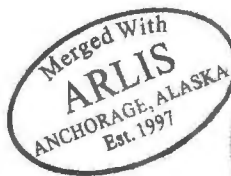


ALASKA PENINSULA/BECHAROF NATIONAL WILDLIFE REFUGES

King Salmon, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1988



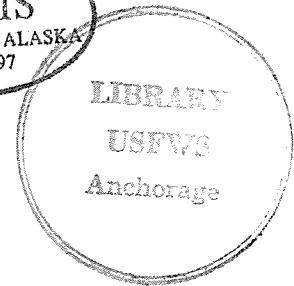
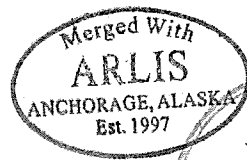
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ALASKA PENINSULA/BECHAROF NATIONAL WILDLIFE REFUGES

King Salmon, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1988



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REVIEW AND APPROVALS

ALASKA PENINSULA/BECHAROF NATIONAL WILDLIFE REFUGES

King Salmon, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1988

<u>Ronald E. Hood</u>	<u>2/20/89</u>	<u>[Signature]</u>	<u>3/3/89</u>
Refuge Manager	Date	Associate Manager Review	Date
<u>[Signature]</u>		<u>5-6-89</u>	
Regional Office Review		Date	

US FISH & WILDLIFE SERVICE--ALASKA



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INTRODUCTION

The Alaska Peninsula splits Bristol Bay and the Bering Sea on the north and west from the Pacific Ocean on the south and east. This rugged peninsula juts out in a southwesterly crescent from the mainland beginning at the 59th parallel of latitude and running nearly 400 miles to about the 54th parallel. The southwestward crescent is continued for another 1500 miles by the Aleutian Islands. The backbone of the Alaska Peninsula is the Aleutian Mountain Range. This volcanic mountain range lies along the Pacific coast on the east side of the peninsula. Numerous peaks rise above 6000 feet elevation. This creates a Pacific coast that is rocky and heavily fjorded. The Aleutian Range, including the Aleutian Islands, contains nearly 50 volcanoes known to have erupted or vented steam since 1760. They are part of a chain of volcanoes that rim the Pacific Ocean known as the "Ring of Fire". The Alaska Peninsula and Becharof National Wildlife Refuges are superimposed over this rugged range of mountains. (Figure 1).

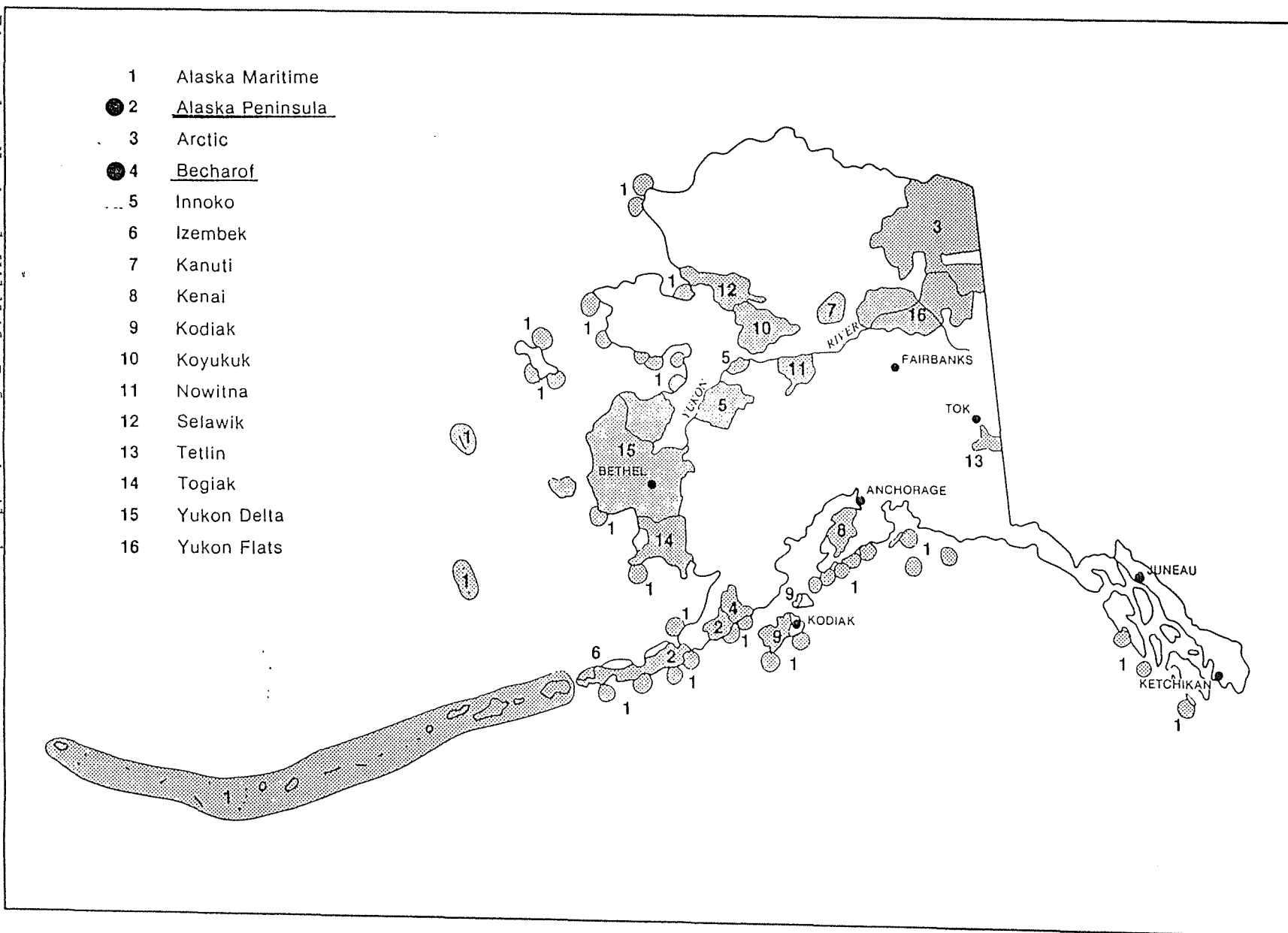
On December 1, 1978 President Jimmy Carter established the **Becharof National Wildlife Monument** by Proclamation 4613. Two years later, on December 2, 1980 the Becharof Monument became extinct and was reincarnated as the **Becharof National Wildlife Refuge**. This was the date on which President Jimmy Carter signed into law the Alaska National Interest Lands Conservation Act (Lands Act). This act also created the **Alaska Peninsula National Wildlife Refuge**.



A fog bank rolls around the northeast flank of Mt. Peulik

REH

Figure 1. National Wildlife Refuges in Alaska.



The **Becharof Refuge** contains approximately 1.2 million acres. It is 10 miles south of King Salmon and 295 miles southwest of Anchorage (Figure 2). The refuge lies between Katmai National Park and Alaska Peninsula Refuge. The refuge landscape consists of tundra, lakes, wetlands, and volcanic peaks. Becharof Lake, the second largest lake in Alaska, is nestled between the low tundra wetlands to the north and west and the Aleutian Mountain Range to the east and south. Mount Peulik drops to the edge of the lake about midway along its southern shore. The geologically active Ukinrek Maars bares scars of the eruption that took place in 1977.

The lowest elevation on the west side of the refuge is about 50 feet above sea level. The highest elevations on the refuge are about 5,000 feet where the northern boundary crosses the Kejulik Mountains. The Kejulik River Valley, about six miles wide at Becharof Lake, splits the main trend of the Aleutian Range, separating the rugged Kejulik Mountains from the coastal range. A few glaciers are on slopes and upper valleys of higher peaks on the northeast boundary of the refuge.

Becharof Lake and its tributary streams provide important nursery habitat for the multi-million dollar salmon industry in Bristol Bay. This system is renowned for its spawning runs of red salmon, an important food source for brown bears. Dolly Varden, Arctic grayling, rainbow trout, five species of Pacific salmon and other fish are found in refuge streams.

The refuge's fauna includes a large population of brown bears. Moose inhabit the area in moderate numbers and over 15,000 caribou migrate through the area during fall and winter. Other animals found are wolves, foxes, wolverines and lynx. Sea otter, sea lions, and harbor seals inhabit the shorelines as do nesting bald eagles, peregrine falcons, and thousands of seabirds on the rocky seacliffs of the Pacific coast. Nesting and migratory waterfowl are found on wetlands and lakes throughout the refuge.

Section 302(2)(B) of Lands Act set forth the following major purposes for which Becharof Refuge was established and shall be managed:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, brown bears, salmon, migratory birds, the Alaskan Peninsula caribou herd and marine birds and mammals;

- (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;

- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and

- (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

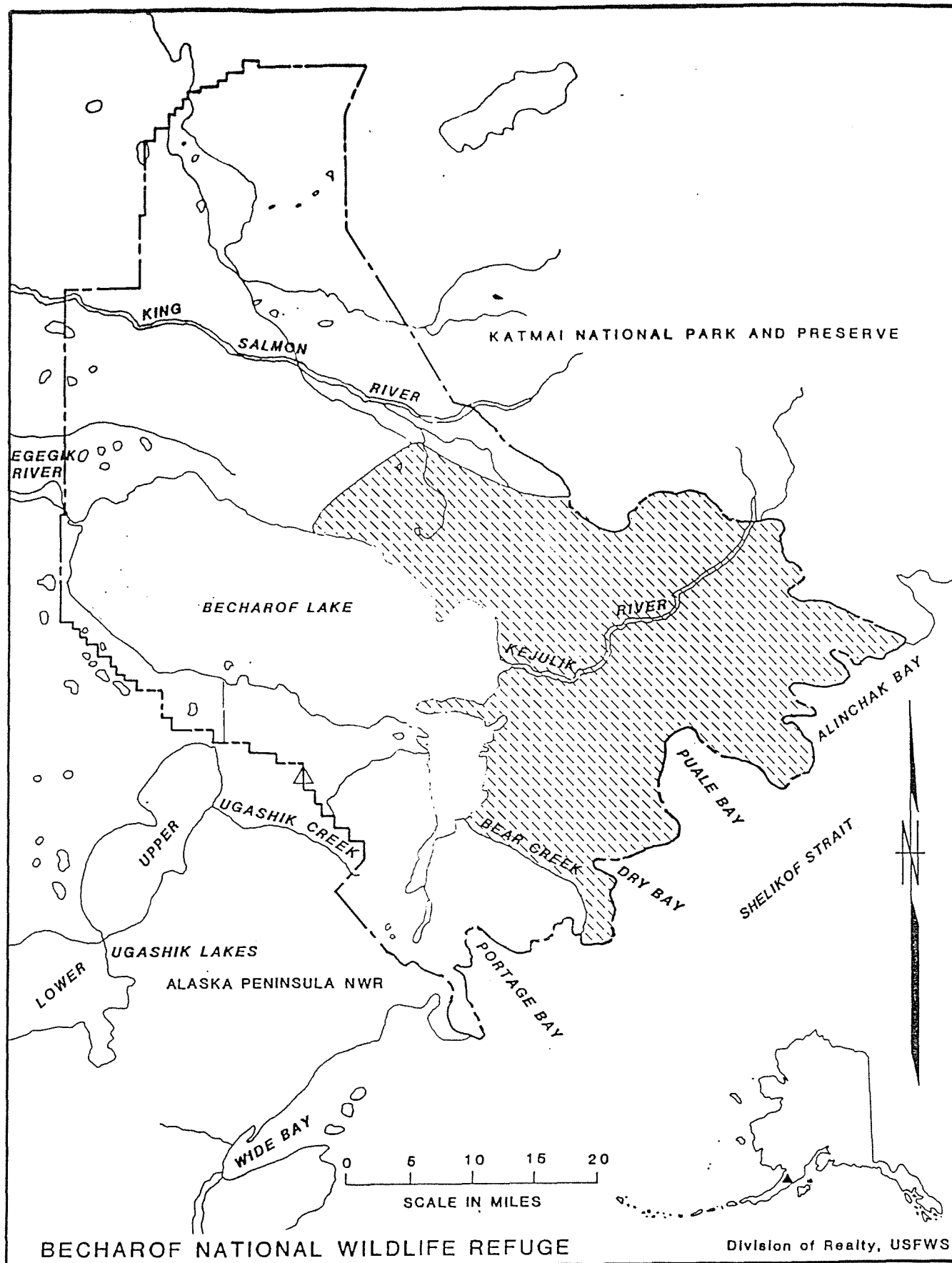


Figure 2. Becharof Refuge.

The Alaska Peninsula Refuge boundaries encompass about 4.3 million acres of land -- an area bigger than the State of Connecticut (Figure 3). Stretching for nearly 340 miles along the Alaska Peninsula, the refuge is subdivided into three units: the Ugashik, Chignik, and Pavlof units. The Ugashik Unit's northeastern boundary is about 60 miles south of the refuge headquarters at King Salmon and 360 air miles southwest of Anchorage. It is bounded on the north by the Becharof Refuge and on the south by the Aniakchak National Monument and Preserve. The Chignik Unit bounds the Monument's southern boundary with the Pavlof Unit occupying the southwestern end of the Alaska Peninsula crescent. Izembek Refuge adjoins the unit's southwest corner.



Looking northeast across Upper Ugashik Lake at Mt. Peulik,
Ugashik Unit. SES

Landforms of the Alaska Peninsula Refuge include rugged mountain crests, rounded sub-summits, U-shaped valleys with sheer walls, sea cliffs and fjords, low tundra wetlands, glacial lakes, and moraines. The dominant geographical feature is the rugged Aleutian Range. Eleven major volcanoes, including seven that are active, are inside the refuge. They range from 4,400 feet to 8,300 feet in elevation. Cinder beds radiate from eruptive centers in the volcanic systems, and the volcano slopes are covered with glaciers and summit ice fields.

The refuge lands on the Bristol Bay side of the range gradually slope toward the Bristol Bay coastal plain northwest of the mountains. The coastal plain terrain is flat, with lakes, and meandering streams.

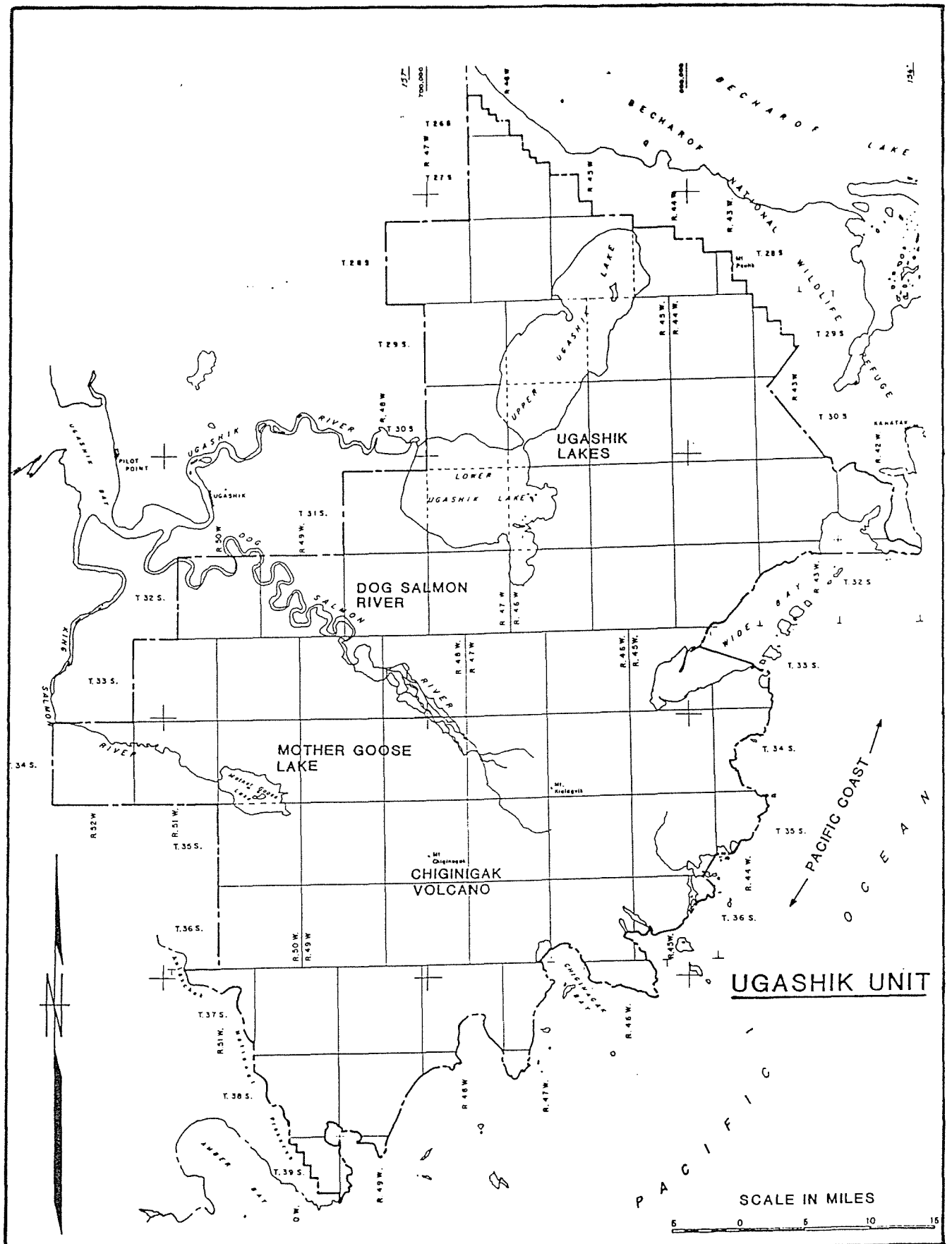


Figure 3. Alaska Peninsula Refuge.

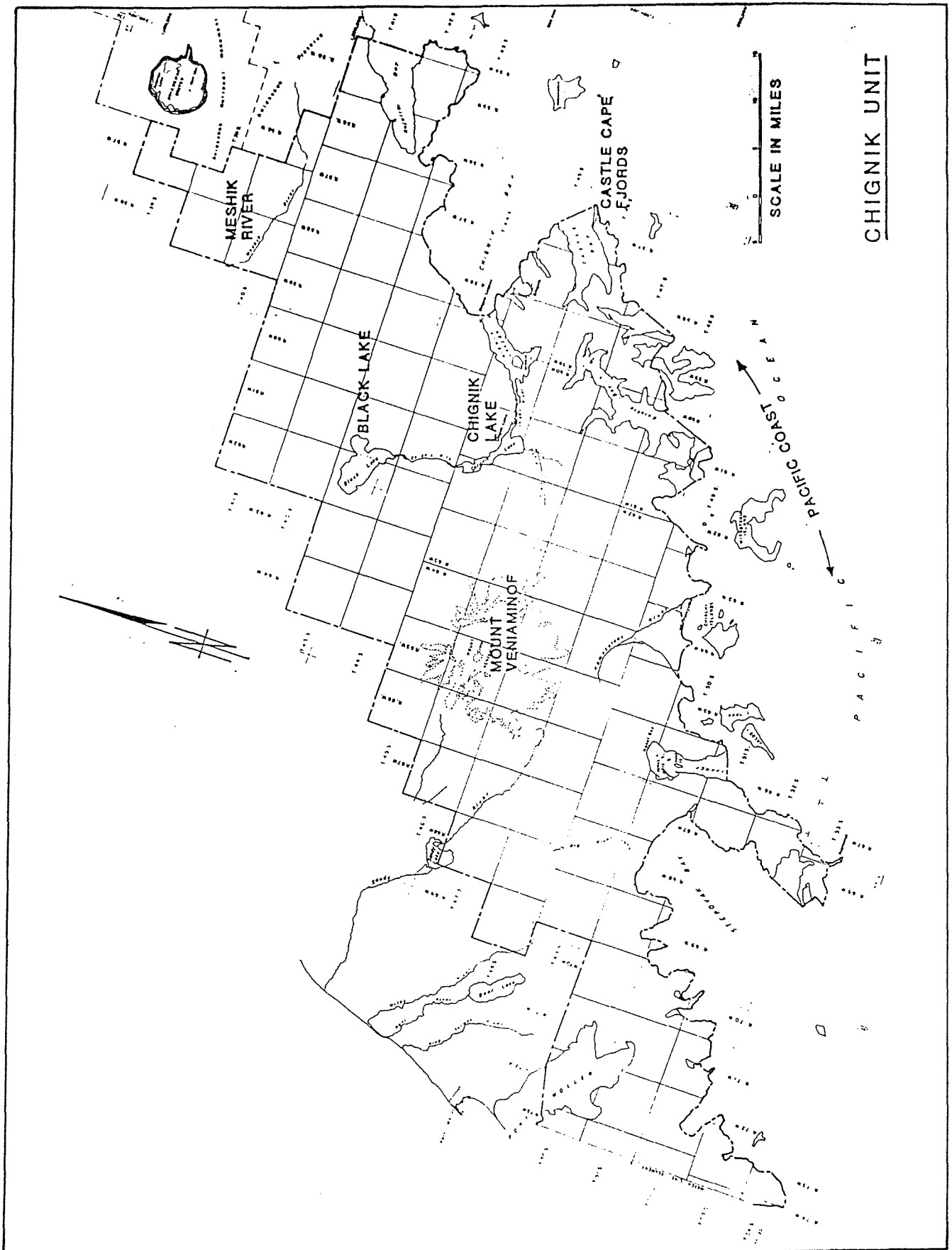


Figure 3. Continued.

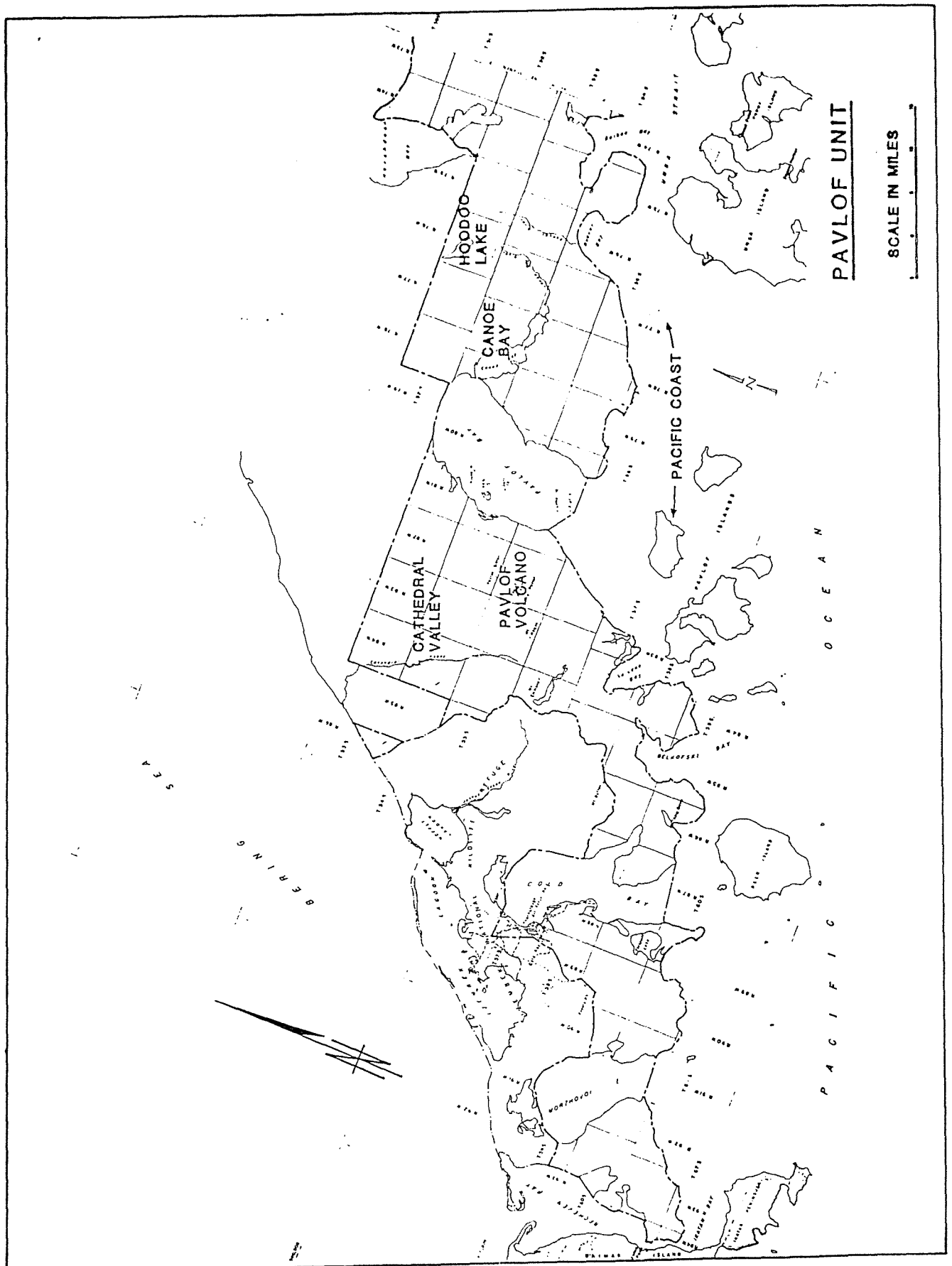


Figure 3. Continued.

Remnants of glacial moraines provide the only local relief. Toward the tip of the peninsula the southwestern half of the refuge has fewer lakes and assumes a progressively narrower slope.

The Ugashik, Meshik, and Chignik rivers, the Ugashik lakes and Black Lake provide habitat necessary for the five species of salmon that spawn in the refuge. Over 30 species of mammals are present, including brown bear, moose, caribou, wolves and wolverine. Sea otters, sea lions, and harbor seals inhabit the Pacific coastal area. The refuge's lakes and wetlands are heavily used by migrating waterfowl.

Section 302(1)(B) of the Lands Act sets forth the following major purposes for which the Alaska Peninsula Refuge was established and shall be managed:

(i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, brown bears, the Alaska Peninsula caribou herd, moose, sea otters and other marine mammals, shorebirds and other migratory birds, raptors, including bald eagles and peregrine falcons, and salmonids and other fish;

(ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;

(iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii) above, the opportunity for continued subsistence uses by local residents; and

(iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

A. HIGHLIGHTS

- On January 4th, the United States District Court for Alaska issued an Order of Dismissal in the Civil Action filed by the Mother Goose Association against the Fish and Wildlife Service. Thus the denial of a special use permit for a recreational cabin issued by Refuge Manager Glenn Elison in June, 1983 was sustained. The refuge assumed ownership of the cabin on October 1, after the Association was given an opportunity to remove the cabin and other personal effects from refuge lands (Section H.).



Mother Goose Association recreation cabin in Ugashik Unit. REH

- The Becharof Refuge donated 148 caribou to the Togiak Refuge in February. This caribou transplant was an interagency effort to establish a caribou herd on Togiak Refuge (Section G.).
- A Contaminants Workshop was presented by Fish and Wildlife Enhancement personnel to refuge personnel at the Alaska Peninsula/Becharof Refuges' bunkhouse in King Salmon on April 18-19 (Section E.).
- The field work for the contaminants study, "Becharof-Abandoned Oil Exploration Wells", was accomplished in June. Four potential contaminant sites were identified and sampled (Section J.).
- Fifty-nine brown bears were captured during the Interagency Black Lake Brown Bear Study. This initial year's field work was conducted on June 1-5 by personnel from Alaska Department of Fish and Game, National Park Service and Fish and Wildlife Service (Sections D. and G.).
- Four revised and two new wildlife inventory procedures were approved by the Regional Office (Section D.).
- The first sign plan for the Alaska Peninsula/Becharof Refuges was completed and approved (Section D.).

- Waterfowl production surveys were completed successfully in June and July. For the first time a helicopter was used to complete the surveys. The helicopter surveys proved to be far superior to ground counts both in terms of cost effectiveness and data quality (Section G.).
- The King Salmon headquarters facilities were transferred from the Department of Commerce to the Department of the Interior (Section C.).
- The Ugashik Narrows public use field camp was maintained for the second year (Section H.).
- Wilderness review amendments for both the Alaska Peninsula and Becharof Refuges were completed. Records of Decision were signed by Regional Director Walt Stieglitz on November 1st (Section D.).
- After several years of staff stability, 1988 proved to be a year of change. Four positions, one-half the permanent staff, were vacated during the year (Section E.).

B. CLIMATIC CONDITIONS

1. General

The upper Alaska Peninsula is characterized by polar maritime climate with moderate temperatures, protracted cloud cover, frequent precipitation and high winds.

Large atmospheric differences between interior Alaska and the Pacific Ocean and Bering Sea are the dominate influences on weather. Pacific Ocean and Bering Sea winds with high moisture content blow frequently across the upper peninsula forming fog and clouds which develop into precipitation. High winds and turbulence are especially common in mountain passes. The heaviest precipitation occurs on the Pacific Ocean side of the refuge. The Bering Sea side enjoys more clear weather but lower average temperatures. From fall to spring, the skies are clear to partly cloudy 40% of the time. In summer this occurs only 20% of the time. King Salmon averages 50 clear days per year.

Precipitation varies with elevation and distance from coasts. Less than 20 inches of precipitation falls annually on the western lowlands, while as much as 160 inches falls on the Pacific side of the refuge.

Temperatures are generally moderate throughout the year. Daily maximum temperatures may exceed the freezing mark all months while daily minimum temperatures drop below freezing on approximately one-half the days of the year. The King Salmon temperatures average 12 degrees Fahrenheit in December, the coldest month, and 54 degrees in July, the warmest month. Extremes range from -46 degrees to 88 degrees.



Mt. Martin, Katmai National Park, sends out a plume of steam. The foreground is proposed wilderness along the King Salmon River in Becharof Refuge. REH

Daily King Salmon winds average 10 to 15 miles-per-hour. However, most months have peak winds from 40 to 70 miles-per-hour with the extreme being 94 miles-per-hour.

At King Salmon the dangerous effects of wind chill can be dramatic. Interior Alaska is known for the low winter temperatures and the Aleutian Islands for their high winds. However, when climatic influences of each area meet on the upper Alaska Peninsula, the wind chill factor may exceed -120 degrees F.

January - March

Like 1987, this year started off with extremely mild temperatures for the first quarter. Monthly averages ranged from six to 13 degrees F above normal (Table 1). The Naknek River, which was safe for crossing through the first of the year, became open and ice jammed by early February and remained unsafe for crossing thereafter. Precipitation was slightly below normal for the quarter. Approximately two feet of snow fell during the quarter; however, groundcover was usually less than an inch. The maximum snowcover was six inches observed on February 17th. It melted to less than an inch by February 23rd. There were only five clear days. The winds blew in excess of 40 miles-per-hour on 20 days. In February, winds exceeded 50 miles-per-hour during five different days. Peak gusts for the quarter were on January 7th and February 22nd when the winds peaked at 56 miles-per-hour.

Table 1. 1988 climatological data - National Weather Service, King Salmon, Alaska.

Month	Temperature (degrees F)				Precipitation (inches)			Max. Snow on Ground	Wind (mph)	Sky Cover ^a (days)			
	High	Low	Avg.	Norm.	Total	Norm.	Snow	(inches)	Avg.	Peak	Clear	Pt. Cldy.	Cldy.
Jan	43	-08	26	13	0.56	1.04	3.3	3	11	56	4	6	21
Feb	43	-16	27	15	0.75	0.88	10.1	6	16	56	1	5	23
Mar	43	-01	25	19	0.74	1.13	9.4	4	12	51		8	23
Apr	48	02	31	31	1.02	1.05	4.6	1	13	48	4	2	24
May	63	27	45	42	2.95	1.18	1.2		10	37		5	26
Jun	71	34	53	50	1.11	1.50			10	40		5	25
Jul	74	40	55	55	2.73	2.08			10	29		5	26
Aug	72	35	54	54	2.88	3.13			10	40		2	29
Sep	61	22	46	47	2.17	2.78			11	52	5	7	18
Oct	57	02	31	33	1.68	1.92	2.2	1	11	43	7	5	19
Nov	45	-28	14	23	1.52	1.40	12.7	8	9	31	5	3	22
Dec	42	-21	21	12	1.57	1.24	9.2	10	13	61	3	2	26
Total					19.68	19.33	52.7				29	55	282

^a Sky cover: Clear = 0 to .3 cloud cover; Partly cloudy = .4 to .7 cloud cover; and cloudy = .8 to 1.0 cloud cover.

April - June

The spring quarter exhibited normal temperatures. Night time temperatures remained above 30 degrees beginning May 3rd. The Naknek River was ice free by the end of May. Precipitation was slightly above normal. The last measurable snowfall for the quarter occurred on April 30th when 1.2 inches accumulated. The ground remained snow free there after. There were only four clear days. Neither May or June exhibited a single clear day. Winds did not exceed 40 miles-per-hour in May. Peak gusts for the quarter were on April 14th when the winds blew at 48 miles-per-hour.

July - September

The summer quarter exhibited near normal temperatures except for August which averaged nine degrees below normal. The high for the year was 72 degrees which occurred on July 9th. The first frost ending the growing season occurred on September 23rd when the temperatures dipped to 26 degrees. The low for the quarter was 22 degrees; recorded on September 26th. Precipitation was normal. During August, precipitation was recorded on all but four days. No snow was recorded within the quarter. There were five clear days during the quarter. Not a single clear day occurred between April 10th and September 22nd. Peak wind gusts for the quarter were on September 19th when the winds blew at 52 miles-per-hour. In July the winds peaked at 29 miles-per-hour. This was the first month the winds did not exceed 30 miles-per-hour since December 1974.

October - December

The fall quarter began with normal temperatures during October. However, November exhibited temperatures nine degrees below normal while December exhibited temperatures nine degrees above normal. During November the daily minimum temperature was below freezing everyday except on the 27th. As a result, the Naknek River froze over during the week of the 13th and became safe for crossing during the week of Thanksgiving. The river remained safe for crossing the remainder of the year. Measurable amounts of snow began accumulating on November 9th. At year's end no snow cover existed. The highest winds for the year were 61 miles-per-hour recorded on December 7th.

