ALASKA HABITAT MANAGEMENT GUIDE

SOUTHCENTRAL REGION

MAP ATLAS

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



JUNEAU, ALASKA 1985

© 1985 BY THE ALASKA DEPARTMENT OF FISH AND GAME

iii

٠

i

Contents

Page

- iv Acknowledgements
- 1 Introduction
- 3 Definitions
- 5 References

List of Plates

Plate Map Title

- 1 Six Regions of the Alaska Habitat Management Guides
- 2 Southcentral Region 1:250,000 Quadrangle Locations
- 3 Distribution of Moose and Pacific Herring
- 4 Distribution of Caribou, Sitka Black-tailed Deer, King Crab, and Tanner Crab
- 5 Distribution of Groundfish and Pacific Halibut, Trumpeter Swan, and Bald Eagle
- 6 Distribution of Ducks and Geese
- 7 Distribution of Anadromous Fish Species and Seabirds
- 8 Distribution of Freshwater Fish Species, Sea Otter, Harbor Seal, and Steller Sea Lion
- 9 Distribution of Dall Sheep, Shrimp, Dungeness Crab, and Razor Clam
- 10 Harvest Report Units for Moose, Dall Sheep, Caribou, and Brown Bear
- 11 Harvest of Ducks, Geese, Sitka Black-tailed Deer, and Selected Fish

This project is under the direction of the Commissioner of the Alaska Department of Fish and Game, Don W. Collinsworth, the Director of the Division of Habitat, Norman A. Cohen, and the Deputy Director, Bruce H. Baker.

Many individuals have been involved in the production of this second Map Atlas. Their contributions have been essential to the production of the maps and are greatly appreciated. All maps were reviewed first by project staff, then distributed for technical review. All reviewed, corrected, and final maps were approved by project staff.

This part of the project was supervised by the following:

Marianne G. See, Coordinator Carol A. Barnhill, Cartographer Lana C. Shea, Team Leader and Wildlife Group Leader C. Wayne Dolezal, Fisheries Group Leader

The mappers and maps* for which they are responsible are as follows:

Wildlife Maps

Steve Albert, Habitat Biologist, ADF&G: Sitka black-tailed deer D; caribou D; Bald Eagle D; harbor seal D; sea lion D; sea otter D.

Michael A. Masters, Habitat Biologist, ADF&G: Sitka black-tailed deer H.

Michael G. McDonald, Game Biologist, ADF&G: moose D.

Frances Van Ballenberghe-Nelson, Game Biologist, ADF&G: trumpeter swan D.

John H. Westlund, Game Biologist, ADF&G: Dall sheep D; ducks D; geese D; ducks and geese H; seabirds D.

Fish Maps

Durand R. Cook, Habitat Biologist, ADF&G: freshwater fish D; marine, anadromous, and freshwater fish SF; salmon CF and P.

C. Wayne Dolezal, Fisheries Biologist, ADF&G: anadromous fish D.

Sandra K. Sonnichsen, Habitat Biologist, ADF&G: razor clam D; groundfish and halibut D.

Kathleen R. Thornburgh, Habitat Biologist, ADF&G: Pacific herring D; Dungeness crab D; Tanner crab D; king crab D; shrimp D.

Keith A. Webster, Fisheries Biologist, ADF&G: freshwater fish D.

*D = distribution maps; SF = sportfishing areas; CF = commercial fishing harvest areas; H = hunting areas; P = personal use.

Acknowledgements

In addition, the following lists the technical production staff:

Charlotte Bridges, Analyst/Programmer Tom Bucceri, Cartographer Bob Durr, Editor Patti Frink, Drafting Technician Michael Frost, Drafting Technician Susan H. Grainger, Typist Juanita R. Henderson, Typist Frances Inoue, Drafting Technician Clare Johnson, Typist Greg Mills, Analyst/Programmer Brooks Pangburn, Analyst/Programmer Gay Pulley, Graphic Artist Lavonne Rhyneer, Drafting Technician Don Shields, Drafting Technician

The following persons either reviewed or in some other way contributed to the reference map series from which the maps in this atlas were prepared. With the exception of selected marine fish and shellfish, the reference maps are at 1:250,000 scale. For information on specific reviewers of each reference map, see the three reference map volumes of the Alaska Habitat Management Guide for the Southcentral Region. The photoreduced maps that were used to create the color maps presented in this atlas were reviewed by project staff, with assistance from selected reviewers as necessary.

Paul Arneson	ADF&G	Div. Game	Anchorage
Warren Ballard	ADF&G	Div. Game	Glennallen
Robert Bentz	ADF&G	Div. Sportfish	Palmer
Edgar Best	IPHC	Senior Biologist	Seattle, WA
Donald Calkins	ADF&G	Div. Game	Anchorage
Bruce Campbell	ADF&G	Div. Game	Anchorage
Bruce Conant	USF&WS	Waterfowl Investigations	Juneau
Durand Cook	ADF&G	Div. Habitat	Anchorage
Kevin Delaney	ADF&G	Div. Sportfish	Anchorage
ack Didrickson	ADF&G	Div. Game	Palmer
lames Faro	ADF&G	Div. Game	Soldotna
Peter Fridgen	ADF&G	Div. Commer. Fish.	Cordova
Herman Griese	ADF&G	Div. Game	Anchorage
David Harkness	ADF&G	Div. Game	Anchorage
Alan Havens	ADF&G	Div. Sportfish	Palmer
Wayne Heimer	ADF&G	Div. Game	Fairbanks
Kelly Hepler	ADF&G	Div. Sportfish	Anchorage
David Holdermann	ADF&G	Div. Game	Homer
effrey Hughes	ADF&G	Div. Game	Anchorage
David Irons	USF&WS	Wildlife Assistance	Anchorage
Michael Jacobsen	USF&WS	Raptor Mgmt. Studies	Juneau
Ancel Johnson	USF&WS	AK Marine Mammal Studies	Anchorage
Alan Kimker	ADF&G	Div. Commer. Fish.	Cordova

