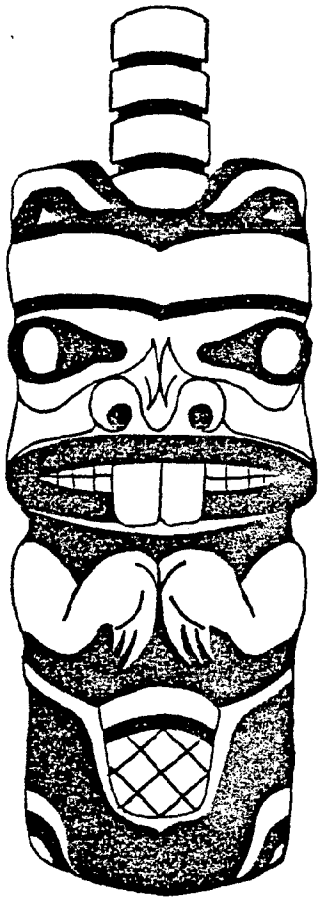
15858

W.P.

A FISH AND WILDLIFE RESOURCE INVENTORY OF SOUTHEASTERN ALASKA

COASTAL ZONE
INFORMATION CENTER

Alaska, Coastal Management Program.
SH327.5 .F63 1977 v.1



1977

VOLUME 1 - WILDLIFE

DRAFT REPORT

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

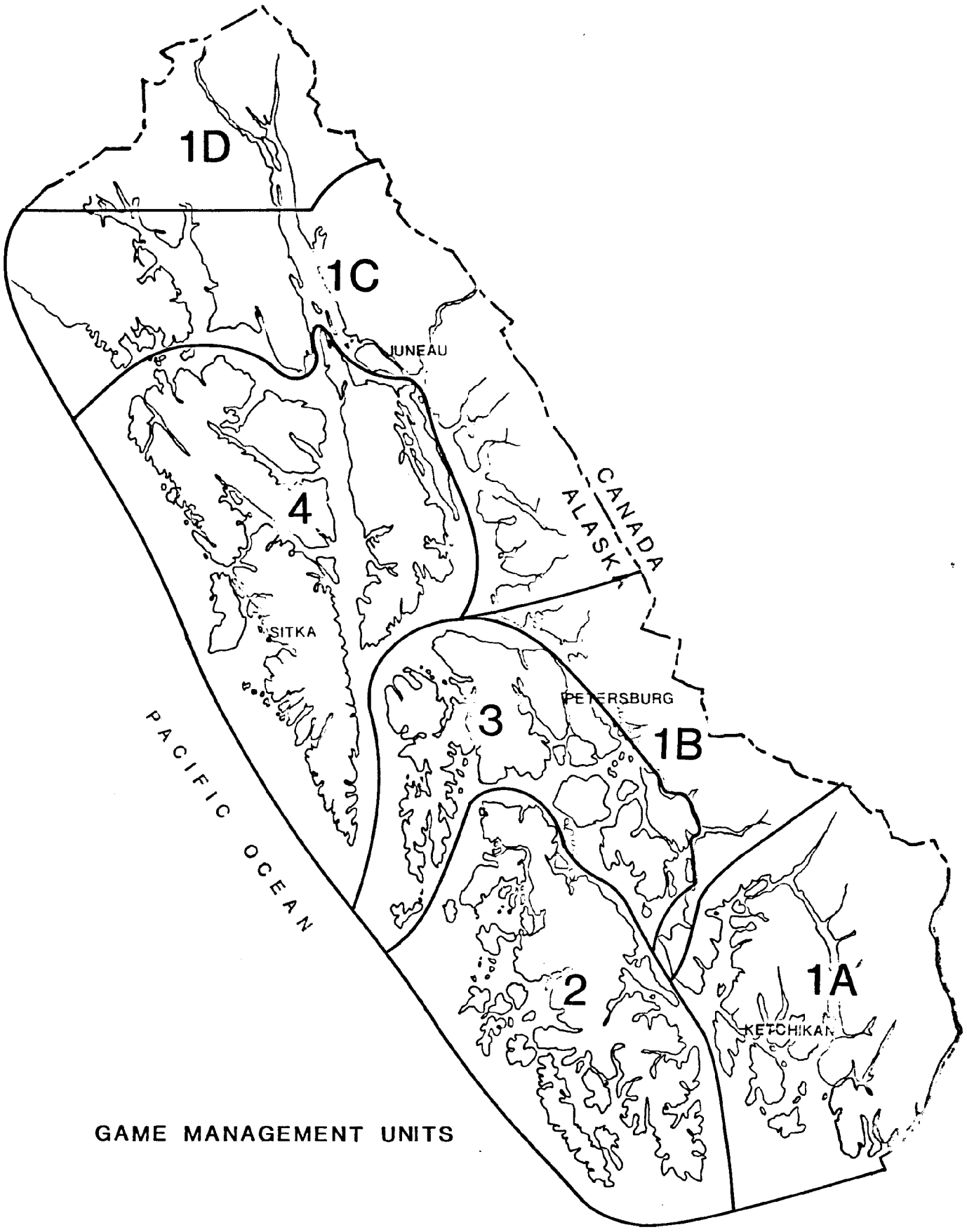
COMPILED BY THE ALASKA DEPARTMENT OF FISH AND GAME UNDER CONTRACT TO THE ALASKA COASTAL MANAGEMENT PROGRAM - DIVISION OF POLICY DEVELOPMENT AND PLANNING

VOLUME 1 STUDY TEAM

EDWARD G. KLINKHART JOHN W. SCHOEN

1977

THIS PROJECT WAS SUPPORTED, IN PART, BY THE FEDERAL COASTAL ZONE MANAGEMENT PROGRAM DEVELOPMENT FUNDS (P.L. 92-583, SECTION 305), GRANTED TO THE STATE OF ALASKA BY THE OFFICE OF COASTAL ZONE MANAGEMENT, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE.



GAME MANAGEMENT UNITS

VOLUME 1 - WILDLIFE

TABLE OF CONTENTS

Introduction..... 1

Moose..... 5

Distribution..... 17
Selected References..... 18

Sitka Black-tailed Deer..... 20

Distribution..... 38
Selected References..... 39

Mountain Goat..... 41

Distribution..... 59
Selected References..... 60

Brown-Grizzly Bear..... 62

Distribution..... 73
Selected References..... 74

Black Bear..... 76

Distribution..... 85
Selected References..... 86

Furbearers, Small Game and Upland Game Birds..... 87

Wolf..... 88
Distribution..... 93
Coyote..... 94
Distribution..... 96
Red Fox..... 97
Distribution..... 99
Lynx..... 100
Distribution..... 102
Wolverine..... 103
Distribution..... 107
Marten..... 108
Distribution..... 110
Mink..... 111
Distribution..... 114

Short-tailed Weasel..... 115
Distribution..... 116
Least Weasel..... 117
Distribution..... 118
Land Otter..... 119
Distribution..... 121
Beaver..... 122
Distribution..... 127
Muskrat..... 128
Distribution..... 130
Marmot..... 131
Distribution..... 132
Red Squirrel..... 133
Distribution..... 135
Northern Flying Squirrel..... 136
Distribution..... 137
Porcupine..... 138
Distribution..... 139
Raccoon..... 140
Snowshoe Hare..... 141
Distribution..... 144
Willow Ptarmigan..... 145
Distribution..... 147
Rock Ptarmigan..... 148
Distribution..... 150
White-tailed Ptarmigan..... 151
Distribution..... 153
Spruce Grouse..... 154
Distribution..... 156
Ruffed Grouse..... 157
Distribution..... 159
Blue Grouse..... 160
Distribution..... 162
Selected References..... 163

Marine Mammals..... 166

Harbor Seal..... 168

Sea Otter..... 173
Distribution..... 182

Sea Lion..... 183

Whales..... 185

Marine Mammals - Selected References..... 189

Waterfowl..... 192

Recreation and Subsistence Use..... 192
Waterfowl Sport Hunting..... 192
Nonconsumptive Recreational Use..... 196
Subsistence Use..... 198

Waterfowl Production..... 198
Ducks..... 198
Geese..... 199
Swans..... 200

General Waterfowl Distribution..... 200

Importance of Waterfowl Habitat..... 203

Rare and Endangered Species..... 204

Land Classification..... 205
Possible Impacts From Various Land Uses..... 207

Appendix A. - Life Histories..... 209

Moose..... 210
Sitka Black-tailed Deer..... 214
Mountain Goat..... 217
Brown-Grizzly Bear..... 220
Black Bear..... 225
Harbor Seals..... 229
Sea Otter..... 233
Sea Lion..... 237

VOLUME 1 - WILDLIFE

TABLE OF TABLES

BIG GAME

Table		Page
1	Moose harvest, Subunit 1(B).....	8
2	Moose harvest, Subunit 1(C).....	10
3	Remainder of Unit 1(C).....	10
4	Moose harvest, Subunit 1(D).....	11
5	Moose sex and age composition count summaries for 1974 -75, Stikine River, GMU 1(B).....	12
6	1974-75 sex and age ratios, Stikine River, GMU 1B.....	12
7	Cementum age data, Unit 1 (C) - Berners Bay.....	13
8	Moose sex and age ratios, Berners Bay and Taku River..	14
9	Cementum age data, Unit 1(D) - Haines.....	15
10	Moose sex and age ratios, Haines, Unit 1(D).....	16
11	Deer harvest, Subunit 1(A) and Unit 2.....	24
12	Deer harvest, Subunit 1(B) and Unit 3.....	26
13	Deer harvest, Subunit 1(C) and 1(D).....	27
14	Deer harvest, Unit 4.....	30
15	S.E. Alaska deer harvest statistics derived from hunter interviews, Units 1 through 4.....	31
16	Chronology of 1974 deer harvest as derived from hunter interviews, Units 1 through 4.....	32
17	Location of 1974 deer kills by Game Management Unit, Units 1-4, as derived from hunter interviews.....	33

Table		Page
18	Deer hunter opinion on 1974 season in comparison to previous seasons as derived from hunter interviews, Units 1-4	34
19	Estimated deer harvest from Game Management Unit 4, 1974	35
20	Historic harvest data, GMU 4, Sitka hunters only	36
21	Winter mortality data, Game Management Unit 4	37
22	Mountain goat harvest, Subunit 1(A)	43
23	Mountain goat harvest, Subunit 1(B)	45
24	Mountain goat harvest, Subunits 1(C) and 1(D)	47
25	Mountain goat harvest, Unit 4	49
26	Goat composition surveys, Subunit 1A, 1968-74	50
27	Goat harvest statistics by area from hunter reports for the years 1972-1975 for Subunit 1B	51
28	Mountain goat composition counts, Subunit 1B, 1959-74.	52
29	Game Management Subunit 1C goat harvest statistics for 1972-1974	53
30	Goat numbers and age ratios obtained from fixed-wing aircraft	54
31	Subunit 1D goat harvest as derived from hunter harvest tickets	55
32	Goat numbers and age ratios obtained from fixed-wing aircraft surveys of selected mountains in Subunit 1D..	56
33	Historic goat survey data, GMU 4	57
34	Mountain goat harvest, by unit, subunit and sex, 1974-1975	58
35	Yearly bear sport harvest 1961-76, GMU 1	65
36	Yearly brown bear sport harvest 1961-76, GMU 4	67

Table		Page
37	Spring brown bear sport harvest 1961-76, GMU 1.....	68
38	Fall brown bear sport harvest 1961-76, GMU 1.....	69
39	Spring brown bear sport harvest 1961-76, GMU 4.....	70
40	Fall brown bear sport harvest 1961-76, GMU 4.....	71
41	Brown/grizzly bear harvest by subunit, GMU 4.....	72
42	Yearly black bear sport harvest 1961-76 GMU 1 and 2....	78
43	Yearly black bear sport harvest 1961-76 GMU 1 and 3....	80
44	Yearly black bear sport harvest 1961-76 GMU 1, Subunits C and D.....	82
45	Black bear harvest statistics for GMU's 1A and 2 with color phase, kill by nonresidents, mean skull size and methods of transportation used for calendar year 1974.....	83
46	Black bear harvest, Units 1(C), 1(D) and 5, 1972-74....	84

FURBEARERS, SMALL GAME AND UPLAND GAME BIRDS

Table		Page
1	Wolf harvest, southeastern Alaska 1961-1976.....	91
2	Units 1A and 2, wolf harvest from sealing records 1971-72 through 1975.....	92
3	Wolverine harvest, southeastern Alaska 1971-1976.....	105
4	Wolverine harvest, Units 1-4, 1975.....	106
5	Method of take of wolverines, 1975, Units 1-4.....	106
6	Beaver affidavit analysis, 1969-1975.....	126

MARINE MAMMALS

Table		Page
1	Seal sightings, southeastern Alaska, April-May, 1975	169
2	Southeastern Alaska seal harvest 1964-75	171
3	Numbers of sea otters transplanted 1955-70	178
4	Sea otter sightings in southeastern Alaska since 1965	179
5	Southeastern Alaska sea lion surveys, 1975	184

WATERFOWL

Table		Page
1	Waterfowl sport hunting statistics by location, 1971-1975 yearly average, southeast Alaska	194

INTRODUCTION

The southeastern region of Alaska is composed of a mainland strip and the Alexander Archipelago -- a wide belt of rugged islands with summits generally 2,500 to 3,000 feet in elevation. Most of the mainland is deeply indented by fiords. Along the Canadian border the peaks rise to about 10,000 feet.

The climate throughout this region is maritime, with considerable rain and moderate temperatures. The south coast averages 200 wet days per year, while the north averages less than 100. This climate has produced dense stands of spruce, hemlock and cedar which occur from tidewater to 3,000 feet elevation.

Game Management Unit 1 includes all of the mainland from Cape Fairweather to Dixon Entrance. Ketchikan and Juneau, the two largest cities in southeastern Alaska, are located in this unit. The eastern portion of this unit contains the rugged Coast Range that is bisected by several major river systems originating in British Columbia. These drainages have provided dispersal corridors from interior to coastal areas for many species not found on the islands of Units 2-4. Although wildlife is not as abundant in Unit 1 as in Units 2-4, Unit 1 contains a greater diversity of species. In terms of big game, it is the only unit in southeastern Alaska where mountain goats, Sitka black-tailed deer, moose, black bear, brown bear, wolves and wolverine coexist.

Unit 2 includes Prince of Wales Island, which is over 2,000 square miles in size, and numerous smaller islands adjacent to the Pacific Ocean. The climate on the west coast is influenced by the ocean and is

milder than that of the inner islands and mainland. The Sitka black-tailed deer, black bear, wolves and many furbearers occur in this area. About one-fourth of the breeding ducks in southeastern Alaska are found in Unit 2.

Game Management Unit 3 is located centrally in southeastern Alaska. It includes several major islands, the largest being Kupreanof, which is slightly over 1,000 square miles in size. The climate in Unit 3 can be quite severe. There is more variation in the average annual winter temperature here than in any other unit. This unit contains some of the best deer habitat in southeastern Alaska. Because of weather, however, it is also subject to the greatest fluctuations in deer numbers. Unit 3 is similar to Unit 2 in that it supports wolf and black bear populations but no brown bear.

Game Management Unit 4 includes the islands of Admiralty, Baranof and Chichagof, as well as many smaller islands. Admiralty and Baranof are each about 1,600 square miles in size, and Chichagof is somewhat over 2,000 square miles. The western portions of both Baranof and Chichagof are exposed to the Pacific Ocean. Vegetation is similar to that in other southeastern Alaska units, but the timberline is somewhat lower than in the southern portion of southeast Alaska. This unit supports the highest brown bear density in southeastern Alaska. Admiralty, Baranof and Chichagof Islands make up the majority of Unit 4, and bears are common to abundant on all of these islands. Deer are generally abundant throughout Unit 4. Baranof Island has a thriving goat population which stems from a transplant in 1923. Sea otters were

reintroduced to southeastern Alaska in 1965 when they were released along the west coast of Chichagof Island. This introduction has resulted in the establishment of sea otters along the entire outside coast of Unit 4.

This report was originally meant to support a series of maps which identified seasonal distribution and movements, high density areas, critical habitat zones and areas of particular concern. Since funding for the cartographic portion of this report was not available, we have attempted to provide information relative to big game, furbearers, small game, waterfowl and marine mammals in narrative form. Narrative accounts and life histories are restricted to information specific to area and species. General life histories for big game and marine mammals may be found in Appendix A. Recreational and subsistence information by area and type of user and distribution and abundance as related to habitat zones is presented for each species. Although not included in this report, it is important to recognize that many species of birds and small mammals inhabit this region. Some species, such as the microtine rodents, are a food source of many mammals and birds. These species play an important part in the total ecosystem.

It is imperative that those who use this report recognize that wildlife populations are a variable, ever-changing resource. The information contained herein is as up-to-date as possible, but changing land tenure, human use and development and a multitude of natural factors require that our data be continuously gathered and updated.

Most of the wildlife information in this report was obtained from Alaska Department of Fish and Game biologists who reside in the area.

Additional contributions were made by other staff members and from members of other wildlife resource agencies. These contributions are greatfully acknowledged.

MOOSE

The moose (Alces alces), which has a circumboreal distribution, is an animal of the northern forests. In Alaska, they range throughout most of the State, except for much of the southeastern portion and the coastal islands. Moose most frequently inhabit regions of second-growth hardwood forests, timberline plateaus and areas along major river systems. The Alaskan subspecies (Alces alces gigas) is the largest subspecies of moose, which is the largest member of the deer family (Cervidae).

Calving occurs in late spring, usually around the first of June. At this time, pregnant cows seek out isolation for the birth of their calves. This usually occurs near riparian or muskeg areas. First-year breeders usually produce a single calf, but after that about 60 percent of the cows produce twins. The productivity in any given area, however, is directly related to the physical condition of the cow, which in turn reflects local range conditions. Calf mortality is often quite high during the first six weeks following parturition. During this period and through summer, moose forage on water-associated vegetation, grasses, sedges, forbs and the leaves of hardwoods, primarily birch, willow and aspen. During summer, moose are usually widely dispersed and solitary.

The rut or breeding season occurs during late September and October. On good range, yearling cows may breed. Cows in less than optimum condition may not breed, however, until they are two and one-half years old. During fall and winter, moose utilize the annual growth of hardwoods, particularly willow, aspen and birch. Winter and early spring is a critical period for moose as forage quality and quantity are generally

low, and consequently, mortality is usually high at this time. This may be further compounded by severe weather, poor range conditions and high predator populations. Although moose may move a distance of from 20 to 40 miles during the year, they are generally considered sedentary compared to species such as caribou or elk. In general, moose prefer forest habitats in early to mid-successional stages of development such as those resulting from fire or timber harvest.

Subunit 1(A)*

Moose occur only in limited numbers in the Chickamin River drainage of Subunit 1(A). Although moose occurred here naturally, additional animals were transplanted in 1963-64 (Burris and McKnight, 1973). A small population of moose also occur in the Unuk River drainage. Only about two to three moose are harvested annually from Subunit 1(A). No other information is available on these populations.

* (Bob Wood, A.D.F.& G., Area Biologist, Ketchikan, pers. comm.)

Subunit 1(B) and Unit 3*

Moose populations within this area have remained relatively stable over the years. The major population in Subunit 1(B) occurs in the Stikine River drainage. A smaller population is located at Thomas Bay, with a few animals occasionally scattered throughout the remainder of Subunit 1(B) and sometimes on Mitkof and Kupreanof Islands in Unit 3.

During the late winter months (February and March), moose tend to move down the Stikine River to avoid deep snow conditions. Throughout the remainder of the year they may occur throughout the drainage system.

The only area which has substantial deciduous forest cover is the Stikine River drainage. This entire area is considered critical moose habitat.

The Stikine herd is heavily hunted (bulls only). The average annual harvest of moose from this herd is about 25 animals. Harvest statistics are presented in Table 1. Each year, most legal bulls are taken. This has resulted in a harvest of over 80 percent of the yearling and two-year-old bulls. In other words, most bulls are harvested before they ever attain full maturity. Most moose hunters in this region are residents of southeastern Alaska. The Thomas Bay herd, although small, provides considerable recreational opportunity. This herd is primarily dependent on early successional stages following logging. The perpetuation of this herd will require spaced cutting entries and perhaps thinning of young conifer reproduction to provide future habitat.

* (Harry Merriam, A.D.F.& G., Area Biologist, Petersburg, pers. comm.)

Subunits 1(C) and 1(D)*

Moose numbers have declined in this region in recent years. The major populations occur in the Haines area, Taku River and at Berner's Bay where they were introduced in 1958 (Burris and McKnight, 1973). Throughout these subunits, important winter range consists of those areas where riparian willow communities and mixed deciduous-coniferous forests occur. This critical winter range is identified in Alaska's Wildlife and Habitat (1973). The most substantial seasonal movements occur in the Haines area where moose move down the long river valleys in November to winter at lower elevations. During June, they again move up these valleys to summer in the uplands. Historical harvest statistics

Table 1. Moose Harvest: Subunit 1(B).

Year	Male	Female	Sex Unknown	Total	Hunters	Percent Success
1970	23	1		24	52	46.2
1971	25	4	1	30	--	--
1972	7	15	1	23	165	13.9
1973	29	18		47	200	23.5
1974	22	1	1	24	200	12.0
1975	24	--		24	168	14.3

Data derived from harvest ticket returns.

are presented in Tables 2 and 3. Viewing and photography of moose occurs throughout the year, primarily at Berner's Bay, Taku River and the Haines Highway.

* (Dave Johnson, A.D.F.& G., Area Biologist, Juneau, pers. comm.)

Units 2 and 4

Moose do not occur in Units 2 or 4.

Table 2 Moose Harvest: Subunit 1(C).

Year	Male	Female	Total	Hunters	Percent Success
		Berners Bay			
1963	3	-	3	-	-
1964	6	-	6	-	-
1965	11	-	11	-	-
1966	10	-	10	61	16.4
1967	18	-	18	-	-
1968	21	-	21	-	-
1969	14	-	14	-	-
1970	10	-	10	-	-
1971*	3	20	23	28	82.1
1972*	5	17	22	35	62.9
1973*	15	18	33	42	78.6
1974*	9	11	20	42	47.6

* Harvest as reported by permittees.

Table 3. Remainder of Unit 1(C)

1959	19			-	-
1960	27			-	-
1961	24			-	-
1962	34			-	-
1963	15			-	-
1964	35			101	34.7
1965	25			-	-
1966	29			69	42.0
1967	30			73	41.1
1968	14			-	-
1969	17			-	-
1970	14			-	-
1971+	19			-	-
1972+	26			-	-
1973+	30			139	21.6
1974+	13			88	14.8
1974*+	10			-	-
1975**+	4			71	5.6

* Taku kill separated out.
** Total 1(C) harvest.
\+ Harvest ticket data.

Table 4. Moose Harvest: Subunit 1(D).

Year	Male	Female	Sex Unknown	Total	Hunters	Percent Success
1959	39	-	-	39	-	-
1960	45	-	-	45	150	30.0
1961	63	-	-	63	124	50.8
1962	66	-	-	66	-	-
1963	81	-	-	81	-	-
1964	79	65	2	146	272	53.7
1965	66	34	1	101	-	-
1966	92	60	-	152	261	58.2
1967	90	47	-	137	-	-
1968	82	61	2	145	-	-
1969	52	24	2	78	-	-
1969*	62	41	-	103	-	-
1970	48	48	-	96	-	-
1971	67	30	-	97	318	30.5
1971*	NA	43	-	NA	-	-
1972	46	45	1	92	325	28.3
1973	69	46	-	115	501	23.0
1974	21	37	4	62	343	18.1
1974*	18	40	-	58	454	12.8
1974**	22	42	1	65	NA	NA
1975+	25	-	1	26	300	8.7

* Haines check station data.
** Combined data of check station and harvest ticket.
\+ Data derived from harvest ticket returns.

Table 5.
Moose, Sex and Age Composition Aerial Count Summaries for the Regulatory year 1974-75, Stikine River, GMU 1B, Southeastern Alaska.

SURVEY DATE	TOTAL MM	FF W/O	FF W/1	FF W/2	TOTAL FF	ADULTS UNID. SEX	TOTAL CALVES	TOTAL SAMPLE	SURVEY TIME (HRS.:MINS.)
8-7-74	1	11	8	1	20		10	31	2:00
11-20,21 25-74	0	43	21	5	69	25	31	125	3:49
3-3-75			23	2	25	52	27	104	3:25
4-3-75			8	0	8	54	8	70	3:20

Table 6. 1974-75 Sex and Age Ratios - Stikine River, GMU 1B

SURVEY DATE	TWINS PER 100 FF W/CALVES	CALF % IN HERD	TOTAL SAMPLE	MOOSE PER HOUR
8-7-74	11.1	32.3	31	15.5
11-20,21, 25-74	19.2	24.8	125	27.2
3-3-75	8.0	26.0	104	36.5
4-3-75		11.4	70	21.0

PREPARED BY: DAVE ZIMMERMAN, GAME BIOLOGIST

Table 7. Cementum age data, Unit 1 C - Berners Bay.

	Males					Females			
Age	1971	1972	1973	1974	Age	1971	1972	1973	1974
C	33.3	-	-	33.3	C	-	-	-	-
1	33.3	80.0	23.1	33.3	1	33.3	8.3	13.3	-
2	33.3	20.0	23.1	16.7	2	8.3	41.7	26.7	-
3	-	-	15.4	16.7	3	41.7	16.7	6.7	-
4	-	-	15.4	-	4	16.7	-	6.7	-
5	-	-	15.4	-	5	-	-	13.3	-
6	-	-	7.7	-	6	-	-	13.3	50.0
7	-	-	-	-	7	-	-	20.0	-
8	-	-	-	-	8	-	-	-	-
9	-	-	-	-	9	-	-	-	-
10	-	-	-	-	10	-	-	-	50.0
11	-	-	-	-	11	-	-	-	-
12	-	-	-	-	12	-	-	-	-
Mean	1.5	1.2	3.0	1.2		4.0	2.4	4.0	8.0
Sample Size	3	5	13	6		15	12	15	2

Age structure in percentages.
Calves not included in mean ages.

Table 8. Moose sex and age ratios

BERNERS BAY

Total	Total MM per 100 FF	Small MM per 100 FF	Small MM per 100 Large MM	Small MM % in Herd	Small MM per 100 MM Calves	Calves per 100 FF	Twins per 100 FF w/Calf	Calf % in Herd	Animals per Hour	Total Sample
1960	-	-	-	-	-	-	-	50.0	-	8
1961	-	-	-	-	-	-	-	6.3	-	17
1962	200.0	-	-	-	-	33.3	-	10.0	13.0	20
1963	-	-	-	-	-	-	60.0	32.0	-	25
1964*										
1965	-	-	-	-	-	-		35.1	19.2	37
1966*										
1967*										
1968	23.5	20.6	700.0	10.4	56.0	73.5	38.9	37.3	25.8	67
1969	9.6	0.0	0.0	0.0	0.0	19.2	11.1	14.9	83.8	67
1970	4.7	1.6	50.0	1.3	22.2	14.1	28.6	11.8	24.5	76
1971	7.1	2.4	50.0	1.5	9.1	52.4	5.0	32.8	26.8	67
1972	20.0	14.5	266.6	8.8	64.0	45.5	27.8	27.5	33.7	91
1973	13.8	5.2	60.0	3.4	27.3	37.9	10.5	25.0	33.8	88
1974	17.2	13.8	400.0	8.9	72.7	37.9	0.0	24.4	23.7	45

*Insufficient data in 1964, 1966 and 1967

TAKU RIVER

Year	Total MM per 100 FF	Small MM per 100 FF	Small MM per 100 Large MM	Small MM % in Herd	Small MM per 100 MM Calves	Calves per 100 FF	Twins per 100 FF w/Calf	Calf % in Herd	Animals per Hour	Total Sample
1961	-	-	-	-	-	-	-	-	-	38
1962	2.9	-	-	-	-	17.1	-	14.3	-	42
1963	-	-	-	-	-	-	-	8.5	23.6	59
1964-68*										
1969	10.0	0.0	0.0	0.0	0.0	55.0	21.4	32.8	41.9	67
1970	6.3	0.0	0.0	0.0	0.0	50.0	23.1	32.0	20.0	50**
1971*										
1972	8.8	3.5	66.6	2.2	13.3	52.6	20.8	32.6	30.0	92
1973	5.5	5.5	N/A	4.3	50.0	22.2	0.0	17.4	7.1	23
1974	6.7	3.3	100.0	2.6	28.6	23.3	0.0	17.9	13.1	39

*Insufficient data

** 1/3 of area not surveyed

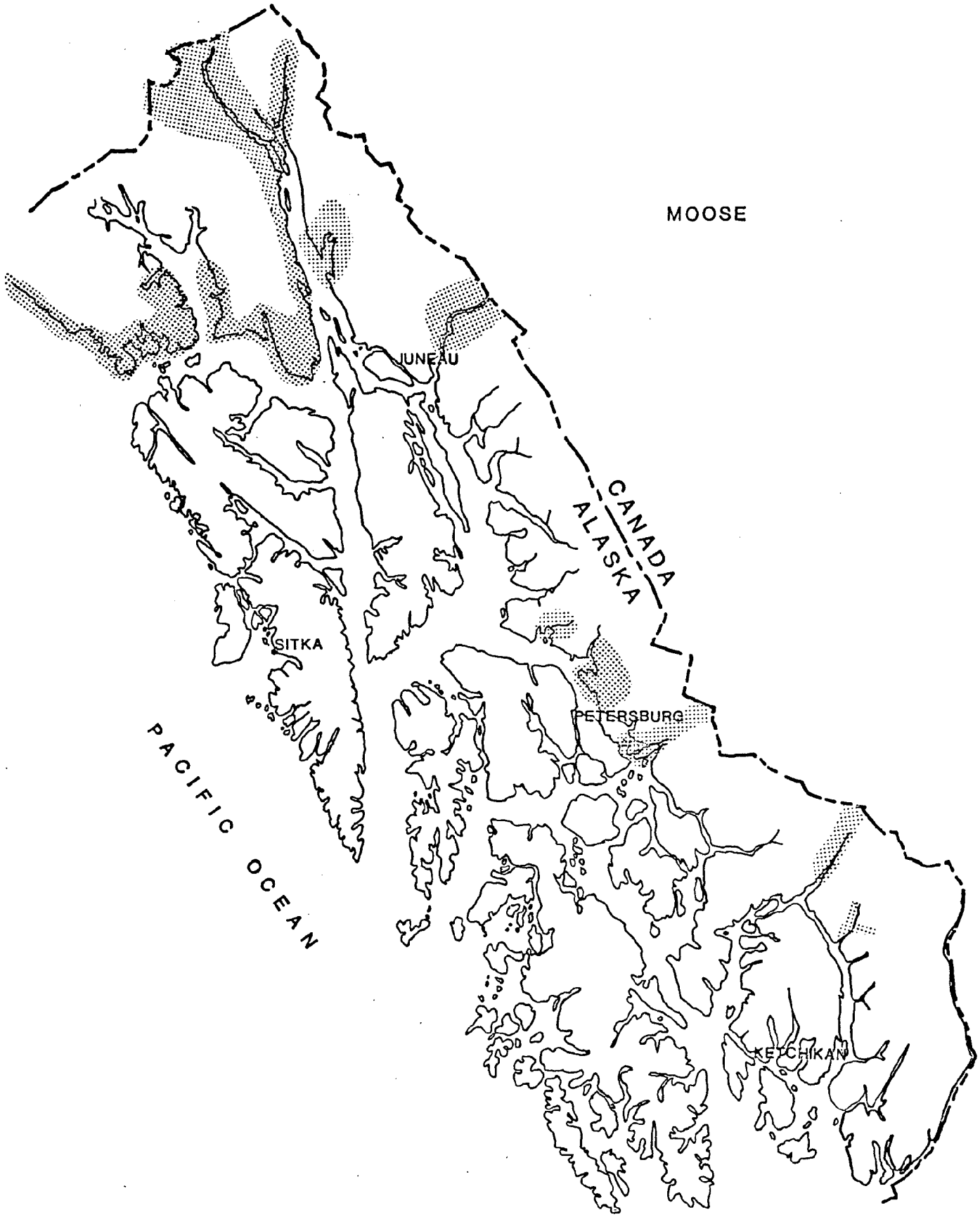
Table 9. Cementum age data, Unit 1D - Haines

	Males						Females				
Age	1970	1971	1972	1973	1974	Age	1970	1971	1972	1973	1974
C	4.2	-	-	10.5	12.5	C	-	10.0	4.5	16.1	10.3
1	20.8	36.4	87.5	31.8	37.5	1	16.7	15.0	36.4	29.0	20.7
2	29.2	45.5	12.5	10.5	31.3	2	27.8	25.0	27.3	-	10.3
3	12.5	9.1	-	15.8	12.5	3	22.2	10.0	13.6	16.1	10.3
4	16.7	-	-	5.3	-	4	5.6	10.0	9.1	6.5	3.5
5	4.2	-	-	10.5	-	5	11.1	5.0	-	9.7	3.5
6	-	-	-	-	-	6	5.6	5.0	4.5	16.1	10.3
7	4.2	-	-	-	-	7	-	5.0	-	-	6.9
8	4.2	-	-	10.5	-	8	-	-	-	3.2	-
9	4.2	9.1	-	5.3	6.2	9	5.6	10.0	-	-	-
10	-	-	-	-	-	10	-	-	-	-	6.9
11	-	-	-	-	-	11	-	-	4.5	-	3.5
12	-	-	-	-	-	12	-	-	-	3.2	-
13	-	-	-	-	-	13	-	-	-	-	-
14	-	-	-	-	-	14	-	10.0	-	-	10.3
15	-	-	-	-	-	15	5.6	-	-	-	-
16	-	-	-	-	-	16	-	-	-	-	-
17	-	-	-	-	-	17	-	-	-	-	3.5
Mean	3.2	2.4	1.1	3.1	1.9		3.8	4.3	2.2	3.1	5.2
Sample Size	24	11	8	19	16		8	20	22	31	29

Table 10. Moose Sex and Age Ratios - Haines - Unit 1D

Year	Total MM per 100 FF	Small MM per 100 FF	Sm. MM per 100 Lg. MM	Sm. MM % in Herd	Sm. MM per 100 MM Calves	Calves per 100 FF	Twins per 100 FF w/Calf	Calf % in Herd	Moose per Hour	Total Sample
1962	5.9	-	-	-	-	29.1	-	21.5	-	181
1963	-	-	-	-	-	-	-	18.7	-	193
1964*										
1965	41.2	15.5	60.5	6.6	63.0	49.3	19.2	20.9	116	349
1966	33.3	15.9	91.7	7.5	46.3	68.8	21.8	32.2	140	295
1967	28.9	12.7	78.6	7.4	58.7	43.4	8.9	25.2	106	298
1968	19.4	9.9	104.2	6.7	69.4	28.5	8.1	19.2	85	374
1969	25.3	0.0	0.0	0.0	0.0	34.1	10.7	21.4	69	145
1970*										
1971	15.9	8.8	125.0	6.5	88.2	20.0	9.7	14.7	47	231
1972	18.5	4.5	32.0	3.0	28.6	31.5	10.0	20.9	42	267
1973	15.9	4.8	42.9	4.7	40.0	23.8	10.3	17.0	60	264
1974	22.2	13.3	150.0	8.7	87.8	30.4	7.9	19.9	33	206

* Not sufficient data.


MOOSE
JUNEAU
CANADA
ALASKA
SITKA
PETERSBURG
PACIFIC OCEAN
KETCHIKAN

MOOSE - SELECTED REFERENCES

Alaska Department of Fish and Game. 1958. Annual report for 1958. Report No. 11. 123 pp.

____. 1959. Annual report for 1959. Report No. 11. 116 pp.

____. 1970. Annual report of survey-inventory activities. Part I. Moose, deer and elk. Fed. Aid. Wild. Rest. Vol. I. Project W-17-2.

____. 1971. Annual report of survey-inventory activities. Part I. Moose, deer and elk. Fed. Aid. Wild. Rest. Vol. II. Project W-17-3.

____. 1973. Annual report of survey-inventory activities. Part I. Moose, deer and elk. Fed. Aid. Wild. Rest. Vol. III. Project W-17-4.

____. 1973. Alaska's wildlife and habitat. Anchorage, Alaska. 143 pp + 563 maps.

____. 1974. Annual report of survey-inventory activities. Part II. Moose, caribou, marine mammals and goat. Fed. Aid. Wild. Rest. Vol. IV. Project W-17-5.

____. 1975. Annual report of survey-inventory activities. Part II. Moose. Fed. Aid. Wild. Rest. Vol. V. Project W-17-6.

____. 1976. Annual report of survey-inventory activities. Part II. Moose. Fed. Aid. Wild. Rest. Vol. VI. Project W-17-7.

____. 1976. A compilation of fish and wildlife resource information for the State of Alaska. Vol. I - Wildlife. 873 pp.

Burris, O.E. 1964. Alaska wildlife stocking. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-11-D-1.

____ and D.E. McKnight. 1973. Game transplants in Alaska. Alaska Dept. of Fish and Game. Game Tech. Bull. No. 4. 57 pp.

Burt, W.H. and R.P. Grossenheider. 1952. A field guide to the mammals. Houghton Mifflin Co., Boston. 284 pp.

Hall, R.E. and K.R. Kelson. 1959. The mammals of North America. Roland Press. New York. Vol. I and II. 1,083 pp.

Manville, R.H. and S.P. Young. 1965. Distribution of Alaskan mammals. U.S. Fish and Wildlife Serv. Cir. 211. 74 pp.

Merriam, H.R. 1960. Moose investigations, southeast Alaska. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-6-R-1.

Neiland, K.A. 1974. Moose disease report. Alaska Dept. of Fish and Game. Fed. Aid. Proj. No. W-17-4,5,6.

Nelson, U.C. 1959. Completion report-development. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. IX. Project W-4-D-9.

Sheets, A.M. 1961. Moose investigations, southeast Alaska. Alaska Dept. of Fish and Game. Fed. Aid. Proj. No. W-6-R-2.

VanWormer, J. 1972. The world of the moose. J.B. Lippincott Co., New York. 160 pp.

Walker, E.P., et al. 1964. Mammals of the world. John's Hopkins Press. Baltimore. Vol. I and II. 1,500 pp.

SITKA BLACK-TAILED DEER

The Sitka black-tailed deer (Odocoileus hemionus sitkensis), which is indigenous to southeastern Alaska, is the northernmost subspecies of the mule deer. Sitka black-tails have been successfully introduced to Yakutat, the Prince William Sound area and the Kodiak-Afognak Island area. Throughout its range, the Sitka black-tail is usually the most abundant species of big game. It utilizes a variety of habitats, but is most often associated with the coastal climax forest. Black-tailed deer in Alaska are highly influenced by the severity of the winters which vary considerably from year to year.

Parturition begins in June, coinciding with the beginning of the new growing season. When does are in good condition, twinning is usually common after the first fawn. As the snow recedes from the high country, most deer begin to move to higher elevations following new plant growth. The alpine zone (2,000 to 3,000 ft.) is the most important deer summer range in Alaska. They usually reach this region during July, although some animals (primarily does and young bucks) remain in the lower country throughout the year. During this period, deer feed on a variety of succulent forbs, the most important of which is deer cabbage. Most deer remain in this area throughout the summer and early fall while it is snow free.

The first frosts generally occur during September, killing the succulent alpine forbs. Following the accumulation of snow and the disappearance of abundant summer forage, deer move toward lower elevations. Food habits change during this period to include more

browse species such as blueberry, salmonberry and currant, and forbs available under timber cover. With fall comes the breeding season, which begins about mid-October and peaks in mid-November. Does in good condition generally breed for the first time during their second fall. Throughout the breeding period, or rut, adult bucks spend little time foraging, and consequently, by the end of this period they have consumed most of their fat reserves. The does, however, enter the winter period in good condition. During late fall and early winter, deer feed chiefly on low growing shrubs and perennial forbs, including blueberry, ground dogwood, trailing bramble, golden thread and ferns. In those years when such species remain available, deer usually remain in good condition. However, during extreme winter conditions when heavy snow restricts movements and limits the availability of forage, deer deplete their fat reserves and mortality from malnutrition may result. During such periods, the available forage consists of blueberry (the principal forage item), as well as salmon berry, menziesia, cedar, hemlock and spruce, all of which generally remain exposed above the surface of the snow. During extreme winter conditions, deer are sometimes forced to the tideline where they forage on dead beach grass and seaweed. It is during such periods, especially if prolonged, that mortality is often substantial.

During early spring, most deer are concentrated near sea level along the forest edge and upper beach zone. As spring progresses and snow recedes, deer movements increase. By May, new plant growth begins to develop and deer concentrate their foraging on such species as beach rye, goose tongue, sedges and skunk cabbage. As summer approaches, they again begin their upward movement toward the productive alpine zone.

Most movement in Sitka black-tailed deer is restricted to seasonal elevational shifts which correspond to changing snow conditions. The major predators of deer include wolves, black bears and brown bears. Deer populations in Alaska often fluctuate substantially from one year to the next, primarily as a result of severe winter conditions.

Clearcut logging appears to have a substantial effect on deer populations throughout southeastern Alaska. Although the early successional stages of forest regeneration provide abundant forage, during heavy winter snows this often becomes unavailable. Thus, clear-cuts may, especially at low elevations, substantially reduce winter range. In the past, some cuts exceeded 1,000 acres. Currently, however, clearcuts are of a much smaller scale and in some instances are designed to improve deer habitat. Substantial clearcutting in critical winter range areas, however, will probably result in reducing deer numbers in those areas. Thus, it is usually recommended that at least a one-quarter mile wide beach fringe of old growth forest be left standing to maintain minimum deer winter range. Generally, the most important deer winter ranges in southeastern Alaska are the low elevation climax forest communities with southern exposures.

When Sitka black-tails are abundant, seasons and bag limits are usually liberal. Historically, the black-tailed deer has been the most abundant big game species inhabiting southeastern Alaska.

Subunit 1(A) and Unit 2*

Black-tailed deer populations in Subunit 1(A) and Unit 2 are currently estimated to be at relatively low densities. Although

population numbers are not available, comparative densities probably lie between those observed in Unit 3 and those in Unit 4.

Deer in Subunit 1(A) and Unit 2 display seasonal movements typical of Southeastern deer in general. During severe winters, probably more than 90 percent of the deer winter in the lower drainages within one-quarter mile of the beach. This region is considered the critical winter range for black-tailed deer in these units. The most important of these areas are identified in Alaska's Wildlife and Habitat (1973).

The influence of hunting pressure on the overall population is relatively minimal except near towns and on small islands. Harvest statistics are presented in Table 11 . Harvest is primarily by area residents. Many local residents rely almost entirely on wild game for their meat supply. Nonconsumptive use of this resource is generally light and restricted primarily to the road system of Revillagigedo Island.

* (Bob Wood, A.D.F.& G., Area Biologist, Ketchikan, pers. comm.)

Subunit 1(B) and Unit 3*

Currently, the deer population in Unit 3 is estimated to be at its lowest recorded level. At the same time, populations in Subunit 1(B) are also low. This downward trend began in the mid-1960's, coinciding with colder than average winters, and was compounded by very severe winter conditions during 1968-69 and 1971-72. In 1970, after drastic reductions in populations from winter losses, predation by wolves became a significant factor in further reducing deer numbers; the break even point had been reached where mortality exceeded productivity. The only available remedial action was to restrict hunting.

Table 11. Deer Harvest: Subunit 1(A) and Unit 2.