C. LAND ACQUISITION

1. Fee Title

Unlike most refuges in the lower 48, Alaska refuges have been created and modified by several major pieces of legislation. On November 16, 1978, the Secretary of the Interior invoked his emergency withdrawal powers under Section 204(e) of the Federal Land Policy Management Act (Organic Act) and withdrew land throughout Alaska. Part of this withdrawal was Public Land Order (Order) 5653 (as amended), which included lands which are now the Alaska Peninsula National Wildlife Refuge. Order 5653 was rescinded in December 1980 with the passage of the Alaska National Interest Lands Conservation Act (Lands Act) and created the Alaska Peninsula National Wildlife Refuge from the lands in the Order.

On December 1, 1978, President Carter established the Becharof National Wildlife Monument by Presidential Proclamation 4614. The Monument then became protected from all forms of land entry under existing Public Domain laws. In 1980 with the passage of the Lands Act, the Becharof Monument became the Becharof National Wildlife Refuge.

Along with the Lands Act, other major legislation has had profound effects on land status in both refuges. These other acts include the Alaska Statehood Act and the Alaska Native Claims Settlement Act (Claims Act). Both pieces of legislation provided a legal means of transfer of lands under Federal trusteeship to State and Native ownership. The implementation of these acts continue to create a dynamic land status on refuge lands due to the selections, transfers and relinquishments by Natives, Native Corporations and the State of Alaska.

The Alaska Peninsula Refuge is divided into three management units: Ugashik, Chignik and Pavlof. For administration purposes the Pavlof Unit is managed from Izembek Refuge in Cold Bay and therefore is not discussed herein. The Ugashik and Chignik units contain nearly three million acres within refuge boundaries. Approximately 2.5 million acres are under Federal jurisdiction at present. The remaining acreage has been selected by 23 Native villages in three Native Regions (Koniag, Aleut, and Bristol Bay), the State of Alaska, individual Native allotments and other private interest (Table 2).

Table 2. Land status of the Alaska Peninsula Refuge.^a

Management Unit	Administration	Acres
Ugashik	Federal	956,583 _b
	Native Selected Lands	175,953 _b
	Native Conveyed Lands	113,545
	Native Allotment Application	591
	Native Allotment Certificate	---
	Historical Place Selection	145 _b
	State of Alaska Selection	142,419 _b
	Private	68
Sub-total		1,389,304
Chignik	Federal	1,656,990 _b
	Native Selected Lands	271,358 _b
	Native Conveyed Lands	430,329
	Native Allotment Application	4,509
	Native Allotment Certificate	296
	Historical Place Selection	140 _b
	State of Alaska Selections	123,990 _b
	Agricultural Selections	220
	Private	1,045
Sub-total		2,488,877
Grand Total		3,878,181

^aThe discussion of the Pavlof Unit of the Alaska Peninsula Refuge can be found in the Izembek Refuge Annual Narrative.

^bSome acreage has been selected by both Native Corporations and State of Alaska.

The "checker board" land status found on the Alaska Peninsula Refuge is largely absent on the Becharof Refuge, primarily because of the protection afforded by previous National Monument status. The overall land status of Becharof is presented in Table 3.

Table 3. Land status of Becharof Refuge.

Management Unit	Administration	Acres
Becharof	Federal	1,153,000
	Native Selected Lands	99,640
	Native Conveyed Lands	4,280
	Native Allotment Application	700
	Native Allotment Certificate	250
	Historical Place Selection	10
	State of Alaska Selections	16,800
Grand Total	Private	200
		1,274,880

Highlights of land acquisition activities in 1988 include:

- Refuge Manager Hood reviewed and provided comments on a legislative package for boundary changes proposed by Comprehensive Conservation Plans for Alaska Peninsula, Becharof, Izembek and Alaska Maritime refuges.
- The Fish and Wildlife Service and the National Marine Fisheries Service entered into a Memorandum of Agreement in 1982 that allowed Alaska Peninsula and Becharof refuges to utilize the Fisheries Service field station at King Salmon as a headquarters site. This facility originally began life as a Fish and Wildlife Service property. When the Bureau of Commercial Fisheries moved to the Department of Commerce as National Marine Fisheries Service, a formal transfer of the King Salmon facility was never made. The Division of Realty discovered this and formally proposed a transfer of real property record responsibility back to the Fish and Wildlife Service. The Department of Commerce agreed to this action. We have now amended our real property inventory. Realty deserves a kudo for their efforts!



The headquarters for the Alaska Peninsula/Becharof Refuges is located adjacent the Naknek River in King Salmon, AK. FRS

- The Bureau of Indian Affairs conducted field investigations of three 14(h)(1) selections (cemetery-historical site) by Koniag, Inc. on Alaska Peninsula and Becharof refuges. Three selections include: 41,743 acres around Becharof Lake (File No. AAl1775); 40,853 acres around Upper and Lower Ugashik Lakes (File No. AAl1776); and 16,670 acres around Mother Goose Lake (File No. AAl1777). The archaeological field crew began a field reconnaissance of the Mother Goose Lake area on August 11. They moved to Lower Ugashik Lake on the 27th. Regional Archaeologist Chuck Ditters monitored the Mother Goose Lake operation on August 11th and 12th.

A total of three sites were discovered and documented at Mother Goose Lake. Site 1 consisted of a single bermed depression. This feature contained historic artifacts such as pane glass and rusty wire nails. The site is probably the remains of a cabin that had sod banked against it for insulation. Site 2 consisted of two depressions. Chipped stone and groundstone artifacts, structural elements (boulders), and charcoal were found. The site represents the remains of a prehistoric house and an associated structure or possibly two houses. Site 3 contained the remains of a late historic to recent collapsed pole, lumber and canvas cabin.



Termination dust on the Aleutian Mountains at Mother Goose Lake,
Ugashik Unit. REH

Field investigations around Lower Ugashik Lake were completed in September. Four sites were discovered and documented around the lakeshore. Site 1 included a partially collapsed two-roomed frame structure, an outbuilding, a bermed depression probably representing the remains of a sod insulated cabin, and a three-sided bermed depression of unknown function. Site 2 contained two depressions that probably represent the remains of prehistoric semi-subterranean houses. Site 3 consisted of a single flake fragment and a small amount of charcoal. Site 4 contained the remains of a sod insulated cabin as evidenced by a bermed depression. Due to field crew fatigue and the lateness of the season, scheduled work on Upper Ugashik Lake and Becharof Lake was cancelled. This work is scheduled to be completed in the 1989 field season.

- The Fiscal Year 1989 budget contained \$100,000 for the purchase of buildings at the Ugashik Narrows on the Alaska Peninsula Refuge. On November 1st, Refuge Manager Hood accompanied Bob Rice, Supervisory Appraiser, on an onsite inspection of the subject buildings. They were appalled by what they found. An open trash pit greeted them as they stepped off the plane. Mt. Peulik Lodge buildings were in ill repair - the whole operation had a run-down appearance. There was a stack of 30 55-gallon drums, 30 5-gallon cans and two 500-gallon fuel tanks on the premises.



Lower Ugashik Lake viewed from Three Bear Mountain. SES

However, the Brod property (Mt. Peulik Lodge) was in good condition compared to the Myers' property. Myers' lodge had been allowed to deteriorate to a point where nothing can be salvaged! Roofs were falling in. There were numerous 5-gallon cans and 55-gallon drums stacked in piles and scattered about. The beach was eroding to the door steps of the main lodge. Words cannot fully convey the conditions that were found. Bob Rice put together a slide presentation for the Regional Director's enlightenment.



The Myers' Lodge (near building) at Ugashik Narrows doesn't look too bad from a distance. REH

2. Easements

The Alaska Land Bank Program (Land Bank Program) was established by Section 907 of the Lands Act, as a mechanism through which lands under the terms of the Claims Act could be retained in Native ownership, yet encourage the same low impact compatible uses as allowed on adjacent Federal lands. Since subsistence activities are an integral part of Native land ownership, small scale development (fish racks, tent platforms and primitive cabins) in support of subsistence life styles is generally considered compatible with the purposes of the Land Bank Program. In addition, the Land Bank Program supports subsistence uses and prevents lands from falling out of Native ownership because of court judgments, adverse possession or taxation.

In January, the Pilot Point Native Association draft land bank agreement was reviewed and comments forwarded to the Regional Office. The agreement covered land in the vicinity of Ugashik Bay which is prime waterfowl habitat. Nearly 67,000 acres were recommended to be included under management category lands.

Shortly thereafter Congress passed amendments to the Lands Act that protects Native lands from adverse actions. This cut the heart out of the Land Bank Program and it died!

D. PLANNING

1. Master Plan

Alaska refuges do not utilize master planning as it exists for the refuges in the lower 48 states, but rather comply with Public Law 96-487, Alaska National Interest Lands Conservation Act (Lands Act). Section 304 directs the Secretary of the Interior to prepare comprehensive conservation plans.

In 1985, the Final Comprehensive Conservation Plan/Environmental Impact Statement and Wilderness Review for the Becharof Refuge was completed. Regional Director Robert Gilmore signed the Record of Decision on August 1, 1985.

On August 1, 1985, the Final Comprehensive Conservation Plan/Environmental Impact Statement and Wilderness Review for the Alaska Peninsula Refuge was completed. A Record of Decision for the Alaska Peninsula National Wildlife Refuge Comprehensive Conservation Plan was signed by Regional Director Walter Stieglitz on December 2, 1987.

Due to procedural flaws identified by the Department of the Interior's Office of Environmental Project Review, the wilderness proposals for both refuges underwent an amendment process in 1988. The major workload was carried by a Regional Office planning team of Bob Seemel, Mary Lynn Nation, Daniel Jerry and Mike Haase. Refuge staff assisted in the effort as needed. Intermittent Biological Technician Karen Wilk was assigned to the planning team. She wrote the "affected environment" section of both plans.

Alaska Peninsula Refuge. On July 15, 1988, the Draft Wilderness Review Amendment and Supplemental Environmental Impact Statement (Draft Statement) for the Wilderness Proposal of the Final Alaska Peninsula Comprehensive Conservation Plan/Environmental Impact Statement/Wilderness Review (Final Alaska Peninsula Plan) was mailed to the public. This Draft Statement was prepared pursuant to Section 3(d) of the Wilderness Act of 1964, Section 1317 of the Alaska National Interest Land Conservation Act of 1980 (Lands Act), and Section 102(2)(C) of the National Environmental Policy Act of 1969. The Draft Statement analyzed the potential impacts of four alternative wilderness proposals for the Alaska Peninsula National Wildlife Refuge.

Section 1317 of the Alaska Lands Act required the Fish and Wildlife Service (Service) to review all lands in the National Wildlife Refuge System in Alaska not Congressionally designated as wilderness to determine their suitability or unsuitability as wilderness and to subsequently recommend areas for inclusion in the National Wilderness Preservation System.

An abstract of the Draft Statement follows:

The environmental impacts of four potential wilderness recommendations for the Alaska Peninsula National Wildlife refuge, including the Service's proposed action, are reviewed in this document. The alternatives range from no action (recommending no additional lands for wilderness) to recommending all suitable lands as wilderness. The

proposed action recommends 640,000 acres for wilderness designation. Suitable areas not recommended for wilderness designation (2.7 million acres) would remain under minimal management. Economic development is largely prohibited under minimal management, but the Service has the option of changing management direction in the future to allow for development if it were found to be compatible with refuge purposes. Such a change would entail full public review. The proposed action would provide additional protection for wilderness values of naturalness, opportunities for solitude, opportunities for primitive recreation, and special features within areas recommended for wilderness designation. Areas not designated may suffer a long-term decline in these values if development were to occur on the refuge.



The Sandy River area has been proposed for Wilderness Area designation.

REH

The Final Statement was mailed to the public on September 30, 1988. An abstract of that document follows:

The environmental impacts of four potential wilderness proposals for the Alaska Peninsula National Wildlife Refuge, including the Service's Proposed Action, were reviewed in the draft supplemental environmental impact statement. The final plan presents the public comments on the draft plan, the Service's responses to those comments, and a errata sheet identifying necessary corrections and changes in the draft plan. The alternatives considered range from no action (recommending no refuge lands for wilderness) to recommending all suitable lands as wilderness. The Proposed Action recommends 640,000 acres for wilderness designation. Areas not recommended for wilderness would be managed under minimal management and enhanced public use categories, categories which allow for certain economic and other activities. The

Proposed Action would provide additional protection for wilderness values - naturalness, opportunities for solitude and primitive recreation, and special features - within areas proposed for wilderness designation. Areas not designated could experience long-term adverse effects on these values if development were to occur on the refuge.

A Record of Decision on the Final Statement was issued by Regional Director Walter Stieglitz on November 1st. The Service is recommending that 640,000 acres of Alaska Peninsula Refuge be added to the National Wilderness Preservation System (Figure 4).

Becharof Refuge. On June 29, 1988, the Draft Statement for the Wilderness Proposal of the Final Becharof Plan was mailed to the public. This Draft Statement was prepared pursuant to Section 3(d) of the Wilderness Act of 1964, Section 1317 of the Lands Act, and Section 101(2)(C) of the National Environmental Policy Act of 1969. The Draft Statement analyzed the potential impacts of three alternative wilderness proposals for the Becharof Refuge.

An abstract of the Draft Statement follows:

The environmental impacts of three potential wilderness recommendations for the Becharof Refuge, including the Service's proposed action, are reviewed in this document. The alternatives range from no action (recommending no additional lands for wilderness) to recommending all suitable lands as wilderness. The proposed action recommends 347,000 acres (25% of the refuge) for wilderness designation. Suitable areas not recommended for wilderness designation (259,000 acres or 21%) would remain under minimal management. Economic development is largely prohibited under minimal management, but the Service has the option of changing management direction in the future to all for development if it were found to be compatible with refuge purposes and following public review. The proposed action would provide additional protection for wilderness values of naturalness, opportunities for solitude or primitive recreation, and special features on most of the refuge. The area not designated may suffer a long-term decline in these values if development were to occur on the refuge.

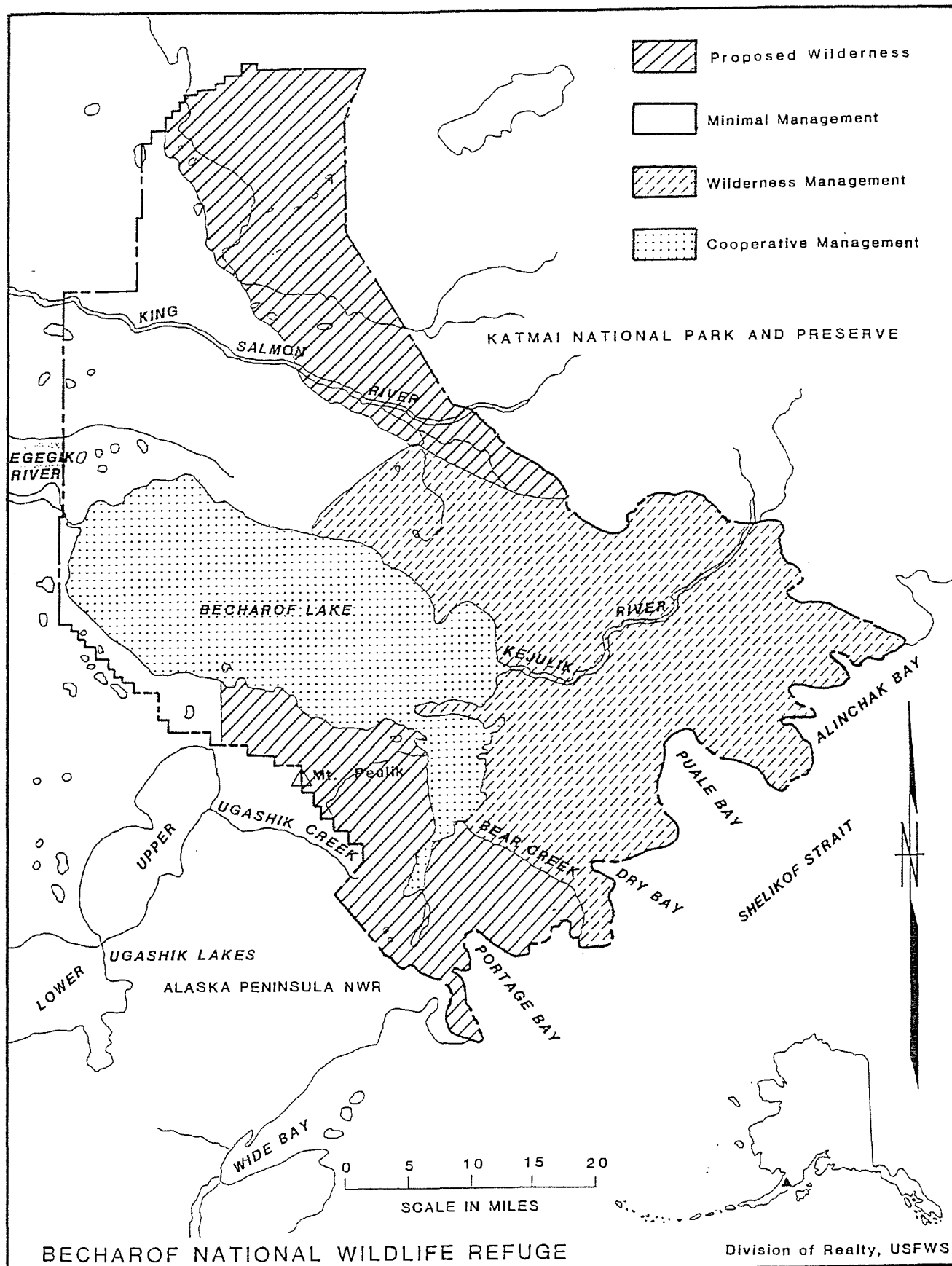


Figure 4. Proposed Wilderness.



Ruth Lake is within the area proposed for Wilderness Area designation. RJW

The Final Statement was mailed to the public on September 30, 1988. An abstract follows:

The environmental impacts of three potential wilderness recommendations for the Becharof Refuge, including the Service's proposed action, are reviewed in this document. The final plan presents the public comments on the draft plan, the Service's responses to those comments, an errata sheet identifying necessary corrections and changes in the draft plan. The alternative considered range from no action (recommending no additional land for wilderness) to recommending all suitable lands as wilderness. The proposed action recommends 347,000 acres for wilderness designation. Suitable areas not recommended for wilderness designation (250,000 acres) would remain under minimal management, but the Service has the option of changing management direction in the future to allow development if it were found to be compatible with refuge purposes and following public review. The proposed action would provide additional protection for wilderness values of naturalness, opportunities for solitude or primitive recreation, and special features on most of the refuge. The area not designated may suffer a long-term decline in these values if development were to occur on the refuge.

A Record of Decision on the Final Statement was issued by Regional Director Walter Stieglitz on November 1st. The Service is recommending that an additional 347,000 acres of Becharof Refuge be added to the National Wilderness Preservation System. (Figure 5).

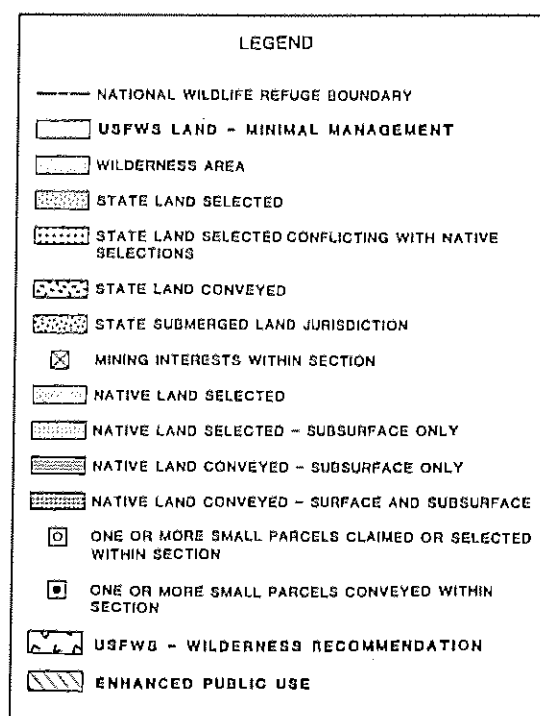


Figure 5. Proposed Wilderness.

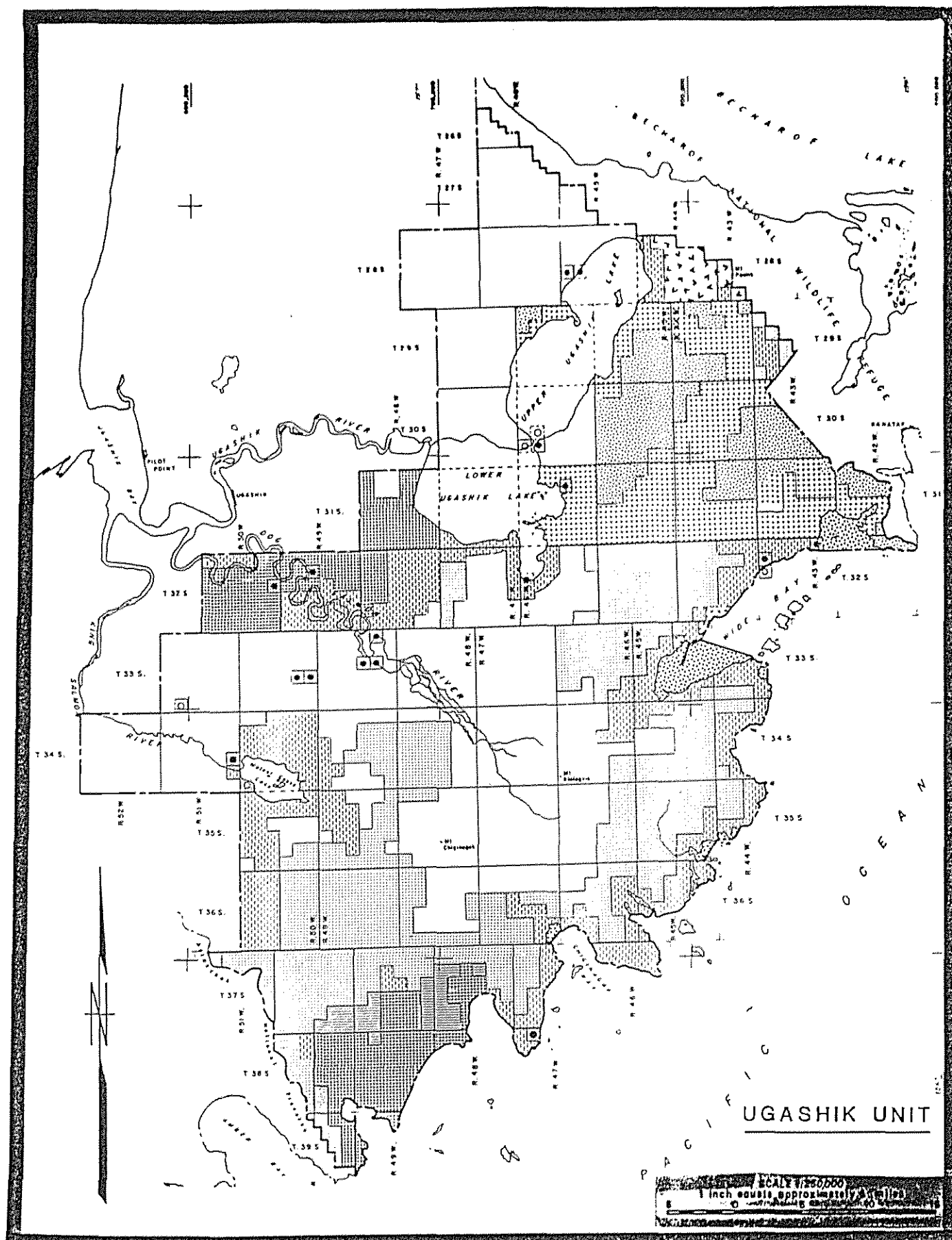


Figure 5. Continued.

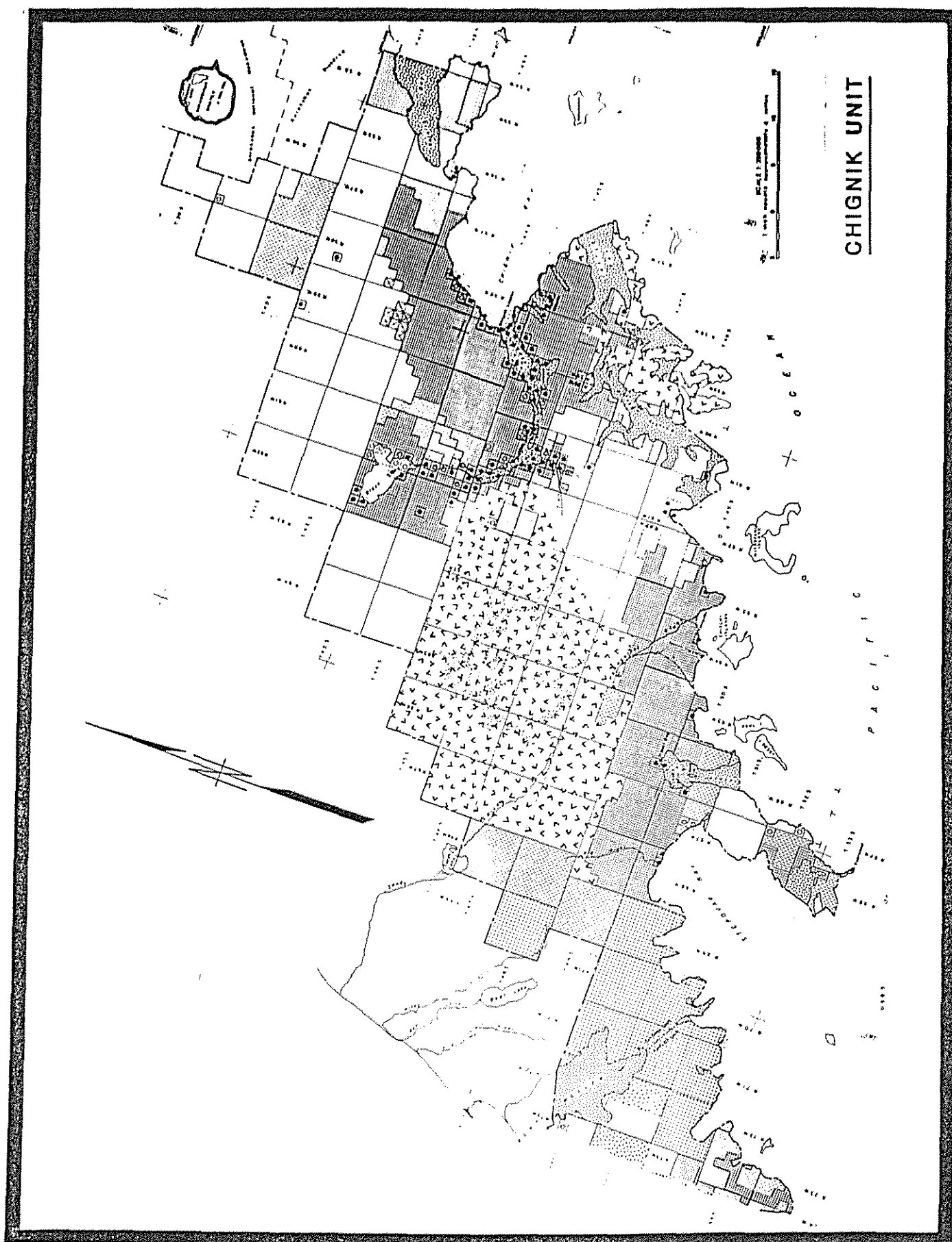


Figure 5. Continued.

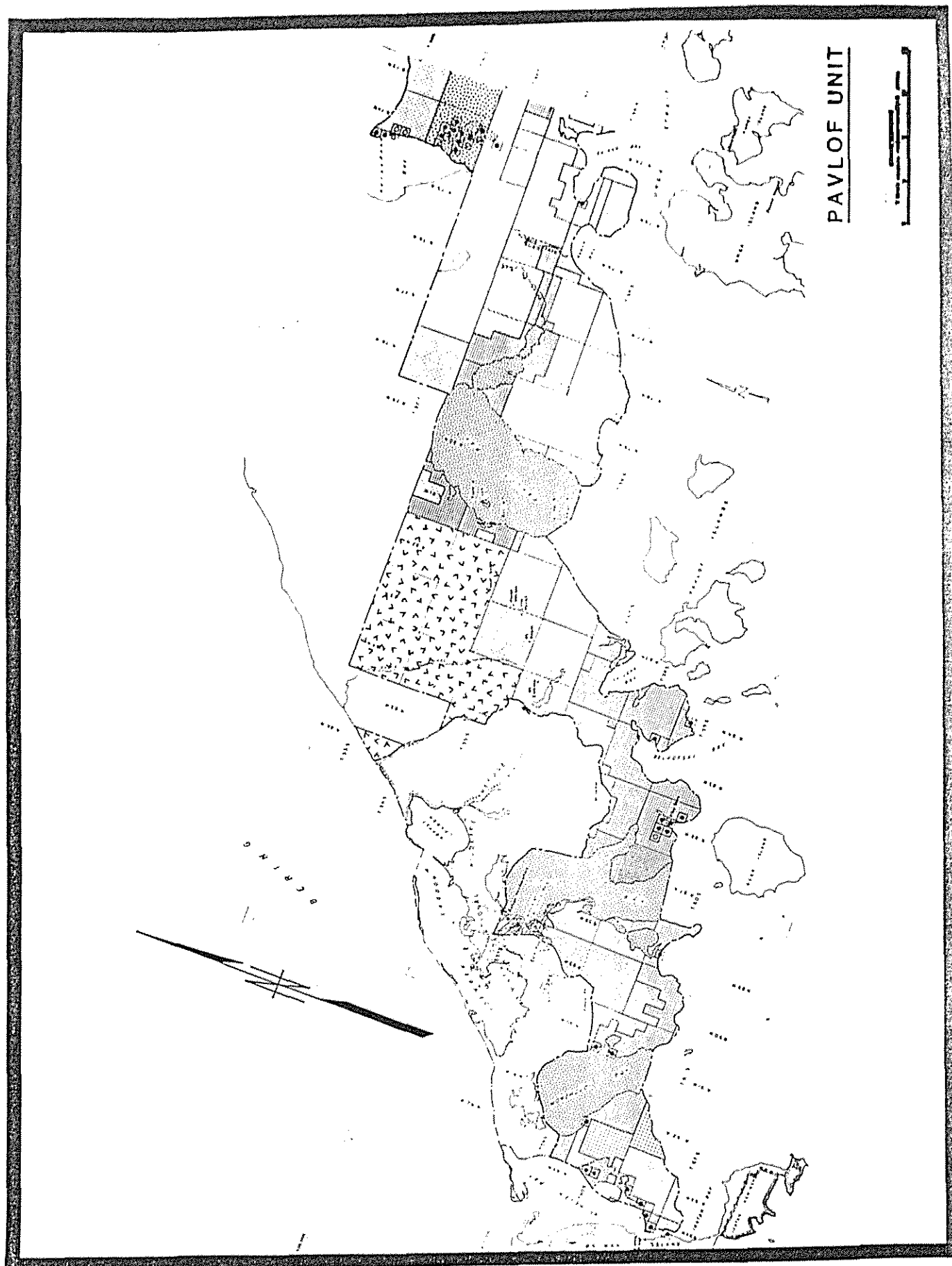


Figure 5. Continued.



Portage Bay is another area within the proposed Wilderness Area designation.

REH

2. Management Plan

Fishery Resource Management Plan. The King Salmon Fishery Assistance Office has the lead in developing a Fishery Resource Management Plan for both Alaska Peninsula and Becharof refuges. No progress was made during the year.

Sign Plan. The first sign plan for the Alaska Peninsula/Becharof Refuges was completed and forwarded for approval on March 1, 1988. It received final approval on March 28th. The Kenai Refuge sign shop is currently manufacturing all routed/painted signs.



This headquarters entrance sign is scheduled to be replaced in 1989. REH

Wildlife Inventory Plan. Four wildlife inventory procedures were revised and two new procedures written during the year. All received Regional Office approval. The effort was part of the refuge staff's initiative to combine/revise/eliminate inventory procedures for Alaska Peninsula and Becharof Refuges. Current approved procedures are:

1. Bald Eagle Population and Nesting Inventory.
2. Monitoring and Estimating Population of Tundra
3. Composition and Trend of Brown Bears Feeding on Salmon Streams.
4. Moose Composition and Population Survey.
5. Naknek River Aerial Survey in Spring.
6. Duck Production Survey.

- Which procedures were revised?
 - Why were they revised?
 - Who revised them? and how?
 - What was the problem? Resolved?

Public Use Management Plan. The first step-down management plan that Alaska Peninsula/Becharof refuges will develop is this important plan. Due to the untimely loss of key personnel, a request for assistance in this effort was made to the Refuge Planning Section in the Regional Office. Initial planning meetings were held at the refuge in December. More to follow in next year's narrative.

- Now that we are a year down the road, what will we see in the FY89 narrative? -

3. Public Participation

Public hearings for the Wilderness Review Amendment and Environmental Impact Statement for Alaska Peninsula and Becharof Refuges were held in Anchorage at the Regional Office on May 2nd (Becharof) and May 3rd (Alaska Peninsula). Refuge Manager Hood represented the refuges. Nine people attended the Becharof hearing while 14 attended the Alaska Peninsula hearing. Both meeting could best be characterized as "low-key".

4. Compliance with Environmental and Cultural Mandates

Refer to the Master Plan section above for environmental impact statement activities.

The Alaska Peninsula Refuge Comprehensive Conservation Plan was finalized and a Record of Decision signed on December 2, 1987. The selected alternative determined that the use of off-road vehicles in minimal management areas was incompatible with the purposes of the refuge. At signing there were four Alaska Peninsula big game guides that had established, used, and maintained "all terrain" vehicle trails on refuge lands. These guides had established this use prior to the establishment of the refuge by the Lands Act in 1980.