ADF&G	Div. Commer. Fish.	Soldotna
USF&WS	Waterfowl Investigations	Juneau
ADF&G	Div. Commer. Fish.	Homer
ADF&G	Div. Game	Glennallen
ADF&G	Div. Sportfish	Soldotna
ADF&G	Div. Game	Anchorage
ADF&G	Div. Sportfish	Seward
ADF&G	Div. Game	King Salmon
ADF&G	Div. Commer. Fish.	Homer
ADF&G	Div. Game	Anchorage
ADF&G	Div. Commer. Fish.	Homer
ADF&G	Div. Game	Cooper Landing
ADF&G	Div. Game	McGrath
ADF&G	Div. Game	Anchorage
ADF&G	Div. Game	Cordova
ADF&G	Div. Commer. Fish.	Glennallen
ADF&G	Div. Game	Anchorage
ADF&G	Div. Commer. Fish.	Soldotna
ADF&G	Div. Game	Anchorage
ADF&G	Div. Commer. Fish.	Homer
ADF&G	Div. Game	King Salmon
USNPS	Wildlife	Anchorage
USF&WS	Wildlife Assistance	Anchorage
ADF&G	Div. Game	Soldotna
ADF&G	Div. Game	Palmer
ADF&G	Div. Game	Anchorage
ADF&G	Div. Game	Anchorage
ADF&G	Div. Game	Dillingham
ADF&G	Div. Game	Anchorage
ADF&G	Div. Game	Glennallen
USF&WS	Wildlife Assistance	Anchorage
ADF&G	Div. Sportfish	Anchorage
ADF&G	Div. Sportfish	Glennallen
	ADF&G ADF&G	ADF&GDiv. Commer. Fish.USF&WSWaterfowl InvestigationsADF&GDiv. Commer. Fish.ADF&GDiv. GameADF&GDiv. SportfishADF&GDiv. SportfishADF&GDiv. CommeADF&GDiv. Commer. Fish.ADF&GDiv. Commer. Fish.ADF&GDiv. Commer. Fish.ADF&GDiv. Commer. Fish.ADF&GDiv. Commer. Fish.ADF&GDiv. GameADF&GDiv. GameADF&GDiv. GameADF&GDiv. Commer. Fish.ADF&GDiv. GameADF&GDiv. Game

The process of developing the initial plan and procedures for this project involved a number of individuals who are not otherwise listed as mappers and contributors. These include many staff within the Division of Habitat, as well as planners and research and management coordinators of other divisions. This group also includes all project team members and all ADF&G regional supervisors. Special mention should be made of the support from Carl Yanagawa, Regional Supervisor of the Division of Habitat for the Southcentral Region (Region II), and of the contributions of Rai Behnert, who was the original coordinator of this project. We would also like to acknowledge the many contributions of John A. Clark, who was Director of the Division of Habitat until his death in 1985.

This atlas was typeset by Visible Ink, Inc. and printed by Van Cleve Printing, Inc. Color artwork was done by the Arctic Environmental Information and Data Center of the University of Alaska.

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 map atlases.

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 of 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.

Introduction

GUIDE: SOUTHCENTRAL REGION

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 Southcentral Region (plate 2). This map atlas includes information on the distribution and human use 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 Southcentral 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 Southcentral 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 and human uses of selected species of fish and wildlife in the Southcentral 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 August 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 and human use, whereas the reference maps illustrate specific distribution and human use 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 Southcentral Region, and mapped information is not depicted beyond these borders. Please see the appropriate regional reference maps for information on areas outside the Southcentral 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 between the time of release of one region's maps and the release of the adjacent region's maps.

In some instances, harvest of fish or wildlife may be indicated in areas outside the mapped area of general distribution of a given species. These discrepancies represent the limitations of experts' knowledge regarding mapped categories or are an artifact of the units by which harvest data are recorded and do not necessarily represent a contradiction of data.

OVERVIEW OF THE SOUTHCENTRAL REGION

The Southcentral Region (plate 2) includes the Chugach, Talkeetna, Wrangell, and Kenai mountains and the southern slopes of the Alaska Range. A few of the larger river basins in the region include the drainages of the Susitna, Beluga, Chakachatna, Big, Crescent, Kasilof, Kenai, Matanuska, Copper, and Bering rivers. Marine waters associated with the region are comprised of the northern Gulf of Alaska, Cook Inlet, and Prince William Sound.

In the following sections, the biophysical, and biotic resources of the region and the uses people make of them are briefly summarized. 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 Southcentral Region are in the maritime, transitional, and continental climatic zones. The weather in the region is the result of the interaction between land topography and major weather systems that move northward across the Gulf of Alaska or eastward across the Bering Sea. Prince William Sound, the southern Kenai Peninsula, and the southwest side of lower Cook Inlet are characterized by a fiordlike coastline rising to mountains up to 12,000 feet. The northwest side of the Kenai Peninsula and lower Cook Inlet and all of upper Cook Inlet are characterized by a relatively regular coastline with numerous sand and gravel beaches and abutting coastal lowlands, often drained by river systems terminating in broad estuarine areas. Major storm tracks move northward off the Gulf of Alaska into the south coastal highland areas, dropping precipitation on the southern side and leaving the leeward (northern) side in somewhat of a rain shadow. Headwater areas of the major drainages are subject to greater temperature fluctuations due to the influence of the continental climatic zone.

Biota

Vegetation in the region is varied. The Sitka spruce-western hemlock forest is restricted to the lower-elevation coastal areas from Prince William Sound to lower Cook Inlet. Various associations of white spruce, black spruce, paper birch, balsam poplar, black cottonwood, and quaking aspen trees are common throughout the forested lowland areas away from the coast. Low and tall shrub communities composed primarily of willow, alder, and shrub birch are common throughout the subalpine zone and in areas subject to periodic disturbance, such as floodplains and avalanche chutes. Dwarf shrubs and a variety of herbaceous communities are common in alpine areas and lower-elevation wetlands.

