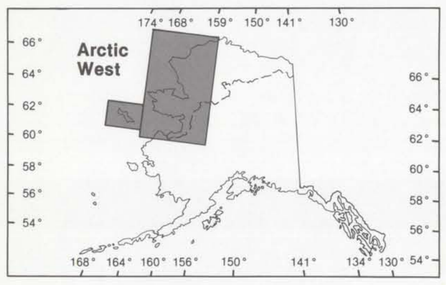


DISTRIBUTION OF GEESE AND DALL SHEEP

GEESE

- General Distribution
- Known Spring Concentration Areas
- Known Fall Concentration Areas
- Known Spring and Fall Concentration Areas
- Known Nesting Concentration Areas
- Known Molting Concentration Areas
- Known Migration Patterns

DALL SHEEP

- General Distribution
- Arctic Regional Boundary

The Dall sheep categories "Known Winter Use Areas" and "Known Mineral Licks" are not included on this map because available data do not document such areas.

The geese category "Known Winter Concentration Areas" is not included in the Arctic Region because available data do not document such areas.

The geese population consists primarily of Pacific black brant; lesser and Taverner's Canada; snow; and white-fronted geese. Emperor geese also occur in limited areas.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

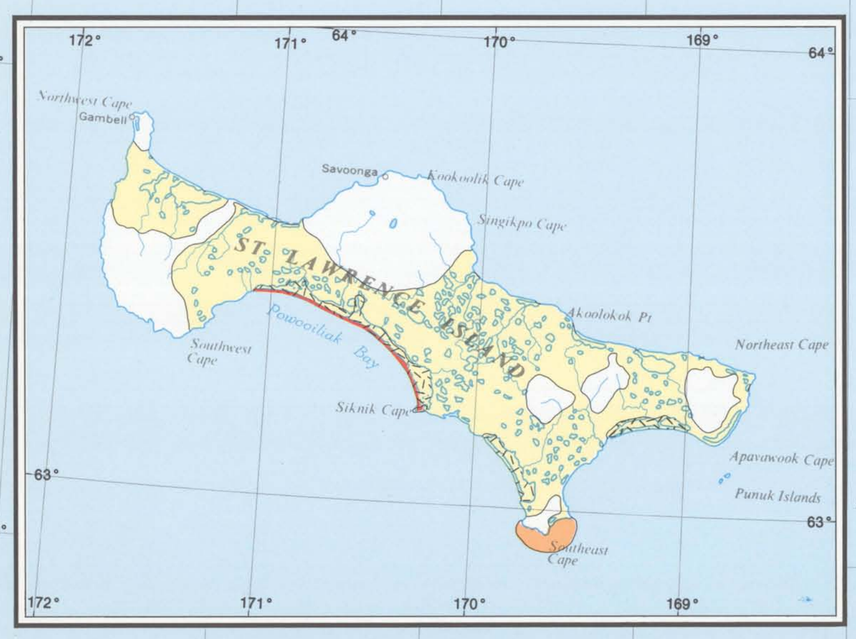
10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Dall Sheep—ADF&G 1973; James, pers. comm.; NANA Region 1984; Singer et al. 1983. **Geese**—Fay 1961; Fay and Cade 1959; Haddock and Evans 1975; Hall, pers. comm.; King, pers. comm.; Lehnhausen and Quinlan 1981; Spindler, pers. comm.

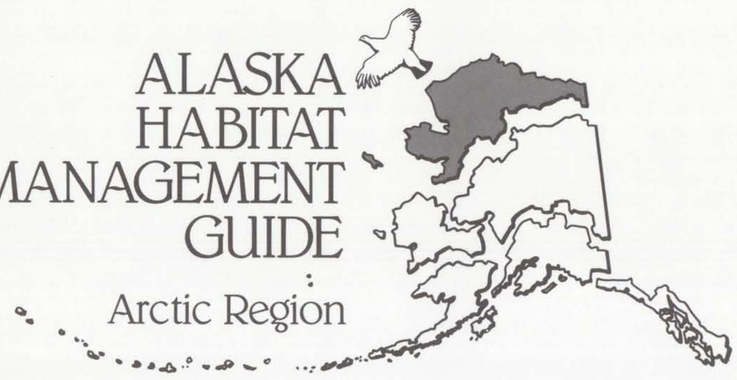
STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

NOTE: Geese migrate along coast and across Norton sound.



ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



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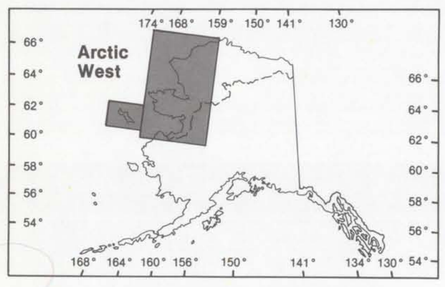


DISTRIBUTION OF FRESHWATER FISH SPECIES

Documented Presence in Stream or Lake of One or More of the Following: Dolly Varden/Arctic Char, Arctic Grayling, Lake Trout, Whitefish and Sheefish.

General Distribution of Selected Species

- Dolly Varden/Arctic Char, Arctic Grayling and Whitefish
- Dolly Varden/Arctic Char
- Whitefish
- Sheefish

Arctic Regional Boundary

Whitefish includes one or more of the following: broad, round, and humpback whitefish; and least, bering and arctic cisco.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: ADF&G 1978a, 1984a, 1984b; Alt 1967, 1978, 1979, 1980, 1981, 1984, pers. comm.; Bendock 1979b; Bendock and Burr 1984a, 1985a; Bigler, pers. comm.; Craig and Schmidt 1982, 1985; DeCicco 1982, 1983; EPA 1984; Hablett 1979; Kogl 1971; Lean, pers. comm.; O'Brien and Huggins 1974; Roguski and Spetz 1968; Webb 1978, 1980; Winslow 1969; Yoshihara 1973.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region

LEGEND

DISTRIBUTION OF FRESHWATER FISH SPECIES

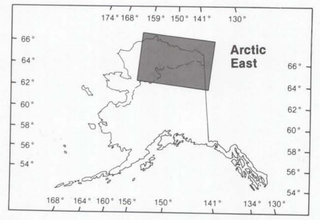
Documented Presence in Stream or Lake of One or More of the Following: Dolly Varden/Arctic Char, Arctic Grayling, Lake Trout, Whitefish and Sheefish.

General Distribution of Selected Species

- Dolly Varden/Arctic Char, Arctic Grayling and Whitefish
- Dolly Varden/Arctic Char
- Whitefish
- Sheefish
- Arctic Regional Boundary

Whitefish includes one or more of the following: broad, round, and humpback whitefish; and least, bering and arctic cisco.

Sources: ADF&G 1978a, 1981e, 1984a, 1984b; Alt 1967, 1976, 1978, 1981, pers. comm.; Bendock 1979b, 1980, 1981, 1982, 1983; Bendock and Burr 1984a, 1984b, 1985a; Bigler, pers. comm.; Burr, pers. comm.; Cohen 1954; Craig 1985; Craig and Schmidt 1982; DeCicco 1982, 1983; Dew 1982; Elliott 1982; Furniss 1974, 1975; Hablett 1979; Kogl 1971; Kogl and Scheil 1974; McCart et al. 1972; McElderry and Craig 1980; Moulton 1980; O'Brien and Huggins 1974; Pearse 1978; Roguski and Komarek 1971; Roguski and Spetz 1968; Roguski and Winslow 1970; USFWS 1977, 1983, 1984; Ward and Craig 1974; Webb 1980; West and Wiswar 1984; Yoshihara 1972, 1973.



Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

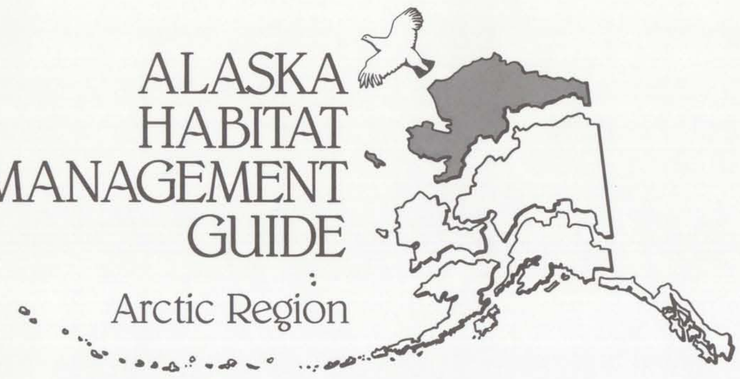
10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



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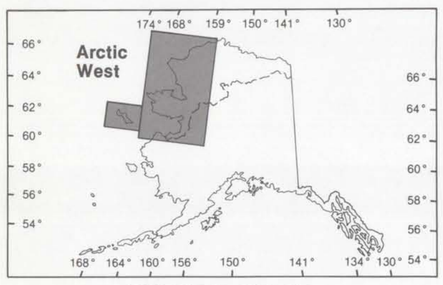