The refuge prepared a compatibility determination concerning the use of these established off-road vehicle trails. We proposed to issue special use permits to these guides under the authority of 43 Code of Federal Regulations Part 36.10 and under the authority of 43 Code of Federal Regulations Part 36.11 for access from inholdings or cabins into guide areas.

In light of the comprehensive conservation plan and the incompatibility of the use, we proposed to limit the succession of this use with the statement, "If the guide area is transferred to another guide, the use of designated off-road vehicle trail will not be authorized for the succeeding permittee".

This document was submitted to the Regional Solicitor on April 18, 1988 to determine if there were any legal concerns in regard to the proposed approach. To date, no response has been received from the Solicitor in this matter.



All-terrain vehicle trails north of Black Lake, compliments of a guide. EJS

5. Research and Investigations

Becharof NR88 - "Island Denning and Seasonal Movement of Brown Bear within Becharof National Wildlife Refuge" (74515-83-01)

In 1983, a study was initiated to determine movements and denning of brown bears in southeast Becharof Lake, known as the "Island Arm". It has been determined that denning on islands is an uncommon occurrence. Flights using radio-tracking in winter showed that most dens occurred in the rugged Aleutian Mountain Range northeast of the capture locations at Becharof Lake. Others winter dens occurred in the mountains to the southeast. The final year of the study was to be 1988. A request to extend the study until January 1, 1990 was approved by the Regional Office. This request was made in order to take advantage of extended battery life on most radios. Preliminary findings are found in Section G.

Alaska Peninsula NR88 - "Wildlife and Vegetation Studies in Alaska Peninsula National Wildlife Refuge" (74515-101-BE3)

Funds from Refuge Resource Problem-Related Projects allocated to Becharof Refuge supported a study in three sites within the Alaska Peninsula Refuge between 1985 and 1987. The locations included Braided Creek (1985-1986) of the Meshik River drainage, southeast Herendeen Bay and Lawrence Valley (1985-1986), and the Dog Salmon River (1986-1987) of the Ugashik River drainage. The studies were established to gather data along "transportation corridors" which were proposed as land use alternatives in the Bristol Bay Regional Management Plan. Tabulation of data and write-up of the results continues. A draft report is expected by April 1, 1989.

Alaska Peninsula/Becharof NR88 - "Aerial Survey and Sampling
of Tundra Swans in the Northern Alaska Peninsula" (74510-85-02)

This study is complete. The final report was distributed pursuant to Refuge Manual. An abstract follows:

Abstract: Data on populations and productivity of tundra swans (Cygnus columbianus) were obtained from aerial surveys in the Bristol Bay Lowlands, northern Alaska Peninsula in 1969 and 1983-1987. Peak arrival did not vary among years despite differences in weather. A late spring resulted in first hatching at least 1 week later than normal years and sizes of broods in July were also smaller. Breeding pair indices as high as 0.60 swans/km² occurred in coastal lowlands and all large lowland drainage basins. Habitat used by swans is characterized by little relief, and an abundance of shallow lakes. Densities of non-breeding flocks were correlated with densities of singles and pairs (potential breeders). Indices of the breeding population ranged from 2,865 \pm 1.0% (SE) to 3,142 \pm 2.7% swans in June, and 2,555 \pm 4.7% to 3,016 \pm 11.0% in July. In July, 50-67% were observed as potential breeders, and the remainder were in non-breeding flocks. Between 28 and 44% of the observed pairs had nests or young. A sampling scheme is presented, and biases in population in the Alaska Peninsula may be less affected by weather than populations at higher latitudes.

Becharof NR88 - "Becharof - Abandoned Oil Exploration Wells" (88-7-113)

Funding for this "Refuge Contaminant Issue of Concern" study was provided in Fiscal Year 1988. The Alaska Peninsula has attracted prospectors for oil and gas since the early 1900's. Ten exploratory wells have been drilled within the Becharof Refuge and five within the Alaska Peninsula Refuge. The objectives of the study were:

1. Conduct a reconnaissance level field inspection of selected, abandoned oil well sites on Alaska Peninsula and Becharof National Wildlife Refuges.
2. Identify and map abandoned physical remains of oil exploration activities for clean-up activities in the "Take Pride in America and Alaska" thrust.
3. Collect opportunistic soil samples for chemical analyses as warranted by reconnaissance of each well site.

The results of the study are summarized in Section J.3.



A natural oil seep on Oil Creek, Becharof Wilderness Area. These natural seeps drew the attention of early oil and gas exploration. REH

Alaska Peninsula NR88 - "Alaska Peninsula - Upper Braided Creek" (88-7-11)

Funding for this "Refuge Contaminant Issue of Concern" study was provided in Fiscal Year 1988. A major purpose for which the Alaska Peninsula Refuge as established is to ensure water quality within the refuge. Valid mining claims for hard rock mining of gold, zinc, silver and lead in the upper Braided Creek of the Meshik River drainage, Chignik Unit, are expected to be placed in production within the next 5 to 10 years. This study is designed to provide background information on selected water quality parameters. The resulting data will expedite the evaluation of possible impacts of this planned mining operation on the water quality of Braided Creek. A control system has been included. Water sampling was completed and samples submitted for analysis.

6. Other

Information meeting on the Service's proposed policy and actions on subsistence taking of migratory birds in Alaska were held in Dillingham on March 11th and in Naknek on March 12th. The meetings were conducted by Dick Pospahala, Chief, Migratory Bird Management, and Paul Schmidt, Refuge Supervisor - South with Jim Sheridan, Assistant Special Agent-in-Charge assisting. Refuge Manager Dave Fisher, Togiak Refuge, chaired the Dillingham meeting while Refuge Manager Ron Hood chaired the Naknek meeting.

On April 22nd, Refuge Manager Hood, Assistant Refuge Manager/Pilot Payne and volunteer Shirley Hood presented a program on the enforcement policy as it regards the take of spring waterfowl at Port Heiden. The village meeting was attended by both adults of the community and the Meshik High School classes. Most questions were directed, not at waterfowl, but at marine mammal regulations. The same afternoon we were invited to present a program to the entire student body of the Meshik School. We fielded question about out jobs, the refuge and wildlife.

On April 23rd, the waterfowl program was also presented in the village of Pilot Point. It became readily apparent we needed to be prepared to talk, not only to the members of the community, but once again, to the school student, as the meeting was attended by the entire Pilot Point School. Most questions were directed at waterfowl regulation and waterfowl take. We left the meeting with the feeling our reasons for restricting spring waterfowl hunting were well received in the village.

E. ADMINISTRATION

The Fish and Wildlife Service intends to reorganize the three Alaska Peninsula refuges (Becharof, Alaska Peninsula, and Izembek National Wildlife Refuges). To accomplish the proposed reorganization, the Service will have to submit a proposal to Congress to adjust the boundaries. Boundaries would be altered by combining Becharof Refuge with the Ugashik and Chignik units of the existing Alaska Peninsula Refuge. The Pavlof Unit would be incorporated into Izembek Refuge. The new boundary between Alaska Peninsula Refuge and Izembek Refuge would cross the peninsula between the Right Head of Port Moller Bay on the Bristol Bay side and American Bay on the Pacific Ocean side. Becharof Refuge would no longer exist as a separate refuge.

The Alaska Peninsula and Becharof refuges are currently being managed as one refuge under this administrative view point. In prior years an annual narrative for each refuge was produced. In 1987, approval was received to produce only one narrative.

1. Personnel

	<u>Name</u>	<u>Title</u>	<u>Grade</u>	<u>EOD</u>	<u>Term.</u>	<u>Status</u>
1.	Ronald Hood	Refuge Manager	GS-485-12	09-15-85	Present	PFT
2.	Elton Savery	Deputy Refuge Manager	GS-485-11	09-29-85	12-17-89	
3.	Randall Arment	Assist. Refuge Manager/Pilot	GS-485-12	10-03-82	Present	PFT
4.	John Payne	Assist. Refuge Manager/Pilot	GS-485-12	09-29-85	12-03-88	PFT
5.	Randall Wilk	Wildlife Bio.	GS-486-11	06-27-83	09-10-88	PFT
6.	Dwight Mumma	Biological Tech.	GS-404-05	02-19-84	Present (local hire)	PFT
7.	Raymond Gallup	Maint. Worker	WG-4749-08	09-27-87	04-28-88	PFT
8.	Gary Terry	Maint. Worker	WG-4749-08	07-31-88	Present	PFT
9.	Janice Collins	Refuge Secretary	GS-318-05	06-11-84	Present	PFT
10.	Karen Wilk	Biological Tech.	GS-404-05	05-14-87	Present	INTM
11.	Susan Savage	Biological Tech.	GS-404-05	05-08-88	10-22-88	Temp



Front row: Savery, Arment, Payne
 Back row: Mumma, Terry, Hood

JEF



Refuge Secretary working at her favorite task - learning another budget tracking system. DDM

YOUTH CONSERVATION CORPS

Chimene Terry	Enrollee	06-20-88	08-20-88
Kevin Champion	Enrollee	06-20-88	08-12-88
Tamara Witcher	Enrollee	06-20-88	08-12-88
Mary Ashby	Enrollee	06-20-88	07-18-88



Terry, Witcher, Champion, Munma

REH

VOLUNTEERS

Shirley Hood	King Salmon, AK	As needed
Vic Hammer	Baldwin, IL	09-05-88 09-30-88

STUDENT CONSERVATION ASSOCIATION

John Bolling	Madison, WI	05-29-88	08-20-88
Teresa Hanks	Shelburne Falls, MA	05-29-88	09-12-88
Patricia Johnson	Spartansburg, PA	05-29-88	08-20-88
Nancy Corona	Staten Island, NY	06-26-88	09-12-88
Catherine Pumphrey	Cheshire, England	07-20-88	09-28-88



Student Conservation Association volunteers with crew leader: Savage, Hanks, Bolling, and Johnson.

FWS



Savage, Pumphrey, Corona, Hanks.

FWS

IN MEMORIAM

Raymond Dean Gallup, age 55, Maintenance Worker for the Alaska Peninsula/Becharof National Wildlife Refuges and the King Salmon Fishery Assistance Office, died by his own hand on April 28, 1988, in King Salmon, Alaska.

He was born in Warner, Alberta, Canada, but spent most of his boyhood in Sunburst, Montana.

Ray served with the U.S. Marine Corps during the Korean conflict and was awarded two Purple Hearts, the United Nations Service Medal, and the Korean Service Medal.

He joined the U.S. Fish and Wildlife Service on July 5, 1987 and resided in King Salmon.

Ray is survived by his mother, Mrs. Margaret Gallup, Billings, Montana; a sister Marjorie Maxwell, Anchorage, Alaska; two brothers, Larrs and Roy, Billings, Montana; three daughters, Laura Robinson, Anchorage, Alaska; Sherry Matthews, Lynnwood, Washington; Debra Strange, Milacha, Minnesota; and three grandchildren.



Raymond Dean Gallup - a friend
we will remember.

FWS

Highlights of the year included:

- Deputy Refuge Manager Jim Savery received a "Sustained Performance" award on March 16th. Jim did an outstanding job during his tenure in King Salmon. The award was well deserved.



Wildlife Biologist Randy Wilk and Deputy Refuge Manager Jim Savery process a brown bear during 1986 radio collaring effort.

REH

- In May, 1988, Wildlife Biologist Randall Wilk accepted the Wildlife Biologist position for Kanuti Refuge in Fairbanks, Alaska. Randy and Karen departed King Salmon on August 12th. He entered on duty at Kanuti Refuge on September 11th.
- Deputy Refuge Manager Savery was detailed to Izembek Refuge as Acting Refuge Manager on June 20th-24th, July 18th-August 12th, and August 22nd-31st.
- On July 1st, Gary Terry was selected to fill the Maintenance Worker position. Gary is from King Salmon and worked for the Federal Aviation Administration for 10 years. We were fortunate to fill this position with such a highly qualified candidate.
- Biological Technician Karen Wilk received a performance award in August for her outstanding efforts on the Alaska Peninsula and Becharof Supplemental Wilderness documents.
- Assistant Refuge Manager/Pilot John Payne, wife Valerie, and son, Joshua, departed King Salmon on December 1st for his new position as a Wildlife Biologist with the Bureau of Land Management in St. George, Utah.



Proud "papa" John Payne with Joshua. DDM

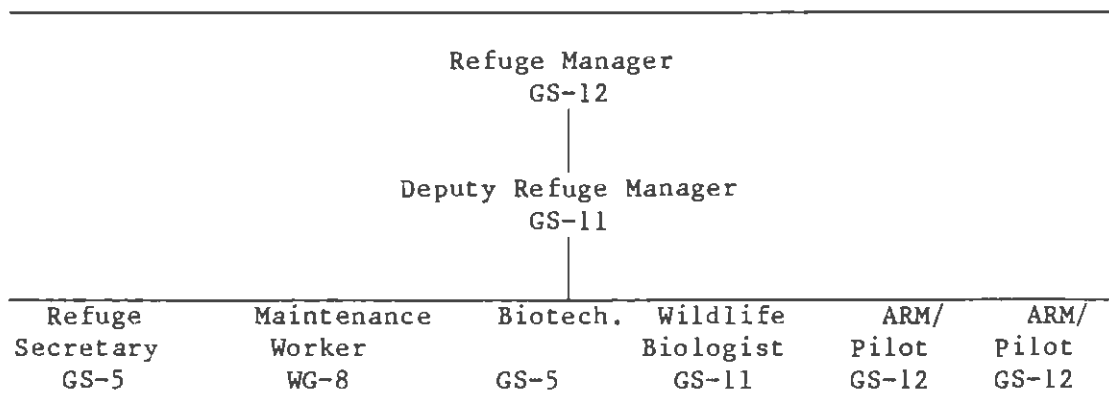
- Deputy Refuge Manager Savery accepted a position as Refuge Manager at Fish Springs Refuge in Dugway, Utah. Jim and wife, Barbara, departed King Salmon on December 14th.
- Refuge Secretary Jan Collins received a "Sustained Performance" award on December 22nd. Without Jan's dedication and hard work, the efficient day-to-day accomplishment of refuge business would never occur!



Refuge Manager Ron Hood presents Jan with her Performance Award. DDM

Alaska Peninsula/Becharof refuges have an approved staffing pattern as shown in Figure 6.

Figure 6. Approved organizational chart for Alaska Peninsula/Becharof refuges.



These positions require 6.8 Full Time Equivalent's. One position is local hire which does not count as a full time equivalent. The full time equivalent and funding for the maintenance position is shared

with the King Salmon Fishery Assistance Office. The allocation history is shown in Table 4.

Table 4. Historic record of full time equivalent allocation and use.

FY	Full Time Equivalent			
	AKP	BCH	TOTAL	USED
89	5.0	4.0	9.0	--
88	5.0	4.0	9.0	8.06
87	5.0	5.0	10.0	8.24
86	3.4	5.7	9.1	8.66
85	3.4	3.4	6.8	6.28

2. Youth Programs

The Refuge staff assisted the National Park Service with establishing their Youth Conservation Corps program by handling the recruiting and selecting process. All applications were submitted to the refuge office where a pool of enrollees was established. All six applicants were selected; four by the Refuge office, one by the King Salmon Fishery Assistance Office and one by the Park Service. This process was established in 1986 and worked very well to reduce the amount of confusion that applicants have between agencies, and the amount of paper work.

The Youth Conservation Corps program began on June 20th and was scheduled for termination on August 12th. The four enrollees included: Mary Ashby, Kevin Champion, Chimene Terry and Tamara Witcher. One enrollee was extended for one additional week to aid the Refuge Secretary in the office. The Deputy Refuge Manager coordinated the program while the Maintenance Worker and Biological Technician directed the field activities.

One enrollee provided operational support to the refuge in the form of office help. Major duties included typing report and correspondence, using both typewriter and word processor, answering the telephone, filing reports and correspondence and distributing mail to various offices. The remaining three enrollees worked on general maintenance and facility projects around headquarters. Most of these projects could not have been accomplished without the Youth Conservation Corps help. The projects included: fertilizing, seeding, trimming and landscaping the lawns around the headquarters and two of the four new residences; painting and staining the dock and boardwalks; facility housekeeping; washing and waxing vehicles; litter control and waterfowl production surveys.



The Youth Conservation Corps produced great results in their seeding and fertilization of the lawn. REH

Several safety topics and environmental awareness programs were presented to the enrollees by the refuge staff through means of lecture and audio/visual aids. Subjects included: description, purposes and objectives of the National Wildlife Refuge System and the Alaska Peninsula/Becharof Refuges; brown bear safety; habitat study and capture techniques; aircraft and flight safety; tundra swan study and banding techniques; area fish population dynamics and safety; and general safety procedures and precautions.

3. Other Manpower Programs

After the successful Student Conservation Program in 1987, the refuges went to the Student Conservation Association for five assistants to work at the Ugashik Narrows field camp. The applications were received in a timely manner and all candidates were interviewed. Selected were: John Bolling, Madison, Wisconsin; Nancy Corona, Staten Island, NY; Teresa Hanks, Shelburne Fall, MA; Patricia Johnson, Spartansburg, PA; and Catherine Pumphrey, Cheshire, England. All worked a minimum of 12 weeks and Teresa liked her job so much she extended for an additional four weeks.

The Student Conservation Association definitely has their act together. Everything went very smooth, all paperwork was completed, airline reservations made and the assistants arrived in King Salmon at their agreed upon times. Undoubtedly, the refuges will continue to utilize the Student Conservation Association in the future.

John Bolling wrote a narrative of how he spent his summer for his Wildlife Ecology class, parts of that narrative follow:

Alaska! That's where I spent my summer, and what a fantastic experience it was. Within the time frame of a couple of months I learned about the program, applied, signed up for internship credit, and off I went.

I was leisurely paging through Outside magazine one day when I noticed a bulletin offering positions with federal interior agencies through the Student Conservation Association. I figured I might as well give it a try, for I had always wanted to travel during one of my college summers. Student Conservation Association returned an application along with a listing of available positions to me promptly. It didn't take me long to choose four interesting ones, fill out the application and return it with the \$5 application fee.

I had many ideas of what I thought my summer should be like. The Alaska Peninsula National Wildlife Refuge position seemed to fit these ideas perfectly. It combined travel to an exciting new place, primitive backcountry living and spectacular wildlife observation. Most importantly, it would contribute to my overall career goals by giving me the opportunity to find out first hand whether or not I would truly enjoy a career in wildlife management.

I was very excited when my spring 88 semester roommate told me that I had gotten a phone call from Alaska! John Payne, the Assistant Refuge Manager and Pilot for Alaska Peninsula Refuge was the man I talked to in a telephone interview when I called back. Finally on April 5th my selection as a Fish and Wildlife Service (Service) volunteer was confirmed. Many arrangements had to be made including flight preparations, equipment purchases, a physical examination and forms to fill out. The Student Conservation Association informed me that they would be paying the \$870.00 for my round trip ticket as well as a \$75 per week subsistence allowance.

The first of two weeks were spent in King Salmon, a small bush community of about 300 people in southwest Alaska. This time was spent meeting co-workers and refuge staff. We were also kept busy gathering and preparing equipment for the move out to the field camp.

The second week of my trip was set aside for an intense 40 hour training period. Certifications in both cardiopulmonary resuscitation (CPR) and basic first aid were achieved, and an intensive study on the habits of brown bears was completed. We (the other volunteers and I) were oriented in firearms, boating and aircraft safety, communications and hypothermia. Perhaps the most fun we had during this training period was trying on some "survival suits" and jumping into the freezing cold waters of the Naknek River. We stayed amazingly dry! We also had an introductory session on the public use survey we were to do for the Service and the creel census which we performed for the Alaska Department of Fish and Game (Fish and Game), in a coordinated study with the Service.



John Bolling practices his first-aid
on Teresa Hanks. SES

On Monday, June 13, we made a flight down to the field camp location (75 miles) to set-up camp. We set up two of the three weatherports (tents with metal frames) to be used.

We got a real idea of what the weather could do to our plans on Tuesday. This was the day we were to fly out to the field camp to stay, but the winds were too strong. We finally made it out on Wednesday.

After spending a couple of days taking care of set-up duties, we were finally ready to work. We really had no concrete schedule but merely interviewed people when fishing lodge planes came down to the Ugashik Narrows to fish. The Narrows is known as a prime spot in the refuge for fishing, especially for Arctic grayling, for a State record was caught here a few years ago. Most of the fishing was done with spinning gear, although some species bit almost exclusively at flies. We fished quite a bit ourselves when no visitors were around, and took biological data on the ones we caught. Sockeye, coho, and humpback salmon, Arctic char, Arctic grayling and lake trout were all weighed, measured, and scales were taken. If the fish was killed we took otolith out to be analyzed later.

The first phase of my work lasted two to three weeks. Although relatively few people came to fish at the Narrows, the other volunteers and I kept ourselves busy collecting and keying out plants for the refuge herbarium, hiking, bird-watching and general wildlife observation, and of course fishing. Every day we kept a list of the birds that we sighted, at what times we sighted them, and what they were doing. Our field camp supervisor had a Master's degree in Wildlife Biology and was very knowledgeable about birds.

Many exploratory trips were made through the entire area, to some islands, up a 1700 foot mountain and around the tundra adjacent to camp. This tundra area was where the second phase of field life was spent, partaking in brood surveys.

The breeding success of migratory waterfowl was to be measured in one-mile plots. A helicopter was used in many areas far away from the Narrows, but the volunteers and supervisor walked about ten one-mile plots, one per day.

The tundra is pockmarked with ponds and marshy areas abound. Here were broods of waterfowl such as black scoters, greater scaup, American widgeons and tundra swans. We walked around each pond and recorded the broods and numbers of young. We were also to determine which age group the young were to be categorized in. Class A for very young, up to class D for nearly full size. This walking was very difficult, as well as being dangerous. Hip waders were necessary for walking, for we sunk far into the marshy tundra. We also had to carry a 12-gauge shotgun for bear protection, the thick brush being prime brown bear habitat. Bear trails were apparent everywhere on the tundra. We used them frequently to travel along.

Another volunteer and I made the trip to the Ugashik Outlet on July 5th. Here a different type of creel survey was done - known as roving creel survey. A stratified random sampling method was used to count anglers and estimate catch and harvest rates. We were assigned different time slots during each day, some of which were counts only and others which were counts and interviews. No public use surveys for the Service were done since this area was not within the Alaska Peninsula Refuge.

Our living quarters here were a state owned cabin which five people shared. Like the Narrows camp, we used inflatable boats to do the surveys. Since the Outlet was a very shallow channel and also very swift, a jet outboard was employed.

Since we were on a rotational scheme, after a couple of weeks it was time for me to take a week break, and for another volunteer to move to the Outlet.

By now it was almost August, and I was back out to the field camp at the Ugashik Narrows. Here I continued my work with the public use survey and angler interviews. Since we had a fair amount of free time on our hands, the two of us stationed here helped the crew from Fish and Game. They were performing an Arctic grayling population study. I got a good introduction into useful fisheries techniques such as beach seining, drift netting, and hook and line fish collection. Biological data were taken on the fish, which were subsequently tagged for possible later recapture.

Before I knew it the middle of August had rolled around, and it was time to pack up my things for the trip back to King Salmon. The nasty weather pinned up down in the field camp for a couple of extra days, but I finally made it out on August 17th. I was lucky because on the 18th I had to register by telephone for fall classes and my plane was due to leave King Salmon on the 20th. I got a great helicopter ride on the day of my departure, but that was about the only high point of leaving. It was very difficult to say goodbye to all of my wonderful new friends.

Overall, when I look back on my internship experience, I feel that I gained a great deal both in career goals and personal growth.

My final impressions were much different than my initial expectations. I had originally expected to be doing, and was prepared for, a lot of tough physical labor, but this was simply not the case. The brood survey section was the toughest part, and even this was not very demanding physically. We worked on a rotational basis so it didn't end up being a lot of laborious days in a row. I also expected to have much more to do. If there was one area

that needed improvement in the program, this was it. If often seemed that we were stuck in the camp waiting for the possible arrival of visitors, or pinned down because of inclement weather.

On the positive side, the program allowed me to work closely with professionals in the field and analyze the organization of the Fish and Wildlife Service. I am truly grateful for this, for now I can say that I somewhat know what to expect if I later end up working for the Service. I increased my human relation skills greatly because I was able to work with people who share common interests. Most importantly, I feel I was successful in achieving my main original objective of gaining valuable background experience in this field. This internship was of tremendous benefit to my career goals. Now that I know what it can do for me. I will not hesitate to go for another one in the near future, possibly next fall before I get my undergraduate degree!

4. Volunteer Programs

The refuges only utilized two volunteers during the year, other than for the "Take Pride in America" program (Section H). Vic Hammer visited the refuge in September and was placed in the Ugashik Narrows public use camp for two weeks.

Shirley Hood volunteered many clerical hours at times when Refuge Secretary Collins was on annual leave. Shirley also served as recorder during public meetings at Port Heiden and Pilot Point.

5. Funding

The funding picture for Fiscal Year 1988 followed the pattern established in 1987. Our funding was not finalized until February--mid fiscal year. Then in May \$40,000 was withdrawn from the stations' budget. The category Accelerated Refuge Maintenance Management (ARMM) changed to Maintenance. Congressional action on the budget included add-on funds for contaminants and Arctic goose information thrusts.

Fiscal Year 1989 diverted from the pattern slightly. Congress passed a budget for the Department of the Interior before the fiscal year began. However, at this writing we are still waiting for final funding allocations. The funding history of both refuges is presented in Tables 5 - 7.

Table 5. Alaska Peninsula Refuge funding Fiscal Years 1984 to 1989 (in thousands).

FY	1260					1360	TOTAL
	Base	MAINT.	RPRP	CIP	TOTAL		
89 ^a	\$368.0	\$ 12.0	--	--	\$380.0	--	\$380.0
88	\$234.5 ^b	\$ 75.5 ^d	\$50.0	\$27.0	\$387.0	--	\$387.0
87	\$323.0 ^c	\$135.0	--	--	\$458.0	--	\$458.0
86	\$180.6	\$ 66.4	--	--	\$247.0	-- ^f	\$247.0
85	\$179.5	\$235.5 ^e	--	--	\$415.0	\$ 5.0 ^f	\$420.0
84	\$285.0	\$130.0 ^g	--	--	\$415.0	\$10.0 ^f	\$425.0

^aInitial allocation.

^bIncludes \$20,000 for Arctic nesting goose information program.

^cIncludes \$115,000 for radio system purchase.

^dIncludes \$45,000 for large ARMM projects.

^eIncludes \$180,000 for large ARMM projects.

^fEarmarked to assist King Salmon Fisheries Resource Station in developing a Fishery Management Plan.

^gEarmarked for large ARMM projects.

ARMM = Accelerated Refuge Maintenance Management

RPRP = Resource Problem-Related Projects

CIP = Contaminant Impact Problems

Table 6. Becharof Refuge funding Fiscal Year 1984 to 1989 (in thousands).

FY	1260					1360	TOTAL
	Base	Maint.	RPRP	CIP	TOTAL		
89 ^a	\$335.0	\$ 5.0	--	--	\$340.0	--	\$340.0
88	\$280.0	\$ 68.0 ^b	\$ 30.0	\$ 30.0	\$408.0	--	\$408.0
87	\$237.0	\$256.0 ^c	\$ 45.0	--	\$538.0	--	\$538.0
86	\$201.6	\$ 56.4	\$101.0	--	\$359.0	--	\$359.0
85	\$216.0	\$169.0 ^d	\$101.0	--	\$486.0	\$ 5.0 ^e	\$491.0
84	\$240.0	\$ 80.0 ^f	--	--	\$320.0	\$10.0 ^e	\$330.0

^aInitial allocation.

^bEarmarked for large ARMM projects.

^cIncludes \$151,000 for large ARMM projects.

^dIncludes \$132,000 for large ARMM projects.

^eEarmarked to assist King Salmon Fisheries Resource Station in developing a Fishery Management Plan.

^fEarmarked for large ARMM projects.

Table 7. Base funding history for Alaska Peninsula/Becharof refuges (in thousands).

FY	AKP	BCH	TOTAL
88	\$234.5	\$280.0	\$514.5
87	\$208.0 ^a	\$237.0	\$445.0
86	\$180.6	\$201.6	\$382.0
85	\$179.5	\$216.0	\$395.5
84	\$285.0	\$240.0	\$525.0
83	\$280.0	\$260.0	\$540.0
82	\$290.0	\$287.0	\$577.0
81	\$ 62.0	\$206.0	\$268.0

^a\$115,000 earmarked for radio system removed from total.

6. Safety

Field operations on the Alaska Peninsula are inherently hazardous. This year several small aircraft accidents on and around the refuge reinforced the obvious fact that the primary means of transportation is not without peril. Weather patterns are unpredictable, operations are usually in remote, rugged areas and both refuges have a healthy population of brown bears. All combine to make life interesting and create a need for constant attention to safety.

Following up with the highly praised 32-hour training course for seasonal staff in 1987, this years course was expanded to a full 40-hours. Additions included certification in first-aid and cardiopulmonary resuscitation (CPR). The basic firearms safety course was also certified this year and an excellent program was presented by the Bristol Bay Borough Police Department.

The Alaska Peninsula/Becharof refuges continue to take the lead in Region 7 by maintaining the training of permanent staff in emergency medical services. Staff members were trained as Emergency Trauma Technicians. Assistant Refuge Manager/Pilot Payne is now a nationally certified Emergency Medical Technician Intermediate and a First-Aid and Cardiopulmonary resuscitation instructor.

Monthly safety programs continued to be presented by various staff members. Each subject was geared toward present field operations and peninsula climatic conditions. The stations safety committee continued its contribution in helping provide a safe and healthy working environment.

A station safety review was conducted by Regional Safety Officer Ginny Hyatt on September 9th. Overall, the inspection went very well. Most of the past safety related problems had been corrected or are in the process of being corrected. The station safety officer was found to be deficient in some training for his position and steps have been taken to correct this situation.

Service Aircraft Manager Gene Stefen visited the station on September 8th and 9th to do a station aviation review. Gene was given a short orientation flight in the refuge Cessna 206 on the evening of the 8th and conducted the review on the 9th. The aviation review was completed without identifying significant shortcomings in the aviation program.

Dick Kivi, Kenai Refuge, was at King Salmon on October 3rd and provided training in the operation of the refuges new 843 Bobcat to staff members. Dick also provided review training on the refuges' Case backhoe.



Dick Kivi, Kenai Refuge, supervises training on our new 843 Bobcat.

FWS

7. Technical Assistance

The Alaska Peninsula/Becharof refuges staff is particularly proud of the assistance that we have provided to other state and federal agencies this year and the benefits that have accrued to the fish and wildlife resources that we are working for. Highlights include:

- Assisted Togiak Refuge and the Alaska Department of Fish and Game in their caribou transplant effort. In early February, 148 caribou were captured on Becharof Refuge and transplanted to Togiak Refuge. We contributed personnel, supercub for spotting, Cessna 206 for personnel transport, coordination and any other held that was needed (Section G.8.).
- Assisted Alaska Fish and Wildlife Research center with a spring migration watch for emperor geese at Cinder River Lagoon.

Personnel, equipment and logistic support was provided. Equipment and logistic support was provided for the fall migration watch (Section G.3.).

- Our scheduled walrus field camp at Cape Seniavin was cancelled due to a very late winter and withdrawal of funds by the Regional Office. However, we were able to assist Sue Hills, Alaska Fish and Wildlife Research Center, in her study efforts. We supplied equipment, logistic help and radio contact. Six walrus were equipped with radio (one was a satellite radio). Valuable information was gained on tranquilizers/drugs. Observations were made on the extreme sensitivity of walrus to aircraft disturbance. Camp dates were May 1st to May 15th (Section G.9.).
- The Black Lake Interagency Brown Study was successfully initiated in early June. This study is a joint effort among the Alaska Department of Fish and Game, the National Park Service and the Fish and Wildlife Service. We furnished funding, personnel and aircraft support to this year's efforts. Fifty-nine bears were captured. Of these, 36 were radio-collared and five were fitted with glue-in transmitters (Section G. 8.).
- At the request of Craig Ely, Alaska Fish and Wildlife Research Center, refuge staff searched for and located a flock of molting white-fronted geese in the Ugashik basin -- over 1,500 white-fronts were located. On July 4th, refuge staff captured 17 white-fronted geese, took standard taxonomic measurements and weights and placed radios on 15 molting birds. These birds arrived early in California (September) and continued to Mexico to winter. This may be a distinct population of white-fronts (Section G. 3.).



Biological Techs. K. Wilk and S. Savage with whitefronts. RJW

- On July 28th, Assistant Refuge Manager/Pilot Arment flew Alaska Department of Fish and Game Biologist Dave Johnson on a radio telemetry survey for caribou. During this single flight the crew was able to locate 18 of the 25 radio-collared caribou and a total of 11,000 caribou (Section G. 8.).
- Assisted Katmai National Park with their bear stream surveys.
- Assisted the Alaska Department of Fish and Game with creel surveys at both Ugashik Narrows and Outlet. This effort stems from 1987 efforts that revealed a potential problem with the grayling population in the Ugashik Lakes. This project started in mid-June and ran through September (Sections G. 11. and H. 9.).

8. Other Items

Refuge staff training and conference attendance.