In addition to the rich marine life of Prince William Sound, lower Cook Inlet, and the Gulf of Alaska, the Copper, Susitna, Kenai, and Kasilof river systems provide optimum conditions for the rearing of five species of salmon, upon which most of the region's fishermen depend. Much of the North Pacific's population of shorebirds and waterfowl use the Copper and Susitna river deltas, and many smaller estuarine areas for spring and fall feeding and migratory staging areas. The region supports harvestable populations of brown and black bears, moose, Dall sheep, mountain goats, caribou, Sitka black-tailed deer, furbearers, waterfowl, and small game. Marine habitats support healthy populations of sea otter, harbor seal, Steller sea lion, belukha whale, and many other species of whales.

Human Activities in the Region

As one would expect from the abundance of fish and wildlife in the Southcentral Region, many human activities revolve around the commercial, recreational, subsistence, and personal uses of these resources. Commercial fishing, seafood processing, and guiding of hunters and fishermen are important segments of the regional economy. Major fishing ports in the region include Cordova, Valdez, Seward, Homer, and Kenai. Noncommercial harvest for recreation and food is a goal of many residents of the region. The rapidly growing tourist industry is often related to the opportunity to fish, hunt, and view fish and wildlife.

Additional economic bases in the region are provided by Anchorage's role as the state's center for banking, oil, gas, and mineral companies, state and federal government agencies, and service-related businesses. Agriculture and cattle grazing are found primarily in the Matanuska-Susitna valley and Kenny Lake area of the Copper River basin. Forestry is limited to small private logging operations. Oil and gas development and production have occurred in Cook Inlet and the Kenai Peninsula for the last two decades. There may also be potential for oil and gas development in other areas of Southcentral Alaska.

Infrastructure development is minimal by national standards, but the Southcentral Region has the most extensive network of roads, rail lines, and airstrips in the state.

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

Definitions

Distribution Maps

Concentrations — 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 its life history, in the narrative portion of this guide, *Volume I: Life Histories and Habitat Requirements of Fish and Wildlife.*

MAMMALS

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 migration patterns — 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 rutting areas — areas where a majority of a specific caribou herd has been observed rutting during more than one year.

Known summer concentration areas — areas where a significant portion of a caribou herd has demonstrated a pattern of use during summer months (June-August). Insect relief areas may be an important component of summer areas, but data indicating recurrent use are not available.

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.

HARBOR SEAL

Known concentrations of 25 or more — locations where concentrations of harbor seals numbering 25 or more animals have been observed hauled out onshore for breeding, pupping, resting, and/or molting purposes during more than one year.

Known haulout concentration areas — areas where concentrations of harbor seals have been observed hauled out on shore or ice floes for breeding, pupping, resting, and/or molting purposes during more than one year.

MOOSE

General distribution — suitable habitat within the known range of moose, including but not limited to known seasonal and life function use areas. **Known calving concentration areas** — areas where concentrations of moose, especially parturient cows, have been observed during the calving period for more than one year.

Known rutting concentration areas — areas where concentrations of moose have been observed during the rutting period for more than one year.

Known winter concentration areas – areas where concentrations of moose have been observed during more than one winter.

SEA OTTER

Known concentration areas — areas where concentrations of sea otters have been observed during more than one year.

Established populations — areas where sea otter populations are established but at low-to-moderate densities. Some of these areas near edges of expanding populations may become concentration areas.

Unpopulated habitat – areas where sea otter densities remain well below the capacity of the habitat but are expected to significantly increase in the next decade.

SITKA BLACK-TAILED DEER

General distribution — suitable habitat within the known range of Sitka black-tailed deer, including but not limited to known seasonal and life function use areas.

Known winter concentration areas – areas where concentrations of Sitka black-tailed deer have been observed during more than one winter.

STELLER SEA LION

Known haulout concentration areas — areas where concentrations of sea lions have been observed hauled out during more than one year. Known rookeries — areas where concentrations of breeding and pupping sea lions have been observed during more than one year.

BIRDS

BALD EAGLE

Known concentration areas — areas where concentrations of feeding or roosting Bald Eagles have been observed during more than one year. **Known nest sites** — sites where active or inactive Bald Eagle nests have been observed.

DUCKS AND GEESE

General distribution — suitable habitat within the known range of dabbling or diving ducks or 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 ducks or geese have been observed during fall migration for more than one year.

Known molting concentration areas – areas where concentrations of one or more species of molting ducks or geese have been observed during more than one year.

Known nesting concentration areas — areas where concentrations of one or more species of nesting ducks or geese have been observed during more than one year.

Known spring concentration areas — areas where concentrations of one or more species of ducks or geese have been observed during spring migration for more than one year.

Known spring and fall concentration areas — areas where concentrations of one or more species of ducks or geese have been observed during spring and fall migration for more than one year.

SEABIRDS

Known nesting colonies – areas where concentrations of one or more species of nesting seabirds have been observed during more than one year.

TRUMPETER SWAN

General distribution – suitable habitat within the known range of trumpeter swan, including but not limited to known seasonal and life function use areas.

Known dispersed nesting and brood-rearing areas — areas where low densities of trumpeter swans have been observed nesting and brood rearing during more than one year.

Known molting concentration areas – areas where concentrations of molting trumpeter swans have been observed during more than one year.

Known nesting and brood-rearing concentration areas — areas where relatively high densities of trumpeter swans have been observed nesting and brood rearing during more than one year.

Known spring and/or fall concentration areas — areas where concentrations of trumpeter swans have been observed during spring and/or fall migration for more than one year.

Known winter concentration areas – areas where concentrations of trumpeter swans have been observed during more than one winter.

FISH

ANADROMOUS FISH

Anadromous watershed areas – drainages or migration corridors with documented presence of anadromous fish.

Documented presence in stream or lake – areas where the presence of an anadromous fish species (i.e., salmon, steelhead trout, or arctic char/ Dolly Varden) 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 and where anadromous fish were documented to not be present.

Unsurveyed watershed areas – areas where documentation of presence or absence of anadromous fish species is not available.

DUNGENESS CRAB

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

Known concentration - **reproduction areas** — areas where concentrations of Dungeness crab have been observed during reproductive activity.

GROUNDFISH AND HALIBUT

Known concentration areas — areas where concentrations of one or more species of groundfish or halibut have been observed but for which the duration of the concentration is unknown.