Date	Male	Female	Undetermined Sex	Total
		Subunit 1(A)		
1972	112	58	6	176
1973	162	65	4	231
1974	169	60	--	229
1975	218	96	6	320
		Unit 2		
1969	114	33	1	148
1970	131	46	--	177
1971	Data unavailable			
1972	67	27	2	96
1973	35	15	--	50
1974	90	19	2	111
1975	135	36	6	177

Data derived from harvest ticket returns.

Throughout the winter period, the beach fringe and adjacent old-growth forest is critical deer habitat. The most important of these areas are identified in Alaska's Wildlife and Habitat (1973). During the summer-fall period, the alpine zone is the most important range.

Corresponding to the population decline in Unit 3, the annual harvest also began to decline. In 1965, almost 2,000 deer were taken, yet in 1974 (according to hunter interviews), less than 50 deer were harvested in this unit. The deer season there has been closed since 1974. In Subunit 1(B), the annual harvest is relatively low. The harvest figures for both of these areas are presented in Table 12 . Nonconsumptive use of deer in these units is relatively minimal.

* (Harry Merriam, A.D.F.& G., Area Biologist, Petersburg, pers. comm.)

Subunits 1(C) and 1(D)*

The overall deer populations in Subunits 1(C) and 1(D) have been relatively stable except for local, short-term fluctuations reflecting winter weather conditions. Many local populations are currently a little lower than usual, however, because of previous severe winters and predation. Critical winter habitat includes old-growth forest near the beach fringe. These areas are identified in Alaska's Wildlife and Habitat (1973). Future clearcutting of these low elevation old-growth forests would eliminate this important winter range. This would probably result in further depressing local populations of black-tailed deer.

The harvest from these subunits is presented in Table 13 . Throughout this area, deer are recognized for their high recreational value. They are also an important food item, especially to the residents

Table 12. Deer Harvest: Subunit 1(B) and Unit 3.

Date	Male	Female	Undetermined Sex	Total
		Subunit 1(B)		
1972	4	--	--	4
1973	3	--	--	3
1974	5	1	--	6
1975	8	1	--	9
		Unit 3		
1969	189	55	1	245
1970	161	21	2	184
1971	Data unavailable			
1972	24	1	--	25
1973	11	--	--	11
1974	13	--	--	13
1975	Season closed			

Data derived from harvest ticket returns.

Table 13. Deer Harvest: Subunits 1(C) and 1(D).

Date	Male	Female	Undetermined Sex	Total
		Subunit 1(C)		
1972	40	30	1	71
1973	48	46	--	94
1974	78	51	--	129
1975	124	102	2	228
		Subunit 1(D)		
1972	2	1	--	3
1973	--	--	--	--
1974	--	--	--	--
1975	2	2	1	5

Data derived from harvest ticket returns.

of Subunit 1(C). In terms of nonconsumptive use, some people enjoy observing deer during the summer in the alpine areas of Douglas Island. A few people also photograph deer throughout the year in these subunits. * (Dave Johnson, A.D.F.& G., Area Biologist, Juneau, pers. comm.)

Unit 4*

The highest deer densities in southeastern Alaska presently occur in Unit 4. Although records are incomplete, deer have historically been an important food source for the human inhabitants of this region. In 1861, for example, Russian settlers purchased 2,700 deer from the local Indians for use as winter food. Population lows were observed twice during this century. These occurred during the late 1920's and the late 1940's. Although periodic highs have also occurred, these have not been well documented. Currently, deer populations are relatively high and stable.

Seasonal movements in Unit 4 are typical of most Southeastern deer populations. Snow depths greatly influence the degree to which deer are concentrated on localized winter ranges. Such areas are considered critical habitat and are identified in Alaska's Wildlife and Habitat (1973). As in other regions, clearcut logging operations can substantially alter this critical winter range. Wolves and black bears do not occur in Unit 4; thus, the only potential predator is the brown bear. Severe winter weather conditions are the most significant cause of deer mortality in this unit.

Unit 4 consistently produces the highest deer harvest in the State. The residents of Sitka, Hoonah, Angoon, Pelican, Tenakee and the local

logging camps account for about 75 percent of the total harvest. Most of these people consider deer hunting primarily as a meat gathering activity, especially those residents of the smaller villages. The City of Sitka has about 1,200 licensed hunters who harvest approximately 2,000 to 3,000 deer annually. Many residents from the larger towns in southeastern Alaska also travel to Unit 4 to hunt. Historic harvest statistics are presented in Table 14 . Currently, hunting does not appear to be a significant factor in reducing deer numbers in this unit. No specific viewing areas have been identified in this unit. Many deer, however, are observed along the shorelines during the winter and spring. * (Loyal Johnson, A.D.F.& G., Area Biologist, Sitka, pers. comm.)

Table 14. Deer Harvest: Unit 4.

Date	Male	Female	Undetermined Sex	Total
1969	508	360	11	879
1970	1,264	635	12	1,911
1971	Data unavailable			
1972	711	699	22	1,432
1973	840	577	14	1,431
1974	1,250	626	22	1,903
1975	2,433	1,657	157	4,247

Data derived from harvest ticket returns.

Table 15
1974 S.E. Alaska Deer Hunter Harvest Statistics derived
from hunter interviews, Units 1 through 4.

Town	Juneau	Ketchikan	Petersburg	Wrangell	Sitka	Other 1/	Total or Mean
Sample Size	249	202	80	63	136		730
% Hunter Success	30.8	25.2	41.9	27.6	70.43		39.2
Deer/Hunter	.61	.36	.88	.62	1.91	.82	.82
Days/Deer	8.69	10.36	5.61	7.44	3.69		7.16
% Kill	40.7	42.9	44.7	33.3	44.7		41.2
License Sales	3,687	2,089	709	581	1265	1602	9933
% who hunted	53.4	69.5	53.8	46.0	84.6	59.5	61.4
Projected No. Hunters	1969	1,451	381	267	1070	953	6077
Total Projected Kill	1201	522	335	166	2044	781	5049

1/ Other than license sales, figures are based on average from the five principal communities.

Table 16.
Chronology of 1974 Deer Harvest as derived from hunter interviews, Units 1 through 4.

Town	Aug	Sept	Oct	Nov	Dec	Unk	Totals
Juneau	2	4	7	35	12	22	82
Ketchikan	4	7	2	37	--	--	50
Petersburg	0	2	2	33	1	0	38
Wrangell	0	0	1	13	4	0	18
Sitka	26	21	29	91	53	0	220
Totals	32	34	41	209	70	22	408
% of harvest	7.8	8.3	10.1	51.2	17.2	5.4	100.0

Table 17.
Location of 1974 Deer Kills by Game Management Unit,
Unit 1-4, as derived from hunter interviews.

Town	Unit 1	2	3	4	Total
Juneau	14 1/	--	--	68	82
Ketchikan	46 2/			4	50
Petersburg	--	--	2	36	38
Wrangell	--	--	3	15	18
Sitka	--	--	--	220	220
Total	58	--	5	343	408
% of harvest	14.3	--	1.2	84.5	100.0

1/ Subunit 1C
2/ Subunit 1A

Table 18.
Deer hunter opinion on 1974 season in comparison to previous seasons as derived from hunter interviews, Units 1-4.

Town	Hunter Class	Opinion - Better	Worse	Same	NA	Total
Juneau	Successful	12	8	15	5	40
	Unsuccessful	4	22	24	164	214
Ketchikan	Successful	3	1	17	10	31
	Unsuccessful	11	22	28	23	84
Petersburg	Successful	2	6	4	6	18
	Unsuccessful	2	12	5	43	62
Wrangell	Successful	0	2	3	3	8
	Unsuccessful	2	3	7	9	21
Sitka	Successful	32	16	22	10	80
	Unsuccessful	6	10	5	18	39
Totals	Successful	49	33	61	34	177
	Unsuccessful	25	69	69	257	420
% of Total		12.4	17.1	21.8	48.7	100.0

Table 19.
Estimated Deer Harvest

From Game Management Unit 4 - 1974

Community	Deer Kill	Source
Sitka	2,428	Hunter Interview (10.8)
Angoon	500	Local Source
Hoonah	400	Estimate
Pelican	400	Estimate
Tenekee	250	Estimate
Other S.E. Communities	500	Estimate
Logging & Mining Camps and Canneries (14)	1,000	Estimate
Petersburg	320	Hunter Interview (11.3)
Ketchikan	50	Hunter Interview (9.7)
Wrangell	100	Hunter Interview (10.8)
Juneau	1,020	Hunter Interview (6.8)
Other	150	Estimate
Total	7,118	

Table 20.
Historic Harvest Data

Game Management Unit 4. Sitka Hunters Only

Data From Post Season Hunter Interviews

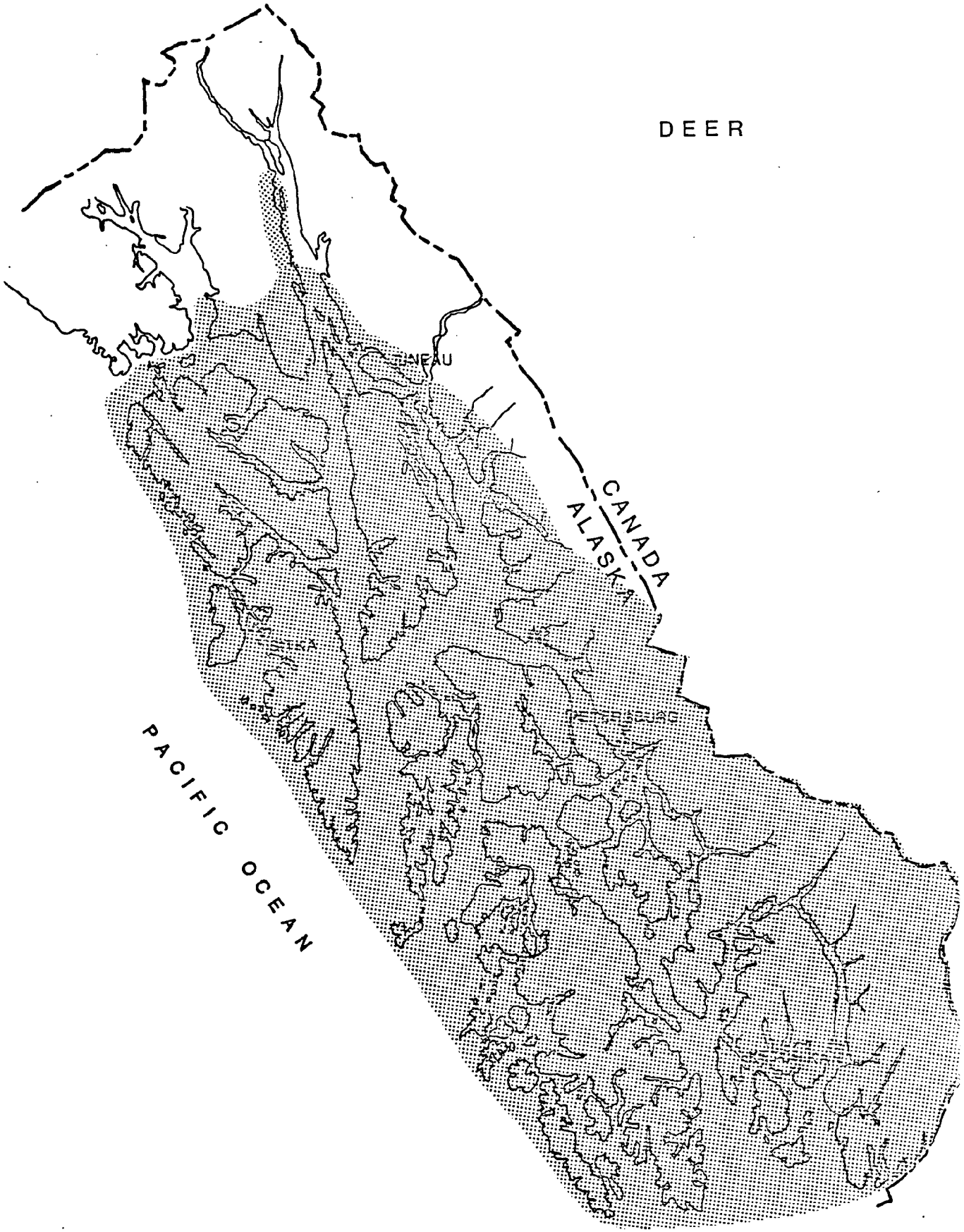
Calendar Year	Kill	License Sales	Interview Sample Size	Total No. of Hunters	Deer Per Hunter
1974	2,428	1,265	136	1,070	2.3
1973	2,489	1,206	126	1,091	2.5
1972	1,058	879	125	752	1.4
1971	1,411	1,025	151	830	1.7
1970	1,720	1,080	150	820	2.1
1969	490	810	100	610	0.8
1968	2,540	1,200	100	940	2.7
1967	1,750	1,200	100	970	1.8
1966	1,740	1,200	100	870	2.0
1965	1,400	1,030	100	880	1.6
1964	1,980	1,100	100	990	2.0
1963	2,090	1,500	110	1,100	1.9
1962	1,940	1,111	105	970	2.0
1961	1,609	1,022	97	894	1.8
1960	2,050	1,051	100	861	2.3

Table 21.
WINTER MORTALITY DATA, GAME MANAGEMENT UNIT 4

Year	Admiralty			Baranof			Chichagof			Kruzof			Unit Total		
	No. Trans	Tot Mort	Per/ Mile	No. Trans	Tot Mort	Per/ Mile	No. Trans	Tot Mort	Per/ Mile	No. Trans	Tot Mort	Per/ Mile	No. Trans	Tot Mort	Per/ Mile
1974-75	11	1	0.09	3	4	1.33	8	4	.50	-	-	-	22	9	.41
1973-74	11	11	1.00	3	2	.67	8	5	.63	1	0	0	23	18	.78
1972-73	11	8	.72	3	0	0	7	5	.71	1	1	1.0	22	14	.64
1971-72[1]/	11	13	1.18	-	-	-	7	7	1.00	-	-	-	18	20	1.11
1970-71[2]/	11	12	1.09	4	4	1.00	7	21	3.00	1	0	0	23	37	1.61
1969-70	10	0	0	4	0	0	5	0	0	-	-	-	19	0	0
1968-69	11	49	8.90	4	19	9.50	6	13	4.34	1	4	8.0	22	85	7.72
1967-68	11	2	.36	4	3	1.50	5	1	.40	1	0	0	21	6	.58
1966-67	11	0	0	4	1	.50	6	0	0	1	0	0	22	1	.10
1965-66	11	12	2.18	4	3	1.50	6	4	1.34	1	0	0	22	19	1.72
1964-65	11	24	4.36	4	2	1.00	6	3	1.00	1	0	0	22	29	2.64
1963-64	11	6	1.08	4	10	5.00	6	2	.66	1	0	0	22	18	1.64
1962-63	11	1	.18	4	0	0	6	2	.66	1	0	0	22	3	.28

1/ Data known to be of questionable veracity.

2/ All transects prior to 1970-71 were 1/2 mile in length. Figures are expanded to represent mortality/mile. After 1971 all transects have been 1 mile long.


DEER
CANADA
ALASKA
PACIFIC OCEAN

DEER - SELECTED REFERENCES

Alaska Department of Fish and Game. 1970. Annual report of survey-inventory activities. Part I. Moose, deer and elk. Fed. Aid. Wild. Rest. Vol. I. Project W-17-2.

____. 1971. Annual report of survey-inventory activities. Part I. Moose, deer and elk. Fed. Aid. Wild. Rest. Vol. II. Project W-17-3.

____. 1973. Annual report of survey-inventory activities. Part I. Moose, deer and elk. Fed. Aid. Wild. Rest. Vol. III. Project W-17-4.

____. 1973. Alaska's wildlife and habitat. Anchorage, Alaska. 143 pp + 563 maps.

____. 1974. Annual report of survey-inventory activities. Part I. Deer, brown-grizzly bear, sheep, bison, elk and muskoxen. Fed. Aid. Wild. Rest. Vol. IV. Project W-17-5.

____. 1974. Annual report of survey-inventory activities. Part I. Deer, brown-grizzly bear, sheep, bison, elk and muskoxen. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. V. Project W-17-6.

____. 1976. Annual report of survey-inventory activities. Part I. Deer, sheep, bison, mountain goat, elk and muskoxen. Fed. Aid. Wild. Rest. Vol. VI. Project W-17-7.

____. 1976. A compilation of fish and wildlife resource information for the State of Alaska. Vol. I - Wildlife. 873 pp.

Burris, O.D. and D.E. McKnight. 1973. Game transplants in Alaska. Alaska Dept. of Fish and Game. Game Tech. Bull No. 4. 57 pp.

Burt, W.H. and R.P. Grossenheider. 1972. A field guide to the mammals. Houghton Mifflin Co., Boston. 284 pp.

Cowan, I.M. 1956. The life and times of the black-tailed deer. In Taylor: The deer of North America. Wild. Mgt. Inst. Stackpole Co., 668 pp.

Hail, R.E. and K.R. Kelson. 1959. The mammals of North America. Roland Press. New York. Vol. I and II. 1,083 pp.

Klein, D.R. 1958. Job completion reports. Sitka black-tailed deer studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. 12. Project W-3-R-12.

____. 1960. Sitka black-tailed deer studies. Annual report of progress 1959-1960. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. I. Project W-6-R-1.

Manville, R.H. and S.P. Young. 1965. Distribution of Alaskan mammals. U.S. Fish and Wildlife Serv. Cir. 211. 74 pp.

Merriam, H.R. 1961. Sitka black-tailed deer investigations. Annual project segment report. 1960-61. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. II. Project W-6-R-2.

____. 1963. Sitka black-tailed deer investigations. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. III. Project W-6-R-3.

____. 1963. Sitka black-tailed deer report. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. IV. Project W-6-R-4.

____. 1965. Deer report. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. VI. Project W-6-R-5,6.

____. 1966. Deer report. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. VII. Project W-6-R-6 and W-15-R-1.

____. 1967. Deer report. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. VIII. Project W-15-R-1,2.

____. 1968. Deer report. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. IX. Project W-15-R-2,3.

____. 1968. The Sitka black-tailed deer in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 pp.

____. 1971. Deer report. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. X. Project W-17-1.

____. 1971. Deer report. Annual project segment report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. XI, Project W-17-2,3.

____. 1971. Response of Vaccinium ovalifolium to fertilization. Final report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-17-2.

____. 1973. Deer habitat studies. Final report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-17-3,4,5.

Walker, E.P., et al. 1964. Mammals of the world. John's Hopkins Press. Baltimore. Vol. I and II. 1,500 pp.

MOUNTAIN GOAT

The natural distribution of the mountain goat (Oreamnos americanus) in North America is limited to Washington, Oregon, Idaho, Montana, western Canada and Alaska. Mountain goats occur in Alaska throughout the entire southeastern mainland, northwest along the coast of Cook Inlet and north into the Talkeetna and Wrangell Mountains. Goats have been introduced to Kodiak, Chichagof and Baranof Islands, but breeding populations have become established only on Baranof and Kodiak.

Mountain goats usually occur in remote and rugged alpine country, generally isolated from human activity. During the summer period, they inhabit high alpine meadows and talus slopes. During winter they move to lower elevations, usually at or near timberline. During extreme winter snow conditions, however, they may be found down near sea level. In some areas, goat and sheep ranges overlap, and occasionally they can be observed foraging on the same range.

Mountain goats generally breed in November and December. Males remain segregated from females and kids except during the rut. During this period, males move considerable distances in search of receptive females. It appears that females may breed for the first time as yearlings. Parturition occurs around the first of June, following an approximate 180-day gestation period. A single kid is usually born (twinning is uncommon), and within hours it is capable of following the mother. Following parturition, females and young sometimes congregate in large herds on the summer range. Kids usually remain with their mothers until the following spring.

During the summer, mountain goats forage on numerous species of grasses, forbs and low growing shrubs which occur in the high alpine meadows. As winter approaches and most annual forbs are frost-killed, goats shift their diet to include more browse species, as well as dried grasses. Hemlock generally appears to be an important winter forage item. Numerous species of shrubs and conifers are taken, however, depending on local availability. Mountain goats also utilize mineral licks, especially during spring and early summer.

Subunit 1(A)*

Although a population estimate is not available, relative goat numbers in Subunit 1(A) appear to have declined to about 15 to 25 percent of the 1965-68 level. Currently, however, it appears that this decline may be leveling off.

Coastal mountain goat populations display substantial vertical migrations on a seasonal basis. In the snow-free summer months, they occur in the highest reaches of the alpine zone. During heavy winter snow conditions, however, they may move to elevations below 500 feet. Goat winter range areas are identified in Alaska's Wildlife and Habitat (1973). Clearcutting in these areas could adversely affect goat winter range.

Goats in Subunit 1(A) are considered by many area residents as meat animals. Harvest statistics for this area are presented in Table 22 . About 10 percent of this harvest is by non-residents. Because of the inaccessibility of most goat habitat, the impact of hunting on goat numbers in this unit has been relatively minimal.

* (Bob Wood, A.D.F.& G., Area Biologist, Ketchikan, pers. comm.)

Table 22. Mountain Goat Harvest: Subunit 1(A)

Year	Male	Female	Undetermined Sex	Total
72	23	23	2	48
73	36	20	4	60
74	26	19	2	47
75	8	10	-	18

Data derived from harvest ticket returns.

Subunit 1(B)*

Mountain goat populations in Subunit 1(B) are currently relatively low. They have been declining since the early 1970's, and are estimated to be about one-third of their level 10 years ago. Goat populations in southeastern Alaska are especially influenced by winter weather conditions. Winter weather and predation by wolves are considered the primary natural mortality factors in this subunit. Although little information is available on their winter habitat requirements, it appears that they generally prefer steep timbered slopes adjacent to forest openings created by slides. During heavy snow accumulation, goats are sometimes forced down to sea level. Winter range areas within this subunit have been identified in Alaska's Wildlife and Habitat (1973).

Hunting pressure within Subunit 1(B) is considered relatively light as less than 50 animals are normally harvested annually. Harvest statistics for this subunit are presented in Table 23 . Most hunting is conducted in the higher elevations during August and September. Because of the inaccessibility of this country, comparatively few hunters take part in the goat harvest. Areas adjacent to suitable aircraft access, however, experience higher hunting pressure. In Subunit 1(B), most hunters consider the mountain goat a trophy species, and thus, meat hunting is a relatively minor aspect of the goat harvest.

Areas within Subunit 1(B) which are utilized for viewing goats include the Horn Cliffs and LeConte Bay. A sightseeing vessel from Petersburg carries about 10 to 20 people per trip three times a week to these areas. It is possible that in the future some areas may be restricted for viewing and photography purposes.

* (Harry Merriam, A.D.F.& G., Area Biologist, Peterburg, pers. comm.)

Table 23. Mountain Goat Harvest: Subunit 1(B)

Year	Male	Female	Undetermined Sex	Total
72	14	23	-	37
73	20	12	-	32
74	9	9	-	18
75	10	5	-	15

Data derived from harvest ticket returns.

Subunits 1(C) and 1(D)*

The mountain goat populations in Subunits 1(C) and 1(D) are some of the highest in the State. Goat numbers within this area appear to have declined since 1970, but are currently static.

Seasonal distribution in these subunits is similar to those in other areas of southeastern Alaska. Heavy snow conditions and predation by wolves appear to be the major causes of natural mortality in these subunits. Specific winter ranges have been identified throughout Subunits 1(C) and 1(D) in Alaska's Wildlife and Habitat (1973).

Harvest statistics for Subunits 1(C) and 1(D) are presented in Table 24 . Thousands of people view mountain goats during all seasons at the U.S. Forest Service Visitor Center at the Mendenhall Glacier near Juneau. Another outstanding area for viewing goats will be the Skagway-Carcross road when it opens in 1977.

* (Dave Johnson, A.D.F.& G., Area Biologist, Juneau, pers. comm.)

Unit 4*

Mountian goats occur in Unit 4 only on Baranof Island where 18 animals were transplanted in 1923 (Elkins and Nelson, 1954). This transplant was very successful as the population increased over the years. Currently, this population appears to be relatively stable, and they now occupy most of the suitable habitat available on the island.

Twenty-five goats were also released on Chichigof Island during the 1950's (Burris and McKnight, 1973). This transplant effort was unsuccessful, and today no goats remain on Chichagof.

Table 24. Mountain Goat Harvest: Subunits 1(C) and 1(D)

Year	Male	Female	Undetermined Sex	Total
		Subunit 1(C)		
72	33	30	-	63
73	56	56	-	112
74	41	50	3	94
75	41	25	1	67
		Subunit 1(D)		
72	36	21	3	60
73	44	39	3	86
74	25	29	-	54
75	21	12	1	34

Data derived from harvest ticket returns.

During the summer, goats on Baranof Island inhabit the alpine regions of the island. In winter they move down the forested slopes and valleys. The winter range is relatively restricted so that all of it can be considered critical. Mountain goat distribution on Baranof has been identified in Alaska's Wildlife and Habitat (1973).

Usually between 10 and 20 goats are harvested annually. On a statewide perspective, this harvest is of little consequence, although it is important for local hunters. Harvest statistics are presented in Table 25.

* (Loyal Johnson, A.D.F.& G., Area Biologist, Sitka, pers. comm.)

Table 25. Mountain Goat Harvest: Unit 4

Year	Male	Female	Undetermined Sex	Total
72	5	4	-	9
73	11	13	-	24
74	7	3	-	10
75	18	10	-	28

Data derived from harvest ticket returns.

Table 26.
MOUNTAIN GOAT-SUBUNIT 1A-KETCHIKAN AREA

Goat Composition Surveys, Subunit 1A, 1968 through 1974

Area K-3 (Rudyerd Bay to Smeaton Bay)

Year	Survey Date	Adults	Kids	Unknown	Total	Kids Per 100 Adults	Survey Time	Goats/Hour
1968	Aug. 20	62	17	--	79	27	100 Min.	47
1971	Sept. 15	69	21	--	94	30	80 Min.	71
1973	No Survey							
1974	No Survey							

Area K-4 (Wilson Arm to Boca de Quadra)

Year	Survey Date	Adults	Kids	Unknown	Total	Kids Per 100 Adults	Survey Time	Goats/Hour
1968	Sept. 17	193	72	--	265	37	80 Min.	199
1971	Sept. 15	155	56	9	220	36	70 Min.	189
1973	Aug. 16	90	13	--	103	14	65 MIn.	95
1974	Aug. 27	26*	8*	--	34*	31	36 Min.*	57

*Incomplete Survey

Area K-5 (Marten Arm to Portland Canal)

Year	Survey Date	Adults	Kids	Unknown	Total	Kids Per 100 Adults	Survey Time	Goats/Hour
1968	Sept. 18	298	73	--	371	24	115 Min.	194
1971	Sept. 16	133	34	1	168	26	83 Min.	121
1973	Aug. 20	59	22	--	81	37	85 Min.	57
1974	Sept. 21	24	6	--	30	25	74 Min.	24

Prepared by: Robert E. Wood Game Biologist

Table 27.
Goat harvest statistics by area from hunter harvest reports for the years 1972-73, 1973-74 and 1974-75 for Subunit 1B.

Area/Year	Harvest M	Harvest F	Harvest Total	No. Hunters Taking Two Goats	Total No. Success. Hunters	Total No. of Hunters	Percent Hunter Success
Farragut							
1972-73	2	4	6	1	5	6	83
1973-74	0	0	0	0	0	(0)	0
1974-75	1	0	1	0	1	1	100
Thomas Bay							
1972-73	3	8	11	4	7	11	64
1973-74	7	4	11	4	7	(13)	n/a
1974-75	1	0	1	0	1	4	25
LeConte-Horn Cliff							
1972-73	4	0	4	0	4	21	19
1973-74	2	1	3	1	2	(8)	n/a
1974-75	2	1	3	1	2	22	9
Stikine							
1972-73	2	4	6	0	6	12	50
1973-74	0	1	1	0	1	(7)	n/a
1974-75	0	2	2	0	2	10	20
Eastern Passage							
1972-73	0	0	0	0	0	0	0
1973-74	2	1	3	0	3	(4)	n/a
1974-75	2	3	5	0	5	7	71
Bradfield Canal and Cleveland Peninsula							
1972-73	5	6	11	2	9	12	75
1973-74	9	4	13	2	11	(14)	n/a
1974-75	4	4	8	2	6	10	60
Unspecified							
1972-73	0	0	0	0	0	0	0
1973-74	0	0	0	0	0	(2)	n/a
1974-75	0	0	0	0	0	2	0
TOTAL							
1972-73	16	22	38	7	31	61	50.8
1973-74	20	12	32	8	24	66	36.4
1974-75	10	10	20	3	17	56	30.4

Note: Figures in parentheses indicate incomplete harvest reports.

Prepared by. David Zimmerman, Game Biologist

Table 28. Mountain goat composition counts, Subunit 1B, 1959 through 1974.

Survey Date	Location	No. Kids	No. Adults	Kids/100 Adults	Survey Time (minutes)	Goats/hr.	Total Count
8/18/59	Patterson Glacier to North Baird Glacier	6	28	21	n/a	n/a	34
8/18/59	Patterson Glacier-LeConte Bay	23	61	38	n/a	n/a	84
9/21/59	LeConte Bay to Stikine River	21	58	36	n/a	n/a	79
9/22/60	Stikine R. to Patterson Glacier	79	184	43	180	124	374
9/1/60	Patterson Glacier to Farragut R.	21	90	23			
8/17/61	Farragut R. to Port Houghton	55	124	44	n/a	n/a	179
1962-1973	No counts conducted						
9/3/74	Stikine R. to LeConte Bay (Wilkes Range only)	15	28	54	195	25	79
9/3&4/74	LeConte Bay to Patterson Gl.	12	24	50			
9/10/74	Patterson Gl. to N. Baird Gl. (Preble Pk. only)	0	0	0	15	0	0
9/10/74	N. Baird Gl. to Farragut R. (Hamilton, Jefferson, Pierce, Hancock & Fulton Pks. only)	6	9	67	25	36	15
9/10/74	Farragut R. to Port Houghton	25	64	39	48	111	89
	Stikine River to Cleveland Peninsula						
8/19/61	Aaron Creek to Unuk River	13	46	28	n/a	n/a	59
9/3/64	Aaron Creek to Unuk River	19	93	20	n/a	n/a	112
8/24/74	Wrangell Pk. to Andrew Creek	0	10	0	65	40	43
8/24/74	Andrew Creek to Goat Lake	4	29	14			

Prepared by: David Zimmerman, Game Biologist

Table 29.
Game Management Subunit 1C Goat Harvest Statistics for 1972, 1973 and 1974 as derived from mandatory hunter report tickets. 1/

Area	Harvest Year	Chronology of Harvest by Month A	S	O	N	D	J 2/	Unk.	Tot.	Total Number Reporting Hunters	Percent Hunter Success	Percent of all Hunters Taking Two Goats	Total Days Hunted	Days Hunted per Goat Harvested
Pt. Bishop to	1972	12	6	1	1	2	0	3	25	33	69.7	6.1	117	4.7
Gilkey River to	1973	9	16	3	0	1	0	0	29	45	57.8	6.7	155	5.3
Norris Glacier (Juneau area)	1974	10	10	3	3	2	0	1	29	32	65.6	25.0	96	3.3
Chilkat Range and	1972	4	2	5	3	0	1	0	15	64	23.4	0.0	146	9.7
Berners Bay above	1973	19	15	3	9	1	0	0	47	84	47.6	8.3	217	4.6
Gilkey River	1974	6	6	2	3	3	0	3	23	71	23.9	8.5	214	9.3
Norris Glacier to	1972	2	2	1	2	2	16	2	27	36	55.6	19.4	108	4.0
Cape Fanshaw	1973	1	1	5	12	16	0	1	36	42	64.3	21.4	141	3.9
	1974	4	1	2	8	28	0	3	46	58	53.4	25.9	187	4.1
Unit 1C-Area	1972	0	0	0	2	0	0	1	3	16	-	-	62	-
Unknown	1973	0	0	0	0	0	0	0	0	7	-	-	13	-
	1974	0	0	0	0	0	0	0	0	12	-	-	38	-
Totals	1972	18	10	7	6	4	16	5	70	149	40.3	6.7	433	6.2
	1973	29	32	11	21	18	0	1	112	178	52.2	10.7	526	4.7
	1974	20	17	7	14	33	0	7	98	173	39.9	16.8	535	5.5

1/ Based upon the following statewide return rates: 1972 - 73.4%, 1973 - 71.7% and 1974 - 69.9%
2/ No January season during 1974.

Table 30.

Goat Numbers and Age Ratios obtained from Fixed-Wing Aircraft

	1961			1962			1971				1972				1973				1974			
	Ad.	Kids	Kid/Ad. Ratios	Ad.	Kids	Kid/Ad. Ratios	Ad.	Kids	Kid/Ad. Ratios	Goats/ hour	Ad.	Kids	Kid/Ad. Ratios	Goats/ hour	Ad.	Kids	Kid/Ad. Ratios	Goats/ hour	Ad.	Kids	Kids/Ad. Ratios	Goat/ hours
Port Houghton to Endicott Arm	178	74	42																			
Tracy Arm, Sweetheart L. to Mt. Sumdum 1/				475	118	25													138	25	18	105
Taku R. to Salmon Cr.	107	23	21																			
Norris G. to Carlson Cr. 2/				131	40	31													23	6	26	28
Carlson Cr. to Mendenhall G.															34	12	35	50	41	12	29	18
Salmon Cr. to Berners Bay	216	61	28																			
Mendenhall G. to Eagle G. 3/				147	30	20					67	13	19	44	42	11	26	52	14	8	57	10
Antler R.							28	13	46	62					37	10	27	53	34	6	18	89
Teardrop L.											26	8	31	68	15	3	20	36				
William Henry Mtn.											61	7	12	82	41	11	27	78	35	9	26	59
Endicott R. to Sullivan R.							153	34	22	167									42	19	45	35

1 1962 survey boundry was Endicott Arm to Whiting River.
2 1962 survey boundry was Taku River to Carlson Creek.
3 1962 survey boundry was Mendenhall Glacier to Berners Bay.

Table 31.
Subunit 1D Goat Harvest as derived from hunter harvest tickets. 1/

Area	Year	Chronology of Harvest A	S	O	N	D	J 2/	Unk.	Total	Total Number Reporting Hunters	Percent Hunter Success	Percent all Hunters Taking Two Goats	Total Days Hunted	Days Hunted Per Goat Harvested
Skagway (Dayebas Creek to Ferebee River)	1972	6	4	0	0	2	2	0	14	24	45.8	12.5	141	10.1
	1973	2	5	4	5	3	0	0	19	20	65.8	30.0	71	3.7
	1974	6	4	4	1	5	0	0	20	36	50.0	5.6	134	6.7
Haines (Remainder of Subunit)	1972	7	10	5	5	2	2	7	38	79	40.5	7.6	275	7.2
	1973	24	20	9	1	11	0	3	68	86	64.0	15.1	263	3.9
	1974	20	4	3	2	3	0	0	32	66	40.9	7.6	180	5.6
1D Unknown	1972	0	0	0	0	0	0	0	0	8	NA	NA	34	NA
	1973	0	1	0	0	0	0	0	1	1	NA	NA	20	NA
	1974	0	0	0	0	0	0	0	0	0	NA	NA	0	NA
Total Unit 1D	1972	13	14	5	5	4	4	7	52	111	38.7	8.1	450	8.7
	1973	26	26	13	6	14	0	3	88	114	60.5	16.7	354	4.0
	1974	26	8	7	3	8	0	0	52	102	44.1	6.9	314	6.0

1/ Statewide return of harvest tickets: 1972 - 73.4%, 1973 - 71.7% and 1974 - 69.9%.

2/ No January season in 1974.

Table 32.
Goat numbers and age ratios obtained from fixed-wing aircraft surveys of selected mountains in Subunit 1D.

Area Surveyed	Date	No. Adults	No. Kids	Total Goats	Kids/100 Adults	Total Survey Time (mins.)	Goats Per Hour
Haines Area							
I Davidson Glacier to McCellan Flats	9/3-5/65	-	-	65	-	20	
	9/18/73	38	4	42	11	40	63.0
	8/16/74	39	3	42	8	35	72.0
II Henry Clay Mtn.	9/19/73	60	21	81	35	60	81.0
	8/16/74	50	14	64	28	78	49.2
III Takshanuk Mtns.	9/5/65	-	-	157	-	55	
	3/15/75	25	8	33	32	168	12.0
	3/25/75	-	-	100	-	110	54.6
Skagway Area							
I Dayebas Creek to Nahku Bay	8/13/74	9	2	11	22	165	4.2
II Kasidaya Creek* to Canadian Border	8/20/74	22	2	24	9	139	10.2
III Warm Pass Valley and	3/15/75	22	2	24	9	-	
AB-Mt. Cleveland to	5/22/75	-	-	17	-	-	
Canadian Border**	6/14/75	37	4	41	11	75	33.0

* Same as Skagway area I but excludes AB-Mt.-Cleveland Mtns.
**Includes portions of Skagway areas I and II

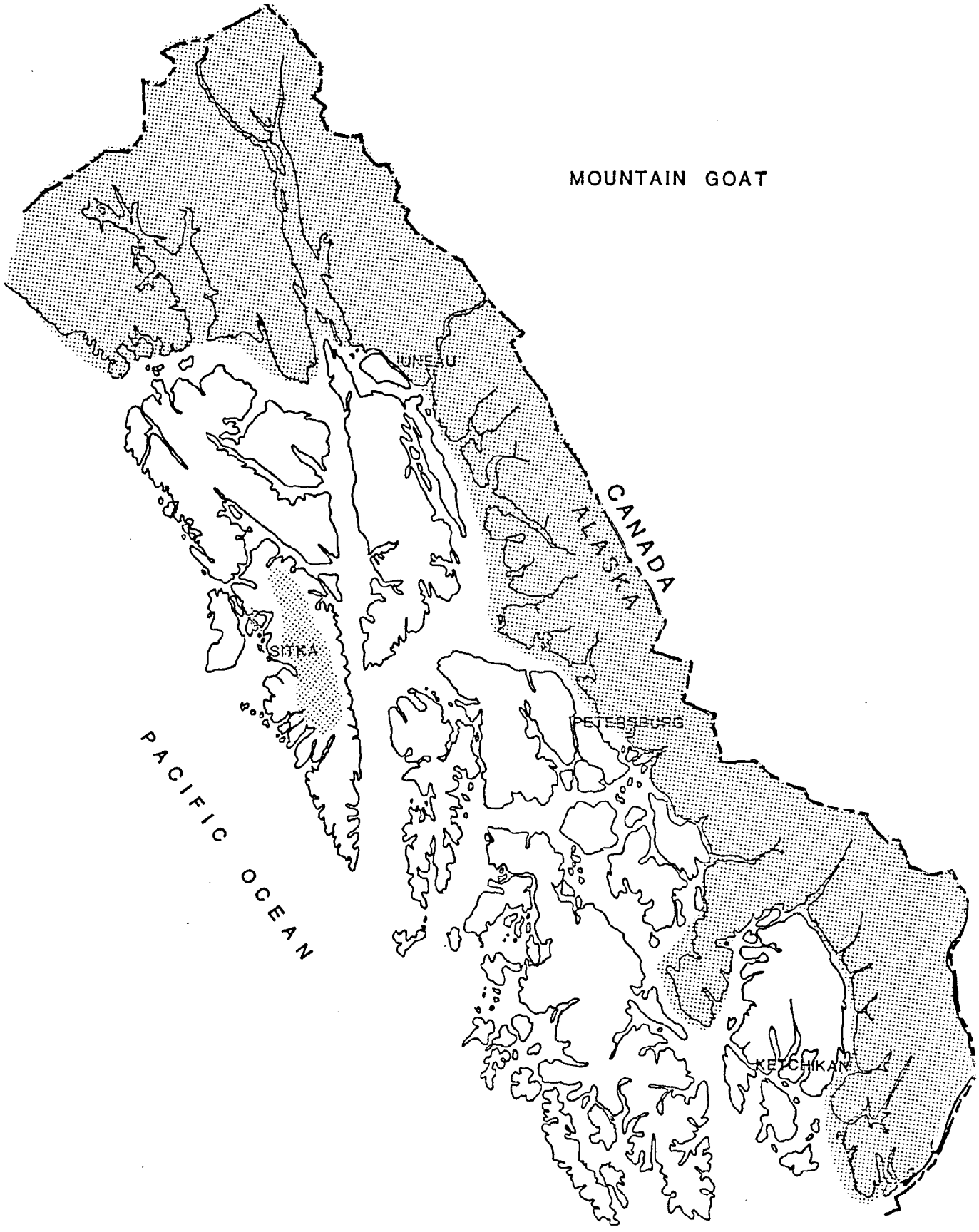
Table 33.
Historic goat survey data - Game Management Unit 4.

Date	No. Kids	No. Adults	Kids/100 Adults	Total Goats	Goats/ Hour	Source
1954	41	222	18.5	263	-	USFWS
9/1/60	26	90	29.0	116	38.4	Merriam - ADF&G
9/11/61	20	98	20.0	118	-	Merriam - ADF&G
1962-69	No data available					
9/3/70	15	139	10.8	154	-	Courtright - ADF&G
9/29/70*	13	108	12.0	121	-	Courtright - ADF&G
9/12&13/73	50	203	24.6	253	36.1	Johnson - ADF&G

* Incomplete coverage

Table 34.
MOUNTAIN GOAT HARVEST -- BY UNIT, SUBUNIT AND SEX: 1974-75

Unit	Male(%)	Female(%)	Unspecified(%)	Total
1A	26(55.3)	19(40.4)	2(4.3)	47
1B	9(50.0)	9(50.0)		18
1C	41(43.6)	50(53.2)	3(3.2)	94
1D	25(46.3)	29(53.7)		54
1 Unk	1(100)			1
Total 1	102(47.7)	107(50.0)	5(2.3)	214
Total 4	7(70.0)	3(30.0)		10


MOUNTAIN GOAT
JUNEAU
CANADA
ALASKA
SITKA
PETERSBURG
PACIFIC OCEAN
KETCHIKAN

MOUNTAIN GOAT - SELECTED REFERENCES

Alaska Department of Fish and Game. 1970. Annual report of survey-inventory activities. Part II. Caribou, brown bear, sheep, furbearers, marine mammals, bison, goat, wolf and black bear. Fed. Aid. Wild. Rest. Vol. I. Project W-17-2.

____. 1971. Annual report of survey-inventory activities. Part II. Caribou, brown-grizzly bear, sheep, furbearers, marine mammals, bison, goat, wolf, wolverine and black bear. Fed. Aid. Wild. Rest. Vol. II. Project W-17-3.

Alaska Department of Fish and Game. 1973. Alaska's wildlife and habitat. Anchorage, Alaska. 143 pp + 563 maps.

____. 1973. Annual report of survey-inventory activities. Part II. Caribou, brown-grizzly bear, sheep, muskoxen, marine mammals, bison, goat and black bear. Fed. Aid. Wild. Rest. Vol. III. Project W-17-4.

____. 1974. Annual report of survey-inventory activities. Part II. Moose, caribou, marine mammals and goat. Fed. Aid. Wild. Rest. Vol. IV. Project W-17-5.

____. 1975. Annual report of survey-inventory activities. Part III. Caribou, marine mammals, mountain goat, wolf and black bear. Fed. Aid. Wild. Rest. Vol. V. Project W-17-6.