<u>Training/Conference</u>	<u>Location</u>	<u>Dates</u>
Refuge Manager Ron Hood:		
Natural Resources Communication Workshop	California State Univ., Chico, CA	1/4 - 1/8
Region 7 Project Leaders Meeting	Anchorage, AK	4/5 - 4/8
Contaminants Workshop	King Salmon, AK	5/18 - 5/19
Equal Employment Opportunity Workshop	King Salmon, AK	9/20 - 9/21
Equipment Trng. (843 Bobcat)	King Salmon, AK	10/5 - 10/10
Managing When the Pressure's On	Anchorage, AK	10/17
CPR Recertification	King Salmon, AK	10/21
Natural Resource Mangrs. in Transition	Utah State Univ. Logan, Utah	11/29 - 12/1
Deputy Refuge Manager Jim Savery:		
Law Enforcement Refresher	Anchorage, AK	2/22 - 2/25

Arctic Survival Training (USAF)	Fairbanks, AK	2/29 - 3/4
Refuge Academy (Advanced Session)	Washington, D.C.	3/14 - 3/30
Contaminants Workshop	King Salmon, AK	5/18 - 5/19
Equal Employment Opportunity Training	King Salmon, AK	9/20 - 9/21
Equipment Training (843 Bobcat)	King Salmon, AK	10/5 - 10/10
CPR Recertification	King Salmon, AK	10/21

Assistant Refuge Manager/Pilot Randy Arment:

Law Enforcement Refresher	Anchorage, AK	2/22 - 2/25
Contaminants Workshop	King Salmon, AK	5/18 - 5/19
Firearms Instructor	Anchorage, AK	8/21 - 8/27
Equipment Training (843 Bobcat)	King Salmon, AK	10/5 - 10/10
Ground School Recurrent Training	Anchorage, AK	12/5 - 12/8

Assistant Refuge Manager/Pilot John Payne:

Law Enforcement Refresher	Anchorage, AK	2/22 - 2/24
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Wildlife Biologist Randall Wilk:

Contaminants Workshop	King Salmon, AK	5/18 - 5/19
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Refuge Secretary Jan Collins:

Administrative Workshop	Anchorage, AK	11/14 - 11/16
Budget Tracking Training	Anchorage, AK	11/17 - 11/18

Biological Technician "Moose" Muma:

Equipment Training (843 Bobcat and Case Backhoe)	King Salmon, AK	10/5 - 10/10
CPR Recertification	King Salmon, AK	10/21

Maintenance Worker Ray Gallup:

Outboard Marine Corp	Kent, WA	4/11 - 4/15
"Outboard I"		

Outboard Marine Corp	Kent, WA	4/18 - 4/22
"Outboard II"		

Maintenance Worker Gary Terry:

Equipment Training (843 Bobcat and Case Backhoe)	King Salmon, AK	10/5 - 10/10
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F. HABITAT MANAGEMENT**1. General**

Geographically, the Alaska Peninsula extends approximately 450 miles from an area near Lake Iliamna to Isanotski Strait at the beginning of the Aleutian Islands. The peninsula's width varies from about 100 miles at Lake Iliamna to three miles near the southern tip. The Becharof and Alaska Peninsula refuges extend over a wide area of land and variety of habitat types on the peninsula. By "lower 48" standards, the manipulation of any of these habitats is not possible. The lack of access by any road system places an absolute limit of mechanical manipulation methods. In addition, the peninsula is considered an extremely low fire risk area. The precipitation and generally wet fuel preclude habitat manipulation using fire.



Brown bear habitat in the Chignik Unit.

REH

Little information is available on the vegetation of either the Alaska Peninsula or Becharof refuges. Studies done to date have been restricted to small, isolated plots, local historical records and military surveys. The best information available is from the 1981 Bristol Bay Land Cover Cooperative Mapping Project. This study utilized Landsat satellite imagery and computer technology to create a gross overview of peninsula cover types (Table 8).

Table 8. Major cover types on the Alaska Peninsula and Becharof refuges.^a

Refuge	Cover Type	Approximate ^b	
		Number	Total
Becharof	Open low shrub/grass tundra	460,000	31.5
	Deep clear water	299,000	20.5
	Barren	120,000	8.2
	Closed shrub/grass	90,000	6.2
	Open low shrub/heath tundra	69,000	4.7
	Miscellaneous deciduous	71,000	4.9
	Snow/cloud/light barren	22,000	1.5
	Marsh/very wet bog	22,000	1.5
	Shallow sedimented water	17,000	1.2
	Wet bog/wet meadow	17,000	1.2
	All other types	273,000	18.6
Total		1,460,000	100.0
Alaska Peninsula ^c	Closed shrub/graminoid	881,000	19.2
	Barren	847,000	18.4
	Snow/cloud/light barren	616,000	13.4
	Miscellaneous deciduous	558,000	12.2
	Deep clear water	473,000	10.3
	Open low shrub/graminoid tundra	431,000	9.4
	Open low shrub/ericaceous tundra	297,000	6.5
	Wet bog/wet meadow	258,000	5.6
	Marsh/very wet bog	142,000	3.1
	Shallow sedimented water	27,000	0.6
	All other types	61,000	1.3
Total		4,591,000	100.0

^aData from Bristol Bay Land Cover Cooperative Mapping Project.

^bDue to scale of Landstat cover type mapping, total land cover acreage does not correlate with land status acreage.

^cIncludes Ugashik, Chignik and Pavlof management units.



Blue Mountain in the Ugashik Unit of Alaska Peninsula Refuge rises out of the Bristol Bay lowlands. This is excellent habitat for moose.

SES

2. Wetlands

A close look at Table 8 shows a significant area of both refuges having some form of water at the surface. The Becharof Refuge has the second largest lake in Alaska as its dominate landmark. Becharof Lake is some 35 miles long and 15 miles wide covering 293,000 acres. The Refuge also contains 172 other lakes totaling over 25 acres in size and thousands of ponds and potholes under 25 acres along with three major drainages: Big Creek (a tributary of the Naknek River), the King Salmon River and the Egegik River.

The Alaska Peninsula Refuge is truly a land-of-many lakes with 300 lakes greater than 25 acres in size, nine lakes over 1000 acres and thousands of small "pot-hole" lakes. There are 18 major rivers, several hundred tributary streams and over 80 coastal bays.

6. Other Habitats

Tundra is the major vegetation type on the Alaska Peninsula. Three general categories of tundra are classified: wet, moist (heath) and alpine.

Wet tundra is generally found below 200 feet elevation. Crowberry, willow and a variety of forbs characterize the vegetation of this zone. Wet tundra is most common on the west side of the peninsula with much of it lying outside of the refuge boundaries.



Cotton grass is characteristic of wet tundra.

REH

Moderately well drained areas are dominated by moist tundra. This type makes up about five percent of the area on Becharof Refuge (Table X) and is a minor habitat on the Alaska Peninsula Refuge. Moist tundra occurs primarily on poorly drained soils, upland sites and on slopes. These plant communities contain dwarf birch with willow or heath shrub, heath mat and cushion tundra.

On somewhat drier slopes, especially on the lower portions of the Alaska Peninsula Refuge, an open low shrub/graminoid tundra occurs. This tundra is very similar to heath tundra but usually has a dense shrub growth form.

Alpine tundra occurs at higher elevation on slopes and ridges of the Aleutian Range, as well as higher, well drained areas. These areas are dominated by crowberry, lichens and grasses.



This lousewort signals spring has arrived.

REH

12. Wilderness and Special Areas

Becharof Refuge. Approximately 400,000 acres or one third of the refuge was established under the Lands Act as the Becharof National Wilderness Area. The values of the wilderness area are several fold. The area represents a variety of superlative pristine habitats with a complete compliment of plant and animal associations still intact. Wilderness designation insures that representative samples of these interdependent associations, some of which are unique, will be perpetuated for this and future generations to enjoy. The genetic diversity protected by the unit will serve as an invaluable source of data for scientific investigation and for potential future needs for fish and wildlife protection, restoration and enhancement. Because of the area's designation as wilderness, it will mean that the special wildlife/wildland association within will be the last place on the refuge subject to irreversible development.



Jute Bay is a great area to dig butter clams. The bay is within the Becharof Wilderness Area.

REH

Four private inholdings currently exist within the wilderness area. Three of the inholdings are owned by registered guides. Registered guide, Philip Shoemaker, owns two of the parcels and has recently built new lodges on both. This year, Mr. Shoemaker moved his wife and children into one of the lodges on a year-round basis. Thus they are experiencing everyone's fantasy -- living the Alaskan Wilderness lifestyle. Former Alaska Governor, Jay Hammond, continues to offer his inholding for sale; but has been very selective about who he sells it to.



A view of Proposed Wilderness Area (Mt. Peulik) from the Becharof Wilderness Area (Kejulik River Valley). REH

An additional 347,000 acres (29%) of the refuge was recommended for wilderness designation in the November 1, 1988 Record of Decision for the Becharof National Wildlife Refuge Final Supplemental Environmental Impact Statement for the Wilderness Proposal of the Final Becharof Comprehensive Conservation Plan/Environmental Impact Statement/Wilderness Review (Refer to Section D.).



View from Kanatak Village on Portage Bay. Another area included in the Proposed Wilderness Area for Becharof Refuge.

REH

Alaska Peninsula Refuge. At present, no refuge lands are designated wilderness. A Record of Decision signed November 1, 1988 for the Alaska Peninsula National Wildlife Refuge Final Supplemental Environmental Impact Statement for the Wilderness Proposal of the Final Alaska Peninsula Comprehensive Conservation Plan/Environmental Impact Statement/Wilderness Review recommended 640,000 acres for wilderness designation (refer to Section D.).

Mount Veniaminof National Natural Landmark. Mount Veniaminof was determined to be eligible for natural landmark status in 1967. It was registered in August 1970. This unique active volcano is located in the Chignik Unit of the Alaska Peninsula Refuge. It is located about 20 miles northeast of Port Moller (Bristol Bay side) and 20 miles west of Chignik (Pacific Ocean side) and approximately 450 miles southwest of Anchorage.

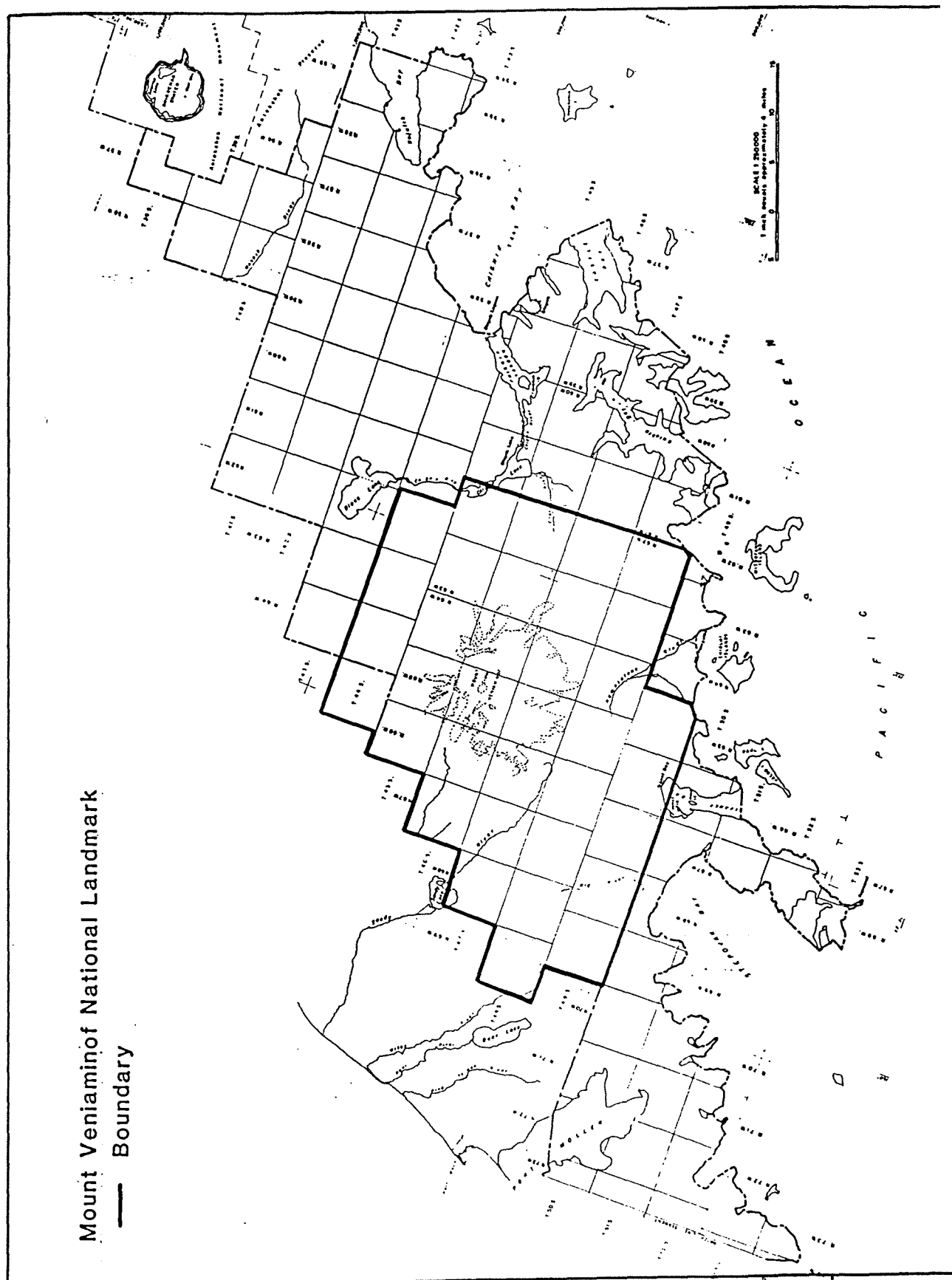


Figure 7. Mt. Veniaminof National Landmark.



Mt. Veniaminof with Black Lake in foreground. This volcano has been proposed for Wilderness Area designation.

REH

Named for Russian Orthodox priest Ivan Veniaminof who studied Aleutian Chain cones early in the 19th Century, this 8,400-foot volcano is centered on the last wide lobe of the Alaska Peninsula. The climactic eruption that formed the Veniaminof caldera occurred about 3700 years ago. Mount Veniaminof is massive. The summit crater is about 5.2 miles in diameter and contains a 25-square mile cupped ice field -- the most extensive crater -- glacier in North America. It is the only known glacier on the continent with an active volcanic vent in its center. The volcano's base is over 30 miles in diameter. The Landmark's boundaries encompass over 800,000 acres.

G. WILDLIFE3. Waterfowl

Estuaries, bays and coastal wet tundra lowlands of the Alaska Peninsula are vital waterfowl habitats for major populations of ducks, geese, tundra swans and brant. Emperor, cackling, and greater white-fronted geese and brant stage in Bering Sea side lagoons during migration. Emperors also occur in much lower numbers on the Pacific side. The northern peninsula lowlands and Izembek Lagoon represent two of 34 areas of importance to waterfowl in the North American Waterfowl Management Plan.



Stellers eiders at Cinder Lagoon.

DDM

Waterfowl Production Surveys

In 1988, the second year of waterfowl production surveys on the Alaska Peninsula were carried out by refuge personnel. Data gathered in these surveys are provided to the Office of Migratory Bird Management as our contribution to the Fish and Wildlife Service's estimate of productivity and recruitment of ducks into the "full flight" forecast for hunting and other purposes. Surveys conducted on the northern Alaska Peninsula are contributions made from Bristol Bay (along with Togiak Refuge) which is stratum 8 of the continental breeding pair survey.

Thirty-eight square mile sampling plots were surveyed in four locations on the northern Alaska Peninsula (Figure 8). Two surveys were conducted. In early July, a dabbling survey was completed. Then in late July, a diver brood survey was completed.

A helicopter was utilized for the first time. Virtually all of the surveys were conducted by helicopter using the same pilot and two observers. Three plots in the Naknek area and five in the Ugashik area were surveyed on foot by ground crews during the dabbling survey only. The entire diver survey was completed by helicopter. The helicopter surveys appear to be far superior to ground counts both in terms of cost effectiveness and data quality.

A total of 22 dabbling broods, averaging 5.5 young were tallied. Species recorded with average brood sized and sample sizes were mallard 4.1 young (n=8), widgeon 7.2 (5), green-winged teal 2.5 (2), and pintail 4.9 (7). An estimated 50-60 broods were tallied in the diver brood survey but data were unavailable. Forty-two per cent more waterbodies were recorded on plots in 1988 than 1987. This was attributed to use of the helicopter.

Tundra Swans

The population of tundra swans of Bristol Bay comprises an estimated 16 and 18 percent of the Pacific Flyway and Alaska populations, respectively. An estimated 70% of the land area encompassing habitats of this population occurs in the lowlands of the northern Alaska Peninsula, with an estimated 10% on refuge lands. Aerial surveys of swans were initiated in 1983, to gather basic data on populations which could be used for management purposes. Population data have been gathered each year since. A sampling scheme was developed and is used in sampling of swan populations (Table 9). One hundred eighty six sampling units were established (Figure 9) with areas of potential habitat of swans ranging from 5 to 159 kilometers.

Aerial surveys are conducted along transect lines within plots equivalent to U.S. Geological Survey quadrangle maps of scale 1:63,360. Swan observations are recorded on maps to distances of one-half mile each side of the aircraft.

Table 9. Sample sizes and allocation of 1/4 map sampling units to obtain 95% confidence intervals on total observed paired and single swans in the northern Alaska Peninsula.

Interval	Number of Sampling Units				Percentage of sampling units
	Low	Medium	High	Total	
+ 0.00	68	58	60	186	100.0
+ 0.05	24	20	43	87	46.8
+ 0.10	10	9	18	37	19.9

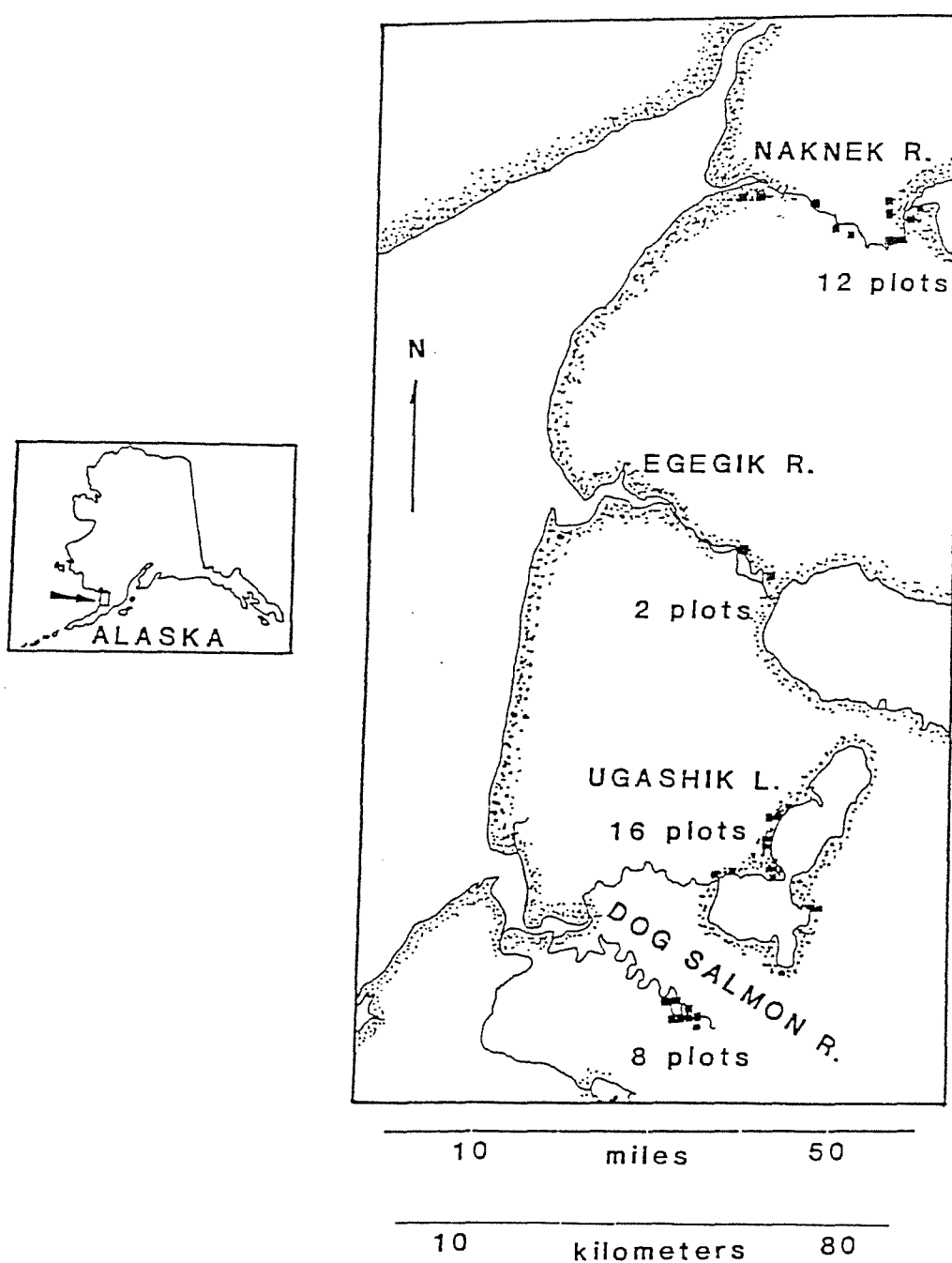


Figure 8. Survey areas, names and approximate locations of sampling plots for duck production surveys on the northern Alaska Peninsula as established in 1987.

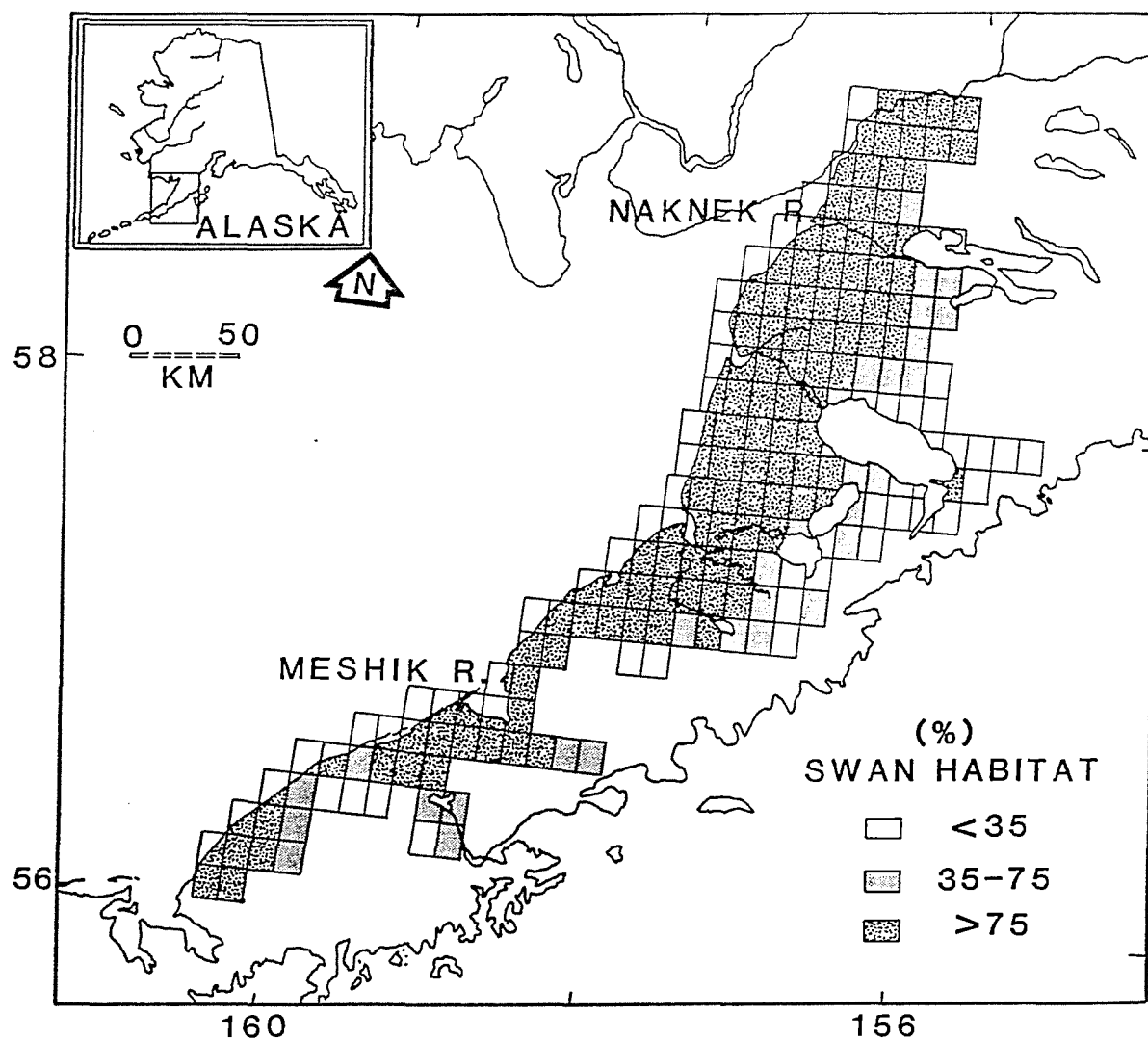


Figure 9. Area of potential habitats on land and water surfaces with sampling plots in the northern Alaska Peninsula.



Tundra swans.

REH

Surveys on nesting tundra swans were conducted on May 23 - 25 by Wildlife Biologist R. Wilk and Biological Technician K. Wilk and Assistant Refuge Manager/Pilot Arment. One hundred thirty-three potential pairs were tallied, of which 34% were with nests. This compares with 37% in 1987. Between August 23 - 26, brood surveys were completed. The surveys were flown by Assistant Refuge Manager/Pilot with Refuge Manager Hood, Biotech. Mummma, and Deputy Refuge Manager Savery observing. The number of broods observed appeared to be down dramatically. Data compilation is incomplete at present.

Emperor Geese

Observations of emperor geese during "migration watches" were first obtained during fall staging in 1986 in the lagoon at Cinder River of the central northern peninsula (Figure 10). In 1988, a spring migration watch was added. The purpose of this effort was to provide information on geese seen with neck collars, and obtain age ratios from flocks feeding in the lagoon.

Thousands of geese stage at Cinder River each fall and spring enroute to and from their Aleutian Island and Alaska Peninsula wintering areas. Some also occur around Kodiak Island in winter. The feeding cycle of staging geese evolves around the tide (Figure 11) which exposes blue mussels and other invertebrates which are fed upon by geese. As the tide ebbs, geese move along the tide line until they concentrate near the outlet of the lagoon by low tide. With the flow of tide, geese begin departing the

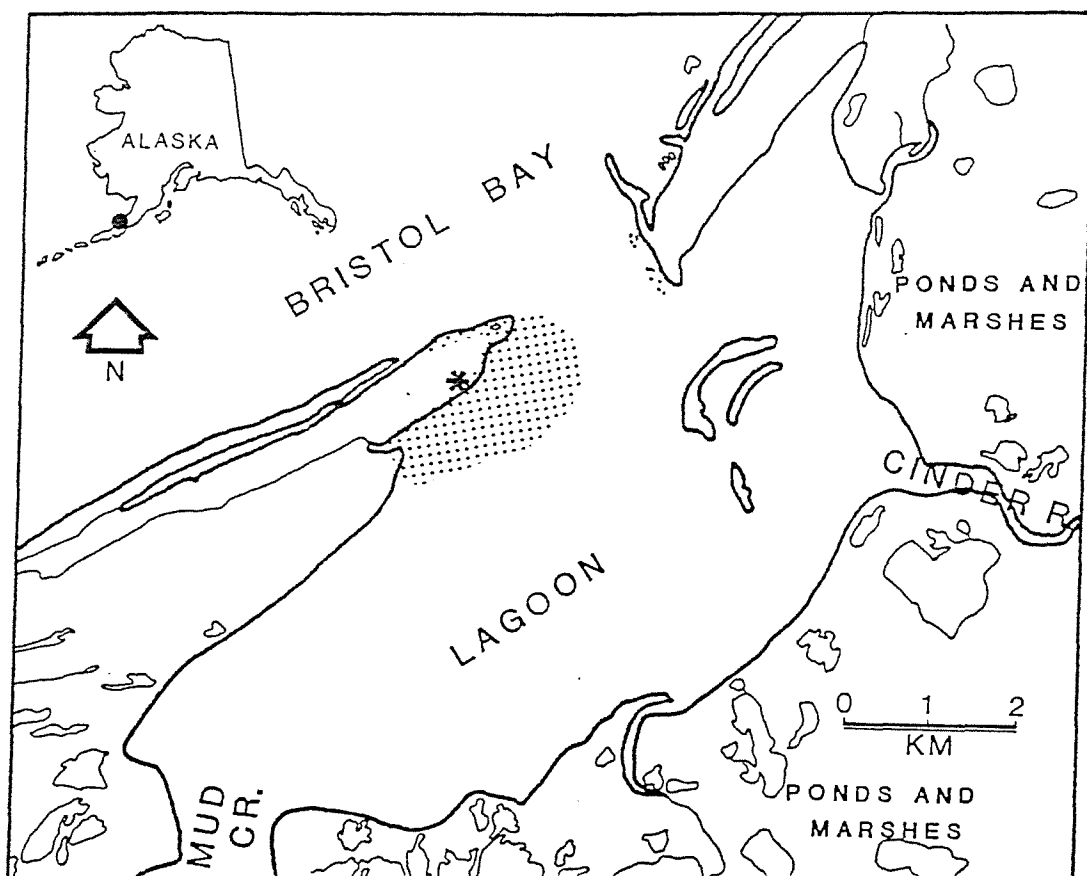


Figure 10. Study area of emperor goose studies in Cinder River Lagoon. Stippling shows locations where flocks were sampled.

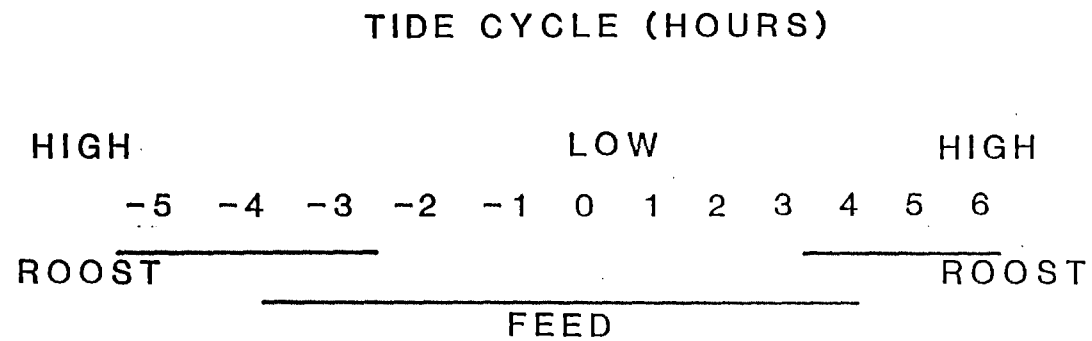


Figure 11. General flock activity of emperor geese in relation to the stage of tide.

feeding areas as the beds are inundated. Geese seek refuge in upland roosts during high tide where they rest and occasionally feed on crowberry (when available) or oysterleaf (along the beach). The feeding flights begin as the tide ebbs, and the cycle continues.

On April 25th, Wildlife Biologist Wilk and Susan Cantor of the Alaska Fish and Wildlife Research Center (Alaska Research Center) were flown to Cinder River Lagoon to begin a three week spring "Migration watch". Observations from Cinder River suggested that goose distribution in spring is markedly different from fall. Most birds were seen feeding along the lagoon's southern and central shoals at low tide, but none occurred in the northern lagoon as in the fall. The dynamic is undoubtedly related to the distribution and abundance of the emperor's main food source in the lagoon - blue mussels.

Susan Cantor, Alaska Research Center, provided the following summary of this years work.

Spring. Staging of emperor geese (Chen canagica) in Cinder Lagoon, Alaska, was monitored from April 25th to May 7th. Migration peaked on May 2nd with 13,000 geese using the lagoon. Geese were only visible from the camp during the lower high and low tides each day. During the low tide, geese fed on shoals east of the main channel. High tide roosts occurred on mudflats along the east and south shores of the lagoon and around the island group. Sixteen neck collars were seen, consisting of six known individuals; only 0.21% of the birds observed were collared. Juveniles comprised 28.9% of geese observed. Future research efforts will be enhanced by improving mobility within the lagoon. A similar field effort will be continued for at least six seasons in conjunction with a second camp on Nelson Lagoon.

Fall. Eleven radio-transmitters applied to emperor geese this summer were tracked during fall migration. Three of these birds remained within specific lagoons; three others used several lagoons as they travelled west along the Alaska Peninsula. Five frequencies were not detected. The range of solar-powered radios was half that of harness radios, and varied with light conditions.

Biologists at Cinder Lagoon identified 165 unique collared individuals during fall migration. Multiple sightings of collared birds suggested the population remained stable throughout the staging period. Following an influx on September 10th, 10,000 to 12,000 geese remained in the lagoon until the end of October. Cinder River contained 15.42% of all geese counted along the Alaska Peninsula during fall migration.

A maximum of 100 collar codes was confirmed in the lagoon at one time, with an average of one collar per 116 geese observed. Only 11 geese collared prior to 1988 were observed, four of which were seen in the lagoon in previous years. The remaining collars observed comprised 19.3% of all those applied this year. Among

birds collared in 1988, the proportion of juveniles originally released was significantly higher than that observed at Cinder Lagoon. This may reflect a higher rate of mortality and collar loss in young birds.

About three hours before low tide, geese fed, preened, and roosted on mudflats. During low tide geese fed on mussel beds exposed at the lagoon mouth, dispersing to areas within the lagoon once the mouth was submerged. As the tide rose, geese moved directly to roosting sites along the Bristol Bay coast.

Age ratios derived from ground observations agreed with aerial photographs, showing 27.0% juveniles at Cinder Lagoon. This proportion was similar to the 20-year average for Bristol Bay.

White-Fronted Geese

The Alaska Peninsula Refuge assisted the Alaska Research Center in a study of subpopulations of Pacific white-fronted geese on the Alaska Peninsula. This effort was opportunistic, and occurred during an annual duck production survey.

Based on past observations of whitefronts in the Ugashik drainage of the Alaska Peninsula in recent years, we determined that several lakes south and east of Hook Lagoon (Figure 12) would be the focus of incidental searches for molting geese (for capture) during late spring and early summer.