Known rearing concentration areas – areas where concentrations of juveniles of one or more species of groundfish or halibut have been observed.

Known spawning concentration areas — areas where concentrations of one or more species of spawning groundfish or halibut have been observed. Known summer concentration areas — areas where concentrations of one or more species of groundfish or halibut have been observed during one or more summers.

Known winter concentration areas — areas where concentrations of one or more species of groundfish or halibut have been observed during one or more winters.

KING CRAB

General distribution — suitable habitat within the known range of king crab, including but not limited to seasonal and life function use areas. **Known historical concentration areas** — areas where concentrations of

king crab have been observed in the past but are not now present.

Known mating concentration areas — areas where concentrations of king crab have been observed during mating activity.

Known summer concentration areas — areas where concentrations of king crab have been observed during summer.

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 feeding concentration areas** — areas where feeding concentrations of Pacific herring have been observed.

Known spawning areas — areas where the presence of spawning Pacific herring or herring roe-on-substrate have been observed.

RAZOR CLAM

Known concentration areas – areas where concentrations of razor clams have been observed.

SELECTED FRESHWATER FISH

Documented presence in stream or lake – areas where the presence of a species in a specific stream segment or lake during any time of year or life cycle has been observed.

General distribution — suitable habitat within the known range of the species, including but not limited to seasonal and life function use areas. (Lake trout are mapped for water bodies in which they are known to occur, but lake trout information is site-specific, and distribution polygons are not drawn for them.)

SHRIMP

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

Known concentration areas – areas where concentrations of shrimp have been observed.

Known spawning concentration areas – areas where spawning concentrations of shrimp have been observed.

TANNER CRAB

General distribution — suitable habitat within the known range of Tanner crab, including but not limited to seasonal and life function use areas. **Known concentration areas** — areas where concentrations of Tanner crab have been observed.

Known mating concentration areas — areas where concentrations of Tanner crab have been observed during mating activity.

Known rearing concentration areas — areas where concentrations of larval and juvenile life stages of Tanner crab have been observed.

Human Use Maps

SITKA BLACK-TAILED DEER

General harvest areas — areas known to have been used consistently over time for the hunting and harvest of Sitka black-tailed deer under the general harvest regulations set by the Alaska Board of Game.

DUCKS AND GEESE

General harvest areas – areas known to have been used consistently over time for the hunting and harvest of ducks and geese under the general harvest regulations set by the Alaska Board of Game.

FRESHWATER, ANADROMOUS, AND MARINE FISH

Sportfishing harvest areas — areas known to have been used consistently over time for sportfishing, as allowed by the Alaska Board of Fisheries.

SALMON

Commercial salmon harvest areas – areas known to have been used consistently over time for commercial salmon fishing, as allowed by the Alaska Board of Fisheries.

Personal use salmon fishing areas — areas known to have been used during the period 1981 through 1984 for the taking of salmon by an individual, as allowed by the Alaska Board of Fisheries.

Commercial and personal use salmon fishing areas – areas in which set gill nets are known to have been used for both commercial harvest and personal use harvest (see definitions above).

References

ADF&G, comp. 1975a. A fish and wildlife resource inventory of the northeast Gulf of Alaska. Vol. 1: Wildlife + maps. [Draft.] 411 pp.

_____. 1976. A compilation of fish and wildlife resource information for the State of Alaska. Vol. 1: Wildlife. Juneau. 873 pp.

. 1977. A fish and wildlife resource inventory of the Cook Inlet-Kodiak areas. Vol. 2: Fisheries. Juneau. 443 pp.

ADF&G. 1973. Alaska's wildlife and habitat. Vol. 1 [R.A. Hinman and R.E. LeResche, eds.]. 144 pp. + maps.

_____. 1975b. Herring and herring spawn on kelp fishery, PWS. Div. Commer. Fish., Cordova.

_____. 1978a. Alaska's fisheries atlas. Vol. 1 [R.F. McLean and K.J. Delaney, comps.]. 33 pp. + maps.

_____. 1978b. Alaska's fisheries atlas. Vol. 2 [R.F. McLean and K.J. Delaney, comps.]. 43 pp. + maps.

_____. 1979-1984. Unpublished statistical reports, 1979 through 1984. Div. Game, Anchorage.

_____. 1979a. PWS area annual finfish management report. Div. Commer. Fish., Cordova.

_____. 1981a. PWS area annual finfish management report. Div. Commer. Fish., Cordova.

_____. 1981b. Subtask 7.10, resident fish investigations on the lower Susitna River - phase 1 final draft. Susitna Hydro Aquatic Studies. Anchorage. 147 pp. + appendices.

_____. 1982b. PWS area annual finfish management report. Div. Commer. Fish., Cordova.

. 1983a. ADF&G's comments on proposed oil and gas lease Sale No. 40. Unpubl. information. Enclosure no. 3 - map of fish and wildlife resources and critical habitats within the proposed Sale No. 40 area.

_____. 1983b. Computer generated vegetation maps - Tyonek and Talkeetna quads. ADF&G, Div. Hab., Anchorage.

_____. 1983d. PWS area annual finfish management report. Div. Commer. Fish., Cordova.

. 1983e. Susitna Hydro Aquatic Studies, phase II basic data report. Vol. 4: Aquatic habitat and instream flow studies, 1982, part 2. Anchorage. 398 pp. + appendices.

_____. 1983f. Susitna Hydro Aquatic Studies, phase II basic data report. Vol. 5: Upper Susitna impoundment studies, 1982. Anchorage. 152 pp. + appendices.

_____. 1983g. Unpubl. unified coding unit maps. Div. Game, Statistical Section, Anchorage.

_____. 1984a. An atlas to the catalog of waters important for spawning, rearing or migration of anadromous fishes, Southcentral Region. Resource Management Region II. Div. Habitat, Anchorage. 5 pp. + maps.

_____. 1984b. An atlas to the fish and wildlife resources element for the Susitna Area Planning Study. Div. Habitat, Anchorage.