DISTRIBUTION OF DUCKS AND BROWN BEAR

DUCKS

- General Distribution
- Known Spring Concentration Areas
- Known Fall Concentration Areas
- Known Spring and Fall Concentration Areas
- Known Winter Concentration Areas
- Known Nesting Concentration Areas
- Known Molting Concentration Areas
- Known Migration Patterns

BROWN BEAR

General Distribution Occurs Region-wide, Except on St. Lawrence Island

- Known Concentrations Along Fish Streams
- Known Spring Concentration Areas
- Known Concentrations Associated with Mammalian Food Sources
- Arctic Regional Boundary

In the Arctic Region, the duck population consists primarily of northern pintail; American wigeon; oldsquaw; Pacific common, king, Steller's, and spectacled eiders; and greater scaup. Lesser numbers of mallard; green-winged teal; northern shoveler; and white-winged, surf, and black scoters also occur.

The brown bear category "Known Concentrations in Berry Areas" is not included on this map because available data do not document such areas.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Brown Bear—ADF&G 1973; Grauvogel, pers. comm.; Reynolds, pers. comm.; Trent, pers. comm. **Ducks**—Fay 1961; Haddock and Evans 1975; Hall, pers. comm.; King, pers. comm.; Lehnhausen and Quinlan 1981; North Slope Borough 1984; Rothe, pers. comm.; Spindler, pers. comm.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

NOTE: Ducks migrate along coast.

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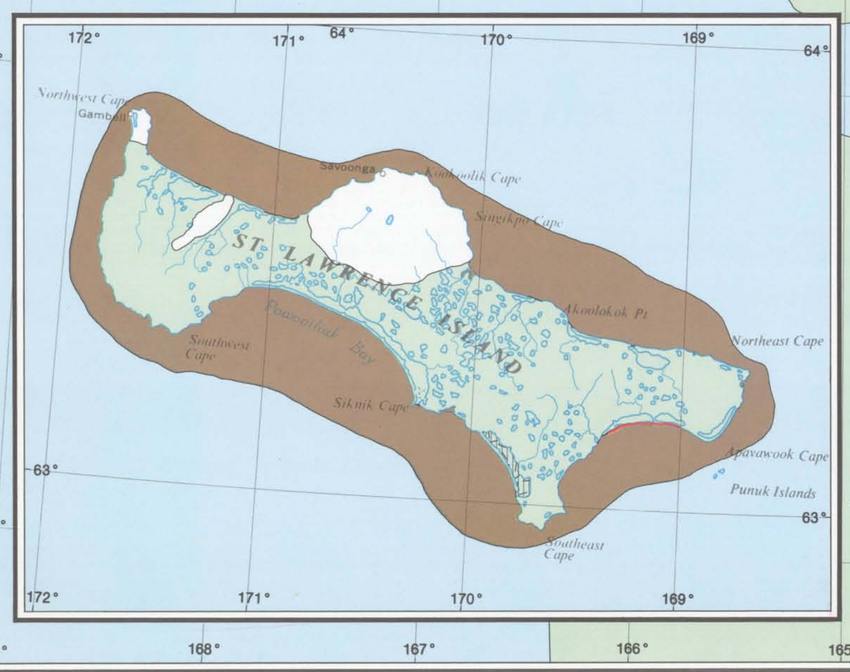

NOTE: Ducks migrate along coast.

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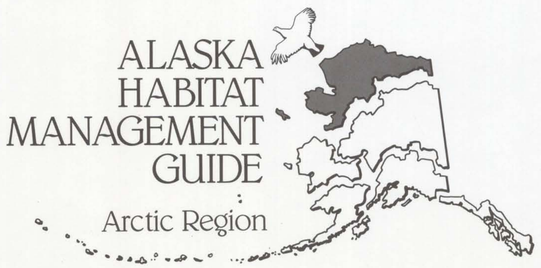
B E A U F O R T S E A

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



LEGEND

DISTRIBUTION OF DUCKS AND BROWN BEAR

DUCKS

- General Distribution
- Known Spring Concentration Areas
- Known Fall Concentration Areas
- Known Spring and Fall Concentration Areas
- Known Nesting Concentration Areas
- Known Molting Concentration Areas
- Known Migration Patterns