On June 21st, Biologist R. Wilk and Pilot J. Payne estimated that between 1,400 and 1,500 whitefronts along with 400-500 Canada geese (probably subspecies minima) occurred on two large lakes in the vicinity of Hook Lagoon (see Figure 12) during a overflight in the refuge Cessna 206. No other large flocks were seen in the area. These geese were in smaller flocks of 200-500 birds in each which collectively comprised the larger totals.

On July 3rd, Biologist Wilk and Biological Tech. K. Wilk set up a corral on the south shore of Lake A to possibly drive molting geese with a helicopter if the opportunity occurred. The next day, an attempt to "herd" several flocks of geese toward the corral with a Bell 206 B III Jet Ranger helicopter (piloted by Ken Butters, Trans-Alaska Helicopter), but the efforts were unsuccessful. It was then decided to run down the geese on foot by pushing them into Elymus stands along the lake shores. Geese were sexed by cloacal examination, measured with vernier calipers and a spring scale (to nearest 25 grams), banded, neck collared and fit with transmitter packs provided by the Alaska Research Center.

Fourteen females and three males were measured and marked. Of these, three females were judged to be yearlings, based on the absence of speckling on their bellies and relatively lighter weights. Twelve geese were taken from Lake A and five from Lake B (Figure 12).

All whitefronts captured were molting although a small percentage of the flock took flight when pursued by foot. In contrast, we estimated at least

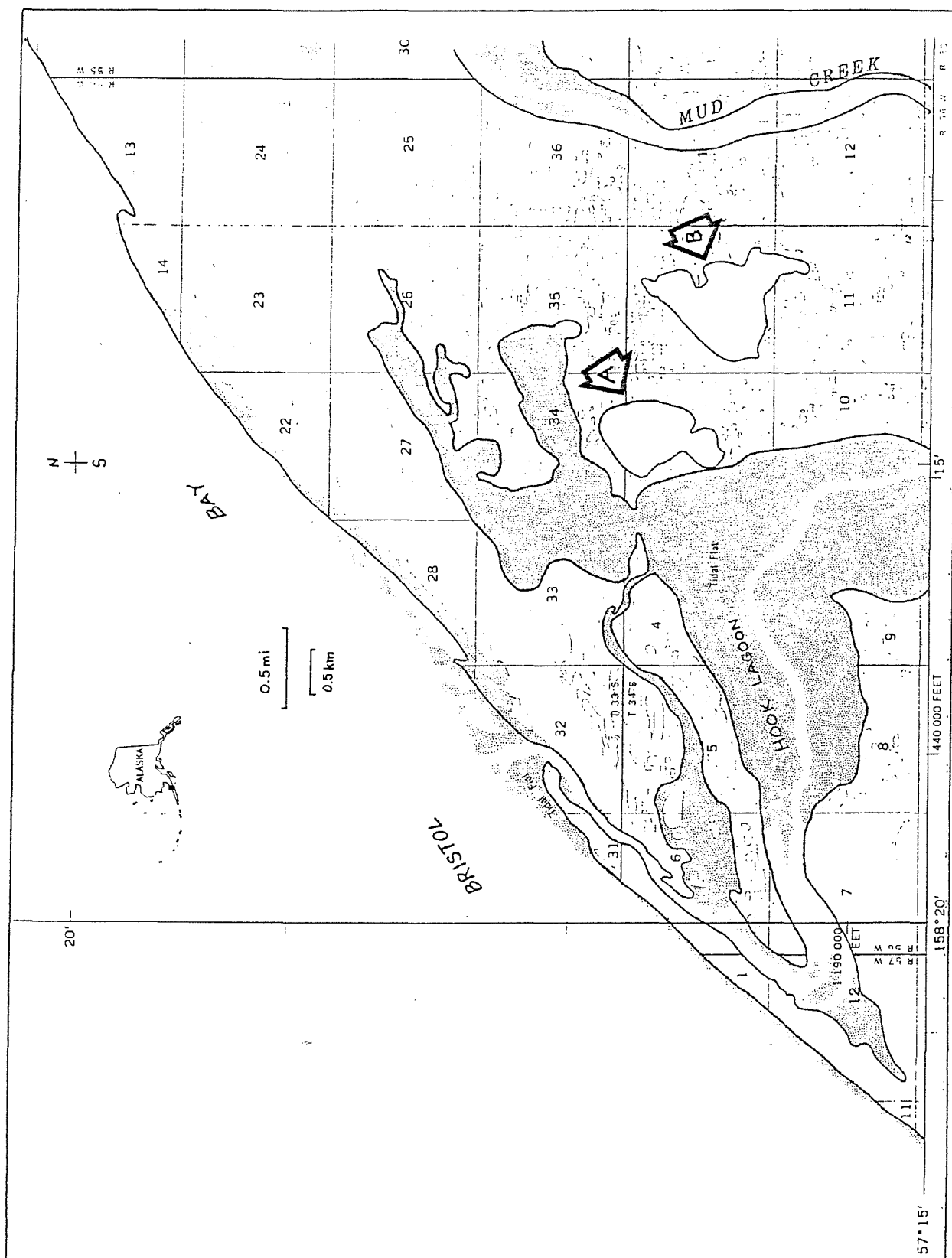


Figure 12. General study area and lakes (A and B) where molting white-fronted geese were captured.

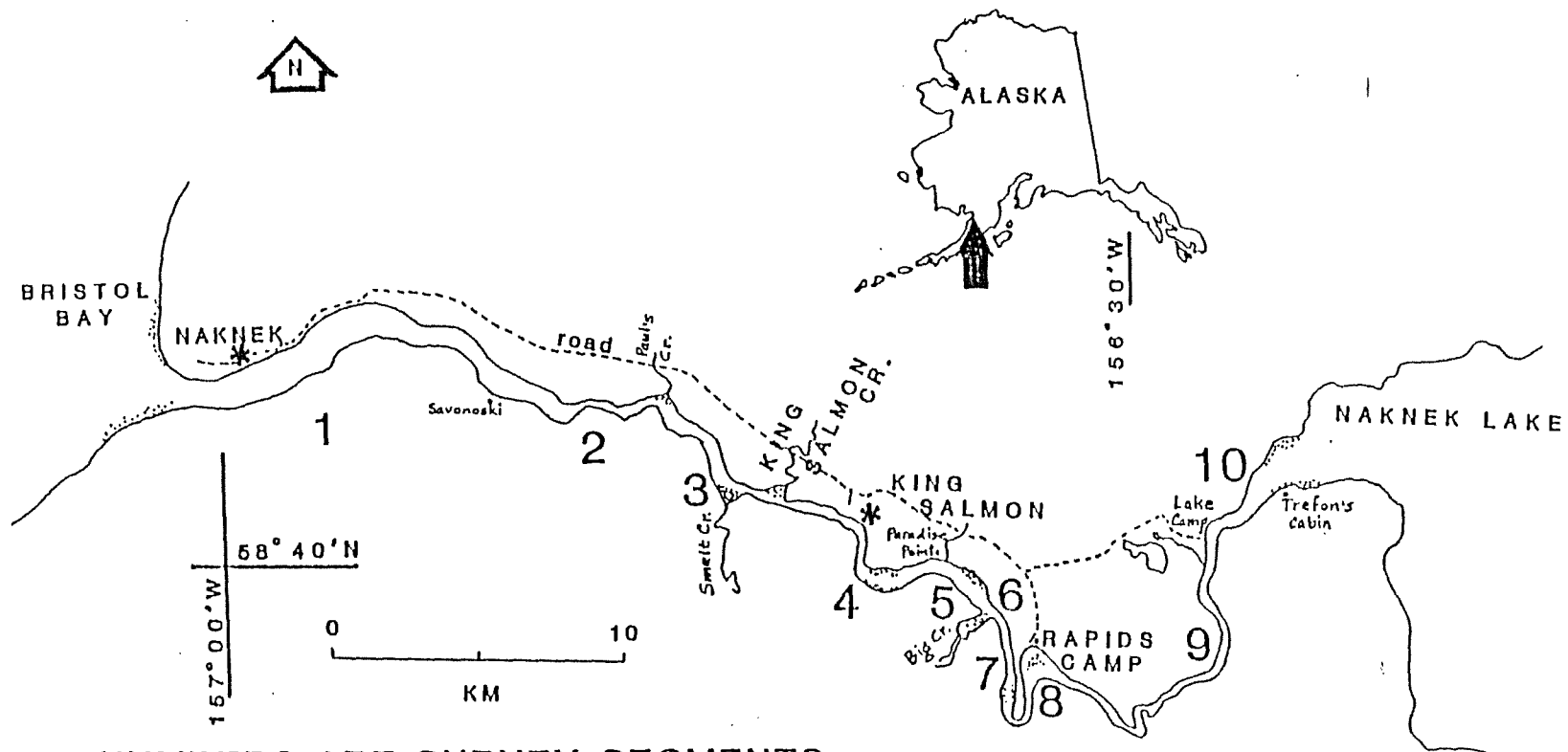
80% of the Canada geese flushed from flocks. In the same general location on July 21, 1987, Biologist Wilk and Pilot Payne recorded 437 Canada and 240 whitefronts along Hook Lagoon. At that time, most whitefronts were flying but most of the Canadas were flightless. These observations suggests that the two species have staggered molts with whitefronts molting earlier than Canada geese.

Craig Ely, Alaska Research Center, provided the following summary of this year's results of his study.

We monitored the movements of 39 greater white-fronted geese (Anser albifrons) outfitted with radio transmitters during July 1988 on the Yukon-Kuskokwim (Y-K) Delta (N = 17), the Alaska Peninsula (N = 15), and Nushagak Peninsula (N = 7). Geese from the Alaska Peninsula and Nushagak Peninsula were morphologically indistinguishable; considered as a group (Bristol Bay birds), they were significantly larger (culmen and tarsus) than geese from the Y-K Delta. Ten of the 15 geese from the Alaska Peninsula were relocated on the wintering grounds; two along the Oregon Washington coast, seven in the Klamath Basin of northern California and/or the Central Valley of California, and one in the Central Highlands of northern Mexico (Laguna Babicora - state of Chihuahua). Bristol Bay geese arrived in the lower 48 states significantly earlier than geese from the Y-K Delta (Sept. 16th and 21st. for Alaska and Nushagak Peninsula geese, respectively, compared to Oct. 12th for geese from the Y-K Delta). Unlike Y-K Delta geese, few Bristol Bay geese were relocated in California after September. The Bristol Bay goose observed in Mexico was with another newly-collared bird, and was in the same flock as four geese marked in the Klamath Basin of California in September; this is further evidence that geese from the Bristol Bay component of the Pacific Flyway white-fronted goose population are early autumn migrants destined for Mexico.

Naknek River Aerial Survey

Each spring the refuge conducts aerial surveys of water birds that stage on the Naknek River near King Salmon (Figure 13). The purpose of the survey is to document the composition and abundance of the common and most visible species, as many use refuge and adjacent wetlands during the breeding season. We have concluded that the peak abundance of tundra swans which stage on the river prior to nesting occurs between April 18th and the 24th, regardless of local weather conditions. In 1985, during a late spring, the peak occurred during the same period, though swans delayed nesting until ponds opened in mid-May. Generally, peak abundance of white-fronts, and northern pintail also occurs at this time. For Canada geese, dates and total numbers may be more variable. Table 10 shows the highest totals of waterfowl recorded and/or estimated on the Naknek River, determined from aerial surveys and ground observations. The peak abundance of each species varies with the timing of migration.



NUMBERS ARE SURVEY SEGMENTS

Figure 13. Naknek River and place names as key starting/ending segments for aerial survey.

On April 25th, Biologist Wilk and Biological Tech. Wilk conducted an aerial survey of the Naknek River to count waterfowl. The most common species recorded were northern pintails (5,618), tundra swans (1,970), mallards (200), whitefronts (124), and Canada geese (68).

Table 10. Species composition and highest recorded or estimated abundance of common waterfowl on the Naknek River, Alaska, March to May 1983-1988.

	Number	Years ^a
Tundra swan	2,903	
Greater white-fronted goose	2,453	
Emperor goose	1	1987
Brant	1	1985
Canada goose	846	
Green-winged teal	200	
Mallard	650	
Northern pintail	5,618	
Northern shoveler	150	
Gadwall	25	
Eurasian widgeon	4	1986-1987
American widgeon	375	
Canvasback	3	1986
Redhead	2	1986
Greater scaup	150	
Oldsquaw	4	1985-1987
Black scoter	50	1986-1987
White-winged scoter	20	1986-1987
Common goldeneye	1,102	
Bufflehead	4	
Merganser (common and red-breasted)	2,075	

^aSpecies recorded in all years, if not listed.

7. Other Migratory Birds

The King Salmon-Naknek Christmas Bird Count took place on December 31st. This marks the third year that local birders have participated in this annual event. The local results were submitted to the National Audubon Society, which sponsors and supervises the event and publishes all counts in its ornithological field journal American Birds.

Seven hardy volunteers braved rain, snow, icy roads and trails, and cold winds to seek out birds. Thirteen species were spotted with a total count of 574 individuals. Table 11 lists the results.



Bald eagles are found on the Alaska Peninsula year-round. DDM

Table 11. Species composition and numbers of birds recorded in the King Salmon-Naknek Christmas Bird Count, 1986-1988.

Species	1986	1987	1988
Goldeneye spp.	30	--	2
Common merganser	293	1,259	44
Red-breasted merganser	--	--	1
Merganser spp.	125	--	--
Oldsquaw	--	--	1
Bald eagle adult(s)	8	14	4
immature(s)	2	2	2
unknown	--	3	1
Peregrine falcon	1	--	--
Northern Goshawk	--	--	1
Willow ptarmigan	--	1	--
Glaucous-winged gull	--	60	80
Gull spp.	--	--	3
Rock dove	1	--	--
Black-billed magpie	42	26	41
Common raven	231	246	285
Gray jay	--	--	21
Black-capped chickadee	20	5	18
Boreal chickadee	4	3	--
Chickadee spp.	--	6	--
Northern shrike	1	3	--
White-crowned sparrow	1	--	--
Pine grosbeak	4	--	10
Common redpoll	19	--	60

8. Game Mammals

Both the Alaska Peninsula and Becharof refuges are open to sport and subsistence hunting of game mammals. A complete discussion of harvest is found in Section H.8. This section deals with the population biology of several large game mammals found on the refuges.

Brown Bear

The refuges continue to make significant contributions concerning peninsula brown bear habits. A radio telemetry program, begun in 1983, indicates a strong tendency for the bears around Becharof Lake to move northward, as much as 70 miles, to seek denning sites. The telemetry data combined with annual bear surveys completed during the peak of the sockeye salmon runs in August (Tables 12 and 13), should help provide a much needed information base for long-term management of this magnificent animal.

Table 12. Becharof Lake brown bear salmon stream trend counts. Becharof Refuge 1985-1988.

Date	Sow/W young		cubs		Yrlgs.		Cubs & Yrlgs.		Singles		Total Sample	Mean ltr. size	
	N	%	N	%	N	%	N	%	N	%		Cubs	Yrlgs
1985	19	19	11	11	24	23	35	34	48	47	102	1.7	1.9
1986	37	36	15	10	53	35	68	45	46	30	151	1.9	1.8
1987	69	19	22	6	93	26	115	32	177	49	361	1.6	1.7
1988	30	17	33	19	28	16	61	34	87	49	178	2.1	2.2

Table 13. Ugashik Lakes brown bear salmon stream trend counts. Alaska Peninsula Refuge, 1965-1967, 1969 and 1981-1984, 1986-1988.

Date	Sow/W young		cubs		Yrlgs.		Cubs & Yrlgs.		Singles		Total Sample	Mean ltr. size	
	N	%	N	%	N	%	N	%	N	%		Cubs	Yrlgs
1965	14	22	14	22	18	28	32	49	19	29	65	---	---
1966	12	22	13	24	15	27	28	51	15	27	55	---	---
1967	12	21	17	29	11	19	28	48	18	31	58	---	---
1969	16	24	14	21	24	36	38	56	13	20	67	---	---
1981	30	20	31	21	33	22	64	42	57	38	151	---	---
1982	34	20	35	20	28	16	63	36	75	43	174	---	---
1983	55	21	46	17	76	29	122	46	87	33	264	2.2	2.2
1984	13	19	16	23	13	19	29	42	27	39	69	2.0	2.6
1985	Not completed due to weather.												
1986	16	17	15	22	21	30	36	52	44	39	96	---	---
1987	Not completed due to weather.												
1988	4	13	2	6	6	20	8	28	17	59	29	2.0	2.0

Becharof Brown Bear Study

In late 1983, a brown bear study was initiated on Becharof Refuge. The objectives of the study are to:

- determine the extent of low elevation denning sites on the islands of Becharof Lake;
- record seasonal movements of brown bears, both in and out of the refuge;
- locate and describe winter denning sites; and
- increase the knowledge of brown bear use on the refuges and establish a data base.

During the summers of 1984, 1985, and 1986, a total of 44 brown bears were captured and collared. Of the 44 initial bears collared, 36 retained the radio collars long enough to track to a den site. Tracking flights during the winters of 1984-1985, 1985-86, 1986-1987 and 1987-1988 have identified 35 general locations of individual dens, most of which were 50 to 70 miles north of Becharof Lake (Figure 14).



Deputy Refuge Manager Jim Savery records data taken during a brown bear capture effort in 1986. RJW

Studies done in 1974 by National Park Service biologist Troyer indicated 14 dens on islands within Becharof Lake. Earlier studies on the Alaska Peninsula and Kodiak Island showed most bear dens occurred mid-slope in mountainous terrain. Preliminary investigations by refuge staff found only one den on an island. No bears involved in the radio telemetry study have shown any tendency toward island denning. Instead, all collared bears have denned at elevations of at least 500 feet above sea level with most denning at elevations above 1200 feet.

In August 1988, a helicopter was available to locate and survey a sample of den sites. The sample concentrated on those areas in Katmai National Park, near Katmai Bay, that have identified, permanent den sites.

Four dens were investigated, two of these were measured and photographed. The other two were located in extremely rough, rugged terrain, with no available access without climbing equipment.

All dens were located in naturally occurring caves or cave-like areas offering a significant amount of protection from winter elements. All were on steep slopes in either volcanic or granite rock being the principle parent material. The two dens measured and photographed were free of animal hair and were generally clean, although damp inside.



The view from a brown bear den in Katmai National Park. JFP

The first collars were placed in service in August 1984. Some of these collars transmitted until late 1987. That's essentially a three-year life span (the company had told us only two years). It appears we are getting the additional life because the collars go into the mortality mode during hibernation. As a result of the unexpected increase in the collar life the refuge has requested and received approval to extend this study through Fiscal Year 1989.

The reassignment of the refuges Supercub (N 3685Z), in April, severely impacted our ability to monitor the collared bears with regularity. Constant, priority demands on the refuges' Cessna 206 has limited tracking flights to only five this calendar year. However, the few flights that were performed proved to be quality time in locating the remaining collared bears. During the winter months, there will be less demand on the Cessna 206 and we hope to increase the tracking flights during the denning period and den emergence.

Black Lake Brown Bear Study

Plans were finalized in 1987 for an Interagency Brown Bear Study among the National Park Service, Alaska Department of Fish and Game (Fish and Game) and the Fish and Wildlife Service. The Alaska Peninsula/Becharof Refuges are providing one-third of the funding and personnel to assist in the study. Fish and Game has the lead.

The study objectives are:

1. Estimate spring density of brown bears in a 500 square mile study area in the Black Lake vicinity.
2. Estimate sex and age compositions of brown bear inhabiting the study area.
3. Estimate productivity of Black Lake bears including: litter size, age at first reproduction, breeding interval, and offspring mortality rates.
4. Estimate mortality rates with special emphasis on mortality resulting from exploitation by hunters. When possible, determine causes of natural mortality.
5. Compare and evaluate changes in density, population composition, reproductive rates, recruitment rates, and mortality rates that have occurred in the study area since the early 1970's.
6. Document the timing and intensity of use by bears of habitats of special importance such as denning areas, salmon fishing areas, berry and vegetation foraging areas, ungulate calving areas, and others that may become evident through monitoring. Determine if different sub-populations of bears use these areas.
7. Evaluate the efficacy of aerial surveys in estimating trends in bear population numbers and composition.
8. Estimate bear numbers (with probable upper and lower bounds) for Game Management Subunits 9E and 9D by extrapolating from the study density estimate.

These objectives will be met through six jobs which have been identified, justified and described in the project proposal and are listed below:

1. Estimation of brown bear density using modified captured-recapture techniques.
- 2.1. Monitor radio-marked bears to assist in defining borders of the density estimation area.
- 2.2. Monitor reproductive rates of radio-marked females and survival of cubs.

- 2.3 Monitor radio-marked bears to determine movements and causes of natural mortalities.
- 3.1. Conduct annual stream surveys.
- 3.2 Evaluate biases in stream survey data.
4. Monitor human harvest and analyze harvest data.
5. Recompilation and reanalysis of raw data collected during other studies.
6. Data analysis and report writing.

The primary objectives of the first two (2) years of this project is to accomplish Job 1, estimation of brown bear density and population structure. Work accomplished in the first year of study was designed to prepare to accomplish this job in the second year of the study. A secondary objective of the first year of study was to begin to mark the animals needed to ultimately accomplish the remaining jobs.



A brown bear sow with cubs in dense alder.

REH

The initial year's field work was launched on June 1st - 5th when a very successful capture effort was conducted. Biologist Wilk represented the refuges in the interagency crew. The 1988 results of this study are summarized in Table 14. Fish and Game Biologist Dick Sellers provided the following summary.

Fifty-nine bears were captured including 39 females and 21 males. There were two (2) capture mortalities, one from drowning and one from probable drug complications. Teeth extracted from bears are in the process of being sectioned and aged by counting cementum annuli: only estimated ages are given.

Table 14. Brown bear capture records, Black Lake, 1988.

ID	Sex	Age	Weight	Capture Date	Radio Type	Comments
001	F	17	415	6/1/88	normal	W/2, captured
002	F	1	125	6/1/88		W/ #1 & sibling #3
003	M	1	136	6/1/88		W/ #1 & sibling #2
004	F	20	425	6/1/88	normal	W/ male #5 and dead ylg.
005	M	12	850	6/1/88	normal	W/ female #4 & dead ylg.
006	F	4	340	6/1/88	w/spacer	W/ male #7
007	M	4	385	6/1/88		W/ female #6
008	F	3	300	6/1/88	normal	Alone
009	M	7	475	6/2/88	w/spacer	W?/ male #10
010	M	4	290	6/2/88	glue-on	W?/ male #9
011	F	22	580	6/2/88	normal	Alone
012	F	9	370	6/2/88	normal	W/ 1 (#13)
013	F	2	150	6/2/88		W/ mom #12
014	M	8	485	6/2/88		W/ male #15
015	M	14	1100	6/2/88	glue-on	W. male #14
016	F	4	275	6/2/88	w/spacer	Alone
017	F	19	500	6/2/88	normal	W/ big male, not captured
018	F	15	400	6/2/88	normal	W/ 2 (#19 & #20)
019	F	1	110	6/2/88		W/ mom #18
020	F	1	90	6/2/88		W/ mon #18 & sib (#19)
021	F	3	175	6/2/88	glue-on	Alone
022	F	10	375	6/2/88		Capture, mortality, drowned
A ?	?	1	100	6/2/88		Darted, not handled
B ?	?	1	100	6/2/88		Darted, not handled
023	F	17	380	6/3/88	normal	W/ 3 (only #24 captured)
024	M	1	40	6/3/88		W/ mom #23 & 2 siblings
025	M	15	1000	6/2/88		Alone
026	F	13	380	6/2/88	normal	W/3, captured
027	F	2	170	6/2/88	glue-on	W/ #26 & sibs
028	M	2	160	6/2/88		W/ #26 & sibs
029	M	2	155	6/2/88		W/ #26 & sibs
030	F	12	385	6/3/88	normal	W/ 1 (#31)
031	M	2	140	6/3/88		W/ mom #30
032	F	12	400	6/3/88	normal	Capt. mort. w/3 (#33)
033	M	3	230	6/3/88		W/ mom #32 & 2 siblings
034	F	17	475	6/3/88	normal	W/ 3, not captured

Including capture sites, the 39 bears successfully outfitted with radios were located a total of 352 times. During 1988 relocation flights were made as follows: June 2nd, July 1st, August 2nd, September 2nd, October 1st and December 1st. As of December 1988, status of the 29 female brown bear outfitted with radios (excluding two capture mortalities) was as follows: two adults died of natural causes, three no longer have functioning radios (two glue-on radios had batteries die and one break-away radio was dropped), and 25 are alive with functioning radios. The status of 10 males outfitted with radios was as follows: one shed his collar, two shed glue-on radios, one glue-on radio went dead, one collar failed, one other either failed or the bear made a long distance movement, and four have functioning radios (one of these moved 110 km north of the study area). Table 15 shows the status of all 59 bears captured.

Table 15. Current status of bears marked near Black Lake, June 1988.

Bear No.	Sex	Est. Age	date last location	Current Status
001	F	17	10/19/88	Alive, lost 1 of 2 yearlings from capt.
002	F	1		Unk, this or sib #3 still w/mother #1
003	M	1		Unk, this or sib #2 still w/mother #1
004	F	20	12/05/88	Alive, denned
005	M	12	06/03/88	Unk, radio failure or long emigration
006	F	4	12/05/88	Alive, denned
007	M	4		Unk, no radio
008	F	3	12/05/88	Alive, not denned yet
009	M	7	09/23/88	Alive
010	M	4	09/08/88	Glue-on radio shed as of 9/8/88
011	F	22	09/08/88	Alive
012	F	9	12/06/88	Alive, presumed to be denned
013	F	2		Unk, no radio
014	M	8		Unk, no radio
015	M	14	06/06/88	Glue-on radio shed
016	F	4	12/05/88	Radio shed or bear denned
017	F	19	12/05/88	Alive, denned
018	F	15	09/22/88	Alive
019	F	1		Separated from mother (#18) at capture, presumed dead
020	F	1		Separated from mother (#18) at capture, presumed dead
021	F	3	09/22/88	Alive, glue-on radio now presumed nonfunctional
022	F	10		Capture mortality
023	F	17	12/05/88	Denned
024	M	1	10/19/88	Presumed denned w/mother (#23)
025	M	15		Unk, no radio
026	F	13	10/19/88	Alive
027	F	2	06/06/88	Unk, glue-on radio nonfunctional
028	M	2		Unk, no radio
029	M	2		Unk, no radio
030	F	12	12/05/88	Alive

Table 15. Continued.

Bear No.	Sex	Est. Age	date last location	Current Status
031	M	2		Unk, no radio
032	F	12		Capture mortality
033	M	3		Unk, no radio
034	F	17	12/05/88	Alive, denned w/3 cubs of the year
036	F	15	06/26/88	Natural mortality
A	F	0		Mother #36 dead, presumed dead
B	F	0		Mother #36 dead, presumed dead
037	F	8	12/05/88	Alive
038	F	16	10/20/88	Alive
039	M	2	07/20/88	Unk. glue-on radio nonfunctional
040	F	6	12/05/88	Alive, denned
041	M	14	06/06/88	Unk, radio shed
042	M	5	11/26/88	Alive, bear moved 110 km north
043	F	5	12/05/88	Alive, presumed denned
044	F	20	10/20/88	Natural mortality
045	F	3	12/05/88	Alive, denned
046	F	16	12/05/88	Alive, lost 3 cubs of the year
047	M	4	12/05/88	Alive, denned
048	M	4	10/20/88	Alive
049	M	10		Unk, no radio
050	F	8	12/05/88	Alive, denned
051	F	14	12/05/88	Alive, denned w/2 yearlings
052	F	4	12/05/88	Alive
053	F	3	10/19/88	Alive
054	M	3	09/08/88	Alive, radio confirmed nonfunctional
055	F	8	10/20/88	Alive
056	M	3		Unk, no radio
057	F	7	12/05/88	Alive, denned
058	F	15	12/05/88	Alive, denned

During 1988, 16 maternal females and 14 of 28 total offspring were captured. One female with two yearlings drowned before biologists could reach her. Neither of her yearlings were marked and their fate is unknown. Another bear with two 2.5 year old cubs died from drug complications. One of the young (#33) was marked but not fitted with a radio so the fate of these two bears is unknown. Two other maternal females died of natural causes as described below. Bear #36 and her two cubs of the year were captured on June 3rd. She was seen on June 5th alone near the capture site, and she was relocated (but not visually seen) the following day with her radio transmitting in the active mode, indicating she was alive. On June 26th she was found dead at the bottom of a cliff. The carcass could not be checked until July 19th. Evidence at the site indicated she was involved in a rock/snow slide and had apparently suffered a broken neck. No sign of her cubs was found and they were presumed dead. Bear #44 and her 2.4 year old cub (#45) were both captured and radio collared on June 3rd. They remained together and were relocated

eight (8) times through September 23rd. On October 20th she was found dead; her offspring was alive about 16 km away. We could not get to the carcass to determine the cause of death.

Barren-ground Caribou

The Alaska Peninsula caribou herd is composed of the northern and southern herds. The northern herd, between 15,000-20,000 animals (Table 16), utilizes both the Alaska Peninsula and Becharof refuges. The animals migrate from traditional calving areas near Port Moller to fall and winter feeding grounds near King Salmon. The southern herd remains south of Port Moller and ranges to Cold Bay. The northern herd is monitored by refuge staff and Alaska Fish and Game personnel, while the southern herd is monitored by Izembek Refuge and Alaska Fish and Game.



A bull caribou in June.

REH

Table 16. Sex and age composition of the northern Alaska Peninsula caribou herd.

Year	Season	Bull:Cow Ratio	Calf:Cow Ratio	Percent Calves	Population Estimate
1970	Fall	48.3:100	46.1:100	23	
1975	Fall	33.0:100	44.6:100	25	10,340
1976	Spring	--	--	--	11,368
1978	Fall	48.3:100	55.2:100	25	--
1980	Fall	52.8:100	56.5:100	27	--
1981	Spring	--	--	27	16,600 ^a
1981	Fall	33.6:100	39.2:100	23	--
1982	Spring	52.5:100	55.4:100	27	16,800 ^a
1982	Fall	43.1:100	51.6:100	27	--
1983	Spring	--	--	28	18,000 ^a
1983	Fall	39.2:100	26.7:100	16	--
1984	Spring	--	--	25	19,000 ^a
1984	Fall	39.0:100	39.0:100	22	--
1985	Spring	--	--	27	18,978 ^a
1985	Fall	--	--	--	--
1986	Spring	--	--	28	15,300 ^b
1986	Fall	50.8:100	34.3:100	18	-- ^b
1987	Spring	--	--	--	-- ^b
1987	Fall	54.0:100	51.5:100	25	18,800 ^b
1988	Spring	--	--	30	20,000 ^b
1988	Fall	49.0:100	49.0:100	25	--

^aPost calving photo count with aid of radio telemetry.

^bSpring counts not complete.

Refuge staff and pilots are becoming more and more involved with Fish and Game in the monitoring of the northern herd.

This assistance is summarized below:

- On March 18th, a radio tracking flight for caribou was made with Fish and Game Biologist Dick Sellers. Nineteen of 25 collared caribou were located. The caribou were much farther north than previous years. Perhaps the never ending winter had slowed migration considerably.
- On July 28th, Assistant Refuge Manager/Pilot Arment flew Fish and Game Biologist Dave Johnson on a radio telemetry survey for caribou. During this single flight the crew was able to locate 18 of the 25 radio collared caribou and a total of 11,000 caribou.
- On August 4th, Assistant Refuge Manager/Pilot Arment flew Fish and Game Biologist Dave Johnson on a radio telemetry survey for caribou. During this flight the crew was able to locate an additional six (6) collared caribou and 4,000 caribou. Between this flight and the initial flight the crew conducted in July, 24 of the possible 25 radio collared caribou and a total of 15,000 caribou were located.

- On September 26th, Assistant Refuge Manager/Pilot Arment flew Fish and Game Biologist Dave Johnson on a caribou radio tracking survey. Fifteen of the 25 collared caribou were located. The 15 collared caribou were located in an area south of the Naknek River, north of Becharof Lake, and west of the Aleutian Range. One signal was tracked back to King Salmon. The collar was traced to an inflatable raft at the Quinnat Landing Hotel. Apparently, hunters had harvested the caribou and failed to turn the collar into Fish and Game.

The great Togiak Refuge caribou transplant was conducted on February 3rd to the 16th. A base camp was established on Becharof Refuge. All 148 caribou were captured within a 10 - 15 mile radius of the base camp. Alaska Peninsula/Becharof refuges contributed personnel, supercub for spotting, Cessna 206 for personnel transport, coordination and any other help that was needed. (See Togiak Refuge's Annual Narrative for details).



State Fish and Game Biologist Ken Taylor runs to take care of another incoming caribou.

REH

An important part of the caribou transplant effort was the outstanding example of public involvement and the "good feelings" that resulted. A meeting with Paug-Vik Corporation, Ltd. in Naknek was arranged by the Alaska Peninsula/Becharof refuges. On February 1st, Assistant Refuge Manager Pete Jerome, Togiak Refuge, presented a video and discussed the transplant effort at Paug-Vik's office. Refuge Manager Hood, Deputy Refuge Manager Savery and Assistant Refuge Manager/Pilot Payne assisted. We also provided transport (C-206 piloted by Assistant Refuge Manager/Pilot Arment) to school groups from Dillingham, Manokatak, Togiak, South Naknek, and Egegik. Throughout the effort many positive comments were heard. Refuge Manager Dave Fisher (Togiak Refuge) and his staff are to be complimented on this outstanding effort.



Deputy Refuge Manager Jim Savery
assists in processing a caribou. REH

Moose

The annual moose survey of Bible Creek and Kejulik River on the Becharof Refuge was not completed in 1988 (Table 17). These annual aerial surveys are conducted to supplement moose surveys done since 1981 by Fish and Game (Table 18). The Fish and Game surveys are done at the extreme northern

boundary of the refuge, while the refuge surveys are well with refuge boundaries.