. 1984c. Computer files. Div. Game, Statistics Section, Anchorage.
 . 1984d. Preliminary review of the 1983 herring fishery, PWS management area report to the Alaska Board of Fisheries. Div. Commer. Fish., Cordova.

- _____. 1984e. PWS area annual finfish management report. Div. Commer. Fish., Cordova.
- _____. 1984f. Regulations of the Alaska Board of Fisheries for commercial fishing in Alaska. Div. Commer. Fish., Juneau. 188 pp.
- _____. N.d. Alaska sportfishing guide. Div. Sport Fish., Juneau. 100 pp.

_____. Unpublished. Fish release records for Regions 1, 2, and 3. Computer printouts, 7 Aug 1984 and February 1985. Div. FRED, Anchorage. 209 pp.

- Alaska OCS (Outer Continental Shelf Office). 1976. Outer Continental Shelf proposed oil & gas leasing in the northern Gulf of Alaska: final environmental impact statement. Sale No. 39. Vol. 1. USDI: BLM, Alaska OCS Office.
- Alaska Power Authority (APA). 1983. Chakachamna Hydroelectric Project interim feasibility assessment report. Vol. I, sections 4 and 8. Anchorage.

Alton, M.S., and R.B. Deriso. 1982. Pollock. Pages 1-63 in J. Balsinger, ed. Condition of the groundfish resources of the Gulf of Alaska in 1982. Unpubl. rept. NWAFC, NOAA, NMFS, Seattle, WA. 198 pp.

Arneson, P. 1983. Personal communication. Nongame Biologist, ADF&G, Div. Game, Anchorage.

BLM. 1981. Proposed outer continental shelf oil and gas lease sale, Lower Cook Inlet/Shelikof Strait: final environmental impact statement [Sale No. 60]. [USDI: BLM, Washington, D.C.].

Bailey, E.P. 1976. Breeding seabird distribution and abundance along the south side of the Kenai Peninsula, Alaska. USFWS/NPS rept. Anchorage, AK. 88 pp.

- Ballard, W. 1984. Personal communication. Game Biologist, ADF&G, Div. Game, Glennallen.
- Barto, D.L., and V.L. Nelson. N.d. Field data summary for Copper River and Prince William Sound lake investigations, 1982. ADF&G, Div. Sport Fish, under contract 82-0933 with Prince William Sound Aquaculture Corp. Cordova.
- Bentz, R.W. 1984. Personal communication. Asst. Area Mgt. Biologist, ADF&G, Div. Sport Fish, Palmer.
- Best, E.A. 1984. Personal communication. Senior Biologist, IPHC, Seattle, WA.
- Bishop, R. 1984. Personal communication. Regional Supervisor, ADF&G, Div. Game, Fairbanks.

Blackburn, J.E. 1983. Personal communication. Fisheries Biologist, ADF&G, Div. Commer. Fish., Kodiak.

- Blackburn, J.E., B. Bracken, and R. Morrison. 1983. Gulf of Alaska-Bering Sea groundfish investigations. ADF&G, Commercial Fisheries Research and Development Act. Proj. 5-49-R-1. Prepared for NOAA, NMFS, Washington, D.C. 85 pp.
- Blackburn, J.E., K. Anderson, C.I. Hamilton, and S.J. Starr. 1980. Pelagic and demersal fish assessment in the Lower Cook Inlet estuary system. RU-512. Pages 197-450 *in* Environmental assessment of the Alaska continental shelf. Final reports of principal investigators. Vol. 17: Biological studies. USDC: NOAA, OOMS; USDI: MMS.

- Bos, G.N. 1974. Nelchina and Mentasta caribou reports. ADF&G, Fed. Aid in Wildl. Rest. Projs. W-17-5 and W-17-6.
- Bucaria, G. 1979. Copper River delta area wildlife resource review. USFS Chugach District. Unpubl. rept.
- Byrne, L.C., D.W. Daum, M.W. Small, and J.S. Henderson. 1983. Results of the 1981 Bald Eagle nest survey in the Gulkana River and Delta River wildlife habitat areas. Open file rept. 4. USDI: BLM. Anchorage, AK. 20 pp.
- Calkins, D.G., K.W. Pitcher, and K. Schneider. 1975. Distribution and abundance of marine mammals in the Gulf of Alaska. Unpubl. rept. prepared by ADF&G under contract with USDC: NOAA. 67 pp.
- Calkins, D.G., and K.W. Pitcher. 1982. Population assessment, ecology, and trophic relationships of Steller sea lions in the Gulf of Alaska. Final rept. to OCSEAP. Boulder, CO.

_____. 1984. Pinniped investigations in southern Alaska: 1983-84. Unpubl. rept. ADF&G, Anchorage. 19 pp.

- Campbell, B. 1984. Personal communication. Asst. Waterfowl Biologist, ADF&G, Div. Game, Anchorage.
- Chugach Natl. Forest. 1981. Raptor nest atlas. [K. Rice, comp.] Anchorage, AK.
- Conant, B. 1984. Personal communication. Waterfowl Biologist, USFWS, Juneau, AK.
- Cook, D.R. 1984. Personal communication. Habitat Biologist, ADF&G, Div. Habitat, Anchorage.
- Corps of Engineers. 1982. Bradley Lake Hydro Project. Final EIS.
- Dames and Moore, Inc. 1979. Birds of Port Valdez. Prepared for Alaska Petrochemical Co. 31 PP.
- Delaney, K.J. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Sport Fish, Anchorage.
- Derksen, D. 1984. Personal communication. Wildlife Assistance, USFWS, Anchorage, AK.
- Didrickson, J. 1984. Personal communication. Game Biologist, ADF&G, Div. Game, Palmer.
- Dolezal, C.W. 1984. Personal communication. Fisheries Biologist, ADF&G, Div. Habitat, Anchorage.
- ERT, Inc. 1983a. Diamond Chuitna project terrestrial wildlife baseline studies report. Vol. II, fig. 3-8. Prepared for Diamond-Shamrock-Chuitna coal joint venture.
- Environmental Research and Technology, Inc. 1984. Diamond Chuitna project aquatic biology studies report. Vol. 1. Ft. Collins, CO.
- Environmental Research and Technology, Inc., and Ott Water Engineers, Inc. 1983. 1982 Diamond Chuitna project data report, aquatic biology studies (draft). Ft. Collins, CO.
- Faro, J. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Game, Soldotna.
- Fridgen, P. 1984. Personal communication. Asst. Area Mgt. Biologist, ADF&G, Div. Commer. Fish., Cordova.
- GAAC (Governor's Agency Advisory Committee on Leasing). 1981. A social, economic and environmental analysis of a proposed oil and gas lease sale in lower Cook Inlet, fish and game appendix 5.