BROWN BEAR

- General Distribution Occurs Region-wide, Except on St. Lawrence Island
- Known Concentrations Along Fish Streams
- Known Concentrations Associated with Mammalian Food Sources
- Known Concentrations in Berry Areas

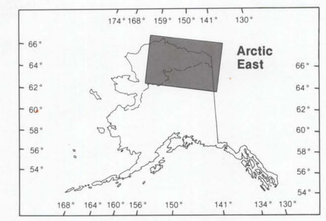
- Arctic Regional Boundary

In the Arctic Region, the duck population consists primarily of northern pintail; American wigeon; oldsquaw; Pacific common, king, Steller's, and spectacled eiders; and greater scaup. Lesser numbers of mallard; green-winged teal; northern shoveler; and white-winged, surf, and black scoters also occur.

The duck category "Known Winter Concentration Areas" is not included on this map because available data do not document such areas.

The brown bear category "Known Spring Concentration Areas" is not included on this map because available data do not document such areas.

Sources: Brown Bear—ADF&G 1973; Reynolds, pers. comm. **Ducks**—Bartels and Zelhoefer 1983; Brackney, pers. comm.; Haddock and Evans 1975; Johnson and Richardson 1980; King, pers. comm.; Lehnhausen and Quinian 1981; North Slope Borough 1984; Rothe, pers. comm.; Schmidt 1970; Seaman et al. 1981; Spindler, pers. comm.; Stroebele, pers. comm.; Taylor, pers. comm.



Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

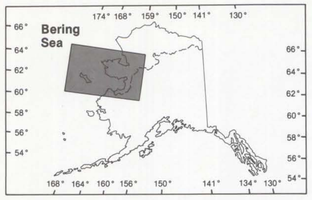
SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986



ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region

LEGEND

DISTRIBUTION OF PACIFIC HERRING, CAPELIN AND KING CRAB

PACIFIC HERRING

- 🟩 General Distribution
- 🟦 Known Overwintering Areas
- 🟥 Known Spawning Concentration Areas

CAPELIN

- ▬ General Distribution
- ○ Known Spawning Concentration Areas

KING CRAB

- ▨ General Distribution
- ○ Known Summer Concentration Areas of Female Red King Crab
- ▨ Known Winter Concentration Areas of Female Red King Crab
- 🟫 Known Concentration Areas of Blue King Crab
- ▬ Arctic Regional Boundary

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

For more detailed information, such as cases where data are too small to portray at this scale, see the Alaska Habitat Management Guide Reference Maps, Arctic Region.

SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

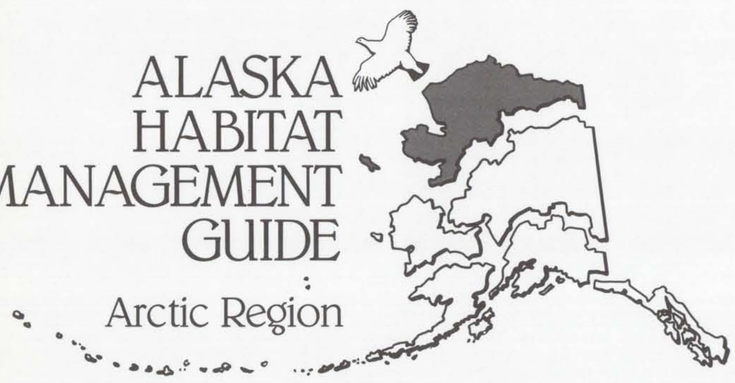
ALBERS EQUAL AREA PROJECTION

Sources: Capelin—Lean, pers. comm.; Pahlke, pers. comm.; Schwarz, pers. comm.; Starr et al. 1981; Whitmore 1983, pers. comm.; Wolotira et al. 1977. **Pacific Herring**—ADF&G 1978a; Barton and Steinhoff 1980; Bigler, pers. comm.; Lean, pers. comm.; Resource Analysts et al. 1984; Schwarz, pers. comm.; Starr et al. 1981; Whitmore, pers. comm.; Whitmore and Bergstrom, 1983; Wolotira et al. 1977. **King Crab**—Powell et al. 1983; Schwarz, pers. comm.; Wolotira et al. 1977.