Table 17. Moose sex and age ratios for the Bible Creek and Kejulik River area of Becharof Refuge.

Year	Total Bulls per 100 cows	Yrlg. Bulls per 100 cows	Yrlg. Bulls/ % of herd	Calves/ 100 cows	Calf	
					% of herd	Total count
1986 ^a	--	--	--	--	--	264 ^b
1987	89	16	8	8	4	148
1988 ^c	--	--	--	--	--	--

^aPoor flying weather and lack of snow cover forced the delay of counts until late January 1987. Bull moose had already dropped antlers, making sex and age determination impossible.

^bTotal count was inordinately high due to a severe winter storm that moved animals from higher elevations in greater than usual numbers.

^cDue to the lack of snow cover and the proper aircraft (PA-18 supercub), the count was not conducted this year.

Table 18. Moose sex and age ratios from fall counts conducted on the northern boundary of Becharof Refuge (Fish & Game data).

Year	Total Bulls/ 100 Cows	Yrlg. Bulls/ 100 Cows	Yrlg. Bulls Herd	Calves/ 100 Cows	Calf % of herd	Total Sample
1981	23	10	7	15	11	95
1982	31	7	5	10	7	118
1983	33	4	3	20	13	139
1984	28	4	3	12	9	196
1985	21	3	2	10	8	153
1986	21	3	2	19	14	142
1987	20	5	4	14	15	113
1988	32	4	3	32	15	155

Alaska Fish and Game also monitors moose populations on the Ugashik Unit of the Alaska Peninsula Refuge. The area around the Dog Salmon River drainage has been monitored with some consistency since 1962 (Table 19). A rapid population decline in the mid-1960's to the early 1970's was attributed to poor browse conditions. Beginning in the early 1970's Fish and Game liberalized moose hunting season to bring the population in line with the grazing capacity of the range. The liberalized seasons resulted in a

composition disparity of many older animals but few younger replacement animals. This was attributed to younger animals being more susceptible to the gun. As a result, the population decline continued, compounded by the loss of additional replacement animals to predation by brown bear, especially on moose calves. In the late 1970's Fish and Game placed trophy-only (bulls with 50 inch or greater antler spread or three brow tines) restriction on hunter take. With hunting restrictions in place, the population began to stabilize and finally, in 1986, the management goal of 40 bulls per 100 cows was reached.



A new born moose and a watchful mom.

REH

Table 19. Moose sex and age ratios for surveys conducted in the Dog Salmon drainage, Alaska Peninsula Refuge (Fish & Game data).

Year	Total Bulls/ 100 Cows	Yrlg. Bulls/ 100 Cows	Yrlg. Bulls Herd	Calves/ 100 Cows	Calf % of herd	Total Sample
1962	119	11	10	17	7	238
1963	--	--	--	--	17	213
1964	77	15	8	7	4	291
1966	89	17	8	30	14	275
1967	44	13	8	16	10	72
1970	62	15	9	10	6	324
1971	57	18	10	19	11	241
1974	22	11	9	6	4	139
1976	34	11	7	20	13	94
1979	26	16	10	24	15	60
1981	60	16	9	28	15	47
1982	56	18	11	8	5	64
1983	57	7	4	18	10	126
1984	61	12	7	9	5	112
1987	53	8	4	23	13	93
1988 ^a	22	4	2	33	21	42

^aIncomplete survey due to poor weather conditions.

9. Marine Mammals

Our scheduled walrus field camp at Cape Seniavin was cancelled due to a very late winter and withdrawal of funds by Regional Office. However, we were able to assist Sue Hills, Alaska Research Center, in her study efforts. We supplied equipment, logistics help and radio contact. Sue advised us that she had a very successful camp. Six walrus were equipped with radios, one being a satellite radio. Valuable information was gained on tranquilizers/drugs. Observations were made on the extreme sensitivity to aircraft disturbance that Cape Seniavin walrus exhibit. Sue provided the following summary of her activities.

Immobilization and Drug Delivery. Twelve walruses were injected with chemical immobilizing agents May 10 - 14 with no mortalities (Table 20). In addition to seven animals injected with Telezol at Round Island in 1987, one additional animal was injected with Telezol. Then four other drugs or drug combinations were tried in an attempt to find one with a shorter induction time and that had an antagonist. Xylazine, in combination with acepromazine (three animals) and diazepam (one animal), had no effect at the dosages given. Etorphine was acceptable on two of three animals, and cargentenil worked well on four of four animals. Two manuscripts on the results of the chemical immobilization trails are currently in preparation.

The jabstick was not used to inject any animals at Cape Seniavin because it was not possible to approach close enough to use it during the Telezol trails, and because the 10 cc of drug required to fill the tubing between the syringe and the needle cannot be used - a problem with expensive and/or dangerous substances. A crossbow was used to inject Telezol; all others were given using a Telinject compressed air gun. The Telinject gun proved very satisfactory in that it is powerful enough to penetrate through the skin at 30-40 meters, is very quite, and is very light weight and easy to handle.

Transmitter attachment and marking. One satellite transmitter with very high frequency (VHF) back up and five other VHF radios were attached to walrus tusks then monitored daily until camp was pulled. All resightings or transmissions heard are summarized in Table 21.

Environmental Conditions. Data will not be analyzed until that from this summer's observations at Round Island and Cape Pierce are received. However, barometric pressure, temperature and wind do not appear to be correlated with numbers of animals hauled out although sea state, or more particularly, wave height may be.

Table 20. Adult male Pacific walruses injected with chemical immobilizing agents at Cape Seniavin, Alaska, May 1988.

Animal number	Drug/Dose	Observations
88-1	Telezol, 1625 mg (1.25 mg/kg est. wt.)	Animal went in water no apparent effect
88-2	100 mg xylazine 5 mg acepromazine	no apparent effect
88-3	200 mg xylazine 10 mg acepromazine	no apparent effect
88-2	200 mg xylazine 10 mg acepromazine	given 110 min after first dose still no apparent effect
88-4	100 mg xylazine 25 mg diazepam	no apparent effect
88-5	5 mg etorphine 8 mg diprenorphine, IV 20 cc Dopram, IV	acceptable level of immobilization, good response to antagonist. VHF radio
88-6	3 mg etorphine	no apparent effect
88-7	4 mg etorphine 6 mg diprenorphine IV 2 mg diprenorphine IM 10 cc Dopram IV	acceptable immobilization good response to antagonist PTT and VHF radio

Animal number	Drug/Dose	Observations
88-8	450 mg xylazine 5 mg acepromazine	no apparent effect
88-9	4 mg carfentanyl 500 mg naloxone IV 500 mg naloxone IM 10 cc Dopram IV 10 cc Dopram IM	acceptable immobilization good response to antagonist VHF radio
88-10	3 mg carfentanyl 300 mg naloxone IV 20 ml Dopram IV	acceptable immobilization good response to antagonist VHF radio
88-11	2 mg carfentanyl 300 mg naloxone IV 20 cc Dopram IV	acceptable immobilization good response to antagonist VHF radio
88-12	3 mg carfentanyl 400 mg naloxone IM 200 mg naloxone IV 20 cc Dopram IV	acceptable immobilization moderate response to antagonist VHF radio

Table 21. Relocations of transmittered male Pacific walruses at Cape Seniavin, AK, through May 15th 1988.

Animal number	Date deployed	Observations
88-5	5/12/88	5/15 - heard and seen, black dye hard to distinguish from black sand, radio looks good, sounds strong.
88-7	5/13/88	5/14 - heard and seen, black and green dyes still good, blue paint looks black, radios look good, sounds strong. 5/15 - same as above.
88-9	5/13/88	5/14 - heard but not seen, strong signal.
88-10	5/13/88	5/15 - heard but not seen, strong signal.
88-11	5/14/88	5/15 - not heard or seen.
88-12	5/14/88	5/15 - not heard or seen.

11. Fisheries Resources

King Salmon Fishery Assistance Office activities on Alaska Peninsula and Becharof Refuges

Stock Identification of Bristol Bay, Alaska Salmon Stocks. Under a contract with National Oceanic and Atmospheric Administration the U.S. Fish and Wildlife Service is conducting a study to determine the feasibility of genetic stock identification of Bristol Bay, Alaska salmon stocks. The King Salmon Fishery Assistance Office, as a study cooperator, is responsible for collection and shipment of salmon tissue samples to the Alaska Fish and Wildlife Research Center, Anchorage. Electrophoretic analysis of eye, muscle, heart, and liver tissue will be used to identify individual salmon stocks.

Chinook, chum, pink and sockeye salmon were collected from five major drainages of the Alaska Peninsula and Becharof National Wildlife Refuges. Chinook and chum salmon, 30 and 42 fish respectively, were collected from Big Creek, a Becharof Refuge tributary to the Naknek River. Six Becharof Lake tributaries were sampled for sockeye salmon: Ruth River, Kejulik River, Featherly Creek, Franks Creek, Bear River, and Bible Creek. Alaska Peninsula Refuge drainages which were sampled for sockeye salmon include five Ugashik Lake system tributaries: Ugashik Creek, Deer Creek, Black Creek, Ugashik Narrows and Lower Ugashik River; and Sapsuk Lake in the Nelson Sapsuk River system. Sockeye salmon samples consisted of a 50 fish sample from each stream and Sapsuk Lake. Sampling individual spawning populations within a major drainage provides for a comparison of spawning populations within the drainage as well as comparisons between the major drainages.

One hundred pink salmon were collected from Lawrence Creek, a Herendeen Bay tributary. Pink salmon populations were not sampled from other Refuge drainages as the population levels are generally small and tend to fluctuate.

The salmon tissue samples are presently being analyzed at the Anchorage Research Center.

Sample site access was provided by a National Oceanic and Atmospheric Administration helicopter or chartered helicopter.

Southwest Alaska Rainbow Trout Investigations Gertrude Creek, King Salmon River Drainage. Gertrude Creek sampling activities occurred between June 27 - 30 and September 3 - 4, 1988. A total of 86 rainbow trout were collected by hook and line sampling. Scales were collected from all of the rainbow trout and 80 fish were sacrificed for otolith samples. The rainbow trout ranged in fork length from 310-588 mm and 0.25-3.75 kg in weight. Preliminary otolith ageing indicates a range of 4-9 year old fish in the sample.



Biotech. Jerry Broda with a Gertrude
Creek rainbow trout. FRS

In addition, 105 Arctic grayling were captured; fork length ranged from 265-492 mm and weight from 0.25-1.0 kg. No scales or bony structures were collected for ageing purposes.

Fifteen char were measured and weighed ranging from 315-532 mm and 0.25-1.50 kg, respectively. Char were more abundant in Gertrude Creek than indicated by the sample size because the crew was targeting rainbow trout and Arctic grayling.

Cooperative Arctic Grayling Management Activities

The Alaska Peninsula/Becharof refuges is assisting Fish and Game with management inventories of Arctic grayling on the Ugashik lakes. This year we provided assistance with creel surveys and tagging of fish. This cooperative venture between our agencies has substantially increased understanding of the sport fishery in the Ugashik system and has uncovered what we consider to be a serious resource problem concerning the grayling stocks of this system. Sport Fish Biologist Eric Minard provided the following summary of the 1988 field work.

Creel Survey

Narrows. A direct expansion creel survey was conducted at the Narrows by Refuge staff under the design of Fish and Game, Sport Fish Division, from June 20 to September 21, 1988. From 479 angler interviews an estimated 2,148 angler-hours were spent to catch : 203 Arctic grayling, 1,360 Arctic char, 22 lake trout, 292 sockeye salmon, and 349 coho salmon. Of those fishes caught 14 Arctic grayling, 109 Arctic char, 14 lake trout, 102 sockeye salmon, and 176 coho salmon were retained (killed).



Biotech. Savage and Student Conservation
Volunteer Hanks conducting creel survey.
FWS

Outlet. A roving creel survey was conducted at the Narrows by Refuge and Fish and Game Sport Fish Division, from July 9 to September 28, 1988. From interviews an estimated 1,753 angler-hours of effort were spent to capture: 2,269 coho salmon, 438 sockeye salmon, 21 Arctic grayling, 108 Arctic char, 7 chinook salmon, 52 pink salmon, and

25 chum salmon. Of those fishes landed 588 coho salmon, 216 sockeye salmon, and 17 Arctic char were retained (killed). No Arctic grayling, pink or chum salmon were reported harvested at the Outlet in 1988.

Biological Sampling

Arctic grayling were sampled throughout the drainage during the 1988 field season. A series of population estimates were conducted using standard mark recapture methods at the Narrows and the Outlet. A total of 667 Arctic grayling were captured and measured for standard age and size information. Scale samples were also collected for aging purposes (Table 22).

Table 22. Numbers of Arctic grayling tagged and recaptured in the Ugashik drainage, by location, 1987-1988.

Location	Tagged Number	Recaptured			
		Narrows	Outlet	Crooked Cr.	E Cr.
Narrows	522	167	1	1	0
Outlet	64	3	19	0	0
Crooked Cr.	46	1	0	2	0
E Creek	20	0	0	0	2
Lower Ugashik Lk	1	0	0	0	0
Grass Creek	14	0	0	0	0

Results of the population estimates suggest a very serious decline has occurred in the numbers of Arctic grayling present at the Outlet. The 1988 estimate of 59 fish (95% CI, 39 - 113) is orders of magnitude smaller than the previous population estimates made in 1969 (1,952 fish), 1971 (1,180 fish), and 1979 (2,053 fish). Abundance estimates for the Narrows in 1988 ranged from a low of 166 fish in June to a high of 1,050 fish in July. No historical abundance information is available for the Narrows (Table 23 and 24).

Table 23. Preliminary Arctic grayling abundance estimates at Ugashik Narrows, 1988.

Dates	Number Caught	Number Marked	Number Recaptured	Point Estimate	95% CI
June 16-18	47	43	3	166	67-414
July 14-18	234	215	18	1050	679-1705
August 8-12	138	123	12	484	285-874
Sept. 12-14	331	265	65	927	739-1200

Table 24. Preliminary Arctic grayling abundance estimates at Ugashik Outlet, 1988.

Dates	Number Caught	Number Marked	Number Recaptured	Point Estimate	95% CI
June 13-15	0	0	0	No estimate	
July 11-12	3	0	0	No estimate	
August 8-12	49	39	10	59	39-113
September	14	9	0	No estimate	



State Fish and Game field crew sampling grayling with seine.

SES

To further understand the apparent decline in grayling stocks at Ugashik, Fish and Game is pulling together all of the historic age, sex and size data from past years and intend to make rigorous statistical comparisons between years and locations using these data. What we hope to accomplish with this comparative analysis is to determine the nature of the decline; was it fishery induced evidenced by loss of the older age classes, or is it due to recruitment failure indicated by a reduction in the younger age classes.

Fish and Game will likely issue an emergency order closure of the Arctic grayling fishery in the Ugashik system for the 1989 season. We will follow that up with a set of proposed regulatory changes concerning this fishery at the Board of Fisheries meetings next December.

16. Marking and Banding

Seventeen white-fronted geese were banded, equipped with neck collars and equipped with a radio transmitter (Table 25). Refer to Section G.3. for details.

Table 25. Identification of molting white-fronted geese captured near Hook Lagoon, Alaska Peninsula, July 4, 1988.

Collar number	Band number	Transmitter			Weight (grams)
		freq. 166.	Age	Sex	
K71	01516	225	ASY	F	2,250
K72	01517	274	ASY	F	2,250
K73	01518	255	SY	F ^a	1,800
K74	01519	195	ASY	F	2,250
K75	01520	176	ASY	F	2,050
K76	01521	294	ASY	F	1,900
K77	01522	305	ASY	M	2,400
K78	01523	165	ASY	F	1,950
K79	01525	204	ASY	M	2,400
K80	01524	264	SY	F ^a	1,850
K81	01526	316	ASY	F	2,350
K82	01527	285	ASY	M	2,250
K83	01528	186	ASY	F	2,350
K84	01529	245	SY	F	1,800
	01530	214	ASY	F	2,050
	1367-34501		ASY	F	2,150
	1367-34502		ASY	F	2,100

^aHad no or very few speckles on belly.

H. PUBLIC USE

1. General

Historically, recreational and subsistence use by local residents are nearly inseparable. The two activities have long meshed as residents have hunted, fished, trapped and gathered berries. However, recreational use by out-of-state visitors and non-locals is easily distinguishable from subsistence use. Most subsistence use comes from twelve villages in and around the boundaries of the refuges. These include Naknek, South Naknek, King Salmon, Egegik, Pilot Point, Ugashik, Port Heiden, Ivanof Bay, Perryville, Chignik Bay, Chignik Lake and Chignik Lagoon. Most out-of-state and non-local recreational use begins in King Salmon since this is the major terminal for commercial jet service from Anchorage. Access to refuge lands is primarily by aircraft; however, Big Creek, the Egegik, Ugashik and Dog Salmon rivers are well used corridors by non-locals and subsistence users alike. The streams also serve as winter trails for all-terrain vehicles for subsistence hunting of moose and caribou by locals.

An increase in air-taxi use and outfitters indicate a continuing increase in recreational use by non-locals. This is evidenced by the fact that the number of Special Use Permits issued by the refuges for guides, outfitters and air taxi operators has increased from 33 in 1982 to 61 (85%) in 1988. The relatively short distance from King Salmon to the Becharof Refuge and Ugashik Unit of the Alaska Peninsula Refuge makes it very convenient for non-locals to access world class caribou and moose hunting and sport fishing. It is now estimated that 70% of the moose, 50% of the caribou harvested on the refuges and 90% of the sport fishing is by non-locals.

Public use inquiries about the refuge, traditionally limited to a few per year, have increased significantly. Much of the increase is due to the publication of the refuge addresses in the state sponsored Alaska Travel Planner. Interestingly enough, the majority of inquiries want information on camp sites, refuge trails and roads along with other visitor facilities. It is very apparent most people who inquire do not consult a map! One inquiry wanted to know how long it would take to drive his motor home from Anchorage to Becharof Lake.

This year Poland continued to be highly represented with 24 inquiries. We had inquiries from 28 states and two other countries. No doubt, we are getting better known.



Hiking is increasing as a public use on the refuges. SES

6. Interpretive Exhibits/Demonstrations

In February Maintenance Worker Gallup completed the framework and hung six display panels at the airport kiosk. Due to expansion plans for the Mark Air terminal, the kiosk was moved across the street to National Park Service lands on May 9th.



The airport kiosk before it was moved.

REH

Each year the Bristol Bay Borough celebrates the end of the commercial fishing season with a "Fishtival" held in the village of Naknek. This year, the refuges participated in these activities for second year. A static display about the Federal Duck Stamp was used. About 600 people viewed the exhibit.

8. Hunting

The Alaska Peninsula is host to an increasing number of non-local and non-resident sport hunters. An examination of the Boone and Crockett record book gives a clear indication of why. Forty-six of the top 100 brown bear, 37 of the top 100 caribou, including number one, and 22 of the top 100 moose were taken on the Alaska Peninsula.

For both the Alaska Peninsula and Becharof refuges, King Salmon is the termination point for commercial air service. Once a hunting party arrives in King Salmon, air taxi and charter service is available to most areas on the refuges. King Salmon is also the base of operation for numerous guides and outfitters operating on the Alaska Peninsula. Those hunters wishing to hire the services of an outfitter or guide find fees are costly and highly variable, dependent upon the length of the hunt, equipment provided, type of animal hunted and the area to be hunted. Commercial guide fees for moose or caribou may range from \$2,500 to \$3,500 while a brown bear hunt may cost \$5,000 to \$10,000.



Caribou hunting is extremely popular.

FWS

An individual wishing to provide privately owned equipment without the benefit of a guide or outfitter will find the fees set by the Alaska Department of Fish and Game for non-resident license and tags to be just the beginning (Table 26). Once the proper license and tags are obtained, the cost of a charter flight can range from \$150 to \$625 per hour of aircraft operation with most camp placement and pick-up requiring three or more hours of aircraft time.

Table 26. Alaska non-resident license and tag fees for 1988 (Fish and Game data).

Type of License	Cost
Hunting	\$ 60.00
Sport fishing and hunting	\$ 96.00
Caribou/moose tag	\$300.00
Brown bear tag	\$350.00

Hunters are required to submit a hunt report to Fish and Game at the close of the hunting season. The report includes information on harvest success. Due to the long hunting seasons, Fish and Game lags behind one year in processing of the harvest reports, thus hunter success in calendar year 1987 is shown in Tables 27 and 28.

Table 27. Caribou and moose harvest for the Alaska Peninsula Game Management Units 9C and 9E, 1987 (Fish and Game data).^a

Species	Bulls	Cows	Ukn.	Total
Caribou	841	158	4	1003
Moose	157	9		166

^aHarvest reports include both Alaska Peninsula and Becharof refuges.

Table 28. Brown bear harvest for the Alaska Peninsula, 1975-1987, Game Management Units 9C and 9E (Fish and Game data).

Date ^b	Total Bears	Percent Boar	Mean Age		Percent Harvest ^a	
			Boar	Sow	Boar	Sow
1975-76	261	62	6	7	49	51
1977-78	311	64	6	7	45	55
1979-80	316	68	6	6	47	53
1981-82	339	59	6	6	47	53
1983-84	268	61	6	8	53	46
1985-86 ^c	263	64	7	8	60	37
1987 ^d	156	49	6	7	44	56

^aFigure represents bears 5 years of age or older.

^bBrown bear hunting season on the peninsula is on a rest-rotation schedule, e.g., the fall of 1985 was open, followed by a season in the spring of 1986. There was no other open season until the fall of 1987, essentially an 18 month cycle.

^cIncludes seven bears of unknown age and/or sex. Drainages listed on harvest reports indicate 144 (55%) of the total harvest was taken either on Alaska Peninsula or the Becharof refuges.

^dIncludes 12 bears of unknown age and/or sex. 1988 spring figures are not available from Fish and Game at this time.

Waterfowl and upland game hunting, on refuge lands, usually occurs in conjunction with big game hunts. Off refuge, the main waterfowl hunting areas are the Naknek River, adjacent to King Salmon, the Pilot Point and the Port Heiden areas.

9. Fishing

The rivers and lakes within the Alaska Peninsula/Becharof Refuges provide world-class fishing opportunities. Game fish include burbot, Dolly Varden/Arctic char, Arctic grayling, rainbow trout and five species of Pacific salmon. In large lakes, northern pike and lake trout are common. In 1981, the Alaska record Arctic grayling was caught in the "Narrows", between Upper and Lower Ugashik Lake, Ugashik Unit.

Access to the numerous fishing areas on the refuges is generally limited to float equipped aircraft. The areas most utilized for sport fishing are upper and lower King Salmon rivers, Big, Gertrude, Featherly and Painter creeks and Upper and Lower Ugashik lakes including the Narrows.

Over 20 fishing guides and transporters, which offer fishing packages, are permitted on the refuges and promote wilderness fishing experiences. Most operators of these lodges promote catch and release angling for resident fish species. They offer a variety of package programs that include lodging and air transportation to the fishing areas. These package deals may range in price from \$1500 to \$5000 depending on the length of stay and quality of amenities offered by the lodge.

Even though estimates indicate that over 90% of all sportfishing is by non-locals, very little information has been available concerning the numbers of recreationists that use site specific areas on the refuges. Much of the information that is available was generated by staff knowledgeable about public use patterns on the refuges and from random observations from aircraft. Concern has been expressed by refuge staff, Alaska State Department of Fish and Game personnel and local fishing guides that historical "hot spots" such as the river between Upper and Lower Ugashik lakes (Narrows) and Gertrude Creek have been getting too much fishing pressure and that trophy-size fish are on the decline.



Fishing for grayling at the "Narrows".

SES

Ugashik Narrows Public Use Study

In the summer of 1987, and again in the summer of 1988, a public-use field camp was established at the Ugashik Narrows to collect site specific creel and public-use data. This site was chosen because it received the most concern from local fishing guides about over crowding. The Narrows is located on the Alaska Peninsula Refuge, 78 miles south of King Salmon (Figure 15). It is a 0.4 mile long river between Upper and Lower Ugashik lakes. The upper lake is approximately 85 square miles in size and the lower lake is 72 square miles in size. Both lakes are drained by the Ugashik River that flows west to Bristol Bay.

Two private commercial fishing lodges are located at the Narrows. One actively operates on a seasonal basis; the other was sold to a Japanese firm that has lodges on Lake Iliamna, but is not yet in operation at the Narrows. Both lodges have Special Use Permits to operate on the refuges.

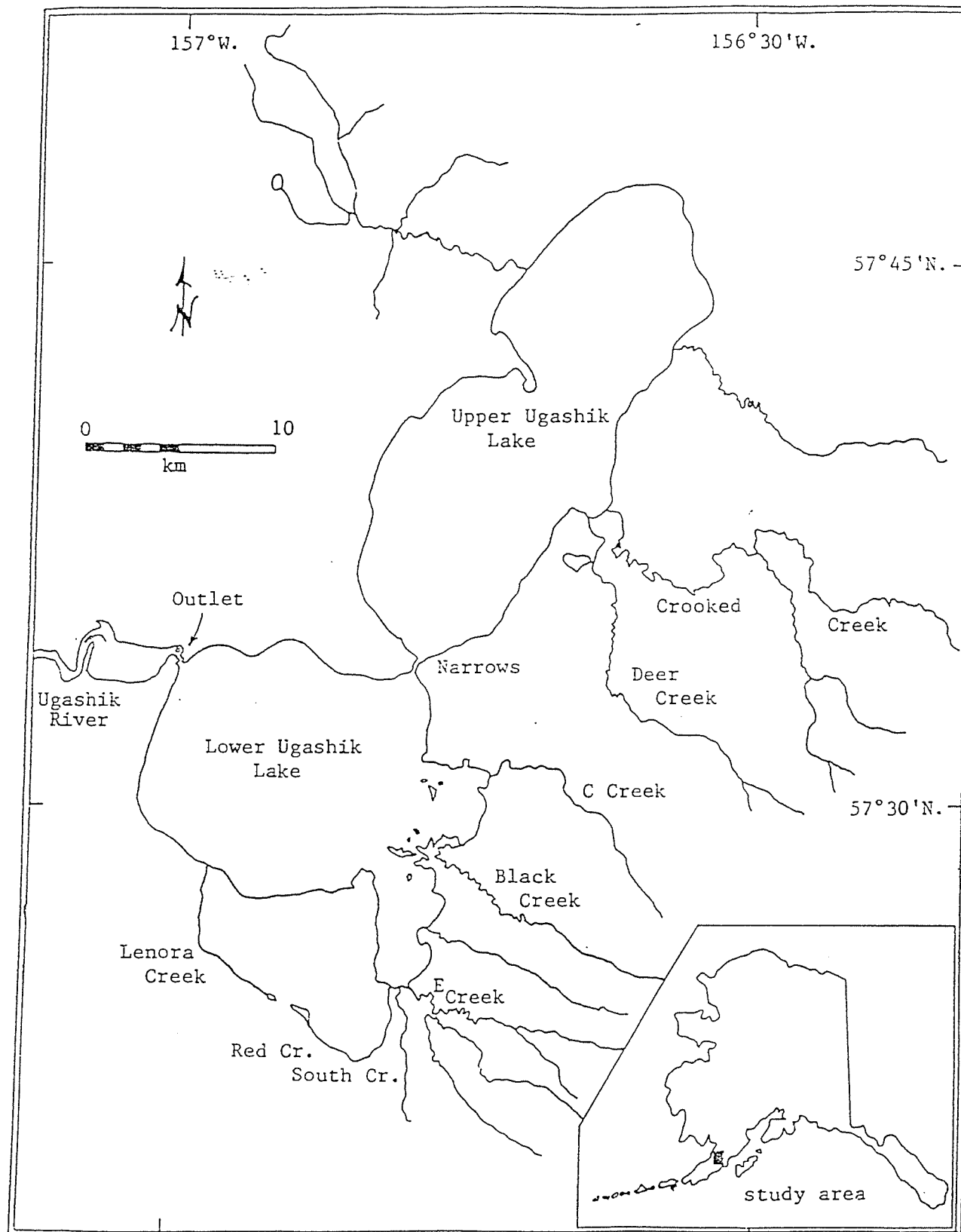


Figure 15. Upper and Lower Ugashik lakes study area.

One outfitter also has a cabin under permit on the west side of the Narrows near the entrance to Lower Ugashik Lake.

The location of the Narrows field camp was retained from 1987 to 1988, but the cabin utilized in 1987 was not available for use in 1988. Two 12' by 20' and one 12' by 10' weatherports were erected behind the cabin and utilized as sleeping, cooking and office quarters. One biological technician and from one to three Student Conservation Association volunteers staffed the camp from June 15th through September 22nd. Throughout the season a total of five individual Student Conservation Association and two Fish and Wildlife Service volunteers helped with the data collection. Additional manpower was volunteered by personnel of the King Salmon Air Force Station to aid in the camp establishment and removal. Data was collected from June 16th to September 21st.



The public use field camp at the "Narrows".

SES

When a party arrived at the Narrows they were greeted by members of the staff, offered refuge and fishing brochures and interviewed for specific information. If the party's purpose was to fish, they were asked to participate in the creel survey when they had completed their fishing activities. Approximate departure time was determined so each party member could be "exit interviewed". Data was recorded on Public Use Survey forms. Members of the public use staff served as a primary information source to visitors concerning National Wildlife Refuges and the Alaska Peninsula/Becharof refuges specifically. Many visitors were unaware they were utilizing refuge resources.

In conjunction with the Fish and Game, the creel survey for 1988 was conducted seven days-a-week, as opposed to four days per week in 1987. The purpose of the seven day surveys were to obtain a complete survey of all users of the Narrows throughout the season, providing for greater accuracy in final data analysis. The creel census data is being analyzed by the Sport Fisheries Division of Fish and Game, Dillingham, Alaska (See Section G.11.).



Student Association Volunteer Nancy Corona releases a red salmon after taking measurements. SES

Survey entries were grouped in three general categories: 1) day use fishermen; 2) overnight fisherman; and 3) other. To further aid in data analysis, fishermen were also categorized as to whether they were guided or unguided. Visitors were also examined on the basis of mode of transportation to the Narrows (e.g. aircraft or boat). Since day fishermen contributed the greatest number of parties these are further analyzed as to the actual number of hours that they visited the Narrows. (NOTE: total use hours are not comparable to "fishing hours" recorded on the creel survey. Fishing hours are those hours fishermen were actually engaged in the sport. Use hours are inclusive of arrival time to departure time, without regard to activity pursued.) Overnight visitors and others were examined in terms of "use days". A use of any part of a day constitutes a use day; e.g. if a party arrives on August 8th and departs on August 9th, it was recorded as two use days. Day use fishermen can be compared to overnight use fishermen by examining the "number of user" category since each client or guide utilized the Narrows one day.

Over the period of June 15th through September 21st, a total of 98 days, 89 parties visited the Narrows. Eighty-six of these parties were interviewed. The majority (66) of these parties visited the Narrows on a day use basis for sport fishing (Table 29). An additional 12 fishing parties stayed at least one night at the two privately owned lodges located at the Narrows (Mt. Peulik Lodge and Iliamna Lake Resort). Although the day fishermen and guides accounted for the majority of parties and individual visitors, the fisherman who stayed overnight contributed almost as many fishing use days. Day fishermen accounted for 292 use days while overnight fishermen contributed 278 use days. The remaining parties were at the Narrows for hunting (63 use days), sightseeing/relaxation (82 use days) or business (five use days).

Following recommendations from the 1987 Narrows report, the field camp was extended into September for 1988. A net increase of 21 days over 1987. A comparison of the 1987 versus the 1988 surveys, through the closure of the 1987 camp on August 31st, show 1988 had only 66 parties versus 86 in 1987. However, a similar number of use days, 582 in 1988 versus 565 in 1987, were recorded. During September of 1988, an additional 22 parties were interviewed for an additional 158 use days. Total use between both years is comparable with an average of 7.64 individuals/day in 1987 and 7.65 individuals/day in 1988.

Day use fishermen accounted for 81% of the total parties in 1987 compared to 74% in 1988. Most of the day use parties arrived by aircraft and were accompanied by a guide. These guided day use fishermen provided 271 use days by bringing in 196 clients and 75 guides to the Narrows (Table 29). Guided parties, arriving by aircraft, stayed at the Narrows an average of 5.3 hours with an average of 4.9 individuals/party. The average client/guide ratio for the guided parties was 2.7.

Table 29. Total client and guide use categorized by day use fishermen, overnight use fishermen and other use.

Category/ Method of Arrival	Number Parties	Number Clients	Number Guides	Total Visitors	Days Avg. Stay	Client Use Days	Guide Use Day	Total Use Days
Day Use Fishermen								
Guided/Aircraft	41	146	54	200	1	146	54	200
Guided/Boat	19	50	21	71	1	50	21	71
Total Guided	60	196	75	271	1	196	75	271
Unguided/Aircraft	5	16	--	16	1	16	--	16
Unguided/Boat	1	5	--	5	1	5	--	5
Total Unguided	6	21	--	21	1	21	--	21
Total Day Use	66	217	75	292	1	217	75	292
Overnight Use Fishermen								
Guided/Aircraft	5	33	9	42	2.1	66	24	90
Guided/Boat	--	--	--	--	--	--	--	--
Total Guided	5	33	9	42	2.1	66	24	90

Table 29. Continued.

Category/ Method of Arrival	Number Parties	Number Clients	Number Guides	Total Visitors	Days Avg. Stay	Client Use Days	Guide Use Day	Total Use Days
Unguided/Aircraft ^a	6	24	--	24	11.5	178 ^b	--	178
Unguided/Boat	1	5	--	5	2.0	10	--	10
Total Unguided	7	29	--	29	9.9	188	--	188
TOTAL NIGHT USE	12	62	9	71	--	254	24	278
TOTAL FISHERMEN USE DAYS - OVERALL								570
Other								
fish/other ^b	--	--	--	--	--	94	--	94
other	8	30	--	30	--	82	--	82
TOTAL USE DAYS AT THE NARROWS IN 1988								746

^aMt. Peulik Lodge included in this category.