- Griese, H. 1984. Personal communication. Asst. Area Mgt. Biologist, ADF&G, Div. Game, Anchorage.
- Gusey, W.F. 1978. Fish and wildlife resources of the Gulf of Alaska. Environmental Affairs, Shell Oil Company. Houston, TX. 564 pp.
- Hamilton, C.I., S.J. Starr, and L.L. Trasky. 1979. Recommendations for minimizing the impacts of hydrocarbon development on the fish, wildlife and aquatic plant resources of Lower Cook Inlet. Vol. 2. ADF&G, Marine and Coastal Habitat Management, Anchorage. 420 pp.
- Hammarstrom, S.L. 1977. Inventory and cataloging of Kenai Peninsula and Cook Inlet drainages and fish stocks. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1976-1977. Vol. 18. Proj. F-9-9, Job G-I-C.
- ______. 1978. Inventory and cataloging of Kenai Peninsula and Cook Inlet drainages and fish stocks. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1977-1978. Vol. 19. Proj. F-9-10, Job G-I-C.
- Hammarstrom, S.L., and J. Wallis. 1979. Inventory and cataloging of Kenai Peninsula and Cook Inlet drainages and fish stocks. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1978-1979. Vol. 20. Proj. F-9-11, Job G-I-C.
- _____. 1980. Inventory and cataloging of Kenai Peninsula and Cook Inlet drainages and fish stocks. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1979-1980. Vol. 21. Proj. F-9-12, Job G-I-C.
- . 1981. Inventory and cataloging of Kenai Peninsula and Cook Inlet drainages and fish stocks. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1980-1981. Vol. 22. Proj. F-9-13, Job G-I-C.
- . 1982. Inventory and cataloging of Kenai Peninsula and Cook Inlet drainages and fish stocks. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1981-1982. Vol. 23. Proj. F-9-14, Job G-I-C.
- _____. 1983. Inventory and cataloging of Kenai Peninsula and Cook Inlet drainages and fish stocks. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1982-1983. Vol. 24. Proj. F-9-15, Job G-I-C.
- Harkness, D. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Game, Anchorage.
- Haugh, J. 1976. Portage wildlife habitat inventory and analysis.
- Havens, A.C. 1984. Personal communication. Fisheries Biologist, ADF&G, Div. Sport Fish, Palmer.
- Heimer, W. 1984. Personal communication. Game Biologist, ADF&G, Div. Game, Fairbanks.
- Hemming, J.E., and K.A. Morehouse, eds. 1976. Wildlife atlas: trans-Alaska oil pipeline. Joint State/Federal Fish and Wildlife Advisory Team. Spec. Rept. No. 3. 30 pp.
- Hepler, K.R. 1984. Personal communication. Asst. Area Mgt. Biologist, ADF&G, Div. Sport Fish, Anchorage.
- Hogan, M.E., and J. Murk. 1982. Seasonal distribution of marine birds in Prince William Sound, based on aerial surveys - 1971. Unpubl. rept. USFWS, Anchorage, AK.
- Holdermann, D.A. 1983. Caribou survey-inventory progress report, 1981-1982. Pages 22-23 in R.A. Hinman, ed. Annual report of surveyinventory activities. ADF&G, Fed. Aid in Wildl. Rest. Vol. 13. Proj. W-22-1.
 - _____. 1984-1985. Personal communication. Asst. Area Mgt. Biologist, ADF&G, Div. Game, Homer.

- Hughes, J. 1983. Personal communication. Nongame Biologist, ADF&G, Div. Game, Anchorage.
- Jacobson, M. 1984. Personal communication. Wildlife Biologist, BLM, Glennallen, AK.
- Kimker, A. 1983. Prince William Sound Management Area shellfish report to the Alaska Board of Fisheries. ADF&G, Div. Commer. Fish., Cordova.

_____. 1984. Personal communications. Shellfish Biologist, ADF&G, Div. Commer. Fish., Cordova.

- King, B. 1984. Personal communication. Fishery Biologist, ADF&G, Div. Commer. Fish., Soldotna.
- King, J. 1984. Personal communication. Wildlife Biologist (Ret.), USFWS, Juneau.
- King, J.G., and B. Conant. 1983. Alaska-Yukon waterfowl breeding pair survey - May 16 to June 11, 1983. Unpubl. rept. USFWS, Juneau, AK.
- Kubik, S.W., and R. Wadman. 1978. Inventory and cataloging of sport fish and sport fish waters of the lower Susitna River and central Cook Inlet drainages. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1977-1978. Vol. 19. Proj. F-9-10, Job G-I-H.
- ______. 1979. Inventory and cataloging of sport fish and sport fish waters of the lower Susitna River and central Cook Inlet drainages. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1978-1979. Vol. 20. Proj. F-9-11, Job G-I-H.
- Kuntz, R.C., F. Broerman, and M.W. Small. 1983. Results of the 1983 Bald Eagle (*Haliaeetus leucocephalus*) nest survey in the Glennallen resource area. BLM, Glennallen, AK. 13 pp.
- Kyle, S. 1984. Personal communication. Asst. Area Mgt. Biologist, ADF&G, Div. Commer. Fish., Homer.
- Lieb, J.W. 1985. Personal communication. Game Biologist, ADF&G, Div. Game, Glennallen.
- Logan, S.M. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Sport Fish, Soldotna.
- Ludlow, G. 1973. Trip report of raptor survey 12-15 July, 1973. Unpubl. rept. BLM, Anchorage, AK. 4 pp.
- Lyubimova, T.G. 1964. Biological characteristics of the school of Pacific rockfish (*Sebastodes alutus*, Gilbert) in the Gulf of Alaska. Pages 208-216 *in* P.A. Moiseev, ed. Soviet fisheries investigations in the northeastern Pacific, Part I. (Transl. Israel Prog. Sci. Transl., Jerusalem, 1968).
- Martugo, Z.D. 1971. Exploratory fishing drags for demersal fish and shellfish - Gulf of Alaska. Shell Oil Co., Environmental Conservation Dept. Feb. 1972.
- McDonald, M.G. 1984. Personal communication. Game Biologist, ADF&G, Div. Game, Anchorage.
- McHenry, E.T. 1984. Personal communication. Fisheries Biologist, ADF&G, Div. Sport Fish, Seward.
- Merritt, M. 1984. Personal communication. Research Biologist, ADF&G, Div. Commer. Fish., Homer.
- Miller, L. 1984. Personal communication. Game Technician, ADF&G, Div. Game, Anchorage.
- Mills, M. 1979. Statewide harvest study. ADF&G, Fed. Aid in Fish Rest. Ann. performance rept. Vol. 20. Proj. F-9 11, Job SW-I-A.