____. 1976. Annual report of survey-inventory activities. Part I. Deer, sheep, bison, mountain goat, elk and muskoxen. Fed. Aid. Wild. Rest. Vol. VI. Project W-17-7.

____. 1976. A compilation of fish and wildlife resource information for the State of Alaska. Vol. I - Wildlife. 873 pp.

Ballard, W. 1975. Mountain goat survey techniques evaluation. Final report. Fed. Aid. Wild. Rest. Project W-17-7.

Burris, O.E. and D.E. McKnight. 1973. Game transplants in Alaska. Alaska Dept. of Fish and Game. Game Tech. Bull. No. 4. 57 pp.

Burt, W.H. and R.P. Grossenheider. 1952. A field guide to the mammals. Houghton Mifflin Co., Boston. 284 pp.

Hall, R.E. and K.R. Kelson. 1959. The mammals of North America. Roland Press. New York. Vol. I and II. 1,083 pp.

Hjeljord, O. 1970. Feeding ecology and habitat preference of mountain goat in Alaska. Alaska Coop. Wildlife Unit. No. 22. U. of Alaska.

_____. 1973. Mountain goat forage and habitat preference in Alaska. J. Wildl. Manage. 37(3):353-362.

Johnson, L.J. 1970. The mountain goat in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 pp.

Klein, D.R. 1952. A reconnaissance study of the mountain goat in Alaska. M.S. Thesis. U. of Alaska. 121 pp.

Merriam, H.R. 1960. Sheep and goat investigations. Annual report of progress. Fed. Aid. Wild. Rest. Vol. I. Project W-6-R-1.

_____. 1961. Sheep and goat investigations. Annual report of progress. Fed. Aid. Wild. Rest. Vol. II. No. 5. Project W-6-R-2.

_____. 1963. Sheep and goat investigations. Annual report of progress. Fed. Aid. Wild. Rest. Vol. III. Project W-6-R-3.

_____. 1963. Sheep and goat investigations. Annual report of progress. Fed. Aid. Wild. Rest. Vol. IV. Project W-6-R-4.

Walker, E.P., et al. 1964. Mammals of the world. John's Hopkins Press. Baltimore. Vol. I and II. 1,500 pp.

BROWN-GRIZZLY BEAR

The brown-grizzly bear (Ursus arctos) is the largest land carnivore in the world. This species attains its largest size in southwestern Alaska. Generally, brown bears are popularly considered coastal populations, whereas grizzlies are considered interior populations of the same species. This species is distributed throughout Alaska, except for the Aleutian Islands beyond Unimak Island, the islands of the Bering Sea and the islands south of Frederick Sound.

Brown-grizzly bears generally appear to prefer open grassland or tundra habitats. The greatest population densities occur in the lush grassland communities on the Alaska Peninsula and Kodiak Island, and also in the coastal forests on Admiralty Island in southeastern Alaska. The brown-grizzly bear utilizes a wide range of forage material. During spring, numerous species of sedges, grasses and forbs make up an important part of the diet, while during summer and fall, a wide variety of fruit and berry producing plants are consumed. Insect larvae, small mammals, occasional ungulates and a variety of carrion are also utilized when available. Spawning salmon is a major food item in late summer and fall, and the cause of bear concentrations near streams.

In Alaska, the brown-grizzly bear breeds from May through mid-July. Both sexes generally attain sexual maturity at about five and one-half years of age. One to four (average of 2.2) cubs are born in the den during late January or February. The female generally breeds every third year.

In Alaska, brown-grizzly bears enter their den during late October or November where they go through a period of winter dormancy.

They emerge from the den during April or May. The length of denning generally reflects the severity and length of the winter season. This varies from region to region.

Subunit 1(A)*

Brown bear populations in Subunit 1(A) have remained relatively stable in recent years. There are, however, no estimates currently available on actual population numbers in this subunit. In spring, following hibernation, brown bears are most common along the shorelines and lower elevations. The tidal flats, adjacent beach fringe and valley bottoms of the major river drainages make up the most important brown bear habitat in this subunit. From late August through October, they are usually concentrated along salmon spawning streams. These concentration areas and general bear distribution throughout Subunit 1(A) are identified in Alaska's Wildlife and Habitat (1973). As logging operations increase and brown bear-people conflicts become more frequent, it is likely that brown bear numbers will decline.

Over the past 20 years, brown bear harvest in this subunit has averaged about two to three bears annually. Most bears are taken from the Unuk River. The entire harvest in this subunit is by residents.

* (Bob Wood, A.D.F.& G., Area Biologist, Ketchikan, pers. comm.)

Subunit 1(B)*

Brown bears occur in limited abundance throughout Subunit 1(B). The highest brown bear densities in this subunit occur in the Stikine River drainage. Although they are common here, they are not usually

abundant. The Bradfield River drainage is the only other area of Subunit 1(B) which supports a significant number of brown bears. During late summer and fall, brown bears occur frequently near salmon spawning streams. Distribution and seasonal concentration areas are identified in Alaska's Wildlife and Habitat (1973). The Stikine River drainage is considered good brown bear habitat.

Brown bear harvest is low in Subunit 1(B), usually less than five animals annually. Most bears are taken incidental to other activities. There are currently no guided hunts in this subunit.

* (Harry Merriam, A.D.F.& G., Area Biologist, Petersburg, pers. comm.)

Subunits 1(C) and 1(D)*

The brown bear population in Subunits 1(C) and 1(D) has remained relatively stable. Brown bear distribution and seasonal concentration areas are identified for this area in Alaska's Wildlife and Habitat (1973). Less than 20 brown bears are harvested annually in this area. The harvest statistics for all of Unit 1 are presented in Table 35 . Limited public viewing of brown bears occurs during the summer at Berner's Bay near Juneau and the Chilkat River near Haines.

* (Dave Johnson, A.D.F.& G., Area Biologist, Juneau, pers. comm.)

Unit 4*

Brown bears are abundant throughout Unit 4. This unit has the highest density of brown bears in southeastern Alaska. The highest densities within this unit occur on Admiralty Island, followed by Chichagof and Baranof, in that order. During winter, brown bears den on

R01-111-0104
03/28/77

Table 35.

GAME MANAGEMENT UNIT 01
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BROWN GRIZZLY

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1961	0012	008	004	067	033	000	001	8	303 DAYS
1962	0013	009	003	075	025	001	004	31	303 DAYS
1963	0007	004	003	057	043	000	002	29	303 DAYS
1964	0020	017	002	089	011	001	002	10	303 DAYS
1965	0009	005	004	056	044	000	001	11	303 DAYS
1966	0014	010	004	071	029	000	004	29	303 DAYS
1967	0030	015	015	050	050	000	008	27	293 DAYS
1968	0017	010	007	059	041	000	004	24	283 DAYS
1969	0024	016	007	070	030	001	001	4	252 DAYS
1970	0012	006	006	050	050	000	004	33	162 DAYS
1971	0009	007	002	078	022	000	003	33	193 DAYS
1972	0018	008	009	047	053	001	004	22	283 DAYS
1973	0010	004	006	040	060	000	002	20	283 DAYS
1974	0017	013	004	076	024	000	004	24	283 DAYS
1975	0013	008	005	062	038	000	002	15	283 DAYS
1976	0021	010	010	050	050	001	007	33	283 DAYS
TOTALS	0246	0150	0091	0062	0038	0005	0053	22	

the high mountain slopes. During early summer, they use the beach areas extensively. From May to July, they are dispersed from the beach fringe into the high country, where they feed on sedges and herbaceous plants. During late summer and fall, most bears concentrate near salmon spawning streams. Brown bear distribution and seasonal densities in Unit 4 are identified in Alaska's Wildlife and Habitat (1973). The southern portion of Admiralty Island is considered critical brown bear habitat. Clearcut logging operations and associated human use in this region would probably have a detrimental effect on the brown bear population.

Usually fewer than 100 bears are harvested annually from Unit 4. Harvest statistics for this unit are presented in Table 36. The highest hunting pressure generally occurs on southern Admiralty Island. There has been an upward trend in the harvest since 1972. The composition of the harvest, however, has remained relatively stable since 1945. Thus, the current harvest pressure appears to exert very little impact on overall population numbers. Ten percent of the total Alaska brown-grizzly bear harvest is from Unit 4. This unit follows Kodiak Island and the Alaska Peninsula in the total statewide harvest of this species. Approximately 50 percent of the brown bears taken annually are by guided non-residents.

Viewing and photography of brown bears in Unit 4 is an important use of this resource. An established viewing area is located at Pack Creek on the northeast corner of Admiralty Island. Another viewing area exists at Thayer Lake, also on Admiralty Island.

* (Loyal Johnson, A.D.F.& G., Area Biologist, Sitka, pers. comm.)

Table 36.

01-111-0104
03/28/77

GAME MANAGEMENT UNIT 04
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BROWN GRIZZLY

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1961	0039	031	008	079	021	000	024	62	303 DAYS
1962	0044	029	014	067	033	001	029	66	303 DAYS
1963	0026	019	007	073	027	000	015	58	303 DAYS
1964	0055	037	017	069	031	001	024	44	303 DAYS
1965	0068	043	022	066	034	003	035	51	303 DAYS
1966	0076	050	024	068	032	002	051	67	303 DAYS
1967	0069	046	021	069	031	002	033	48	293 DAYS
1968	0050	039	011	078	022	000	016	32	283 DAYS
1969	0065	049	016	075	025	000	036	55	252 DAYS
1970	0072	052	020	072	028	000	037	51	162 DAYS
1971	0079	053	022	071	029	004	041	52	193 DAYS
1972	0077	058	019	075	025	000	041	53	283 DAYS
1973	0099	067	031	068	032	001	040	40	283 DAYS
1974	0086	063	021	075	025	002	043	50	283 DAYS
1975	0105	071	030	070	030	004	060	57	283 DAYS
1976	0142	091	050	065	035	001	086	61	283 DAYS
TOTALS	1152	0798	0333	0071	0029	0021	0611	53	

Table 37.

01-111-0104
03/28/77

GAME MANAGEMENT UNIT 01
SPRING BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BROWN GRIZZLY

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1961	0006	005	001	083	017	000	000	0	01/01-06/30
1962	0006	005	001	083	017	000	001	17	01/01-06/30
1963	0004	003	001	075	025	000	000	0	01/01-06/30
1964	0008	006	001	086	014	001	000	0	01/01-06/30
1965	0006	004	002	067	033	000	001	17	01/01-06/30
1966	0007	006	001	086	014	000	002	29	01/01-06/30
1967	0018	010	008	056	044	000	003	17	01/01-06/20
1968	0006	005	001	083	017	000	000	0	01/01-06/10
1969	0006	006	000	100	000	000	000	0	01/01-06/10
1970	0000	000	000	000	000	000	000	0	04/01-06/10
1971	0003	003	000	100	000	000	000	0	04/01-06/10
1972	0005	004	000	100	000	001	000	0	01/01-06/10
1973	0004	003	001	075	025	000	000	0	01/01-06/10
1974	0010	008	002	080	020	000	002	20	01/01-06/10
1975	0005	004	001	080	020	000	000	0	01/01-06/10
1976	0009	005	004	056	044	000	003	33	01/01-06/10
TOTALS	0103	0077	0024	0076	0024	0002	0012	12	

Table 38.

)1-111-)104
03/28/77

GAME MANAGEMENT UNIT 01
FALL BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BROWN GRIZZLY

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1961	0006	003	003	050	050	000	001	17	C9/01-12/31
1962	0007	004	002	067	033	001	003	43	C9/01-12/31
1963	0003	001	002	033	067	000	002	67	C9/01-12/31
1964	0012	011	001	092	008	000	002	17	C9/01-12/31
1965	0003	001	002	033	067	000	000	0	C9/01-12/31
1966	0007	004	003	057	043	000	002	29	C9/01-12/31
1967	0012	005	007	042	058	000	005	42	C9/01-12/31
1968	0011	005	006	045	055	000	004	36	C9/01-12/31
1969	0018	010	007	059	041	001	001	6	C9/01-11/30
1970	0012	006	006	050	050	000	004	33	C9/01-11/30
1971	0006	004	002	067	033	000	003	50	C9/01-12/31
1972	0013	004	009	031	069	000	004	31	C9/01-12/31
1973	0006	001	005	017	083	000	002	33	C9/01-12/31
1974	0007	005	002	071	029	000	002	29	C9/01-12/31
1975	0008	004	004	050	050	000	002	25	C9/01-12/31
1976	0012	005	006	045	055	001	004	33	C9/01-12/31
TOTALS	0143	0073	0067	0052	0048	0003	0041	29	

Table 39.

1-111-0104
03/28/77

GAME MANAGEMENT UNIT 04
SPRING BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BROWN GRIZZLY

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1961	0028	025	003	089	011	000	018	64	01/01-06/30
1962	0032	023	009	072	028	000	019	59	01/01-06/30
1963	0018	016	002	089	011	000	011	61	01/01-06/30
1964	0040	029	010	074	026	001	017	43	01/01-06/30
1965	0043	027	015	064	036	001	019	44	01/01-06/30
1966	0049	036	011	077	023	002	030	61	01/01-06/30
1967	0042	031	009	078	023	002	017	40	01/01-06/20
1968	0037	029	008	078	022	000	011	30	01/01-06/10
1969	0043	036	007	084	016	000	023	53	01/01-06/10
1970	0057	043	014	075	025	000	032	56	04/01-06/10
1971	0062	043	015	074	026	004	030	48	04/01-06/10
1972	0051	043	008	084	016	000	027	53	01/01-06/10
1973	0071	050	021	070	030	000	026	37	01/01-06/10
1974	0063	050	012	081	019	001	027	43	01/01-06/10
1975	0076	055	017	076	024	004	039	51	01/01-06/10
1976	0112	076	036	068	032	000	065	58	01/01-06/10
TOTALS	0824	0612	0197	0076	0024	0015	0411	50	

Table 40.

01-111-0104
03/28/77

GAME MANAGEMENT UNIT 04
FALL BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BROWN GRIZZLY

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1961	0011	006	005	055	045	000	006	55	09/01-12/31
1962	0012	006	005	055	045	001	010	83	09/01-12/31
1963	0008	003	005	038	063	000	004	50	09/01-12/31
1964	0015	008	007	053	047	000	007	47	09/01-12/31
1965	0025	016	007	070	030	002	016	64	09/01-12/31
1966	0027	014	013	052	048	000	021	78	09/01-12/31
1967	0027	015	012	056	044	000	016	59	09/01-12/31
1968	0013	010	003	077	023	000	005	38	09/01-12/31
1969	0022	013	009	059	041	000	013	59	09/01-11/30
1970	0015	009	006	060	040	000	005	33	09/01-11/30
1971	0017	010	007	059	041	000	011	65	09/01-12/31
1972	0026	015	011	058	042	000	014	54	09/01-12/31
1973	0028	017	010	063	037	001	014	50	09/01-12/31
1974	0023	013	009	059	041	001	016	70	09/01-12/31
1975	0029	016	013	055	045	000	021	72	09/01-12/31
1976	0030	015	014	052	048	001	021	70	09/01-12/31
TOTALS	0328	0186	0136	0058	0042	0006	0200	61	

Table 41.
Brown/Grizzly Bear BMU 4 Brown Bear Harvests by Sub-unit. Legal Sport Kills Only.

Location	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974*
Baranof 4-A	5	14	12	14	6	11	12	13	17	9	4
% of Unit 4	10	22	16	22	12	17	17	17	23	9	5
Chichagof 4-B	13	16	16	17	16	24	21	25	32	45	36
% of Unit 4	25	25	22	27	31	36	29	32	43	46	43
Admiralty Total	33	33	45	32	29	31	39	39	28	45	43
% of Unit 4	65	52	62	51	57	47	54	51	36	46	52
Northern Admiralty 4-C	14	14	10	10	13	6	13	9	9	12	12
% of Unit 4	27	22	14	16	26	10	18	12	12	12	15
Southern Admiralty 4-D	19	19	35	22	16	25	26	30	19	33	31
% of Unit 4	37	30	48	35	31	38	36	39	25	33	37
Pybus Bay	3	4	16	7	5	3	10	8	8	8	5
Gambier Bay	9	7	3	1	4	3	7	4	3	4	3
Chiak Bay	3	5	3	3	2	4	2	1	2	7	7
Hood Bay	1	1	2	6	0	4	0	0	0	3	4
Total These bays	16	17	24	17	11	14	19	13	13	22	19
% Admiralty	49	52	53	53	38	45	49	33	46	49	44
% Unit 4	31	27	33	27	22	21	26	17	17	22	23
Total for Unit	51	63	73	63	51	66	72	77	77	99	84
% Statewide Total	9	8	8	8	8	13	11	10	9	11	11

* Percentages based on 83 of 84 known kills.

BROWN BEAR
JUNEAU
CANADA
ALASKA
SITKA
PETERSBURG
PACIFIC OCEAN
KETCHIKAN

BROWN BEAR - SELECTED REFERENCES

Alaska Department of Fish and Game. 1970. Annual reports of survey-inventory activities. Part II. Caribou, brown bear, sheep, furbearers, marine mammals, bison, goat, wolf and black bear. Fed Aid. Wild. Rest. Vol. I. Project W-17-2.

____. 1971. Annual report of survey-inventory activities. Part II. Caribou, brown-grizzly bear, sheep, furbearers, marine mammals, bison, goat, wolf, wolverine and black bear. Fed. Aid. Wild. Rest. Vol. II. Project W-17-3.

____. 1973. Alaska's wildlife and habitat. Anchorage, Alaska. 143 pp + 563 maps.

____. 1973. Annual report of survey-inventory activities. Part II. Caribou, brown-grizzly bear, sheep, muskoxen, marine mammals, bison, goat and black bear. Fed. Aid. Wild. Rest. Vol. III. Project W-17-4.

____. 1974. Annual report of survey-inventory activities. Part I. Deer, brown-grizzly bear, sheep, bison, elk and muskoxen. Fed. Aid. Wild. Rest. Vol. IV. Project W-17-5.

____. 1974. Annual report of survey-inventory activities. Part I. Deer, brown-grizzly bear, sheep, bison, elk and muskoxen. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. V. Project W-17-6.

____. 1976. Annual report of survey-inventory activities. Part III. Caribou, brown bear, polar bear and black bear. Fed. Aid. Wild. Rest. Vol. VI. Project W-17-7.

Burt, W.H. and R.P. Grossenheider. 1952. A field guide to the mammals. Houghton Mifflin Co., Boston. 284 pp.

Dufresne, F. 1946. Alaska's animals and fishes. A.S. Barnes and Co., N.Y. 279 pp.

Eide, S. The brown-grizzly bear in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series No. 7. 2 pp.

Erickson, A.W. 1962. Characteristics of the brown-grizzly bear harvest. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. III. Project W-6-R-3.

____. 1963. Bear report. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. IV. Project W-6-R-4.

____ and D.B. Siniff. 1963. A statistical evaluation of factors influencing aerial survey results on brown bear. Trans. N. Am. Wild. Conf. 28:391-409.

Glenn, L.P. 1970. Report on 1969 brown bear studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-17-2.

Hall, R.E. and K.R. Kelson. 1959. The mammals of North America. Roland Press. New York. Vol. I and II. 1,083 pp.

Hensel, R.J., et al. 1969. Reproduction in the female brown bear. J. Wild. Mgt. 33(2):357-365.

Klein, D.R. 1958. Brown bear studies. Alaska Game Comm. Job completion report. Fed. Aid. Wild. Rest. Vol. 13. No. 1. Project W-3-R-13.

Lentfer, J.W. 1965. Bear studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. VI. Project W-6-R-5,6.

____, et al. 1966. Bear studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. VII. Project W-6-R-6 and W-15-R-1.

____, et al. 1967. Report on 1966 bear studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Vol. VIII. Project W-15-R-1,2.

____, et al. 1968. Report on 1967 brown bear studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-15-R-2,3.

____, et al. 1969. Report on 1968 brown bear studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-15-R-3 and W-17-1.

Manville, R.H. and S.P. Young. 1965. Distribution of Alaskan mammals. U.S. Fish and Wildlife Ser. Cir. 211. 74 pp.

Somerville, R.J. 1965. An evaluation of the 1961-63 Alaskan brown and grizzly bear management program. M.S. Thesis. U. of Montana. 177 pp.

Walker, E.P., et al. 1964. Mammals of the world. John's Hopkins Press. Baltimore. Vol. I and II. 1,500 pp.

Wood, R.E. 1973. Southeastern brown bear studies. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Project W-17-4.

____. 1976. Movement and populations of brown bears in the Hood Bay drainage of Admiralty Island. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Rest. Final report. Project W-17-5,6,7.

BLACK BEAR

Black bears (Ursus americanus) range throughout most of northern North America. They are comparatively much more adaptable to human encroachment than are brown-grizzly bears. The black bear, however, has a more limited distribution in Alaska than does the brown-grizzly bear. Primarily a forest animal, black bears range throughout most of the State, except north of the Brooks Range, the western Seward Peninsula, Kuskokwim Delta, Alaska Peninsula south of the Branch River, the islands of southeastern Alaska north of Frederick Sound, Kodiak, Montague and Hinchinbrook Islands, as well as the Aleutians and the islands to the north. In terms of island distribution, they are generally absent from those occupied by brown-grizzly bears. Black bears are generally associated with open forests which include fruit producing shrubs interspersed with meadows and streams. In southeastern Alaska, they are associated with coastal beaches.

Sexual maturity in black bears is generally attained at about three and one-half to four and one-half years of age. Breeding occurs from mid-June through mid-July. Normally two cubs are born in the den during late January or February. Females usually breed in alternate years.

Black bears are omnivorous. During spring and early summer, they feed primarily on grasses and herbaceous vegetation. During late summer and fall, they consume quantities of berries and spawning salmon. Invertebrates and carrion are also taken when available.

Winter denning in black bears usually begins in October and extends through April and sometimes into May. As in brown-grizzly bears, the duration of denning varies regionally.

Subunit 1(A) and Unit 2*

Black bear populations in Subunit 1(A) and Unit 2 have been relatively stable in recent years. However, no estimate of actual population numbers is available for this area. Although black bears are distributed throughout this region, seasonal concentrations occur along fish streams in late August through November. During spring, as bears come out of hibernation, they move to the tidal flats and adjacent beach fringe. These areas are considered critical habitat. General distribution and seasonal concentration areas are identified in Alaska's Wildlife and Habitat (1973).

Hunting pressure throughout Subunit 1(A) and Unit 2 appears to have increased during recent years. Currently, the Alaska Department of Fish and Game has been sealing approximately 60 to 70 black bears during the spring season in these units, and about 20 to 30 bears during the fall season. Harvest statistics are presented in Table 42.

* (Bob Wood, A.D.F.& G., Area Biologist, Ketchikan, pers. comm.)

Subunit 1(B) and Unit 3*

Black bear populations have remained relatively stable throughout Subunit 1(B) and Unit 3 for many years. They are, however, comparatively more abundant in Unit 3 than in Subunit 1(B). At various seasons of the year, they may occur from the beach zone to the alpine zone. In spring, black bears concentrate along beaches and grass flats in estuarine areas. During late summer and fall, they concentrate along salmon spawning streams. At this same time, some bears also occur in the alpine areas. Black bears in these units usually enter their dens in

Table 42.

01-111-0104
03/28/77

GAME MANAGEMENT UNIT 01 SUB-UNIT 0001
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BLACK

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1971	0000	000	000	000	000	000	000	0	01/01-12/31
1972	0000	000	000	000	000	000	000	0	01/01-12/31
1973	0007	005	002	071	029	000	001	14	01/01-12/31
1974	0048	040	007	085	015	001	002	4	01/01-12/31
1975	0033	028	004	088	013	001	001	3	01/01-12/31
1976	0027	023	002	092	008	002	000	0	01/01-12/31
TOTALS	0115	0096	0015	0086	0014	0004	0004	3	

01-111-0104
03/28/77

GAME MANAGEMENT UNIT 02
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BLACK

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1971	0000	000	000	000	000	000	000	0	01/01-12/31
1972	0000	000	000	000	000	000	000	0	01/01-12/31
1973	0004	001	001	050	050	002	000	0	01/01-12/31
1974	0027	020	004	083	017	003	003	11	01/01-12/31
1975	0042	033	009	079	021	000	018	43	01/01-12/31
1976	0078	064	013	083	017	001	018	23	01/01-12/31
TOTALS	0151	0118	0027	0081	0019	0006	0039	26	

November when they go into their winter dormancy. They generally leave the den in May, depending on local weather conditions. The black bear distribution and seasonal concentration areas within these units is identified in Alaska's Wildlife and Habitat (1973).

Black bear harvest statistics for Subunit 1(B) and Unit 3 are presented in Table 43 . Following a successful brown bear hunt, many brown bear hunters also take black bears. Recently there has been an increase in the number of black bears taken by local residents.

Non-consumptive use of black bears in Subunit 1(B) and Unit 3 is extensive. The Anan Creek Sanctuary on the Cleveland Peninsula was established specifically to provide viewing and photographic opportunities of black bears. The lower portion of this drainage has been closed to black bear hunting for many years. Black bears concentrate on Anan Creek during the summer and fall months when salmon are present. This area has probably the greatest seasonal concentration of black bears in southeastern Alaska. Many people, including local residents, sport fishermen and professional photographers, use this area to view and photograph black bears. Petersburg Creek on Kupreanof Island is also an important area for observing black bears. This area is utilized by many local residents. In 1975, the Board of Game approved a public request that the drainage be closed to black bear hunting. Blind Slough, near Petersburg, is also an important area for viewing black bears and may, in the future, be classified for non-consumptive use. Other areas where black bears are viewed include Rocky Pass, Duncan Canal, Tebenkof Bay and the lower Stikine River.

* (Harry Merriam, A.D.F.& G., Area Biologist, Petersburg, pers. comm.)

Table 43.

-111-0104
3/28/77

GAME MANAGEMENT UNIT 01 SUB-UNIT 0002
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BLACK

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1971	0000	000	000	000	000	000	000	0	01/01-12/31
1972	0000	000	000	000	000	000	000	0	01/01-12/31
1973	0004	004	000	100	000	000	001	25	01/01-12/31
1974	0015	012	003	080	020	000	007	47	01/01-12/31
1975	0008	006	002	075	025	000	003	38	01/01-12/31
1976	0014	011	001	092	008	002	006	43	01/01-12/31
TOTALS	0041	0033	0006	0085	0015	0002	0017	41	

RD1-111-0104
03/28/77

GAME MANAGEMENT UNIT 03
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BLACK

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1971	0000	000	000	000	000	000	000	0	01/01-12/31
1972	0000	000	000	000	000	000	000	0	01/01-12/31
1973	0010	007	003	070	030	000	007	70	01/01-12/31
1974	0027	025	002	093	007	000	018	67	01/01-12/31
1975	0048	040	007	085	015	001	030	63	01/01-12/31
1976	0060	052	007	088	012	001	038	63	01/01-12/31
TOTALS	0145	0124	0019	0087	0013	0002	0093	64	

Subunits 1(C) and 1(D)*

The current black bear population in Subunits 1(C) and 1(D) appears to be relatively static. General distribution and seasonal concentration areas of black bears in these subunits are identified in Alaska's Wildlife and Habitat (1973).

Approximately 30 to 60 black bears are harvested annually from Subunits 1(C) and 1(D). Harvest statistics are presented in Table 44 . During the spring, public viewing of black bears occurs at Port Houghton in Subunit 1(C).

* (Dave Johnson, A.D.F.& G., Area Biologist, Juneau, pers. comm.)

Unit 4

Black bears do not occur in Unit 4.

Table 44.

R01-111-0104
03/20/77

GAME MANAGEMENT UNIT 01 SUB-UNIT 0003
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BLACK

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1971	0000	000	000	000	000	000	000	0	01/01-12/31
1972	0000	000	000	000	000	000	000	0	01/01-12/31
1973	0016	008	008	050	050	000	007	44	01/01-12/31
1974	0046	036	010	078	022	000	012	26	01/01-12/31
1975	0046	036	010	078	022	000	018	39	01/01-12/31
1976	0065	057	008	088	012	000	024	37	01/01-12/31
TOTALS	0173	0137	0036	0079	0021	0000	0061	35	

R01-111-0104
03/20/77

GAME MANAGEMENT UNIT 01 SUB-UNIT 0004
YEARLY BEAR SPORT HARVEST 1961 - 1976
HARVEST SUMMARY BY YEAR, SEX OF BEAR, AND RESIDENCY OF HUNTER
BLACK

CALENDAR YEAR	TOTAL KILL	# OF MALES	# OF FEMALES	% OF MALES	% OF FEMALES	# OF UNKNOWN	# BY NONRES	% BY NONRES	SEASON DATES
1971	0000	000	000	000	000	000	000	0	01/01-12/31
1972	0000	000	000	000	000	000	000	0	01/01-12/31
1973	0008	006	002	075	025	000	000	0	01/01-12/31
1974	0008	006	002	075	025	000	001	13	01/01-12/31
1975	0018	011	006	065	035	001	002	11	01/01-12/31
1976	0024	019	005	079	021	000	000	0	01/01-12/31
TOTALS	0058	0042	0015	0074	0026	0001	0003	5	

Table 45. Black Bear Harvest Statistics for GMU's 1A and 2 with Color Phase, Kill by Non-Residents, Mean Skull Size and Methods of Transportation Used for Calendar Year 1974.

GMU	Season	Kill	No.* Males	No.* Females	Unk. Sex	% Cinnamon	Kill by Non-Resident	Mean Skull Size-Male**	Mean Skull Size-Female**	Transport Used (%) Air	Boat	Road Vehicle	Other
1A	Spring 1974	34	31	2	1								
	Fall 1974	13	8	5	0								
	Total	47	39	7	1	12.8	2 (4.3%)	17.8(36)	15.2(5)	19	77	2	2
2	Spring 1974	22	17	3	2								
	Fall 1974	5	3	1	1								
	Total	27	20	4	3	0	3 (11.1%)	19.1(15)	16.2(2)	37	33	22	7

* Sex classification based 81% on hunters word.

** ( ) = Sample Size.

Prepared by: Robert E. Wood, Game Biologist

Table 46.

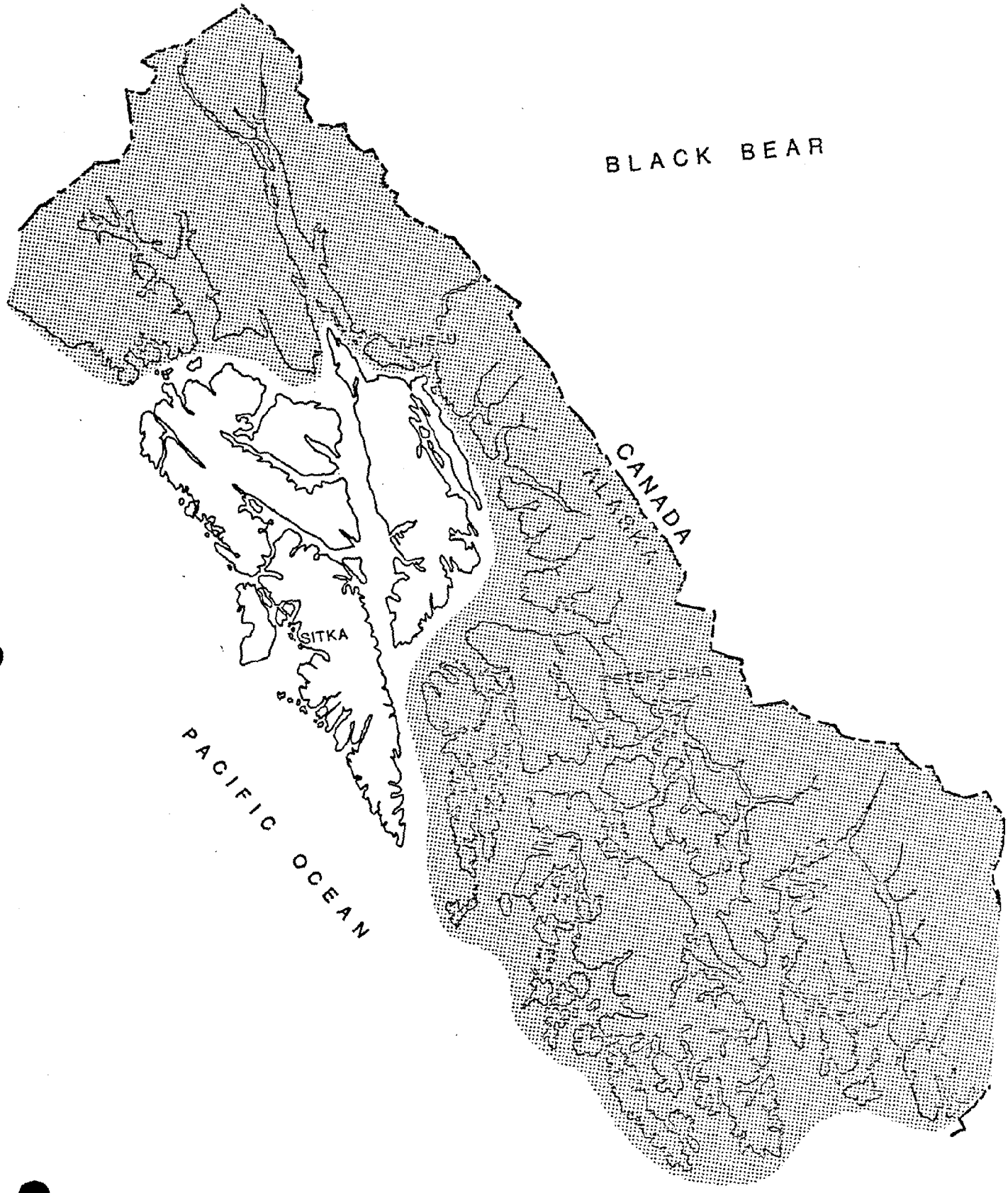
Black bear harvest, calendar years 1972 through 1974: participation by nonresidents, mean and range of skull sizes and color phase of bears presented for sealing.

GMU	Calendar Year	Tot. Kill	No. Males	% Males 1/	No. Nonres.	% Nonres.	Mean Skull Size M. 2/	Range Skull Sizes M. 2/	Mean Skull Size F. 2/	Range Skull Sizes F. 2/	No. Cinn. or Blue* Color	% Cinn. or Blue* Color
1(C)	1974	47	38	81	12	26	17.1	14.5-19.2	15.8	14.0-17.6	6	12.8
1(D)	1974	13	10	77	1	8	16.7	13.3-18.4	13.3	11.8-15.4	4	30.8
5	1972	17	12	71	10	59	17.9	14.3-19.3	14.2	9.8-15.8	2*	11.8*
5	1973	19	12	63	13	68	15.9	13.0-18.8	15.3	12.8-16.3	1*	5.3*
5	1974	9	6	67	7	78	16.7	15.0-18.6	15.5	15.5-15.5	1*	11.1*

1/ All male % based on known sex bears

2/ Length plus width given in inches

Prepared by: David A. Johnson, Game Biologist III and Warren Ballard, Game Biologist II.


BLACK BEAR
CANADA
SITKA
PACIFIC OCEAN

BLACK BEAR - SELECTED REFERENCES

Alaska Department of Fish and Game. 1973. Alaska's wildlife and habitat. Anchorage, Alaska. 143 pp + 563 maps.

____. 1974. Annual report of survey-inventory activities. Part III. Furbearers, small game, raptors, wolf, wolverine and black bear. Fed. Aid. Wild. Rest. Vol. IV. Project W-17-5.

____. 1975. Annual report of survey-inventory activities. Part III. Caribou, marine mammals, mountain goat, wolf and black bear. Fed. Aid. Wild. Rest. Vol. V. Project W-17-6.

____. 1976. A compilation of fish and wildlife resource information for the State of Alaska. Vol. I - Wildlife. 873 pp.

Burt, W.H. and R.P. Grossenheider. 1952. A field guide to the mammals. Houghton Mifflin Co., Boston, 284 pp.

Dufresne, F. 1946. Alaska's animals and fishes. A.S. Barnes and Co., N.Y. 279 pp.

Erickson, A.W. 1965. The black bear in Alaska-Its ecology and management. Fed. Aid. Wild. Rest. Vol. V. Project W-6-R-5, Work Plan F.

Hall, R.E. and K.R. Kelson. 1959. The mammals of North America. Roland Press. New York. Vol. I and II. 1,083 pp.

Johnson, L.J. 1971. The black bear in Alaska. Alaska Dept. of Fish and Game. Wildlife Notebook Series. 2 pp.

Manville, R.H. and S.P. Young. 1965. Distribution of Alaskan mammals. U.S. Fish and Wildlife Ser. Cir. 211. 74 pp.

Walker, E.P., et al. 1964. Mammals of the world. John's Hopkins Press. Baltimore. Vol. I and II. 1,500 pp.

FURBEARERS, SMALL GAME AND UPLAND GAME BIRDS

Twenty-three species of furbearers, small game and upland game birds occur throughout southeastern Alaska. These include wolf, coyote, red fox, lynx, wolverine, marten, mink, short-tailed weasel, least weasel, land otter, beaver, muskrat, marmot, red squirrel, northern flying squirrel, porcupine, snowshoe hare, willow ptarmigan, rock ptarmigan, white-tailed ptarmigan, blue grouse, ruffed grouse and spruce grouse. Fisher may also occur in the extreme southern portion of southeastern Alaska; however, if they do, they are probably rare. Raccoons have been introduced to southeastern Alaska in several areas and have established small breeding populations.

Although some species occur throughout all the units (1-4) of Southeastern, many have a more limited distribution, especially with respect to island distribution. The post glacial distribution of mammals in this region has been discussed by Klein (1965). The land otter and the mink are the widest ranging species and occur on most islands. Knowledge of the island distribution of many species, however, is still incomplete and remains a fertile field for future research. Specific data for most of the species inhabiting these units is not available. In some cases relative abundance can be estimated from trapping records, but these are often incomplete and pertain only to specific species. Most of the information presented here was obtained either from the literature or from Alaska Fish and Game Department Area Biologists, U.S. Fish and Wildlife Service Biologists and U.S. Forest Service Biologists familiar with the area.

WOLF

The wolf (Canis lupus), once distributed throughout most of North America, is today limited primarily to the northern wilderness of Canada and Alaska. Wolves are very adaptable in terms of climate and habitat. They occur throughout the entire State of Alaska, except for the offshore islands of the Bering Sea, the Aleutians south of Unimak, the Kodiak group, the islands of Prince William Sound and the islands south of Frederick Sound in southeastern Alaska. In Alaska, wolves are classified both as a big game species and as a furbearer. Current market value averages $127 per pelt (Seattle Fur Exchange, February, 1977).

Since wolves prey primarily on big game species such as caribou, moose and deer, they often come into conflict with man, who places a high recreational and/or subsistence value on these same species. This and the fact that they often took domestic stock (because their natural prey was reduced by hunting or habitat reduction) were the primary factors which brought about their demise, through predator control programs, throughout most of the lower 48. Other prey species utilized by wolves (although of secondary importance) consist of snowshoe hares, beaver, salmon, sheep and goats. Their food consumption is in the range of four to eight pounds of meat per wolf per day.

In general, wolves usually range over a large area (up to 60 miles or more in diameter) and travel in packs of from 2 to 30 animals. In southeastern Alaska, however, this range area is probably smaller, and pack size averages five to seven animals. The social structure of these packs is highly developed and complex, and is an important factor in their success as a predator.

Pupping usually occurs in May or early June. Females generally produce their first litter at two years of age, and most litters average five to six pups. In Alaska, although most females breed every year, survival is related to available food resources; and in periods of low prey densities, pup mortality may be high.

Historically, the wolf has been a controversial figure. Today, emotions run high on both sides of the issue of wolf management. The logical approach to such problems, however, is to develop sound management policies, based on objective biological data. Such management should provide for the long-term conservation of our big game species, as well as ensuring the continued conservation of the wolf, which is considered by many to be a symbol of the northern wilderness.

Units 1, 2 and 3

Wolves are distributed throughout the entire mainland area and the larger islands within Units 1, 2 and 3. Population estimates, however, are unavailable for this region. Although little information is available on their movements or habitat requirements within this region, they are undoubtedly most abundant near regions of high prey densities, especially those of black-tailed deer. Their general distribution within this region is identified in Alaska's Wildlife and Habitat (1973).

The average annual harvest for this region is approximately 135 wolves. Wolf harvest statistics from Southeastern, by game management unit, are presented in Table 1. Over the last 15 years, the wolf harvest in southeastern Alaska has averaged about 15 percent of the statewide harvest. Wolves are harvested by both hunting and trapping.

Although many people are interested in the opportunity to view or photograph wolves, this rarely happens in southeastern Alaska.

Unit 4

Wolves do not occur in Unit 4.

Table 1. Wolf Harvest, Southeastern Alaska
1961-1976

Unit	Year														
	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70	70-71	71-72	72-73	73-74	74-75	75-76
1	67	23	36	36	17	24	53	41	53	67	97	35	50	62	65
2	12	43	53	57	50	66	78	113	83	59	42	29	15	10	44
3	18	26	37	27	52	40	82	15	72	38	57	24	27	11	24
Total	97	92	126	120	119	130	213	169	208	164	196	88	92	83	133

Data Source:
Bounty records through June 1, 1969; Bounty records and aerial permits through 1971; Mandatory sealing 1972 to present.

Table 2.

Units 1A and 2, Wolf harvest from sealing records 1971-72 through 1974-75

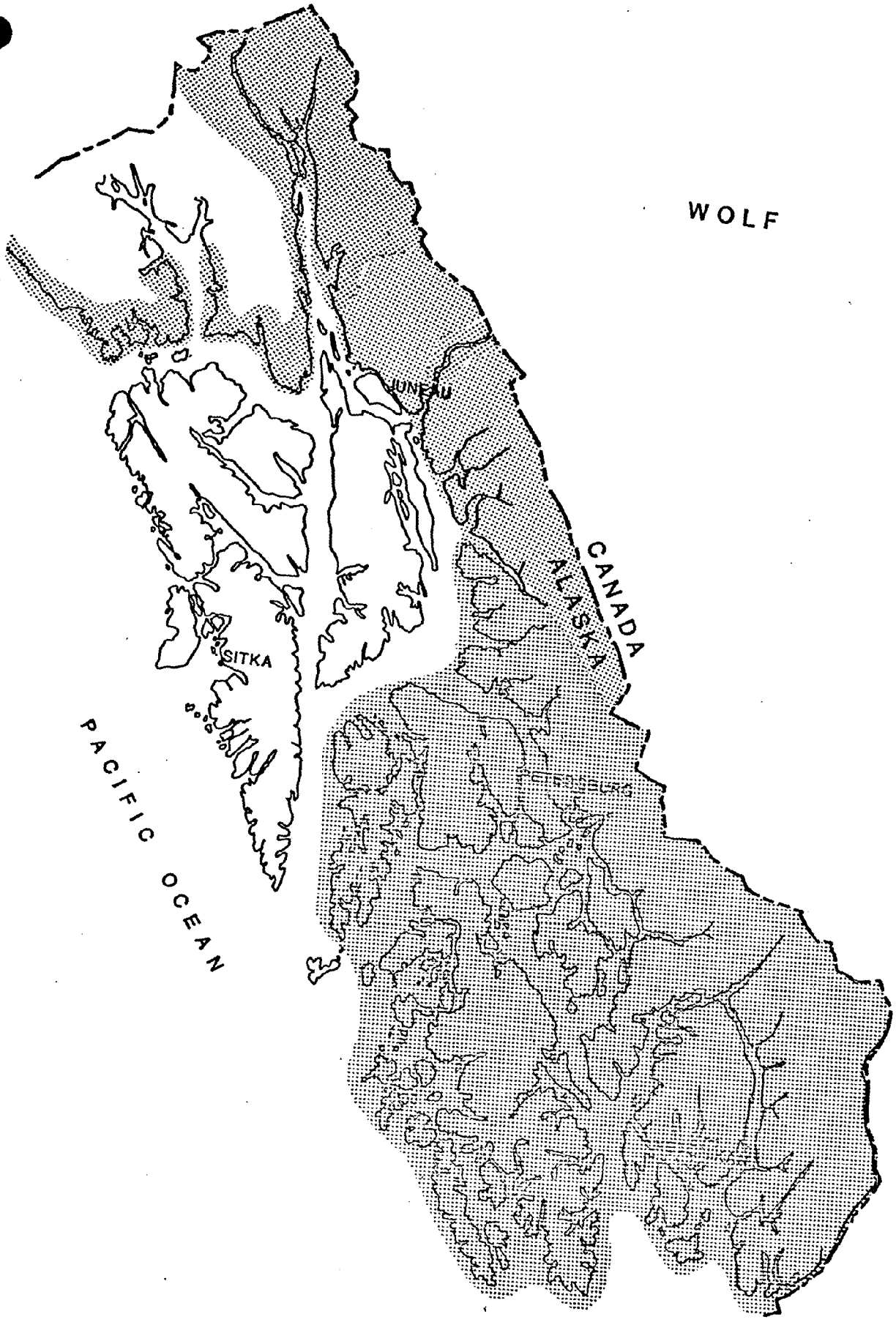
Subunit 1-A

Year	Males	Females	Unknown	Total	% Taken by trapping
1971-72	39	23	0	62	77
1972-73*	9	12	1	22	64
1973-74	12	14	0	26	81
1974-75	20	11	2	33	73

Unit 2

Year	Males	Females	Unknown	Total	% Taken by trapping
1971-72	19	18	5	42	64
1972-73*	13	15	1	29	62
1973-74	7	8	0	15	60
1974-75	5	5	0	10	40

* Bounties not paid during 1972-73.