^bIf an individual visited the Narrows and stated the primary purpose of the visit was fishing, but **did not** fish, then their use was placed in the fish/other category.

Twenty-three parties arrived at the Narrows by boat. Of the 23 boat arrivals, 19 were from either Bear's Den Lodge (located at the Ugashik Outlet) or Lamoureux Lodge (near the southeast side of Upper Ugashik Lake) (Table 31). The two lodges provided 50 clients and 21 guide use days. An overall total of 282 hours of use was recorded for these lodges (Table 30). Generally, clients flying in from other lodges were one time visitors to the Narrows, however boat clients often were repeat visitors. This was primarily due to the close proximity of the two aforementioned lodges to the Narrows. The average length of a boat arrival visit was 3.8 hours while the party size averaged 2.7 individuals. The client/guide ratio of 2.6 was comparable to fly-in arrivals.

Thirteen lodges brought 61 guided parties to the Narrows and one lodge dropped off their clients without a guide (Table 30). These lodges and their respective guides accounted for nearly one-half of the total use days at the Narrows (Figure 16). As in 1987, Bear's Den Lodge contributed the greatest number of guided parties (14) which resulted in 14% of the use hours. Compared with Bear's Den activities in 1987 (21 visits), their total visits in 1988 were significantly lower. This may be due to the highly unfavorable weather which occurred in August 1988, which prevented boat trips across Lower Ugashik Lake. Although Bear Den's Lodge contributed the most visits and the most day use visitors, Enchanted Lake Lodge, in nine visits contributed 51 use days and 25% (336) of the day use hours. No-See-Um Lodge, with eight visits, 38 use days and 17% of the total use hours was also a major user of the Narrows' resources.

Table 30. Use hours of fishing, 1988, Ugashik Narrows.

Category/Lodge	June Hours		July Hours		August Hours		September Hours		Total Client Hours	Total Guide Hours	Overall Total Hours
	Cl't	Gui	Cl't	Gui	Cl't	Gui	Cl't	Gui			
<u>Guided</u>											
Adventure Unlt./											
Fox Bay Lodge	--	--	--	--	--	--	53.7	19.8	53.7	19.8	73.5
Alagnak Lodge	--	--	12.0	4.0	--	--	--	--	12.0	4.0	16.0
Bears Den Lodge	--	--	117.5	35.3	12.0	4.5	32.3	12.3	161.8	52.1	213.9
Crystal Creek Lodge	--	--	12.0	6.0	--	--	--	--	12.0	6.0	18.0
Cusack's Lodge	32.0	16.0	--	--	--	--	32.0	8.0	64.0	24.0	88.0
Enchanted Lk Lodge	--	--	64.3	28.5	78.3	32.7	100.7	31.7	243.3	92.9	336.2
Iliamna Lake Resort	--	--	--	--	51.0	19.3	13.5	9.0	64.5	28.3	92.8
Kulik Lodge	--	--	35.7	8.9	22.3	3.8	--	--	58.0	12.7	70.7
Kvichak Lodge	--	--	--	--	9.0	6.0	--	--	9.0	6.0	15.0
Lamoureux Lodge (air)	--	--	--	--	17.8	10.1	--	--	17.8	10.1	27.9
(boat)	--	--	--	--	39.8	28.3	--	--	39.8	28.3	68.1
No-See-Um Lodge	22.0	5.5	--	--	54.3	5.5	106.0	29.8	182.3	40.8	223.1
Quinnat Hotel	10.5	3.5	71.8	24.5	--	--	--	--	82.3	28.0	110.3
Total Hours Guided	64.5	25.0	313.3	107.2	284.5	110.2	338.2	110.6	1000.5	353.0	1353.5
<u>Unguided</u>											
Blue Mt. Lodge	--	--	12.0	--	--	--	--	--	12.0	--	12.0
Private Interests	--	--	42.8	--	4.0	--	3.5	--	50.3	--	50.3
Total Hours Unguided	--	--	54.8	--	4.0	--	3.5	--	62.3	--	62.3
Total Combined Use Hours	64.5	25.0	368.1	107.2	288.5	110.2	341.7	110.6	1062.8	360.8	1415.8

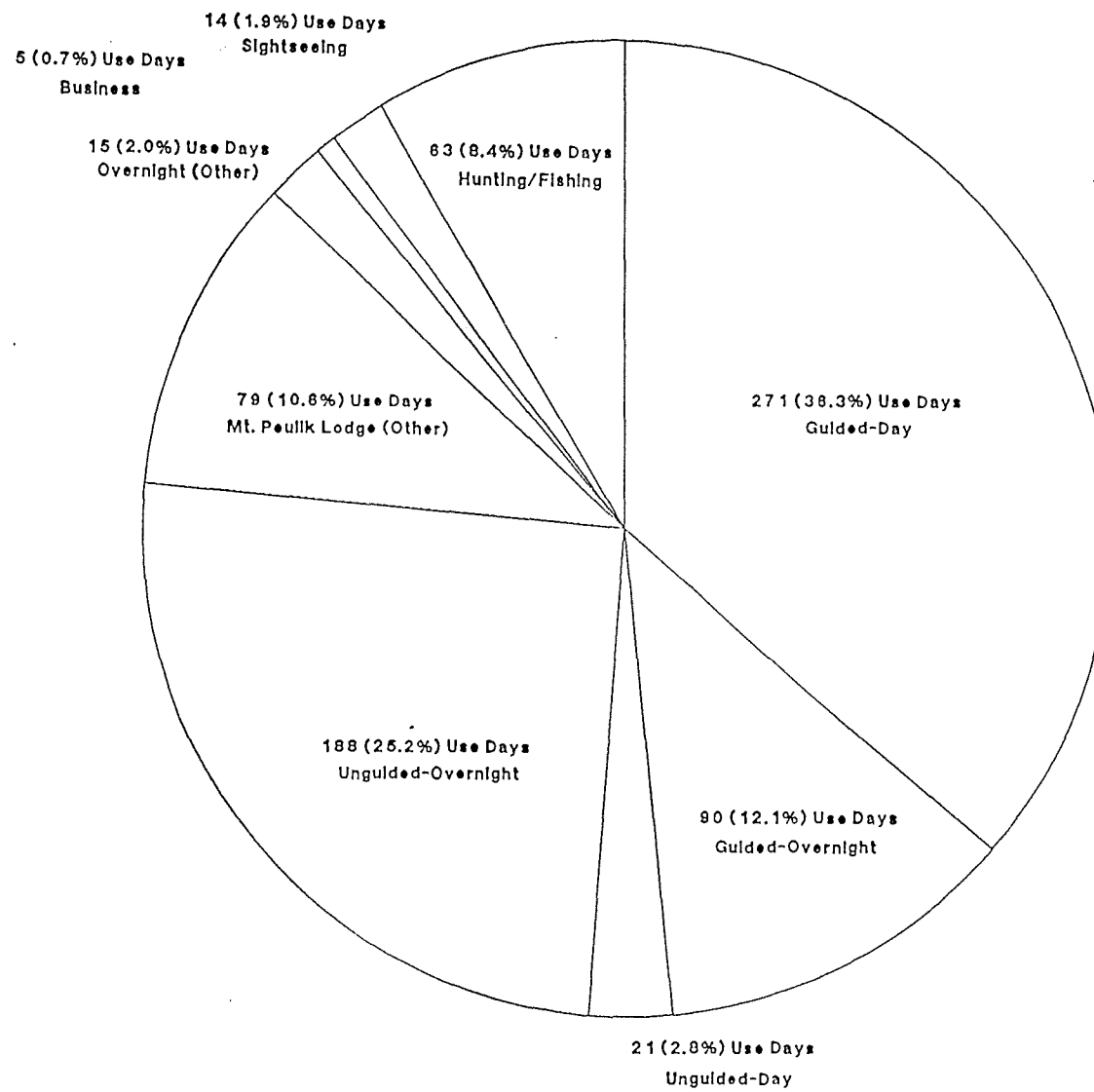
Table 31. Use days for Ugashik Narrows, 1988.

Category/Lodge	June Hours		July Hours		August Hours		September Hours		Total Client	Total Guide	Overall Total	Number of
	Clt	Gui	Clt	Gui	Clt	Gui	Clt	Gui	Use days	Use days	Use days	Parties
<u>Day Use - Guided</u>												
Adventure Unlt./												
Fox Bay Lodge	-	-	-	-	-	-	8	3	8	3	11	2
Alagnak Lodge	-	-	3	1	-	-	-	-	3	1	4	1
Bears Den Lodge (boat)	-	-	27	8	5	2	9	4	41	14	55	14
Crystal Creek Lodge	-	-	4	2	-	-	-	-	4	2	6	1
Cusack's Lodge	8	4	-	-	-	-	4	1	12	5	17	3
Enchanted Lk Lodge	-	-	9	4	12	5	16	5	37	14	51	9
Iliamna Lake Resort	-	-	-	-	11	5	3	2	14	7	21	5
Kulik Lodge	-	-	8	2	6	1	-	-	14	3	17	3
Kvichak Lodge	-	-	-	-	3	2	-	-	3	2	5	1
Lamoureux Lodge (air)	-	-	-	-	4	3	-	-	4	3	7	2
(boat)	-	-	-	-	9	7	-	-	9	7	16	5
No-See-Um Lodge	4	1	-	-	8	2	18	5	30	8	38	8
Quinnat Hotel	3	1	14	5	-	-	-	-	17	6	23	6
Total day use - guided	15	6	65	22	58	27	58	20	196	75	271	60
<u>Day Use - Unguided</u>												
Blue Mt. Lodge	-	-	3	-	-	-	-	-	3	-	3	1
Private Interests	-	-	13	-	2	-	3	-	18	-	18	5
Total day use - unguided	-	-	16	-	2	-	3	-	21	-	21	6
Total Combined - day use	15	6	81	22	60	27	61	20	217	75	292	66

Table 31. Continued.

	June Hours		July Hours		August Hours		September Hours		Total Client	Total Guide	Overall	Number
Category/Lodge	Cl't	Gui	Cl't	Gui	Cl't	Gui	Cl't	Gui	Use days	Use days	Total Use days	of Parties
<u>Overnight use - guided</u>												
Diamond Lodge	-	-	4	1	42	5	-	-	46	6	52	3
Iliamna Lake Resort	-	-	-	-	12	12	8	6	20	18	38	2
Total overnight use - guided	-	-	4	1	54	17	8	6	66	24	90	5
<u>Overnight use - unguided</u>												
Mt. Peulik Lodge	-	-	78	-	66	-	3	-	147	-	147	4
Private Interests	-	-	9	-	32	-	-	-	41	-	41	3
Total overnight use - unguided	-	-	87	-	98	-	3	-	188	-	188	7
Total combined overnight use	-	-	91	1	152	17	11	6	254	24	278	12
<u>Other Use</u>												
Mt. Peulik Lodge (other)-	-	-	38	-	41	-	-	-	79	-	79	-
Overnight (other)	-	-	9	-	6	-	-	-	15	-	15	-
Business	-	-	5	-	-	-	-	-	5	-	5	2
Sightseeing	-	-	14	-	-	-	-	-	14	-	14	3
Hunting/Fishing	-	-	-	-	-	-	63	-	63	-	63	3
Total other	-	-	66	-	47	-	63	-	176	-	176	8
Total combined - all uses	15	6	238	23	259	44	135	26	647	99	746	86

Figure 16. Total use days, Ugashik Narrows, 1988.



Overnight use, by fishermen, contributed to 37% of the 1988 use days. As in 1987, the majority (68%) of overnight use was by unguided fishermen. Two lodges, Diamond and Iliamna Lake Resort, provided guided overnight trips to the Narrows and combined accounted for 90 use days. Mt. Peulik Lodge, located at the Narrows, provides clients with meals and lodging, but does not provide fishing guides. Thus Mt. Peulik Lodge provided 78% of the unguided fishing use days (Table 30). Only three parties, independent of any lodge, visited the Narrows during 1988. Combined they contributed 41 overnight fishing use days. Overall, 57 individuals remained overnight at the Narrows; over 75% of these visitors were either European or Japanese.

In addition to the overnight fishing use by Mt. Peulik Lodge, their clients contributed 79 use days to the 176 days of "other" use and 12 of the 63 hunting/fishing use days (Table 30). Fifty-one use days were contributed by a hunting party that camped 1.5 miles west of the Narrows in mid-September. Members of this party, on occasion, utilized the Narrows for fishing. Two separate parties visited the Narrows by boat from the village of Ugashik and Pilot Point for sightseeing. Two parties arrived by aircraft to conduct business at the property owned by Iliamna Lake Resort adjacent to the Narrows.



Public use at the "Narrows" was not always fishing. SES

Several other visitors either briefly stopped at the Narrows on the way to other areas of the Alaska Peninsula or were on official travel in relation to resource management. These parties included hunters passing through the Narrows on the way to more productive games areas, a Bureau of Indian Affairs archeology investigations team, Fish and Wildlife Service administrators and Special Agents and Alaska Department of Fish and Game personnel conducting the Arctic grayling survey.

To examine seasonal use of the Narrows, use days were divided into 14 one week periods. Utilizing this method, peak use occurred during the week ending on August 31st (Figure 17). The use in this time period paralleled the silver salmon and arctic char runs. Overnight unguided use contributed a relatively constant number of use days over a seven week mid-season period. The peak use period is heavily weighted by guided day and guided overnight use.

Day use appears to be heavily influenced by both the peninsula weather and the overall availability of fish. During July and late August, wind was either calm or light and flight visibility good. In contrast, the last survey week in September, weather made access by aircraft or boat marginal. Fishing pressure, from Mt. Peulik Lodge, also appears to be weather dependent. Often, during period of good boating weather, clients from Mt. Peulik would leave the Narrows to fish other areas, but with inclement weather, clients would remain at the Narrows to fish. The availability of targeted fish species has a definite impact on use days. In June and early July the targeted fish species was generally Arctic grayling, while in July and August, overnight users seemed more catholic in their fishing goals. In late August and through September large Arctic char migrate to the Narrows to feed on salmon spawn and begin their own spawning.

A substantial number of comments were received from some lodge pilot/guides that they made a "fly-over" of the Narrows, but did not attempt to land because of the amount of activity occurring. Many lodges appear to attempt to offer their clients a quality "wilderness experience". With the activity of Fish and Game in conducting the Arctic grayling survey, the presence of the refuges public use camp and, on occasion, several aircraft, the pilot/guides left the Narrows to seek greater solitude.

Each lodge had its particular approach to fishing the Narrows and sometimes had to modify their approach due to the presence of other fishing parties. Fly-in lodges most often utilized the west bank of the Narrows, mooring the aircraft on a gravel spit at the north end of the Narrows or at the beach adjacent to the refuge camp. Mt. Peulik clients generally utilized the east bank of the Narrows. Later in the season, when the Arctic char began their run, several lodges utilized the large island for both fishing and mooring of their aircraft. This enabled the clients more direct access to the Arctic char concentrating in the backwashes around the island.

Illegal fishing activities were observed at the Narrows. Two violations which occur with regularity include intentional snagging, especially of sockeye salmon, and exceeding personal bag limits. To help curtail these activities, an Alaska Fish and Wildlife Protection Officer was detailed to the Narrows to observe. The officers' visit netted one citation and loss of fishing gear to one of Mt. Peulik Lodge's clients.

Parties were made up of people from wide geographic locations. Twenty-eight states and seven countries were represented, with California contributing the most individual visitors (50). Alaska residents were second in visitation with 26 fishermen and 19 individuals engaged in other recreation orientated sports. Visitors came from Germany, Italy, Austria, Switzerland, Great Britain, South Africa and Japan.

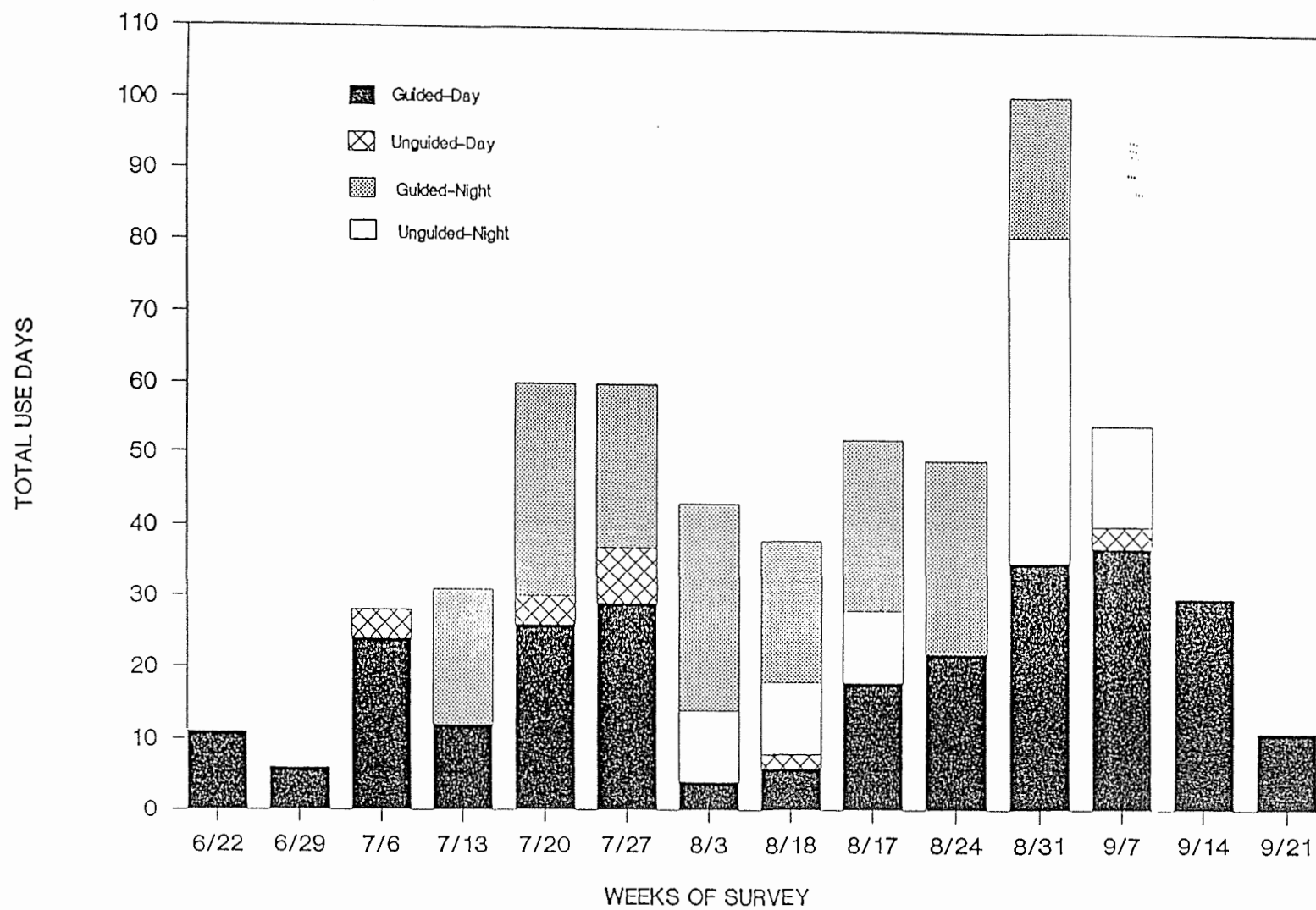


Figure 17. Use days by category and survey week, Ugashik Narrows, 1988.

10. Trapping

Historically, the trapping of fur bearing mammals was a full-time winter endeavor on the Alaska Peninsula. Today, trapping still takes place but is highly variable due to the price fluctuation of raw hides. Fox, mink, ermine and beaver are commonly trapped. To a lesser extent, coyote, wolf, wolverine, lynx and otter are caught. Fish and Game requires, as a method of monitoring take, a sealing tag be placed on wolverine, wolf, lynx, otter and beaver. Data from the sealing records is in Table 32. No records are available on fox, mink, ermine or coyote.

Table 32. Fur bearer harvest in Game Management Units 9C and 9E (Fish and Game data).

Year (winter)	Number Harvested				
	Beaver	Otter	Lynx	Wolverine	Wolf
1984-85	--- ^a	24	4	14	14
1985-86	166	25	23	20	10
1986-87	240 ^b	112 ^b	27	22	10
1987-88	254 ^b	152 ^b	3	30	14

^aNo data available.

^bIndicative of increasing prices for short-hair furs.

15. Off-Road Vehicling

The Lands Act modified the way we manage off-road vehicles in Alaska. When a person is in pursuit of traditional activities on refuge lands (including wilderness) they may use snowmachines, motorboats, airplanes and non-motorized surface transportation. When rural residents are involved in the pursuit of subsistence activities they may use snowmobiles, motorboats, off-road vehicles and other means of surface transportation traditionally employed.

The Alaska Peninsula's ever-changing weather prevents a long term snow cover in winter. Thus snow machines cannot be relied upon for surface transportation. As a result, the three-wheeled all-terrain-vehicle and more recently, the four-wheeled all-terrain vehicle, have become the mainstay method of transportation for peninsula residents.

Some commercial big game guides used tracked all-terrain vehicles before the passage of the Lands Act. Refuge policy is to limit this use to trails between camps or for access to inholdings (43 Code of Federal Regulations (CFR) Part 36.10 and 36.11). Four Special Use Permits are issued to guides for use of tracked all-terrain vehicles (See Section D.4.).

17. Law Enforcement

Law enforcement activities, curtailed by the reassignment of the refuges' supercub, continued with significant efforts directed toward cooperation

efforts with State law enforcement personnel. This was evidenced by the refuge providing aircraft for the checking of bear hides and skulls during the spring hunt, the placement of an undercover state officer at Ugashik Narrows (Section H. 9.) and the coordination with State officers in King Salmon.

An incident at the Island Arm area of Becharof Lake in September brought a response from the Alaska State Troopers. It seems three members of a hunting party were utilizing a cabin on a refuge inholding as their base camp when three other individuals (local resident arriving by boat) claimed the cabin and, at gun point, removed all the hunters gear and the hunters from the premises. One hunter was assaulted, while another had about \$100 removed from his wallet at gun point. All the hunters involved were interviewed, but due to the lack of backup and the questionable mental nature of the individuals in the cabin, the information was forwarded to the State Troopers for follow-up action.

During the moose hunting season, 17 hunters were field checked; no citations were issued. One hunting camp had lots of discarded trash and a generally messy camp. The parties involved were warned and a check the following day showed the warning to clean-up was heeded.

In August, Assistant Refuge Manager/Pilot Arment attended the Federal Firearms Instructor Training Course sponsored by the Federal Bureau of Investigation. In September he put his newly acquired training to good use by qualifying Deputy Refuge Manager Savery and Assistant Refuge Manager/Pilot Payne of our staff and Refuge Manager Fisher and Wildlife Biologist/Pilot Hotchkiss of Togiak Refuge.

The annual law enforcement refresher course was held in Anchorage in late February. This year's refresher was once again excellent in that it involved refuge officers in actual law enforcement. This year's bust centered on confiscating several aircraft and vehicles owned by a well-known big game outfitter and used for alleged illegal hunting activities. He had been operating as a permittee within Alaska Peninsula/Becharof refuges. He subsequently pled guilty to several offenses and was denied a Special Use Permit for 1988.

The refuges were awarded top honors in the annual law enforcement refresher by having the best region-wide qualification score and by Assistant Refuge Manager/Pilot Arment leading the field in accurate shooting. The refuge proudly displays the trophy (and we intend to win it again in 1989!).

In November a citation was issued to Ludwig Brod, owner of Mt. Peulik Lodge, for dumping garbage and trash in an open pit near the lodge. The trash pit was found by Refuge Manager Hood and Realty Specialist Bob Rice while they were conducting a property value appraisal. Brod was instructed to clean up the trash and haul it away from the area.

20. Cabins

It is the policy of the Service to allow the continued customary and traditional uses of existing cabins (constructed prior to December 2, 1980), provided that the uses are consistent with existing laws and

regulations and compatible with the purposes for which the refuge was established (Lands Act 304(d), 1303 (b), 1315 and 1316).

It is the policy of the Service to limit new cabins to those essential for the continuation of an "ongoing activity" or use allowed within the refuge (Lands Act 304 (d), 1303 (b)).

On December 1st, the Revised Draft Cabin Management Policy on National Wildlife Refuges in Alaska was made available for public review and comments. The final policy will be issued in 1989.

The Becharof Refuge currently has six cabin sites with usable structures. Current status of these cabins is: four have been permitted; one is being handled by Bureau of and Management; and one is designated for administrative purposes. The Becharof Refuge has seven private inholdings with associated cabins.

Two cabins changed status during 1988. An administrative cabin within the Becharof Wilderness burned to the ground. Origin of the fire is unknown. We do not plan to replace the cabin. The second change in cabin status occurred when a cabin located adjacent Featherly Creek was converted to a private inholding after the Bureau of Land Management approved a selection made by a South Naknek resident.



The refuge administrative cabin in the Kejulik River Valley burned in 1988.

REH

The Ugashik Unit of the Alaska Peninsula Refuge currently has 16 cabin sites with usable structures. Current status of these cabins is: 11 have been permitted; two applications are pending; two are designated for administrative purposes; and one application has been denied. The Ugashik Unit has nine inholdings with associated cabins.

The Chignik Unit currently has 13 cabin sites with usable structures. Current status of these cabins is : nine have been permitted; three applications are pending; and one is designated for administrative purposes. The Chignik unit has three inholdings with associated cabins.

Assistant Refuge Manager/Pilot Arment and Deputy Refuge Manager Savery completed most of the annual cabin inspection program April 25th to 28th. Refuge Manager Hood was also involved in the completion of the project on June 29th. A Bell-206 Jet Ranger was used for access.

Project objectives included inventorying eight cabins and approximately 100 miles of off-road vehicle trails that have been claimed by four commercial big game guides -- Don and Howard Flynn, John McLay and John Swiss. The crew was based at Port Heiden while inspecting cabins in the Chignik and Ugashik units of Alaska Peninsula Refuge. Depending upon site specific needs, various items were addressed including: (1) photo documentation; (2) measuring dimensions of cabins and outbuildings; (3) determining whether the site is on Native and/or State selected lands; (4) determining Special Use Condition compliance; (5) determining appropriate action(s) to take in regards to the "Take Pride in America/Alaska" program (6) determining off-road vehicle trail status; (7) posting inspection notices; and (8) assessing landing site suitability, etc.

Listed below is specific data for each cabin inspected April 25th to 28th.

Scotty's Island - This cabin is permitted to Jay King. There appears to be a new addition to the back of the cabin. It may be two or three years old and measures 12' by 20'.

There is also a pile of trash including five gallon cans behind the cabin. In general it looks trashy all around the cabin. An air boat was parked at the far east end of the runway.



Scotty's Island guide cabin site was owned by the late Eddie King, former owner and founder of Kings Flying Service. "Fast Eddie" as he was called passed away on 3/22/88 EJS



The Scotty's Island site is still used by the King family. Fortunately the all-terrain vehicle has not been used. These vehicles are known to cause irreversible damage to the fragile arctic tundra. EJS



Garbage dump adjacent the King cabin site. We are writing guides in an effort to have them clean up and "Take Pride" in their cabin sites. EJS

Keith Johnson - This cabin is located in the West Fork Creek valley area. In 1987 and 1988 we could not inspect the area due to heavy accumulation of snow and low visibility. This year there was evidence of a very large avalanche against the north wall of the mountains. The cabin should be rescheduled for 1989 inspection.

John Swiss/Ferguson (Cub Lake) - This cabin site is located on Cub Lake. It consists of two aluminum sided cabins and a small shed. There was trash scattered behind the cabins and in a pile near the lake. This pile consisted of five gallon gas cans. There is also a large tracked vehicle in the yard that appears to be in working condition.

In the same area were inspected a small aluminum sided shed on Unnamed Lake. There is a lot of trash inside the shed and six barrels on the outside.



Cub Lake Cabin site claimed by big game guide John Swiss.
EJS



Mr. Swiss is one of three commercial guides claiming use of off-road vehicle trails within the Alaska Peninsula Refuge. However, upon investigating it was noted that his all-terrain vehicle at Cub Lake appeared not to have been utilized for several years.
EJS



Mr. Swiss' Cub Lake site represents one of the messier
garbage problems.

EJS



The garbage at Cub Lake site affect both land and water
resources.

EJS

Butch Hautenan - This cabin is located four miles northwest of Mother Goose Lake. There was almost no trash around the cabin. The cabin door was open and one window broken out.

Private Weather Port - The site was found approximately six miles south of Lower Ugashik Lake. The individuals at this site were checked during moose season 1987. They said they would clean the area when they left. When we inspected the site one large burned area was found with trash in it. Some parts of the weather port were left at the site. This is a trashy area and needs to be cleaned up. This site needs to be checked this fall during hunting season to warn these people about the mess.

Brent Jones' site on Upper Dog Salmon River (formerly owned by Oldhams) - No cleaning of garbage has occurred here at all. The garbage pile behind the house is gradually disappearing by rotting into the ground. The large (six foot high) pile of five gallon gas cans is still there.

A four foot by four foot storage area attached to the cabin has two sides blown off.

Brent Jones' cabin on Big Creek (formerly Oldhams) - This is a very small cabin. A small amount of trash is behind cabin. There is a small landing strip on top of the knoll by the cabin.

Andy Runyan - This cabin, located on Wolf Lake, is very neat and clean inside and out. He has a bath tub and portable toilet in the back of the house. One of the neatest cabins we have seen on the refuges.

In summary, four of the cabin sites had trash/garbage problems. They included the site on Scotty's Island permitted to Jay King, Cub Lake permitted to John Swiss, Unnamed Lake site (permit denied) and Big Creek (Wide Bay area) permitted to Brent Jones.

Off-road vehicle trails used by permittees, Don and Howard Flynn, John McLay, and John Swiss, were inventoried. All trails were examined except those of John Swiss in the Black Lake area which led off into many directions -- too numerous to discern. An all-terrain vehicle appearing to be in operable condition was documented at the Cub Lake cabin site. However, it and the local trails showed no recent usage.

Upon closer inspection of John McLay's State guide area No. 9-51, one game observation tower was documented in Township 32 South, Range 46 West, Section 20.

Two archeological house pits complete with timbers were documented during the cabin inspection project. One was in Township 32 South, Range 46 West, Section 8, while the other was in Township 33 South, Range 48 West, Section 12.

The three cabin sites inspected on June 29th are located in the Becharof Wilderness area. Two of the sites appeared to be in good condition, however the cabin at the third site in Alinchak Bay had been turned upside down by high winds.

The inspection project was followed by a letter to the permittee of each inspected cabin site. The letter advised the cabin users of our findings, possible recommendations and expectations in relation to compliance with Special Use Permit Conditions.

Between the 13 cabin sites inspected in 1986, the 11 cabin sites inspected in 1987 and the 11 cabin sites inspected as part of this year's program, a total of 35 sites have been checked. These 35 cabins include approximately 55 cabins and associated structures, most of which are used in conjunction with about 30 commercial guiding operators.



Assistant Refuge Manager/Pilot Randy Arment posting the Mother Goose Association cabin on October 4th. REH



The cabin now belongs to the Service.

REH

21. Guides and Outfitters

Between Alaska Peninsula and Becharof refuges, a total of 61 Special Use Permits were issued for commercial guiding, outfitting and transporting activities (Table 33). The number of permits issued have increased over the past few years due primarily to two reasons: 1) an increase in the number of outfitters wanting to use the refuges; and 2) an increased awareness of the refuges and permit requirements by outfitters who have been working the area in past years without our knowledge. As more people are made aware of the refuge, more of the outfitters are coming under permit. By the end of 1988, an estimated 95% of the outfitters using the refuges were under permit.

Table 33. Special Use Permits issued for Guides/ Outfitters 1982-1987.

Year	Number
1982	33
1983	30
1984	35
1985	40
1986	42
1987	53
1988	61

A total of 47 commercial guiding/outfitting permittees recorded approximately 5287 total client use days within the refuges this year (Table 34). Fishing clients represented approximately 54% of the total clients. However big game hunters represented approximately 62% of the total client use days.

Table 34. Permittee, and total associated client use within the refuges 1987.

Permittee	Big Game Hunting		Fishing		Total	
	Client		Client		Client	
	Clients	Days	Clients	Days	Clients	Days
Aldridge	12	84	6	24	18	108
Bath	19	95	16	32	35	127
Blue	12	72	12	24	24	96
Branham			6	18	6	18
Brod			31	230	31	230
Cann	4	13			4	13
Cerami	4	13			4	13
Condict			1	7	1	7
Cusack B.	2	10			2	10
Cusack M.			75	150	75	150
Dykema	20	86			20	86
Flynn, D.	10	106	6	12	16	118
Flynn, H.	10	57	6	10	16	67
Frazier	12	33	uk	uk	(12)	(33)
Gaudet	4	28	2	14	6	42
Gillis	6	16			6	16
Grasser	13	84	67	469	80	553
Hancock	4	52			4	52
Hartley	61	315	33	150	94	465
Hautanen	10	71	uk	uk	(10)	(71)
Hays			22	66	22	66
Huber	12	50	9	50	21	100
Johnson	24	210			24	210
King	11	63	8	42	19	105
Klutch	31	250	12	40	43	290
Lamoureux	18	138	12	56	30	194
Langvardt	15	150	2	20	17	170
Lazer	11	110	11	30	22	140
Loesche			25	25	25	25

Table 34. Continued.