_____. 1980. Statewide harvest study. ADF&G, Fed. Aid in Fish Rest. Ann. performance rept. Vol. 21. Proj. F-19 12, Job SW-I-A.

_____. 1981b. Statewide harvest study - 1980 data. ADF&G, Fed. Aid in Fish Rest. and Anadromous Fish Studies. Ann. performance rept. Vol. 22. Proj. F-9-13, Job SW-I-A.

_____. 1982. Statewide harvest study - 1981 data. ADF&G, Fed. Aid in Fish Rest. and Anadromous Fish Studies. Ann. performance rept. Vol. 23. Proj. F-9-14, Job SW-I-A.

_____. 1983. Statewide harvest study - 1982 data. ADF&G, Fed. Aid in Fish Rest. and Anadromous Fish Studies. Ann. performance rept. Vol. 24. Proj. F-9-15, Job SW-I-A.

Modafferi, R. 1983. Personal communication. Game Biologist, ADF&G, Div. Game, Anchorage.

Morrison, R. 1984. Personal communication. Central Alaska Groundfish Biologist, ADF&G, Div. Commer. Fish., Homer.

Nelson, D.C. 1977. Russian River sockeye salmon study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1976- 1977. Vol. 18. Proj. AFS-44-3.

_____. 1978. Russian River sockeye salmon study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1977-1978. Vol. 19. Proj. AFS-44-4.

_____. 1979. Russian River sockeye salmon study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1978-1979. Vol. 20. Proj. AFS-44-5.

_____. 1980. Russian River sockeye salmon study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1979-1980. Vol. 21. Proj. AFS-44-6.

_____. 1981. Russian River sockeye salmon study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1980-1981. Vol. 22. Proj. AFS=44=7.

_____. 1982. Russian River sockeye salmon study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1981-1982. Vol. 23. Proj. AFS-44-8.

_____. 1983. Russian River sockeye salmon study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1982-1983. Vol. 24. Proj. AFS-44-9.

- Nelson, J.W., and A.L. Sowls. 1982. A census of colonially breeding waterbirds on Lake Louise and Skilak Lake, Alaska, 21-22 July 1981. USFWS, Anchorage, AK. Unpubl. admin. rept.
- Nichols, L. 1984. Personal communication. Game Biologist, ADF&G, Div. Game, Cooper Landing.
- Nickerson, R.B. 1975. A critical analysis of some razor clam (*Siliqua patula*, Dixon) populations in Alaska. ADF&G, Div. FRED, Juneau. 144 pp.
- Nysewander, D.R., and S.M. Patten. 1983. Surveys and productivity estimates of colonially breeding waterbirds at Lake Louise, Skilak Lake, and other locations in southcentral Alaska, 6-11 June and 22-27 July 1982. USFWS, Marine Bird Management Project. Anchorage, AK. 19 pp.
- PWSRPT (Prince William Sound Regional Fisheries Planning Team). 1983. Prince William Sound-Copper River Comprehensive Salmon Plan, Phase I - 20 year plan (1983-2002). Cordova, AK. 176 pp.
- Paul, D.M. 1982. Distribution of juvenile *Chionoecetes bairdi* in Cook Inlet. Pages 175-184 *in* Proceedings of the international symposium on the genus *Chionoecetes*. May 3-6, 1982, Anchorage, AK. Alaska Sea Grant Rept. 82-10.

- Pitcher, K.W. 1982. Susitna Hydroelectric Project. Phase 1: final rept., big game studies. Vol. 4: Caribou. ADF&G, submitted to the Alaska Power Authority. Anchorage. 101 pp.
- _____. 1983. Susitna Hydroelectric Project. Phase 2: 1982 ann. rept., big game studies. Vol. 4: Caribou. ADF&G, submitted to the Alaska Power Authority. Anchorage. 43 pp.
- _____. 1984-1985. Personal communication. Game Biologist, ADF&G, Div. Game, Anchorage.

_____. 1984. Susitna Hydroelectric Project. Phase 2: 1983 ann. rept., big game studies. Vol. 4: Caribou. ADF&G, submitted to the Alaska Power Authority. Anchorage. 41 pp.