WOLF
JUNEAU
CANADA
ALASKA
SITKA
PACIFIC OCEAN

COYOTE

The coyote (Canis latrans) has only recently become established in Alaska. It was first observed in Alaska around 1915. Following their first appearance they spread rapidly across the State, with the highest density centered in the Tanana Valley around 1950. By 1953, the center of their distribution had shifted toward southcentral Alaska. In 1964, the Alaska Department of Fish and Game reported: "We can advise that these animals (coyotes) are at an extremely low level of abundance in Alaska at this time. Formerly, we had good populations which apparently crashed as a result of rabies or some other disease." Today coyotes occur in most areas of the State, except the Arctic coast, the far western portion, most of the Alaska Peninsula, much of Southeastern and the coastal islands. Although coyotes are common throughout their range, they are usually not abundant. Coyotes are very adaptable animals and occur throughout a variety of habitats.

Coyotes prey on a wide variety of small mammals, including hares, ground squirrels and numerous species of mice. They are opportunistic foragers, and their diet includes berries, invertebrates and carrion when available. Although they prefer to hunt during the night or during the twilight hours, they are also active during daylight throughout the northern summer. Coyotes usually hunt alone, although occasionally they hunt in pairs.

Coyotes usually breed from January to March. After a gestation period of approximately 60 days, females give birth to five to seven pups. Pups are born in a den usually located in the cover of a natural

crevice. Females become sexually mature during their second winter and usually produce one litter per year.

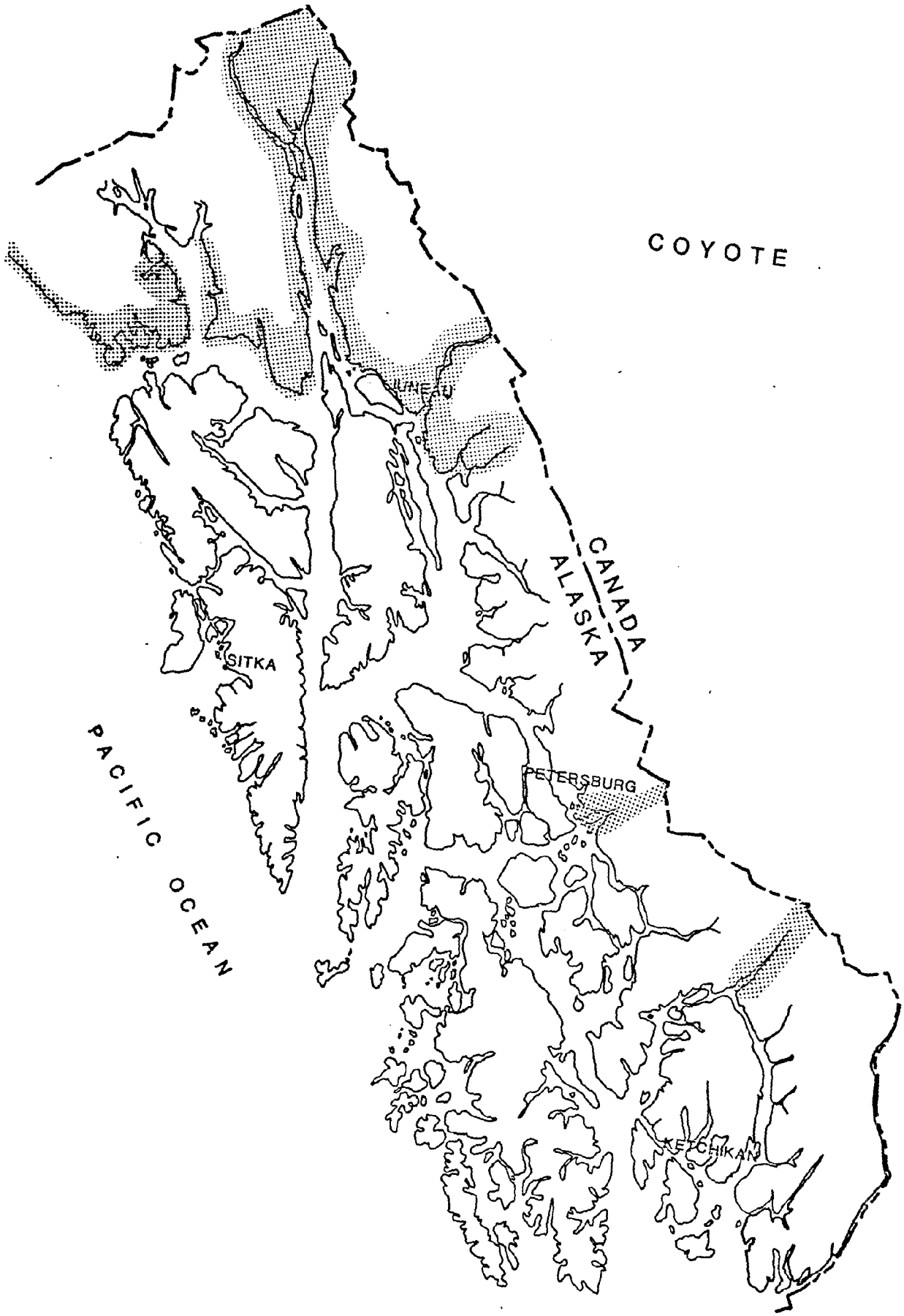
Prior to 1969, there was a bounty on coyotes throughout Alaska. This was removed in 1969 since coyotes do not significantly affect the abundance of most game species. Coyotes are occasionally trapped for their pelts.

Unit 1

Coyotes occur in limited numbers along the southeastern mainland. They have been observed in the Stikine, Taku and Chilkat River drainages, generally occurring in the same habitats as showshoe hares and lynx. Coyotes are scarce throughout this entire area. A few coyotes, however, are harvested each year in the Haines-Skagway area.

Units 2, 3 and 4

Coyotes do not occur in these units.


COYOTE
JUNEAU
CANADA
ALASKA
SITKA
PACIFIC OCEAN
PETERSBURG
KETCHIKAN

RED FOX

The red fox (Vulpes fulva) occurs throughout Alaska except for some islands in the Bering Sea, the Aleutian Chain and the islands in southeastern Alaska and Prince William Sound. Red foxes inhabit a variety of habitats, but they seem to prefer broken country or forest openings interspersed with hills and draws south of the Arctic tundra. This species is native to most of Alaska, but has been introduced to many islands as a result of fox farming operations in the early 1900's.

Red foxes are omnivorous and forage on a wide variety of items, including small mammals, birds, eggs, invertebrates, plant material and carrion. Their diet fluctuates seasonally, reflecting the relative availability of specific items. Generally, however, mice (especially microtines) and hares appear to be preferred and are probably taken most often. Red fox populations fluctuate with respect to changes in prey densities. During summer and fall, foxes feed heavily on berries and invertebrates. During winter, they are restricted almost exclusively to fresh meat and carrion.

Red foxes breed during February and March. Following breeding, a pair of foxes locates an appropriate denning site. Their dens are excavations, usually 15 to 20 feet long, located on the side of a well-drained hill. A den may have several entrances. Following a 53-day gestation period, a litter of usually four kits is born in a grass-lined nest within the den. One litter is usually produced each year. Both parents care for the young, and the family unit persists until fall when the individuals disperse.

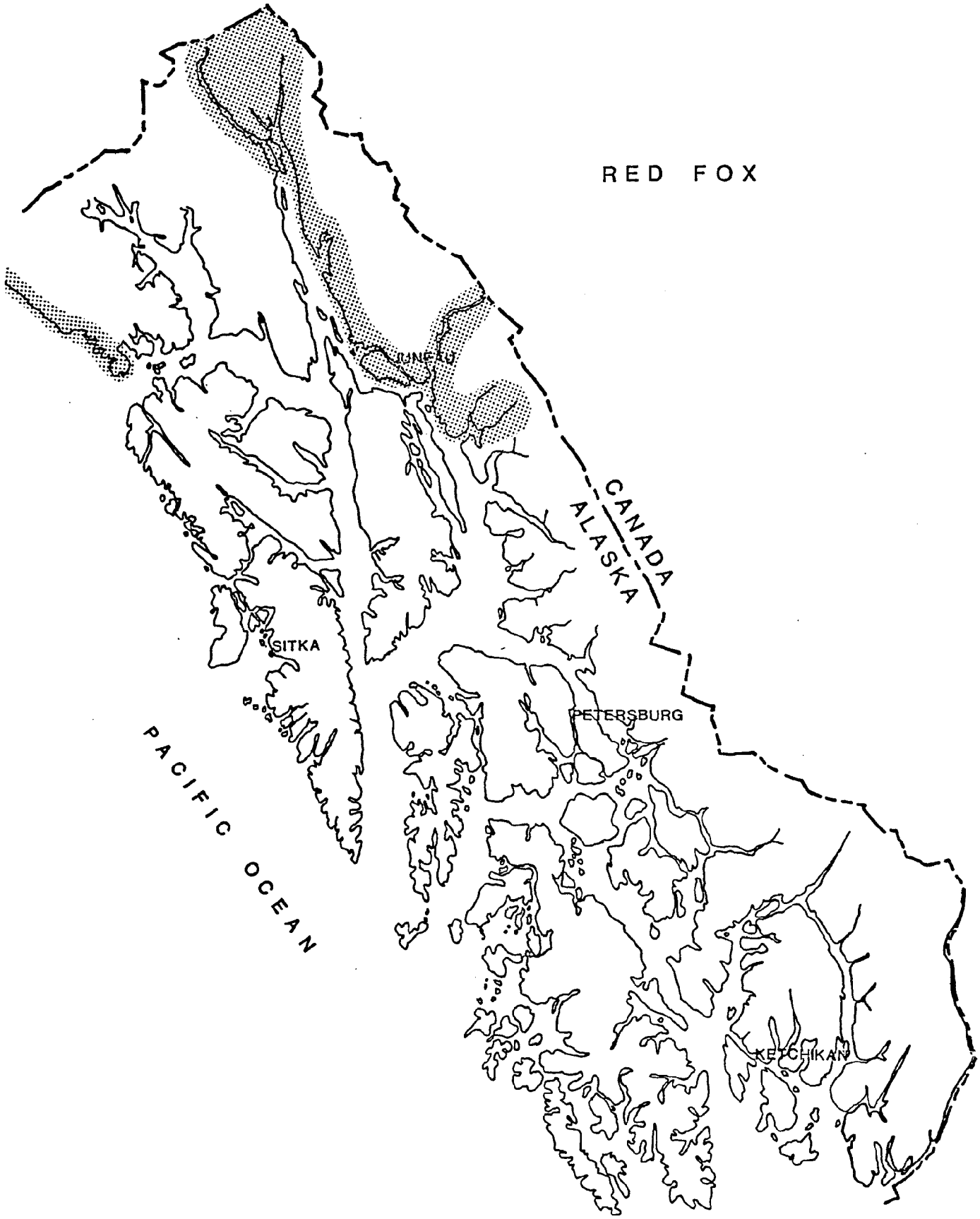
Red foxes are considered one of Alaska's most important furbearers, and recently their value has increased. The current market value for a single pelt averages $90 (Seattle Fur Exchange, February, 1977). This increase in value may result in increasing harvest pressure. Currently, however, they do not appear to be over harvested anywhere in the State.

Unit 1

Red foxes occur in very limited numbers in southeastern Alaska. They are confined to the Southeastern mainland river drainages and are probably most abundant in the Haines area. No other information is currently available on their status in this unit.

Units 2, 3 and 4

Red foxes do not occur in any of these units.


RED FOX
JUNEAU
CANADA
ALASKA
SITKA
PETERSBURG
PACIFIC OCEAN
KETCHIKAN

LYNX

The lynx (Lynx canadensis) is the only member of the cat family (Felidae) native to Alaska. Lynx occur throughout Alaska, except for the Yukon and Kuskokwim Deltas, the southern portion of the Alaska Peninsula, the coastal islands and much of southeastern Alaska. They generally prefer climax forests with dense undercover where their primary prey, the snowshoe hare, occurs. A solitary animal, the lynx is usually nocturnal, except during the long daylight periods of the Arctic summer.

Lynx generally breed during March or April. After approximately a 60-day gestation, usually one to four kittens are born in a den formed by a natural cavity. Productivity is closely related to prey density, and thus, is prone to fluctuation.

Lynx feed on a variety of small mammals and birds, as well as carrion. Their primary prey, however, is the snowshoe hare, whose populations are prone to drastic fluctuations. Lynx populations also fluctuate in response to these changes in prey density. The lynx-hare cycle is well known by biologists, and population highs can sometimes be predicted, usually every eight to ten years.

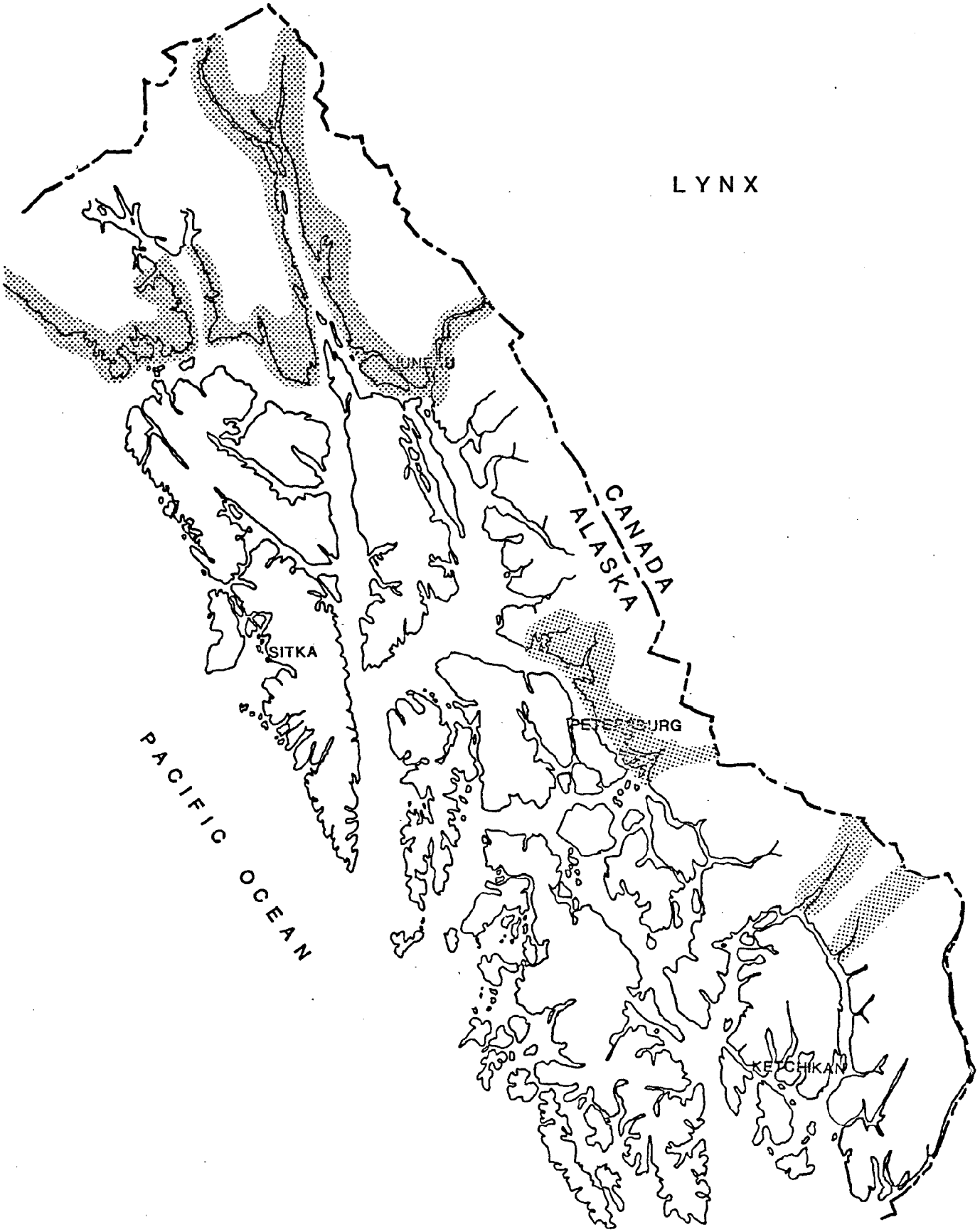
The lynx is regarded as a highly valuable fur bearer, and is harvested throughout its range, primarily by trapping. Currently, prime pelts may average over $300 (Seattle Fur Exchange, February, 1977).

Unit 1

Lynx have never been abundant in southeastern Alaska. They have been observed within Unit 1 in the Chilkat River drainage near Haines, in the Taku River drainage near Juneau and occasionally in the Stikine River drainage north of Wrangell (Manville and Young, 1965; A.D.F.& G., 1976). In general, lynx distribution, limited as it is, overlaps snowshoe hare distribution along the major mainland river drainages. Lynx are rarely harvested in southeastern Alaska.

Units 2, 3 and 4

Lynx do not occur in any of these units.


LYNX
CANADA
ALASKA
SITKA
PACIFIC OCEAN
KETCHIKAN

WOLVERINE

The wolverine (Gulo luscus) is the largest North American land member of the weasel family (Mustelidae). They occur throughout northern North America in Canada, Alaska and a few northwestern states. In Alaska, they occur throughout the mainland and on a few islands in the southeastern portion of the State. Wolverines inhabit forests and tundra from sea level into the mountains. Although they have a wide distribution throughout the State, they are nowhere found in high densities.

Wolverines are omnivorous and eat a wide variety of material, including small mammals and birds, fruits, berries, insect larvae and carrion. They generally breed during May through July. Following delayed implantation, parturition occurs from January through April. Kits, born in a den, usually number two to three.

The specific habitat requirements for the wolverine are unknown. They occur over a large area of diverse country where food is abundant. There is no evidence, however, that wolverine predation adversely affects game populations or causes excessive economic loss. The wolverine is considered a valuable furbearer, and the current value of a single hide averages $120 (Seattle Fur Exchange, February, 1977).

Units 1 and 3

Wolverines occur throughout the entire mainland and most of the major islands of Units 1 and 3. Reports from Kuiu Island indicate they have recently increased their range within Unit 3. Populations appear

to be relatively stable in both of these units. Wolverines inhabit a variety of habitats, from tideline to the alpine zone, during the summer-fall period. During winter, however, they occur most commonly near beaches where they utilize a variety of food, including carrion. The general distribution of wolverines throughout southeastern Alaska is defined in Alaska's Wildlife and Habitat (1973).

The wolverine is a valuable furbearer in this region. Although they are generally not abundant enough to trap intensively, some are taken in wolverine sets and in conjunction with wolf trapping. The total wolverine harvest for Units 1 and 3 averages approximately 35 animals annually. Harvest statistics are presented in Table 3. Because wolverine are so rarely observed, nonconsumptive use is minimal.

Units 2 and 4

Wolverines do not occur in Units 2 or 4.

Table 3. Wolverine Harvest, Southeastern Alaska
1971 - 1976

Unit	Year				
	71-72	72-73	73-74	74-75	75-76
1	16	15	50	33	33
3	-	12	12	5	3

(From mandatory sealing data)

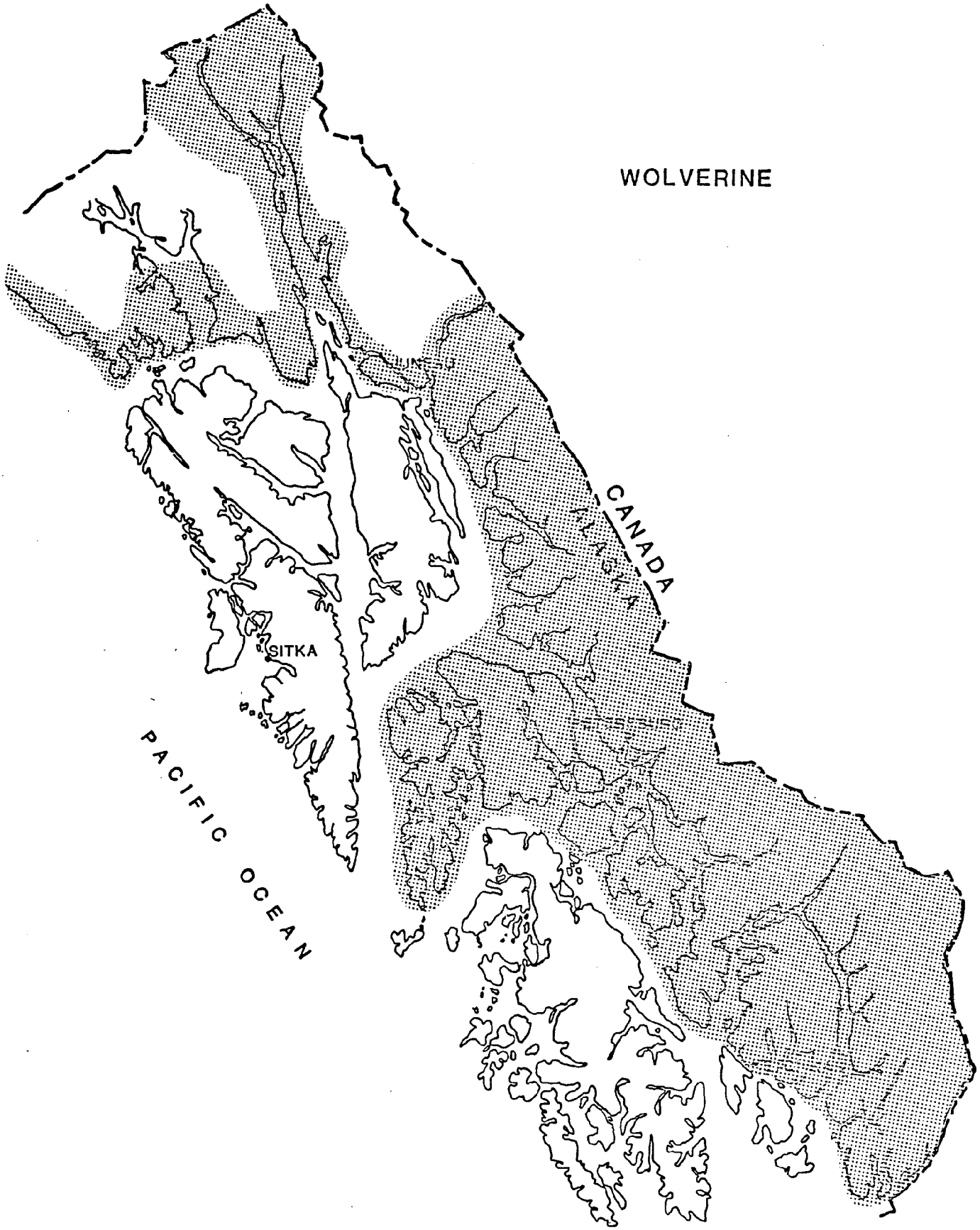
Table 4. Wolverine harvest, 1975 Units 1 - 4*

Unit	Sex	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Unk.
	M				4	1			
1A	F					4			
	Unk								
	M								
1B	F								
	Unk				1				
	M				1	2			
1C	F					2			
	Unk				3	1			
	M				7	2		1	
1D	F					2			
	Unk				1				1
	M				2	1			
3	F					1			
	Unk				1				
TOTAL					20	16		1	1

* No wolverine sealed from Units 2 and 4 in 1975.

Table 5. Method of take of wolverines, 1975, Units 1 - 4.

Method	1A	1B	1C	1D	2	3	4
Ground Shooting	1	0	1	1	0	0	0
Trapping	8	1	9	13	0	5	0


WOLVERINE
CANADA
SITKA
PACIFIC OCEAN

MARTEN

The marten (Martes americana) occurs throughout Alaska except for the Arctic Slope, Seward Peninsula, Yukon-Kuskokwim Delta and most of the Alaska Peninsula. The distribution of marten is limited primarily to climax spruce forests from sea level to timberline. This forest community, therefore, is the critical habitat element for this species.

Marten food habits vary according to what food items are available. During the summer and fall, berries constitute an important part of the diet. Throughout the year, microtine rodents, red squirrels, hares, birds and carrion are taken relative to their abundance. On the coasts, marten also forage along beaches.

Marten breed during the summer months. Parturition generally occurs in April following a long gestation period of from 220 to 290 days (approximately five months of this period are the result of delayed implantation). Litter size ranges from two to four young which are usually born in a den located in a hollow tree or log. Sexual maturity is reached at about two years of age.

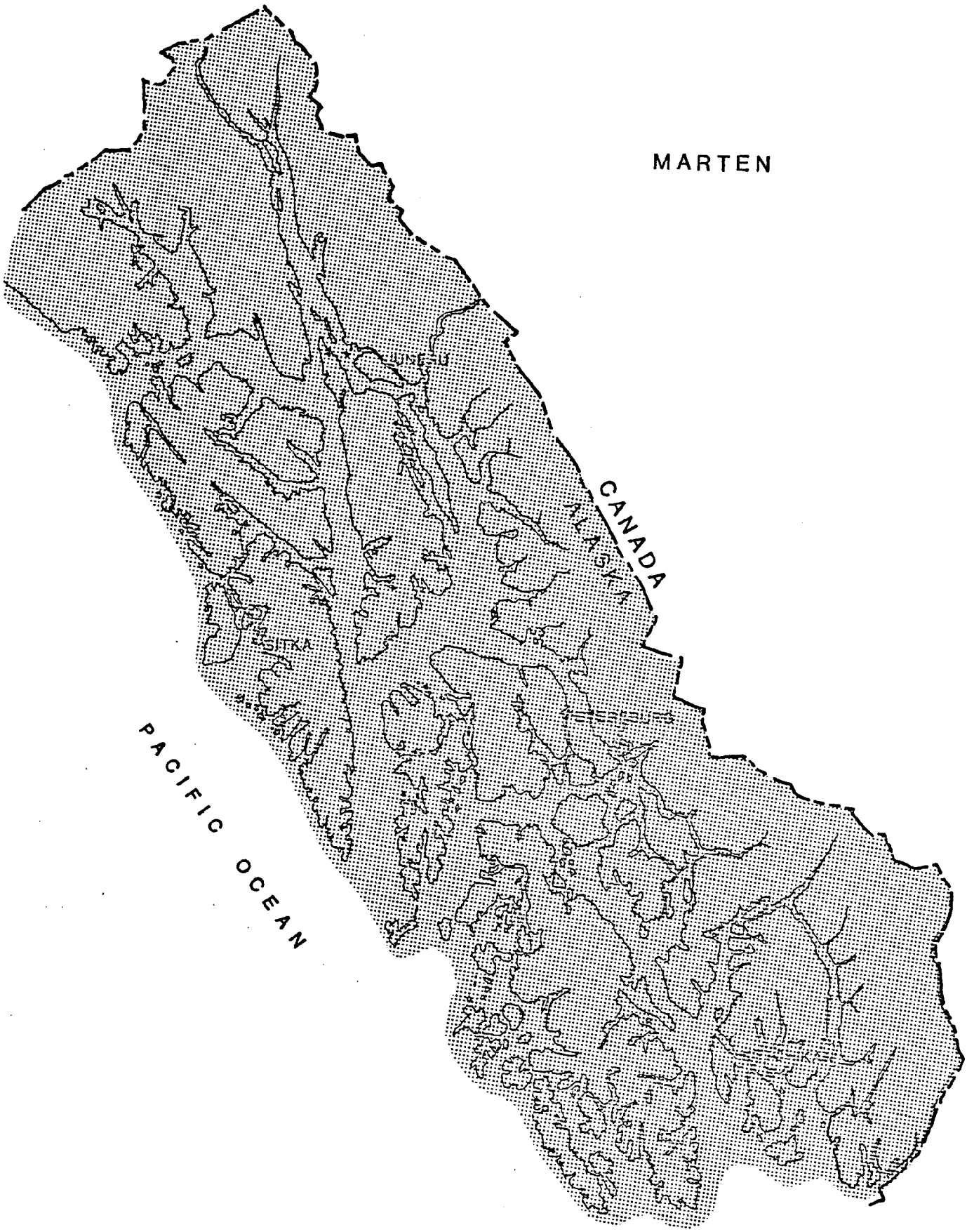
The marten is one of the most important furbearers in Alaska. Prior to 1973, the annual statewide harvest averaged 8,000 animals. Following an increase in fur prices, however, trapping pressure increased substantially. Statewide, the current average value of a prime pelt is $45 (Seattle Fur Exchange, February, 1977). Although trapping pressure often influences local marten densities, loss of habitat has a greater influence on overall numbers.

Units 1-4

Marten are present throughout the coastal forests of the mainland and on many islands in southeastern Alaska. In 1934, ten marten were released on Prince of Wales Island in Unit 2 and seven on Baranof Island in Unit 4 (Elkins and Nelson, 1954). Between 1949 and 1952, marten were also established on Chichagof Island in Unit 4 (Elkins and Nelson, 1954). Southeastern Alaska marten currently appear to be relatively abundant in both their native and introduced ranges. Although primarily a forest animal whose food consists chiefly of small mammals, marten often occur along the shorelines where they forage on marine invertebrates. It is anticipated that future logging operations throughout southeastern Alaska could reduce marten habitat and thus reduce marten densities in this region. Much of the marten trapping in southeastern Alaska is recreational trapping. Marten are often observed near shoreline campsites throughout this area and thus provide viewing opportunities for wildlife observers.

Related species:

Another Mustelid, the fisher (Martes pennanti), has been reported from the extreme southern Alaska Panhandle (Manville and Young, 1965). No further information is available on this species.


MARTEN
CANADA
ALASKA
PACIFIC OCEAN

MINK

The mink (Mustela vison), a member of the family Mustelidae, is one of the most important furbearers inhabiting Alaska. Mink occur throughout the entire State except for most of the Arctic slope, the offshore islands of the Bering Sea, the Aleutians west of Unimak and the Kodiak group. Preferred mink habitats include wetland areas associated with streams, ponds and marshes, and coastal beaches. However, during periods when microtine rodent and hare populations are abundant, mink often move inland in search of these prey species.

Mink utilize a wide variety of food resources which include fish, birds, eggs, small mammals and invertebrates. Of the small mammals, snowshoe hares, microtine rodents and muskrats are commonly consumed. Their diet varies both regionally and seasonally relative to prey availability.

In Alaska, mink breed from March through late April. Some latitudinal variability in breeding occurs, with southern populations generally breeding two weeks earlier than northern populations. Gestation varies from 40 to 75 days, with an average of 51 days. This great variability is a result of delayed implantation which is characteristic of many of the mustelids. Parturition usually occurs during mid-June. The average litter is five, with a range of from four to ten. This variability in litter size is related to prey density. Mink become reproductively mature at one year of age.

Mink are harvested by trapping and provide a source of income and recreation for many Alaskans. In a single year, the combined income

generated from mink trapping exceeded one million dollars (Burns, 1968). The average statewide value of a mink pelt is currently $33 (Seattle Fur Exchange, February, 1977). The highest quality mink found in the State occur in the Yukon-Kuskokwim Delta.

Units 1-4

Mink are present throughout southeastern Alaska. Densities within this region are not uniform, however, but vary according to the availability of suitable habitat. Throughout Southeastern, most mink populations are confined to the small band of habitat (approximately 100 yards deep) which includes the forest-beach edge. The most suitable foraging habitats in southeastern Alaska are relatively steep, rocky beaches. These areas are highly productive foraging sites since they support high densities of intertidal marine invertebrates (the primary prey item of coastal mink). These rocky beaches also provide adequate security cover. Shorelines with long, sloping beaches or bluffs do not provide either the amount of forage or cover needed to support high density mink populations. Areas above suitable beaches which contain abundant den sites, such as rock crevices and root cavities, are the most critical denning habitats.

In general, mink densities in southeastern Alaska are much higher than interior Alaska. This is primarily because southeastern mink populations are not food limited to the extent that interior populations are. Track counts along the beaches of Duncan Canal have indicated pre-harvest densities of 20 mink per mile of beach (A.D.F.& G., 1976). The mink harvest in some portions of Southeastern may often reach 10 to

15 animals per mile of beach. Such trapping pressure could potentially reduce population densities. Sport trapping near Ketchikan may presently be heavy enough to limit mink populations in that area. Trapping is relatively light in other areas, however.

MINK
CANADA
ALASKA
PACIFIC OCEAN

SHORT-TAILED WEASEL

Short-tailed weasels or ermine (Mustela erminea) occur throughout Alaska except for the offshore islands of the Bering Sea and the Aleutian Islands west of Unimak. Short-tailed weasels prefer forested or brushy areas in broken terrain. They occur, however, throughout a wide range of habitats.

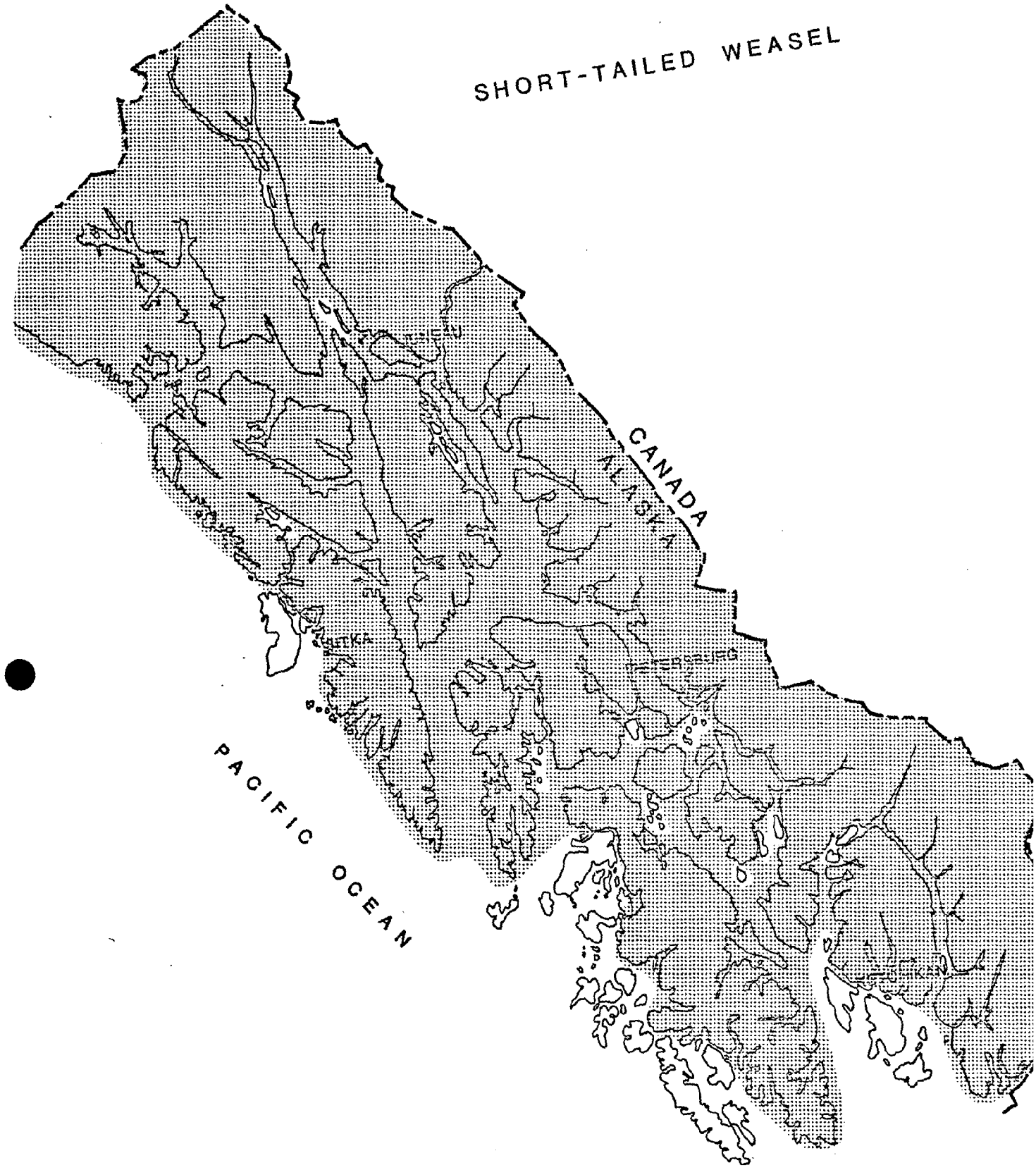
The primary prey of the short-tailed weasel includes microtine rodents, shrews and mice. Other prey items included in their diet consist of birds, eggs, young hares, pikas, insects and fish. Predators of the shore-tailed weasel include owls, hawks, falcons, lynx, fox, coyotes and mink.

Short-tailed weasels usually breed during their second summer. Parturition takes place during April or May, following a ten-month gestation period. Litter size usually ranges between four and eight young.

As a furbearer, short-tailed weasels are not of major importance. They are usually taken incidental to the trapping of other furbearers. The value of the average pelt is generally worth about $1.

Units 1-4

Short-tailed weasels occur throughout the mainland and major islands of southeastern Alaska. Their distribution on the smaller islands, however, is not well known. This species appears to be relatively common in Units 1 and 3. Weasel trapping is minimal. They are taken most often in conjunction with marten trapping.


SHORT-TAILED WEASEL
CANADA
ALASKA
SITKA
PACIFIC OCEAN

LEAST WEASEL

Least weasels (Mustela rixosa) occur throughout most of the State except the offshore islands of the Bering Sea, the Aleutians west of Unimak Island, the Kodiak Island area and most islands in southeastern Alaska. This weasel is sparsely distributed throughout its range except along the Arctic Slope where it becomes abundant, especially during periods of high microtine rodent populations. Least weasels occur throughout a variety of habitats, including forest and tundra.

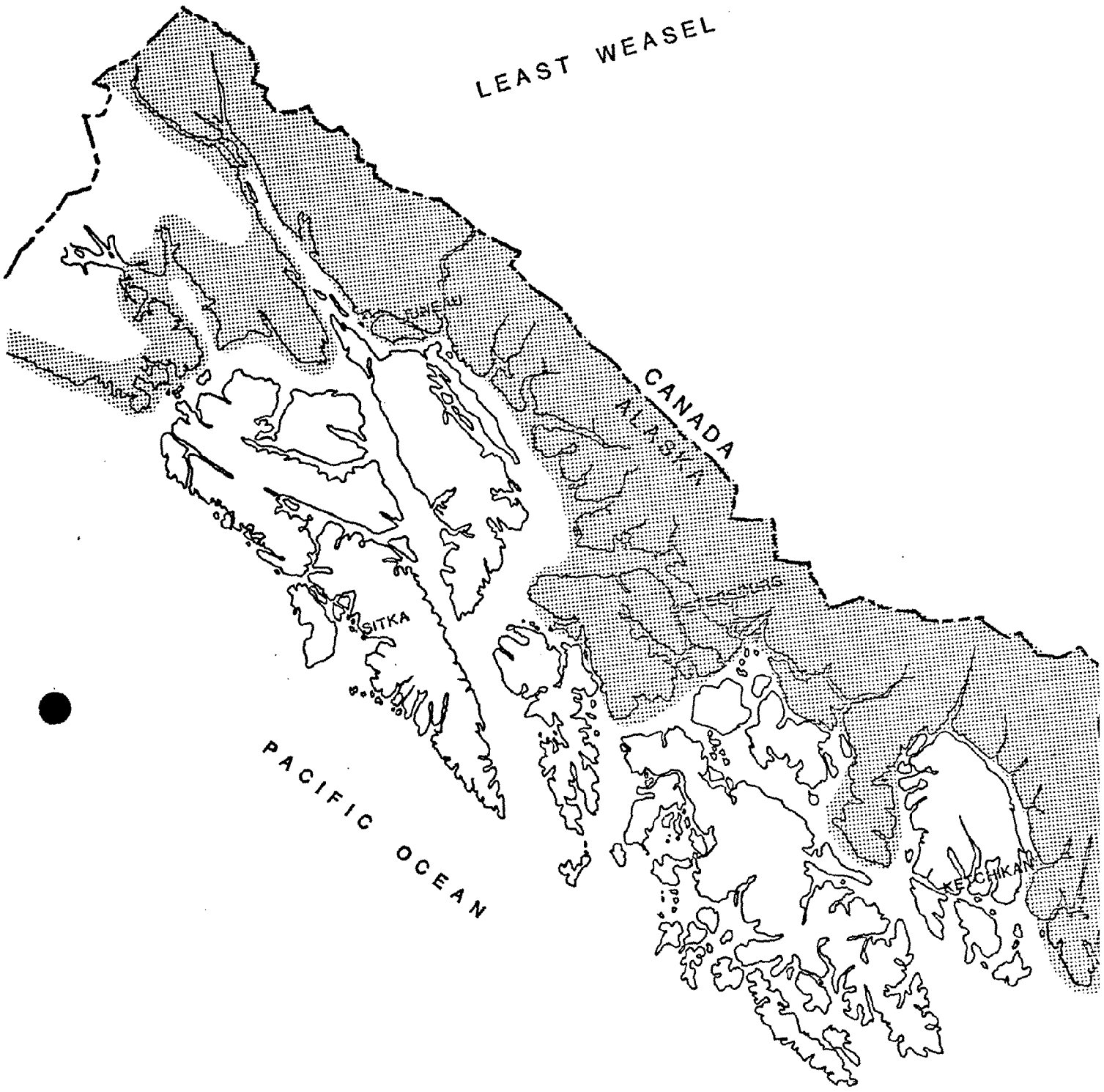
Least weasels prey primarily on mice and voles. They also feed on birds, insects and worms. Five young are usually born during the spring. Owls, hawks and a variety of mammalian predators prey on the least weasel. Their population densities, however, are probably most influenced by prey abundance. Trapping of this species is minimal.