Permittee	Big Game		Fishing		Total		
	Hunting						
	Client	Client	Client	Client			
Clients	Days	Clients	Days	Clients	Days		
Martin			70	210	70	210	
Matthews			42	42	42	42	
McLay	9	52			9	52	
McNutt	5	38			5	38	
Meredith	7	52			7	52	
Munsey	10	120	3		9	13	129
Myers, J.	4	28			4	28	
Myers, R.	4	23			4	23	
Oldham	23	99	5	10	28	109	
Pederson, A.	1	7			1	7	
Pederson, H.	6	34	2	2	8	36	
Runyan	4	39			4	39	
Sarp	15	77	77	120	92	197	
Shoemaker	21	168			21	168	
Sjoden			12	54	12	54	
Swiss	12	90			12	90	
Thompson	15	75	10	25	25	100	
Vrem	43	296	14	42	57	338	
Totals	47	504	3304	597	1983	1101	5287

() = Minimum Figure

A total of 38 big game guiding/outfitting permittees were responsible for harvesting a minimum of 77 brown bears, 58 moose and 278 caribou this year (Table 35). Sows represented approximately 29 percent of the bear harvest, while cows represented approximately 3 and 5% of the moose and caribou harvest respectively.

On October 21st, the Alaska State Supreme Court ruled that the exclusive guide area system as it has existed in Alaska is unconstitutional (Owsichuk vs. State of Alaska, Guide Licensing and Control Board). However in December the Service received word that the State Supreme Court has granted a stay until June 1, 1989 on the portion of Opinion 3389 which declares that the exclusive guide areas are without legal force. To this end the Service intends to work with the State of Alaska, other Federal agencies, Alaska Professional Hunters Association and interested organizations and individuals to assist in developing a new system under the State of Alaska's authority and in compliance with State and Federal laws, regulations and policies. It is highly desirable that a new system be developed early in 1989 so as to be in place in time for the 1989 hunting season. However, there is no assurance at this time that a new system can be developed in such a short time span. Accordingly, the Service developed an interim program for managing commercial big game hunting within the refuge. It is expected that this interim program will be implemented in January 1989.

Table 35. Permittees, client use and big game harvested within the refuges - 1987.

Permittee	Bear					Moose					Caribou					Harvest Unit(s)
	Client		Harvest			Client		Harvest			Client		Harvest			
	Clients	Days	M	F	T	Clients	Days	M	F	T	Clients	Days	M	F	T	
Aldridge						2	4	2	2		10	80	9	9	Ugashik	
Bath						3	15	2	2		16	80	13	13	Becharof	
Blue						2	12	1	1		10	60	13	13	Becharof	
Cann	2	8	2		2						2	5	2	2	Becharof	
Cerami	3	10									1	3			Becharof	
Cusack, B.											2	10	2	2	Becharof	
Dykema											20	86	19	19	Becharof	
Flynn, D.	3	36	3		3	3	30	2	2		4	40	3	3	Ugashik	
Flynn, H.	3	15	3		3	3	10	2	2		4	32	2	2	Ugashik	
Frazier	5	23	2	1	3						7	10	5	5	Chignik	
Gaudet											4	28	4	4	Becharof	
Gillis	3	7	1	2	3	3	9	3	3						Chignik	
Grasser	4	31	U	U	3						9	53	U	U	9	Ugashik
Hancock	2	26	1		1						2	26	2	2	Ugashik	
Hartley	11	65	U	U	4	10	50	3	3		40	200	25	15	40	Bech/Ugas
Hautanen	1	5	1		1	2	15	1	1		7	51	7	7	Ugashik	
Huber						4	4				8	46	4	4	Becharof	
Johnson	12	120	4	7	11	6	60	6	6		6	30	6	6	Chignik	
King	3	21	U	U	3						8	42	8	8	Chignik	
Klutch	6	60	1	2	3	5	50	5	5		20	140	20	20	Bech/Chig	
Lamoureux	2	30	2		2	6	48	6	6		10	60	10	10	Ugashik	
Langvardt	3	30	1		1	4	40	4	4		8	80	8	8	Ugashik	
Lazer											11	110	11	11	Bech/Ugas	
McLay	3	17	3		3	2	12	2	2		4	23	4	4	Ugashik	

Table 35. Continued.

Permittee	Bear					Moose					Caribou					Harvest Unit(s)	
	Clients	Client	Harvest			Clients	Client	Harvest			Clients	Client	Harvest				
		Days	M	F	T		Days	M	F	T		Days	M	F	T		
McNutt	4	32		4	4							1	6		1	1	Ugashik
Meredith	4	40	3	1	4							3	12				Becharof
Munsey	4	48	2	1	3			6		72		6	6				Becharof
Myers, J.	2	14	2		2							2	14	2		2	Becharof
Myers, R.	1	3	1		1	1	10	1		1		2	10	2		2	Becharof
Oldham	2	10	1		1	8	43	7		7		13	46	12		12	Ugashik
Pederson, A.	1	7	1		1												Chignik
Pederson, H.	4	17										2	17	2		2	Ugashik
Runyan	1	10										3	29	2		2	Ugashik
Sarp												15	77	8		8	Bech/Ugas
Shoemaker	7	70	6	1	7	7	49		4	4		7	49	12		12	Becharof
Swiss	3	30	2	1	3	2	18		2	2		7	42	7		7	Chignik
Thompson												15	75	15		15	Becharof
Vrem	9	101	3	2	5	5	50	5		5		29	145	12		12	Bech/Ugas
Totals 38	108	886	45	22	77	78	529	56	2	58		318	1889	254	15	278	
					10 U											9 U	

M = Male
 F = Female
 T = Total
 U = Unknown

A total of 31 fish guide/outfitting permittees were responsible for the harvest of approximately 862 fish (Table 36). Approximately 55% salmon, 30% Arctic char, 12% Arctic grayling and 3% rainbow trout made up the total reported harvest.

Table 36. Permittees, client use and fish harvested within refuges - 1987.

Permittee	Clients	Client		Fish				Total	Harvest Unit(s)
		Days	Salmon	Char	Grayling	Trout			
Aldridge	6	24		30				30	Ugashik
Bath	16	32			30			30	Becharof
Blue	12	24	5	4	10			19	Becharof
Branham	6	18		3	2			5	Becharof
Brod	31	230	58	19	12			89	Ugashik
Condict	1	7		1				1	Ugashik
Cusack M.	75	150	60	20	2			82	Bech/Ugas
Flynn, D.	6	12	12	30				42	Ugashik
Flynn, H.	6	10	6	20				26	Ugashik
Frazier	uk	uk	10					10	Chignik
Gaudet	2	14		10	2	1		13	Becharof
Grasser	67	469	50					50	Ugashik
Hartley	33	150	60	10				70	Bech/Chig
Hautanen	uk	uk	15	20				35	Ugashik
Hays	22	66	12					12	Bech/Ugas
									Chignik
Huber	9	50							Becharof
King	8	42	24					24	Chignik
Klutch	12	40	20	10				30	Bech/Chig
Lamoureux	12	56							Ugashik
Langvardt	2	20	5	10				15	Ugashik
Lazer	11	30	20	15	9			44	Bech/Ugas
Loesche	25	25		7				7	Bech/Ugas
Martin	70	210	75	10				85	Ugashik
Matthews	42	42		8	1			9	Bech/Ugas
Munsey	3	9	2		4		6	12	Becharof
Oldham	5	10	1	13				14	Ugashik
Pederson, H.	2	2	2					2	Ugashik
Sarp	77	120							Bech/Ugas
Sjoden	12	54	20	10				30	Ugashik
Thompson	10	25	10	5	25	15		55	Becharof
Vrem	14	42	10	7	4			21	Bech/Ugas
Totals	31	597	1983	477	262	101	22	862	

A total of 17 permittees were responsible for the harvest of approximately 551 game birds (Table 37). Eight ptarmigan were reported for every duck harvested.

Table 37. Permittees, and game birds
harvested within the refuges - 1987

Permittee	Ptarmigan	Ducks	Harvest Unit(s)
Blue	15	4	Becharof
Cusack, M.	20	4	Bech/Ugas
Frazier	6		Chignik
Hartley	15	20	Bech/Chig
Hautanen		32	Ugashik
Hüber	12		Becharof
Klutch	50		Bech/Chig
Lazer	40		Bech/Ugas
Meredith	7		Becharof
Munsey	5		Becharof
Myers, R.	6		Becharof
Oldham		2	Ugashik
Runyan	8		Ugashik
Shoemaker	30		Becharof
Swiss	75		Chignik
Thompson	50		Becharof
Vrem	150		Bech/Ugas
Totals 17	489	62	

22. Take Pride in America and Alaska

The Take Pride in America and Alaska Program was highly visible on both refuges in 1988. Throughout the year, refuge personnel met with the King Salmon Air Force Station, Wildlife Ethics Committee personnel to establish a resource program that is orientate toward the Take Pride efforts. Committee members (approximately 50 members) provided opportunities for the refuge to present programs on the resources of the refuges.

The Take Pride effort began with the Commander of the King Salmon Air Force Station offering personnel to participate in local clean-up efforts. The clean-up of the Naknek River launched a major effort. The Air Force provided over fifty personnel and heavy equipment to remove tons of discarded trash and 55-gallon fuel drums from the banks of the Naknek River in late April and early May. That was followed in June by two Air Force personnel spending a week at the Ugashik Narrows public use camp. Their primary mission was to help establish the camp, but they volunteered to help gather trash for later removal. Later in the month, three Air Force volunteers spent three days at old cabin sites around Becharof Lake picking up trash and metal cans. This effort was followed with Air Force personnel in July, August and September. During the summer the Air Force provided numerous volunteers to gather and transport much trash from both the Ugashik Narrows and Becharof Lake. Some of the old cabin sites cleaned up had been trashed out since before the time the refuges were established.



Volunteers Mike Gardner and Gary Sonnevil load 55-gallon barrels onto the refuge boat during a clean-up of the Naknek River sponsored by the Bristol Bay Lions Club. REH

I. EQUIPMENT AND FACILITIES

1. New Construction

Titan Construction Company, Anchorage continued work on the new fuels storage building and gas dispensing pump. This construction was begun in fall 1987. All work was completed and passed final inspection on October 12, 1988.



New fuels shed and gas dispensing unit.

REH

Work continued on the new information kiosk located at the airport. Six display panels were constructed with cedar and hung on the interior of the structure. This is a joint use facility developed by the Fish and Wildlife Service, National Park Service and Alaska Department of Fish and Game.

In May the three agencies were notified that the Kiosk would have to be moved due to airport expansion. After the kiosk was moved to Park Service property the airport expansion was cancelled.

On June 21st, engineering initiated a \$10,000 contract to do dirt work around the four new residences to correct drainage problems caused by both engineering design and failure of the contractor to complete the project. A reduction in the contract to \$2,000 was required due to Davis-Bacon wage rate problems. This limited the amount of dirt work that could be accomplished. Only work at Quarters #26 was completed. Problems at the other residences were to be corrected at a later date. In September a contract for additional dirt and fence work at the four new residences was awarded to D. R. Lax Construction, Naknek, Alaska for \$40,438. Construction has been scheduled for summer 1989.

In July, a shrubbery landscaping plan was developed for the four new residences. The plants were ordered and planted in early August.

2. Rehabilitation

The "made for Florida" refuge dock was rehabed once again. All of the six-inch anchor pipes were cut off, shortened and rewelded. The angle iron frame was also straightened in several areas. Each year the process of removing this structure from the Naknek River and then putting it back in after break-up takes its toll.

Engineering and refuge staff spent three days digging up the culvert and water line to Quarters #8 and replacing it with new copper tubing and insulation. This water line was not replaced by the contractor who installed the new refuge water system in 1987. The line was frozen all winter since it had not been insulated properly.

In July, a "request for quotes" was issued for rehab work on Quarters #8. Rand Construction Company, Anchorage, Alaska was awarded the contract for the bid of \$15,650. The work included installing ceiling vapor barrier, ceiling wall board and new attic vents. The project was completed in November; however, it was not accepted by Contracting.

The finished joints in the wall board were noticeable due to a poor taping job. Since this residence is scheduled to be replaced, it was decided to pay the contractor for materials and transportation but penalize him for the cost of his labor. The contractor said it would take 8 - 9 days to strip the wall board and redo the job. The added inconvenience to the occupants was not worth the gain in ceiling appearance.

The old fuel oil tank for the bunkhouse was removed by Maintenance Worker Terry in October and a new 1000 gallon tank buried in the ground. The new tank met all SP-3 system specifications and should have a 25-years life expectancy.

As part of the contract to construct a new fuels storage building, the exterior of the shop was redone. The exterior aluminum siding and roofing were completely stripped off and new baked on enamel siding and roofing installed. New double pane windows and personnel doors were also installed.



New siding and thermopane windows for shop.

REH

This same contract also contained provisions to replace the large overhead garage door at the warehouse. When the new door arrived, it proved to be four inches too short. Since it was a special order door and not the contractors error, he was given authority to box in the door opening to fit the door.

3. Major Maintenance

George Ziotts, Regional Engineering Office, inspected all refuge structures (dock, sewage system, fence and fuel facilities) for Phase II of the Maintenance System implementation. All deficiencies were noted and will be tabulated for inclusion in the system.

In November, three new Monitor 21 oil stoves were ordered and installed in Quarters 9, 10, and 11. These new units are smaller in size but have more heat output and are much more fuel efficient than the old stoves. The old units were completely worn out and did not circulate heat very well.

A purchase order was issued in November to Turnagain Paint and Construction Company, Anchorage, Alaska for \$22,900 to repaint the four new residences. The contractor completed the project in three days. He worked fast and the quality of his work reflected his hurried pace. The job was rejected by Contracting. The contractor returned in two weeks to redo part of the work. Contracting accepted the work on November 30th.



Quarters No. 27 after the painting project was complete.

REH

The hydrocarbon pollution saga for our water system continued in 1988. Following the Alaska Department of Environmental Coordination regulations for a "Class B" water system, a purgeable aromatic test was completed in December 1987; no hydrocarbons were found!

A casual conversation with the Regional Contaminants Coordinator in April resulted in a campaign on his part to conduct a more reliable test. In October the refuge was notified that arrangements had been made to test the standing water column in our water system well. The local well drilling company, Johnson Drilling, conducted the sampling on November 5th. On November 18th, we were notified that our water system samples had tested positive for hydrocarbons (0.08 mg/l, 0.07 mg/l, and 0.09 mg/l). We were ordered to stop drinking the water.

The November 5th water samples were taken with a teflon sample bottle from the surface of the water in the well. Clearly these samples represent a worst case condition for the drinking water -- everyone knows that oil floats. And any hydrocarbon pollution from whatever source is likely to remain in place for years.

On December 13th we finally receive instructions for a second round of testing. The samples were taken on the 14th. The refuge headquarters system, three residence wells and a Fishery Assistance rental unit well were sampled. At month's end, we received word that the purgeable aromatics test (detection limit of one-part-per-billion) had found no hydrocarbons in any of the samples -- the water is safe to drink!

4. Equipment Utilization and Replacement

A new 1988 Chevorlet Astro mini-van was received on station August 5th. The old 1979 Chevorlet suburban was transferred to the King Salmon Fishery Assistance Office.



Our 1988 Chevorlet Astro mini-van.

REH

The station also received a model 843 Bobcat on the same barge that brought the Chevy van. Accessories received with the machine included a loader bucket, backhoe, tracks, post hole digger, and fork lift. This will be a welcomed addition to the refuges equipment inventory.

5. Communications Systems

The Alaska Peninsula/Becharof refuges historically used a high frequency (HF) radio system. This system proved to be extremely unreliable. Field camps have gone for days without being able to contact refuge headquarters. In 1987, funds were provided to replace it with a very high frequency (VHF)/ ultra high frequency (UHF) system. During the spring, system components trickled into the office a few at a time.



The radio repeater shelters were assembled at King Salmon.

REH

A contract was awarded to Revl Communication to install new radio systems at several refuges. On June 20th to 23rd, the contractor installed our base station and a repeater on Whale Mountain near Becharof Lake. Logistics and weather prevented the installation of the second repeater on Salmon Mountain near Mother Goose Lake. The contractor was unable to return and complete the installation due to scheduling problems and lack of funds to cover additional costs.

The new system has failed to live up to our expectations todate. The repeater at Whale Mountain has failed several times and the base station has failed once. We are optimistic that the bugs will be worked out this year and installation completed on the second repeater site.



A Bell 206 helicopter transported the radio repeater shelters to the mountain top.

REH

6. Computer Systems

The Data General 10 SP Computer system purchased in 1986 continues to serve the refuges administrative needs well. In January, WordPerfect Word Processing was added to the system. Most word processing is now done in WordPerfect. The old CEO is being phased out. Financial Tracking was done in prior years on the Data General with a program developed by Information Resource Management.

In November, the refuges were instructed in a new financial tracking system using Lotus 1-2-3 on Personal Computers. The new budget tracking system was developed by Yukon Delta Refuge and adopted for use by the Region. In December the new budget tracking system went into effect and all stations now track their budgets via this method.

The Epic AT personal computer that was received in September 1987, has now become an administrative use computer. Research into the best type of computer for use in the biological program will be done and a new computer for the biological program will be ordered.

8. Other

In November 1987, two of the old house trailers were transferred to the National Park Service in King Salmon. The trailers were moved in April 1988. These were 1975 vintage trailers and were transferred to Fish and Wildlife Service from the Federal Emergency Management Agency in Fairbanks. The third trailer was retained on station for use as a Fishery Assistance Office annex. All units were beginning to deteriorate rapidly and it was sure nice to move all occupants into the new residences.



National Park Service moving trailers.

DDM

J. OTHER ITEMS

2. Other Economic Uses

In addition to 61 Special Use Permits issued for cabins, guides, outfitters and transporters, eight (8) Permits were issued for other uses (Table 38). Only one of the eight permits was issued for other economic uses. Several permits have required site specific Compatibility Determinations and Section 810 (Lands Act) evaluations.

Table 38. Special use permits issued for other economic use, etc.

Year	Other Economic Uses		Sub Total	Non-Economic Uses			Sub Total	Total
	Oil/Gas	Mineral		Federal	State	Other		
1984	9	1	10	4	2	1	7	17
1985	5	1	6	3	2		5	11
1986		1	1	2	2	1	5	6
1987	1	1	2	4	1		5	7
1988	1		1	5	1	1	7	8

3. Items of Interest

Refuge Contaminant Issues of Concern

During 1988, two contaminants studies for Alaska Peninsula/Becharof refuges were funded (see Section D.5.). These studies proved to carry a paperwork burden that nearly broke the staff's back. The impact to the refuge workload far exceeded the small amount of funds that were received. For each study we produced:

- Draft General Study Plan
- Final General Study Plan
- Draft Supplemental Study Plan
- Final Supplemental Study Plan
- Draft Sample Catalog
- Final Sample Catalog

The long review/approval process made it seem that we would never complete the process. But we endeavored to persevere -- and successfully completed the year's work!

A summary of each study follows.

Becharof - Abandoned Oil Exploration Wells. A total of 26 oil and gas wells have been drilled on the Alaska Peninsula since the turn of the century. Ten of these exploratory wells were drilled within the area of the Becharof Refuge and five within the area of Alaska Peninsula Refuge. To date, no commercial quantities of oil have been reported. A brief history of this interest in the search for oil and gas on the Alaska Peninsula can be found in the Oil and Gas Assessment, Alaska Peninsula/Becharof National Wildlife Refuges compiled by the Bureau of Land Management.

This study was the first opportunity for refuge staff to conduct onsite inspections of these oil exploration well sites. Figure 18 shows the locations inspected. They are summarized as follows:

Location 1 - A series of oil exploration wells completed in 1903-1904. No samples were taken.



Rod Jackson stands on pile of coal used to fire boiler
on a well drilled in 1904.

REH

Location 2 - A series of wells completed in 1923 to 1926. One collapsed building containing an estimated 8 tons of hardened sacks of drill mud components was found. Composite soil samples for metals analysis were collected near an accumulation of rusted barrels.



Rod Jackson mixes a composite sample taken from a drainage of the upper oil camp area.

REH



We estimated eight tons of drill mud was stored in this storage building.

REH



Randy Arment takes a soil sample adjacent and downslope from the drill mud storage building. REH

Location 3 - An oil well completed in 1950. At support facilities located on Jute Bay, two potential sources of contaminants were discovered. Both were in collapsed buildings. The first was a very deteriorated pile of hardened drill mud components. The second was a six-inch deep deposit that resembled bentonite. Composite samples for metals analysis were collected. Also taken was a sample of the suspected contaminant source.



Bentonite deposit on Jute Bay in Becharof Wilderness Area.
REH

Location 4 - An oil well completed in 1959. A land fill was discovered at the well site that appeared to have drill mud components, 55-gallon drums, and other trash eroding out the banks of a small creek. Composite sediment samples for organic and metals analyses were collected.



Well site on Bear Creek in Becharof Wilderness Area. REH



Drill mud and plastic eroding out from side of well pad. REH

Location 5 - This is Kanatak Village. It was the support base for oil exploration in the 1920's. Two potential contaminant sources were discovered. The remains of a building with very deteriorated sacks of hardened drill mud components were found. A sample of the suspect contaminant source and composite soil sample for metals analysis were collected. Five drums (assumed to have contained crude oil) were discovered nearby. Grab samples of soil were collected for organic and metals analyses along with a sample of the suspect contaminant source.



Sacks of drill mud. Kanatak Village remains are in the background
REH



Barrels of crude oil have left their mark.
REH

Location 6 - An oil well that was completed in 1953. No samples were taken.



A drake green-winged teal sits on a 55-gallon drum within a pit left by oil exploration effort on Wide Bay. REH

Major "Take Pride" cleanup needs identified were a large number of 55-gallon drums at Kanatak, a stock-pile of hundreds of 55-gallon drums at Jute Bay, and many culverts washed out of the road hed to the Bear Creek well site.



A pile of 55-gallon drums left behind by oil company. The salt air is removing this eyesore; but why was it left here in the first place?
REH



A 1959 drilling effort left a road with numerous culverts to be washed out.
REH



More culverts.

REH

The historic findings of the study are fascinating. The remains of two drilling rigs and support camps from the 1903-1904 time period were found. A complete oil camp from the 1923-1926 era with two rigs was found on Ugashik Creek. A grave site marker for a man killed in the drilling of an oil well on Salmon Creek was dated 1938. The refuges contain a complete history of oil exploration drilling activities in Alaska



J.H. Costello #1 completed in 1903 is located in the Becharof Wilderness Area.

REH



Helicopter pilot Ken Butters checks out the artifacts. REH



An unknown well site found in the headwaters of Becharof Creek, circa 1904. REH



Ugashik Caldera viewed from oil camp developed in mid-1920's
on Ugashik Creek. REH



Standard Oil of California well (Lee No. 1) completed
in 1926. REH



Drilling tower from Tidewater Associated Oil Company well (Finnegan No. 1) completed in 1923.

REH

The samples taken during the study are currently being analyzed by the Geochemical and Environmental Research Group, Texas A & M University, College Station, Texas.

Alaska Peninsula - Upper Braided Creek. The Lands Act established the Alaska Peninsula National Wildlife Refuge in 1980. A major purpose for which the refuge was established is to ensure water quality within the refuge.

Valid mining claims for hard rock mining of gold, zinc, silver and lead in the upper Braided Creek of the Meshik River drainage, Chignik Unit, are expected to be placed in production within the next 5 to 10 years (Figure 19). This study was designed to provide background information on selected water quality parameters. The resulting data will expedite the evaluation of possible impacts of this planned mining operation on water quality of Braided Creek. A control system was included.

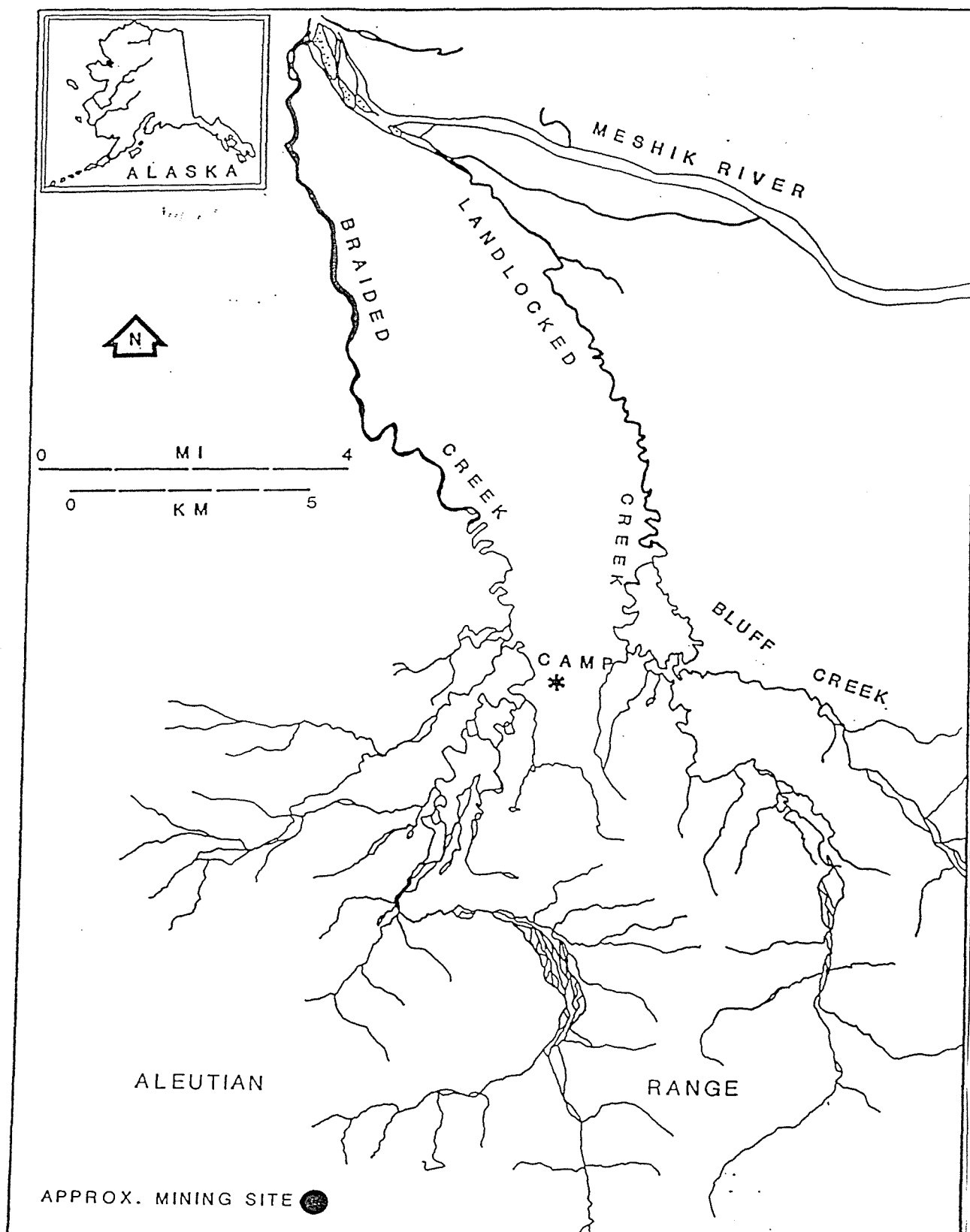


Figure 19. Study area.

All samples were collected between August 2nd and August 4th. At each sampling station, water grab samples were taken using 250 ml acid-rinsed polyethylene bottles. Concentrated nitric acid was added to reduce the sample ph to 2.0 or less. All dissolved metal samples were filtered through a 0.45 micron paper filter. Sediment samples were taken with a bottom sampler and were transferred to acid-rinsed polyethylene jars. Sediment bottles were kept cool and shaded in the field, and were frozen upon return from the field. Water samples were kept cool and were shaded and then refrigerated.

Samples have been forwarded to an approved laboratory for analyzing.

Other Items

During the year aviation mishaps occurred with the vicinity of the refuges which were reported to the Federal Aviation Administration. This includes mishaps reported by certified air taxi operators. It should be noted that many accidents/incidents occurring within the refuges are never reported. A brief summary is included for each mishap.

- On January 30th, A PA-32 operated by Peninsula Airways crashed on the Alaska Peninsula near Trader Mountain, southwest of Nelson Lagoon. The aircraft broke apart and was completely destroyed. The pilot received only minor injuries.
- On March 14th a DeHaviland Beaver crashed while attempting to take off from Nelson Lagoon strip during a stiff gusty crosswind. The aircraft was substantially damaged, however Sam "the produce man" was unhurt.
- On May 9th, a Peninsula Airways Cessna 180 went over on its nose while attempting a landing at a guide camp in the Becharof Wilderness area. With their short, soft landing sites, guide camps within the Alaska Peninsula/Becharof refuges are reliably accessible only by supercub.
- On May 18th a Peninsula Airways aircraft was substantially damaged during a take off attempt at Cinder River. The plane went over a slight drop-off at the end of a soft strip. No injuries were reported.
- On the first of July refuge permittee Mike Cusack's King Salmon Lodge was reported to have dumped a DeHaviland Beaver on floats in the King Salmon River. The accident occurred where the river crosses the refuge boundary, 12 miles east of Mother Goose Lake. No injuries were reported, however, the aircraft was substantially damaged.
- At approximately 3:45 p.m. on Saturday, August 13th, Chief Ranger Steve Hurd of Katmai National Park Service contacted Assistant Refuge Manager/Pilot Arment expressing his concern for Park Superintendent/Pilot Bane since he was overdue on his flight plan. Hurd and Arment took off to search for Bane about 4:30 p.m. The wide ranging satellite hits and signals picked up by various aircraft, showed the new Christen Husky to be anywhere between Iliamna Lake to the north, Becharof Lake to the south, the Pacific coast to the east and Bristol Bay to the west. As a result, Hurd and Arment decided to work the distress signal as one might do when tracking a radio

collared bear near the Aleutian Range. As it turned out, this technique permitted Hurd and Arment to locate the Husky crew within 45 minutes of initiating the procedure. Of the other four spotter planes in the air at the time of the find, the closest one was over 25 miles away and not headed in the right direction. The air taxi pilot did not know which direction the distress signal was coming from due to the rugged terrain. The Husky was on its back; however both Bane and his crew member were okay. The agencies involved are to be commended for a job well done.

- Search and Rescue assistance was requested by the Coast Guard and Alaska State Troopers on September 17th to search for an overdue Branch River Air Service Beaver (N67207). The Coast Guard located the downed aircraft on Ruth Lake. Assistant Refuge Manager/Pilot Payne and Deputy Refuge Manager Savery responded to the scene with medical gear. Fortunately, there were no injuries other than a bump to a head and a very bruised ego for the pilot. The pilot was transported back to King Salmon. The aircraft was a total loss.



The remains of Branch River Air Service Beaver N67207.
Ron and Jim flew in this aircraft the day before it crashed!

JFP

- Search and Rescue assistance was requested again on September 13th by the State Troopers to assist in searching for a supercub alleged to be down in the Kujulik River valley. The area was searched, no emergency locator transmitter was received and no aircraft was found. Apparently, the supercub was repaired and flown out of the area.

On April 6th, Assistant Refuge Manager/Pilot Payne presented a program on aircraft use on refuges. The presentation was made to about 25 area pilots and was part of the Federal Aviation Administration sponsored safety seminar.

Assistant Refuge Manager/Pilot Payne attended a going away dinner for SMSgt. Danny Buckner, U.S. Air Force, on April 23rd. Danny was chairman and founder of the King Salmon Air Force Station Wildlife Ethics Monitor Committee. Danny was presented with a letter of recognition from the Alaska Peninsula/Becharof Refuges.

Assistant Refuge Manager/Pilot Payne was detailed to Tetlin Refuge from May 15th through the 25th. Payne ferried Tetlin's new supercub (3685Z) to Tok and spent 10 days flying wolf surveys.

On June 16th the refuge provided an aerial tour of portions of Katmai National Park, Becharof Refuge, Alaska Peninsula Refuge and Bristol Bay lowlands for Robi Robinson, Regional Director for U.S. Environmental Protection Agency and Al Ewing, Alaska Operation Office. Potential contaminants problems were identified and discussed. Examples used were the Becharof oil exploration wells study and the Kanatak Road proposal.

A film crew from KYVE-TV (Washington) visited the Bear's Den Lodge at Ugashik Outlet during the week of August 21st. The crew was filming for the television series "Northwest Outdoors". The film crew recorded creel census work, by Biological Technician Savage and Student Conservation Association volunteer Hanks. The crew also visited Lenora Creek on Lower Ugashik Lake on the Alaska Peninsula Refuge.

Refuge Manager Hood and Assistant Refuge Manager/Pilot Payne maintained an all night watch on October 21st when Susan Cantor of the Cinder River Lagoon camp was stranded in the Cinder Lagoon with both motors on her boat inoperative. Night was setting in and there was a major out-going tide threatening to carry her into Bristol Bay. After notifying the Coast Guard, Hood and Payne remained by the HF radio and were ready to provide a relay for assistance. Fortunately, the north winds kept Susan out of the main tidal surges and after 13 hours she was able to get to shore; cold, but otherwise okay.

4. Credits

Arment	Sections B.; E. 2.; H. 20., 21.; J. 2., and editing.
Collins	Sections E. 8.; I. 6., typing, editing and compiling.
Hood	Introduction, Sections A., C., D., E. 1., 4., 5., and 7.; F.; G. 3, 7, 8, 9, 11, and 16.; H. 15.; I. 5.; J. 3.; K. and editing.
Mumma	Section H. 8, and 10.; data compiling, and picture placement.
Payne	Sections C. 1.; E. 3. and 6.; G. 8.; and H. 1., 6., 9., 17., and 22.
Savery	Section I. 1, 2, 3, 4, and 8.
King Salmon Fishery Assistance Office	Section G. 11.

Photograph credits.

CRA	C. Randall Arment
JEF	James E. Finn
REH	Ronald E. Hood
DDM	Dwight D. Mumma
JFP	John F. Payne
SES	Susan E. Savage
EJS	Elton "Jim" Savery
RJW	Randall J. Wilk
FRS	Fishery Assistance Office
FWS	Photographer unknown

K. FEEDBACK

There are moments that make all the hassel of life disappear -- and provide some understanding of what we are trying to accomplish!

SES