- Pitcher, K.W., and D.G. Calkins. 1979. Biology of the harbor seal, *Phoca vitulina richardsi*, in the Gulf of Alaska. OCSEAP rept. prepared by ADF&G. RU-229. Contract No. 03-5-002-69. 72 pp.
- Pitcher, K.W., and J. Vania. 1973. Distribution and abundance of sea otters, sea lions, and harbor seals in Prince William Sound, summer 1973. Unpubl. rept. ADF&G. 18 pp.
- Reynolds, J.L. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Game, Cordova.
- Roberson, K. 1984. Personal communication. Research Project Leader, ADF&G, Div. Commer. Fish., Glennallen.
- Rucks, J. 1977. An inventory of wildlife and wildlife habitat of the Gulkana River, Alaska. BLM, Anchorage, AK.
- Ruesch, P. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Commer. Fish., Soldotna.
- Schmidt, D.C., C.C. Estes, D.L. Crawford, and D.S. Vincent-Lang, eds. 1984.
 Access and transmission corridor aquatic investigations (July-Oct. 1983). Rept. No. 4 (draft). ADF&G, Susitna Hydro Aquatic Studies, Anchorage. 88 pp. + appendices.
- Schneider, K. 1985. Personal communication. Research Coordinator, ADF&G, Div. Game, Anchorage.
- Schroeder, T.R. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Commer. Fish., Homer.
- Science Applications, Inc. 1977. Interim lower Cook Inlet synthesis report. Environmental assessment of the Alaska continental shelf. USDC: NOAA, ERL.
- Sears, H.S., and S.T. Zimmerman. 1977. Alaska intertidal survey atlas. USDC: NOAA, NMFS, NWAFC. Auke Bay. Unpubl.
- Singer, F. 1984. Personal communication. Wildlife Biologist, NPS, Anchorage, AK.
- Skoog, R.O. 1968. Ecology of the caribou (*Rangifer tarandus granti*) in Alaska. Ph.D. Thesis, Univ. California, Berkeley. 699 pp.
- Sowls, A.L. 1984. Personal communication. Seabird Biologist, USFWS, Wildlife Assistance, Anchorage, AK.
- Sowls, A.L., S.A. Hatch, and C.J. Lensink. 1978. Catalog of Alaskan seabird colonies. USFWS, Anchorage, AK. 254 pp.
- Spraker, T.H. 1984-1985. Personal communication. Area Mgt. Biologist, ADF&G, Div. Game, Soldotna.
- . 1984. Caribou survey-inventory progress report, 1982-83. Pages 1-2, 22-23 in R.A. Hinman, ed. Annual report of survey-inventory activities. ADF&G, Fed. Aid in Wildl. Rest. Vol. 14, Part 6. Proj. W-22-2.

- St. Pierre, G. In press. Locations and times of spawning for Pacific halibut. IPHC sci. rept.
- Steen, N.C. 1984. Personal communication. Asst. Area Mgt. Biologist, ADF&G, Div. Game, Palmer.
- Stratton, L. 1982-1984. Field research. ADF&G, Div. Subsistence, Anchorage.
- Timm, D. 1976. Report of survey and inventory activities waterfowl. Fed. Aid Wildl. Rest. Vol. 7. Proj. prog. rept. Proj. W-17-8, Jobs 11.0, 11.1, 11.2, and 11.3. 59 pp.
- _____. 1980. Eagle survey, May 6, 1980. Unpubl. rept. ADF&G files.
- Timm, D.E. 1984. Personal communication. Regional Mgt. Coordinator, ADF&G, Div. Game, Anchorage.
- Tobey, B. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Game, Glennallen.
- USFWS. 1981. Valdez Duck Flats July 1981. Unpubl. rept. USFWS, Anchorage, AK.

_____. 1983. Raptor management studies. Maps prepared by R. Ritchie, Alaska Biological Research, Inc. for USFWS.

- VanBallenberghe-Nelson, F. 1984. Personal communication. Game Biologist, ADF&G, Div. Game, Fairbanks.
- Wallis, J., and D.T. Balland. 1981. Anchor River steelhead study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1980-1981. Vol. 22. Proj. AFS-48-1.
- _____. 1982. Anchor River steelhead study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1981-1982. Vol. 23. Proj. AFS-48-2.
- _____. 1983. Anchor River steelhead study. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1982-1983. Vol. 24. Proj. AFS-48-3.
- Watsjold, D.A. 1977. Inventory, cataloging and population sampling of the sport fish and sport fish waters in upper Cook Inlet. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1976-1977. Vol. 18. Proj. F-9-9, Job G-I-D.
- _____. 1978. Inventory, cataloging and population sampling of the sport fish and sport fish waters in upper Cook Inlet. ADF&G, Fed. Aid in Fish
- Rest. Ann. rept. of prog., 1977-1978. Vol. 19. Proj. F-9-10, Job G-I-D.
- _____. 1980. Inventory and cataloging of the sport fish and sport fish waters in the upper Cook Inlet. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1979-1980. Vol. 21. Proj. F-9-12, Job G-I-D.
- ______. 1984. Personal communication. Regional Research Coordinator, ADF&G, Div. Sport Fish, Anchorage.
- Westlund, J. 1984. Personal communication. Game Biologist, ADF&G, Div. Game, Anchorage.
- Wheelabrator Coal Services. 1984. Assessment of the feasibility and implementation of port and transportation system alternatives for the Bering River coal field, final rept. Vol. 2, exhibits 13 and 14. Prepared for the City of Cordova.
- Williams, F.T. 1977. Inventory and cataloging of sport fish and sport fish waters of the Copper River, Prince William Sound, and the upper Susitna River drainages. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1976-1977. Vol. 18. Proj. F-9-9, Job G-I-F.
 - _____. 1984. Personal communication. Area Mgt. Biologist, ADF&G, Div. Sport Fish, Glennallen.

Williams, F.T., and W.D. Potterville. 1978. Inventory and cataloging of sport fish and sport fish waters of the Copper River, Prince William Sound, and the upper Susitna River drainages. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1977-1978. Vol. 19. Proj. F-9-10, Job G-I-F.

. 1981. Inventory and cataloging of sport fish and sport fish waters of the Copper River, Prince William Sound, and the upper Susitna River drainages. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1980-1981. Vol. 22. Proj. F-9-13, Job G-I-F.

_____. 1982. Inventory and cataloging of sport fish and sport fish waters of the Copper River, Prince William Sound, and the upper Susitna River drainages. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1981-1982. Vol. 23. Proj. F-9-14, Job G-I-F.

_____. 1983. Inventory and cataloging of sport fish and sport fish waters of the Copper River, Prince William Sound, and the upper Susitna River drainages. ADF&G, Fed. Aid in Fish Rest. Ann. rept. of prog., 1982-1983. Vol. 24. Proj. F-9-15, Job G-I-F.





