Units 1-4 *

Least weasels occur in Unit 1 along the entire mainland of southeastern Alaska and have occasionally been reported on the islands within Unit 3.

Least weasels are not known to occur on the islands in Units 2 or 4.

* (Harry Merriam, A.D.F.& G., Area Biologist, Petersburg, pers. comm.)


LEAST WEASEL
CANADA
SITKA
PACIFIC OCEAN
KETCHIKAN

LAND OTTER

The land or river otter (Lutra canadensis) occurs in suitable habitat throughout Alaska except for most of the area north of the Brooks Range, the Aleutian Islands west of Unimak and the offshore islands of the Bering Sea. Preferred otter habitat includes areas associated with streams and rivers or coastal marine shorelines. Consequently, otters are most abundant statewide in the Yukon-Kuskokwim River Deltas and in the southcentral and southeastern coastal regions. Throughout the coastal areas, otter populations are relatively stable since food is usually abundant in these marine environments.

The food habits of land otters are varied. In the interior, they prey on freshwater fishes, frogs, birds, small mammals and insects, as well as consuming some plant material. On the coast, however, their diet also includes a variety of marine invertebrates such as shellfish and crustaceans, saltwater fishes and marine birds.

In Alaska, land otters usually breed during May. Following a gestation period of between nine and thirteen months (like most mustelids, otters undergo delayed implantation), the young are born between February and June. One to six (an average of three) young are usually born in an underground den.

Land otters are trapped commerically in many parts of the State. A prime pelt currently averages $76 on the fur market (Seattle Fur Exchange, February, 1977). Most of the harvest is taken from the southeast, southcentral and Yukon-Kuskokwim Delta regions. Land otters are also an important nonconsumptive resource in terms of providing photography and viewing opportunities.

Units 1-4

Land otters occur throughout the mainland and on islands in southeastern Alaska. Otter populations have remained stable throughout this region for many years. Currently, the most abundant populations appear to occur in Units 3 and 4. Otters are, however, relatively abundant throughout the entire region. Within this region, land otters inhabit streams, lakes and coastal shorelines. The most important habitat here is the marine intertidal community where they forage on an abundant source of marine invertebrates, bottom fish and sometimes marine birds. Preferred denning sites appear to be timbered points of land around shallow bays.

Commercial trapping of land otters in this region has remained relatively stable. Although overtrapping may sometimes occur near the larger towns and villages, it is not a problem throughout most of the area. Land otters provide excellent viewing opportunities for many people, especially near the coastal communities.

LAND OTTER
CANADA
ALASKA
PACIFIC OCEAN

BEAVER

The beaver (Castor canadensis), a large aquatic rodent, is widely distributed over most of the North American Continent. Beavers occur throughout most of the State of Alaska south of the Brooks Range. They do not occur in the Aleutians or in the far western portion of either the Seward or Alaska Peninsulas, and they only occasionally occur on the Kuskokwim Delta. Beavers occur from sea level up to 4,000 feet along slow moving rivers, streams and lakes where willow, aspen, birch, poplar and cottonwood are present.

Beavers consume a variety of vegetation, including the leaves and bark of deciduous trees and shrubs, as well as roots and stems of aquatic vegetation and sedges. Conifers are also used occasionally in some areas. During spring and early summer succulent plants are consumed, while during fall and winter beavers are limited primarily to the bark of shrubs and trees. Beavers seem to prefer aspen, although willow is probably the most important forage staple. Birch, cottonwood and poplar are also important forage species. Most beaver colonies collect a winter food supply during the fall. This food supply is usually placed in a winter storage pile anchored in the mud on the bottom of the pond near the beavers' lodge.

Beavers are well known for their construction of dams and lodges. These are usually built of mud and sticks on slow moving streams. Most of this activity occurs at night or during dawn and dusk. A beaver colony, consisting of a pair of adults, young of the year and yearlings, generally occupies a single lodge. Not all beavers build winter lodges

or dams, however. Some simply burrow into the banks of streams or lakes.

Adult beavers breed from January through March. Their gestation period is believed to be around 100 days. Parturition occurs from late April to late June, with the average litter generally consisting of four kits. During spring, the two-year-old kits are driven from the colony. They soon disperse and generally form colonies of their own.

As one of the State's most valuable furbearers, beavers played an integral part in Alaska's history. Beaver pelts and castoreum were extensively exported during both the early Russian trade and later under U.S. Territorial status. Following American occupation, beavers were harvested to the point that their populations declined to low levels, and the taking of beavers was eventually prohibited in 1910. The beaver season was opened in 1921, and more than 16,000 beavers were harvested before the season was again closed in 1922. The Alaska Game Commission reopened the season in 1926 with an annual limit of 20 beavers. From 1926 to 1929, about 60,000 beaver pelts were exported from Alaska. Since 1932 to the present, beaver seasons have been regulated according to the regional abundance of these animals. Although the value of beaver pelts has not risen at the same rate as other furs, beavers are still considered one of the State's most important furbearers. Currently the average pelt is valued at $30 (Seattle Fur Exchange, February, 1977). Since 1957, beaver pelts have been sealed and measured. This has provided annual harvest statistics, as well as the age structure of the harvest. A harvest of over 20 percent kits in any given area generally reflects an overharvested population.

The nonconsumptive value of beavers for viewing and photography is relatively high throughout many areas of the State. Beavers are also valuable in that their dams create water impoundments which are often beneficial to many other wildlife species.

Unit 1

Beavers occur throughout Unit 1 where they are confined primarily to the major river systems. The Stikine and Taku River systems support large numbers of beavers. Extensive freshwater marsh areas and deciduous woodlands are characteristic of both these areas. Beavers are also abundant in the Chickamin River Valley between the South Fork and Leduc Rivers where they have been observed all the way to the Chickamin Glacier. They are moderately abundant in the Unuk River drainage and less numerous on the Salmon River near Hyder. Over the past 10 years, beaver populations in this unit have remained relatively stable.

In recent years, limited trapping has been conducted in the Chickamin and Unuk River drainages. Trapping pressure is minimal in the Stikine and Taku Rivers because late breakup results in a relatively unproductive harvest. The harvest statistics for Units 1, 2, 3 and 4 are presented in Table 6 . Although there is little domestic use of beavers in southeastern Alaska, probably 50 percent of the trapping effort is primarily recreational.

Units 2 and 3

Although beavers occur on many islands in Units 2 and 3, aside from harvest figures (presented in Table 6), little information is

available on their status there. Generally, island distribution of beavers appears to be dependent on the size and isolation of the island, as well as whether or not there is suitable habitat present. Beaver distribution on the smaller islands is not well known.

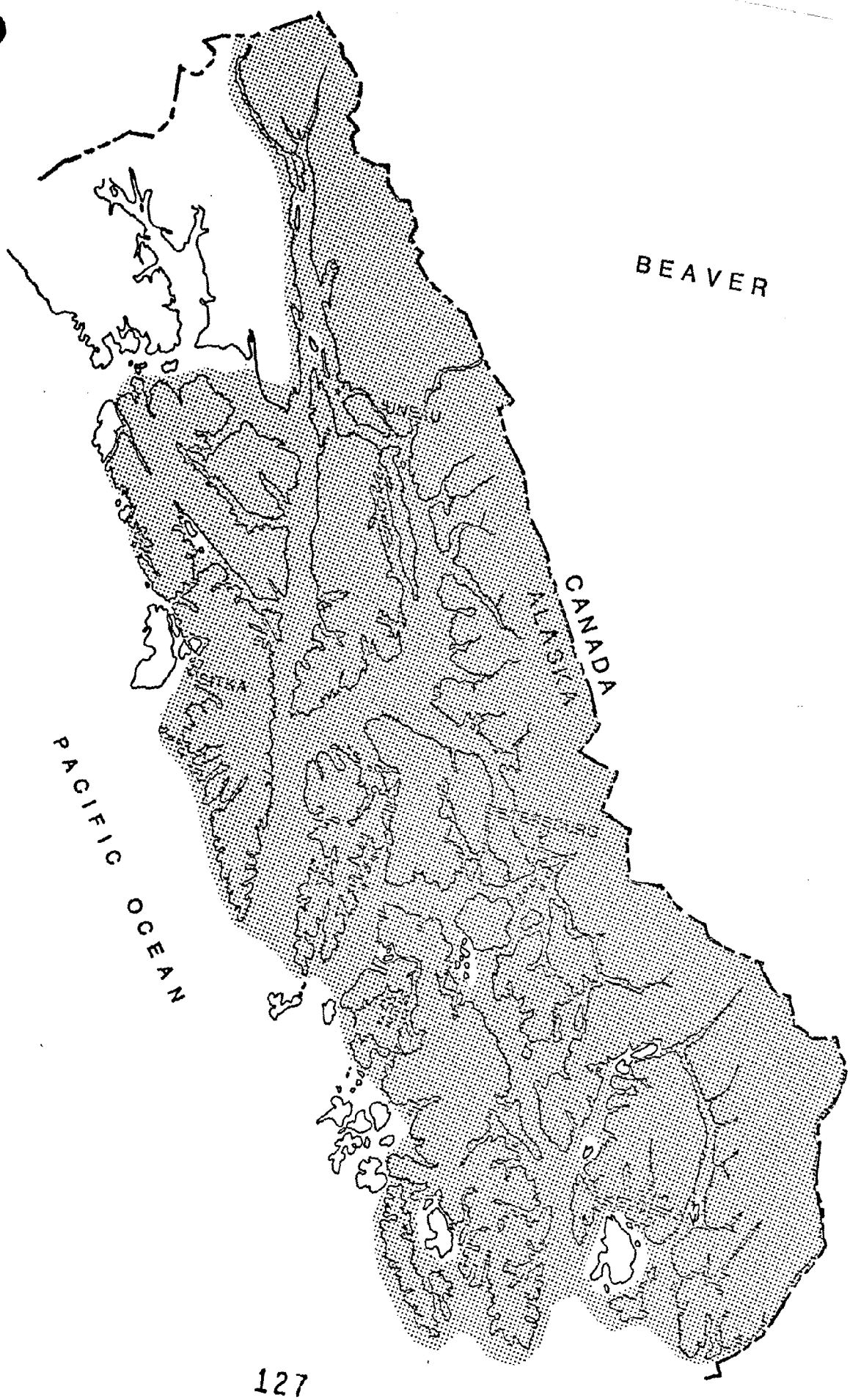
Unit 4

Beavers were introducted to Baranof Island near Goddard Hot Springs in 1927 (Elkins and Nelson, 1954). This transplant resulted in a small beaver population which now inhabits Baranof Island. Beavers also occur on Chichagof and Admiralty Islands. Beavers are not considered an important furbearer in this unit. Harvest figures have been presented in Table 6.

Table 6. Beaver Affidavit Analysis, 1969-1975.

Game Mgmt. Unit	Year	Limit	% Kits (Under 54")	% Kits and Yearlings (Under 59")	% Adults (Over 59")	Total No. of Beaver	No. of Trappers	Average No. Beaver/Trapper
1	1969	No limit	15.1	41.1	58.9	75	9	8.3
	1970	No limit	15.2	38.0	62.0	165	24	6.8
	1971	No limit	15.5	25.0	75.0	84	7	12.0
	1972	No limit		20.0	80.0	5	3	1.7
	1973	No limit	7.3	20.0	80.0	169	18	9.4
	1974	No limit	9.4	28.3	71.8	154	19	8.1
	1975	No limit*	14.1	26.9	70.4	81	14	5.8
2	1969	No limit	8.7	39.1	61.2	23	4	5.8
	1970	No limit	21.4	52.4	47.6	42	6	7.0
	1971	No limit	20.0	40.0	60.0	5	1	5.0
	1972	No limit		66.7	33.3	3	1	3.0
	1973	No limit	40.8	66.7	33.3	27	4	6.7
	1974	No limit	7.7	45.5	54.5	22	4	5.5
	1975	No limit	37.5	37.5	62.5	12	4	3.0
3	1969	No limit	No harvest reported					
	1970	No limit	30.6	45.1	54.9	62	5	12.4
	1971	No limit	40.0	60.0	40.0	20	1	20.0
	1972	No limit	25.0	50.0	50.0	8	3	2.7
	1973	No limit	44.5	44.5	55.5	9	5	1.8
	1974	No limit	No harvest reported					
	1975	No limit	No harvest reported					
4	1969	No limit	33.3	66.6	33.4	3	2	.6
	1970	No limit	50.0	80.0	20.0	10	2	5.0
	1971	No limit	No harvest reported					
	1972	No limit			100.0	1	1	1.0
	1973	No limit*		100.0		1	1	1.0
	1974	No limit*				1	1	1.0
	1975	No limit*	No harvest reported					

* Unit was divided with closed areas.


BEAVER
CANADA
KLUKWAN
JUNEAU
SITKA
PACIFIC OCEAN

MUSKRAT

Muskrats (Ondatra zibethicus) occur throughout most of the Alaskan mainland except the Arctic Slope north of the Brooks Range. They are relatively sparse, however, throughout the southeastern portion of the State. Muskrats inhabit water-associated areas bordering fresh and saltwater marshes, rivers, streams and lakes. However, they sometimes travel several miles from water.

Muskrats feed on a variety of material including sedges, aquatic plants, invertebrates and fish. They construct houses out of vegetation and sometimes nest in association with beavers. Muskrats begin breeding in March or April. Their gestation period is approximately thirty days. They usually produce two litters per year, with an average of six young per litter.

High mortality is characteristic of most muskrat populations. The mink is the primary predator of the muskrat. In the interior, muskrat populations are also influenced by extreme winter temperatures which cause many lakes and ponds to freeze solid. For example, during winters when ice thickness of five feet or more is common, muskrat populations throughout the interior are substantially reduced.

The muskrat is an important furbearer in Alaska in terms of total numbers taken. Approximately 40,000 are harvested annually - more than any other furbearer. Although the muskrat season begins in November and terminates in June, most animals are taken during the last six weeks of the season. Eighty percent of muskrats harvested in Alaska are taken by shooting with a .22 caliber rifle. Statewide, only a small proportion of good muskrat habitat is hunted or trapped.

Units 1 and 2

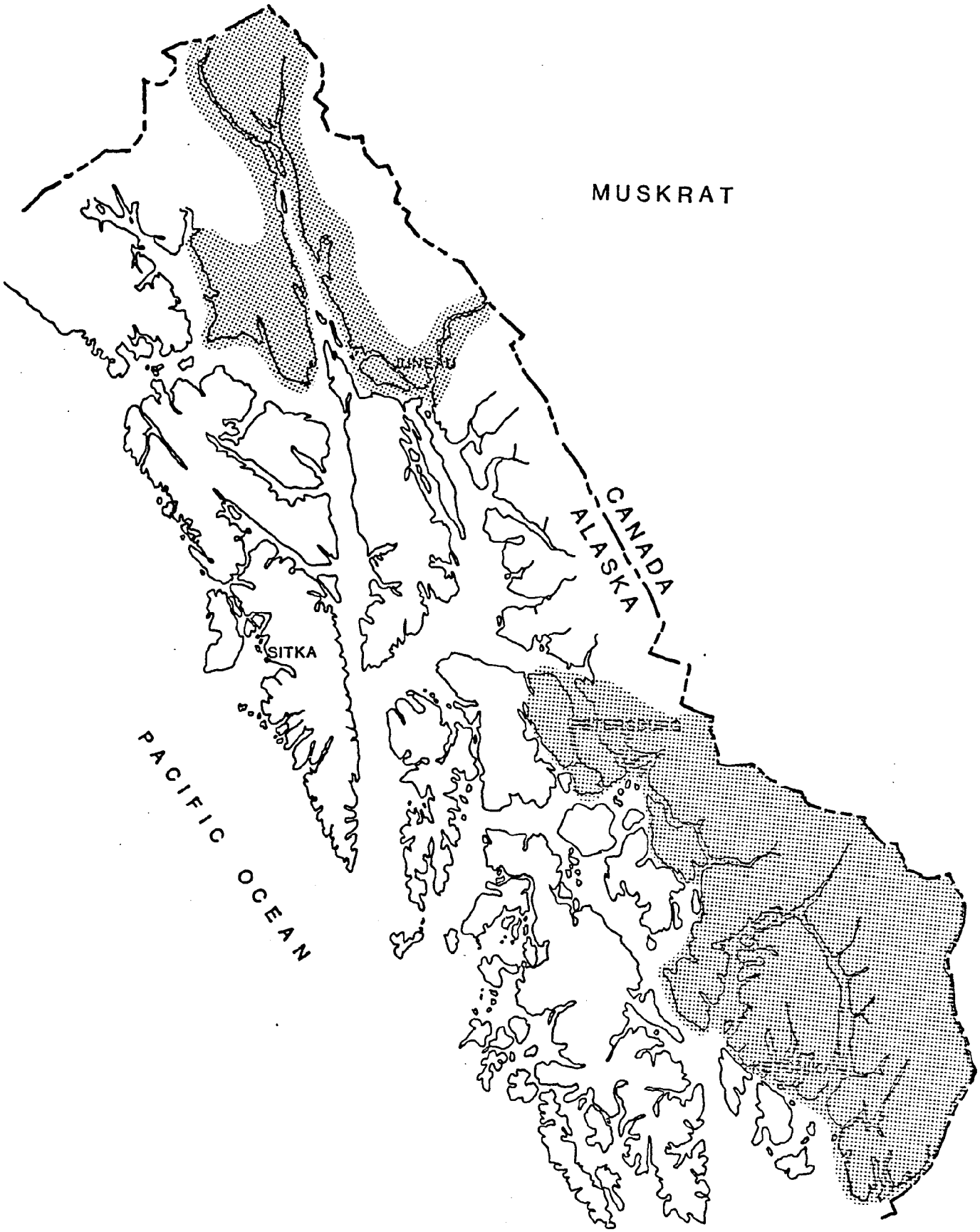
Muskrats occur throughout the southeastern mainland (Unit 1) in isolated pockets. They are not common anywhere in this region but are found most regularly where beaver occur. Although muskrats were introduced to Prince of Wales Island (Unit 2) in 1929 and 1930, they did not become established there. Muskrats are harvested only occasionally, primarily in conjunction with beaver trapping. No other information is currently available on the status of muskrats in this region.

Unit 3

Isolated muskrat colonies occur on Mitkof, Kupreanof and Wrangell Islands in Unit 3.

Unit 4

Muskrats do not occur in Unit 4.


MUSKRAT
JUNEAU
CANADA
ALASKA
SITKA
PACIFIC OCEAN

MARMOT

The hoary marmot (Marmota caligata) inhabits the mountainous regions of mainland Alaska. It prefers talus slopes bordering meadow vegetation, near or above timberline.

Marmots are herbivores. They consume a variety of green vegetation, including tender stems and leaves of grasses and forbs. Marmots breed shortly after they emerge from hibernation. Following a gestation period of approximately one month, a single litter is produced which numbers three to eight young. During the summer, marmots accumulate fat which enables them to enter their winter hibernation in a burrow under the snow. Their primary predators include golden eagles, coyotes, wolves and wolverines.

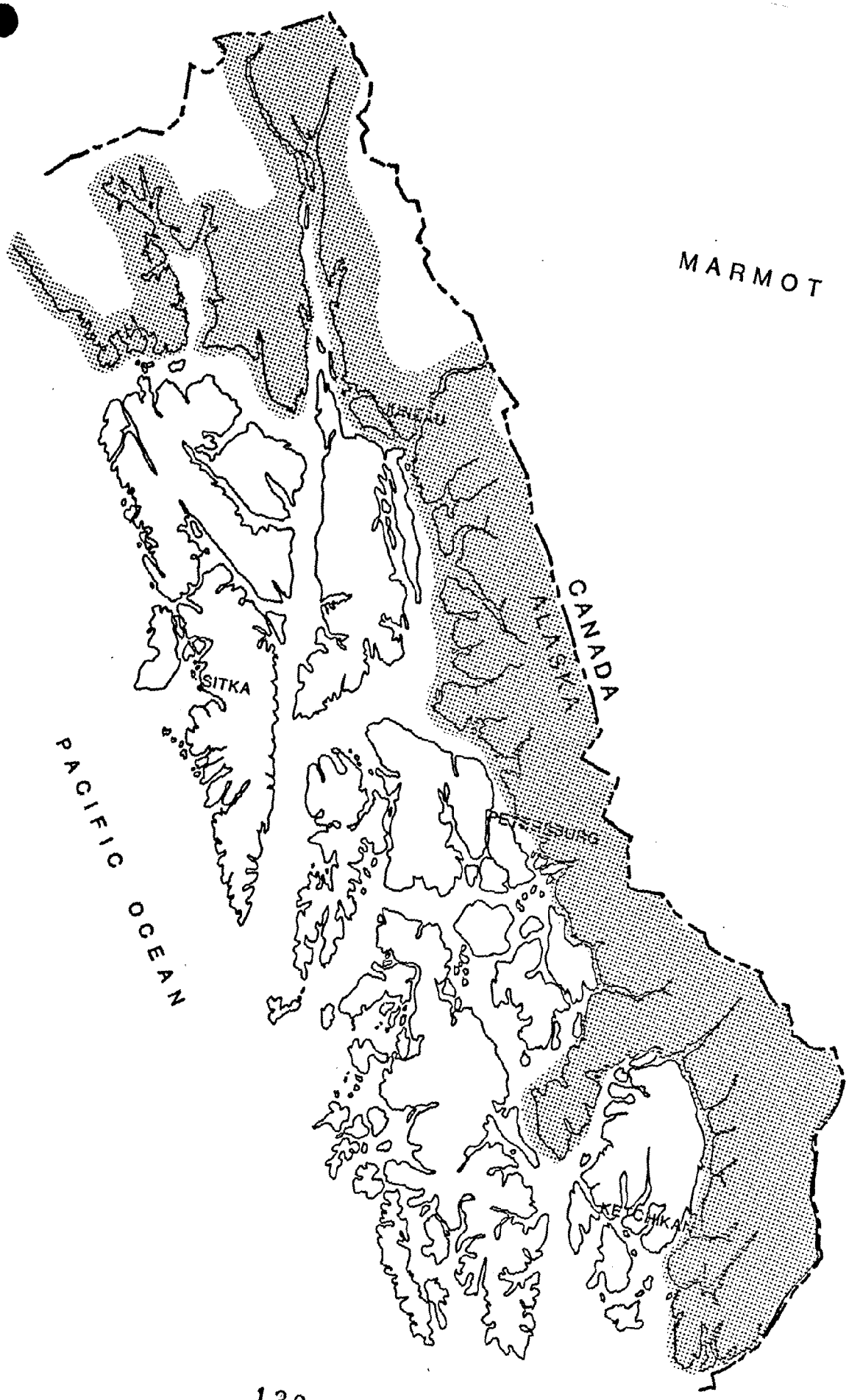
Although marmot fur is sometimes used locally for parka trim, there is no commercial market for their fur. Where these animals are abundant, they provide viewing and photographic opportunities for the wildlife observer.

Unit 1

Hoary marmots occur throughout suitable alpine habitat along the mainland portion of southeastern Alaska (Unit 1). No additional information is available on their distribution or abundance within this unit.

Units 2, 3 and 4

Hoary marmots are not known to occur in these units.


MARMOT
CANADA
ALASKA
SITKA
PACIFIC OCEAN
KETCHIKAN

RED SQUIRREL

Red squirrels (Tamiasciurus hudsonicus) inhabit most of forested Alaska, principally throughout the coniferous forests. They do not occur north of the Brooks Range, on most of the Seward Peninsula, the Yukon-Kuskokwim Delta or the lower portion of the Alaska Peninsula approximately south of the Naknek River.

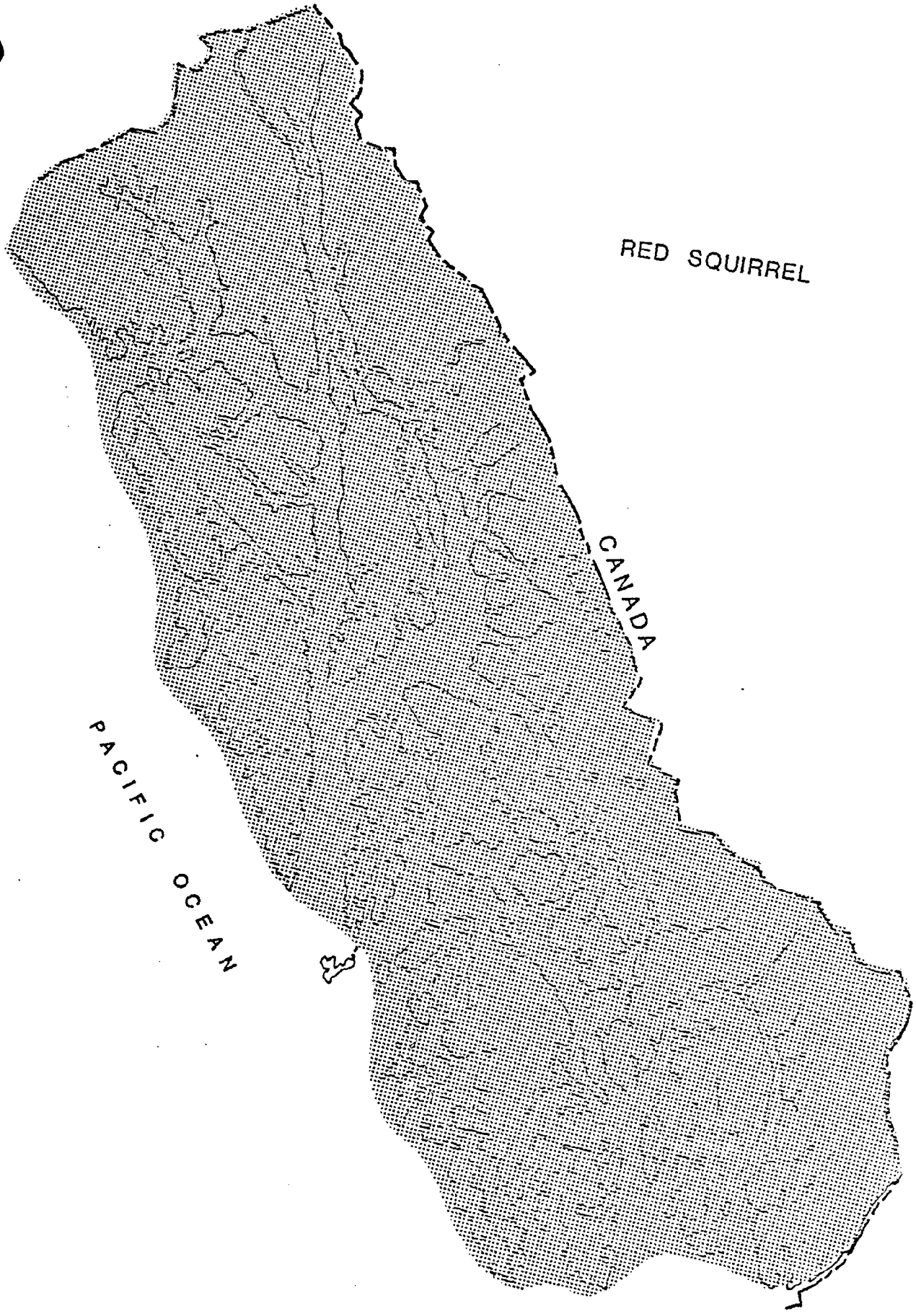
Throughout most of interior Alaska the primary food item of the red squirrel is the seed of the white spruce, whereas throughout the coastal forest it is presumably the seeds of Sitka spruce. They also utilize seeds and leaf buds of other conifers and hardwood trees. Red squirrels produce one litter per year, averaging four young per litter. Breeding usually occurs during late April or May, with parturition occurring during late May or June. Predators include marten, fox and raptors. A few squirrels are hunted or trapped, while many provide viewing and photography opportunities for the noncomsumptive user.

Units 1, 2 and 3

Red squirrels occur throughout the spruce-hemlock forests of the southeastern Alaska mainland and islands. However, knowledge of their occurrence on many of the smaller islands is still incomplete. There is currently no information on their abundance within these units. They are occasionally hunted for recreation within this area.

Unit 4

Red squirrels apparently were not native to the islands of Unit 4. They were introduced to Baranof and Chichagof Islands around 1930 (Elkins and Nelson, 1954). Red squirrel populations are currently well established on both of these islands. Although they have been reported from Admiralty Island (McGregor, 1958), they are presently not commonly observed there.


RED SQUIRREL
CANADA
PACIFIC OCEAN

NORTHERN FLYING SQUIRREL

The northern flying squirrel (Glaucomys sabrinus) is a seldom-observed, nocturnal tree squirrel. It occurs throughout the boreal forests of Alaska, preferring open stands of mixed deciduous-coniferous forests. The range of this species in Alaska is poorly defined since it is so seldom observed.

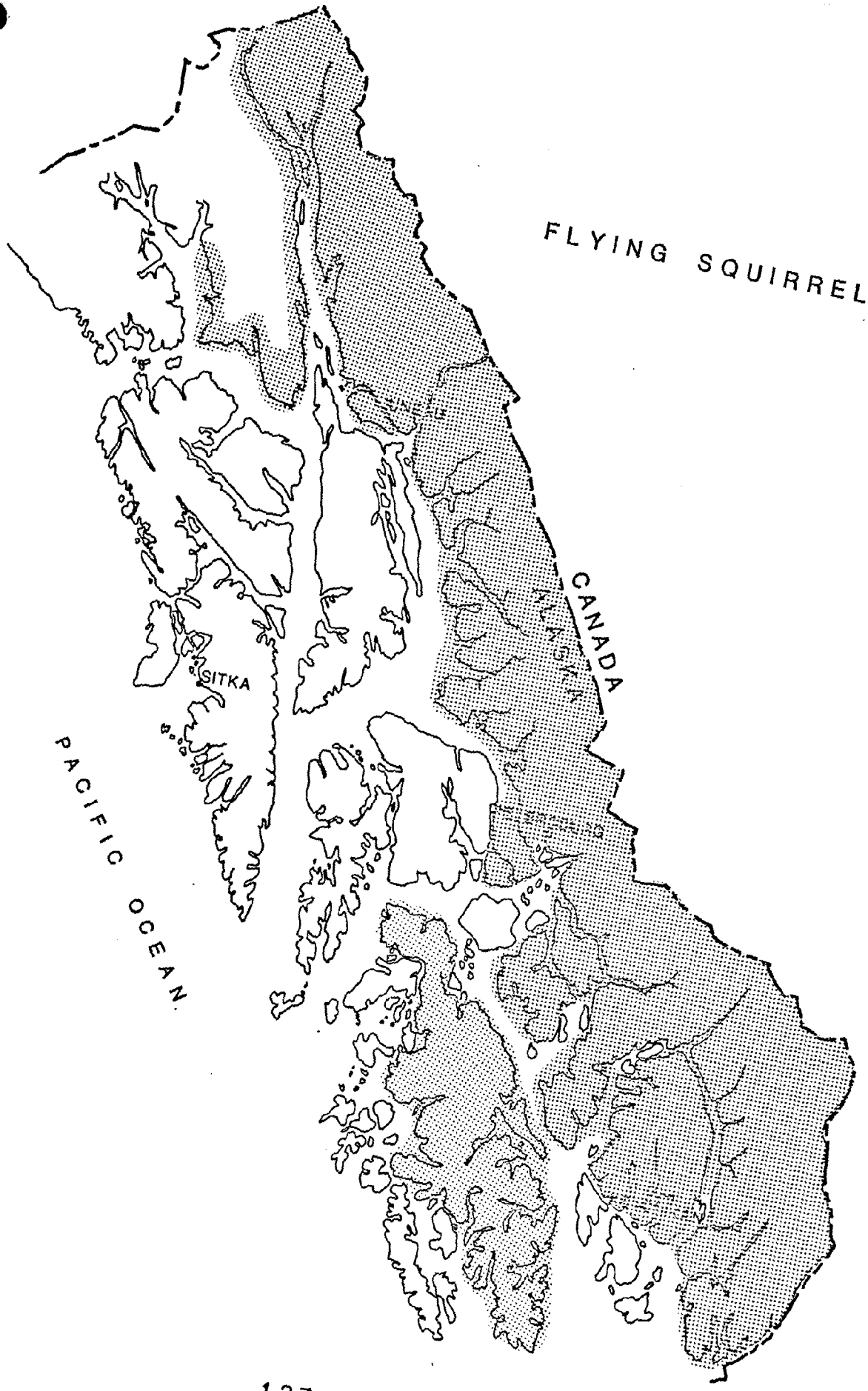
Flying squirrels forage at night, both in trees and on the ground. Their diet includes arboreal lichens and buds, leaves, seeds, fruits and nuts, as well as insects, birds and eggs when available. They also sometimes feed on carrion.

Flying squirrels produce one litter per year, which averages three young usually born in May. These squirrels are generally quite sociable, and are often found together in small groups.

Although flying squirrels are often caught in marten traps, they are of no value as a furbearer. Consequently, many trappers consider them a nuisance.

Units 1, 2, 3 and 4

Flying squirrels occur throughout the forests of mainland southeastern Alaska. They have also been reported from Prince of Wales, Etolin, Mitkof, Wrangell and Revillagigedo Islands (McGregor, 1958). Information on this species is sparse, however, since they are seldom observed.


FLYING SQUIRREL
CANADA
ALASKA
SITKA
PACIFIC OCEAN

PORCUPINE

Porcupines (Erethizon dorsatum) occur throughout most of the State of Alaska. They are absent or rare on the northern slope of the Brooks Range, the Seward Peninsula, the delta regions of the Kuskokwim and Yukon Rivers and most coastal islands. The porcupine is primarily a forest animal. In Alaska, it inhabits both conifer and deciduous forests, as well as willow thickets along water courses. Occasionally, however, it does wander far from timbered areas.

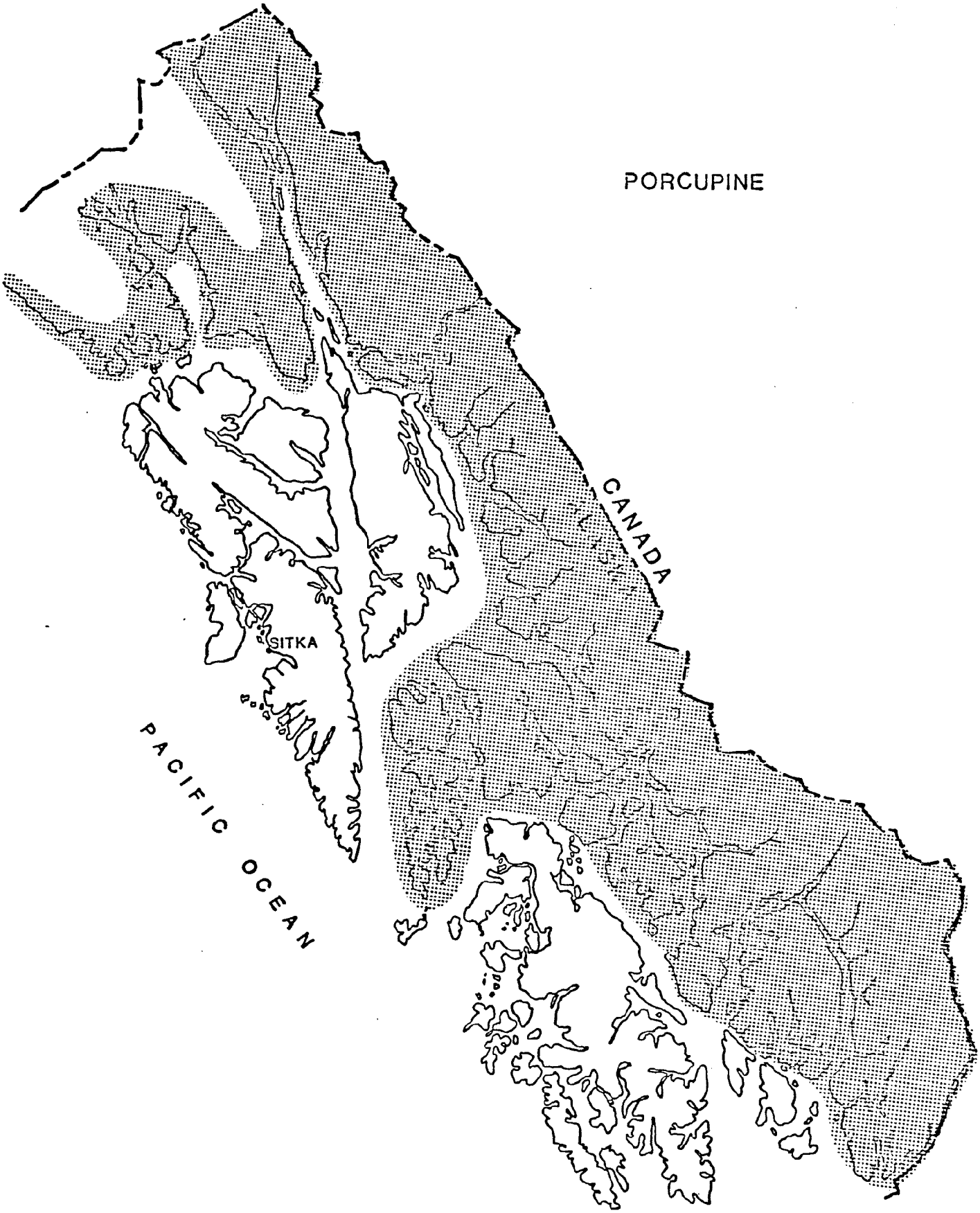
Porcupines feed primarily on the cambium layer (inner bark) of spruce, birch and aspen during the winter. In summer, their diet consists of a variety of green vegetation, including the leaves, buds and twigs of forbs, shrubs and trees. Porcupines are solitary animals and are most active during nocturnal periods. They utilize natural cavities or depresssions for shelter and nesting. Porcupines generally breed during November. Following a sixteen-week gestation period, they produce a single young. Natural predators of the porcupine include wolves, coyotes, fox, lynx and wolverines.

Units 1 and 3

Porcupines occur throughout the southeastern mainland (Unit 1) and on some of the major islands in Unit 3. No other information is currently available on their status in these units.

Units 2 and 4

Porcupines are not known to occur in these units.


PORCUPINE
CANADA
SITKA
PACIFIC OCEAN

RACCOON

The raccoon (Procyon lotor) is not native to Alaska. They were introduced, however, to Singa Island near Prince of Wales Island (Unit 2) in 1941 and to Japonski Island near Sitka (Unit 4) in 1950 (Elkins and Nelson, 1954). Both of these introductions were successful as raccoon populations flourished on these islands and have spread to other islands, including El Capitan and Baranof. Little trapping pressure is exerted on these populations. It is presumed that most raccoon populations in this area are closely tied to the marine intertidal shoreline in terms of food habits.

SNOWSHOE HARE

Two species of hare occur in Alaska, the snowshoe hare and the tundra hare. The snowshoe or varying hare (Lepus americanus) is the most common and widespread of these species. They occur in suitable habitat throughout the State. Snowshoe hares are absent from the lower portion of the Alaska Peninsula, the northern portion of the Arctic coast and most islands. They are relatively sparse in the southeastern portion of the State. During population lows, they are also rare north of the Brooks Range and in the tundra areas of the Seward Peninsula and in the lower Kuskokwim Delta.

Snowshoe hares inhabit a variety of habitat types, including sub-alpine areas, brush lands, white spruce-birch communities, black spruce communities and riparian areas. Habitat types most preferred include aspen and birch communities with brushy understories of willow, alder, highbush cranberry and wild rose, and riparian areas with an abundance of willow. Disturbances such as fire or logging, which increase the abundance of brushy understory species providing cover, usually enhance snowshoe hare habitat.

Snowshoe hares feed on succulent grasses, buds, twigs and leaves during the summer. During winter, they consume the twigs and needles of spruce and the bark and buds of many hardwood species. Hares are generally nocturnal, but forage most actively during dawn and dusk periods. During years when hare populations are high, they often cause extensive range damage by girdling the bark of willows and other browse species. This range deterioration often affects the range conditions for other species such as moose and deer.

Snowshoe hares generally have two or sometimes three litters per year. They breed for the first time at about one year of age and have a gestation period of approximately 36 days. The first litter, usually averaging four young, is born around the middle of May. Females breed shortly after the birth of a litter. The young are usually born on the surface of the ground in an unlined, natural depression usually concealed by vegetative cover. Hares, in contrast to rabbits, are fully furred at birth with eyes open.

The snowshoe hare is a cyclic species. Population peaks usually occur approximately every ten years. During these peaks, population densities sometimes average over 2,000 hares per square mile. Local hare abundance, however, may sometimes vary substantially from the general pattern over a larger geographical area. When populations are high, snowshoe hares are often found occurring in marginal habitat where none occurred during population lows.

Snowshoe hares are an important food resource for many furbearers. They are the primary prey of the lynx, whose populations fluctuate in response to the hare cycle. Hares are also prey for red fox, mink, weasels and great horned owls.

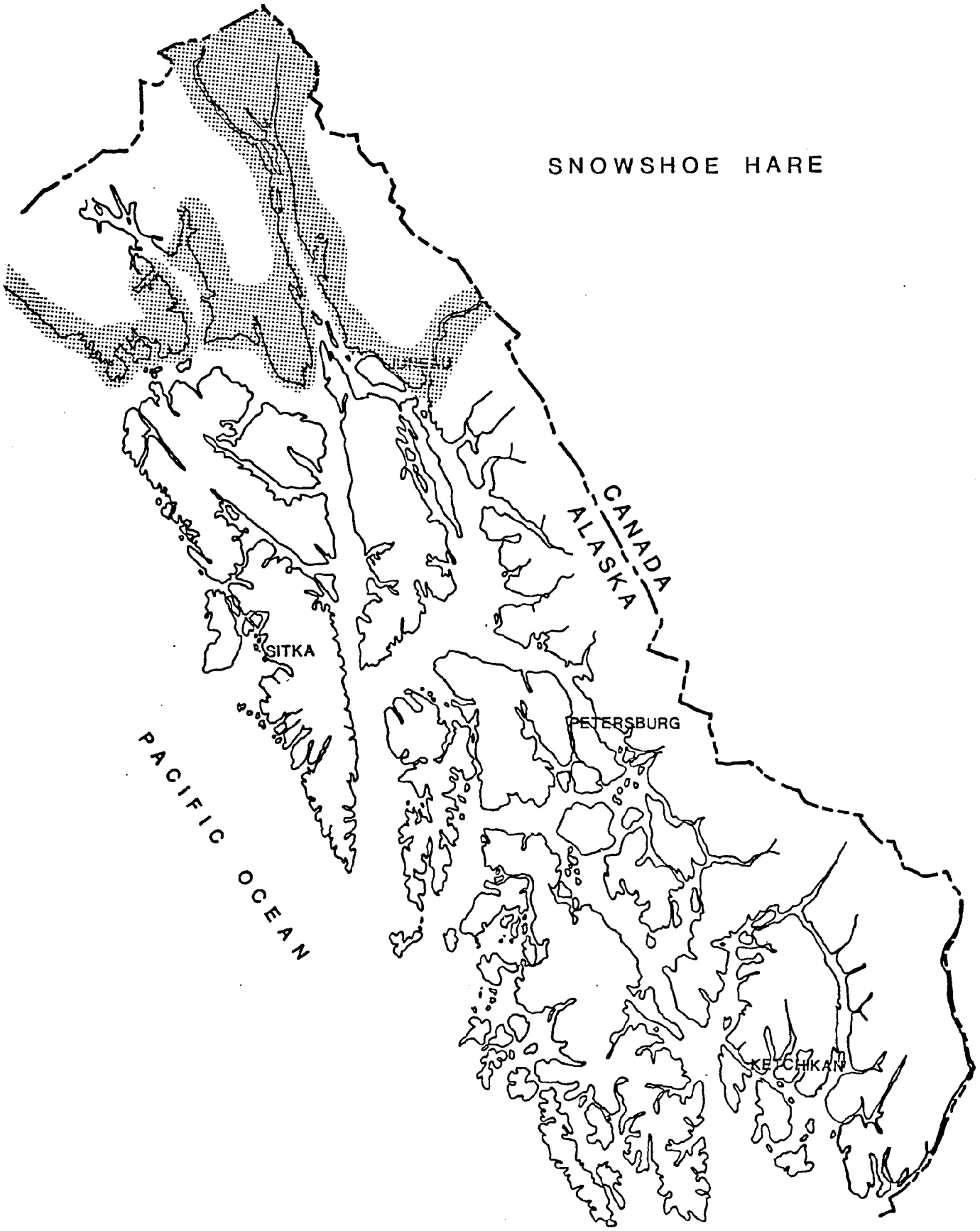
Although snowshoe hares are of little commercial value, during population highs they constitute an important resource for sport hunting and for subsistence use. Most sport hunting occurs during the fall and winter months. This pressure is usually concentrated along road systems near villages and towns. Such harvests, however, do not appear to substantially affect overall hare populations.