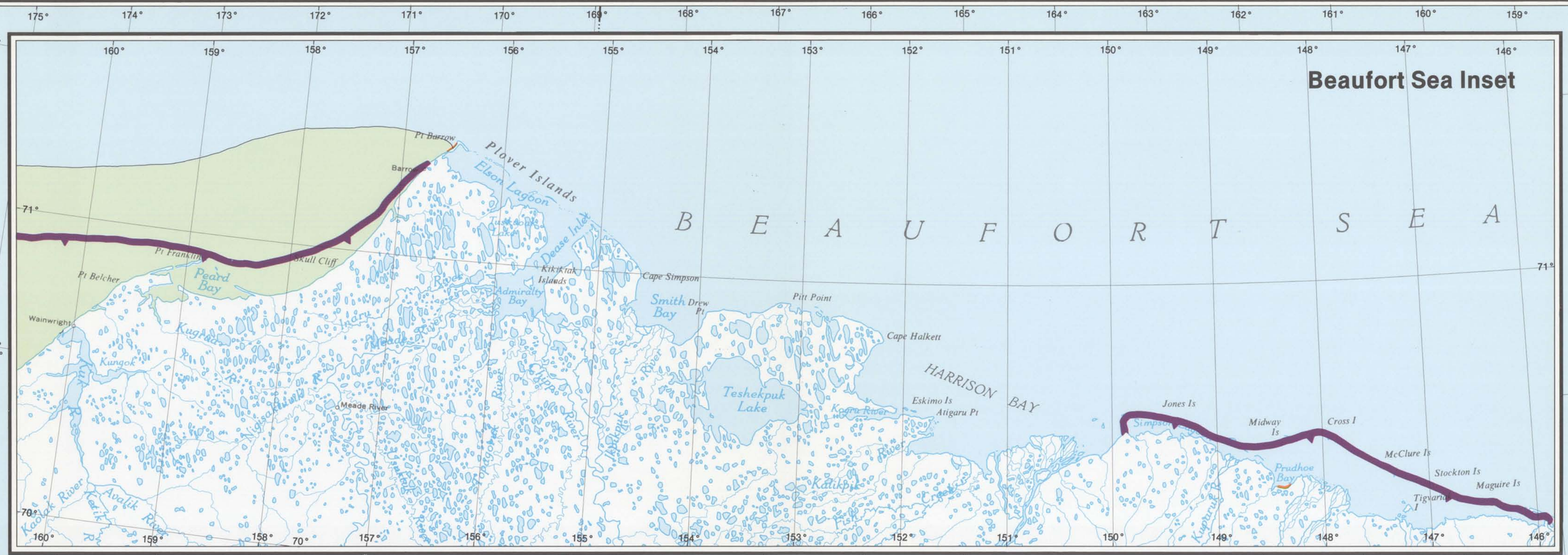
STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986

ALASKA HABITAT MANAGEMENT GUIDE

Arctic Region



Beaufort Sea Inset



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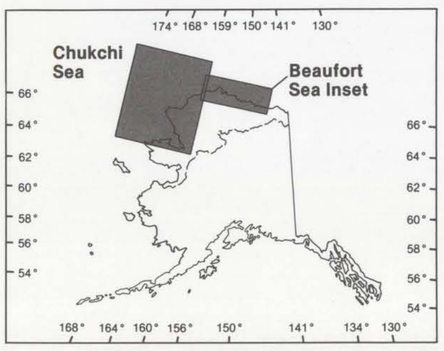

DISTRIBUTION OF PACIFIC HERRING, CAPELIN AND KING CRAB

PACIFIC HERRING

- General Distribution
- Known Spawning Concentration Areas

CAPELIN

- General Distribution
- Known Spawning Concentration Areas

KING CRAB

- General Distribution
- Known Concentration Areas of Blue King Crab

- Arctic Regional Boundary

The Pacific herring category "Known Overwintering Areas" is not included on this map because available data do not document such areas.

The king crab categories "Known Summer Concentration Areas of Female Red King Crab" and "Known Winter Concentration Areas of Female Red King Crab" are not included on this map because available data do not document such areas.

Definitions for map categories can be found in the Alaska Habitat Management Guide, Arctic Region Map Atlas.

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SCALE 1:1,000,000

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

ALBERS EQUAL AREA PROJECTION

Sources: Capelin—Craig 1984a, 1984b; Craig and Haldorson 1980; Bendock 1977; Pahlke, pers. comm.; Schwarz, pers. comm.; Whitmore, pers. comm.; Wolotira et al. 1977. **Pacific Herring**—ADF&G 1978a; Craig 1984a, 1984b; Resource Analysts et al. 1984; Whitmore, pers. comm.; Whitmore and Bergstrom 1983; Wolotira et al. 1977. **King Crab**—Schwarz, pers. comm.; Wolotira et al. 1977.

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
HABITAT DIVISION
1986