Unit 1

Scattered populations of snowshoe hares occur along the northern mainland. The best hare habitat in this region is limited primarily to the Chilkat and Taku river valleys, with an isolated local population in the Mendenhall River drainage near Juneau. Recreational hunting of hares is relatively minimal in southeastern Alaska.

Units 2, 3 and 4

Snowshoe hares do not occur in these units.


SNOWSHOE HARE
CANADA
ALASKA
JUNEAU
SITKA
PETERSBURG
KETCHIKAN
PACIFIC OCEAN

WILLOW PTARMIGAN

Willow ptarmigan (Lagopus lagopus) are the most widely distributed species of ptarmigan in Alaska. Willow ptarmigan occur in suitable habitat throughout most of the State. They are absent from several coastal islands and are uncommon in the broad, forested valleys of the interior and the dense forests of southeastern Alaska. Willow ptarmigan breed close to timberline, often partially within the fringe of the coniferous forest woodland, along stream courses and in riparian shrub communities, usually between 2,000 and 2,800 feet elevation (Jerry McGowan, A.D.F.& G., Game Biologist, Fairbanks, pers. comm.). This species prefers wetter habitats than either the rock or white-tailed ptarmigan. Tall shrubs also appear to be an important feature of good willow ptarmigan habitat.

The primary food of the willow ptarmigan consists of willow. During the summer, they forage primarily on leaves of willow shrubs. Throughout the winter, the buds, twigs and catkins of willow provide over four-fifths of their diet. Other items consumed during the year consist of invertebrates, berries and the flowers and shoots of many herbaceous plants.

During April, male ptarmigan establish and defend a breeding territory. Females arrive later and select a mating area and mate. By late May or early June, they have laid their first eggs. Eggs begin to hatch in late June or early July. Male willow ptarmigan, unlike the other two species of ptarmigan, remain with the female to help care for the young. By late summer, ptarmigan families group together to form

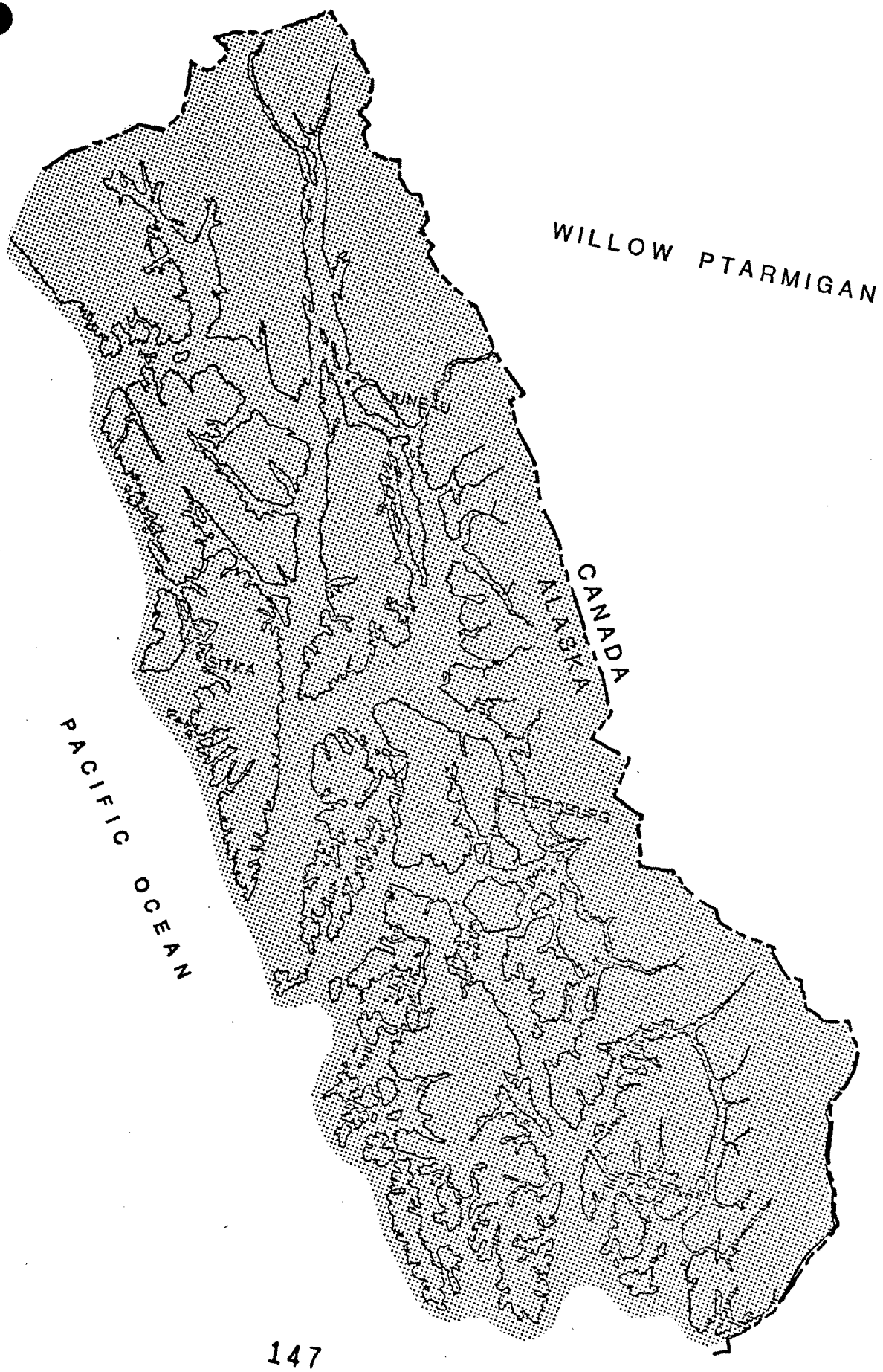
large flocks. By October, the sexes separate as the females move to lower elevations and the males remain near their breeding range. The sexes remain segregated throughout winter until the following breeding season.

Willow ptarmigan populations are characterized by marked fluctuation in population densities, with seven to nine years between peaks. Although these patterns may be evident over a large geographical area, local population densities often vary from the general pattern.

Willow ptarmigan are harvested more heavily than either of the other two ptarmigan species. Sport hunting is mainly confined to the areas around major cities and road systems. The total harvest is greatly influenced by the local density of birds and the abundance of alternative game.

Units 1-4

Willow ptarmigan are the most common and widely distributed species of ptarmigan in southeastern Alaska. They occur throughout the mainland (Unit 1) and the major islands in Units 2, 3 and 4 (Gabrielson and Lincoln, 1959). Knowledge of their distribution on the smaller islands in these units is incomplete. Mainland populations are currently at moderate levels, whereas island populations have never been high. Hunting pressure on this species is minimal throughout its range.


WILLOW PTARMIGAN
CANADA
ALASKA
PACIFIC OCEAN

ROCK PTARMIGAN

Rock ptarmigan (Lagopus mutus), although not as widely distributed as willow ptarmigan, occur over much of the State. They do not occur on the northern Arctic Slope, the offshore islands of the Bering Sea, the Yukon-Kuskokwim Delta, the forested interior valleys, the central portion of the Alaska Peninsula or the islands of southeastern Alaska. Their preferred breeding habitat is the mountainous tundra area, with scattered shrubs and herbaceous vegetation, from timberline to approximately 3,500 feet elevation (Jerry McGowan, A.D.F.& G., Game Biologist, Fairbanks, pers. comm.). Although the range of this species sometimes adjoins that of the willow ptarmigan, rock ptarmigan generally occur in higher elevations which are usually drier and rockier.

During fall, winter and spring, rock ptarmigan feed almost exclusively on the buds and catkins of dwarf birch. A variety of green herbaceous vegetation, insects, berries and seeds make up most of their diet throughout the summer. During April, males select and defend a breeding territory. Females arrive later and begin laying their eggs during late May and early June. By late June and early July, the eggs begin to hatch. Most males move toward the higher ridge tops once incubation is in progress. By late August, females and chicks also move to higher elevations where they join the males in large flocks. Females move down to lower elevations near the forest edge during late September, while males remain on the breeding range throughout the winter. At this time, flocks of each sex move in search of food in a nomadic fashion.

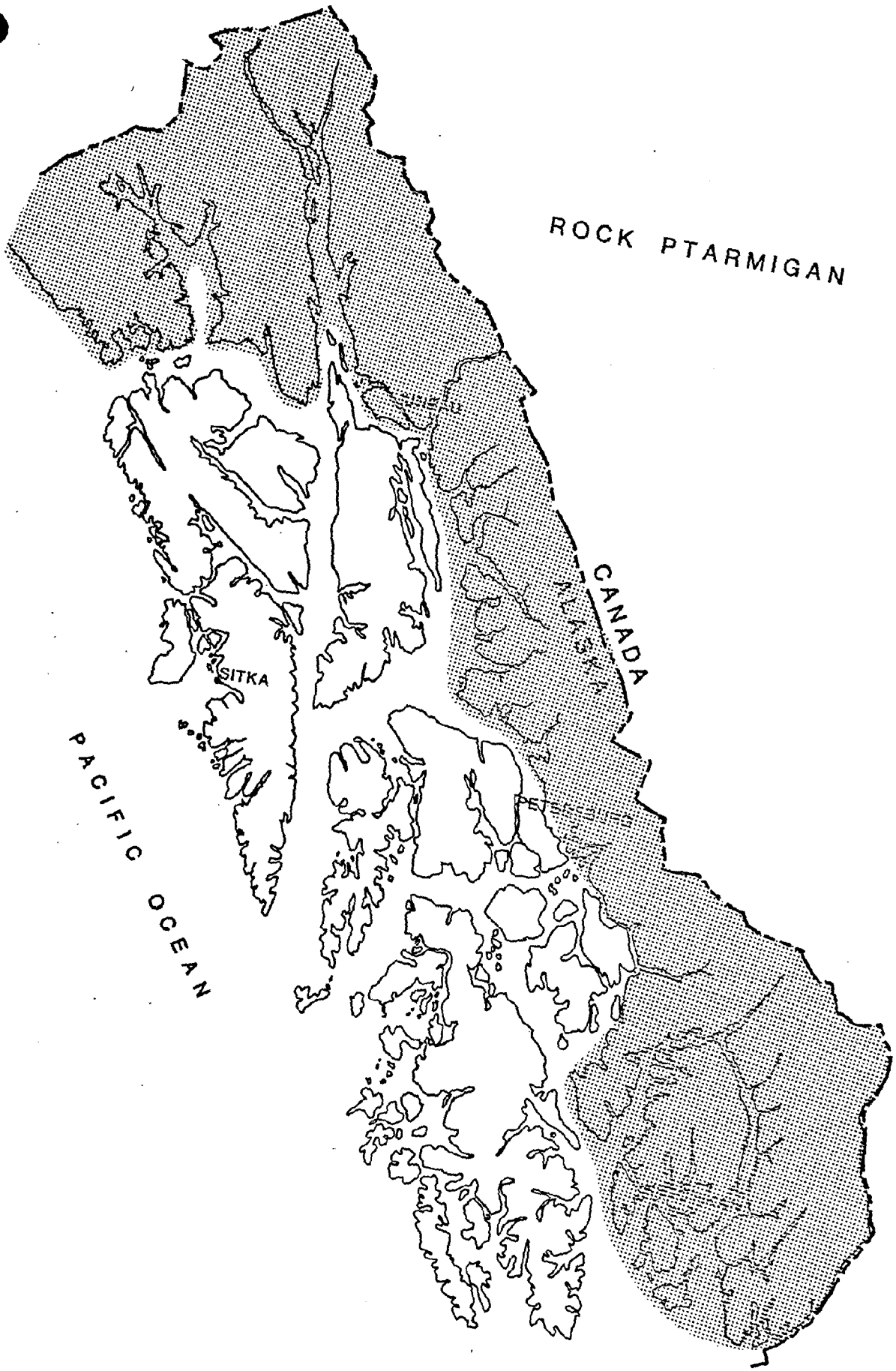
Like the willow ptarmigan, rock ptarmigan populations display periodic fluctuations in numbers. Human harvest of rock ptarmigan is generally lighter than for willow ptarmigan. Hunting pressure is relative to population density.

Unit 1

Rock ptarmigan occur throughout suitable habitat along the entire mainland coast of southeastern Alaska and on Revillagigedo Island. Throughout their range, populations are currently low, especially on Revillagigedo Island. Hunting pressure on this species is minimal and is primarily concentrated near Juneau, Haines and Ketchikan.

Units 2, 3 and 4

Rock ptarmigan are not known to occur in these units.


ROCK PTARMIGAN
CANADA
SITKA
PACIFIC OCEAN

WHITE-TAILED PTARMIGAN

Of the three species of ptarmigan, white-tailed ptarmigan (Lagopus leucurus) have the most limited distribution in the State. They occur primarily in the mountains of southcentral and southeastern Alaska. White-tailed ptarmigan inhabit rugged, sparsely-vegetated areas above timberline from 3,500 feet to over 5,000 feet (Jerry McGowan, A.D.F.& G., Game Biologist, Fairbanks, pers. comm.).

White-tailed ptarmigan forage on a wider variety of plants than do the other two species. During the summer, they feed on insects and the tender leaves, buds and flowers of alpine plants. They consume seeds and berries in the fall, while during winter their diet changes to buds and twigs.

The reproductive biology of the white-tailed ptarmigan is similar to that of the other two species of ptarmigan. Breeding behavior begins in April and eggs are hatched by July. This species is not as migratory or nomadic as are the other two species of ptarmigan. Their populations are also not as prone to drastic fluctuations in numbers as are either the willow or rock ptarmigan.

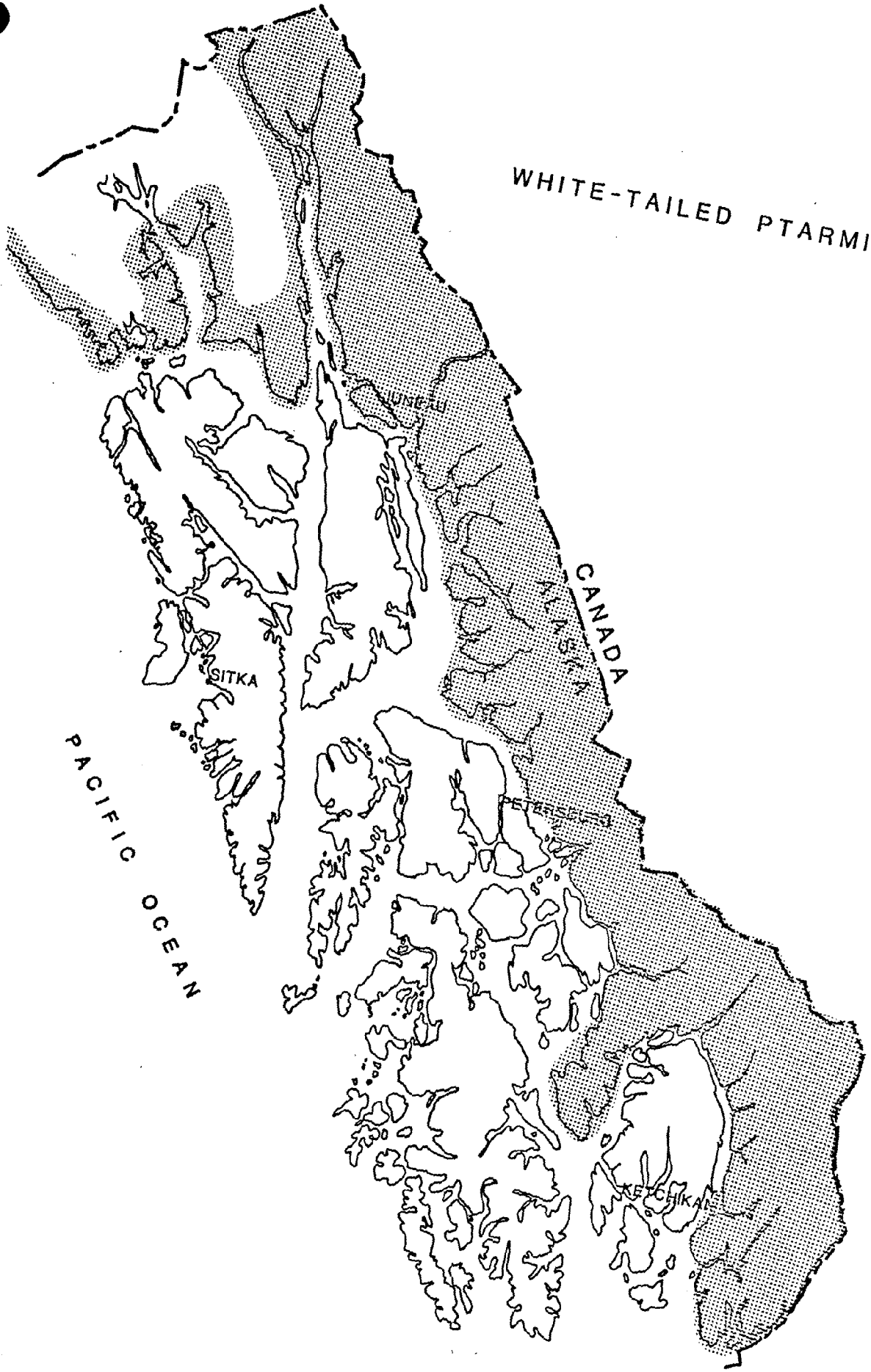
Because these birds are more inaccessible, less information is available on their biology. Also, because of this inaccessibility, they sustain a much lower harvest than do willow or rock ptarmigan.

Unit 1

While-tailed ptarmigan occur in suitable habitat throughout the southeastern mainland. A low level of recreational hunting occurs near Haines, Juneau and along the Stikine River.

Units 2, 3 and 4

White-tailed ptarmigan are not known to occur in Units 2, 3 or 4.


WHITE-TAILED PTARMIGAN
CANADA
ALASKA
JUNEAU
SITKA
PETERSBURG
KETCHIKAN
PACIFIC OCEAN

SPRUCE GROUSE

Spruce grouse (Canachites canadensis) occur throughout most of the forested portions of the State. They inhabit mature white spruce-birch woodlands, black spruce bogs and, in the southern portion of southeastern Alaska, Sitka spruce-hemlock forests. Throughout their range, spruce grouse commonly occur along roadsides where they search for grit which aids in their digestion.

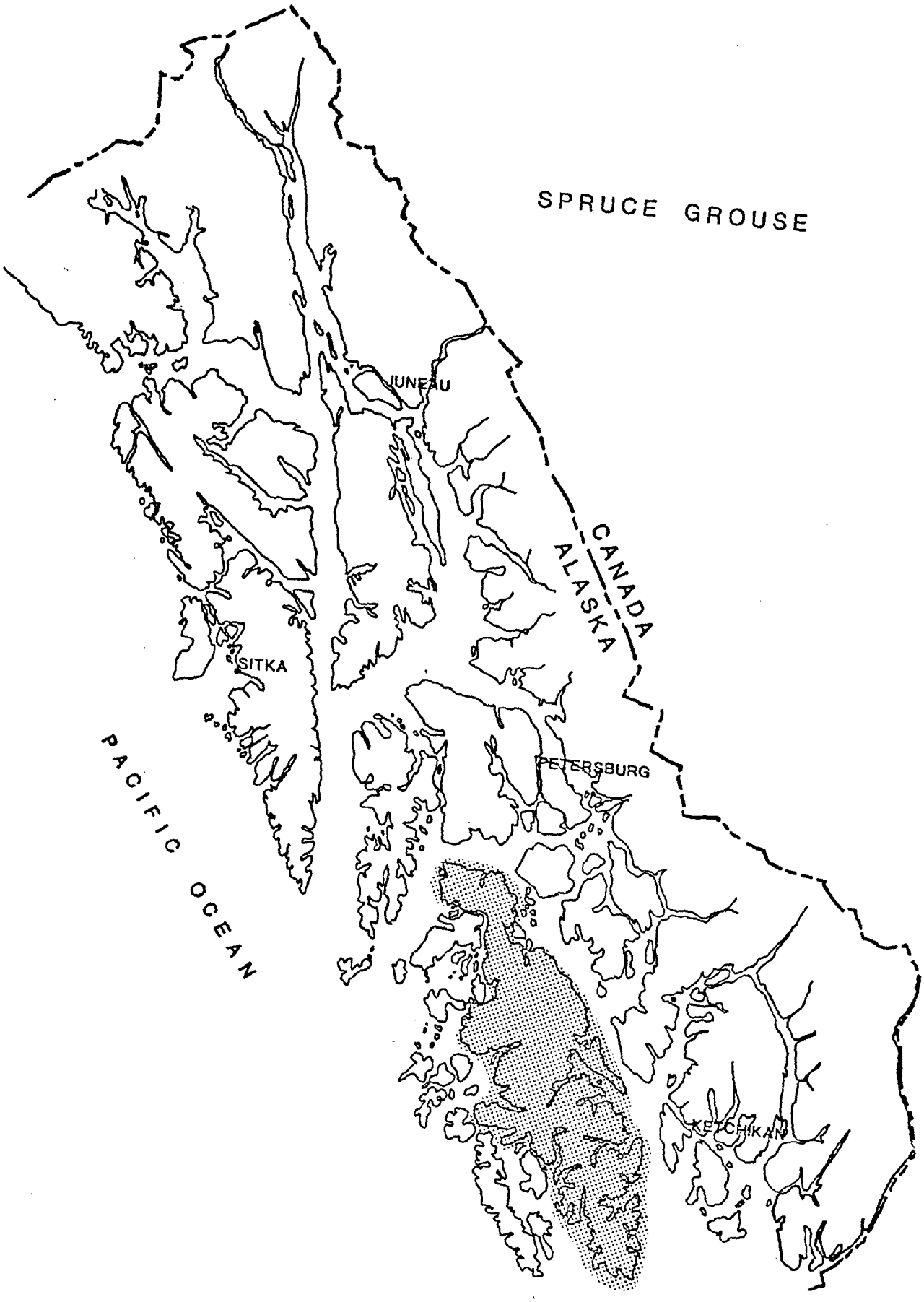
During the winter, spruce grouse forage almost exclusively on spruce needles. In summer and fall they feed on cranberries, blueberries, crowberries, various seeds and the flowers and leaves of herbaceous plants. Breeding activity usually begins in April, with egg laying in May. Five to nine chicks are hatched in June. The male does not participate in incubation or rearing of the young, but during September often associates with several females forming family flocks. By October, these flocks disband and small groups settle in dense spruce stands for the winter. When abundant, spruce grouse are extensively hunted for recreation and subsistence.

Unit 2

Spruce grouse are present only in Unit 2 on Prince of Wales Island and a few nearby islands. Populations occur there in relatively low numbers. Spruce grouse distribution on the small islands within this unit is not well documented. Hunting pressure on this species is relatively minimal in this region.

Units 1, 3 and 4

Spruce grouse are not known to occur in these units except possibly on a few of the southern islands in Unit 3.


SPRUCE GROUSE
JUNEAU
CANADA
ALASKA
SITKA
PACIFIC OCEAN
PETERSBURG
KETCHIKAN

RUFFED GROUSE

Ruffed grouse (Bonasa umbellus) occur only in central Alaska and in a small portion of the southeastern mainland. They inhabit forested regions along major river drainages. Preferred ruffed grouse habitat includes deciduous woodlands interspersed with spruce on relatively dry, well-drained, south-facing slopes. Like spruce grouse, they commonly frequent roadsides where they seek grit.

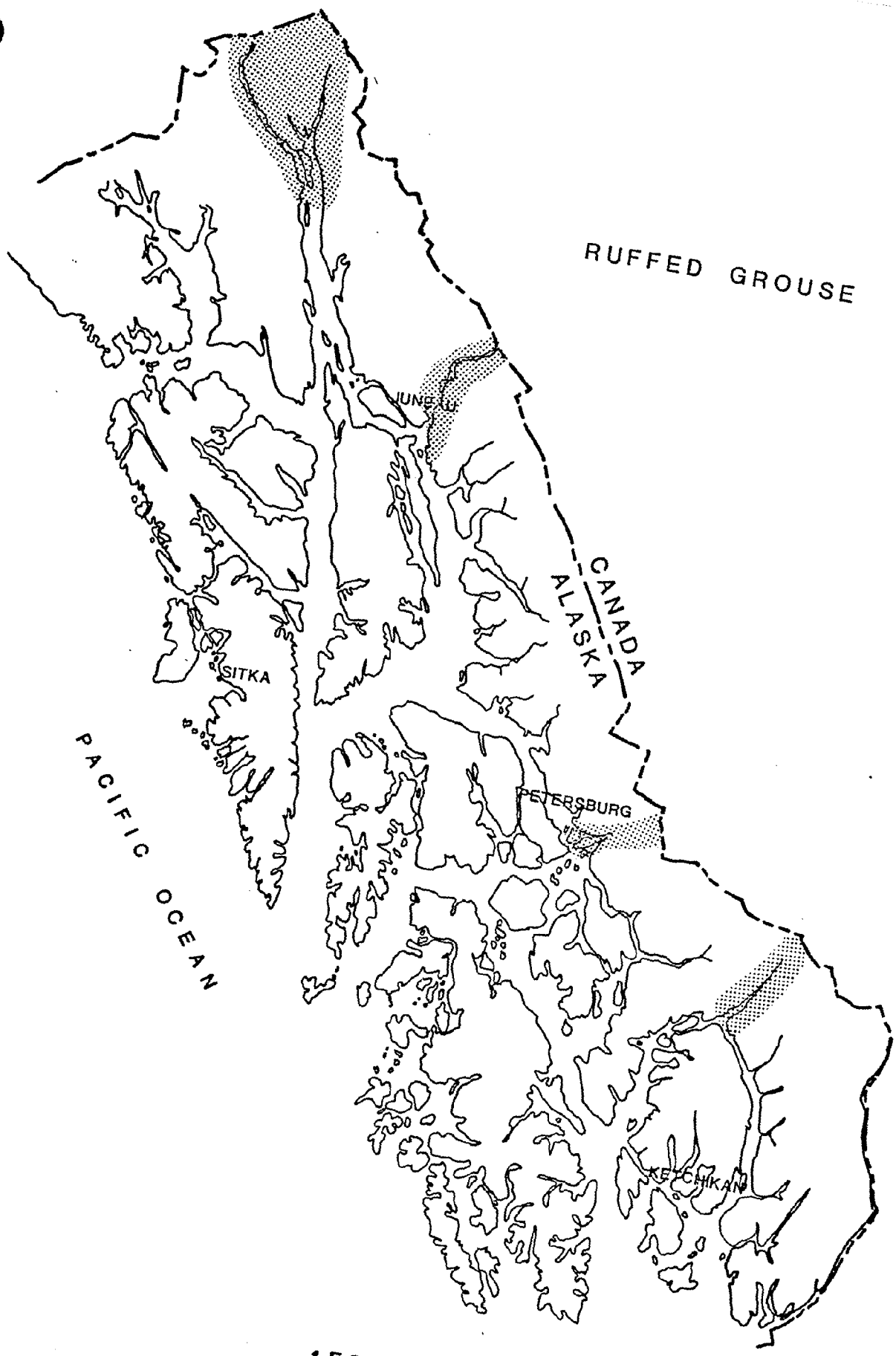
During the spring, usually in April, male ruffed grouse establish territories by drumming with their wings on the tops of logs. Few ruffed grouse nests have been found in Alaska. Females and chicks usually remain together in shrubby, moist areas near the woodland fringe until late September. Following breeding, however, males remain segregated from the females and chicks. Ruffed grouse do not form flocks as do ptarmigan or sharp-tailed grouse. Populations of ruffed grouse display fluctuations in numbers similar to other grouse. Hunting pressure for this species is light in Alaska.

Unit 1

Ruffed grouse occur in small populations throughout the major mainland river drainages from the Unuk River north to Haines. In the last 30 years, successional changes resulting in increased coniferous forest communities have reduced ruffed grouse habitat in this region. Hunting pressure on ruffed grouse populations is relatively light throughout this unit.

Units 2, 3 and 4

Ruffed grouse do not occur in these units.


RUFFED GROUSE
JUNEAU
SITKA
CANADA
ALASKA
PETERSBURG
PACIFIC OCEAN
KETCHIKAN

BLUE GROUSE

Blue grouse (Dendragapus obscurus) are present in Alaska only in the southeastern portion of the State. They occur in suitable habitat throughout the entire mainland from south of Yakutat to the Canadian border. They also occur on most islands except Prince of Wales Island. Throughout their range, blue grouse inhabit dense forests of Sitka spruce and western hemlock.

Blue grouse forage primarily on the needles of conifers during the winter. Throughout late summer and early fall, they feed on a variety of berries and herbaceous vegatation. Breeding activity begins in April, with egg laying in May. By late June, hens and chicks frequent the edge of muskegs, clearcut slashings and roadsides. In late summer and early fall, family groups move up into alpine meadows near timberline. The birds move back down into the dense conifer forests as winter approaches.

Blue grouse populations appear to fluctuate in numbers. These fluctuations, however, do not approach the magnitude of those observed in ptarmigan.

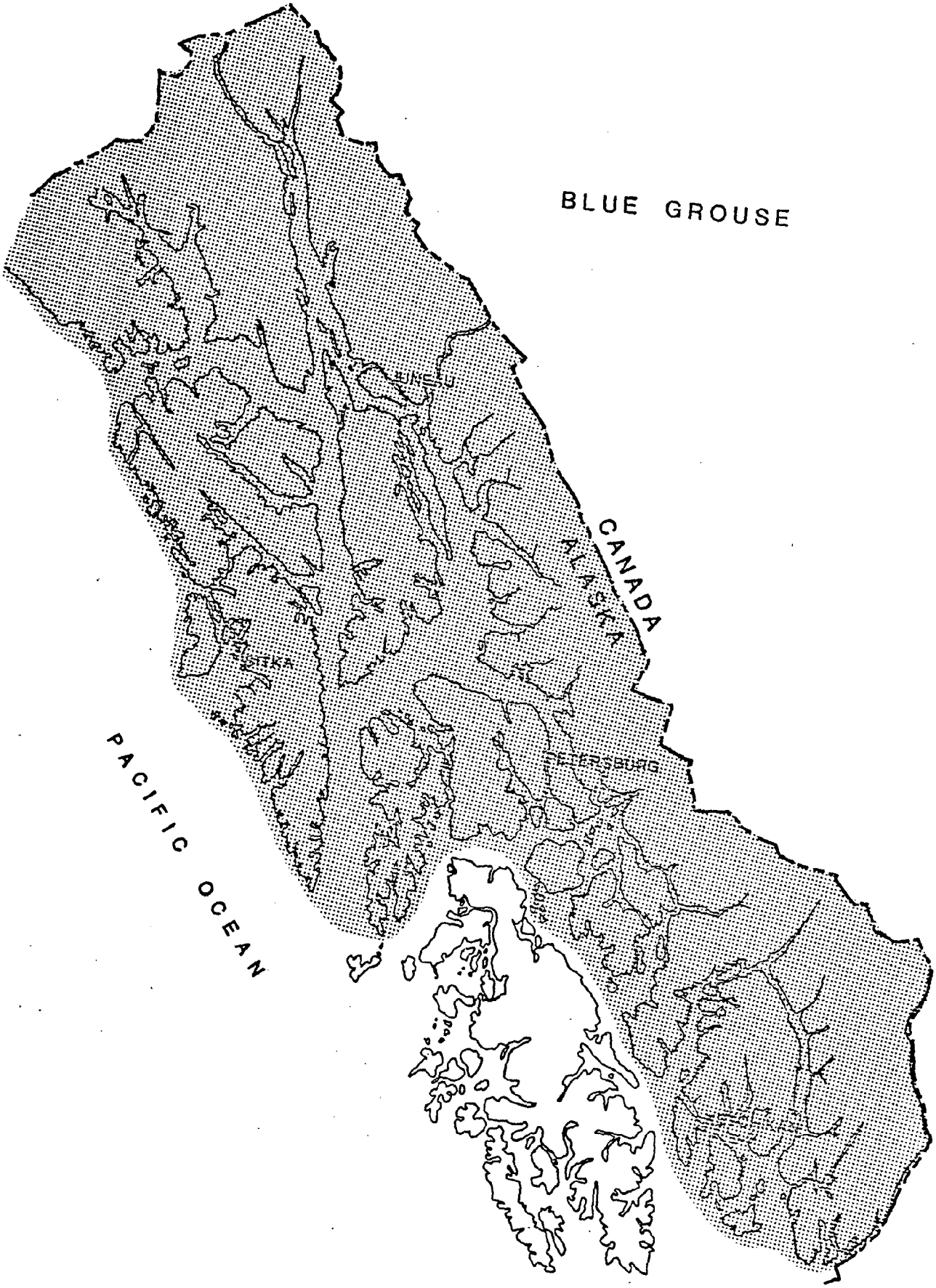
Units 1, 3 and 4

Blue grouse occur throughout Units 1, 3 and 4. During the winter, they inhabit mature conifer forests. Thus, logging operations in the important winter range areas may have a major impact on local blue grouse populations. During the breeding season, however, they utilize burned or clearcut areas quite extensively.

The annual harvest of blue grouse is relatively low throughout this region. Most are harvested in spring by local residents. Blue grouse are observed and photographed along the Chilkat Highway, and during the spring, many people enjoy listening to hooting males.

Unit 2

Blue grouse do not occur in Unit 2.


BLUE GROUSE
CANADA
ALASKA
PACIFIC OCEAN
JUNEAU
SITKA
PETERSBURG

FURBEARERS - SMALL GAME - UPLAND GAME BIRDS

SELECTED REFERENCES

Alaska Dept. of Fish and Game. 1970. Report of survey-inventory activities. Part III. Waterfowl and small game. Fed. Aid. Wild. Rest. Vol. I. Project W-17-2.

____. 1970. Annual report of survey-inventory activities. Part II. Caribou, brown bear, sheep, furbearers, marine mammals, bison, goat, wolf and black bear. Fed. Aid. Wild. Rest. Vol. I. Project W-17-2.

____. 1971. Annual report of survey-inventory activities. Part II. Caribou, brown-grizzly bear, sheep, furbearers, marine mammals, bison, wolf, wolverine and black bear. Fed. Aid. Wild. Rest. Vol. II. Project W-17-3.

____. 1973. Alaska's wildlife and habitat. Anchorage, Alaska. 143 pp., 563 maps.

____. 1973. Annual report of survey-inventory activities. Part III. Wolf, wolverine, small game and furbearers. Fed. Aid. Wild. Rest. Vol. III. Project W-17-4.

____. 1974. Annual report of survey-inventory activities. Part III. Furbearers, small game and raptors, wolf, wolverine and black bear. Fed. Aid. Wild. Rest. Vol. IV. Project W-17-5.

____. 1975. Annual report of survey-inventory activities. Part IV. Furbearers, small game and wolverine. Fed. Aid. Wild. Rest. Vol. V. Project W-17-6.

____. 1976. A compilation of fish and wildlife resource information for the State of Alaska. Vol. I. - Wildlife. 873 pp.

Berrie, P.M. The lynx in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 p.

Bromley, D. 1972. The porcupine in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 p.

Burns, J.J. 1968. The mink in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 p.

Burris, O.E. 1966. Alaska Dept. of Fish and Game. Furbearer report. Proj. Seg. Rpt. Vol. VII. Fed. Aid Wild. Proj. W-6-R-6 and W-13-R-1.

____. 1968. Furbearer report. Alaska Dept. of Fish and Game. Proj. Seg. Rpt. Vol. VIII. Fed. Aid Wild. Proj. W-13-R-2.

_____. 1969. Furbearer report. Alaska Dept. of Fish and Game. Proj. Seg. Rpt. Vol. VIII. Fed. Aid Wild. Proj. W-13-R-3.

_____. 1971. Furbearer report. Alaska Dept. of Fish and Game. Proj. Seg. Rpt. Vol. IX. Fed. Aid Wild. Proj. W-17-1.

_____ and D.E. McKnight. 1973. Game transplants in Alaska. Alaska Dept. of Fish and Game. Wildlife Tech. Bull No. 4. 57 pp.

Burt, W.H., R.P. Grossenheider. 1952. A field guide to the mammals. Houghton Mifflin Co. Boston. 284 pp.

Dufresne, F. 1946. Alaska's animals and fishes. Binfords and Mort, Portland, Oregon. 297 pp.

Elkins, W.A. and U.C. Nelson, 1954. Wildlife introductions and transplants in Alaska. Proc. 5th Alaska Science Conf. 21 pp. (mimeo).

Ellison, L.N. The grouse of Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series, Birds; No. 2.

Ernest, J.R. 1971. The hare in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 p.

Gabrielson, I. and F. Lincoln. 1959. The birds of Alaska. Wild. Mgt. Institute, Wash., D.C. 922 pp.

Garceau, P., et al. 1963. Fur mammal investigations and snowshoe hare investigations. Alaska Dept. of Fish and Game. Proj. Seg. Rpt. Vol. III. Fed. Aid Wild. Proj. W-6-R-3.

Gibson, D. and S. McDonald. 1975. Bird species and habitat inventory, mainland southeast Alaska, summer 1974. U. of Alaska Rept. to U.S. Forest Ser. 73 pp.

_____. 1976. Bird species and habitat inventory Alexander Archipelago, Alaska, summer 1975. U. of Alaska Rept. to U.S. Forest Ser. 66 pp.

Hall, R.E. and K.R. Kelson, 1959. The mammals of North America. Roland Press. New York. Vol. I and II. 1,083 pp.

Jennings, L. 1968. The red fox in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 p.

Klein, D. 1965. Port glacial distribution of mammals in southern coastal Alaska. Arctic 18(1)7-20.

Manville, R.H. and S.P. Young. 1965. Distribution of Alaska mammals. Bureau of Sport Fish and Wild. Cir. 211. 74 p.

McGregor, R. 1957. Small mammal distribution maps, southeastern Alaska. Forest Science Lab. U.S. Forest Ser. Juneau. 15 pp.

____. 1958. Small mammal studies on a southeast Alaska cutover area. Alaska Forest Research Center. U.S. Forest Ser. Juneau. No. 8. 9 pp.

Meehan, W. 1974. The forest ecosystems of southeast Alaska. IV. Wildlife habitats. U.S. Forest Ser. Pacific N.W. Forest and Range Exper. Station, Portland. Tech. Rept. PNW-16. 32 pp.

Park, E. 1971. The world of the otter. J.B. Lippencott Co. 159 pp.

Rausch, R.A. The wolf in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 p.

____. 1961. Furbearer report. Alaska Dept. of Fish and Game. Proj. Seg. Rpt. Vol. VI. Fed. Aid Wild. Proj. W-6-R-5,6.

Rue, L.L. 1964. The world of the beaver. J.B. Lippincott Co. 158 pp.

____. 1969. The world of the red fox. J.B. Lippincott Co. 204 pp.

Seattle Fur Exchange. 1977. Range of prices: Alaskan and Canadian Wild. Furs. February Info. Bull.

Solf, J.D. 1972. The land otter in Alaska. Alaska Dept of Fish and Game. Wildlife Notebook Series. 2 p.

Strevelar, G. and Park. 1971. Natural history of Glacier Bay Nat. Park. Ser. Rept. Juneau.

Walker, E.P., et al. 1964. Mammals of the world. John Hopkin's Press. Baltimore. Vol. I and II. 1,500 pp.

Weeden, R.B. The ptarmigan in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series No. 1. 2 pp.

____. 1965. Grouse and ptarmigan in Alaska. Alaska Dept. of Fish and Game. Fed. Aid. Wild. Proj. W-6-R-5, Work Plan I.

____ and L.N. Ellison. 1968. Upland game birds of forest and tundra. Alaska Dept. of Fish and Game. Wildlife Booklet No. 3. 44 pp.

MARINE MAMMALS

Because of the year-round abundance of marine fish and shellfish throughout southeastern Alaska, marine mammals historically have been utilized here to a lesser degree than by native Alaskans from the northern and arctic coastal regions of the State. The use of marine mammals by Southeastern inhabitants has been as a subsistence supplement rather than a necessity. It is doubtful that the historical take of marine mammals had an influence on population numbers. Today, with the exception of the sea otter, marine mammal populations are considered to be near or at carrying capacity for the habitat over much of southeastern Alaska.

In the early 1960's, Alaska harbor seals entered the European fur market. High prices for raw skins stimulated a great deal of interest in harvesting these animals. In 1965, over 13,000 seals were taken in southeastern Alaska. The market prices of skins then dropped, resulting in a decline in hunting pressure.

Widespread public concern for the welfare of harbor seals and other marine mammal populations has been demonstrated in recent years. The Marine Mammal Protection Act of 1972 (Public Law 92-522) was a misguided result of this concern. In general, this Act placed a moratorium on the taking of all marine mammals and placed the responsibility for their management under federal jurisdiction.

Major conflicts have arisen between marine mammals and man for valuable fish species. Salmon purse seine fishermen complain of seals and sea lions occasionally getting into their nets, causing partial or

complete loss of their catch and damage to nets. Salmon trollers often report sea lions stealing hooked salmon from their lines. Gill net fishermen complain of sea lions robbing their nets and tearing up gear.

Most marine mammals inhabit a very specific environment - the near shore community. This environment is extremely susceptible to disturbance in the form of man's encroachment through pollution, development or removal of components from the system. In particular, oil and gas developments along our coast will inevitably result in the contamination of some marine ecosystems. Degradation of marine habitats, whether resulting from spills, logging, mining or other activities, may impact marine mammal populations by lowering ecological productivity as well as by direct injury to animals.

HARBOR SEALS

Harbor seals (Phoca vitulina) are commonly found in the near shore marine environment throughout the mainland coast and the islands of southeastern Alaska. During summer they regularly ascend some of the large freshwater rivers such as the Taku, Stikine and Chilkat. Although they are scattered throughout the Alexander Archipeligo, concentrations in excess of 3,000 seals occur in Glacier Bay during the pupping season. Small concentrations occur in other glacial fiords and in a few island areas along the outside coast.

Harbor seals have not been studied extensively in southeastern Alaska. Direct population enumeration work has been done only in Glacier Bay. The secretive nature of the animals, coupled with the broad expanse of habitat in which they occur, make direct population estimates difficult. An indication of seal numbers in typical seal habitat was obtained in 1975 when Pitcher (Alaska Department of Fish and Game, Anchorage, unpublished data) traveled 675 miles by boat in southeastern Alaska. He observed 720 seals, for 1.06 seals per mile traveled (Table 1.). While this is the crudest type of index to abundance, it does give an indication of seal numbers throughout a large segment of their habitat.

Seasonal fluctuations in numbers appear to be a factor of food availability and breeding and pupping. In Glacier Bay a large proportion of the seals which occupy the area in summer leave during the winter. Concentrations of seals near stream mouths and in freshwater streams are common when food species are concentrated.

Table 1. Seal sightings, southeastern Alaska, April-May, 1975.

Date	Quadrangle	Location	Number of Seals
April 30	9	Pt. Astley	2
		Sunset Is.	8
		Turnabout Is.	12
	7	Bay of Pillers	1
May 1		Bay of Pillers	1
		Outside Bay of Pillers	12
		South Bay of Pillers	20
		Gap Point	14
	3	Channel Is.-Coronation Is.	10
May 2		Westernmost Spanish Is.	10
		Easternmost Spanish Is.	6
May 3		Maurelle Is.-Turtle Is.	14
		N.W. Anguilla Is.	6
May 4		Twin Is.	10
		Wood Is.	4
		Emerald Is.	13
		San Real Marina	19
May 5	2	W. side Barrier Is.	40
		Little Pass - Barrier Is.	25
		Rocks W. side Barrier Is.	18
		Round Is.	25
		Barrier Is.	20
		E. side of Long Is.	3
May 6	1	Percy Is.	15
May 7		Duke Is.	20
May 9	6	Snow Pass	5
		Rocky Pass	15
May 10	8	Sea Lion Rocks - Kruzof Is.	25
May 11	7	Necker Is.	5
		Necker Is.	30
May 13	8	Khaz Bay area	100
		Khaz Bay - Lisianski Inlet	12
May 15	12	Surge Bay area	100
May 16	12	Cape Spencer area	100

Harbor seals were basically unexploited in southeastern Alaska until 1964. Prior to that time, incidental bounty hunting, limited subsistence hunting and localized control programs on the Taku and Stikine Rivers were the only harvest. In 1927 a $2.00 bounty was placed on all seals. In 1939 this was increased to $3.00. This $3.00 bounty was retained until 1967 when the Alaska Legislature eliminated the bounty in southern Alaska. As a whole, the bounty system did not control seal numbers. Subsistence hunting was limited to a few coastal residents who used harbor seals for food and clothing. A predator control program designed to aid in the reduction of harbor seals, where they caused damage to commercial fisheries, was inaugurated in 1951 on the Stikine and Taku Rivers (Alaska Department of Fisheries, 1951). From 1951 to 1959, over 6,500 seals were killed on the Stikine River and over 900 on the Taku River (Alaska Department of Fish and Game, 1959).

In 1962-63, Alaskan harbor seals entered the European fur market. High prices were paid for raw skins, stimulating a great deal of interest in harvesting the animals. In 1964, an average prime adult skin was worth $20.00 to the hunter; choice pelts brought as much as $50.00; pup skins averaged $17.00 each (Alaska Department of Fish and Game, 1964). The estimated yearly harvest from southeastern Alaska climbed to over 13,000 seals in 1965 (Table 2.). The market prices of seal hides then dropped, resulting in a significant decline in hunting pressure. This harvest appeared to depress seal numbers in many areas; however, the population appears to have largely recovered.

Table 2. Southeastern Alaska seal harvest 1964-75.*

Year	Number of Seals
1964	3,000
1965	13,000
1966	5,200
1967	3,000
1968	1,000
1969	1,000
1970	740
1971	1,000
1972	1,000
1973	400
1974	400

* Harvest figures are reconstructed from bounty records, fur export permits, fur buyer interviews, field monitor activities and knowledge of hunting activities.

Seals tolerate moderate boat traffic and some disturbance through their marine habitat. Although seals may be able to tolerate low levels of pollution, toxic substances in the water would be detrimental by harming seals and their food supply. The direct effect of land based activities such as logging and mining are yet to be determined.

SEA OTTER

Sea otters (Enhydra lutris) were completely exterminated from southeastern Alaska by commercial hunters by 1900. A few reports indicate that occasional individuals may have strayed into the area, but it is unlikely that any established population existed. Between 1965 and 1969, 403 sea otters were relocated to areas between Cape Spencer and Dixon Entrance by the Alaska Department of Fish and Game (Table 3.). Several surveys of the northern areas were made between 1965 and 1971, but information from the south and inside waters was limited to sightings by other than marine mammal biologists.

Between April and May, 1975, a joint U.S. Fish and Wildlife Service and Alaska Department of Fish and Game survey was made in portions of southeast Alaska to determine the distribution and approximate abundance of sea otters. Results of the survey, as reported by Schneider (1975), are as follows:

The pattern of distribution found on this survey followed that found in the past. Most of the otters were concentrated in small areas that appear to contain exceptional sea otter habitat. Most often these were areas with a southwest exposure to the open ocean that contained many rocks and small islands. The otters were usually in or near the outermost rocks that would still provide some protection from heavy seas. The area occupied by each concentration was usually less than two square miles. Six concentrations were located on this survey.

Surge Bay - Yakobi Island. No sea otters were released at Surge Bay; however, some moved there immediately after the first release of 23

otters at Khaz Bay, 28 miles to the south, in 1965. These otters settled in the exact spot presently occupied by the main concentration. The population grew over the next few years, probably through immigration from the release sites at Cape Spencer, 12 miles to the north, Lisianski Strait, 13 miles to the south, and Khaz Bay.

The area was not surveyed thoroughly until 1971. At that time, a minimum of 54 adults (including subadults) and 17 pups were counted. That survey was more thorough than the present one, and there can be little doubt that the 224 adults and 21 pups seen represent a large and real increase. The magnitude of the difference between the two counts indicates that immigration from Khaz Bay and perhaps other areas may have continued after 1971.

There has been no change in the area used by the otters since the first sighting in 1966. The only change observed since 1971 was the more intensive use of the north side of Surge Bay itself. Most of the animals using this area were probably males and perhaps some subadult females.

The Surge Bay area appears to contain some of the best sea otter habitat in southeast Alaska. It supports the largest concentration of sea otters (over 50% of the otters sighted), and this concentration has grown faster than any other.

Khaz Bay. The north side of Khaz Bay was the primary release site in southeast Alaska. A total of 194 sea otters were released there between 1965 and 1969. Many otters remained in the area, and counts have steadily increased over the years. However, there are probably fewer otters there today than were released. Obviously, large numbers

migrated north to the Surge Bay area. The population appears well established with a high rate of reproduction, and is probably second only to Surge Bay in size.

After an initial period of scattering around the area, the transplanted otters began to concentrate in the rocks south of Black Island. Smaller numbers could always be found around the Granite Islands and the outer rocks to the southeast. Occasional animals have been seen throughout the area but have never remained outside of the Black-Granite Island area long. The only change in distribution observed on this survey was the concentration of females with pups in the eastern edge of their range. In previous surveys, this segment of the population was found near Black Island. Now it appears that the Black Island area is occupied primarily by males and perhaps subadult females.

Necker Islands. Forty-eight sea otters were released in the Necker Islands in 1968. This area does not contain large expanses of ideal sea otter habitat. It was selected primarily to provide the residents of Sitka with an early opportunity to view sea otters. Small numbers of otters have remained there, but it appears that the majority left the area and perhaps ultimately joined the Khaz Bay, Surge Bay or Coronation Island groups. Survey conditions on this trip were poor. No large groups of otters have been reported, even though the area is frequently visited by the public. The small population inhabiting the area may grow, but it could also easily die out. This is the smallest resident group of sea otters of which we are aware.

Coronation - Spanish Islands. Coronation Island was considered as a potential release site, but no otters were ever released there. The closest release sites were the Necker Islands, 70 miles to the north, and the Maurelle Islands, 25 miles to the southeast. We were not aware of the presence of sea otters there until a pod of over 30 was reported in 1973 (Al Davis, A.D.F.& G., Sitka, Pers. Comm.). It is possible that this group has been established there for five or six years. The otters appear to be occupying a very small area of very good habitat. The population is already using most of the area that could be considered ideal. The nearby areas of good habitat such as Windy Bay and the west side of Cape Decision were not surveyed. However, it has been reported that some animals are occasionally in the latter area. Range expansion of this group may occur before any other. Over the years, a number of unconfirmed reports of stray sea otters around Kuiu Island have been received. These may be nonbreeding animals from the Spanish Islands.

Maurelle Islands. Fifty-one sea otters were released in the Maurelle Islands in 1968. No reports have been received from the area, and the Department has not been able to completely survey it. Thus, a number of otters may have been missed. The population appears well-established in the vicinity of the Wood and Twin Islands. If the distribution of the population fits the pattern of other areas (and in all other respects it does), no large groups were missed in the survey. The present population size may be only slightly greater than the number released; however, it is almost certain that a large percentage of the released animals migrated to Coronation Island.

Barrier Islands. In 1968, 55 sea otters were released in the Barrier Islands. A few otters were seen during the month after release, but no subsequent surveys were made and no sightings were reported by the public until 1974 when four to six were seen. Fishermen have periodically seen sea otters here, as well as in other areas such as the Maurelle Islands and Coronation Island, but have never reported them.

Coverage of the area was fairly complete; and, while scattering of animals may have reduced the count, it seems unlikely that the population exceeds the number released. The population probably has a much greater chance of persisting than that in the Necker Islands but is in a tenuous position. The lower numbers are probably at least in part the result of movememts to other areas.

The prospects for continued rapid increase in sea otter numbers are good, at least in the vicinities of Surge Bay, Khaz Bay, Coronation Island and the Maurelle Islands (Schneider, 1975).

Table 3. Numbers of sea otters transplanted 1955–70.

Release	Site	1955	1956	1959	1965	1966	1968	1969	1970	1971	1972	Total
Aleutians	Attu Is.		5									5
Pribilofs	Otter Is.	19[1/]										19
	St. Paul Is.			7								7
	St. George Is.						57					57
Southeast Alaska	Yakutat Bay					10						10
	Khaz Bay (Chichigof Is.)				23	20	93	58				194
	Yakobi Is.						30					30
	Biorka Is.						48					48
	Barrier Is.						55					55
	Heceta Is.						51					51
	Cape Spencer						25					25
British Columbia	Vancouver Is.							29	14		46	89
Washington								29[2/]	30			59
Oregon									29	63		92
Total		19	5	7	23	30	359	116	73	63	46	741

1/ None believed to have survived.

2/ At least 13 died shortly after release.

Table 4. Sea otter sightings in southeastern Alaska since 1965.

Area	1965	1966	1967	1968
Yakutat Bay		10 released (Aug.)		4 (5/5-5/11)
Outside Coast-C. Suckling-C. Fairweather				5 Icy Bay (6/22)
Cape Fairweather-Glacier Bay				25 released (July-Aug.) 1 Penta Cove (9/12)
Yakobi I.		2 Surge Bay (Jan.)		30 released (July-Aug.)
Lisianski Strait-Khaz Bay	23 released (Aug.) 3 Hogan I.	20 released (Aug.) 1 Klag Bay (6/22) (6/30)	6-8 Khaz Bay (7/8-7/13)	93 released (July-Aug.) 1 Granite I. (5/23)
Khaz Pen.-Sitka Sound		1 Klokachef I. (7/4)	4 Fish Bay 12/28	
Sitka Sound-C. Ommaney				48 released (July-Aug.)
Coronation I.-C. Muzon			2 Heceta I. (4/5)	51 released (July-Aug.)
C. Muzon-Wales I.				55 released (July-Aug.)
Inland Waterways		1 Tracy Arm (7/16-7/30)		1 Kuiu I. (9/19)

continued

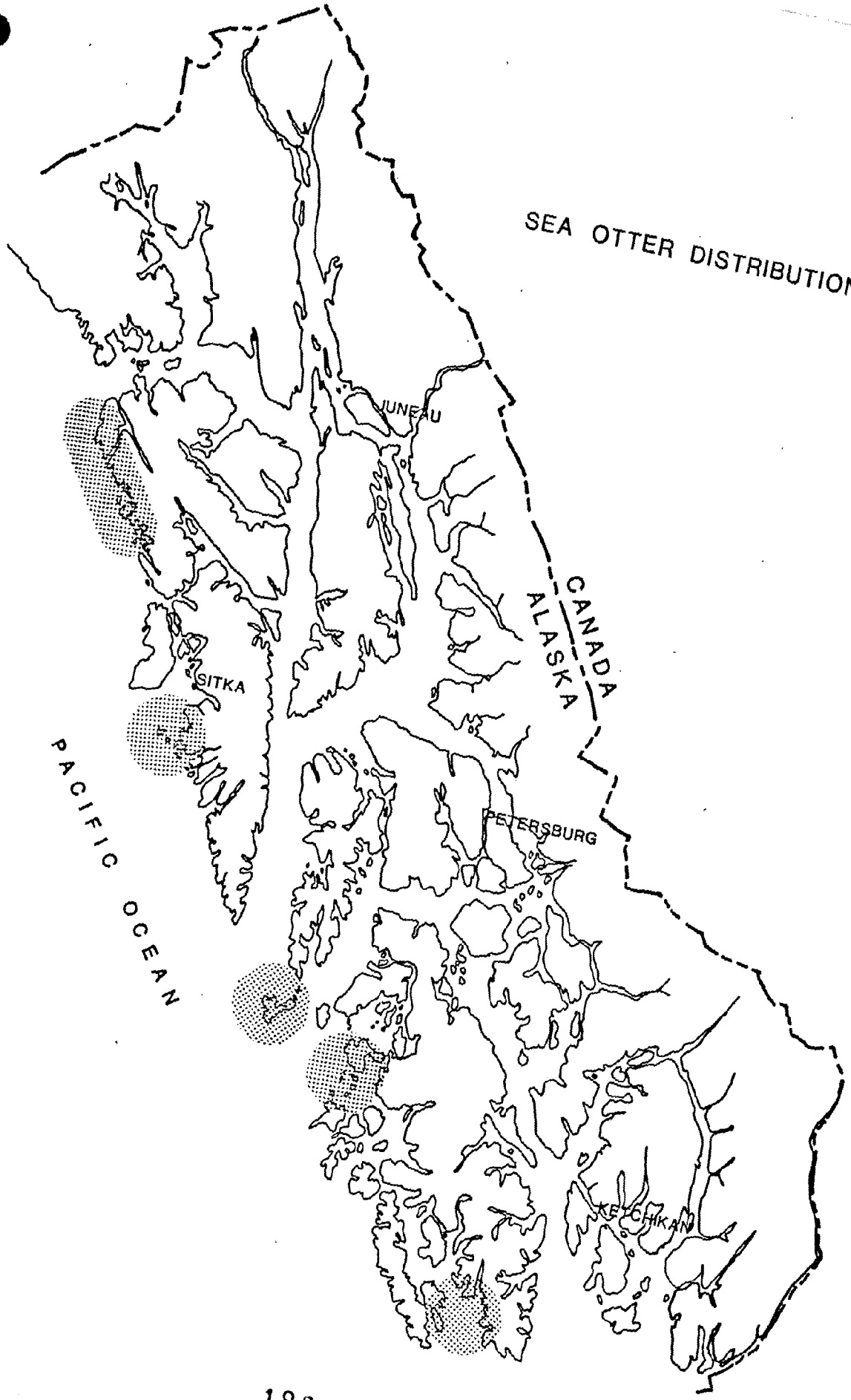
Table 4 (continued). Sea otter sightings in southeastern Alaska since 1965.

Area	1969	1970	1971
Yakutat Bay	15 (10/1-10/8)		
Outside Coast-C. Suckling-C. Fairweather		5 Akwe-Dangerous R. (5/29) 1 E. of Dry Bay (5/29)	
Cape Fairweather-Glacier Bay			
Yakobi I.	2 Surge Bay (6/12)	25 Surge Bay 8/23	40-50 Surge Bay 5/21 71 Surge Bay 8/3-5, 1 Squid Bay
Lisianski Strait-Khaz Bay	58 released (July-Aug.) 39 Khaz Bay (6/13-6/19)	4-7 Khaz Bay 8/24-25	2 Pt. Urey 8/3 54 Khaz Bay 8/5
Khaz Pen.-Sitka Sound	1 Ramp I. 6/18		
Sitka Sound-C. Ommaney			2 Necker I. 8/8, 1 Yamini I. 2 Scow I.
Coronation I.-C. Muzon			3 Abbess I. 7/29 4 St. Ignace I. 7/12
C. Muzon-Wales I.			
Inland Waterways			1 Appleton Cove, Peril St.

continued

Table 4. (continued). Sea otter sightings in southeastern Alaska since 1965.

Area	1973	1974	1975
Yakutat Bay			
Outside Coast-C. Suckling-C. Fairweather			
Cape Fairweather-Glacier Bay			
Yakobi I.			245 Surge Bay 5/15
Lisianski Strait-Khaz Bay			95 Khaz Bay 5/14
Khaz Pen.-Sitka Sound			
Sitka Sound-C. Ommaney			4 Necker Is. 5/12
Coronation I.-C. Muzon	30+ Spanish I. 8/2		65 Spanish Is. 5/2 47 Maurelle Is. 5/4
C. Muzon-Wales I.			
Inland Waterways			2-3 Basket Bay Chatham St. 3/75


SEA OTTER DISTRIBUTION
JUNEAU
SITKA
PETERSBURG
KETCHIKAN
CANADA
ALASKA
PACIFIC OCEAN

STELLER SEA LION

The Steller sea lion (Eumetopias jubatus) is found along the entire coast of southeastern Alaska.

Because of their dependence on land, particularly during the breeding season, population enumeration on rookeries and hauling grounds through aerial and ground surveys are possible. Such surveys, though subject to error, provide at least a minimum estimate of the number of sea lions which may use a particular rookery or hauling ground.

Repetitive surveys of selective rookeries indicate that in most areas of southeastern Alaska sea lion populations are at or near the maximum levels attainable within the ecological limits of the habitat. Greater expansion of the population in the future is not anticipated.

Little change has occurred in the population status of sea lions from that reported in Alaska's Wildlife and Habitat, 1973. However, several additional rookeries and hauling grounds have been found, and recent surveys have revealed seasonal changes in population numbers (Table 5.).

Sea lions usually inhabit offshore rocks and islands that are seldom visited by man, but human activities may cause animals to leave rookery areas. Vania, 1971, found that since the harvesting of sea lion pups began, a gradual decline occurred in the number of adults that utilized the Sugarloaf Island rookery. When harvesting was closed, adult numbers again increased. Since rookery and haulout areas are vital to the well being of sea lions, careful planning must be made before these areas are disturbed by man.

Table 5. Southeastern Alaska sea lion surveys, 1975.

Quadrangle	Reference Number	Location	Population	Date
Sundum	415	Stephens Passage	None	4/30/75
	416	Sunset Island	None	4/30/75
	417	W. Brother Island	50	4/30/75
	418	Round Rock	None	4/30/75
Sitka	411	Turnabout Rocks (not Pinta Rocks)	8	4/30/75
	410	White Sisters	700	5/14/75
	447	Sea Lion Islands	200	5/10/75
	448	Cape Cross	350	5/15/75
Port Alexander	449	Jacob Rocks	150	5/12/75
	450	Biali Rocks	500	5/12/75
Mt. Fairweather	395	Cape Bingham	None	5/15/75
	442	Cape Fairweather	200	

Many cetaceans have been recorded from Alaskan waters, but only a few can be considered frequent visitors to the inside waters of southeastern Alaska. The following accounts are presented here only to indicate the presence of cetaceans in both inshore and offshore waters. No population estimates can be made, nor can distribution be clearly defined.

Blue Whale (Balaenoptera musculus)

Blue whales are found off the coast of southeastern Alaska from May through September as they make their annual migration to an area southeast of the Aleutian Islands. With the arrival of winter in the North Pacific, they reverse the migration routes and return to their tropical and subtropical grounds.

Fin Whale (Balaenoptera physalus)

Fin whales are widely distributed in the Pacific Ocean. Their winter grounds are poorly known. In summer they are found in the immediate offshore waters around the North Pacific and as far south as Baja, California (Leatherwood, et al., 1972).

Sei Whale (Balaenoptera borealis)

The summer range of the sei whale extends from Alaska south to California. Details of their distribution and migration, however, are not clearly known.

Humpback Whale (Megaptera novaeangliae)

Humpback whales are widely distributed from Alaska south to Mexico. They are commonly seen in inside waters during the summer months.

Right Whale (Balaena glacialis)

This large whale was hunted to near extinction and today is considered rare. The distribution of right whales is poorly known. In recent years, they have been seen from the northern gulf of Alaska and as far south as Baja, California. The population of right whales, like that of most of the baleen whales, probably shifts northward in summer and southward in winter (Leatherwood, et al., 1972).

Sperm Whale (Physeter catodon)

Sperm whales are widely distributed in the North Pacific. Their annual migrations take them offshore of southeastern Alaska.

Gray Whale (Eschrichtius robustus)

Gray whales are migratory. The vast majority of the animals spend from about May through November feeding in the waters of the Bering and Chukchi Seas. From December through January, individuals and small groups move southward off the coast of southeastern Alaska on their way to wintering grounds in Baja, California.

Goose-beaked Whale (Ziphius cavirostris)

The goose-beaked whale is found from the Bering Sea south at least to the tip of Baja, California, primarily in offshore waters.

Minke Whale (Balaenoptera acutorostrata)

Minke whales are relatively common in the Gulf of Alaska and may be found in inshore waters of southeastern Alaska. They are migratory, moving into Alaskan waters in the spring and returning south in the fall. The minke is the most common small whale in the Gulf of Alaska.

Killer Whale (Orcinus orca)

Killer whales are found in the entire Pacific Ocean. They are common in the inshore waters of southeastern Alaska. They are frequently seen moving into bays and inlets far from the open sea.

Pacific White-sided Dolphin (Lagenorhynchus obliquidens)

The Pacific white-sided dolphin is a common resident along much of the Pacific coast. It is most often confused with the Dall's porpoise, but is not as common in inshore waters as is the Dall's porpoise.

Dall's Porpoise (Phocoenoides dalli)

The Dall's porpoise prefers the cold waters along the coast of Alaska, and is seldom seen south of 35° N. latitude. It is very common in the inshore waters of southeastern Alaska.

Harbor Porpoise (Phocaena phocaena)

The harbor porpoise is the smallest cetacean found in the eastern North Pacific. As the name implies, the harbor porpoise inhabits bays, harbors, river mouths and relatively shallow inshore waters. Though it may travel in groups of nearly 100 individuals, it is more often seen in pairs or in small schools of from five to ten individuals.

Giant Bottlenose Whale (Berardius bairdi)

These whales are found from Alaska to California. They usually inhabit offshore waters where they make deep dives to feed on squid, octopi, rockfish and herring.

MARINE MAMMALS - SELECTED REFERENCES

Alaska Department of Fisheries, 1951. Annual Report No. 3. 84 pp.

Alaska Department of Fish and Game, 1959. Annual Report No. 11. 116 pp.

____. 1973. Alaska's wildlife and habitat. Anchorage, Alaska, 143 pp. + 563 maps.

____. 1975. A fish and wildlife resource inventory of the Northeast Gulf of Alaska. Vol. I - Wildlife. 411 pp. 128 maps.

____. 1976. A compilation of fish and wildlife resource information for the State of Alaska. Vol. I - Wildlife. 873 pp.

Bigg, M. A. 1969. The harbor seal in British Columbia. Fish Res. Bd. Can. Bull. 172. 33 pp.

Bishop, R. H. 1967. Reproduction, age determination and behavior of the harbor seal, Phoca vitulina L., in the gulf of Alaska. MSc. Thesis. Univ. of Alaska, College, Alaska. 120 pp.

Burris, O. E., and D. E. McKnight. 1973. Game transplants in Alaska. Alaska Department of Fish and Game. Tech. Bull. No. 4. 57 pp.

Fiscus, C. H., and G. A. Baines. 1966. Food and feeding behavior of Steller and California sea lions. Jour. Mamm. 47; 196-200.

Imler, R. H., and H. R. Sarber. 1947. Harbor seals and sea lions in Alaska. U.S. Fish and Wild. Serv. Spec. Sci. Rept. 23. 22 pp.

Kenyon, K. W. 1969. The sea otter in the eastern Pacific Ocean. N. Amer. Fauna No. 68: U.S. Government printing office, Washington, D.C. 352 pp.

Klinkhart, E. G. 1969. The Harbor Seal in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 p.

Leatherwood, S., W. E. Evans and D. W. Rice. 1972. The whales, dolphins and porpoises of the eastern North Pacific, a guide to their identification in the water. NUC TP 282, 175 pp. Not for sale. Can be obtained through MMD.

Lensink, C. J. 1960. Status and distribution of sea otters in Alaska. Jour. Mamm. 41; 172-182.

____. 1962. The history and status of sea otters in Alaska. Ph.d. Thesis. Purdue Univ., Lafayette, Ind. 188 pp.

Mathisen, O. A., R. T. Baade and R. J. Lopp. 1962. Breeding habits, growth and stomach contents of the Steller sea lion in Alaska. Jour. Mamm. 43; 469-477.

____, and R. J. Lopp. 1963. Photographic census of the Steller sea lion herds in Alaska, 1956-1958. U.S. Fish and Wild. Serv. Spec. Sci. Bull. No. 424. 17 pp.

Pike, G. C. 1956. Guide to the whales, porpoises and dolphins of the northeast pacific and arctic waters of Canada and Alaska. Fish. Res. Bd. Canada. Circ. 32.

Sandegren, F. E. 1970. Breeding and maternal behavior of the Steller sea lion (Eumetopias jubatus) in Alaska. MSc. Thesis. Univ. of Ak., College, Alaska. 138 pp.

Scheffer, V. B., and J. W. Slipp. 1948. The whales and dolphins of Washington State with a key to the cetaceans of the west coast of North America. Am. Midland Naturalist 39(2):257-337.

Schneider, K. B. 1971. An evaluation of sea otter survey techniques. Alaska Department of Fish and Game. Unpub. report. Anchorage, Alaska. 18 pp.

____. 1972. Sea otter report. Alaska Fed. Aid. Wild. Rest. report. Proj. W-17-4. 15 pp.

____. 1973. Sea otter report. Alaska Fed. Aid. Wild. Rest. report. Proj. W-17-5. 15 pp.

____. 1974. Sea otter report. Alaska Fed. Aid. Wild. Rest. report. Proj. W-17-5. 18 pp.

____, and J. B. Faro. 1975. Effects of sea ice on sea otters (Enhydra lutris). Jour. Mamm. 56: 91-101.

____. 1975. Survey of transplanted sea otter populations in southeast Alaska, April 30 - May 16, 1975. Alaska Dept. of Fish and Game. Unpub. report.

Slijper, E. J. 1962. Whales. Hutchinson & Co. London. 475 pp.

Spalding, D. J. 1964. Comparative feeding habits of the fur seal, sea lion and harbor seal on the British Columbia Coast. Fish. Res. Bd. Can. Bull. 146. 52 pp.

Vania, J. S., and E. G. Klinkhart. 1966. Marine mammal report. Alaska Fed. Aid. Wild. Rest. Rpt. Proj. W-14-R-1&2.

_____, and E. G. Klinkhart. 1967. Marine mammal report. Alaska Fed. Aid. Wild. Rest. Rpt. Proj. W-14-R-1&2.

_____, E. G. Klinkhart and K. B. Schneider. 1968. Marine mammal report. Alaska Fed. Aid. Wild. Rest. Rpt. Proj. W-14-R-2&3.

_____. 1968. The Sea Otter in Alaska. Alaska Dept. of Fish and Game. Wild. Notebook Series. 2 pp.

_____, E. G. Klinkhart and K. B. Schneider. 1969. Marine mammal report. Alaska Fed. Aid. Wild. Rest. Rpt. Proj. W-14-R-3 and W-17-1.

_____. 1971. Sea lion and Beluga report. Alaska Fed. Aid. Wild. Rest. Rpt. Proj. W-17-2 and W-17-3.

Wada, S. 1972. The ninth memorandum on the stock assessment of whales in the north Pacific. Unpub. report submitted to Scientific Committee, Internation Whaling Commission.

WATERFOWL*

WATERFOWL RECREATION AND SUBSISTENCE USE

Waterfowl Sport Hunting

Waterfowl sport hunting statistics in Alaska are generated from a combination of two sources. Total duck harvest, number of days, snipe and crane harvest and goose harvest by species are calculated from an annual mail survey of about 10 percent of all hunting license buyers in Alaska. This survey is conducted by the Alaska Department of Fish and Game. Duck species composition information is derived from a U.S. Fish and Wildlife Service survey where hunters send in duck wings.

About one-fifth of all Alaskan waterfowl sport hunters live in southeast Alaska. Average duck stamp sales for the two-year period 1974-75 were about 3,000 in southeast Alaska, or between 18 and 19 percent of statewide stamp sales. Stamp sales, by town, relate primarily to total population within those towns; therefore, Juneau, Ketchikan, Sitka, Wrangell and Petersburg are where most waterfowl hunters reside.

Hunters in southeast Alaska have birds available throughout the entire hunting season. Some duck species begin migrating by September 1; however, the best hunting usually occurs in mid to late September and October when most birds from the north are in migration. There are relatively few hunting areas in Southeast which can be reached by car as most areas are accessible only by plane or boat. Consequently, much of the duck and goose hunting occurs from people making several day

* This entire section by Dan Timm, A.D.F.& G., Anchorage.

waterfowl hunting excursions. However, a significant amount of waterfowl harvest occurs incidentally to deer and bear hunting trips. An indication of this phenomena was gained from the 1971-72 state hunter success survey when 14 percent of waterfowl hunters reporting from Southeast said that they hunted waterfowl only incidental to other game. Eighty-six percent of the hunters said they did hunt at least once during the season specifically for waterfowl. All but the most avid hunters usually do not hunt after mid-November because of severe weather conditions. The Stikine River Delta is the most well-known area to which people travel by aircraft or ferry for extended hunting trips.

Table 1 shows the 1971-75 yearly average sport hunting statistics for the eight major hunting areas in southeast Alaska. Table 1 also shows combined statistics for all other areas in southeast Alaska, as well as showing regional totals. As shown in Table 1, the Mendenhall Wetlands annually accomodates about 25 percent of the hunter days and duck harvest in southeast Alaska. About 10 percent of the total hunting days occur on the Stikine Delta. About 20 percent of the total ducks shot in southeast Alaska are taken there. The Stikine Delta is also the single largest goose harvest area in southeast Alaska. About 40 percent of the hunter days and duck harvest and over 50 percent of the goose harvest occurs in areas other than on the eight major hunting areas. This, again, is indicative of waterfowl hunting incidental to other hunts and also indicates the thousands of small but generally productive hunting areas which are available in southeast Alaska. The average of 45 sandhill cranes taken per year in southeast Alaska represents about five percent of the state's total harvest. The 735 snipe per year represents almost 25 percent of the total harvest in Alaska.

Table 1. Waterfowl sport hunting statistics by location, 1971-1975 yearly average, southeast Alaska.

Category	Mendenhall	Stikine Delta	Rocky Pass	Blind Slough	Duncan Canal	Chilkat River	St. James Bay	Farragut Bay	Other Areas	Total Southeast
Hunter days	3,660	1,285	295	715	285	605	205	230	5,155	12,435
Ducks shot	3,430	2,985	655	895	615	750	360	315	6,755	16,760
Geese[1/]										
Canada	--	--	--	--	--	--	--	--	--	1,670
White-fronted	--	--	--	--	--	--	--	--	--	80
Snow	--	--	--	--	--	--	--	--	--	65
Brant	--	--	--	--	--	--	--	--	--	10
Total geese	150	215	60	140	120	50	50	50	990	1,825
Cranes shot	--	--	--	--	--	--	--	--	--	45
Snipe shot	--	--	--	--	--	--	--	--	--	735

1/ 1972-1975 average

Over 90 percent of the total duck harvest in southeast Alaska is comprised of mallards (50 percent), green-winged teal (18 percent) and pintail and widgeon (12 percent each). Less than five percent of the duck harvest is comprised of sea ducks and mergansers, while the remaining duck harvest is made up of a variety of other dabblers and diving ducks.

Over 90 percent of the goose harvest is comprised of Canada geese. Probably over 80 percent of these Canadian geese are Vancouver Canada geese, a resident subspecies of southeast Alaska. The remainder of the goose harvest is comprised of white-fronted geese, snow geese and a few black brant.

In a report to the Federal-State Land Use Planning Commission, the Department of Fish and Game calculated approximate economic values of waterfowl hunting in Alaska and dollars generated outside Alaska from waterfowl sport hunting of Alaskan birds (Alaska Department of Fish and Game, 1976). Using the values of: $33.50 per day spent by waterfowl hunters in southeast Alaska; 1.25 and 5.0 pounds per duck and goose shot, respectively; $1.50 per pound for meat value of ducks and geese shot; and the hunter days, ducks shot and geese shot per year (Table 1); the following values for waterfowl hunting in southeast Alaska and dollars generated by waterfowl produced in southeast Alaska but shot elsewhere are calculated. We estimate that waterfowl hunters in southeast Alaska spend an average of $416,600 each year. The meat from the birds which are harvested has a calculated value of $45,100, for a total value of $461,700. Using an estimated 100,000 ducks in the fall flight from southeast Alaska and 60,000 Canada geese (see section on

waterfowl production), we project a total dollar value from hunting southeast Alaska produced waterfowl, outside Alaska, to be $621,700. The total estimated economic value of waterfowl hunting in southeast Alaska and outside Alaska on southeast produced birds exceeds one million dollars.

Noncomsumptive Recreational Use

Nonconsumptive recreational use of waterfowl and other birds, or any wildlife, is a difficult entity to quantify under most circumstances. Under highly controlled situations such as national parks, visitor days can be measured and outdoor activities evaluated by questionnaires. However, in southeast Alaska only descriptions of the noncomsumptive values can be provided. Probably few people travel to this region specifically to view waterfowl or seabirds. The one exception might be people who charter boats from Sitka to visit St. Lazaria Island, a national wildlife refuge protecting large seabird colonies. This is the most accessible large seabird colony for public observation in southeast Alaska.

Glacier Bay National Monument contains several small islands upon which seabirds breed. The tour boats which go through Glacier Bay stop alongside these islands, and tourists are treated to a firsthand look at small seabird colonies. Park Service records show that several thousand people each year use the tour boat facilities. Also, there have been breeding ecology and other research studies conducted on the seabird colonies in Glacier Bay in the past few years.

The Mendenhall Wetlands at Juneau is perhaps the most noted and heavily used nonconsumptive recreational use area in southeast Alaska. The combination of easy access from public roads, favorable habitat for a variety of birds which use the area year-round and a dense human population provide excellent opportunities for waterfowl and other bird viewing, photography, educational studies and general nature enjoyment. Canada geese, mallards and other ducks can frequently be seen immediately adjacent to the Glacier Highway. Again, it is difficult to quantify nonconsumptive use on the Mendenhall Wetlands, but we can safely say that all of the Juneau-Douglas residents and many of the tourists which visit Juneau at some time during the year utilize the waterfowl and other bird resources for nonconsumptive purposes.

Virtually all cities, towns and villages in southeast Alaska are located on the coast. For that reason, residents in all towns utilize waterfowl for nonconsumptive purposes to varying degrees, depending on the amount of habitat and number of birds near their residence. Also, the greater the road system along the coast near each village, the greater the number and diversity of birds that are generally available. The towns of Petersburg, Haines, Sitka, Ketchikan, Gustavus and Angoon, particularly, have good bird viewing available close to town.

Out-of-state tourists traveling on state ferries and tour boats have reasonably good bird viewing throughout the Inland Passage in southeast Alaska. Several areas are particularly conducive to viewing from these large vessels, such as the Wrangell Narrows near Petersburg and other confined channels. Eagles are of particular interest to passengers on the state ferries because the U.S. Forest Service provides

a public information officer on the larger ferries during the summer months who describe the eagle resources of southeast Alaska and eagle management programs.

Subsistence Use

Native inhabitants of southeast Alaska and early prospectors, trappers, traders and other individuals were undoubtedly dependent upon waterfowl to varying degrees for survival. However, this dependency on waterfowl to sustain life no longer exists. We are not aware of widespread or even occasional hunting of waterfowl outside of the legal seasons in southeast Alaska. Residents of southeast Alaska have achieved a standard of living which precludes the use of waterfowl as food necessary for survival.

The Migratory Bird Treaty between the United States and Great Britian, for Canada, allows the taking of alcids and their eggs any time of the year for food and clothing, but not for sale, by Eskimos and Indians. Additionally, Indians are allowed to take scoters during any time of the year for food. Apparently, Natives of southeast Alaska could harvest scoters any time of the year, as well as alcids and their eggs. However, we are unaware of such practices.

WATERFOWL PRODUCTION

Ducks

Unlike other production areas in Alaska, there have been no aerial surveys or ground surveys conducted to assess the number of breeding birds or ducklings produced in southeast Alaska. The rugged terrain and

widely scattered areas where waterfowl are produced is not conducive to aerial surveys. Ground studies have, for the most part, not been conducted due to the lack of priority and funds.

We conservatively estimate that a total of 100,000 ducks, comprised of adult breeders and their young, are in the fall flight from southeast Alaska. We estimate that dabblers comprise about 50 percent, divers 10 percent and mergansers 40 percent of this total. Additionally, there are tens of thousands of nonbreeding scoters and adult male scoters which return to southeast to molt and spend the summer.

Production habitat utilized by dabblers include: drier portions of the thousands of sedge-grass meadows located at the heads of bays; grassy meadows around beaver ponds; areas around alpine ponds; and pond and stream edges and other suitable habitat in the larger river valleys. Diving ducks primarily use beaver ponds, alpine ponds and probably the larger ponds in the sedge-grass meadows at the heads of bays which are not flooded during the summer months. Mergansers nest in association with the smaller creeks and rivers in Southeast, probably some distance up the streams from saltwater.

Geese

The average annual fall population of Vancouver Canada geese is estimated to be between 60,000 and 80,000 birds. These geese are largely residents of southeast Alaska which remain in the region throughout their lives. Little study has been conducted on Vancouvers compared to other Canada goose subspecies in North America. In 1973 a feasibility study, preliminary to PhD work, was made on Vancouvers. Unfortunately,

the PhD study did not materialize. However, some insights into the birds' life history were gained. Goose nests were found primarily on small islands, generally at the heads of saltwater bays and coves. Nests were also found on rocks and small islands in freshwater ponds near the seacoast. One nest was found on the bank of a freshwater beaver pond. Perhaps the most interesting nest was found on a spruce tree limb about 50 feet above ground. Geese are also known to nest on stumps and other elevated areas in sedge-grass flats at the heads of bays. Brood rearing is known to occur in the larger sedge-grass meadows at the heads of bays and other areas where there is substantial exposed tideflat at low tide. Also, adults are known to take broods from nesting areas to some alpine ponds. About 83 percent of all Vancouver geese banded in southeast Alaska were recovered there. Some travel to Oregon's Willamette Valley to winter.

Swans

Only three confirmed instances of trumpeter swans nesting in southeast Alaska have occurred. These were near Haines, Ketchikan and on Prince of Wales Island. All three broods were hatched on freshwater lakes. Considerable swan use occurs in southeast Alaska at other times of the year (see Alaska's Wildlife and Habitat, A.D.F.& G., 1973).

GENERAL WATERFOWL DISTRIBUTION

Little information other than that presented in Alaska's Wildlife and Habitat (1973) and in Alaska Wildlife Management Plans, Southeastern Alaska (1977) is available. Few systematic waterfowl surveys have been

conducted in southeast Alaska, primarily because of the widespread distribution of waterfowl, lack of priority and expenses involved in large-scale waterfowl surveys. All of the areas listed in Alaska's Wildlife and Habitat (1973) and Alaska Wildlife Management Plans, Southeastern Alaska (1977) are major waterfowl use areas. However, thousands of smaller sedge-grass flats and intertidal areas also support significant numbers of waterfowl year-round. As a generalization, the bigger the habitat is, the more birds will be present.

Numerous counts of waterfowl have been made in various areas in southeast Alaska during different times of the year. However, this data provides little information except that there were a given number of birds at a given place at one point in time. Numerous variables affect numbers of birds present at a given place at a given time, and if surveys were repeated on some areas, the numbers of birds observed would undoubtedly be different.

During spring and fall migration, peak concentrations of migrating birds occur in Southeast as follows: northern half of the region, October 7-22 and April 10-May 1; southern half of the region, October 10-November 1 and April 5-25. The greatest shore bird concentrations in the fall occur about one month or more earlier and in the spring about one to two weeks later. More geese are present during spring migration than fall because during fall migration black brant and many of the Canada goose subspecies migrate from the Alaska Peninsula across the Gulf of Alaska. In the spring, the coastal route through southeast Alaska and offshore is more extensively used.

During late summer and fall when salmon and other fish are running up freshwater streams, large concentrations of ducks can be found at the mouths of streams and upstream for some distance. Salmon eggs and flesh from dead fish are preferred food for mallards. Vancouver Canada geese have also been observed feeding on fish eggs several miles up streams during the fall.

The most extensive waterfowl inventory in southeast Alaska was conducted during the winter of 1966 by the Fish and Wildlife Service in an attempt to ascertain the numbers of over-wintering ducks. During that survey birds were counted near shore along 14.5 percent of the beach line in southeast Alaska. However, counts were conducted only in the area north of Wrangell, but birds observed per linear mile of beach were expanded for all of Southeast. Bird numbers expanded for the entire region are conservative for two major reasons: (1) numbers of wintering waterfowl in the southern portion of southeast Alaska are probably greater than in the northern portion because of more moderate weather conditions; and (2) miles of beach were calculated using one inch to four mile maps. One inch to one mile maps would result in approximately 30 percent more total miles of beach and larger bird populations.

The results of that survey indicated a total of 149,000 dabblers (130,000 of which were mallards) were wintering in southeast Alaska in 1966. Also, there were a calculated 165,000 diving ducks, 112,000 scoters and a conservative estimate of 100,000 old squaws and 100,000 mergansers present, for a total of 755,000 waterfowl, including 52,000 Vancouver Canada geese. A conservative estimate of the number of

waterfowl present during the winter in southeast Alaska would be well over 1.25 million.

Importance of Waterfowl Habitat

Southeast Alaska contains literally thousands of bays, estuaries, coves and salt chucks that are important to waterfowl. Within each of these areas there are generally two types of important habitat: sedge-grass flats, usually located at the heads of bays; and mud-sand flats, which are exposed at lower tides and contain little or no vegetation. The sedge-grass flats are used primarily for waterfowl loafing and feeding at high tides and for a limited amount of waterfowl nesting. In the aggregate, these sedge-grass flats produce significant numbers of birds. The exposed tide flats are used primarily for feeding and loafing purposes during low tide periods. Many of these exposed flats, including shallow water areas which never become exposed, contain eel grass which is a favored waterfowl food.

One of the major reasons why intertidal areas and sedge-grass flats are so important is their high productivity of plant and animal matter. Tidal action creates a constant interchange of nutrients and organic matter for plant and animal growth. Freshwater streams are frequently associated with these flats. Brackish water (mixed salt and fresh) is more productive than either salt or freshwater singularly. Varying tide levels create a transition of plant and animal communities from mud (most frequently flooded) to sedge-grass and finally spruce forest (never flooded). The species of plants and animals within each "life zone" are often different, thus creating diverse food sources for large

numbers and many species of birds. It is difficult to say, in most instances, that the loss of a given tide flat will result in a given number of birds disappearing. In many cases the birds can go elsewhere; this is especially true in southeast Alaska. However, exactly what the carrying capacity for birds is for any given area of tidal flats would be very difficult to determine. Over a long period of time, the loss of a few areas here and a few areas there will accumulate to a significant total loss.

A critical function of the intertidal areas in southeast Alaska, and elsewhere in Alaska, is that they provide safe places for birds to use during the spring before inland nesting areas are ice and snow free and in the fall after they become snow and ice covered. Because the nesting season in Alaska is short, it is imperative that waterfowl and other birds arrive on their breeding grounds ready to nest when conditions allow. If the intertidal areas were not available or did not contain adequate food sources, waterfowl and shore birds would have to overfly from their wintering grounds directly to nesting areas. If such were the case, far fewer birds would be in Alaska than are here today. The same situation is true in the fall, except in reverse.

In Alaska's Wildlife and Habitat (1973) we have provided a list of the most important swan and other waterfowl use areas in southeast Alaska. This list also occurs in the recently published Alaska Wildlife Management Plans, Southeastern Alaska (1977).

RARE AND ENDANGERED SPECIES

There have been no verified sightings of rare and endangered waterfowl in southeast Alaska. However, the rare and endangered

Aleutian Canada goose possibly occurs in the region during fall migration, and probably occurs during their northward spring migration. The furthest west verified sighting of Aleutian Canadas was at Agattu during September, 1976. The birds may well travel across the Gulf of Alaska from the eastern Aleutians to California during fall migration. However, if they use spring migration routes similar to other goose species, they travel through southeast Alaska. The most probable Aleutian Canada goose use areas in southeast Alaska would be the outside coasts of Chichagof, Baranof, Dall and other western islands of southeast Alaska. Known use areas along the coast in other areas are small grass-covered islands. For a more thorough discussion of Aleutian Canada geese, refer to the contract work between CZM and A.D.F.& G. for the Bristol Bay-Aleutian Islands area.

The only other rare and endangered bird species which is known to occur in southeast Alaska is arctic peregrine falcons. Arctic peregrines occur strictly as occasional migrants on their way to and from interior Alaska breeding grounds. Very little is known about the abundance of arctic peregrines during their migration through southeast Alaska. However, there is probably no single, major use area.

Land Classification

There are a number of areas in southeast Alaska which have special classification and protection which are related to waterfowl and other birds.

There are three national wildlife refuges which were created during the early 1900's to protect large seabird colonies. These are Forester

Islands (including Wolf Rock), 2,832 acres; Hazy Island, 42 acres; and St. Lazaria Island, 65 acres. Alaska's Wildlife and Habitat (1973) describes these areas in more detail.

There is a state wildlife refuge in southeast Alaska which covers state-owned tide and uplands on the Mendenhall Flats near Juneau. This refuge was created in 1976. The Mendenhall Wetlands are an extremely popular area for Juneau residents as a site for hunting, viewing, photography and other uses. The wetlands also provide valuable migration and wintering habitat for thousands of waterfowl.

There are two areas in southeast Alaska under cooperative management agreement. One agreement covers most of the Stikine River Flats, located at the mouth of the Stikine River. In 1962 the U.S. Forest Service and the Departments of Fish and Game and Natural Resources entered into an agreement whereby the three agencies recognize wildlife as the primary resource value. The purpose of the agreement is to manage, maintain and develop wildlife resources and associated habitats. In 1972 the U.S. Forest Service, Department of Fish and Game and the U.S. Fish and Wildlife Service entered into a cooperative agreement which covers the Seymour Canal eagle management area. The purpose of this agreement is to manage and protect wildlife and their habitats, with special emphasis on bald eagles. Seymour Canal contains the highest nesting density of bald eagles found anywhere in the world.

There is one state critical habitat area designated in southeast Alaska. This is located on the Chilkat River between Haines and the Kelsall River. The area is a 4,800-acre strip along the river which protects critical eagle use and salmon spawning habitat. Each fall and

through part of the winter thousands of bald eagles gather to feed on the late run of dog salmon in the Chilkat River. The Department of Fish and Game has proposed, or has considered proposing, to the legislature additional critical habitat in southeast Alaska. These include Chaik Bay, Pybus and Little Pybus Bays, Farragut Bay, Rocky Pass, Duncan Canal, Blind Slough, Mitchell Bay and Gambier Bay. These areas are not currently designated as critical by the legislature.

There are no designated wilderness areas in southeast Alaska. The three national wildlife refuges, Forester, Hazy and St. Lazaria Islands, have been studied for their inclusion in the national wilderness system, but no action to date has been taken. The U.S. Forest Service is currently studying the northwest side of Chichagof Island and the west side of Yakobi Island for their potential as wilderness. Admiralty Island has, for many years, been discussed by various state and national organizations as a possible wilderness area or national wildlife refuge or some other special land use classification.

Possible Impacts from Various Land Uses

In the foreseeable future there are relatively few land uses which will have significant impact on waterfowl habitat. Human activity associated with logging probably affects waterfowl as much as any single factor. For example, Vancouver Canada geese are known to leave, for an unknown period of time, areas which are being logged. Logging for a period of years probably eliminates nesting areas of Vancouver geese, mergansers and other waterfowl. When logs are stored in bays, there is probably waterfowl food loss through bark sloughing from the logs and

subsequent change in substrate composition. However, this has not been documented. There have also been waterfowl lost, but probably not in significant numbers, from pulp mill effluents. Logging probably affects other birds more than waterfowl. For example, the U.S. Fish and Wildlife Service, in the course of its eagle studies, has not found an eagle nest in anything but mature, virgin timber. Even 90-year-old second growth timber has produced no eagle nests. These studies have resulted in an eight-acre leave strip around each nest tree identified. The U.S. Fish and Wildlife Service eventually hopes to have a continuous leave strip along all beaches. Large clearcuts undoubtedly affect the species diversity and numbers of birds living in clearcut areas versus uncut areas. However, many small clearcuts possibly increase both numbers of birds and diversity of species.

Small-scale habitat destruction occurs primarily near towns and villages in southeast Alaska through airport expansion and construction, road construction and alteration of sedge-grass flats for other purposes. The most notable waterfowl habitat alteration of this nature has occurred in the Gastineau Channel.

If mining activities are conducted in accord with the Department of Environmental Conservation and A.D.F.& G. standards, this activity should have no significant impact on waterfowl. If mine tailings are not spread on tide land areas, the most significant impact will probably be waterfowl disturbance through associated human activity.

APPENDIX A

Life Histories

MOOSE

The moose (Alces alces) is the largest member of the deer family in the world; and the Alaska form (Alces alces gigas) is the largest of all subspecies.

Adult males in prime condition that have been weighed indicate that 1,000-1,6000 pounds is the usual range; females weigh 800-1,200 pounds. Only bulls have antlers. The largest moose antlers in North America come from Alaska. In Alaska, trophy class bulls are found throughout the state, but the largest come from the Alaska Peninsula, lower Sisitna Valley and Kenai Peninsula. Moose produce trophy-size antlers when they are six or seven years old and may continue to produce large antlers until they are 13 or 14. In the wild, moose may live more than 20 years.

Moose are long legged, short bodied, have a drooping nose, a "bell" or dewlap under the chin, and no apparent tail. They are colored a variety of brindle browns, shading from pale yellow to almost black, depending upon the season and the age of the animal. The hair of newborn calves is generally an orange-brown that fades to a lighter rust color within a few weeks. Newborn calves weigh 28-35 pounds and grow to over 300 pounds within five months.

Moose have adapted well to man's incursions and where they have been given protection from excessive exploitation, they and man have coexisted in close association. In Alaska, they occur in suitable habitat from the Stikine River in the Panhandle to the Colville River on the Arctic Slope. Moose are most abundant in second growth birch forests, timberline plateaus and along the major rivers of southcentral and interior Alaska.

Moose are generally sedentary animals, but seasonal movements associated with breeding, partutition and treks to favored forage areas may cover 20-40 miles. A tagged moose is known to have moved 60 miles.

In mountainous areas, bulls spend most of the summer and early fall at or above timberline, while cows with calves prefer more dense cover at lower elevations. Cows move toward timberline during the rut and the bulls meet them about halfway. The sexes separate after the breeding season; and groups of 10-20 bulls at or above timberline are common.

Both sexes are sexually mature at 16 months on the best ranges. Breeding begins in late August when the larger bulls shed their antler velvet and begin pre-rut behavior. This includes antler polishing, a cessation of feeding activities, jousting with similar-sized males, calling and seeking receptive females. Males exhaust the entire reserve of fat accumulated during the summer months during the rut. This may include 20-25% of their total weight, and they enter the winter exhausted. Most breeding takes place from September 15 to October 10, with most females conceiving during the first estrus cycle. Calves are born in late May and early June after a gestation period of approximately 240 days.

About 90% of the females over two years old breed every year. Cows generally produce a single calf the first time they breed, but thereafter up to 60% produce twins depending upon the quality and quantity of available food. Triplets occur rarely, perhaps once every 1,200-2,000 births. Most calves are born in swampy muskeg areas. A cow moose will defend her newborn calf vigorously.

The reddish-brown calves weigh 25-35 pounds at birth. Thereafter, they grow at a fast rate, reaching 300-400 pounds four months later. A little milk plus vast quantities of willow leaves, sedges, pond weeds and a sampling of most everything green except spruce trees produces

animal tissue at a prodigious rate. Calves are weaned in the following fall about the time the mother reenters estrous.

Newborn calves may represent 40-50 percent of a moose population in the spring, but mortality is great, and by November their number often has been reduced by half. Many calves die during the six weeks following birth. Mortality factors include predators, malnutrition and abandonment.

Unlike species dependent upon pristine wilderness or climax vegetation, moose are adaptable to many situations. They thrive on transitional vegetation such as that which follows forest fires, clear-cut logging operations, land clearing for agricultural purposes, highway right-of-way clearing, receding glaciers and braided river beds. Their annual habitat requirements are broad but include the following: breeding grounds, winter feeding areas, calving grounds and summer feeding areas.

During fall and winter, moose consume great quantities of willow, birch and aspen. They may establish a hedge or browse line six to eight feet above the ground by clipping all the terminal shoots of favored food species. When food supplies become critical, moose may eat food that have little nutritional value. The young terminal tips and bud ends and leaves contain most of the nutrients. But when shortages exist, moose will consume the older two-year growth. Occasionally, they will even resort to feeding on some three-year old growth. Since there is little food value in this material, the survival chances of the animals may be lowered.

Spring is the time for grazing, and moose utilize a variety of foodstuffs, particularly sedges, equisetum (horsetail), pond weeds and grasses. In some areas they feed on vegetation in shallow ponds all summer; in other situations forbs, and leaves or birch, willow, alder and aspen are the main summer diet.

Wolves may take a considerable number of calf moose in late May and June. Since there is total overlap of the distribution of wolves and moose, wolves must be considered major users of the moose resource. Black bears and brown bears both eat moose calves but their impact upon populations has never been thoroughly evaluated.

The winter period is crucial not only to the survival of adults and young of the year, but also to the survival of the following year's calves through abortion of fetus or resorption by the cow. Winter food shortages result in malnutrition and may cause losses to the population. Some losses may not be directly caused by the malnutrition but result from diseases or parasites that attack undernourished moose.

Internal parasites that affect moose include liver flukes, tapeworms and other roundworms, stomach flukes and lungworms. The winter or moose tick, is the only external parasite that is a serious health hazard to moose. Other diseases reported in moose include blindness, Bang's disease, tuberculosis, arthritis and necrotic stomatitis.

Automobile collisions kill some moose, especially in winter when moose refuse to leave the easy travelled route of a snow-plowed highway. Moose also prefer to move along plowed railroad right-of-ways rather than flounder through deep snowdrifts. During winters with exceptionally deep snow, as many as 200 moose have been killed by the Alaska Railroad.

Moose may move into residential areas and occupy yards; gardens and similar sheltered areas during severe winters. They often become such nuisances that they have to be destroyed.

SITKA BLACK-TAILED DEER

The Sitka black-tailed deer (Odocoileus hemionus sitkensis) is native to the wet, coastal rain forests of southeast Alaska and north coastal British Columbia. Its original distribution has been expanded by transplants and now established populations also occur near Yakutat in Prince William Sound and on Kodiak and Afognak Islands.

The Sitka black-tail is smaller, stockier and has a shorter face than other members of the black-tail group. Fawn weigh six to eight pounds at birth. The average October live weight of adults is about 100 pounds for does and 150 pounds for bucks. The largest dressed weight on record for a buck is 212 pounds.

The summer coat is reddish-brown and is replaced by dark gray in winter. Antlers are dark brown, with typical black-tail branching. Fully developed antlers have five points (including the eye-guard) on each side. They are relatively small, very few scoring more than 110 points by the Boone and Crockett system. Largest antler development normally occurs on four and five-year-old bucks.

The average life span of most deer is only about six years, but a few have been known to attain an age of at least twelve.

Fawns are born in May and June, usually in the fringe of trees adjacent to a lowland muskeg or beach. During summer months, there is an upward migration to open alpine ranges. After the first heavy frosts of fall, deer move downward into the high timber. Rutting activity begins in late October and peaks about mid-November. Bucks gradually lose weight during the rut, and by late December have utilized most of their fat reserves.

Throughout the winter the majority of deer remain just below the snow line, moving up and down with changing snow depths. During periods of deep snow, most of the deer population concentrates in a narrow zone adjacent to the beaches.

On summer range, food is generally abundant and of good quality. Summer food species are mainly herbaceous plants. In the spring, deer congregate on the beaches utilizing new shoots of beach grasses, sedges and plantain. As the snow recedes, skunk cabbage, marsh marigold and salmonberry and blueberry leaves become primary foods. By July most deer are in the high country where, throughout the summer, deer cabbage is the major food. After the first heavy frosts of fall, deer again move into the high timber and alder slides where they feed on the leaves and young shoots of salmonberry and black current. During the winter months, deer continue to use the low-growing herbs when available. These supply a good quality diet, but when snow covers the ground, woody plant species such as blueberry become important. These woody plants are termed "browse". Browse alone does not constitute an adequate diet, and if deer are confined to it exclusively, they gradually lose weight. At times snow becomes so deep that deer are forced to the open beaches where they feed on dry beach grass and kelp. The quality of these foods is low, and deer may actually starve with full stomachs.

Deer populations in Alaska fluctuate with the severity of the winters. The average winter is mild and deer losses small. Periodically, however, an extremely rigorous winter reduces the population to a low level. Deer have a high reproductive potential, and populations recover rapidly when a severe winter is followed by a series of mild winters.

It is difficult to accurately estimate the number of deer in southeast Alaska. There are about 25,000 square miles of deer range, and on most of this, the hunter take consists of a high proportion of older age animals, indicating that deer are fairly abundant.

Wolves are the only major predator on deer, although black bear, brown bear, wolverines and bald eagles all take a few. Wolves are only present on about half of Alaska's deer range. The largest deer and some of the highest populations occur on ranges where deer and wolves are found together.

Alaskan deer are remarkably free from parasites and diseases. There are no known incidences of significant losses from these factors.

MOUNTAIN GOAT

The mountain goat (Oreamnos americanus) is the single North American representative of a widespread group of goat-antelopes. All are characterized by relatively short horns and a fondness for living in rugged terrain. Occupying the remote habitat it does, little was known about the mountain goat until almost 1900. Goat hides had been obtained by Captain Cook as early as the later 1700's, but he had presumed the specimens were white bears and the species was not described.

The mountain goat's range is restricted to the alpine zone of higher mountain ranges of northwestern North America and extends from Idaho and Oregon to southcentral Alaska. Mountain goat populations are scattered throughout this range, but some seemingly suitable areas are completely devoid of goats. In Alaska, mountain goats occur through the Southeastern Panhandle and continue north and west along the coastal mountains to Cook Inlet. In southcentral Alaska they are generally confined to the south slope of the Chugach Mountains, although their range extends into the Talkeetna Mountains nearly to McKinley Park. Goats also have been transplanted to Kodiak, Chichagof and Baranof Islands where they have apparently established breeding populations.

Mountain goats are one of the two species of all-white, hooved, large mammals found in Alaska. They are often confused with young and female Dall sheep, but are easily distinguished by their longer hair, deeper chest and black horns. There is a crest of long, erect hair up to six or more inches in length along the spine, on the rump and over the shoulders and neck. Long hair on the feet gives the animal the

appearance of wearing pantaloons. A shaggy crop of hair hangs down from the chin and lower jaw. The pelage is much longer in winter than summer. Both sexes have a crescent-shaped gland behind each horn that increases in size during the rutting season. The appearance of both sexes is much alike except that males are about 10 to 12 percent larger than females. The horns of an average adult female are equal in length to those of an average adult male but are more slender. Sexes are extremely difficult to differentiate in the field unless the female is accompanied by a kid. Goats are usually quite docile, and their usual gait, even when alarmed, is a deliberate pace.

Mountain goats mate in November and December, and billies may wander considerable distances in search of receptive females. They do not collect harems, but some battling occurs as males often show puncture wounds. Except during the rut, adult males are segregated from other age classes and often are seen in pairs. Females with kids and immature animals are generally found in groups. In unhunted areas, nannies, kids and young goats sometimes congregate in herds of 70 to 100 or more members. A single kid is born in late May and early June after a gestation period of approximately 180 days. Twinning is not common. Kids are very precocious and can keep up with adults when only hours old and hardly larger than snowshoe hares. Nannies seek solitude prior to giving birth, but shortly thereafter join other nannies with newborn kids to form nursery flocks. Kids usually remain with their mothers until the next breeding season. As one often sees nannies with yearling kids in late spring, it is suspected that goats may not breed every year. Mountain goats may live 14 to 15 years. Many goats show healed

wounds and missing teeth, indicating a high incidence of accidents, presumably from falls.

Mountain goats are both grazing and browsing animals, depending on the particular habitat and season of the year. They normally summer in high alpine meadows where they graze on grasses, herbs and ground-growing shrubs. As winter advances and the more succulent species are frost-killed, the feeding habits shift to browsing. Hemlock is an important winter diet item, but feeding habits in winter are mainly a matter of availability. Most goats migrate from alpine summer ranges to winter at or below tree line but some may remain on windswept ridges. One known goat range consists of a series of low but very steep grass covered hills. The area supports a very good and healthy goat population which subsists the entire year largely on a grass diet. All goats examined from this area have been extremely fat and most had very dirty pelage. This range is isolated from other nearby ranges by 20 to 30 miles of glaciers and swamp. On many goat ranges in Alaska animals can be observed year round on the same ridge tops.

BROWN-GRIZZLY BEAR

The brown-grizzly bears (Ursus arctos) are the largest animals of the genus, with the Alaskan brown-grizzly bears the largest of all carnivores. Most taxonomists now believe that the brown bear and grizzly bear are all of a single species. Brown bears on the Kodiak-Afognak Island group are a reproductively isolated population with distinctive cranial features, and are considered a separate subspecies. However, reference to the brown bear implies southern coastal populations; whereas, reference to the grizzly bear indicates northern and interior Alaska populations.

The brown bear resembles its close relative the black bear, Ursus americanus. The brown bear, however, is usually large, has a more prominent shoulder hump and longer, straighter claws. Other characteristics such as the shape and relative massiveness of the head help to differentiate these species. Color is not a reliable key in differentiating these bears for both species have many color phases.

Mature males weigh between 500 to 900 pounds with extremely large individuals weighing as much as 1,400 pounds. Females weigh one-half to three-quarters as much as equivalent aged males in given locales. An extremely large brown bear may have a skull approaching 18 inches in length. Such a bear when standing on its hind feet is about nine feet tall. Inland, bears are usually smaller than coastal bears; perhaps because they lack the rich supply of fish.

The Alaska brown-grizzly bear is common over most of the state. They inhabit the Alaskan Peninsula, Kodiak and Afognak Islands, Montague and Hinchinbrook Islands in Prince William Sound and Baranof, Chichagof and Admiralty Islands in southeastern Alaska.

Although there are no precise data on the abundance of brown-grizzly bears in the state, there is a general understanding of the species' status. Numerous attempts to determine the abundance of brown-grizzly bears in various areas have met with little success except to yield minimum estimates and to provide information on their relative abundance.

Brown bears are probably as abundant as during earlier times, except where they have been displaced by man. Definite reductions in bear numbers have occurred near human population centers. A marked reduction has occurred on the Chiniak portion of Kodiak Island, where conflicts between livestock interests and brown bears are common.

Tagging studies have shown that bear movements are confined to limited areas and movements in excess of 30 miles are unusual. Burns and Hensel, (1972) state that in the Kodiak National Wildlife Refuge the size of individual activity areas, established by eight bears, averaged 5.5 square miles and four bears used two activity area each that averaged 5.7 square miles in size. Activities were associated with food gathering and winter denning. Fixed frequency and location indicated that the 14 bears studied spent 50 percent of their time in lowland habitat.

The breeding biology of brown-grizzly bears is reasonably well known. Both sexes usually attain sexual maturity at 3 1/2 to 4 1/2 years. Females mature as early as 2 1/2 years while others are 6 1/2 years old at first breeding. Males are usually sexually mature by 4 1/2 years of age.

Matings take place from May through July with the peak of activity in early June. Brown bears generally do not have strong mating ties, but individual bears have been observed remaining with their mates for over a month. The hairless young, weighing less than a pound, are born the following January or February in a winter den. Litter size ranges

from one to four cubs; two are most common.

The large size attained in several months' growth by coastal brown bear cubs compared to interior cubs suggests the differences are largely caused by environment rather than by genetics. A richer food supply, particularly protein-rich salmon, is generally available to coastal bears. The foraging period of coastal bear cubs is also several months longer than that of interior bear cubs which spend more time denning.

The gestation period, usually about 245 days, includes a relatively long period of delayed implantation. Implantation usually occurs in October or November.

The cubs remain with their mothers through their second year of life. Female brown bears give birth to a new litter every two or three years. There is strong evidence that the usual interval between litters is three years.

Maximum life span in the wild is unknown, though captives have lived to be 30 years old. Age determinations of wild bears using tooth cementum aging techniques suggest that some bears reach their late 20's.

Cub and yearling litters observed in summer average slightly in excess of two, suggesting a high survival rate for cubs from conception to family breakup. However, it is possible that natural mortality affecting litters may most often involve the entire litter rather than individual cubs, thereby masking the true extent of mortality.

During winter, bears experience a period of dormancy which they spend in dens. During this time their body temperature drops, and their general metabolic rate is reduced. This is not considered complete hibernation since they do occasionally emerge from their dens to forage, particularly during spells of warm weather and during years when food is scarce prior to denning.

Bears usually enter dormancy in November and December and emerge during April or May. The den is often a natural shelter between tree roots or rocks or may be an excavation dug by the bear itself. Dens are most common at high elevations near timber-line, but may be found anywhere from sea level to alpine areas. On the Alaska Peninsula and Kodiak, dens are usually located in the alder, willow and grass zone, and are often lined with grass and leaves.

The precise habitat requirements of brown-grizzly bears are unknown, but they are seemingly most at home in open tundra and grassland areas. Even where they occur in forested areas, as in southeastern Alaska, substantial mountain meadows, muskegs, sedge flats, and other grassland areas are present. Perhaps the best indication of habitat requirements is the fact that the most dense populations occur in lush grassland communities, as on Kodiak Island and Alaska Peninsula. Grassland types appear especially critical for bears during the spring, when other high quality foods are scarce.

The brown-grizzly bear is an opportunist and will feed on game or domestic animals when it is available. The brown bear is probably not a significant predator on big game species except possibly during spring when the young are most vulnerable. Bears are fond of carrion and will feed on carcasses of any animals they come across. Some instances of cannibalism have been recorded. As a rule, animal matter constitutes a lesser but important portion of the grizzly bear's diet. An exception is coastal areas where abundant salmon comprise a major segment of the summer and early fall diet.

Bears often congregate where food is abundant, and may be seen fishing side by side in salmon streams. On July 28, 1970, thirty-one brown bears were seen fishing at McNeil River falls at one time.

Human activities are the most significant mortality source. Sport hunting is presently the most important human-related mortality factor, but there is also a high mortality of nuisance bears near inhabited areas. Often situations attractive to bears, such as garbage dumps and free-ranging livestock, are responsible for conflicts ending in the bear's death. Factors limiting remote and unexploited populations are largely unknown. Of all Alaska's wildlife, brown-grizzly bears are probably least compatible with human activities. Without special consideration, their numbers will be markedly reduced where substantial and sustained human occupation and confrontation occur. Even with protection, a certain amount of conflict and consequent attribution of bears can be expected. The whole history of the species on this continent has followed this pattern, and today grizzly bears have disappeared from most of their former range in the contiguous United States and Central America. Their numbers have been markedly reduced over much of Canada and in small portions of Alaska. The brown bear in Europe has suffered a similar fate.

The eventual survival of the brown-grizzly bear may not depend entirely on the designation of vast tracts of unspoiled "wilderness", as shown by conflicts occurring in large national parks. Instead, the future of the bear lies in the reassessment of human values to include reasonable co-existence with it. Bears are not constant competitors and the major conflicts usually have resulted from improper land planning and classification, marginal economic pursuits, and basic misunderstanding of bears and their behavior.

BLACK BEAR

The black bear (Ursus americanus), the smallest of the North American bear, is bulky in build and is quite variable in size depending on sex, age and time of year. As adults, black bears stand about 26 inches at the shoulders and measure about 60 inches from nose to tail. An average adult male in summer weighs 180-200 pounds, with few exceeding 300 pounds. Female average weight is somewhat lighter than males. Fall specimens weigh 20 to 30 percent more than equivalent spring specimens. The usual color of the black bear is jet black with a distinctive brown muzzle and a small white chest patch.

In Alaska, black bears are distributed over about three-fourths of the state with no consistent records of the species north of the Brooks Range, on the Seward Peninsula, the Kuskokwim Delta, the Alaska Peninsula south of the Branch River, or on the islands in Southeastern Alaska north of Frederick Sound. They are also absent from some of the large islands of the Gulf of Alaska, notably Kodiak, Montague, and Hinchinbrook.

The black bear is a forest species, and in Alaska it's distribution coincides closely with distribution of forests. It has a decided preference for open forests rather than heavy timber and maximum populations generally occur in areas of broken habitat types. Semi-open forest areas composed primarily of fruit-bearing shrubs and herbs, lush grasses and succulent forbs are particularly favored. Expansive open areas are generally avoided by black bears.

Very little is known of the abundance of the black bear in Alaska. Areas of high relative abundance are known to occur, such as Prince of Wales Island in Southeastern Alaska. Elsewhere in the state black

bear numbers are likely to be more sparse than in the southern climates where foraging seasons are longer and richer food complexes (fish) will favor greater densities.

Black bears have very poor eyesight, but their senses of smell and hearing are well-developed.

Both sexes attain sexual maturity at approximately 3 1/2 years, though females may not breed until 5 or 6. Breeding takes place from about mid-June through mid-July.

Gestation lasts approximately 7 months, however almost no active embroyonic growth occurs during the first half of pregnancy. This is due to a delay in the implanting of the embryo (delayed implantation). Implantation of the embryo occurs in early December. Following first conception, breeding occurs during alternate years unless the cubs are lost or spearated from the mother prior to or during the following breeding season.

Young are born during late January or February while the mother is in the winter den. At birth the cubs weigh only 8 to 10 ounces, the eyes are closed and they have little hair. The normal litter is two, but a litter of three or four is not uncommon. Litter sizes observed in late summer and early fall suggest a low cub mortality. Upon emerging from the den in May the cubs weigh about five pounds and are covered with fine woolly hair. Cubs are very precocious. Black bear cubs as young as five months have survived with no maternal care.

Cubs are normally weaned by September when they are eight months old. They apparently remain with their mother through the first hibernation period following their birth.

The life expectancy of black bears in the wild is unknown, but is probably much shorter than the 25 years attained by some captive bears.

The winter-denning period of the black bear is variable as to time and duration depending upon location and the animal's physical condition. Denning in Alaska will usually begin in October and extend through April and into May. Females with cubs usually emerge from dens later and den earlier than single bears. This is not considered true hibernation as they do occasionally emerge from their dens. Warm weather, particularly if flooding of the den results, is often associated with bears leaving dens for a short period. A few black bears have been seen moving about in deep snow.

The location selected for dens varies considerably. Most black bears favor dens dug beneath logs, or in holes dug into hillsides, although a few bears over-winter with little or no shelter at all. Some bears will spend considerable amounts of time constructing elaborate dens lined with leaves, ferns and other vegetable matter.

The diet of the black bear in Alaska is imprecisely known and is variable depending on the portion of the state in which they live. Bears are omnivorous and are opportunistic when it comes to food, and simple food availability is one of the most important factors governing food habits.

Upon emergence in the spring, grasses, sedges, and other early-appearing herbaceous plants appear to constitute the bulk of the diet. After mid-July and throughout the fall a variety of berries such as blueberry, low bush cranberry, high bush cranberry, elderberry and Arctic blueberry become the most important food utilized by Alaska's interior black bears. However, in areas where salmon occur, black bears food habits change to salmon as they become available.

Animal food, however, constitutes only a minor portion of the black bears total food intake. It consists of less than 15 percent of the annual diet, is apparently taken whenever it is obtainable, and is frequently carrion. Invertebrates (particularly insects) along coast areas are also sought by bears. The black bear will take an occasional prey animal, but is of little significance as a predator. Black bears, as with most bears, have been known to be cannibalistic.

Although quite wary of man, some black bears frequent garbage dumps in populated areas, often being encouraged as tourist attractions. Such bears frequently raid human dwellings, which results in a wasteful mortality of these nuisance animals.

Mortality factors affecting bear populations are for the most part unidentified. In accessible and inhabited areas, hunting and other human activities are the most significant. Relatively unexploited populations appear naturally limited by other, unidentified factors.

Parasitic infestations of black bear are generally low. Endo-parasites, such as roundwarms, tapeworms, lungworm, hookworms and filariid worms are common. Trichinae give the most cause for public concern, as most bears are infected by this parasite. All bear meat should be well-cooked before eating.

HARBOR SEALS

The harbor seal (Phoca vitulina) is a member of the family Phocidae that includes "true" seals, They differ from their nearest relatives the sea lions, fur seals and walruses in that they have no external ears, have flippers that cannot be turned forward and may be found in a marine, estuarine or fresh water environment. In Alaska, it is known also as the common or spotted seal. It is the only hair seal (phocid) found in southern Alaska and the Aleutian Islands. From Bristol Bay north, it shares its range with bearded seals (Erignathus barbatus) ribbon seals (Histriophoca fasciata) and ringed seals (Pusa hispida).

Harbor seals usually occur in close proximity to the coast although sightings of animals a mile or two offshore are not unusual. Spalding (1964) did not consider the harbor seal a pelagic species and states that they are seldom found more than five miles from shore. Bigg (1969) supports this as he states that "harbor seals live mainly along the coast." However, it is apparent from observations made by the National Fisheries Service during pelagic fur seal investigations that individual animals occasionally do occur some distance offshore. They made a number of sightings, nearly all of single animals, up to 50 miles offshore. Seals thrive equally well in areas with rocky or muddy ocean bottoms. Unlike sea lions and sea otters, which prefer relatively clear water, harbor seals occupy both clear and turbid waters. They are able to catch fish in silt-laden glacial streams and at the bases of glaciers extending to the sea.

Haul-out areas include offshore rocks, sandbars and beaches of

remote islands. Floating ice pans calved from glaciers are used for hauling out when available. During winter, ice shelves which form at the heads of bays are frequently used as hauling platforms.

The average weight of the adult harbor seal is about 200 pounds and length is five to six feet. Their color varies greatly, but is basically a bluish-grey on the back with a scattering of black spots and irregular white rings and loops; the belly is silvery-white with scattered dark spots. Occasionally, there are marked differences in coloration between seals of two different bays or fiords.

From southeastern Alaska to the Aleutian Islands, harbor seals give birth between late May and mid-July, with most pups being born during the first three weeks of June. Birth occurs on sandy beaches or remote reefs and rocks or on glacial ice pans. Usually one pup is born, but twinning does occur. Newborn pups are about 35 inches long and weigh about 28 pounds. The pups are able to swim almost immediately after birth and often take to the water before the next high tide covers their birth place. Pups are usually weaned after three to four weeks.

In northern Alaska pupping occurs on drifting sea ice during the first part of April. Pups are born with a long white coat which is retained for several weeks. Apparently they do not enter the water until the fetal coat is replaced by their first coat of adult-like hair.

Female harbor seals attain sexual maturity when three or four years old. Mating usually occurs in July, shortly after the females have stopped nursing their pups. Delayed implantation occurs and embryonic development is retarded for about two months. The period of active fetal development is about 8.5 months. These seals are relatively long-lived, and some survive longer than 30 years in the wild.

The most common foods eaten by harbor seals are fish and crustaceans. K. Pitcher (A.D.F.&G., Anchorage, AK., pers. comm.) reported that as of September 1, 1975 he had analyzed stomach contents from 161 seals collected in the Prince William Sound-Copper River Delta area. Dominant species included Alaska pollock (Theragra chalcogramma), herring (Clupea harenigus), eulachon (Thaleichthys pacificus), and octopus (Octopus sp.). Other species identified included shrimp (Pandalus sp.), squid, salmon (Oncorhynchus sp.), sand lance (Ammodytes hexaptenus) and starry flounder (Platichythys stellatus). This wide variety of food items indicates that seals will take what is most readily available at the time of feeding.

Other than man, their only major predators appear to be killer whales and sharks, although some may be taken by eagles and wolves. Some mortality does occur when rookery areas are disturbed during pupping. This disturbance increases the rate of abandonment of pups. Very few cases of severe pathology have been observed in harbor seals. Almost all adult seals have roundworms and spiny-headed worms.

Seals tolerate moderate boat traffic through their marine habitat and some disturbance. Although seals may be able to tolerate low levels of pollution, large amounts of oil or other toxic substances in water would be detrimental by harming seals and their food supply.

In arctic Alaska the harbor seal has long been a source of food and clothing for the Indian and Eskimo. However, in southern waters his habit of plundering fishermen's nets has resulted in considerable persecution by fisheries interests. They were regarded as a nuisance and as a result, in 1927 a $2.00 bounty was placed on all seals. In 1939, this was increased to $3.00. This $3.00 bounty was retained until 1967 when the Alaska Legislature eliminated the bounty in southern Alaska. During that 40-year period over one million dollars was spent on bounties. As a whole, the bounty system did not control seal numbers.

In 1962-63, Alaskan harbor seals entered the European fur market, a market which annually consumes up to 500,000 seal skins. High prices were paid for raw seal skins, stimulating a great deal of interest in harvesting the animals. In 1964, an average prime adult skin was worth $20.00 to the hunter; choice pelts brought as much as $50.00; pup skins averaged about $17.00 each (Alaska Department of Fish and Game, 1964). The estimated yearly harvest in Alaska, south of Bristol Bay, climbed from about 6,000 to 10,000 seals prior to 1963 to over 50,000 in 1965. The market prices of seal hides then dropped, resulting in a significant decline in hunting pressure. The seal harvest in 1966 dropped to less than 30,000 and continued to decline each year thereafter.

Widespread public concern for the welfare of harbor seals and other marine mammal populations has been demonstrated in recent years. The Marine Mammals Protection Act of 1972 (Public Law 92-522) was a misguided result of this concern. In general, this act placed a moritorium in the taking of all marine mammals and placed the responsibility for their management under federal jurisdiction.

SEA OTTER

The sea otter (Enhydra lutris) lives in shallow water areas along the shores of the North Pacific. Once, its range extended from southern California north through the Aleutian Islands to the Kamchatka Peninsula and south to the northern islands of Japan. In 1742, Vitus Bering's men returned with sea otter pelts from the historic voyage of discovery of Alaska. These rich furs stimulated excited interest, initiating an era of exploitation which almost wiped out the sea otter. Finally, in 1911 when so few animals were left (in many areas they were completely exterminated) that it was no longer profitable to hunt them, sea otter were given full protection under the Fur Seal Treaty. Recovery has been slow, but today the population has grown until there are 100,000 or more sea otters in Alaska from the Aleutians to Prince William Sound. Small populations also exist in Russia's Commander Islands and Kurile Islands, and in California. The Alaska Department of Fish and Game has transplanted sea otter to unoccupied areas of their former range, particularly southeastern Alaska.

Although sea otter are called marine mammals, they are actually members of the weasel family (Mustelidae) and are related to mink and land otter rather than to seals, seal lions and walrus. Adult males weigh 70 to 80 pounds with some individuals weighing 100 pounds. Females average 40 to 60 pounds. Adults reach a length of 4 1/2 feet. The hind feet are webbed and are used for swimming. While the toes on the fore feet are short and stiff, the animal is able to use them deftly to handle objects such as food. Sea otter are adapted to ocean life. On land their gait is clumsy and they are easily run down by a man.

Probably because of this vulnerability, they are seldom found more than a few yards from water.

In water they are graceful and powerful swimmers capable of quickly covering considerable distances above or beneath the surface. When chased they sometimes swim porpoise style, alternately swimming underwater and arcing above the surface for air.

The fur, which is possibly the finest in the world, consists of a very dense fine underfur of inch-long fibers and very sparce guard hairs. The underfur ranges from brown to almost black. Guard hairs may be black, pale brown, or silver. Older animals often develop a silvery head. This combined with the prominent whiskers lead to the nickname of "Old Man of the Sea".

Unlike seals, which rely on a heavy layer of blubber for protection against the cold North Pacific waters, the sea otter must depend upon air trapped in its fine dense fur for maintaining body temperature. If the fur becomes soiled or matted by material such as oil, the insulating qualities are lost resulting in loss of body heat and eventually death. For this reason otter spend much time cleaning and rubbing their fur to keep it clean.

Perhaps the most characteristic behavior of sea otter is their habit of swimming on their backs. In this position they propel themselves with their hind flippers, using them alternately like paddles. They may be seen in shallow off-shore areas, often in kelp beds, floating on their backs, feeding, preening or sleeping.

Sea otter mate at all times of the year, and their young may be born at any time; however, there appear to be more born in late spring and in summer than any other time of the year. Like other marine mammals they have only one pup during each breeding cycle. Pups weigh three to

five pounds at birth and are light brown in color. The female cares for the pup except when diving for food. When traveling, sleeping or preening, the pup usually rides its mother's chest as she floats on her back. The pup may weight 25 pounds when weaned and looks almost as big as its mother.

Recent studies suggest that females won't mate while they have pups with them. As a result they probably average one pup every two years.

Sea otter do not migrate and seldom travel far unless an area has become overpopulated and food is scarce. They are gregarious and may become concentrated in an area, but they do not normally form herds. An exception is pods of up to several hundred animals which occasionally form off-shore. They do not appear to defend territories and there is little, if any, aggressive behavior. The killer whale is the only likely natural enemy. Evidence suggests that sea otters may live for 15 to 20 years.

Fish, sea urchins, rock oysters, crabs, mussels, various other mollusks and octopus make up the normal diet of sea otter. They usually dive to the bottom in five to fifty feet of water, although sometimes deeper, and return with several pieces of food, roll on their backs, place the food on their chests and eat it piece by piece using their forepaws. Occasionally one will crack clams by hitting them together or even by placing a rock on its chest and pounding the clam against it. In the wild, sea otters never eat on land.

The search for food is one of the most important daily activities of sea otters, as large amounts are required to sustain the animal in healthy condition. Early morning and late afternoon and evening hours are usually spent hunting for food while the midday period is spent

cleaning their fur and resting. Feeding dives generally last less than one minute although some otter are capable of staying under water for five minutes or more.

Since 1911, it has been illegal to kill sea otter or to even posses a hide without a permit. They are protected by an international treaty on the high seas and by State and Federal laws in territorial waters.

SEA LION

The Northern, or Steller's sea lion (Eumetopias jubatus) is a member of the family Otariidae which includes sea lions and fur seals. It differs from the common seal family Phocidae in that it has hind flippers that can be turned forward and used in a more four-footed method of movement on land, has external ears, and is found almost exclusively in a marine environment.

Sea lion pups are most commonly born during late May and June, with the majority of pupping occurring during the first two weeks in June. Usually only one pup is produced, but twinning occurs rarely. The average weight at birth is 44 pounds. Females eventually weigh 600 to 800 pounds, and males may grow as large as 2,400 pounds.

Breeding activity begins in late May when mature bulls begin defending territories on the coastal rookeries. Females may move about the territories, but all intruding males are challenged. On large rookeries, males generally have 14-17 females within their defended areas. Most females breed within a week or ten days after giving birth, with the peak of breeding activity occurring in Mid-June.

Not all sea lions go to rookery areas during the breeding season. Large numbers of bulls occupy male hauling grounds, generally located adjacent to rookeries. Also, males and females without pups may gather on hauling grounds where males also defend territories and engage in breeding activities. Territorial behavior by males begins to decrease around the first of July and by mid-July most breeding activity has ended.

Pups are capable of swimming within hours after birth, but most do not venture into the water until they are at least a month old.

By late July, rookery populations begin to decline as some territorial bulls and females without pups leave the area. Hauling grounds that contained few or no sea lions during the summer gradually begin to attract more animals, but the number using each hauling ground varies from day to day and month to month.

As many as 25% of adult females fail to produce a pup each year. In addition, more than half the new pups die in their first year. Drowning, abandonment, malnutrition and predation are the major causes of death. Killer whales, sharks and men prey on adults as well as pups.

Sea lions are generally shy animals and rush to the water when approached by man, except during the June breeding season. During that month, sea lions on rookeries show great reluctance to leave the land. Although most females will finally flee when a man approaches too closely, some become very protective of their pups and refuse to leave their sides. Similarly, many males continue to defend their territories against all intruders, including men.

During winter, some sea lions move into the more protected waters of bays and inland passages. They use hauling grounds that may have been unoccupied in summer and often follow predictable feeding patterns, such as moving into herring spawning areas in spring.

Although sea lions live in the marine environment, they occasionally ascend freshwater rivers for short periods of time. They seem to thrive best in remote island areas with extensive shallow water and rocky bottoms highly productive with fish life.

Offshore rocks exposed through all stages of the tide are important

as resting areas. Sea lions are excellent swimmers and range widely in search of food. They are uncommon in glacial areas where the water is turbid, as they prefer relatively clear waters.

Sea lions eat a wide variety of foods including rockfish, sculpin, cod, greenling, sand lance, smelt, salmon, halibut, flounder, octopus, squid, shrimp and crab.

Sea lions have long been considered an enemy of fishermen because of their dietary preference for fishes. But few quantative data are available concerning the extent of predation on commercially exploited fishes.

Populations of sea lions have been exploited by man throughout history. The earliest harvest records of sea lions come from middens near native village sites and show that sea lions were used extensively.

Commercial interest in sea lions brought about harvests of pups for their pelts. Over 45,000 sea lions pups were recorded harvested from Alaskan rookeries from 1959 through 1972 (Calkins et al. 1975). The Marmot Island and Sugarloaf Island rookeries contributed 31,070 of this total. The average price paid to the hunter for sea lion pup skins was about $8.00. All harvesting of sea lions ceased with the advent of the Marine Mammals act of 1972.

NOAA COASTAL SERVICES CTR LIBRARY
3 6668 14110895 3

SH
327.5
.F63
1977
v.1